HIV MEDICINE

Published on behalf of the British HIV Association and the European AIDS Clinical Society

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Contents

Oral Abstracts

O1

Antiretroviral treatment uptake and outcomes in heterosexual people living with HIV in the United Kingdom according to ethnic group

R Dhairyawan[1], H Okhai[2], T Hill[2] and C Sabin[2,3]

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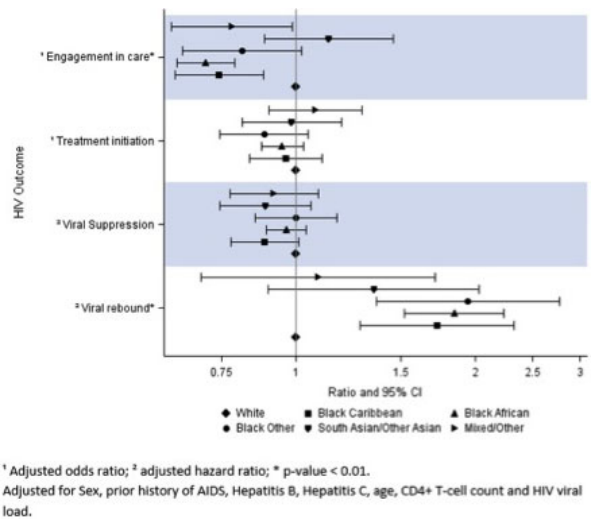
Background: We investigated differences in engagement-in-HIV-care, treatment uptake and outcomes by ethnic group in heterosexual men and women in the UK Collaborative HIV Cohort Study (UK CHIC).
Method: Heterosexuals aged ≥16 years with known ethnicity and ≥1 day follow up from 2000 to 2017 were included. Black, Asian and minority ethnic (BAME) men and women were categorised as Black African, Black Caribbean, Black Other, South Asian/Other Asian and Other/Mixed. Models were built using logistic/Cox Proportional hazard regression (as appropriate) to assess four HIV outcomes: engagement-in-care (using the REACH algorithm), combination antiretroviral therapy (cART) initiation, viral suppression (<50 copies/ml) and viral rebound (two consecutive viral loads > 50 copies/ml), after adjustment for age, sex, prior AIDS, Hepatitis B/C, CD4 + T-cell count and HIV viral load.
Results: Of 12,302 eligible heterosexuals (median age: 37 (interquartile range: 31–44) years), around half (52.5%) were women and 80.9% BAME; 7,919 (64.4%) Black African, 773 (6.3%) Black Caribbean, 449 (3.6%) Black Other, 401 (3.3%) South Asian/Other Asian and 415 (3.45) Other/Mixed. White subjects had a higher median CD4 count at enrolment than the BAME groups (380 vs. 248–287 cells/mm^3). Participants were followed for a total of 85,846 person-years, and were engaged-in-care for 79.6% of that time. 8,867 subjects started cART, of whom 79.1% achieved viral suppression within 12 months. After adjustment, there were no differences between ethnic groups in cART initiation or viral suppression (Figure O1.1). Black and Other/Mixed groups were less likely to be engaged-in-care compared with the White group (adjusted odds ratios: Black African: 0.70 (95% confidence interval 0.63–0.79), Black Caribbean: 0.74 (0.63–0.88), Other/Mixed: 0.78 (0.62–0.98), Black Other: 0.81 (0.64–1.02)). A fifth (22.2%) of those virally suppressed experienced virological failure. All BAME groups were more likely to experience virological failure than White subjects (Black Other: 1.95 (1.37–2.77), Black African: 1.85 (1.52–2.24), Black Caribbean: 1.73 (1.28–2.33), South Asian/Other Asian: 1.35 (0.90–2.03), Other/Mixed: 1.09 (0.69–1.71).
Conclusion: Although we found no difference in treatment uptake or time to viral suppression by ethnic group in heterosexual men and women in UK CHIC, there are disparities in engagement-in-care and viral rebound, which warrant further investigation.



¹ Adjusted odds ratio; ² adjusted hazard ratio; * p-value < 0.01.
Adjusted for Sex, prior history of AIDS, Hepatitis B, Hepatitis C, age, CD4+ T-cell count and HIV viral load.

Figure O1.1. Adjusted ratios for HIV outcomes amongst heterosexual individuals in UK CHIC by ethnic group.

O2

The impact of pregnancy on engagement of care (EIC) of women living with HIV in the UK CHIC Study

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Background: Previous research has shown one in eight women with HIV in England, Wales and Northern Ireland did not return for HIV care in the year after pregnancy; poor clinic attendance postpartum may negatively impact the long-term health of women and their families. We explored EIC in the periods before, during and after pregnancy among women in the UK CHIC study and the National Surveillance of HIV in Pregnancy and Childhood (NSHPC).
Method: The first recorded pregnancy was selected where women had a live, full-term birth recorded between 2000 and 2017 in the linked UK CHIC/NSHPC dataset and had 12 months follow-up both pre-pregnancy (calculated from estimated delivery date) and post-pregnancy (calculated from delivery date). The Retention and Engagement Across Care services for HIV (REACH) algorithm was used to determine EIC, with follow-up time split into three periods (pre-, during and post-pregnancy). We investigated whether EIC differed across the periods using logistic regression, with adjustment for ethnicity, calendar year, AIDS, Hepatitis B/C, initiation of combination antiretroviral therapy (cART), CD4 count and HIV viral load.
Results: 2,009 women (median age 32 (interquartile range: 28–36) years), 82.1% black, 12.2% white, 5.7 other) had a median CD4 count of 490 (360–645) cells/mm^3 prior to their pregnancy. Almost three-quarters (1,447, 72.0%) had initiated cART (median 3.3 (1.8–5.4) years before pregnancy) and 57.1% were virally suppressed before pregnancy. Over the three periods, the proportion with a CD4 count > 500 cells/mm^3 (46.0%, 43.6% and 54.1%, respectively) and the proportion of time spent with virological suppression (62.0%, 68.0% and 76.0%) both increased. The proportion of time spent EIC in the three periods was 77.0%, 89.8% and 84.6%. In adjusted analyses, women had a lower odds of EIC both pre- (adjusted odds ratio 0.35 [95% confidence interval 0.30–0.39]) and post- (0.42 [0.36–0.47]) pregnancy compared to during pregnancy.
Conclusion: EIC rates are highest during pregnancy; whilst EIC is lower post-pregnancy, rates remain higher than those in the year pre-pregnancy. Our findings suggest that pregnancy is a key opportunity to engage women in long-term HIV care, but underscore the importance of continued support for EIC in all women regardless of pregnancy status.

O3

Breastfeeding and women with HIV living in the UK: BHIVA guidelines and real world experience

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Background: The NSHPC holds data for 135 women living with HIV (WLWH) who have breast fed with medical support (2012–2019). Since 2015 we have supported 19 WLWH to breastfeed their babies; 15% of the national total. We use the BHIVA guidelines and patient information leaflets to inform our patients and try to support women's choices while endeavouring to protect their infants from risk of exposure to HIV. Over time we have gained experience but have found a few areas where regular deviation from the guidelines has occurred.
Method: Case note review.
Results: 21 babies have commenced breast feeding, 1 set of twins, 1 mother feeding 2 babies in subsequent pregnancies. Duration of feeding was 6 months or less for 17 babies, but more than 6 months for 4 babies (19%). These 4 babies have had solids introduced by 6 months and continued breast milk and first foods. Despite best attempts infant testing has been performed less often than the recommended monthly intervals.Maternal monitoring was also at longer than 1 month intervals.In 1 case a maternal viral load blip was detected and the mother informed and stopped breast feeding within 48 hours of the test. 2 infants had significant "failure to thrive" while breast feeding but rapidly gained weight on switching to formula.Several infants are currently breastfed or still within the testing window and to date no transmissions have occurred in this cohort or in any formula fed baby delivered in our unit over the same time period.
Conclusion: BHIVA guidelines continue to recommend formula feeding for infants born to HIV positive mothers due to lack of data about the risk of HIV transmission via breast milk in high income countries. Data does exist from low to middle income countries and some understanding of the maternal and infant factors that increase risk. We have found that women want the opportunity to make an informed choice; most of those who have breast fed finding this a very positive experience.

O4

Follow-up status of HIV exposed infants in the UK 2012–2019

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Background: The current vertical HIV transmission (VT) rate is < 0.3% among diagnosed women living with HIV (WLHIV) in the UK; this rate excludes a few children whose status remains unknown for various reasons. BHIVA guidelines state that all HIV-exposed infants should be tested at age ≤ 48 hours, 6 and 12 weeks with antibody testing for seroreversion at age 18–24 months ('18–24 Ab'). Even if earlier PCR tests are negative, the 18–24Ab remains important as postnatal transmission may occur.
Method: The Integrated Screening Outcomes Surveillance Service (ISOSS) conducts UK population-level surveillance of all pregnancies in WLWH, their children, plus any children diagnosed < 16 years. All HIV-exposed children are followed-up until 18–24 months to determine infection status. Reports are triangulated with laboratory reports from PHE. We report the follow-up status of 6547 HIV-exposed children born 2012–2018, reported by December 2019.
Results: Overall, 4860 (74%) children were confirmed uninfected based on a negative 18–24Ab; 861 (13%) are indeterminate and in follow-up; 27 (0.4%) were confirmed infected. 370 (5.7%) infants were lost-to-follow-up before 18–24Ab established (59/370 gone abroad); 26 (0.4%) died before infection status established; in 5 cases follow-up testing was declined; 14 had follow-up testing carried out in primary care (not covered by ISOSS reporting).
313/6547 (5%) infants were discharged based on negative antibody at < 18 months, including 24 with negative antibody at <12 months (min: 3 months). 71 infants were discharged based on negative PCRs only; 11 discharged at <12 months and 40 at <18 months. Of the 370 infants lost-to-follow-up with unknown infection status, 67 (18%) had only a birth PCR test (16 gone abroad).
Conclusion: Despite well-established guidelines and pathways for follow-up of HIV-exposed infants in the UK, there remains some variation in practice and deviation from BHIVA guidelines, with 6% of infants being discharged without 18–24 Ab testing. Some of the VTs reported to ISOSS have been identified through 18–24 Ab testing with negative PCRs after birth. Vigilance is required regarding potential postnatal transmission, especially in the era of supported breastfeeding in the UK. ISOSS are uniquely placed to monitor outcomes and practice across units and regions, and will continue to provide robust data to support and promote guidelines.

O5

Does the menopause have an impact on virological outcomes and engagement in care (EIC) in UK CHIC participants?

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Background: Research suggests that menopausal symptoms are associated with sub-optimal antiretroviral therapy (ART) adherence and EIC. We investigate whether menopausal stage (using age as a proxy) is associated with EIC and/or virological outcomes among women in UK CHIC.
Method: Women acquiring HIV through heterosexual sex with > 1 day of follow-up and entering the cohort after 1/1/2000, were grouped by age (<40, 40–50, >50 years), broadly corresponding to pre-, peri- and post-menopausal stages. EIC (derived from the Retention and Engagement Across Care services for HIV (REACH) algorithm), HIV viral load (VL) suppression (<50 copies/ml) and rebound (two consecutive VL > 50 copies/ml) after starting ART were compared across age groups using logistic/Cox proportional hazards regression, adjusting for ethnicity, calendar year, AIDS, Hepatitis B/C, CD4 count and VL.
Results: The 6,455 eligible women (median age 36 [Interquartile range, IQR: 29–42], 64.4% black African, 19.1% white, 6.3% black Caribbean, 3.7% black other, 3.4% mixed/other and 3.0% south Asian/other Asian) contributed 44,226 person-years (PYRS) of follow-up; 29,846, 10,980 and 3,399 PYRS in those aged < 40, 40–50 and > 50 respectively. Median [IQR] CD4 count was 444 [304–611], 503 [347–690] and 544 [372–744] cells/mm^3 in the three age groups. Overall, women had EIC for 79.5% of follow-up time; 3,344 (78.0%) experienced virological suppression within 12 months of ART and 739 (22.1%) experienced VL rebound. Crude VL suppression (75.8%, 82.1%, 78.9%) and EIC (73.6%, 83.0%, 86.0%) increased with age, although after adjustment, women aged > 50 years had lower EIC than those aged < 40 years (adjusted odds ratio 0.87 [0.78–0.96]). Women aged 40–50 were more likely to have VL suppression (1.25 [1.14–1.37]) and less likely to experience VL rebound (0.82 [0.68–0.98]) than those aged < 40 years.
Conclusion: Peri-menopausal age (40–50) was associated with greater VL suppression and less frequent VL rebound among women. However, post-menopausal age (>50) was associated with reduced EIC. This analysis suggests that women of peri- and post-menopausal age are adherent to ART but may need support to remain in care as they age. Further comparisons of these trends with men are needed to ascertain whether this pattern is specific to women.

O6

Measuring healthcare HIV knowledge within our NHS Trust

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Background: The Positive Voices and Stigma Index UK surveys (2017) demonstrated that HIV-related stigma within healthcare settings remains a significant concern for people living with HIV (PLHIV) and can lead to treatment avoidance. We aimed to assess the HIV knowledge of professionals in our Trust.
Method: A paper questionnaire exploring knowledge of HIV and attitudes towards PLHIV was distributed to staff on adult medical and surgical wards at

three hospitals within our Trust on three separate days between December 2019 - January 2020. Data was analysed using Minitab 18.
Results: 411 questionnaires were completed. Demographics are shown in Table O6.1. Eighty percent had not heard of U=U and 38% felt at risk of acquiring HIV when treating PLHIV. Almost half (47%) felt they may get HIV from a needle-stick injury from a patient with an undetectable viral load. Three quarters (76%) were not confident discussing HIV with patients. The majority (62%) were aware of pre-exposure prophylaxis (PrEP) and post-exposure prophylaxis (PEP), but 45% believed that PrEPshould be used after a needle-stick injury. A third (35%) thought that women living with HIV would pass HIV on to their children, even if they had an undetectable viral load. A quarter (25%) would consider isolating patients in side-rooms and 52% thought PLHIV should be placed at the end of operating lists because they had HIV. Most (82%) requested further information and training on HIV (Figure O6.1).

Table O6.1. Demographics (n=411)

Age Group	Count (%)
18–29	136 (33.1%)
30–39	122 (29.7%)
40–49	86 (20.9%)
50–60	55 (13.4%)
≥60	12 (2.9%)
Sexual (n=411)	
Heterosexual	374 (91%)
MSM*	19 (4.7%)
Bisexual	15 (3.65%)
WSW-	3 (0.65)
Ethnicity (n=411)	
White	150 (36.5%)
Black	119 (28.9%)
Asian	110 (26.8%)
Any other ethnicity	32 (7.8%)

*Men who have sex with men
-Women who have sex with other women

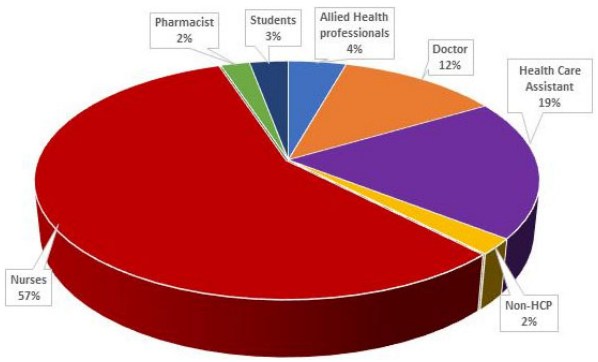

Figure O6.1. Pie chart showing occupation of participants in the U=U survey

Conclusion: Reducing HIV-related stigma is a vital component of HIV prevention and care. Our results show that knowledge of HIV transmission, U=U and prevention is low amongst professionals in our Trust.Worryingly many still believe PLHIV need to be isolated in side-rooms and put last on operating lists due to HIV. However, most are keen for more HIV education and we plan a programme to address this.

O7

Digital health solutions in HIV: supporting a reduced visit pathway of care for people living with medically stable HIV in a UK centre

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Background: Digital health options provide an opportunity to think differently about outpatient services that we provide to people living with HIV. Data are presented from a UK centre participating in a European project which has been evaluating reduced visit follow-up for people living with medically stable HIV.
Method: Following an initial background assessment, a digital pathway of care was co-designed with community & clinicians. Potential participants [age > 18; owning smart phone; stable HIV (based on WHO criteria)] were invited to see their clinician annually, with interim results (6 & 18 months) checked, encrypted and pushed securely to their mobile device alongside appointment, medication and other information. Data are reported on uptake; clinical outcomes; SAEs; patient activation (PAM-13); quality of life (EQ5D5L, PROQOL-HIV); system usability (SUS) & patient reported experience.
Results: Co-design and stakeholder involvement were key to the successful integration of the platform into the clinic informatics system and introduction of the mHealth pathway in this setting.
565 individuals enrolled at the UK site between April 2017 & October 2018, representing 24.2%(565/2338) of the clinic cohort: 523/565(92.6%) male; median age 47(IQR39–53); 480/565(85%) Caucasian; 483/565(85.5%) MSM; 163/565(28.8%) non-national. Viral load remained undetectable in 523/525 (99.6%) at 12 months; 174/175(99.4%) at 24 months. No SAEs related to the pathway were reported. Participants were followed up for between 12–30 months: during this time 75/565(13.3%) either returned to routine follow up [47/565] or moved away from the area [28/565]. Patient activation was high: PAM-13 median continuous score 70.2 (IQR58.1–80.9); 473/540(87.6%) at level 3/4 at baseline; with no significant change at 12/24 months. Whilst QOL scored highly - EQ5D5L median index score 0.973 (IQR 0.86–1.00) – 1/3rd reported some problems with pain/discomfort; 41% with anxiety/depression at baseline. Median scores for PROQOL-HIV domains are shown in Table O7.1: stigma scores the lowest; no significant change at 12/24 months. Usability rating was excellent: median SUS score 80%. 93.9% would recommend to a friend.
Conclusion: This digital pathway is a feasible and acceptable option in the menu of care for people living with medically stable HIV. Clinical outcomes remained excellent and QOL measures were stable in this population.

Table O7.1. PROQOL-HIV domains

PROQOL-HIV domains	n	Median	(IQR)
Physical Health and Symptoms	530	83.3	(66.7–97.2)
Body Change	537	87.5	(68.8–100.0)
Social Relationships	545	100.0	(75.0–100.0)
Intimate Relationships	537	83.3	(50.0–100.0)
Stigma	540	75.0	(50.0–100.0)
Emotional Distress	542	93.8	(68.8–100.0)
Health Concerns	547	81.3	(62.5–100.0)
Treatment Impact	529	92.5	(85.0–97.5)

General Health (n=523): very good 251 (48.0%); good 188 (35.9%); fair 67 (12.8%); poor 16 (3.2%); very poor 1 (0.2%)

O8

POSITIVE OUTCOMES: properties of a novel brief tool to measure and improve person-centred outcomes in routine HIV care

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Background: The proposed 4th"90" of the UNAIDS target to end the epidemic focuses on quality of life, in line with WHO and UNAIDS strategies to reorient care towards "person-centredness". Patient-reported outcome measures (PROMs) in routine practice improve patient/clinician communication, understanding of patient problems, empower patients, and improve management of problems. UKCAB and BHIVA developed an HIV-specific PROM ("POSITIVE OUTCOMES") for routine use, with established face and content validity, and refined it following cognitive interviewing. This study aimed to determine its psychometric properties among outpatient participants of the EmERGE study in Belgium, Croatia, Portugal, Spain and UK.
Method: Participants self-completed POSITIVE OUTCOMES yearly. Self-report data were linked to patient electronic records. The analysis plan followed the COSMIN guidance for development and validation of PROMs, conducted on N=1,392 who completed one timepoint and n=313/1392 (22.5%) who completed a second timepoint.
Results: Sample was 92.4% male, median age 45 years (IQR 38–52), median CD4 741 (577–925). 2.3% of items were missing. Most severe problems (>10% scored worst 2 response levels on 5 point Likert scale, i.e. "severe" or "overwhelming") were worry (17.4%), sexual intimacy (14.1%), money (14.0%), safety in relationship (12.8%), sexual health (12.3%), sleep (11.2%), anxiety (11.1%) and ability to perform usual activities (10.9%). Tool properties were as follows: 1) Exploratory factor analysis revealed a 5 factor structure: a) psychosocial wellbeing, b) interpersonal relationships, c) social security, d) physical symptoms, e) stability; 2) Internal consistency was good for the total score (Cronbach's alpha 0.88) and was above 0.7 for 4/5 subscales. 3) Test-retest reliability was demonstrated for an unchanged population (i.e. undetectable VLand no change in frailty status between measurements n=130) with median POSITIVE OUTCOMES score change = 0 (IQR -0.18, 0.18). 4) Discriminant validity using logistic regression on known comparison groups found a point increase in mean POSITIVE OUTCOMES score increased odds of being frail/pre-frail 5.1-fold ($p<0.001$). 5) For construct validity, POSITIVE OUTCOMES was moderately negatively correlated to PROQOL-HIV (Spearman's rho = −0.45).
Conclusion: POSITIVE OUTCOMES was developed with UK community and clinicians, and has proven properties for routine use. Implementation strategies must now be developed for UK and other European countries.

O9

Increasing access to peer-support for people living with HIV in the UK: an evaluation of 'Project 100'

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Background: Despite NHS England and the British HIV Association acknowledging the importance of peer-support within the care pathway of people living with HIV, 43% of those in need of peer-support were not accessing services in 2017. We aimed to evaluate how a 4-year national peer-support programme helped build capacity and increase access to peer-support among the HIV community across the UK.
Method: PositivelyUK '2015–2019 Project 100' provided a 3-day standardised peer-mentoring training, access to accredited qualifications in peer-support and HIV treatment literacy, alongside organisational and operational support, policies and protocols to community HIV organisations and specialist clinics, on how best to implement peer support in line with national standards for peer support in HIV. We used a mixed-method approach, including clinic and programmatic questionnaires, focus group discussions and separate semi-structured telephone interviews to collect qualitative and quantitative data on the success of capacity building and strong partnership while identifying potential barriers to implementation.
Results: PositivelyUK provided training, financial and logistical support and leadership to > 100 clinical and voluntary sector partners across the country. 42 peer-mentoring training events were delivered to a total 700 adult volunteers living with HIV, building knowledge, skills and confidence to deliver peer-support sessions and develop life skills. 81 and 13 peer-mentors completed the OCN level 2 qualification in peer-mentoring and HIV treatment literacy, respectively, and 20 peer-mentors trained as 'Project 100' trainers. In addition to recruiting, managing and supervising peer-mentors, project coordinators at partner agencies were responsible for seeking referrals, assessing the needs of mentees, matching mentees with suitable peer-mentors, and producing local evaluation reports and funding proposals. 93 coordinators participated in network meetings, sharing experiences, learning from and supporting each other.
The main challenges included defining accountability and ownership of peer-mentors, and the difficulties of maintaining a pool of trained peer-mentors, securing long-term funding at agency-level and getting engagement and referrals from clinical services, although some HIV clinics directly supported volunteer peer-mentors.
Conclusion: 'Project 100's standardised and accredited training brought structure and consistency to the provision and delivery of peer-support at national level, creating an enduring legacy by increasing capacity, access to volunteer peer-mentors and regional partnership work.

O10

Late diagnosis and a lack of engagement with care and treatment are still causing deaths among HIV patients in London

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Background: As part of the Fast Track Cities initiative (FTCi), London set a target of zero HIV-related preventable deaths. We describe deaths among patients registered at HIV clinics in London over a three-year period (2016–2018).
Method: London Trusts commissioned by NHS England to provide HIV care have been invited to report data on deaths among adult HIV patients (aged ≥ 15) for the past five years. Data have been submitted to Public Health England using a modified Causes of Death in HIV reporting form since 2017. Cause of death is categorised on an annual basis by an epidemiologist and two HIV clinicians.
Results: All 16 Trusts submitted data for the three years. Overall, 597 deaths were reported: 200 in 2016, 166 in 2017 and 231 in 2018. Corresponding mortality rates per 1,000 HIV patients were: 5.41 in 2016, 4.44 in 2017 and 6.30 in 2018. Most deaths were among men (76%; 454) and the median age of death was 53 years [IQR: 46–62] (similar across years). Cause of death was ascertained for 84% (501) of patients, increasing from 78% (155) in 2016 to 87% (201) in 2018. The distribution of cause of death was consistent across all

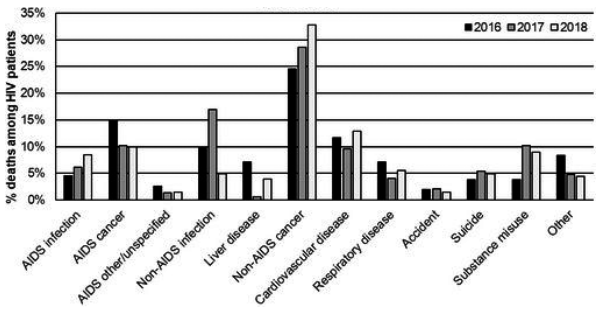

Figure O10.1. Distribution of cause of death among HIV patients in London 2016–2018

years (Figure O10.1); the most common cause of death was non-AIDS cancers (29%; 146) followed by: AIDS (20%; 100), cardiovascular disease (12%; 58), non-AIDS infections (10%; 50), substance misuse (8%; 39), accident/suicide (7%; 33), respiratory disease (6%; 28), liver disease (4%; 20) and other causes (6%; 29). Among the 101 people who died within a year of HIV diagnosis, 65% had a CD4 count < 350 cells/mm^3 and 39% had an AIDS-defining illness at diagnosis. Overall, treatment coverage and viral suppression (<200 copies/ml) at death were 82% (436) and 73% (421) respectively.
Conclusion: There has been little change in the clinical profile of HIV patients who died in recent years. One in five deaths were HIV-related and potentially preventable, as a result of late diagnosis and/or sub-optimal engagement with care and treatment. To meet the FTCi target on death, rapid scale-up of HIV testing is needed, alongside interventions to improve retention and promote the benefits of early ART and Undetectable=Untransmittable.

O11

Differential effects of HIV antiretrovirals on human coronary artery endothelial cells

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Background: People living with HIV (PLWH) are at increased risk of cardiovascular (CV) disease, which is driven in part by endothelial and platelet dysfunction. Some antiretrovirals such as abacavir sulphate (ABC) have been linked with an increased risk of myocardial infarction (MI).We hypothesise that ABC and tenofovir alafenamide (TAF) differentially affect human coronary artery endothelial cell function and endothelial-platelet crosstalk and thus have different CV risk profiles. Our objective was to measure inflammatory and thrombotic molecule expression in endothelial cells following ABC and TAF exposure, to determine effects on endothelial function and better understand mechanisms of increased CV risk for PLWH.
Method: Coronary artery endothelial cells (isolated from a 58 yr HIV-negative Caucasian male, sourced from PromoCell), were treated with plasma C_{max} concentrations of ABC or TAF for 2 days (90 min/day), stimulated with TNF-alpha to mimic inflammation and analysed by flow cytometry. Inflammation, pro-thrombotic and anti-thrombotic properties were evaluated by adhesion molecule (ICAM-1), tissue factor (TF) and ectonucleotidase expression, respectively. Endothelial-derived microparticles (EMP) were characterised, incubated with platelet-rich plasma for 30 min, and platelet activation was monitored by flow cytometry following ADP, collagen or thrombin receptor activating peptide (TRAP)-6 stimulation. Statistical significance was determined by one-way ANOVA with Tukey's multiple comparison test.
Results: ABC exposure enhanced TNF-alpha-induced ICAM-1 and TF expression compared to TAF (+2.7- and + 1.3-fold, p<0.05). ABC-treated cells also had lower anti-thrombotic ectonucleotidase expression compared to TAF (-1.3-fold, p<0.05). ABC treatment also increased numbers of ICAM-1$^+$ and TF$^+$ EMP compared to TAF (+2.4- and + 3.9-fold, p<0.05). Finally, EMP isolated from ABC-treated cells enhanced collagen-, but not ADP- or TRAP-6-evoked, platelet integrin activation (+1.9-fold, p<0.05) and alpha-granule release (+1.5-fold, p<0.05).
Conclusion: ABC and TAF differentially affect the inflammatory and thrombotic properties of human coronary artery endothelial cells. ABC augments inflammatory responses and endothelial-platelet crosstalk which may increase MI risk, whilst TAF presents a relatively cardio-protective profile via unaffected ectonucleotidase levels. Our results indicate that antiretroviral-mediated changes in endothelial function may contribute to increased CV risk amongst patients. Studies in PLWH and with various third agents are needed to determine the clinical significance of these suggested mechanisms of increased CV risk.

O12

Mitochondrial DNA damage and brain ageing in HIV

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Background: Neurocognitive impairment (NCI) remains common in people living with HIV (PLWH), despite suppressive anti-retroviral therapy (ART), but the reasons remain incompletely understood. Mitochondrial dysfunction is a hallmark of ageing and of neurodegenerative diseases. We hypothesised that HIV or ART may lead to mitochondrial abnormalities in brain thus contributing to NCI.
Method: We studied post-mortem frozen brain samples from 52 PLWH and 40 HIV negative controls. Cellular mitochondrial DNA (mtDNA) content and levels of large-scale mtDNA deletions were measured by real-time PCR. Heteroplasmic mtDNA point mutations were quantified by deep sequencing (Illumina). Neurocognitive data were taken within 6 months antemortem.
Results: We observed a decrease in mtDNA content, an increase in the mtDNA 'common deletion', and an increase in mtDNA point mutations with age (all p<0.05). Each of these changes was exacerbated in HIV positive cases compared with HIV negative controls (all p<0.05). ART exposures, including nucleoside analogue reverse transcriptase inhibitors, were not associated with changes in mtDNA. The number of mtDNA point mutations was associated low CD4/CD8 ratio (p 0.04) and with NCI (Global T-score, p 0.007).
Conclusion: In people with predominantly advanced HIV infection, there is exacerbation of age-associated mtDNA damage. This change is driven by HIV *per se* rather than by ART toxicity and may contribute to NCI. These data suggest that mitochondrial dysfunction may be a mediator of adverse ageing phenotypes in PLWH.

O13

Discontinuation of tenofovir alafenamide (TAF) containing antiretroviral therapy (ART) due to adverse drug reactions (ADRs): experience of four London HIV units

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Background: Following observations of people living with HIV (PLWH) discontinuing TAF containing ART due to ADRs, we present real world data on TAF use in four central London HIV units. Describing ADR-related discontinuation rates, influence of third agent and impact of TAF cessation on symptoms.
Method: Retrospective analysis of PLWH who switched from any non-TAF ART to TAF-based ART and subsequently discontinued TAF from 04/2016 to 08/2019 were included . The following data was collected: ART history, patient demographics, switch indication, short-term outcomes and reason for TAF discontinuation.
Results: 3960 PLWH were prescribed TAF-containing ART over the observed period. 211(5.3%) switched off TAF based ART. 120 (3%) switched off TAF due to reasons other than ADRs (did not meet NHS TAF criteria, transferred care)

	Reason for discontinuation – ADR category (n=91)									
	CNS (n=36)	GI (n=26)	Derm (n=7)	MSK (n=1)	Allergic Reaction (n=1)	Weight gain (n=6)	Blood Disorder (n=2)	Renal Decline (n=4)	Other (n=5)	Not doc (n=3)
Pre switch to TAF										
Backbone										
TDF/FTC	13	14	4	-	1	3	1	2	2	
ABC/3TC	11	5	2	-	-	3	-	-	1	
Third agent										
NNRTI	7	7	5	-	-	1	1	2	1	
INSTI	10	3	1	-	1	3	-	-	1	
PI	8	10	-	-	-	2	1		1	
PI dual/mono therapy	9	6	1	1	-	-	-	2	1	
Switch to TAF										
TAF replace TDF only	12	13	5	-	-	3	1	2	2	
No change to third agent	24	18	6	-	-	6	-	-	3	
TAF + change of third agent	11	3	1	1	1	-	-	2	2	
Mean duration of therapy (months)	4.8	5.5	10.4	1	0.5	15.5	2	10.25	8	
Post switch off TAF										
Symptoms resolved										
Fully/Partially	21	17	4	1	1	4	1	3	2	
Not resolved	5	2	2	-	-	1	-	-	-	
Not doc	10	7	1	-	-	1	1	1	3	

Table O13.1. Discontinuation of TAF containing ART due to ADR

and were excluded from the analysis. 91(2.3%) switched due to an ADR (Table O13.1) with a median age of 54 years, 62 (69%) were male, 62 (68%) white. At time of switch off TAF-containing ART, 86(94%) had a CD4 count > 350 cells/mm^3 and 80(87%) were virologically supressed (VL < 50 copies/ml).

Pre switch backbones were 47% TDF/FTC, 23% ABC/3TC and 22% were on protease inhibitor dual or mono therapy. Third agents: 45% PI, 25% NNRTI, 23% INSTI and 5.5% other. Indications for TAF: 42% CKD, 23% osteoporosis/osteopenia, 24% other and 9% not documented. Median time to TAF discontinuation was 12 weeks. For 43% of patients, the only change in ART was TDF to TAF and for 75% third agent was unchanged.

Symptoms either fully or partially resolved post switching off TAF for 55%, of whom 60% switched back to their pre-TAF ART.

Conclusion: Rate of discontinuation of TAF-containing ART was relatively low at 2.3%, but higher than described in clinical trials. Despite the limitations of a retrospective analysis, TAF side effects are becoming clearer from real world experience and should be taken into consideration in clinical practice.

O14

Respiratory symptoms and chronic bronchitis in people with HIV and demographically similar HIV-negative controls: prevalence and risk factors

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Background: Respiratory symptoms and chronic bronchitis (CB) have been reported in people with HIV (PWH) although it remains unclear whether these conditions are more prevalent than in the general population.We investigated the prevalence of respiratory symptoms and CB in PWH and HIV-negative controls in the POPPY study.

Method: Assessment of respiratory symptoms and CB (St. George's Respiratory Questionnaire for COPD, SGRQ-C) was undertaken in a sub-set of POPPY participants.Univariate (Chi-squared, Mann-Whitney-U, Spearman's rank correlation) and multivariable (linear/logistic regression) analyses considered associations between respiratory symptoms and demographic, lifestyle and HIV-related parameters, as well as with depressive symptoms and quality-of-life.

Results: Of the 1377 POPPY participants, 619 (315 older PWH, 152 younger PWH, 152 HIV-negative) completed a respiratory questionnaire; 79.6% were male, 86.6% white, 70.3% men-having-sex-with-men and the median (interquartile-range, IQR) age was 54 (50–60) years.127 (20.5%) and 236 (38.3%) were current/social or ex-smokers, respectively and 156 (25.2%) reported recent recreational drug use. Respiratory symptoms were more commonly reported in older and younger PWH compared to older HIV-negative controls, with a median (IQR) Symptoms score of 17.7 (6.2–39.5), 17.5 (0.9–30.0) and 9.0 (0.9–17.5) in the three groups, respectively (p=0.0001); these differences remained significant after confounder (including smoking) adjustment.Sixty-three participants (10.2%) met the criteria for CB (44 (14.0%) older PWH, 14 (9.2%) younger PWH, 5 (3.3%) older HIV-negative controls, p=0.002), with these differences also remaining after confounder adjustment (older vs. younger PWH: odds ratio 4.48 (95% confidence interval 1.64–12.30), p=0.004; older PWH vs. HIV-negative controls: 4.53 (1.12–18.28), p=0.03).Respiratory symptoms and CB were both associated with a substantial impact on quality-of-life and worse depressive symptoms (Table O14.1).Among the 467 PWH, the median current and nadir CD4 + T-cell counts were 667 (IQR 522–883) and 202 (98–310) cells/mm^3; no strong associations were reported between CB and immune function, HIV RNA or previous AIDS diagnosis.

Conclusion: Respiratory symptoms and CB are more common in PWH than in demographically and lifestyle similar HIV-negative controls and have substantial impact on mental health and quality-of-life. Identification and management of risk factors for these symptoms will be essential to ensure optimal health-related outcomes for PWH.

Table O14.1. Associations of the symptom score and the prevalence of chronic bronchitis and patient-reported outcomes (CES-D, PHQ-9 and SF36)

Measure	Symptom score – Spearman's r	p-value	No chronic bronchitis Median (IQR)	Chronic bronchitis Median (IQR)	p-value
Depressive symptom score					
CES-D	0.41	0.0001	7 (3, 15)	16 (7, 28)	0.0001
PHQ-9	0.41	0.0001	2 (0, 6)	9 (2, 13)	0.0001
SF-36 subscale					
Physical functioning	−0.39	0.0001	95 (80, 100)	80 (40, 95)	0.0001
Physical limitations	−0.35	0.0001	100 (75, 100)	50 (0, 100)	0.0001
Emotional limitations	−0.31	0.0001	100 (67, 100)	67 (0, 100)	0.0005
Energy/fatigue	−0.42	0.0001	65 (50, 80)	50 (30, 65)	0.0001
Emotional wellbeing	−0.34	0.0001	80 (64, 92)	68 (48, 80)	0.0001
Social functioning	−0.38	0.0001	90 (68, 100)	68 (43, 90)	0.0001
Pain	−0.35	0.0001	80 (58, 100)	68 (32, 90)	0.0001
General health	−0.45	0.0001	70 (55, 85)	55 (30, 75)	0.0003

O15

Incidence and risk factors for tuberculosis among people with HIV on antiretroviral therapy in the UK

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Background: The UK has a low tuberculosis (TB) incidence, but risk is increased in people with HIV (PWH). Earlier combination antiretroviral treatment (cART) initiation is expected to have reduced TB incidenceamong PWH. We analyse epidemiological patterns of TB over a 20-year period and identify risk factors among PWH in the UK Collaborative HIV Cohort (CHIC) study.

Method: Individuals aged > 15 attending for HIV care from 1996–2017 with > 3 months follow-up were included. Incidence rates of new TB events were calculated and stratified by ethnicity (white/black/other). Poisson regression models were used to determine the associations of calendar year, ethnicity and other potential TB risk factors after cART initiation. We explored in further detail the incidence by ethnicity (black Caribbean/black African/black African/[south Asian/other Asian]/[Mixed/Other]).

Results: 58,776 participants (26.3% female; 54.5% white, 32.0% black, 13.5% other/unknown ethnicity; median (interquartile range) age 34 (29–42) years) were followed for 546,617 person-years. 704 were treated for active TB (rate 1.3 [95% confidence interval (CI) 1.2–1.4]/1000 person-years). TB incidence decreased from 1.3 [1.2–1.5] to 0.6 [0.4–0.9]/1000 person-years from pre-2004 to 2011–2017. The decline among people of black ethnicity was less steep than among those of white/other ethnicities (Figure O15.1), with incidence remaining high among black participants in the latest period (2.1 [1.4–3.1]/1000 person-years). 283 participants (191 (67%) black African) had TB with viral load < 50 copies/ml. In adjusted analyses of 44,628 participants who initiated cART, individuals of black ethnicity had a higher TB risk (adjusted rate ratio 3.13 [95% CI 2.23–4.38]) than other ethnicities. Higher CD4 + count (0.85 [0.80–0.89]/100 cells/mm^3) was associated with reduced TB incidence and higher viral load (1.43 [1.32–1.55]/$\log_{10}$ higher) with increased TB incidence. More recent cART initiation (0.93 [0.91–0.95]/later year) and longer cART duration (0.95 [0.92–0.99]/additional year) were associated with reduced TB incidence. The highest risk of TB was amongst the black African ethnic group (RR 2.1 [1.2–3.7] vs. black Caribbean).

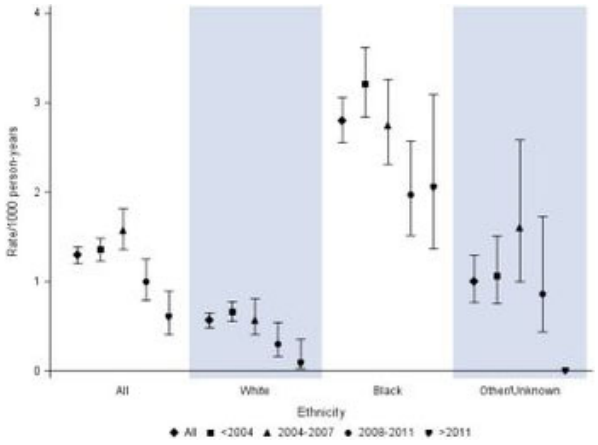

Figure O15.1. Tuberculosis incidence rate (/1,000 person-years) stratified by year of entry to UK CHIC and ethnicity in all CHIC participants (TB events = 704).

Conclusion: Despite the known protective effect of cART, a continuing disproportionately high TB incidence is seen among black African PWH compared with white or other ethnicities. Results support expanded use of TB prevention interventions for this population.

O16

Measuring endemic transmission of HIV in the United Kingdom: implications for HIV elimination

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Background: Over the past three decades, the UK HIV epidemic has been concentrated in: UK-born gay, bisexual and other men who have sex with men (GBM) and heterosexuals born abroad. We explore probable place of HIV acquisition by country of birth among key populations to better understand endemic transmission.
Method: We used UK HIV surveillance data to examine trends in new diagnoses between 2009 and 2018 among GBM and heterosexuals (aged ≥ 15 years). Probable place of acquisition was clinician-reported for those UK-born. For those born abroad, it was based on last negative test information and a CD4 decline model with the following inclusion criteria: known year of UK arrival and CD4 count within a year of diagnosis and prior to treatment initiation (52% met all criteria).
Results: Between 2009 and 2018, new diagnoses among GBM declined from 2,709 to 1,908; the proportion of GBM born in the UK fell from 65% (1,737/2,654) to 48% (873/1,807). Overall, 93% (14,469/15,524) of UK-born GBM probably acquired HIV in the UK (similar across years); a minority acquired HIV whilst living/travelling abroad (15% Thailand, 15% Spain). The proportion of GBM born abroad and acquiring HIV in the UK remained relatively constant over the decade at 55% (334/609) [uncertainty range: 46%-66%] in 2009 and 53% (418/787) [49%-57%] in 2018.
New diagnoses among all heterosexuals decreased from 3,235 in 2009 to 1,550 in 2018, whilst the proportion born in the UK increased from 23% (731/3,136) to 31% (452/1,475). Overall, 73% (4,664/6,368) of UK-born heterosexuals probably acquired HIV in the UK (proportions similar across years but declining numbers). Of those UK-born who acquired HIV abroad, the most common countries of acquisition were Thailand for men (53%) and Zimbabwe for women (11%). Among heterosexuals born abroad, 53% (6,381/11,866) [43%-61%] acquired HIV post-migration (similar across years).
Conclusion: These analyses indicate that about half of GBM and heterosexuals born abroad are acquiring HIV in the UK. The true proportion may be higher, as last negative test information is under-reported. The large majority of people born in the UK acquire HIV within the UK. Monitoring place of HIV acquisition is a key element of monitoring the elimination of HIV transmission.

O17

'Get Tested LeEDs': testing for blood-borne viruses (BBV) via notional consent in emergency departments (ED)

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Background: PHE aims to eliminate HIV transmission in the UK by 2030. Currently 7,500 PLWH are undiagnosed, 2 in 5 are diagnosed late. NICE NG60 recommends in areas of high prevalence everyone attending ED undergoing blood tests be offered HIV testing. UK ED in 2018 performed 56,986 HIV tests - 28% of tests performed in secondary care. HIV test positivity was 0.7% (compared to 0.3% in GP in extremely high prevalence areas and 0.5% in other secondary care settings). Implementing ED testing is challenging with concerns around impact on frontline staff and requirements for verbal consent. Get Tested LeEDs implemented BBV testing via a notional consent policy in October 2018, testing is ongoing.
Method: From October 2018 all ED attendees aged 16 to 65 years having U&Es taken were offered BBV testing via notional consent (departmental posters and a leaflet). If deemed to have capacity and not declined, BBV (HIV, hepatitis B and hepatitis C) testing was performed. To prompt testing BBV requests were electronically reflexed from U&Es.
Results: (data to 9.12.19)Prior to implementation 200 ED attendees were surveyed. 100% felt ED was an appropriate testing setting, 83% felt notional consent was acceptable. Of 161,817 attendees 56,076 had U&Es requested, 50% tested for BBVs. HBV new/lost-to-follow-up (LTFU) prevalence was 0.19%. 3 months post diagnosis 65% were linked to care (LTC). 516 (1.83%) were HCV antibody positive; 215 (0.76%) were RNA positive. 6 months post diagnosis 65% wereLTC and 30% started treatment.
HIV new or LTFU prevalence was 0.08% (23/29,369). Median age was 50 years (range 16–64), 30% female, 65% white ethnicity and 65% were new diagnoses. Median CD4 count 132 (range 1–593): 57% and 22% had very late and late diagnoses respectively. Despite only 3 months of testing (Oct to Dec) 23% of our HIV department's 2018 very late HIV diagnoses were made via ED.
Conclusion: The high percentage of very late and late (79%) diagnoses demonstrates that testing for HIV in ED offers an opportunity to diagnose those missed by traditional testing settings. Despite 2016 NICE guidance HIV testing in ED across UK is not widespread. ED have their own targets to meet and implementation is dependent on a process that limits the impact on frontline staff.

O18

High-level compliance to opt-out HIV testing in the emergency department (ED) of a large teaching hospital using the biochemistry sample as the sample type for HIV screening

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Background: NICE recommend those aged 15–59 should be offered HIV testing when admitted to hospital or attending emergency departments (ED) in areas with a prevalence ≥ 2 per 1,000 in order to achieve zero transmissions by 2030. Where an additional sample is required for HIV testing, the uptake is estimated to be 25–49% of those attending ED who have blood tests. We aim to improve the HIV testing uptake by reporting HIV results from the biochemistry samples sent from ED.
Method: ED HIV testing was implemented on 1st October 2018, initially opt in and subsequently changed to opt out on 1st February 2019. HIV testing was added to the U&E profile performed on ED biochemistry samples of those aged 18–59 years. Biochemistry tests were performed on the ED 'hot lab' autoanalyzser and then passed onto the blood sciences track for HIV

testing. The Roche 4th generation HIV1/2 test (sensitivity 99.78%, specificity 99.70%) was used.Single testing avoided inadvertent confirmation of HIV sample contamination originating from manual sample handling or machine contamination from using chemistry modules. HIV results were reported as reactive rather than positive and a further sample for HIV confirmation was requested.

Results: During year 1, 16,944 HIV tests were performed from an estimated 24,081 ED attendances who had blood tests in the same age range, demonstrating overall 70.4% testing coverage. On implementation of opt out testing, the proportion of tests increased (57.5% to 76.4%). Of the 355 reactive results, 252 (71%) were known HIV positive, 21 (6%) new diagnoses, 3 (0.9%) were uncontactable, 1 retested elsewhere and 1 declined retest. There were 77 false positives (0.45%) determined by follow up testing. Of the new diagnoses 8 (38%) were symptomatic with HIV, 3 (14%) presenting with an AIDS defining illness, and 5 (24%) with seroconversion. An HIV diagnosis was suspected in only 4 (19%) cases (Table O18.1).

Table O18.1. New diagnoses

Variable	Summary statistic	N=21
Age	Median (range)	37 (20–61)
Male sex	N (%)	19 (90.5)
HIV risk		
MSM	N (%)	11 (52.3)
Heterosexual	N (%)	9 (42.9)
IVDU	N (%)	1 (4.8)
CD4 cell count (cells/μl)	Median (range)	352 (9–1025)
CD4 < 350 (cells/μl)	N (%)	10 (47.6)
HIV viral load (cps/ml)	Median (IQR)	137,000 (14,075–677,000)
Never tested	N (%)	12 (57)

Conclusion: HIV opt out testing provides an excellent opportunity to diagnose patients who perceive themselves as low risk or who have never tested. Using the biochemistry samples has enabled us to improve compliance and streamline the testing process thereby maximising the proportion of patients testing compared to published literature.

O19

BBV_TestPrompt: using technology to increase blood-borne virus testing in primary care

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Background: Late diagnosis of HIV, hepatitis B and C (blood-borne viruses-BBVs) remains common with resulting high mortality and morbidity. Universal BBV screening programmes outside high-risk populations are costly and labour-intensive. Many patients with undiagnosed BBV infections visit primary/secondary care in the years prior to diagnosis, with missed opportunities for testing frequently identified. The aim of this pilot study was to develop and test an electronic clinical decision support system, BBV_TP1.

Method: BBV-TP1 was developed in a widely-used electronic patient record system (SystmOne) with patient-level risk stratification using data from demographics, diagnostic codes, abnormal tests and prescriptions. A combination of hard prompts for high-risk patients, and soft prompts for moderate-risk patients were designed, with the system identifying previously-untested patients and recommending testing during consultations. BBV_TP1 was assessed in 14 general practices in a low-prevalence region for 6 months: testing rates for each BBV after the system was activated were compared via unpaired *t*-test to rates prior to activation (previous 12 months) and in 54 other non-intervention practices. An online surveywas conducted in all study practices for clinicians and patients exploring the acceptability of the technology.

Results: In the two and six months following the intervention, HIV testing rates increased by 1,009% & 433%, HBV by 540% & 254%, and HCV by 214% & 158% ($p<0.001$ for each comparison), with no significant differences observed for any BBV in the non-intervention practices over the same period. Testing rates declined towards baseline after initial increases. Clinician's perceptions of the prompt system were largely positive (above mean neutral scale of 3), with average additional time required for BBV test discussion in consultations estimated at 2 minutes, and a majority of practices wanting to retain the system. The patient survey also showed a strongly positive acceptance of the technology and use of patient medical data to inform risk assessment.

Conclusion: This pilot study demonstrated that BBV-TP1 increased BBV testing rates in primary care via targeted screening although testing rates subsequently fell. Such systems can potentially reduce late diagnoses, whilst being acceptable to clinicians and patients. Larger studies with longer follow-up may be needed to demonstrate efficacy and cost-effectiveness.

O20

Use of HIV pre-exposure prophylaxis among gay, bisexual, and other men who have sex with men (GBMSM) in England: data from the AURAH2 study

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Background: Pre-exposure prophylaxis (PrEP) is not yet available through the National Health Service England but has been available through the PrEP Impact Trial (Public Health England) since October 2017, or by online purchasing. We report changes in PrEP and (Post-exposure prophylaxis) PEP awareness and use among HIV-negative GBMSM in AURAH2, a prospective cohort study, and assess predictors of PrEP initiation.

Method: Participants self-completed a baseline paper questionnaire at one of three UK GUM clinics (June 2013-Apr 2016), and subsequent four-monthly and annual online questionnaires, including information on socio-demographics, HIV status, sexual behaviours, to March 2018. PrEP and PEP use in the previous 12 months was obtained at baseline and annual questionnaires; PrEP and PEP awareness were ascertained at baseline only. Age-adjusted Poisson models were used to assess factors associated with PrEP initiation among participants who reported never used PrEP at baseline.

Results: 1167 men (mean age 34 years, 84% white, 94% gay, 74% university-educated) completed a baseline questionnaire; 482 completed at least one annual questionnaire. PrEP awareness at baseline increased from 42.5% of men recruited in Jul-Dec2013 to 92% of men recruited in Jan-Mar2016. PEP awareness was high throughout (92.5% in Jul-Dec2013, 96.8% in Jan-Mar2016). PrEP use in the past year increased from 0% in Jul-Dec2013 to over 40% by Jan-Mar2018; PEP use declined after 2016 (Figure O20.1).
Among 460 men who had never used PrEP at baseline, predictors of initiating PrEP included: age $\geq$ 40 years (aIRR 4.25, p=0.03); employment (aIRR 2.84, p=0.032); homeowner (aIRR 7.9, p=0.044); recent HIV test (aIRR 5.17, p=0.001); condomless sex in previous 3 months (aIRR 5.01, p<0.001); condomless sex with $\geq$ 2 partners (aIRR 5.43, p<0.001); group sex (aIRR 1.69, p=0.045); recreational drugs/chemsex use (aIRR 2.05, p=0.007); PEP use (aIRR 4.69, p<0.001); and calendar year (aIRR for 2017–2018 21.19 versus 2013–2015, p<0.001). Online PrEP purchasing still continued even after the PrEP Impact Trial started.

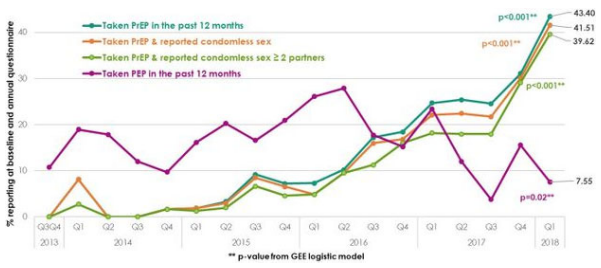

Figure O20.1. Prevalence of PrEP and PEP use in the past 12 months among GBMSM in the AURAH2 study (2013–2018)

Conclusion: PrEP awareness and use increased significantly over time among a cohort of GBMSM in England. High-risk HIV-related sexual behaviours, older age and more favourable economic situation were associated with PrEP initiation.

O21

Increasing awareness of HIV PrEP in African communities using trained community champions

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Background: PrEP awareness and uptake in African communities remains low. PrEPARED hypothesised that HIV prevention messages would be delivered more effectively by community insiders who share language and culture and are already respected and trusted.
Method: PrEPARED is a community-based asset development process. 13 champions from Zimbabwe, Cameroon, South Sudan, Kenya and Nigeria were trained and supported to disseminate information about HIV and specifically the availability of PrEP. Over 3 months, they met with members of their communities at community meetings, church gatherings and through informal one-to-one discussions. Returned questionnaires, group feedback sessions and one-to-one interviews produced data for analysis.
Results: 326 Africans were reached in face-to-face sessions locally. At least a further 123 were reached through online/social media innovations, both nationally and internationally. 127 PrEP surveys were returned. These data indicated that 85% of contacts had never heard of PrEP. 44% stated that they would take PrEP without any qualifications, rising to 61% if a) their sexual risk changed *and* b) PrEP was freely available. 96% would recommend PrEP to anyone at risk of contracting HIV. 65% of questionnaire respondents stated stigma as a major barrier to PrEP uptake.
Conclusion: PrEPARED offered communities the opportunity to talk about PrEP, HIV and related issues on their own terms, in their own languages and in culturally responsive ways. Younger Africans have limited knowledge about rates of HIV in their communities because many families migrated before they could understand the pandemic and HIV is not discussed by elders due to stigma. The sessions highlighted the role of PrEP in allowing women to quietly protect themselves from HIV, by enabling them to have safe-sex and protect themselves from accusations of infidelity (by requesting condom use) and the violence that refusal of sex can entail.
Black Africans continue to be conceptualised as a homogeneous group, despite huge internal diversity. This model demonstrated that this is not a 'hard-to-reach' community, rather one that lacks relevant information on PrEP, and stigma then further hampers uptake. PrEPARED offers a comparatively low-cost and highly replicable model to deliver PrEP information to more at risk communities, who would then advocate its use.

O22

Delivery of oral HIV pre-exposure prophylaxis for people who inject drugs and are at risk of sexual exposure to HIV during an outbreak

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Background: An HIV outbreak among PWID in Glasgow, Scotland, is related to sexual as well as injecting transmissions. In Scotland HIV pre-exposure prophylaxis (PrEP) is delivered via NHS sexual health clinics for individuals meeting sexual risk criteria. PWID face barriers to accessing HIV prevention services. We hypothesised that it is feasible and acceptable to deliver PrEP to PWID at risk of sexual acquisition of HIV, by tailoring services appropriately. Here we describe the findings from the service.
Method: PWID at high risk of sexual acquisition were identified by sexual health nurses at drug treatment services with physician review to determine appropriateness of PrEP. PrEP was dispensed daily alongside opiate replacement therapy, supervised by community pharmacists. Nurses actively followed up individuals in outreach services for monitoring, HIV testing and regular assessment of adherence. Adherence breaks initiated active recall, assessment and HIV testing.
Results: By 28th November 2019, 25 at-risk PWID were identified – all out with sexual health services. 68% (17/25) were female and median age was 39 years. 76% (19/25) had injected drugs in the last 3 months. 96% (24/25) had accepted the recommendation of PrEP. 68% (17/25) commenced PrEP and one planned to start. Of those not on PrEP, three were untraceable after initial contact, one became ineligible, three entered inpatient drug rehabilitation or hospital (decreasing current HIV risk).
29% (5/17) have discontinued PrEP: 2/5 no longer required PrEP, 2/5 entered prison or rehabilitation and 1/5 stopped due to side effects. There was a median of 16 days (IQR 54.5) from identification as eligible to commencing PrEP. Aside from discontinuation during rehabilitation, prison incarceration, or complete disengagement from care, PrEP was taken on 95% (1210/1275) of days prescribed with 41% (7/17) of individuals adherent on 100% of days. No patients have tested positive for HIV.
Conclusion: Delivering PrEP to this highly vulnerable group is feasible and acceptable in the context of an HIV outbreak; achieving high levels of drug adherence. Modifications to PrEP service delivery are required to remove barriers to case finding, PrEP initiation and adherence. Close communication among the team was vital to success.

O23

Factors associated with reported STI-prophylaxis ('Doxy-PrEP'/'Doxy-PEP') use among HIV-PrEP users in the UK

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Background: Reported STI diagnoses among HIV-PrEP users are high. Use of antibiotics as both pre- and post-exposure prophylaxis for STI prevention is not currently recommended due to the potential to select resistance in STI pathogens and other bacterial species. Some evidence has suggested, however, that HIV-PrEP users are using antibiotics for STI prevention (STI-Prophylaxis). We determined the prevalence and factors associated with STI-Prophylaxis use among a community sample of HIV-PrEP users.
Method: From 17 May-1 July 2019, 2,389 participants recruited through the iWantPrEPNow mailing list, social media and Grindr completed the 2019 online PrEP User Survey. Participants were eligible for the survey if they were UK residents and reported HIV-PrEP use or unsuccessfully trying to obtain HIV-PrEP, since January 2017. We collected data on patient demographics, HIV-PrEP use, sexual behaviour, HIV and STI testing practices and STI diagnoses. STI-Prophylaxis use was defined as an affirmative response to the question: "Do you buy antibiotics to prevent STI infections, either privately or through the internet?". Univariate and multivariable logistic regression analyses were performed to assess factors associated with STI-Prophylaxis use among HIV-PrEP users.
Results: Overall, 78% (1,856/2,389) of participants reported using HIV-PrEP and 9% of HIV-PrEP users (167/1,856) reported STI-Prophylaxis use. Among the 167 HIV-PrEP users reporting STI-Prophylaxis; 91% reported identifying as gay men, 84% were of white ethnicity, 55% resided in London and 37% were aged 35–44 years. Statistically significant associations were observed between reporting STI-Prophylaxis use and; those aged 35–44 years compared to 16–34 years (adjusted odds ratio [aOR] =1.60; 95%CI = 1.07–2.38), reporting $\geq$ 5 condomless sex partners compared to 1–4 condomless sex partners in the past 6 months (aOR = 1.76; 95%CI = 1.20–2.60), reporting chemsex (using $\geq$ 1 of the following drugs just before/during sex; crystal methamphetamine, GBH/GBL, mephedrone, ketamine) compared to no drug use in the past 12 months (aOR = 1.87; 95%CI = 1.19–2.92) and reporting an STI diagnosis in the past 12 months (aOR = 1.63; 95%CI = 1.14–2.32).
Conclusion: Our prevalence estimate of 9% of HIV-PrEP users reporting STI-Prophylaxis use is very similar to estimates from two smaller studies in London, UK and Melbourne, Australia. Our analyses indicate STI-Prophylaxis users are at very high risk of HIV/STI exposure. Clinicians should consider asking sexual health service attendees, especially HIV-PrEP users, about the use of antibiotics as STI-Prophylaxis, to inform appropriate counselling, testing and management.

O24

Longer term safety of emtricitabine/tenofovir alafenamide (F/TAF) and emtricitabine/tenofovir disoproxil fumarate (F/TDF) for HIV pre-exposure prophylaxis (PrEP): DISCOVER trial week 96 results

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Background: In DISCOVER, a multinational, double-blind, randomised controlled trial, F/TAF compared to F/TDF demonstrated noninferior efficacy for HIV prevention and improved bone mineral density (BMD) and renal safety biomarkers at week (W) 48. We now report W96 safety outcomes.
Method: Renal and lipid parameters and weight changes in participants on F/TAF vs F/TDF were evaluated through W96. BMD was evaluated in a substudy and also examined in younger participants (age < 25 years) who are still accruing bone mass. Glomerular function, proteinuria, and biomarkers of proximal tubular injury (PTI; β2M/Cr, RBP/Cr) were evaluated in participants ≥ 50 years and those with moderate renal impairment (eGFR 60–<90 ml/min).
Results: Among 5387 participants evaluated, F/TAF users (n=2,694) had significantly increased BMD (g/cm2): BL spine/%Δ W96 (mean [SD]) was 1.13 (0.16) / +0.95 (3.40) for TAF users, compared to F/TDF users (1.13 [0.14] / -1.39 [3.54]; p<0.001). Participants < 25 years had greater BMD decline on F/TDF with a greater magnitude of difference between groups than those ≥ 25 years. Overall, F/TAF users had significantly less eGFR decline and declines in UPCR and PTI biomarkers compared with F/TDF users. Older participants on F/TDF had a greater magnitude of decline in eGFR and a greater increase in UPCR and PTI markers compared to younger F/TDF users. Similarly, those with eGFR 60–<90 ml/min had greater statistically significant changes in PTI markers, if on TDF, compared with those with eGFR ≥ 90 ml/min. Those on F/TAF had stable fasting lipids through W96, whereas F/TDF users had decreases in lipids at W48 and W96. Those on F/TDF had a smaller weight increase than those on F/TAF through W96 (change from BL weight +0.5 kg vs. +1.7 kg, respectively).
Conclusion: Overall, those on F/TAF had increased BMD compared to declines in those on F/TDF, with more pronounced differences in younger participants. Older participants on F/TDF and those with impaired renal function had more adverse impact on renal biomarkers. Lipid and weight changes were consistent with the known lipid-lowering and weight suppressive effects of TDF.

O25

Virological and immunological evaluation of individuals with spontaneous persistent viral control without ART

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BHIVA Research Awards winners 2018, Maryam Khan and Borja Mora-Peris

Background: HIV elite controllers (EC) maintain undetectable viral loads (<20 HIV RNA copies/ml) and normal CD4/CD8 counts without ART. Despite WHO guidelines recommending ART irrespective of CD4 count and viral load, there remains a lack of consensus on best EC management. We have applied molecular and immunological assays to better understand mechanisms of natural viral control and possible negative immunological consequences.
Method: A prospective study of 17 ECs attending a tertiary referral clinic (2017–2019), measuring the following:
NRTIs plasma concentrations by LC-MS; nucleic acids by single copy assays - RNA /ml and DNA/10^5 PBMCs, targeting gag, pol, LTR and int genes; CD4, CD8, CD25 and HLA-DR by flow cytometry; HIV specific CD8 T-cell responses using pool of gag, env, nef and vif peptides in IFN-γ ELISPOT; plasma cytokines (IL-2, IL-6, TNF-α, MIP-1β, CRP) by mesoscale Vplex.
Results: EC had a median age 42 (IQR = 37–54), 10 were female and NRTIs were not detected.
HIV nucleic acid was not detected in 5 (molecular-negative) but detected in 12 (molecular-positive); HIV RNA in 9/12 (median 5 cpm, range 2–17), HIV DNA in 7/12.
All had CD4 and CD8 counts within normal range and 16 had CD4:CD8 ratio > 1. Neither T-cell activation markers (Table O25.1) nor plasma cytokine concentrations (not shown) differed significantly between groups but HIV specific responses were more frequent in the molecular-negative EC (Figure O25.1).

Table O25.1. T-cell activation

EC	CD4	CD8	CD4:8	T-cell activation
Molecular-positive Median (IQR)	1015 (751–1369)	553 (372–817)	1.9 (1.3–2.5)	CD4CD25%=23 (18–32)CD8CD25%=8.5 (6.7–11)CD4DR%=7(5.7–10)CD8DR%=19(15–31)
Molecular-negative Median (IQR)	785 (685–1138)	779 (436–911)	1.5 (0.8–2.5)	CD4CD25%=22 (11–24)CD8CD25%=6(4.5–11)CD4DR%=8(5–8) CD8DR%=16(10–24)

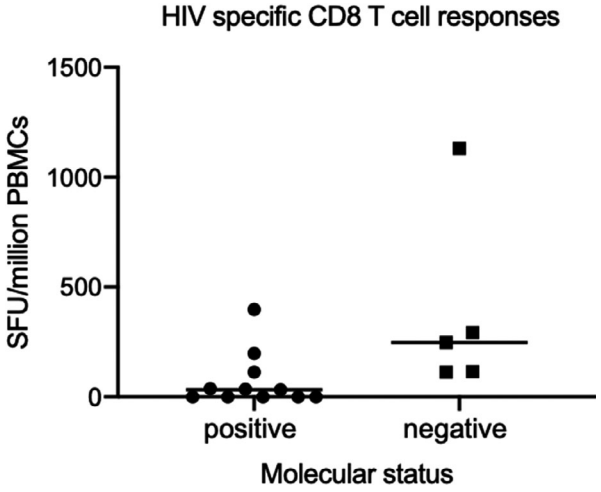

Figure O25.1. Frequency of HIV-specific CD8 responses was significantly higher (p=0.01) in molecular-negative EC (median = 248 SFU/10^6 PBMCs), IQR = 115–293 than molecular-positive EC (median = 33 SFU/10^6 PBMCs) IQR = 0–75.

Conclusion: EC can be sub-classified as molecular-positive and molecular-negative. The higher frequency of HIV-specific CD8 responses in molecular-negative compared with positive suggests this may be important in the level of natural control. In this cohort, irrespective of detection of nucleic acids, there is no evidence of increased T-cell activation or inflammation. Further studies are essential to determine the role of lifelong ART in such EC.

O26

The use of next-generation sequencing technology to detect integrase inhibitor resistance in treatment-naïve patients with HIV in Wales

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Background: In July 2018, the switch to next generation sequencing (NGS) for the routine detection of HIV resistance within Public Health Wales (PHW)

was made. This enables sequencing of the protease (PR), reverse transcriptase (RT) and integrase (INT) regions to be performed simultaneously. In this respect, the PHW laboratory is the first in the UK to offer a fully UKAS accredited HIV resistance service via NGS and so is uniquely placed to report on the laboratory and clinical experience thus far. The use of integrase inhibitors (INI) as first-line ART is increasing while their use as a component of post-exposure prophylaxis (PEP) is already standard. Recent BHIVA audit data reports that 17% of patients commence ART on their first specialist visit despite only 30% having resistance results available. Prior to the implementation of NGS, average turnaround time (TAT) for resistance testing was 14 days. Typically, baseline testing does not usually include the INT region. Although estimates of INI resistance are low (0–1.5%), these are derived from sentinel and retrospective reporting. Prospective studies in a treatment naïve population are limited. Our aims were to estimate the prevalence of INT resistance in ART naïve patients and to measure TAT post introduction of NGS technology.

Method: A retrospective analysis of HIV resistance testing performed by NGS in PHW between July 2018 - January 2020 was undertaken.

Results: Baseline HIV resistance testing by NGS was undertaken in 110 treatment naïve patients across Wales. The median age was 39 years. Overall transmitted drug resistance (TDR) was 16.4% (n=18) and comprised of 1.8% PI (2), 2.7% NRTI (3), 10.9% NNRTI (12) and 1% dual NRTI/NNRTI (1). Whilst no major INI mutations were detected, the minor E157Q was found in 3 patients. The average TAT decreased by 43% to 8 days, n=62 range (7.1–8.6).

Conclusion: Reassuringly, no major INI mutations were detected supporting the continued use of these agents, particularly raltegravir for first-line therapy and PEP. E157Q is reported to have little effect on overall INI susceptibility. The introduction of NGS technology resulted in a significantly decreased TAT permitting faster delivery of results to the clinical frontline with laboratory staff reporting improved efficiency.

O27

Increase in bone mineral density and weight in women who switch from TDF/FTC/NNRTI to ABC/3TC/DTG

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Background: Tenofovir disoproxil fumarate (TDF) is associated with bone loss and renal tubular dysfunction (RTD) and integrase inhibitors with weight gain, which may lead to metabolic syndrome (MetS). These are undesirable side effects in peri/post-menopausal women. We evaluated changes in bone mineral density (BMD), renal tubular function, insulin resistance and MetS prevalence in peri/post-menopausal women who switched from TDF/FTC/NNRTI to ABC/3TC/DTG.

Method: We conducted a randomized controlled trial in which women aged ≥ 40 years were randomized 1:2 to continue TDF/FTC/NNRTI or switch to ABC/3TC/DTG. We analysed BMD (dual-energy xray absorptiometry), bone turnover (CTX, P1NP), vitamin D, PTH, cystatin C, renal tubular function (RBPCR, phosphate fractional excretion), and fasted serum glucose, lipids and insulin concentrations at baseline and week 48. Insulin resistance was calculated using HOMA, QUICKI and Insulin Resistance (IR [McAuley]) indices. MetS was defined by ATPIII criteria. Mean difference from baseline to week 48 between the two arms for each parameter was estimated by linear regression, using multiple imputation with chained equations for missing data.

Results: 91 women (86% black ethnicity, mean [SD] age 50.4 [6.6] years, CD4 cell count 639 [263] cells/mm^3, BMI 30.3 [6.5] kg/m^2) were randomized; 29/32 (91%) in the TDF/FTC/NNRTI vs. 51/59 (86%) in the ABC/3TC/DTG arm continued through week 48. Women who switched to ABC/3TC/DTG maintained viral suppression and experienced improvements in total hip and lumbar spine BMD and proteinuria (Table O27.1). No change in other bone and renal markers was observed. Although women switched to ABC/3TC/DTG were more likely to experience > 5% weight gain (5.3% vs. 35.3%, p=0.019), switching in non-diabetic participants was not associated with worsening insulin resistance or MetS (Table O27.1). Proportion of women with MetS on TDF/FTC/NNRTI vs ABC/3TC/DTG was 36.8% vs 41.2% at baseline and 57.9% and 47.1% at week 48 (p>0.05); 26.3% and 17.7% developed new-onset MetS.

Outcome measure		TDF/FTC/NNRTI Baseline	TDF/FTC/NNRTI Week 48	ABC/3TC/DTG Baseline	ABC/3TC/DTG Week 48	Mean difference (95% CI) between arms	P-value
BMD total hip (g/cm^2)	Mean [SD]	1.03 (0.98, 1.08)	1.03 (0.98, 1.08)	0.96 (0.92, 0.99)	0.97 (0.94, 1.00)	0.01 (0.002, 0.03)	0.027
BMD lumbar spine (g/cm^2)	Mean [SD]	1.07 (1.02, 1.12)	1.06 (1.02, 1.11)	1.03 (0.99, 1.07)	1.05 (1.01, 1.10)	0.03 (0.01, 0.05)	0.002
PCR (mg/mmol)	Mean [SD]	10.7 (7.1,14.4)	9.4 (7.0,11.9)	10.2 (8.1,12.4)	6.7 (5.6,7.8)	-0.03 (-0.06, -0.01)	0.003
RBPCR (µg/mmol)	Mean [SD]	2.8 (1.0, 4.5)	2.3 (0.6, 3.9)	2.3 (1.5, 3.1)	1.3 (0.7, 1.9)	-0.79 (-1.92, 0.34)	0.17
Weight (kg)	Mean [SD]	85.0 [17.9]	85.4 [18.1]	76.8 [17.1]	79.7 [16.9]	1.45 [-0.70, 3.60]	0.18
Glucose (mg/dL)	Mean [SD]	89.1 [7.5]	87.0 [9.5]	85.1 [8.9]	88.2 [10.7]	3.91 [-1.68, 9.49]	0.17
Insulin (µU/ml)	Median [IQR]	6.6 [4.2, 9.1]	10.4 [4.9, 16.1]	5.7 [3.0, 9.6]	6.4 [4.0, 9.3]	-3.28 [-6.28, -0.29]	0.033
HOMA-IR	Median [IQR]	1.6 [0.9, 2.2]	2.3 [1.1, 3.5]	1.2 [0.6, 2.1]	1.9 [0.8, 2.2]	-0.31 [-0.93, 0.31]	0.32
QUICKI index	Mean [SD]	0.2 [0.0]	0.2 [0.0]	0.2 [0.0]	0.2 [0.0]	0.002 [-0.008, 0.01]	0.71
IR index (McAuley)	Median [IQR]	7.9 [7.4, 9.0]	7.0 [6.0, 9.1]	8.4 [7.0, 11.0]	8.7 [6.7, 10.2]	0.41 [-0.47, 1.29]	0.35

3TC=lamivudine; ABC=abacavir; BMD=bone mineral density; CTx=serum collagen type 1 cross-linked C-telopeptide; DTG=dolutegravir; eGFR=estimated glomerular filtration rate; FTC=emtricitabine; NNRTI=non-nucleoside reverse transcriptase inhibitor; P1NP=procollagen type 1 N-terminal propeptide; PCR=protein:creatinine ratio; RBPCR=retinol-binding protein creatinine ratio; TDF=tenofovir disoproxil fumarate

Table O27.1. Mean difference between arms from baseline to week 48 in bone, renal and metabolic parameters

Conclusion: Switch from TDF/FTC/NNRTI to ABC/3TC/DTG resulted in improvements in BMD and proteinuria. Although one third of women switched from TDF/FTC/NNRTI to ABC/3TC/DTG experienced > 5% weight gain, this strategy did not result in worsening insulin resistance or an excess in the proportion of women with new-onset MetS. Larger studies need to confirm these findings.

O28

Single doses of long-acting capsid inhibitor GS-6207 administered by subcutaneous injection are well tolerated and efficacious in people living with HIV

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Background: GS-6207 is a novel, long-acting, HIV-1 capsid inhibitor. In HIV-negative volunteers, a single dose of subcutaneous (SC) GS-6207 (30–450 mg) was well tolerated and maintained systemic exposure ≥ 24 weeks

Method: This is an ongoing, phase 1b, randomised, double-blind, placebo-controlled, proof-of-concept study in people living with HIV who are ART-naïve or -experienced but capsid inhibitor naïve. A single SC dose of GS-6207 (20, 50, 150, 450, or 750 mg) or placebo was administered. Primary endpoint was maximum reduction of HIV-1 RNA through day (D) 10. We present antiviral activity (through D10) and blinded safety (through at least D16) for the 50, 150, and 450 mg cohorts. Pharmacokinetics of GS-6207 were assessed.

Results: Eighteen participants received GS-6207 (n=6/cohort) and 6 placebo (n=2/cohort). Mean maximum reduction in HIV-1 RNA by D10 ranged from 1.76 to 2.20 $\log_{10}$ copies/ml (Figure O28.1), which were all significantly greater compared with placebo (all p<0.0001) and comparable across cohorts.

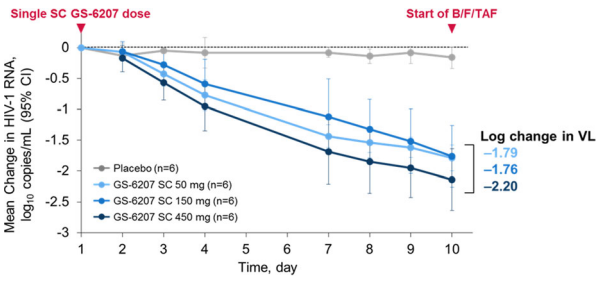

Figure O28.1

All participants receiving GS-6207 had at least 1 $\log_{10}$ copies/ml reduction (range: 1.16–2.86). At these doses, the inhibitory quotients (mean GS-6207 concentrations/protein-adjusted EC_{95} for wild type HIV-1) on D10 ranged from 1.1 to 9.9. No serious AEs, AEs leading to discontinuation, Grade 3/4 AEs, or clinically relevant Grade 3/4 laboratory abnormalities were reported. The most common AEs were mild or moderate injection site reactions (63%; 15/24). Available data from remaining cohorts will be presented.

Conclusion: These preliminary data demonstrate proof-of-concept for in vivo antiviral activity via capsid inhibition. Following a single SC dose, potent antiviral activity was observed in all participants who received GS-6207 at 50, 150, or 450 mg through D10. GS-6207 was generally well tolerated. These results support further evaluation of GS-6207 as a long-acting antiretroviral agent in people living with HIV.

O29

Long-acting cabotegravir + rilpivirine for HIV treatment: FLAIR week 96 results

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Background: First Long-Acting Injectable Regimen (FLAIR; NCT02938520) is a phase 3, multicentre study investigating noninferiority of switching to monthly cabotegravir/rilpivirine (CAB+RPV) long-acting (LA) versus daily dolutegravir/abacavir/lamivudine (DTG/ABC/3TC [CAR]) in virologically suppressed adults infected with human immunodeficiency virus type 1 (HIV-1).

Method: Antiretroviral therapy (ART)-naive participants received induction therapy with oral CAR for 20 weeks. After 16 weeks, participants with HIV-1 ribonucleic acid (RNA) < 50 c/ml could enter the maintenance phase (MP) and were randomized (1:1) to switch to LA or continue CAR. Those in the LA arm received an oral lead-in of CAB 30 mg + RPV 25 mg once daily for 4 weeks before receiving monthly injectable CAB+RPV LA. The primary endpoint was viral load (VL) ≥ 50 c/ml at MP Week 48 (W48) by US Food and Drug Administration snapshot algorithm (inferiority margin 6%).

Results: From 629 participants who initiated induction therapy, 566 entered the MP (n=283 for each arm); 22% were female and 74% were white. At Week 96 (W96), 9 (3.2%) participants in each arm had HIV-1 RNA ≥ 50 c/ml, underscoring the noninferiority established at W48 (Table O29.1). For the LA arm, the rate of confirmed virologic failures (CVFs; 2 consecutive VLs ≥ 200 c/ml) was unchanged from W48 at W96 (4 participants [1.4%]); 3 had mutations in the non-nucleotide reverse transcriptase inhibitor and integrase strand transfer inhibitor domains). The CAR arm had 4 CVFs through W96 (3 through W48); none had mutations. Across both treatment arms, adverse events (AEs) leading to withdrawal were infrequent. Injection-site reactions (ISRs) were the most common drug-related AE (86% in the LA arm); their frequency decreased over time. Median ISR duration was 3 days, and 99% were grade 1/2. At W96, the LA regimen was associated with greater treatment satisfaction vs oral CAR, as measured by the HIV Treatment Satisfaction Questionnaire (status version).

Conclusion: CAB+RPV LA maintained viral suppression without further CVFs between W48 and W96 and was noninferior to oral standard-of-care ART. Although ISRs were frequently reported with CAB+RPV LA, they seldom led to withdrawal, and overall treatment satisfaction was higher than with ART. These results attest to the durability of CAB+RPV LA.

Table O29.1

Outcome, n (%) ITT-exposed population	CAB+RPV LA n=283	CAR[a] n=283
HIV-1 RNA ≥50 c/mL at W96[b]	9 (3.2)	9 (3.2)
Adjusted difference (95% CI)[c]	0.0 (−2.9, 2.9)	
Data in window not <50 c/mL	3 (1.1)	2 (0.7)
Discontinued due to lack of efficacy	6 (2.1)	5 (1.8)
Discontinued due to other reasons while not suppressed	0	2 (0.7)[d]
No virologic data in W96 window	29 (10.2)[e]	21 (7.4)
Discontinued study due to AE or death[f]	12 (4.2)	4 (1.4)
Discontinued study for other reasons	16 (5.7)[g]	17 (6.0)[h]
HIV-1 RNA <50 c/mL at W96[b]	245 (86.6)	253 (89.4)
Adjusted difference (95% CI)[c]	−2.8 (−8.2, 2.5)	
Adjusted difference in HIVTSQ score (95% CI)	2.3 (1.1, 3.5)	
Safety – all maintenance data		
Number of injections Number of ISR events Grade 1 events – mild Grade 2 events – moderate Grade 3 events – severe ISR duration ≤7 days Number of ISR events leading to withdrawal	12,552 3100 2730 352 18 2746 4	N/A
Maximum grade 3 or 4 AEs	40 (14.1)	16 (5.7)
Maximum grade 3 or 4 AEs, excluding ISRs	29 (10.2)	16 (5.7)
Maximum drug-related grade 3 or 4 AEs excluding ISRs	4 (1.4)	0
Serious AEs	24 (8.5)	22 (7.8)

[a]DTG plus 2 alternative non-ABC NRTIs was permitted if a participant had tolerability issues or was HLA-B*5701 positive. [b]Per FDA snapshot algorithm. [c]Proportion on LA minus proportion on CAR. Adjusted for gender at birth and induction baseline HIV-1 RNA (<100,000 vs ≥100,000 c/mL). [d]One relocation, 1 lost to follow-up. [e]One on study but missing data in window. [f]No deaths occurred during the maintenance phase. [g]Three relocations, 2 intent to become pregnant, 2 tolerability of injections, 2 lost to follow-up, 1 need to initiate prohibited medication, 1 incarceration, 1 pregnancy, 1 frequency of visits, 1 burden of travel, 1 change of job incompatible with treatment, 1 unreliable with visits. [h]Four frequency of visits, 3 noncompliance with study treatment and protocol procedures, 1 relocation, 1 participant decision to stop treatment, 1 late to attend visits, 1 lost to follow-up, 1 pregnancy, 1 burden of travel, 1 unspecified reason, 1 prohibited medication use, 1 substance abuse, 1 met protocol stopping criteria. ABC, abacavir; AE, adverse event; CAB, cabotegravir; CAR, DTG/ABC/lamivudine; CI, confidence interval; DTG, dolutegravir; FDA, US Food and Drug Administration; HIV-1, human immunodeficiency virus type 1; HIVTSQ, HIV Treatment Satisfaction Questionnaire; ISR, injection-site reaction; ITT, intention-to-treat; LA, long acting; N/A, not applicable; NRTI, nucleoside reverse transcriptase inhibitor; RNA, ribonucleic acid; RPV, rilpivirine; W96, Week 96.

O30

Cabotegravir + rilpivirine every 2 months is noninferior to monthly: ATLAS-2M study

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Background: Long-acting (LA) cabotegravir (CAB) and rilpivirine (RPV) dosed intramuscularly every 4 weeks (Q4W) was noninferior to daily oral 3-drug antiretroviral therapy in phase III studies. These results and supportive CAB+RPV LA pharmacokinetics enable evaluation of an 8-week (Q8W) dosing interval.

Method: Antiretroviral Therapy as Long Acting Suppression every 2 months (ATLAS-2M) is a randomized (1:1), phase IIIb study of CAB+RPV LA maintenance therapy administered Q8W (600 mg CAB + 900 mg RPV) or Q4W (400 mg CAB + 600 mg RPV) to human immunodeficiency virus (HIV)–infected, virologically suppressed adults on CAB+RPV LA Q4W (ATLAS study rollover) or oral standard-of-care. The primary and key secondary endpoints at Week 48 were proportions with plasma HIV-1 ribonucleic acid ≥ 50 c/ml (with a 4% noninferiority margin) and < 50 c/ml (with a −10% noninferiority margin), respectively (Snapshot, intention-to-treat–exposed).

Results: 1045 participants were treated with CAB+RPV LA Q8W (n=522) or Q4W (n=523); 27% were female; 73% were white. 63% were naive to CAB+RPV LA. CAB+RPV LA Q8W was noninferior to Q4W dosing in the primary (1.7% vs 1.0%) and secondary analyses (94.3% vs 93.5%; Table O30.1). 8 and 2 confirmed virologic failures (CVFs; 2 sequential measures ≥ 200 c/ml) on Q8W and Q4W dosing occurred, respectively; 5 and 0 CVFs, respectively, had archived resistance-associated mutations (RAMs) to RPV (E138A, Y188L, H221Y, Y181C), either alone (n=4) or with a CAB RAM (G140R; n=1) in baseline peripheral blood mononuclear cells (PBMCs). On-treatment RAMs to

RPV (K101E, E138K, M230L), CAB (N155H, Q148R, E138K), or both, not present in baseline PBMCs were found in 5 of 8 Q8W CVFs and both Q4W CVFs. Injection-site reactions (ISRs) were mostly mild or moderate (98% overall) with a median duration of 3 days. Discontinuation for an adverse event occurred in 2% of patients (Q8W, n=12; Q4W, n=13), with 5 (1%) in each group due to ISRs. One death occurred (Q8W; sepsis). 93% (115/124) of ATLAS study rollover participants treated Q8W in ATLAS-2M expressed a preference for Q8W dosing.

Conclusion: Q8W dosing of CAB+RPV LA was noninferior to Q4W dosing and was well tolerated, thus supporting the therapeutic potential of CAB+RPV LA administered every 2 months.

Table O30.1

Outcome, n (%), ITTe	Q8W (n=522)	Q4W (n=523)
Primary endpoint HIV-1 RNA ≥50 c/mL at Week 48	9 (1.7)	5 (1.0)
Adjusted difference (95% CI)[a]	0.8 (−0.6, 2.2)	
Data in window not <50 c/mL	3 (0.6)	2 (0.4)
Discontinued for lack of efficacy	6 (1.1)	2 (0.4)
Discontinued for other reasons while not <50 c/mL	0	1 (0.2)
No virologic data	21 (4.0)	29 (5.5)
Discontinued for AE or death	9 (1.7)	13 (2.5)
Discontinued for other reasons	12 (2.3)	16 (3.1)
Key secondary endpoint HIV-1 RNA <50 c/mL at Week 48	492 (94.3)	489 (93.5)
Adjusted difference (95% CI)[a]	0.8 (−2.1, 3.7)	
All AEs	473 (90.6)	482 (92.2)
Serious AEs	27 (5.2)	19 (3.6)
Grade 3-5 AEs	41 (7.9)[b]	49 (9.4)
Discontinued due to AEs	12 (2.3)	13 (2.5)
Number of injections	8470	15,711
Number of ISR events	2507	3152
Grade 1 – mild	2010 (80.2)	2561 (81.3)
Grade 2 – moderate	454 (18.1)	543 (17.2)
Grade 3 – severe	43 (1.7)	48 (1.5)
Drug-related grade 3-5 AEs, excluding ISRs	4 (0.8)	5 (1.0)
Discontinued due to ISRs	5 (1.0)	5 (1.0)

[a]Cochran–Mantel–Haenszel analysis adjusting for prior exposure to CAB+RPV (0, 1-24, or >24 weeks).
[b]Includes 1 death from sepsis on Day 205.
AE, adverse event; CAB, cabotegravir; CI, confidence interval; HIV-1, human immunodeficiency virus type 1; ISR, injection-site reaction; ITT-e, intention-to-treat–exposed; Q4W, every 4 weeks; Q8W, every 8 weeks; RNA, ribonucleic acid; RPV, rilpivirine.

Poster Abstracts

Antiretrovirals: efficacy, interactions and pharmacokinetics

P1

Examining the efficacy in clinical practice of the dual antiretroviral therapy regimen of boosted protease inhibitors with maraviroc

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Background: A focus on reducing long-term drug exposure while maintaining viral suppression has led to new strategies for treatment-experienced patients involving dual therapy. Maraviroc (MVC), a chemokine receptor 5 co-receptor antagonist, is licensed for use in treatment experienced HIV-1 positive patients. Boosted protease inhibitor (bPI) with MVC is not a recommended combination in guidelines.In the past, this option was chosen for selected patients with some declining to switch despite evidence. We set out to assess the outcomes of patients who have or are currently receiving this combination in our clinic.
Method: All patients prescribed a bPI with MVC until December 2018 were identified through our HIV database. Age, sex, and time on ART before/after switch were collected. A review of medical records determined reasons for switch off bPI/MVC where relevant.
Results: In total 114 patients (mean age 53 years (range 33–76), 80% male) had been prescribed bPI/MVC. The median time on ART prior to bPI/MVC switch was 13 years. Patients stayed a median of 4 years on bPI/MVC; 63 (55%) patients were on MVC 300 mg dosing while 51(45%) were dosed at MVC 150 mg. At censure 69 (61%) remained on bPI/MVC, 30 (26%) had switched ART, 7 (6%) died, 7 transferred their care, and 1 was lost to follow up. Reasons for switching included hyperlipidaemia (n=6), lipodystrophy (n=2), rationalisation (n=6), drug interactions (n=5), potential toxicity (n=5), side effects (n=1), no documentation (n=1) and viral failure (n=5). Four of the five patients who failed therapy reported issues around adherence. Of patients who remained on bPI/MVC 97% (67/69) were virally suppressed (median duration 4.5 years). 7 patients were identified to be X4 tropic before initiation of bPI/MVC. Of those, 3 were started to increase the overall CNS penetration of the regimen. Remaining 4 patients have been reviewed and changed to a more suitable alternative regimen.
Conclusion: We continue to proactively review patients on bPI/MVC and suggest contemporary alternatives but our data suggest that, if adherence is good, for patients who decline a switch, they may be reassured regarding viral suppression.

P2

HIV specialist pharmacists: an essential role in managing complexity in HIV-related frailty and ageing services

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Background: Our clinic has an ageing cohort of around 3500 HIV patients of whom 46% are over 50.An unexpected increase in the number of co-morbidities associated with ageing is documented in patients living with HIV which may then lead to polypharmacy. Polypharmacy can lead to adverse effects and drug-drug interactions (DDIs), which may affect the clinical condition, lifespan, and quality of life of HIV patients. We present our findings through comprehensive medicine usage reviews (MURs) performed on patients seen in our dedicated frailty clinic to identify DDIs between antiretroviral medication and medication prescribed in primary care and their management.
Method: The frailty clinic carousel allocates specific time for each patient to be reviewed by the specialist HIV pharmacist. Patient consent was established to enable access to summary care records in order to determine list of non-antiviral medication. During the consultation, MURs were performed and DDIs were identified and discussed with patients.
Results: 42 patients were seen within the first 8 monthly clinic sessions. 12 female, 30 male. Mean age was 67y. Patients were found to be on an average of 7 non-antiretroviral medications. Total number of drug-drug interactions identified was 73.Of these, 54 (74%) were potential interactions requiring dose adjustments of non-antiviral medication. 18 (25%) were weak interactions requiring monitoring of side effects. 1 (1%) significant interaction was identified where co-administration of the non-antiviral medication was not recommended with the ARV regimen. This non-antiviral medication was stopped post review. Upon questioning, the majority of the patients were unaware of these interactions.
Conclusion: This review highlights the important role of specialist HIV pharmacists in a frailty clinic. In future this patient population could be targeted by specialist pharmacists for MURs in a wide variety of HIV outpatient clinics and for patients within a similar age group who initiate treatment.

P3

Switching off a protease-inhibitor regimen: what to, when and why

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Background: It is widely accepted, patients on boosted protease inhibitor therapy (bPI) for HIV should be reviewed as better tolerated drugs may be clinically appropriate; as well as fewer drug-drug interactions (DDIs) and less metabolic side effects. Our aim was to review patients switching off bPIs: what were they switched to, when was the switch made and why.
Method: We identified patients on bPI based anti-retroviral therapy (ART) between 01/01/2019 and 31/07/2019. Pharmacy systems were used to identify patients that switched off a bPI and their electronic notes were reviewed.
Results: 1120 patients were on a bPI, of which, 75 switched off (patients are seen twice a year). 56 were male; age range 24–73 years. Patients had been living with HIV between 1 and 34 years with a CD4 nadir of 5–870 cells/mm^3.
WHAT – from 75 patients:61 switched off darunavir, 12 off atazanavir, 2 off lopinavir.63 switched to an integrase inhibitor, 12 switched to a non-nucleoside reverse transcriptase inhibitor based ART.
WHEN –patients had been on a bPI for an average time of 54 months (1–229).
WHY – reasons for switching ART:DDIs (18), simplification/single tablet regimen (STR)(16), acute HIV (7), cardiovascular risk (7), genotype availability (7), intolerance (6), low level viraemia (LLV)(3), virological failure (VF)(3), renal impairment (2), diabetes (1), end of pregnancy (1), fatty liver (1), lipids and STR (1), lipids and renal impairment (1), lipodystrophy (1).
Since switching ART, 10 have switched treatment again: 6 secondary to intolerance, 1 patient switching back to a bPI. 1 patient died from a cardiac arrest. 4/6 patients that switched secondary to VF/LLV have since resuppressed.
Conclusion: The majority of patients switching off a bPI switched onto an integrase inhibitor for an STR or to avoid DDIs. With an ageing population, these reasons are becoming more common; having the choice of ART to allow concomitant administration of many drugs helps minimise problems with polypharmacy. However, switching was not always successful. Remaining on a bPI in this cohort may be due to choice, resistance or intolerance to other classes. We review patients ART at each visit with new data available.

P4

Dual antiretroviral (ARV) therapy: safe and efficacious even in a heavily ARV experienced real-world cohort

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Background: Although the safety and efficacy of dual ARV therapy has been established in large scale clinical trials (GEMINI-1 and -2, SWORD-1 and -2), there is currently a lack of data on the use of dual therapy in heavily treatment-experienced 'real world' cohorts.
Method: Patients previously on triple ARVs who had been switched to dolutegravir (DOL) based dual ARV therapy with either lamivudine (LAM) or rilpivirine (RPV) were identified from pharmacy databases. Demographic, clinical and virological data pre- and post-switch was extracted retrospectively from electronic patient and laboratory records.
Results: Twenty-five patients (18 male) were switched to dual therapy (10 to DOL/LAM, 15 to DOL/RPV), median age 52 years (range 21–62), median CD4 count 564 cells/mm^3 (247–1,043), 17/25 (68%) had co-existing morbidities, e.g. chronic kidney disease, diabetes. Median length on ARVs prior to switch was 14 years (0.4–26), median number of prior ARV regimens was 5 (1–13), 7/25 (28%) had a history of ARV resistance (NRTI, NNRTI and/or PI). Patients were switched due to ARV toxicities (cardiac = 6, bone = 4, neuropsychiatric = 3, renal = 2), regimen simplification (n=4), drug interactions (n=2) or other issues, such as tablet size. Median length of follow up on dual therapy was 12 months (1–31). All patients had undetectable HIV RNA at last visit. Four patients (16%) discontinued dual therapy due to adverse effects, none due to virologic failure.DOL/LAM versus DOL/RPV cohorts were similar in median age (53 v 52), years on ARV (14 v 14.5) and baseline CD4 count (766 v 506) but differed in prior ARV resistance (0 v 47%), presence of co-morbidities (50 v 80%) and median length of follow-up (9 v 16.5 months).
Conclusion: In this cohort of heavily ARV-experienced patients with multiple co-morbidities, more than a quarter of whom had a history of ARV resistance, dual therapy was effective, well tolerated and appeared safe. No virological breakthrough was observed in over 24 patient-years of follow-up.

P5

Switching to bictegravir/emtricitabine/tenofovir alafenamide (B/F/TAF) in adults aged >65 or older: week 48 results from a phase 3b, open-label trial

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Background: As the age of people living with HIV increases, studies are needed to assess the safety and efficacy of antiretroviral therapy in this population. B/F/TAF is a small single-tablet regimen with few drug-drug interactions and a high barrier to resistance. In this ongoing 96 week study, we evaluated the efficacy and safety of switching participants ≥65 years to B/F/TAF.
Method: Virologically suppressed (HIV-1 RNA <50 copies/ml) participants >65 years old currently receiving either elvitegravir(E)/cobicistat(c)/F/TAF or a TDF-based regimen were switched to B/F/TAF. The primary endpoint was HIV-1 RNA <50 copies/ml at Week(W) 24 as defined by the Food and Drug Administration Snapshot algorithm. Here we report efficacy and safety outcomes at W48.
Results: 86 participants were enrolled at sites across 5 European countries, median age was 68 years (IQR 66, 71), 13% were female, and 99% were White; 92% were receiving E/C/F/TAF at baseline.At W48, HIV RNA<50 copies/ml was 87% (75/86); 11 (13%) had no virologic data in window (3 discontinued study drug due to adverse events (AE) but had last available HIV-1 RNA<50 copies/ml; 4 had no data within the window but had HIV-1 RNA<50 copies/ml after the W48 window, and 4 had missing data). Using the missing = excluded analysis, W48 HIV RNA < 50 copies/ml was 100%. There were no virologic failures. No Grade 3–4 study drug-related AEs were observed. Three AEs led to premature study drug discontinuation; one (abdominal discomfort, grade 2) was considered study drug-related (Table P5.1). Median changes from baseline in lipid parameters were: total fasting cholesterol (−16 mg/dl), LDL (−5 mg/dl), HDL (−1 mg/dl), triglycerides (−26 mg/dl) and total cholesterol:HDL (−0.2).

Table P5.1

Adverse Event	B/F/TAF (N=86), % (n)
Any Grade 3–4 Study Drug-Related AEs	0
Grade 3 or 4 Laboratory Abnormalities	6% (5)
Any Study Drug-Related Serious AEs	0
AEs Leading to Study Drug Discontinuation	3.5% (3)*
*1) abdominal discomfort (grade 2, drug-related), 2) alcohol withdrawal, 3) benzodiazepine withdraw	

Conclusion: Through W48, high rates of virologic suppression were maintained in older participants who switched to B/F/TAF. The safety and efficacy data support the switch to B/F/TAF in virologically suppressed HIV-infected individuals aged ≥ 65 years.

P6

Effectiveness, safety and tolerability of bictegravir/emtricitabine/tenofovir alafenamide (B/F/TAF) in adult patients living with HIV-1 in routine clinical practice: 6-month results of the BICSTaR cohort

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Background: In clinical studies, B/F/TAF is highly efficacious and well tolerated in both antiretroviral treatment (ART)-naïve (TN) and ART-experienced (TE) HIV-1-infected participants, with zero resistance. BICSTaR is the first cohort to evaluate the effectiveness, safety and tolerability of B/F/TAF in clinical practice.
Method: BICSTaR is an ongoing, non-interventional, prospective, multinational, cohort study planned to enroll at least 1400 adult participants. In this analysis, data from 20 German sites are presented. Outcomes included HIV-1 RNA (loss-to-follow-up/missing=excluded), drug-related (DR) adverse events (AEs) and persistence of the B/F/TAF regimen.
Results: A total of 223 HIV-1 infected participants (32 TN, 191 TE) initiated B/F/TAF and were followed-up for at least 6 months at time of data cut-off. Main reasons for starting B/F/TAF were "patient's wish" (53%, TN) and "simplification" (63%, TE). Comorbidities at baseline included neuropsychiatric disorders (23%), arterial hypertension (21%), hyperlipidemia (15.3%) and cardiovascular disorders (10%). Of those participants with available HIV-1 RNA data at month 6 (n=180), HIV-1 RNA was < 50 copies/ml in 21/25 (84%) TN participants (24/25 [96%] <200 copies/ml) and in 143/155 (92%) of TE participants (153/155 [99%] <200 copies/ml). Median CD4 cell counts increased from 479 to 731 and from 695 to 752 cells/μl, respectively. Persistence with B/F/TAF was high (96% still on treatment) with 8 (4%; 1 TN and 7 TE) participants discontinuing B/F/TAF prior to month 6 (3 due to DRAEs). No discontinuations were due to renal or bone AEs. Overall, DRAEs and DR serious AEs were reported in 21 (10%) and 1 (0.4%) participants, respectively. Most common DRAEs were psychiatric, 7 (3%) and gastrointestinal disorders, 5 (2%).
Conclusion: Consistent with randomized controlled trials, preliminary data from this observational cohort support the effectiveness, safety and tolerability of B/F/TAF in routine clinical practice, including in participants with comorbidities, and demonstrate high persistence through 6 months.

P7

Real-world experience of bictegravir (BIC)/emtricitabine (FTC)/tenofovir alafenamide (TAF) in a diverse urban HIV clinic cohort

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Background: BIC/FTC/TAF is a novel, unboosted INSTI, coformulated with an NRTI backbone in a fixed dose combination. The increase in prescribing of BIC/FTC/TAF has been identified in clinical practice with little real-world data available regarding its use. This study looks at experience of this regimen in a HIV cohort in terms of tolerability, reasons for switch, efficacy and safety; with a focus on HIV laboratory data, weight and previously identified resistance mutations notably M184V.
Method: A retrospective cohort study of patients commenced on BIC/FTC/TAF January-December 2019 was conducted, approved by local ethics committee. Patients were identified through pharmacy dispensing records. Data was collated from electronic patient records. Data analysis was performed using excel™.
Results: 263 patients were commenced on BIC/FTC/TAF January-December 2019. 75% (n=196) were male, 74% (n=195) white, 15% (n=38) black. Age range was 18 to 79 years (median 45 years). 18 patients were treatment naïve, 7 rapid-start ART. Reasons for switch/start included single tablet regimen 34% (n=90), side effects 28% (n=78) or drug-drug interactions 19% (n=45). Mean weight prior to ART switch/start was 76.8kg (sd 17.8) vs 80.4kg (sd 18.5) after BIC/FTC/TAF. Of treatment naïve patients (n=18), 9 had undetectable HIV viral load (VL), 8 had a >3-fold drop in HIV VL at follow up. In treatment experienced patients (n=254), 206 had an undetectable VL pre-switch and 213 had an undetectable VL afterwards. 10% (n=27) had CD4 count <200 cells/mm^3. BIC/FTC/TAF was well tolerated in 97% (n=254) of patients. 10% (n=27) had prior resistance mutations, 4% (n=10) had an M184V, 1 patient had INSTI mutation A128T. 13 patients were not maintained on BIC/FTC/TAF. 7 lost to follow up, 2 weight gain (7kg and 3kg), 2 GI upset, 1 joint pain, 1 unknown. There was no rash or significant biochemical derangement reported.
Conclusion: This study suggests that in both treatment naïve and experienced patients, BIC/FTC/TAF is well tolerated, safe and efficacious in our cohort, including those with M184V. Weight gain was reported in only a small number of patients; more longitudinal data analysis is required.

P8

Long-term efficacy and safety of bictegravir/emtricitabine/tenofovir alafenamide (B/F/TAF) in ART-naïve adults

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Background: To evaluate comparative efficacy and safety of B/F/TAF and dolutegravir (DTG)-containing regimens through 144 weeks (W).
Method: We conducted two randomised, double-blind, active-controlled phase 3 studies of B/F/TAF in treatment-naïve adults living with HIV. Study 1489 randomised HLA-B*5701-negative adults without HBV to receive B/F/TAF or DTG, abacavir, and lamivudine (DTG/ABC/3TC). Study 1490 randomised adults to B/F/TAF or DTG + F/TAF. Participants were pooled into three groups: B/F/TAF (Studies 1489, 1490), DTG/ABC/3TC (Study 1489), and DTG + F/TAF (Study 1490). A pre-specified pooled analysis at W144 assessed efficacy as the proportion with HIV-1 RNA <50 c/ml (FDA Snapshot) and safety; proteinuria and bone mineral density (BMD) were measured in 1489 only
Results: 1274 adults were randomised/treated (634 B/F/TAF, 315 DTG/ABC/3TC, 325 DTG + F/TAF), 89% male, 33% Black. Baseline characteristics were similar across groups. At W144, 82% on B/F/TAF, 84% on DTG/ABC/3TC, and 84% on DTG + F/TAF achieved HIV-1 RNA <50 c/ml. No participant developed resistance. The proportion with drug-related adverse events of any grade was 26% (B/F/TAF), 42% (DTG/ABC/3TC), and 29% (DTG + F/TAF). Adverse events led to discontinuation for 1% (B/F/TAF), 2% (DTG/ABC/3TC), and 2% (DTG + F/TAF). Changes in eGFR at W144 were similar across groups. In Study 1489, comparing B/F/TAF to DTG/ABC/3TC, changes in proteinuria and renal biomarkers were similar and mean percentage change from baseline in hip and spine BMD by DXA at W144 were similar. Small treatment differences in changes from baseline in fasting LDL, HDL, and TC:HDL ratio were observed with B/F/TAF vs DTG/ABC/3TC but not vs DTG + F/TAF.
Conclusion: Through 3 years of follow-up in ART-naïve adults, use of B/F/TAF resulted in high rates of virologic suppression through W144. B/F/TAF was well tolerated, had fewer drug-related adverse events compared with DTG/ABC/3TC, and no clinically relevant effect on bone and renal safety or fasting lipids.

P9

Sustained viral suppression among participants with pre-existing M184V/I who switched to bictegravir/emtricitabine/tenofovir alafenamide

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Background: Pre-existing resistance can affect antiretroviral therapy efficacy in people living with HIV. One of the most common treatment-emergent resistance substitutions is M184V/I. This substitution can be transmitted, archived in the viral reservoir, and reactivated, even when genotyping shows wild-type virus. Studies 1844, 1878, 4030, 4449, and 1474 demonstrated the safety and efficacy of switching stably suppressed HIV-1-infected individuals to bictegravir/emtricitabine/tenofovir alafenamide (B/F/TAF). In this pooled analysis, we investigated the prevalence of pre-existing M184V/I and impact on virologic outcomes.
Method: Participants enrolled were aged ≥18 years (studies 1844, 1878, and 4030), ≥65 years (study 4449), or 6 to <18 years (study 1474). Pre-existing drug resistance was assessed by historical genotypes and/or retrospective proviral DNA genotyping (GenoSure Archive® assay, Monogram Biosciences). Virologic outcomes were based on last available on-treatment HIV-1 RNA, where early discontinuation with HIV-1 RNA <50 copies/ml was considered suppressed.
Results: Altogether, 1545 participants switched to B/F/TAF and were treated for 24 to 144 weeks. Cumulative baseline genotypic data from historical and/or proviral genotypes were available for 89% (1356/1545). Pre-existing M184V/I was detected in 9.7% (132/1356) of participants: by proviral genotyping only (83%, 109/132), historical genotype only (9%, 12/132), or both (8%, 11/132). At baseline, participants with pre-existing M184V/I were 15–78 years old. At the time of analysis (≥24 weeks of B/F/TAF treatment), 98% (129/132) of participants with pre-existing M184V/I were suppressed compared to 99% (1528/1545) of the overall B/F/TAF study population. No B/F/TAF-treated participant developed new drug resistance.
Conclusion: Pre-existing M184V/I was detected in nearly 10% of suppressed participants' baseline genotypes, the majority of which was previously undocumented. High rates of virologic suppression in participants who switched to B/F/TAF, and the absence of treatment-emergent resistance, indicate B/F/TAF may be an effective and durable treatment for suppressed patients with archived M184V/I.

P10

Efficacy and safety of bictegravir/emtricitabine/tenofovir alafenamide versus comparators in cis-women and girls (living with HIV): an analysis of five clinical trials

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Background: Globally, the majority of people living with HIV are cis-women. Cis-women bear the brunt of HIV epidemic but remain significantly under-

represented in clinical trials. Coformulated bictegravir/emtricitabine/tenofovir alafenamide (B/F/TAF) is a once-daily, single-tablet regimen with demonstrated efficacy and safety in clinical trials of treatment-naïve and virologically suppressed adults, adolescents and children living with HIV. Efficacy and safety of B/F/TAF versus comparators in cis-women and girls across five phase 2/3 B/F/TAF clinical trials through 48 weeks were assessed.
Method: Analysis included cis-women and girls from five clinical trials: virologically suppressed (VS) adults (studies 1961, 4449) and adolescents and children (study 1474), and treatment-naïve (TN) adults (studies 1489, 1490). Participants were grouped by age: children (6–11), adolescents (12–17), adults (18–49) and older adults (≥50). Comparators included dolutegravir/abacavir/lamivudine (DTG/ABC/3TC) (1489), DTG+F/TAF (study 1490), elvitegravir/cobicistat/F/(TAF or tenofovir disoproxil fumarate[TDF]) (study 1961) or atazanavir+ritonavir+F/TDF (study 1961). We assessed efficacy using FDA Snapshot for HIV-1 RNA <50 c/ml, safety, and tolerability at Week 48.
Results: 679 cis-women and girls were analysed: 373 receiving B/F/TAF (69 TN, 304 VS), 306 comparator (70 TN, 236 VS). Age range was 6–74 years; 44% Black, 28% White, 17% Asian and 12% other. High and similar rates of virologic suppression were observed across age groups (B/F/TAF 87%-100%; comparators 86%-95%). No treatment-emergent resistance was detected with B/F/TAF versus 1 participant on comparator regimen developed resistance. Drug-related adverse events (AEs) occurred in similar proportions of participants taking B/F/TAF versus comparators. Overall rates of grade 3/4 AEs were low. No women and 1 girl discontinued due to any AE in B/F/TAF group vs 2 women in comparators.
Conclusion: B/F/TAF is an effective, well tolerated HIV treatment in this large analysis of cis-women and girls living with HIV spanning ages 6–74 years. High rates of virologic suppression and low incidence of AEs, observed among diverse participants, make B/F/TAF an important treatment option for cis-women and girls.

P11

Two-drug therapy with dolutegravir+lamivudine in an adult HIV service

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Background: Following recent licensure, dual therapy with dolutegravir and lamivudine (DTG+LAM) is an approach being considered to reduce potential longer term side-effects and drug-drug interactions associated with standard triple anti-retroviral (ARV) regimens. Real life clinical experience is desirable before switching patients from existing successful regimens. We aim to describe the characteristics and outcome of patients treated with DTG+LAM in our centre.
Method: Retrospective review in a single centre of patients living with HIV (PLHIV) who were initiated (n=2) or switched (n=65) to DTG+LAM during 2019–20. Baseline characteristics collected include: age, gender, ARV history, time since HIV diagnosis, presence of previous viral blips or resistance mutations, QRISK3 (cardiovascular), FRAX (bone density) and CKD (renal) risk scores. Clinical outcomes before and 3–6 months after DTG+LAM introduction were collected and included ARV tolerability, viral load, lipid profile, weights (if new to DTG), estimated glomerular filtration rate, and urinary albumin-creatinine ratio.
Results: Data collection and analyses remain underway as additional patients have been switched to DTG+LAM. Of 2 patients initiated on DTG+LAM, both had viral load <30 copies/ml at 6 to 9 months. Of around 65 patients switched to DTG+LAM, 19% were female with mean age of 54.1 years (range 28–72). Patients were switched for at least 1 of following reasons: lipid elevation (28%), increased cardiovascular risk (25%), simplification (25%), drug interactions (19%), renal (13%), existing ARV intolerance (6%) or bone (6%) risks. 59% were switched from non-DTG containing regimens; among these patients there was a mean weight gain of0.35 kg (max 4.8kg, >7% body weight). At 6 months, 3% had discontinued to likely DTG intolerance (neruological or gastrointestinal), 3% experienced mild self-limiting gastrointestinal disturbance and 1.6% were discontinued due to virological failure (no resistance mutations) after switch.
Conclusion: Dual treatment with DTG+LAM is well tolerated and maintains virological control in PLHIV.

P12

A re-audit of low-level viraemia management in a large city clinic

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Background: A 2017 audit of low-level viraemia management in a large HIV clinic led to the amendment of local policies. This re-audit aimed to review practice and impact on patient recall.
Method: A database search of HARS identified patients with a viral load 100–200 copies/ml, 01/01/19–30/06/19. Patients not on, or new to treatment were removed. EPR was then reviewed, and time from sample taken to laboratory receipt.
Local standards for viral load 100–200: check adherence. PI or dolutegravir based regime normal recall. All other regimes recall <6 weeks and repeat.
Results: 64 patients had a low-level viraemia 100–200 copies/ml. The majority (69%) were on combination regimes with a high resistance threshold (28/64 (44%) on PI-based,16/64 (25%) dolutegravir-based) (Tables P12.1 and P12.2).
Documentation that the result had been reviewed was found in 84% of EPR, with ARV adherence recorded in 92% of EPR.
Recommended recall for low-level viraemia is dependent on the antiretroviral regime.

Table P12.1

	Median time to repeat (weeks)	Tested according to standards
NNRTI	8	38%
PI	13.5	53%
Dolutegravir	13	44%
Other Integrase inhibitors	4.5	67%
Other	4	100%

Consultants and registrars have improved decision documentation since the previous audit.

Table P12.2

	Consultant		CNS		Registrar		Pharmacy	
	2017	2019	2017	2019	2017	2019	2017	2019
Documentation VL>100	60%	82%	84%	83%	88%	93%	n/a	75%
Median time to documentation (weeks)	4	4	2.5	2	2	2.5	n/a	2
Documentation of Adherence	88%	86%	96%	94%	100%	100%	n/a	100%

6/64 had their ARV regimen changed (2/6 for clinical indications, 4/6 due to low level viraemia. Regimens switched away from for viraemia: NNRTIs in 2 cases, 1 case of dual therapy and a patient already on PI was changed to a single-tablet regime.

43/64(67%) samples with low-level viraemia were processed by the laboratory within 6 hours and 21/64(33%) >14 h after taking. For those processed within 6hrs, 3/43 (7%) remained over 100 copies/ml at repeat; samples processed >14 h later, repeat viral load was >100 copies/ml in 6/21 (29%) cases.
Conclusion: Documentation of low-level viraemia results has improved. Management of low-level viraemia is variable within our large service with many clinicians; local guidelines will be re-presented alongside the audit data to staff. Delay in sample processing did not correlate with low-level viraemia.

P13

Associations with weight change and patient-reported outcomes after switching from efavirenz/emtricitabine/tenofovir disoproxil fumarate (EFV/FTC/TDF) to bictegravir/emtricitabine/tenofovir alafenamide (BIC/FTC/TAF)

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Background: Novel integrase inhibitors bictegravir (BIC) and dolutegravir (DTG) are the preferred anchors for most people living with HIV (PLWH) according to major HIV treatment guidelines due to their high barrier to resistance, efficacy and safety. However, both BIC and DTG are associated with significantly more weight gain than EFV in treatment naïve populations. To date, no data has been presented regarding changes in weight with patient-reported outcomes (PROs) after switching to BIC. In this secondary analysis, we aim to determine if there are any associations with PROs and changes in weight 48 weeks after switching from EFV/FTC/TDF to BIC/FTC/TAF.
Method: We conducted a 48-week, open-label, single-center, single-arm, prospective study evaluating the efficacy, safety, and tolerability of switching from EFV/FTC/TDF to BIC/FTC/TAF in PLWH > 18 years of age who were virologically suppressed. A secondary analysis was conducted to identify associations with PROs (using the HIV Symptom Index), sleep quality and weight change at week 48. We defined weight change as loss (3% decrease) and gain (3% increase). Using Rasch analysis combined with mixed-effect generalized linear models, we examined the relationship between weight change as a function of PROs and sleep quality.
Results: A total of 87 participants completed the study and were included in the analysis. Median age 55 (range 28–71); 98% male; 94% white, 5% black; 19% identified as Latinx. At 48 weeks, virologic failure was seen in 3 participants (3.3%; viral load range 50–54 c/ml) and there were no discontinuations of drug for any reason. The mean weight at baseline and 48 weeks after switch was 87 13.5 kg and 88.112.7 kg, respectively (p=0.339). At week 48, 14.9% of subjects had lost weight, 50.5% remained neutral, and 34.6% gained weight. Three (3.5%) participants gained 10% or more. There were no associations with weight change and sleep quality or PROs, including complaint of weight gain (p>0.05) (Figure P13.1).

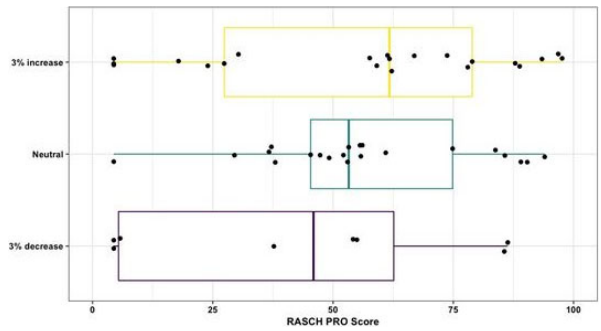

Figure P13.1

Conclusion: Switching virologically suppressed PLWH from EFV/FTC/TDF to BIC/FTC/TAF did not result in significant overall weight gain. There were there any associations with weight change and PROs or sleep quality.

P14

Clinical outcomes of naïve patients started on bictegravir/emtricitabine/tenofovir alafenamide – Biktarvy ®

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Background: A Single Tablet Regimen (STR) containing bictegravir, emticitabine and tenofovir alafenamide (TAF), marketed as Biktarvy, was approved for use in Wales on 14th November 2018. This offers the first unboosted TAF based Integrase (INSTI) STR. We aim to address concerns about efficacy, safety, and tolerability from our clinical data in naive patients.
Method: Naïve patients started on Biktarvy between 14th November 2018 and 14th December 2019 were identified from pharmacy records. Data was collected on demographics, baseline characteristics. Data was also collected at 4 weeks and at regular intervals, on clinical parameters along with patient reported side effects.
Results: 22 notes were identified as eligible for inclusion. The majority were male (86%) of which 81% were white MSM. Median age was 48 years with a range of 24–64 years. Baseline median CD4 count was 105 cells/mm3 (range 30 to 800) and median VL was 4.5 x 10^5 copies/ml. Median baseline weight was 72kg (range 54–102)
Of these 22 patients:: 7 patients had concomitant AIDS defining infections – pneumocystis jirovecii pneumonia, cerebral toxoplasmosis, karposis sarcoma and cryptococcal meningitis. Of these 5 patients required starting ARVs prior to resistance test results. Once known, 1 patient switched therapy due to resistance (K65R, T215Y, M184V).
2 patients experienced IRIS after commencing Biktarvy – 1 patient requiring ITU admission
Length of time on Biktarvy treatment ranged from 12 to 48 weeks. Median decrease in VL at 4 weeks was 3 logs, with a third of patients achieving a VL <40 copies/ml. 95% of patients achieved a VL <40 copies/ml within 8 weeks – this patients VL measured at 106 copies/ml at 12 weeks.
5 patients reported side-effects but only 2 patients stopped treatment – 1 due to angioedema and 1 due to rash. No patients discontinued due to weight gain.
Conclusion: In this small number of patients, Biktarvy appears efficacious with 95% achieving an undetectable VL at 8 weeks. It appears well tolerated with few experiencing transient side-effects and a low incidence of discontinuations. No patients discontinued due to weight gain. This data supports the benefits of starting Biktarvy, and offers a safe and financially viable option for healthcare providers.

P15

Clinical outcomes of stable patients switched to bictegravir/emtricitabine/tenofovir alafenamide – Biktarvy ®

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Background: A Single Tablet Regimen (STR) containing bictegravir, emticitabine and tenofovir alafenamide (TAF), marketed as Biktarvy, was approved for use in Wales on 14th November 2018. This offers the first unboosted TAF based Integrase (INSTI) STR. We aim to address concerns about efficacy, safety, and tolerability from our clinical data in switch patients
Method: All stable patients switched to Biktarvy between 14th November 2018 and 14th December 2019 were identified from pharmacy records. Data was collected on demographics, baseline characteristics. Data was also collected at 4 weeks and at regular intervals, on clinical parameters along with patient reported side effects.
Results: 87 notes were identified as eligible for inclusion. The majority were male (71%) of which 90% were white MSM. Median age was 49 years with a range of 29–70 years. Baseline median CD4 count was 640 cells/mm3 (range 250 to 1120) and all patients had a VL <70 copies/ml. Median baseline weight was 86kg (range 52–124)
Of these 87 patients:: 7 patients had documented resistance prior to a switch, but none to the constituents of Biktarvy
The main reasons for a switch included – 22% low or declining eGFR, 14% required an STR, 31% had metabolic co-morbidities and 10% were concerned about drug interactions or potential interactions. Overall 75% of switches were classified as a cost reduction.
63% were on an INSTI containing regimen and 13% were on a PI based regimen. 57 patients were on a TAF based regimen and switched to Biktarvy primarily driven by cost.
11% reported side-effects of any severity post switching, of which 6 patients discontinued treatment with Biktarvy – 1 diarrhoea, 3 weight gain >6 kg and 2 low mood.
All patients maintained a VL <70 copies/ml. Length of time on Biktarvy treatment ranged from 4 to 48 weeks.
Conclusion: In this small number of patients Biktarvy appears efficacious with all patients maintaining an undetectable VL. It seems well tolerated with few experiencing transient side-effects and a low incidence of discontinuations.3 patients discontinued due to weight gain. This data

supports the benefits of switching patients to Biktarvy, and offers a safe and financially viable option for healthcare providers.

P16

Ranitidine supply disruption: reviewing ranitidine prescribing and managing alternative options in patients taking rilpivirine or atazanavir at our service

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Background: In October 2019 the Medicines and Healthcare Products Regulatory Agency (MHRA) issued an alert recalling stocks of ranitidine. The Department of Health advised all healthcare professionals to review ranitidine prescribing, where appropriate switching to an alternative, reserving ranitidine for patients with no alternative. Alternative treatments include antacids where possible, followed by omeprazole as first line proton pump inhibitor (PPI). Other H2 receptor antagonists could be considered if available but avoided as a first line switch. Due to significant therapeutic drug loss of atazanavir and rilpivirine if co-administered with a PPI our department identified patients at risk of this potential drug interaction.
Method: Electronic patient records were reviewed for any patient taking an anti-retroviral (ARV) regime that contained rilpivirine or atazanavir with a historic or current record of ranitidine. Patients were contacted to establish the indication for ranitidine treatment and our multi-disciplinary team, including pharmacy, to determine if ranitidine was still required. Patients were managed according to clinical complexity and indication, and an alternative treatment plan was implemented: antacids or PPI with ARV switch. All contacted patients were reminded about drug interactions. Additionally information about ranitidine was provided to all patients via posters in waiting areas and our clinic website.
Results: 44 patients were identified, 34 male, median age 54, 8 on atazanavir and 36 on rilpivirine. Seventeen patients were currently on ranitidine: 12 for Gastro-Oesophageal Reflex Disease, 2 for hiatus hernia, 1 for gastritis and 2 for high gastro-intestinal bleeding risk. Of these 17 patients, 4 were able to manage their symptoms with antacids, 1 was switched to famotidine and 2 were recommended to remain on ranitidine. Ten patients will require treatment with a PPI and therefore have been invited in to discuss and initiate an ARV regime switch.
Conclusion: In view of ranitidine rationing we have successfully reviewed and managed patients prescribed ranitidine on an ARV regime that contains rilpivirine or atazanavir. In this cohort we have been able to prevent the consequences of potential drug interactions with alternative treatments that may be prescribed by other healthcare professionals or self-sourced while continuing to support our patients' other health requirements and reserving the limited supply of ranitidine for where there is clinical need.

P17

Outcomes of patients on antiretroviral medication with low-level viraemia

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Background: Low level viraemia (LLV) is defined by the British HIV Association (BHIVA) as a persistent viral load (VL) between 50–200 copies/ml. BHIVA treatment guidelines do not recommend intensifying by adding a single additional active antiretroviral (ARV) but does state that in patients with persistent LLV on a low genetic barrier (LGB) regimen (including NNRTI or integrase inhibitor (INI) based therapy), a regimen change is warranted.
A review was undertaken of how patients with LLV were managed at an inner city HIV clinic to determine whether any interventions were successful at achieving virological suppression.
Method: Patients with persistent LLV were identified using:

1 Multi-disciplinary team discussions
2 HARS report for 2018.

They were included if:

1 On ARVs for ≥6 months
2 ≥3 VLs between 50–500 copies/ml over ≥6 months
3 Good adherence.

Results: 64 out of 78 patients with persistent LLV had one or more intervention(s) (Tables P17.1–3):

Table P17.1. Outcome of interventions on VL (undetectable = ≤50copies/ml).

	Intensification n=31	Switch n=54	Simplification (n=10)	Dose intensification (n=4)	Other (n=2)	Total (n=101)
Undetectable VL after 3 months	12 (39%)	22 (41%)	6 (60%)	0	1 (50%)	41 (41%)
Detectable VL after 3 months	19 (61%)	32 (59%)	4 (40%)	4 (100%)	1 (50%)	60 (59%)

Intensifications and switches were further analysed.

Table P17.2. Outcome of intensifications with additional active ARV

	Protease Inhibitor (PI) n=11	INI (n=15)	CCR5 inhibitor (n=4)	Other (n=1)
Undetectable VL after 3 months	3 (27%)	7 (47%)	1 (25%)	1 (100%)
Detectable VL after 3 months	8 (73%)	8 (53%)	3 (75%)	0

Table P17.3. Outcome of switches between LGB and high genetic barrier (HGB) ARVs (LGB = NNRTIs, INIs, maraviroc. HGB = PIs)

	LGB-HGB (n=27)	LGB-HGB (n=21)	HGB-HGB (n=4)	HGB-LGB n=2
Undetectable VL after 3 months	9 (33%)	9 (43%)	3 (75%)	1 (50%)
Detectable VL after 3 months	18 (66%)	12 (57%)	1 (25%)	1 (50%)

Conclusion: The overall likelihood of achieving virological suppression following any intervention is low (41%) and only 43% of patients became undetectable after switching from a LGB to a HGB regimen. The BHIVA guidelines do not differentiate between INIs however the newer ones may also be considered to have a HGB.

P18

Switching to dolutegravir-based two-drug regimens (DTG-2DR): performance in clinical practice

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Background: GEMINI/SWORD trials have shown that DTG-2DR can achieve/maintain virologic suppression in selected patients. JUNGLE and COMBINE-2 trials are underway to ascertain DTG-2DR performance. We aimed to evaluate ongoing performance of this approach in our cohort. DTG-2DR locally includes DTG/3TC, DTG/RPV and DTG/FTC (to minimise pill burden).
Method: Clinic database search of all patients prescribed DTG-2DR from 1/Jan/15–15/Dec/19. Demographic data, HIV viral load, baseline resistance and ART history were analysed.
Results: Of 3251 clinic cohort, 299 (9.2%) were switched to DTG-2DR (DTG/3TC207/299 (69.2%); DTG/FTC 23/299 (7.7%); DTG/RPV 69/299 (23.1%) by 15-Dec-19. Subsequently 11.4% (34/299) switched off due to side effects/tolerability issues. Follow up was 269.9 total person years.
Median age 52.5 years (IQR 46.5–58 years). 229/299 (76.6%) male, 70/299 (23.4%) female. Median time since diagnosis 16.8 years. Virological

suppression (VL < 50 c/ml) occurred in 263/265 (99.2%). Viral load blips occurred in two receiving DTG/3TC: 87 and 105c/ml.
Of the 34 patients who switched off DTG-2DR, 4 (11.8%) demonstrated virological failure (Table P18.2). An inpatient psychiatric admission leading to ART cessation and DTG tolerability issues were reported.
119/167 remaining on DTG-2DR (71.3%) had no baseline resistance associated mutations (RAMs) in reverse transcriptase (RT):

Baseline RT RAMs (Table P18.1):
Table P18.1

Regimen	RAMs
DTG/3TC	K103N (3/183), E138A (3/183)
DTG/RPV	M184V/I (15/62), K103N (6/62)
DTG/FTC	K65K/E (1/20), V179D (1/20), A98G (1/20)

Patients with viraemia >50 c/ml on DTG-2DR (Table P18.2):

Table P18.2

VL (c/ml)	Regimen	Baseline resistance (RT)
Ongoing DTG-2DR:		
87	DTG/3TC	None
105	DTG/3TC	Not available
Switched off DTG-2DR:		
68	DTG/RPV	K103N, M184V
72	DTG/3TC	None
4,571	DTG/3TC	None
520,000	DTG/3TC	Not available

The patient switched off DTG/RPV with baseline K103N and M184V had no RT RAMs on most recent resistance testing. Other reasons except viraemia for switch off included renal impairment and psychiatric side effects.
Conclusion: Overall, with 269.9 person years follow up the majority of our cohort remained virologically suppressed on DTG-2DR, including small numbers receiving DTG/FTC. DTG tolerability was an appreciable reason for switch, comparable to other published cohorts. Careful selection of patients for DTG-2DR switch is important, particularly considering potential archived mutations.

P19

Switching from a three-drug TAF-based regimen to a two-drug DTG/3TC FDC was not associated with a higher frequency of intermittent viraemia in suppressed patients in TANGO

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Background: The Switch Study to Evaluate Dolutegravir Plus Lamivudine in Virologically Suppressed Human Immunodeficiency Virus Type 1 (HIV-1) Positive Adults (TANGO) is a 200-week, phase III, randomized, open-label trial to evaluate efficacy and safety of switching from a tenofovir alafenamide fumarate (TAF)–based regimen to a 2-drug regimen (2DR) of dolutegravir (DTG)/lamivudine (3TC) in HIV-1-infected adults, with HIV-1 ribonucleic acid (RNA) <50 c/ml and without prior virologic failure or historical nucleoside reverse transcriptase inhibitor or integrase strand transfer inhibitor major resistance mutations. Switching to DTG/3TC was noninferior to continuing a TAF-based regimen through Week 48 using a 4% noninferiority margin for Snapshot virologic failure.
Method: The frequency of elevated viral loads (VLs; HIV-1 RNA ≥50 c/ml) was assessed over 48 weeks of therapy overall and in a subset of participants with archived M184V/I and K65R/E/N. Proviral deoxyribonucleic acid genotyping was conducted retrospectively on baseline whole blood samples using GenoSure Archive assay (Monogram Biosciences). Participants with ≥1 postbaseline VL (intention-to-treat–exposed population) were categorized (Table P19.1). Results were generated using all available on-treatment VL through the Week 48 visit.
Results: 741 participants were randomized and exposed (DTG/3TC, 369; TAF-based regimen, 372). At baseline, M184V/I was detected in 1% (7/643) of participants by proviral genotype, and K65R/E/N was present in <1% (2/643). One participant (<1%) on the TAF-based regimen met confirmed virologic withdrawal criteria with no resistance mutations observed at failure. Through Week 48, the occurrence of elevated VL was low and comparable across arms (Table P19.1); most frequently observed VL rebounds were in category 1a. Elevated VLs (regardless of category) were not observed in the low number of participants with archived M184V/I or K65R/E/N.

Table P19.1. Summary of participants with elevated VL categories through week 48 and prevalence of archived mutations

Elevated VL category for participants in the ITT-E population	DTG/3TC FDC (N=369) n (%)	TAF-based regimen (N=372) n (%)
1. Participants with VLs between 50 and <200 c/mL and no VL ≥200 c/mL	**11 (3)**	**22 (6)**
1a. VLs between 50 and <200 c/mL with adjacent values <50 c/mL (**"blips"**)	9 (2)	18 (5)
1b. ≥2 consecutive VLs between 50 and <200 c/mL	2 (<1)	4 (1)
2. Participants with ≥1 VL ≥200 c/mL	**3 (<1)**	**3 (<1)**
2a. A single VL ≥200 c/mL and no 2 consecutive VL ≥50 c/mL	3 (<1)	1 (<1)
2b. ≥2 consecutive VLs ≥50 c/mL with ≥1 VL ≥200 c/mL	0	2[a] (<1)
Total (all categories)	**14 (4)**	**25 (7)**
Participants with baseline resistance testing data available[b]	**N=322**	**N=321**
M184I/V (occurrence of elevated VL)	4 (1)	3 (<1)
K65R/E/N (occurrence of elevated VL)	0 (0)	2 (<1)

[a]1 participant met CVW criteria by Week 48. CVW was defined as 2 consecutive on-treatment VL ≥50 c/mL with the second VL ≥200 c/mL. [b]Percentage is based on N – number of participants with baseline proviral DNA genotypic data available from the PRAP. PRAP is based on the ITT-E population for whom there are: (1) available proviral DNA genotyping data; (2) ≥1 postbaseline on-treatment HIV-1 ribonucleic acid VL result available; and (3) reason for withdrawal is not protocol deviation. CVW, confirmed virologic withdrawal; DNA, deoxyribonucleic acid; DTG, dolutegravir; FDC, fixed-dose combination; HIV-1, human immunodeficiency virus type 1; ITT-E, intention-to-treat–exposed; 3TC, lamivudine; PRAP, proviral DNA resistance analysis population; TAF, tenofovir alafenamide fumarate; VL, viral load.

Conclusion: The incidence of intermittent viremia through 48 weeks was low and similar between the 2 treatment arms. The frequency of archived M184V/I or K65R/E/N at baseline was very low and did not increase the risk of elevated VL in either treatment arm, with no participants exhibiting intermittent viremia through Week 48. Switching from a 3-drug TAF-based regimen to a DTG/3TC 2DR was not associated with a higher frequency of intermittent viremia.

P20

Use of immediate ART in late HIV presenters is feasible and efficacious in groups beyond MSM

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Background: Immediate antiretroviral therapy (ART), within seven days of HIV diagnosis, has been introduced as a strategy to improve clinical outcomes and reduce barriers to ART for people living with HIV (PLWH).Late diagnosis of HIV remains common in the UK but data on the use of immediate-ART in this group are lacking.We introduced an outpatient immediate ART pathway for a cohort with a high proportion of female, heterosexual and Black, Asian and minority ethnic (BAME) PLWH. We present the characteristics and outcomes for this cohort comparing those with late and non-late diagnosis.
Method: Clinical data were collected using electronic records for all users of the immediate ART pathway during 2019. Late presentation is defined as a diagnosis of HIV with a CD4 count<350 cells/mm^3. Time to immediate ART was defined as the time from confirmed HIV diagnosis to ART initiation.Comparisons between groups were made using non-parametric tests. Time-to & Kaplan-Meier analysis was used to compare time to viral load <50 copies/ml (VL < 50) between groups
Results: Fifty-four individuals used the pathway, 94% accepted immediate-ART and 70.4% were initiated on ART within 7 days of HIV diagnosis (Table P20.1).Median (IQR) time to ART initiation was 6 (2, 9) days and time to VL < 50 was 57 days (28,104). Integrase inhibitors were associated with faster time to VL < 50 (Log-rank test, p=0.02). Baseline resistance was noted in 11%, primary infection accounted for 22%. 87% achieved VL < 200 copies/ml during follow-up to date. 35.2% had a late diagnosis and this was more common among older (p=0.03), black (57.9%) and heterosexual (57.9%) individuals. HIV VL (p=0.004) was higher in late compared to the non-late

groups. Uptake of immediate ART (94% for both) and the median time to ART start were similar (p=0.75) in the late (7 days) and non-late (4 days) presenters, as was time to VL < 50 (Log Rank p=0.22) (Figure P20.1).

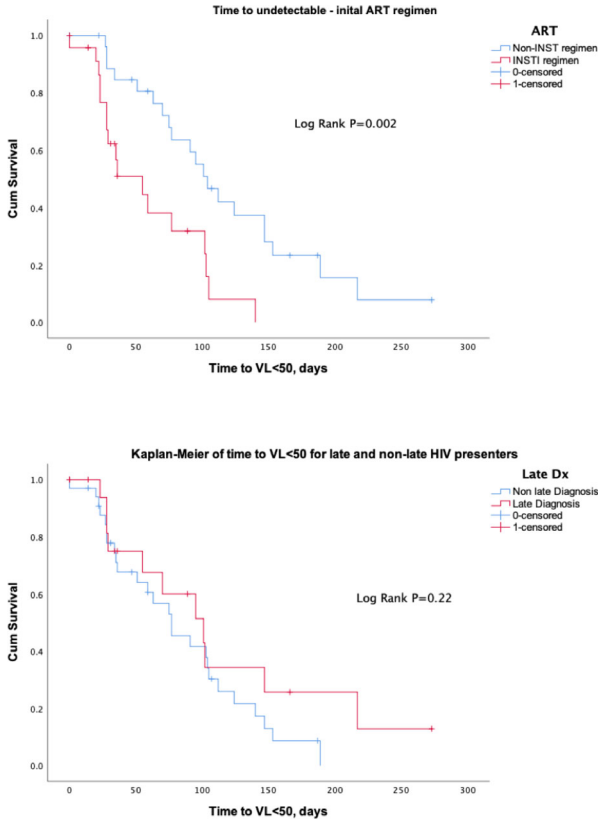

Figure P20.1

Table P20.1. Immediate ART pathway patient characteristics

	Late HIV Diagnosis (n=19)	Non-late HIV Diagnosis (n=35)	P values
Age (median, IQR)	46 (32,51)	29 (25,42)	0.03
Gender			
Female (%)	42.1	17.1	
Risk Group (%)			
MSM	36.8	65.7	
Heterosexual	57.9	34.3	
Other	5.3	-	
Ethnicity (%)			
White	31.6	51.4	
Black	57.9	28.6	
Other	10.6	20.1	
Never tested (%)	57.9	28.6	
ART initiated (%)	94.7	94.3	
Time to ART, days	7 (3, 7)	4 (2, 11)	0.75
Immediate ART-within 7 days (%)	78.9	65.9	
INSTI in initial regimen (%)	52.6	40	
Baseline Resistance (%)	15.8	8.8	
Mutations	E138AE, Y181CYFIN K103Q, H211Y	K103N M46L T215D	
ALT >ULN (%)	10.5	17.1	0.58
GFR<60 mls/min(%)	5.3	8.6	0.20
CD4/CD8 (median, IQR)	0.2 (0.1,0.4)	0.6 (0.4,1.0)	0.001
Log HIV VL (median IQR)	5.14 (4.46,5.98)	4.36 (3.93, 5.0)	0.004
Time to VL<50, days	55 (28,102)	59 (27, 105)	0.90
Achieved VL <200 cpm*(%)	89.5	85.7	

IQR; Interquartile range. VL; viral load. MSM; men who have sex with men. INSTI; integrase inhibitors. ALT; alanine transaminase. ULN; upper limit of normal CPM; copies per ml.
*n=5 had less than 3 months on ART

Conclusion: Immediate ART was feasible and acceptable in our clinical setting.ART uptake and the proportions achieving virological suppression were similar in both late and non-late presenters, while integrase inhibitors may be preferred for more rapid viral suppression. These data support the use of outpatient immediate ART at all CD4 counts and in groups beyond white MSM, such as women and BAME PLWH.

P21

Does nevirapine still have a place in HIV treatment? A multicentre study

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Background: Nevirapine, a non-nucleoside reverse transcriptase inhibitor, was licensed for the treatment of HIV -1 infection in 1998. Generics of both the standard and extended release preparations are now available making it an inexpensive treatment option and it is considered metabolically neutral, however BHIVA no longer recommends nevirapine in its treatment guidelines due to the risk of hypersensitivity reaction. A number of patients remain stable on nevirapine we sought to describe persistence on nevirapine and to determine its long term effectiveness.
Method: Six HIV centres from North West England and Yorkshire identified adult patients currently prescribed nevirapine using local dispensing information. Further data was extracted from electronic patient records and pathology systems, including years on treatment, number of treatment regimens and current and previous viral suppression as well as age, gender and whether continuation on nevirapine had been determined by the patient or their clinician. Data was pooled for analysis.
Results: 217 patients on nevirapine provided data for analysis. 88% (n=192) of patients were aged 40 and over and 54% (n=117) were male. 82% of patients had been on antiretroviral treatment for more than 10 years, with 75% of patients having over 10 years' experience on nevirapine. 43% of patients have only ever received nevirapine-containing regimens.
94% (n=209) of patients had a viral load <50 copies/ml at their most recent clinic appointment. In the previous 5 years on nevirapine treatment 75 patients experienced a viral load >50. Five of those patient's continue to have low-level viraemia with the remainder fully suppressed at most recent follow up.
In 39 cases patient choice was documented as the reason for continuation.In all other cases continuation on nevirapine was led by clinician choice or there was no cause to switch.
Conclusion: It appears a selection of patients have remained stable on nevirapine for many years with the majority established on nevirapine for over 10 years some as long as 30 years. Persistence on therapy demonstrates nevirapine is well tolerated and effective in our cohort. Nevirapine appears to be a safe option in an ageing patient population although further investigation is needed.

P22

Prospective interruption of therapy towards a cure for HIV (PITCH): experiences of patients on treatment interruption (TI)

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Background: Increasingly cure trials require a treatment interruption (TI) in order to evaluate whether an intervention has worked. In order to ensure that future TI trials are designed sensitively with participants at the heart of the process, we carried out qualitative interviews with individuals taking part in the PITCH TI study.
Method: We recruited participants with primary HIV infection, who commenced ART within three months of diagnosis, have been on ART for at least two years with HIV-1 DNA levels <3.25 log copies/million CD4 T cells, CD4 count >500 or CD4:8 ratio> 1, with suppressed plasma VL < 50 copies HIV RNA/ml.

Upon ART cessation, for the first 12 weeks participants were required to undergo point- of-care quantitative GeneXpert viral load testing on a twice per week basis, with additional visits if desired. In-depth qualitative face-to-face interviews were conducted two weeks before, at least two weeks during and two weeks after TI. The interviews aimed to explore views and experiences about TI.

Results: Five out of six participants participated: n=3 were interviewed before TI, n=5 were interviewed during TI and n=4 were interviewed after TI.

Seven themes were identified: 1) Motivation to participate: all participants reported participation in TI was to help others in future. 2) Benefits of TI: Stopped experiencing ART side effects and being off treatment saved NHS money. 3) Challenges of TI: frequent appointments with NHS for blood test. 4) Risks associated with TI: passing on HIV if detectable. Participants used prevention tools (PrEP/condoms). 5) Vicious cycle of worry: anxious/worried their viral load was going up and that they might transmit HIV. 6) Being undetectable: participants knew that undetectable=untransmittable. 7) Treatment rotation: TI is not a cure butswapping treatment with the partner who has to take PrEP.

Conclusion: Participants found that taking a TI as part of a cure trial to be a positive experience and valued the break from taking treatment every day. However psychosocial consideration should be incorporated into planning for TI studies including family/partner involvement. TI studies should provide PrEP to partners of participants as a risk reduction tool and have strategies to reduce participant anxiety during the TI phase.

P23

Is treatment emergent weight gain on dolutegravir-based antiretroviral therapy reversible following discontinuation? A retrospective cohort study

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Background: Weight gain following initiation of antiretroviral therapy (ART) is well described, particularly as part of "return-to-health", however specific associations between weight gain and dolutegravir (DTG) have been reported.We evaluated weight changes following DTG therapy discontinuation amongst a cohort of adults living with HIV at one London centre.

Method: Study design is a retrospective cohort study undertaken between November 2015 and December 2019. Eligible participants were on DTG ≥4 months and switched to a non-DTG regimen with 6-month minimum follow-up post-switch. We collected data on age, ethnicity, gender, CD4 count at time of DTG start, reason for discontinuation, NRTI backbone, weight/BMI prior to DTG start, at time of switch, and at 6 months post-switch. Statistical analysis was descriptive, a comparison was made between those who gained significant weight and those who didn't using Fisher's exact test.

Results: A total of 65 patients met our inclusion criteria, mean age was 45, mean CD4 count was 608 and mean time on DTG was 506 days. Data is available on weight for 46/65; of these 78% (36/46) gained weight during therapy. The average weight change on DTG was +2.54kg. Mean BMI increased from 25.70kg/m2 to 27.92kg/m2. 54% (25/46) gained significant weight (>2 kg). Of this group, 60% (15/25) were on ABC/3TC, 36% (9/25) were on TDF and 4% (1/25) were on F/TAF (Table P23.1).

Table P23.1

	No significant weight gain (n=21)	Significant weight gain (N=25)	
Female	7	15	p=0.085
Black ethnicity	5	14	p=0.038
CD4 <200	1	5	p=0.198

Following DTG discontinuation amongst those who gained significant weight on DTG, we had follow-up data at 6 months on 19/25. 74% (14/19) lost weight. The average weight change at 6 months following discontinuation was −2.83 kg (IQR −0.05, −6.05).

Conclusion: In this small UK cohort, we have identified risk factors for weight gain on DTG. Discontinuation of DTG amongst individuals who gained weight on treatment was associated with weight loss by 6 months after switch in 74% of individuals demonstrating reversibility in the majority of cases.

P24

Tenofovir alafenamide: are we adhering to commissioning guidance?

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Background: In 2016, NHS England published clinical criteria for the commissioning of tenofovir alafenamide (TAF). We aimed to review whether our centre was initiating or switching to TAF-based regimens in accordance with commissioning policy. As part of the review we examined renal parameters, lipid profiles and viral markers post-switch.

Method: A retrospective notes review of all patients newly commenced or switched to TAF-containing regimens in our service from 2016 to present was performed using electronic patient records. Indications were reviewed and additional information on changes in renal function, urine protein creatinine (UPCR), weight and lipid profiles over 6 or 12 months were noted.

Results: A TAF-containing regimen was initiated in 115 patients of whom 89 (77.4%) were male with a median age of 54 years (range 23–83 years). A total of 73 (63.5%) identified as Caucasian with 28 (24.3%) of Afro-Caribbean origin. Median CD4 was 567 cells/mm^3 (n=105) with a median viral load that was undetectable (range <50–7,280,000 copies/ml). Only three (2.6%) were co-infected with hepatitis B. Within the cohort, 77.4% were switched from a tenofovir disoproxil fumarate (TDF)-containing regimen, 20% from a non-TDF containing regimen and 2.6% were newly initiated on a TAF-based regimen. The majority (n=73, 63.4%) were switched or initiated due to aberrant renal function with 19.1% (n=22) due to concerns regarding bone health. Other documented indications for switching included polypharmacy, poor adherence and resistance. A mean increase in estimated glomerular filtration (eGFR) rate of 2.54 ml/min/1.73m^2 after six months alongside an expected decrease in protein creatinine ratio (5.51 mg/mmol) at twelve months was noted. Additionally, both total cholesterol (1.10 mmol/l) and low-density lipoproteins (0.70 mmol/l) rose at twelve months in line with recently published data.

Conclusion: Our results indicate that the majority of our patients are switched to a TAF-based regimen in accordance with commissioning criteria. It is important, however, to consider an abacavir/lamivudine backbone, if clinically permissive, before making this change. We also acknowledge the cost-effectiveness of some regimens over others, particularly as generic TDF is now available. Future studies are needed to assess the long-term safety and side-effect profiles of TAF-containing regimens, including weight gain and dyslipidaemia.

P25

No further immune recovery after switching to raltegravir (RAL) or dolutegravir (DTG) in virally suppressed, antiretroviral therapy-experienced adults

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Background: Immune recovery on antiretroviral therapy (ART) influences long-term outcomes; smaller rises in CD4+ count are associated with non-AIDS complications. Integrase strand transfer inhibitors (INSTIs) are increasingly used and have been shown to cause rapid viral suppression to ultralow levels. The NEAT022 study showed an increase in CD4+ after switch to DTG from a protease inhibitor (PI), however, data is lacking for cohorts switching from non-PIs and for other INSTIs. This study sought to describe changes in CD4+/CD8+ counts and ratio pre- and post-switch to INSTI for a real-life cohort, comparing RAL vs. DTG.

Method: Adults attending a large, Central London clinic who switched to RAL or DTG from any regimen before July 2018 were included if: virally suppressed (<50 copies/ml) ≥2 years pre-switch, ≥6 months on RAL/DTG, and ≥1 lymphocyte subset result pre- and post-switch (within 4 and 2 years of switch, respectively). Only data pertaining to first use of RAL/DTG was considered. Adherence issues, insufficient data, viral failure (>200 copies/ml), consecutive blips (>50, <200 copies/ml), elvitegravir exposure, and history of chemotherapy or bone marrow transplantation were exclusions. A random effects model with linear slope pre- and post-INSTI was used, adjusting for

age-at-switch, gender, ethnicity, RAL vs. DTG, and pre-switch regimen (PI vs. non-PI).
Results: See cohort characteristics in Table P25.1. For our unadjusted model, slopes showing mean change/year pre- vs. post-switch showed no evidence of change in CD4+ (-28.8 [95% CI −62.9–5.3, p=0.1]), CD8+ (-4.7 [-56.4–47.0, p=0.9]), or CD4:CD8 ratio (-0.02 [-0.07–0.02, p=0.3]) post-INSTI. Adjusted models found no evidence for any associations of interest.

Table P25.1. Cohort summary

	Overall (n=246, %)
Male	201 (81.7)
White ethnicity	173 (70.3)
Switch to raltegravir	158 (64)
Pre-switch regimen	
PI	139 (56.5)
Non-PI	107 (43.5)
Median age at switch (years)	49 (IQR 43–55)
ART-start to switch (median, years)	11 (8–16)
Range of switch dates (years)	9.5
Median pre-switch CD4+ count (cells/μl)	665 (IQR 490–840)
Lymphocyte readings	1045
Pre-switch	561 (53.7)
Post-switch	484 (46.3)
Median per person	4 (IQR 3–5)

ART=antiretroviral therapy, PI=protease inhibitor

Conclusion: Switching to a RAL- or DTG-based regimen in suppressed patients on non-INSTI ART did not yield further immune recovery.

P26

Trends in transmitted drug resistance in a cohort of ART-naive individuals living with HIV in Ethiopia

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Background: Transmitted drug resistance (TDR) is associated with suboptimal treatment outcomes and there are limited data from Ethiopia. The aim of this study was to assess HIV-1 genetic diversity and transmitted drug resistance mutations among ART-naive newly diagnosed asymptomatic HIV-1 infected individuals in Addis Ababa, Ethiopia.
Method: This was a prospective study amongst 51 newly diagnosed ART-naive HIV-1 infected patients seen in our center in Addis-Ababa from June to December 2018. Partial HIV-1 pol region (PR) covering the complete Protease (PR) and partial Reverse Transcriptase (RT) regions were amplified and sequenced using an in-house assay. Drug resistance mutations were examined using calibrated population resistance (CPR) tool version 6.0 from the Stanford HIV drug resistance database and the International Antiviral Society-USA (IAS-USA) 2019 mutation lists.
Results: Using both algorithms, 9.8% (5/51) of analyzed samples had at least one TDR Mutation. TDR mutations to Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTIs) were the most frequently detected mutation (7.8% and 9.8%, according to the CPR tool and IAS-USA algorithm, respectively). The mutations observed by both algorithms were K103N (2%), Y188L (2%), K101E (2%), and V106A (2%) but only E138A (2%) was observed according to IAS-USA. Y115F and M184V (mutations that confer Resistance to NRTIs) were detected according to both criteria's in a single study participant (1/51, 2%) who also had NNRTIs associated mutation (Y188L). Similarly, TDR mutation to protease inhibitors were found to be low (G73S; 2%) seen only with the CPR tool. Phylogenetic analysis showed that all 51/51 (100%) of the study participants were infected with subtype C virus.
Conclusion: This study showed significant polymorphism at the PR and RT regions associated with TDR and confirmed homogeneity in the circulating HIV-1 clade C. We will recommend routine baseline genotypic drug resistance testing in all newly diagnosed HIV infected patients before initiating treatment. This will aid the selection of appropriate therapy in achieving 90% of patients having undetectable viral load in consonance with the UN targets.

P27

Impact and management of low-evel viraemia in a large London cohort

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Background: Management of low-level viraemia (LLV) in patients on combination antiretroviral therapy (cART) remains a challenge. LLV is an independent risk factor for virological failure.We examined resistance patterns and management of patients with LLV in our clinic cohort.
Method: Individuals attending our HIV clinic who experienced LLV (defined as ≥2 consecutive detectable viral loads of 21–200 cps/ml) between 2015–2019, were included. Characteristics at the time of first detectable VL and development of new mutations and cART history were summarised.
Results: 84 experienced LLV during follow-up, 2% of the total clinic population. Characteristics are shown in Table P27.1. Most (59%) were on PI-based ART, and most were on a triple class regimen (89.3%).67 (79.8%) had at least one resistance test performed at baseline, of which 6 (9.0%) failed to amplify.Of those that did amplify, 15/61 (24.6%; 95% CI 14.5%-37.3%) had baseline resistance to at least one-class (4 [6.6%;1.8–15.9%] PI-associated, 11[18.0%;9.4%-30.0%]NNRTI-associated, 7 [11.5%;4.7%-22.2%] NRTI-associated, 0 [0.0%] triple-class).24 patients went on to have a second resistance test whilst experiencing LLV, a median (IQR) of 5(3,7) months later; 8 (33.3%; 95% CI15.6%-55.3%) had a new major mutation detected. There were 5 new M184V/I mutations detected, 2 new K103N and one each of K219E, D67N, P225H, Y188H/Y and low-level resistance to INSTI. 2.4 [1–7] switches in drug regimen were made per person on average. 118 resistance tests were done in total (average = 1.5/person [1–4]. 6 [1–35] viral loads per person were performed on average (sum = 193).

Table P27.1. Characteristics of PLWH experiencing low-level viraemia, 2015–2019

	N (%) or Median (IQR; range)
Total	84 (100%)
Age (years)	51 (45, 56; 20, 91)
Ethnicity	
White	35 (41.7%)
Black	43 (51.2%)
Other	6 (7.1%)
Gender	
Male	67 (79.8%)
Female	17 (20.2%)
Time since diagnosis (years)	9 (5, 15; 0, 29)
CD4 nadir (cells/mm^3)	224 (111, 328; 10, 783)
Ever hepatitis B/C co-infected	11 (13.1%)
NRTI backbone	
Tenofovir+emtricitabine	60 (71.4%)
Abacavir+lamivudine	16 (19.1%)
0 or 1 NRTIs	8 (9.5%)
"Third" drug	
Efavirenz/ Nevirapine	13 (15.5%)/ 3 (3.6%)
Rilpivarine/ Etravirine	6 (7.1%)/ 1 (1.2%)
Darunavir	38 (45.2%)
Atazanavir	12 (14.3%)
Dolutegravir	6 (7.1%)
Raltegravir	10 (12.9%)
Maraviroc	6 (7.1%)
Time from diagnosis to starting ARVs (years)	1 (0, 3; 0, 17)

Conclusion: Low level viraemia in our cohort was rare.15% had evidence of prior resistance.Resistance testing during LLV was not done routinely, and management was individualised. A third developed a new significant mutation,

however there were no emergent PI or major INSTI mutations. M184V and K103N were the most commonly occurring mutations. Management of LLV in this cohort included adherence support, resistance testing and modification of cART to include an agent with a high genetic barrier to resistance. Patients with LLV have frequent VL monitoring, resistance tests and cART switches which have psychological and financial implications for patients and the service respectively.

P28

Low prevalence of baseline integrase resistance in antiretroviral naïve, newly diagnosed individuals with HIV

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Background: Current guidelines do not recommend integrase resistance testing at HIV diagnosis due to lack of evidence of transmitted integrase resistance. Baseline integrase testing has been performed routinely at a London teaching hospital since September 2014, following previously reported data from this cohort between 2014–2016 which demonstrated 11.6% prevalence of integrase resistance mutations. The aim of this study was to identify the prevalence of baseline integrase resistance in newly diagnosed, ART naïve patients from 2016 onwards following increased use of integrase inhibitors (INIs) in routine HIV care and post-exposure prophylaxis.
Method: A single centre, retrospective review of INI resistance reports of individuals diagnosed 1st January 2017 to 7th November 2019 was performed. Baseline demographic, HIV and resistance data were collected and described, including the presence of major and minor INI resistance and the effect on susceptibility to INIs.
Results: 215 individuals notes were reviewed, 119 were newly diagnosed and ART naïve with INI resistance data available; 70.6% male, mean (SD) age 44 (12.8) years, 60.5% heterosexual with a median CD4 556 (IQR: 394,725) cells/ul and viral load 79150 (IQR: 5560, 428250) copies/ml. Single major INI mutations were detected in 6 (5%), none of which reduced INI susceptibility alone (E138EK [n=4], G140DGS [n=1], S147SG [n=1]). Minor mutations were noted in 10 (8.4%) individuals (A128AGST [n=3], E157EQ [n=5], T97A [n=1], H51HY [n=1]). No individual had more than one INI mutation. 3 individuals had baseline nucleotid(s)e resistance (M41L plus T215S, M184V, T215E respectively). 93% remained in care and were commenced on treatment; 63.1% with a TAF/TDF/FTC backbone, 88% commenced Dolutegravir, 8.7% Raltegravir and 3.3% Bictegravir, the majority prior to the availability of a resistance test.
Conclusion: No increase in the prevalence of INI resistance among ART naïve individuals was noted despite increased use of INIs. The majority of mutations did not affect INI susceptibility and major mutations including Y143R, N155H and Q148K were not detected. While databases are being established to monitor INI resistance, this cohort provides a useful update on resistance in ART naive individuals, however further analysis on the economic impact of INI screening of these individuals is required.

P29

Starting antiretroviral therapy in elite or low-level viraemic controllers

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Background: Controversy remains about starting antiretroviral therapy (ART) in elite controllers (EC), which is not fully addressed by the findings of the Strategic Timing of Anti-Retroviral Treatment (START) study. We reviewed elite and low-level viraemic controllers in our clinic cohort to look at factors associated with starting or deferring ART.
Method: We reviewed all patients attending our service from 01/12/04 – 01/12/19 who had not received ART at a time when their viral load (VL) was recorded as <40 (copies m/l). We reviewed subsequent VL where available, to establish whether individuals were true EC (maintaining VL<40 without ART), or had subsequent detectable virus (termed nonEC).
We examined various demographic factors, ART status, and bloods results from our electronic record. CD4 count, CD8 count, viral load and CD4:CD8 ratios were all evaluated, as these had clear cut-offs for demonstrating the benefits of ART in the START results. Most recent measurements were evaluated for patients not receiving ART. For those initiated on ART we looked at the most recent results as well as those prior to receiving ART.
Results: 38/3251 patients in our clinic met the entry criteria. Of these, 11/38 (29%) were defined EC. None had initiated ART. Of these: 5/11 (45.5%) had CD4>800; and 100% had a CD4:CD8 ratio >0.5.
27/38 (71%) were defined as nonEC. ART had been initiated in 25/27 (93%) of such patients. Of those on ART, 5/19 (26%) had CD4>800, and 15/19 (79%) had CD4:CD8 ratio >0.5. CD4 data was unclear in 6 patients due to patients moving centres or receiving treatment outside of the UK.
Conclusion: ART appears to not currently be initiated in our EC cohort, all of whom appear to have a good CD4:CD8 ratio. ART is initiated in most patients with a history of no ART and VL <40 who become detectable, even with low-level viraemia. Further research is required to fully understand the possible benefits and drawbacks of initiating ART in true elite controllers.

P30

ATLAS-2M subanalysis based on prior injection exposure: efficacy, ISRs, and preference of cabotegravir + rilpivirine every 2 months

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Background: In Antiretroviral Therapy as Long Acting Suppression every 2 Months (ATLAS-2M), long-acting (LA) cabotegravir (CAB) and rilpivirine (RPV) dosed every 8 weeks (Q8W) was noninferior to every 4 weeks (Q4W); there were few virological failures.
Method: Efficacy, injection-site reactions (ISRs), and preference outcomes were evaluated based on previous CAB+RPV exposure (none, 1–24weeks, >24 weeks). Primary and secondary endpoints at Week 48 (W48) are proportion of participants with plasma human immunodeficiency virus type 1 (HIV-1) ribonucleic acid (RNA) ≥50c/ml (Snapshot; intention-to-treat–exposed [ITTe]; noninferiority margin, 4%) and with HIV-1 RNA <50 c/ml (Snapshot; ITTe; noninferiority margin, −10%), respectively.
Results: 1045 participants were randomized to CAB+RPV LA Q8W (n=522) or Q4W (n=523); 63% were CAB+RPV naive, whereas 37% transitioned from ATLAS (13% with 1–24weeks and 24% with >24 weeks of Q4W exposure). Q8W was noninferior to Q4W for primary and secondary endpoints (Table P30.1) and by prior CAB+RPV exposure stratification, demonstrating comparable efficacy between arms. Discontinuation due to adverse events occurred in 2% of participants (Q8W, n=12; Q4W, n=13), with 5 (1%) in each group related to ISRs. Of 24,181 injections, 5659 ISRs occurred (Q8W, 2507; Q4W, 3152), with 98% being mild/moderate with a median duration of 3 days; injection-site pain was the most common ISR (Q8W, 2014; Q4W, 2567). Incidence of ISRs decreased over time for participants without prior exposure to or with 1–24 weeks of CAB+RPV exposure (Figure P30.1). For participants with >24 weeks exposure, ISRs remained consistent over time. By W48 no

Table P30.1. Primary and secondary endpoints at week 48 based on prior CAB+RPV dosing

	Prior CAB + RPV treatment[a]			
End point	None (n=654)	1-24wk (n=137)	>24wk (n=254)	Total[b] (n=1045)
Efficacy – primary (HIV-1 RNA ≥50 c/mL)				
Q8W arm, n/N (%)	5/327 (1.5)	3/69 (4.3)	1/126 (0.8)	9/522 (1.7)
Q4W arm, n/N (%)	5/327 (1.5)	0/68 (0.0)	0/128 (0.0)	5/523 (1.0)
95% CI	0.0 (−2.2, 2.2)	4.3 (−1.3, 12.3)	0.8 (−2.2, 4.4)	0.8 (−0.6, 2.2)
Efficacy – secondary (HIV-1 RNA <50 c/mL)				
Q8W arm, n/N (%)	306/327 (94)	66/69 (96)	120/126 (95)	492/522 (94.3)
Q4W arm, n/N (%)	300/327 (92)	65/68 (96)	124/128 (97)	489/523 (93.5)
95% CI	1.8 (−2.3, 6.0)	0.1 (−8.3, 8.6)	−1.6 (−7.4, 3.7)	0.8 (−2.2, 3.7)

[a]Total time on treatment includes both the oral and LA doses. 95% CIs are computed on the difference in proportions within each stratum. [b]95% CIs are computed on the difference in proportions, adjusted for randomization stratum. CAB, cabotegravir; CI, confidence interval; HIV-1 human immunodeficiency virus type 1; LA, long acting; Q4W, every 4 wk; Q8W, every 8 wk; RNA, ribonucleic acid; RPV, rilpivirine.

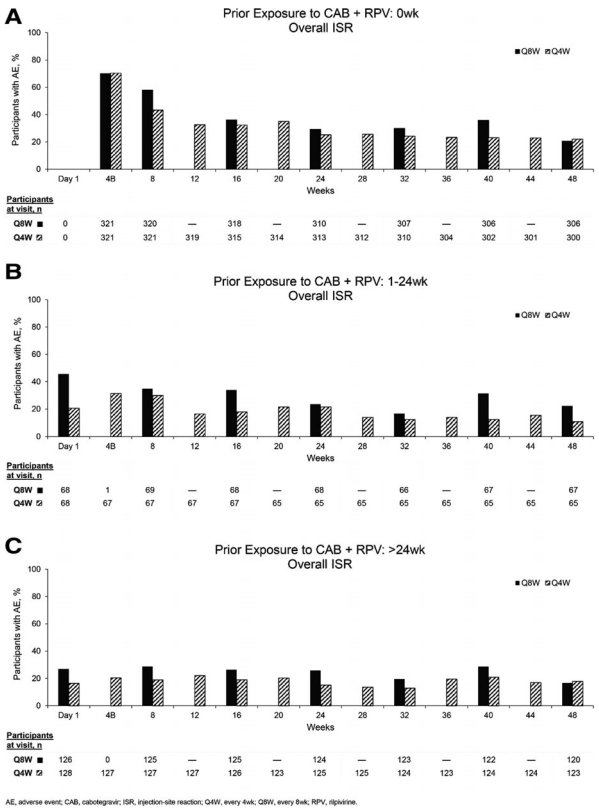

Figure P30.1. Incidence of ISRs for participants (A) without prior exposure to or (B) with 1–24 weeks or (C) >24 weeks of exposure to CAB+RPV

difference was seen in ISRs between arms. In the Q8W arm, 98% (300/306) of participants with no prior exposure to CAB+RPV preferred Q8W dosing, 1% (4/306) preferred daily oral dosing, and <1% (2/306) had no preference. In participants with prior Q4W exposure (≥1week), 94% (179/191) preferred CAB+RPV Q8W dosing, 3% (6/191) preferred Q4W dosing, 2% (4/191) preferred daily oral dosing, and 1% (2/191) had no preference.
Conclusion: Efficacy, ISRs, and preferences were similar among participants with and without previous CAB+RPV dosing. These results support the therapeutic potential of CAB+RPV LA administered every 2 months.

P31

Shorter time to treatment failure in PLHIV switched to dolutegravir plus either rilpivirine or lamivudine compared to integrase inhibitor-based triple therapy in a large Spanish cohort – VACH

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Background: Randomised controlled clinical trials have demonstrated non-inferiority of two-drug combinations (2DC) of dolutegravir (DTG) plus either rilpivirine (RPV) or lamivudine (3TC) compared to triple-therapy (TT). Data on real-world effectiveness of 2DC strategies are limited. This study compared time to discontinuation due to treatment failure (TF) and adverse events (AEs) of DTG-based 2DC versus integrase inhibitor (INSTI)-based TT in a real-world setting.
Method: A retrospective analysis was performed using data from the VACH cohort (prospective, multicentre, Spanish cohort of adult HIV patients). All patients switching to INSTI-based TT or to a 2DC consisting of DTG+RPV or DTG+3TC between 02/05/2016–15/05/2019 were included. Unit of analysis was patient-regimen. Relevant endpoints were time to discontinuation due to TF (defined as clinician report of virological failure (VF), immunologic failure or disease progression), VF and AEs. Patients were censored at loss-to-follow-up, death or end of observation period (20/06/2019). Kaplan-Meier curves and Cox proportional hazard models (controlling for demographics, viral load, CD4, number of previous regimens/VFs, and years on antiretroviral therapy) were conducted.
Results: 5,047 TT and 617 2DC patient-regimens were analysed. Baseline patient-regimen characteristics differed between groups; 2DC were older (mean 52.0 vs 48.1 years, p<0.0001) with more prior ART regimens (7.4 vs 5.3, p<0.001), but a higher proportion were virologically suppressed at switch (90.2 vs 81.0% VL<50 copies/ml, p<0.0001). Time to TF was significantly shorter for 2DC (p<0.0001). The hazard ratio (HR) for discontinuation due to TF on 2DC vs TT was 2.334 (p=0.003). No difference was observed for discontinuation due to AEs (HR=0.797, p=0.488). Results were maintained when looking at discontinuations due to VF (HR=2.236, p=0.024) and when restricting to patients with viral load <50 copies/ml at regimen initiation.
Conclusion: In a real-world setting, the risk of discontinuation due to treatment failure and virological failure were more than two-times higher in patients switching to DTG-based 2 drug combinations compared to INSTI-based triple therapy, with no difference in discontinuation due to adverse events.

P32

Viral rebound (VR) 14 years after discontinuation of antiretroviral therapy (ART)

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Background: Prolonged post-treatment control of HIV-1 viremia (VL) after stopping ART following primary HIV-1 infection (PHI)can occur, but is considered unlikely with ART alone and especially if documented treatment failure. Whether virological rebound (VR) is preceded by clinical symptoms remains unclear.
Method: Case note and laboratory review over a 22-year period of a patient presenting with symptomatic PHI in 1997..
Results: A young female (23 years old) was initiated on ART for symptomatic PHI in October 1997 (CD4 <200 cells/mm^3, VL >750,000 HIV-1 copies (c)/ml). She failed to virologically suppress on ART until April 1999 (07.01.1998:94,000 c/ml; 15.04.1998: 9,700 c/ml; 18.11.1998: 109 c/ml) when she became undetectable after ART switch. During ART discontinuation from January 2004, she maintained aviremia until 12 July 2017(all yearly VL <50 HIV-1 c/ml) (Figure P32.1) with preservation of her CD4 T cell count and CD4/CD8 ratio, detectable HIV-1 DNA and an asymptomatic clinical status.
While still undetectable in 2017 the patient presented in early March of that year with chronic low-level constitutional symptoms (headache, tiredness, urinary symptoms). All investigations including a CSF (<40 HIV-1 c/ml) and CT chest-abdominal-pelvis remained negative. VR was noted on 17.04.2018 at 1,047 HIV-1 c/ml with a CD4 of 796 cells/mm^3. Repeat measurements showed on 30.04.2018 a VL of 308 HIV-1 c/ml, on 03.05.2018 at 380 c/ml and on 04.09.2018 at 13,183 HIV-1 c/ml andCD4 of 554 cells/mm^3. ART was restarted with an undetectable VL (04.10.2018: <40 c/ml, CD4 of 612 cells/mm^3;

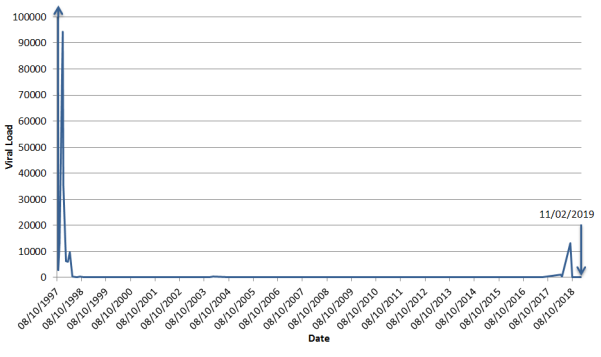

Figure P32.1. HIV-1 viral load 1997–2019. ART stopped in January 2004 – restart September 2018.

12.2.2019: <40 HIV-1 c/ml, CD4 of 1052 cells/mm^3). Symptoms subsided after ART restart.
Conclusion: Very prolonged aviremia can be sustained in ART-only treated individuals, even after initial virological failure, with late VR. Atypical constitutional symptoms may precede VR and should raise suspicion of potential VR. This case highlights the need of close clinical and laboratory monitoring in the long-term in post-treatment controllers in order to re-initiate ART to prevent clinical progression and onward transmission.

P33

Tolerability of dolutegravir-containing ART regimens in a cohort of youth living with perinatallyacquired HIV

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Background: Dolutegravir (DTG) based antiretroviral therapy (ART) is highly effective with low toxicity in adults living with HIV. Data in paediatric and youth populations is more limited, particularly outside of clinic trials. This study evaluated the safety, efficacy and tolerability of DTG-containing regimes for adolescents and youth living with perinatally-acquired HIV (AYLPaHIV) attending a UK service.
Method: Retrospective analysis of electronic patient and pharmacy records of AYLPaHIV aged ≥10 years who ever received DTG to December 2019. Data extracted included: demographics, height, weight, CD4 count, viral load (VL), ART history, time on DTG, toxicity and reasons for switch. Weight change was evaluated by gender and current nucleoside backbone; tenofovir disoproxil fumarate (TDF), tenofovir alafenamide (TAF) and abacavir. Virological failure (VF) was defined as two HIV VL > 20 copies/ml.
Results: Of 282 eligible patients, 83 (29%) ever received DTG-ART, 33/83 (40%) were male and 59/93 (71%) were black British/African. The current median age was 20 years (IQR17–25). The median duration of DTG-ART was 694 days (IQR 387–1031).
46/83 (55%) were suppressed at switch to DTG-ART, 43/46 (93%) remain suppressed beyond 24 weeks. 3 with documented poor adherence experienced VF with no new HIV-1 resistance mutations. 37/83 (45%) had VF at start of DTG-ART, median CD4 count 517 (IQR 231–718). 27/37 (73%) achieved viral suppression by 24 weeks.
8/83 (10%) discontinued DTG after a median of 347 days for; low mood (2), ART simplification (2) and one each: weight gain (10kg), pregnancy, injectable ART and low level viraemia. Median weight gain on DTG-ART was 4kg (IQR 0.3 – 9.8) in males and 3kg (IQR 0 – 6) in females. Weight gain by NRTI backbone was, median (range): TDF 5.5kg (-0.75 to 11), TAF 3kg (0–6), abacavir 3 kg (0–7.5).
Conclusion: Dolutegravir-containing regimes appeared to be generally well-tolerated and efficacious in this small population of AYLPaHIV. Evidence to date to did not suggest significant weight gain beyond that expected during late adolescence in this population of young people, with women and those of black ethnicity uniquely well represented.

P34

Dolutegravir use in a cohort of treatment-experienced young adults with perinatally acquired HIV

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Background: Dolutegravir (DTG) based antiretroviral therapy (ART), is highly effective as first line therapy. However, there is less data in treatment experienced patients, particularly in the perinatally-acquired HIV (PaHIV) population with historical exposure to sub-optimal ART and significant archived drug resistance. DTG with 2 nucleoside reverse transcriptase inhibitors (NRTIs) potentially offers a well-tolerated, small tablet, low pill burden regimen to those who struggle with protease inhibitor (PI) based ART. This study evaluated the pragmatic use of DTG and 2 NRTIs in treatment experienced PaHIV cohort.
Method: Retrospective cohort analysis of electronic records of PaHIV individuals aged ≥10 years with prior virological failure prescribed DTG plus 2 NRTIs attending one UK centre. Data collected: age, gender, sequential HIV viral load (VL) from DTG start and cumulative HIV-1 associated resistance mutations.
Results: Thirty-five PaHIV eligible individuals were included; current median age 22 (IQR 19–25) years, 29/35 (83%) were female and 28/35 (80%) black African/British ethnicity.
14/35 (40%) switched from PI-based ART to DTG and 2 NRTIs with a suppressed HIV VL (<20 copies/ml). Of these, 9/14 (64%) had archived HIV-1 resistance mutations: single class 7/9 (78%) (5 to NNRTI, 2 to NRTI), dual-class 1/9 (NRTI/NNRTI), and triple class 1/9 (NRTI/NNRTI/PI). 13/14 (93%) have maintained a VL <20 copies/ml to at least 24 weeks, one stopping ART with depression.
21/35 (60%) treatment-experienced individuals with documented poor ART adherence, started DTG and 2 NRTIs with virological failure, median VL 14927 copies/ml (IQR 2935–88812). Of these, 12/21 (57%) had documented HIV-1 resistance mutations: 8/12 (67%) single class (6 NNRTI, 2 NRTI) and 4/12 (33%) dual class (3 to NRTI/NNRTI, 1 NRTI/ PI). Fifteen 15/21 (71%) ever achieved VL <20 copies/ml.
Conclusion: Despite significant archived resistance in this small, treatment experienced perinatal cohort, dolutegravir-containing triple therapy was effective at suppressing viral load, including those who had historically struggled with adherence to second line therapy.

P35

QRISK3 to assess cardiovascular risk in people living with HIV (PLWH) on abacavir and the outcome

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Background: This quality improvement project aimed to review the extent of abacavir use in patients with a high cardiovascular risk (defined as an adjusted QRISK3 score of more than 10%).
Method: A prospective, single centre analysis of patients on abacavir were reviewed. At first screening, 1,228 records of patients were identified as receiving abacavir between December 2017 and December 2018. A Raosoft calculator was used to identify a sample size of 293 patients with a 5% error margin and 95% confidence level. A pre-clinical assessment of QRISK3 score was calculated (adjusted for HIV) and if >10% this was documented in the patients' electronic medical notes prompting a review of the appropriateness of abacavir. Patients were excluded if they did not have recent information available recorded to calculate a QRISK3 score.
Results: 72 (24%) patients had an adjusted QRISK3 score higher than 10%. 9 out of 22 (41%) patients that have been seen in clinic since this have now switched off abacavir. 13 patients have remained on abacavir and the reasons for this are summarised in Table P35.1. The remaining 50 patients will be due to have their abacavir reviewed at their next appointment within 6 months.

Table P35.1. Reasons for patients remaining on abacavir

Reason for remain on abacavir	Number
Patient choice	5
Lost to follow up or transferred their care	4
QRISK<10% based on latest results	3
Not documented	1
Total	13

Conclusion: 41% of patients seen during this period had their ART modified based on the QRISK3. Pre-clinical assessment of cardiovascular risk and documentation prompts a discussion in risk reduction strategies including ART modification which is key for PLWH particularly in our aging population.

P36

Comparability of 48-week efficacy and safety of cabotegravir + rilpivirine long-acting every 8 weeks to standard of care in patients with suppressed HIV-1

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Background: Switching to cabotegravir (CAB) + rilpivirine (RPV) Long-Acting (LA) every 4 weeks (Q4W) has demonstrated noninferiority in maintaining viral suppression compared to maintenance of Standard of Care (SoC) in 2 pivotal phase 3 clinical trials (Antiretroviral Therapy as Long Acting Suppression

[ATLAS] and First Long-Acting Injectable Regimen [FLAIR]). CAB+RPV LA every 8 weeks (Q8W) has demonstrated noninferiority in viral suppression compared with CAB+RPV LA Q4W in a phase 3b study (ATLAS every 2 Months [ATLAS-2M]). The objective of this analysis was to assess the comparability of CAB+RPV LA Q8W to SoC via indirect comparison of these trials.

Method: CAB+RPV LA Q8W and SoC were indirectly compared through a generalisation of Bucher's methodology to calculate relative risk, odds ratio, and risk differences using CAB+RPV LA Q4W as common comparator. Pooled data from ATLAS and FLAIR studies (N=591 per group) and the ATLAS-2M patient subgroup with no prior CAB+RPV exposure (N=327 per group) were used to inform the analysis, given homogeneity in baseline patient characteristics. Outcomes analysed were snapshot viral load ≥50 copies/ml, virological suppression, CD4+ cell count change from baseline, overall discontinuations, discontinuations due to adverse events (AEs) and grade 3/4 non–injection-site reaction AEs at week 48.

Results: There was no statistically significant difference in any key outcomes analysed for CAB+RPV LA Q8W compared with SoC at week 48 (Table P36.1). Proportion of patients on integrase strand transfer inhibitor–based regimens at baseline was higher in the pooled ATLAS/FLAIR population (65%, 767/1182) compared with the ATLAS-2M subgroup (42%, 277/654); however, no significant difference in snapshot virologic failure at week 48 was found in a subgroup analysis by baseline treatment class either in the individual studies, or in the indirect comparison.

Table P36.1. Results of the indirect comparison of CAB + RPV LA Q8W with SOC at 48 weeks

	Comparative effect measure (95% CI)		
	Relative risk	Odds ratio	Risk difference, %
Snapshot viral load HIV RNA ≥50 copies/mL	1.10 (0.25, 4.9)	1.10 (0.24, 5.03)	0.2 (-2.2, 2.6)
Snapshot virological suppression (HIV RNA <50 copies/mL)	1.01 (0.95, 1.06)	1.04 (0.49, 2.22)	0.5 (-4.4, 5.3)
CD4+ cell change from baseline, per μL[a]	—	—	5.0 (-29.8, 39.8)
Overall discontinuations	0.93 (0.44, 1.95)	0.93 (0.42, 2.05)	0.0 (-4.7, 4.7)
Discontinuations due to AEs	1.64 (0.48, 5.62)	1.66 (0.47, 5.88)	1.5 (-1.6, 4.6)
Grade 3/4 non-ISR AEs	1.68 (0.78, 3.61)	1.74 (0.77, 3.92)	3.3 (-1.3, 7.8)

[a]Mean difference. AE, adverse event; CAB, cabotegravir; CI, confidence interval; HIV, human immunodeficiency virus; ISR, injection-site reaction; LA, long-acting; Q8W, every 8 weeks; RNA, ribonucleic acid; RPV, rilpivirine; SOC, Standard of Care.

Conclusion: Every 2 months injections with CAB+RPV LA demonstrated comparability in efficacy and safety with SoC consisting of guideline-recommended daily oral antiretroviral therapy (ART), supporting its therapeutic potential for virologically suppressed patients infected with human immunodeficiency virus who seek an alternative treatment option to daily oral ART.

P37

Medical needs for alternatives to daily oral HIV treatments in western Europe

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Background: Current antiretroviral treatments (ARTs) require daily oral dosing, a challenge for some people living with human immunodeficiency virus (HIV; PLWHIV). Four categories of unmet medical needs associated with daily oral ARTs have been identified in studies/interviews with health care professionals (HCPs) and PLWHIV: (1) Medical conditions interfering with daily oral administration, (2) suboptimal adherence, (3) confidentiality concerns (stigma), and (4) quality-of-life issues related to daily tablet requirements (Table P37.1). We quantified these categories to assess the potential benefits of alternatives to daily oral ARTs such as injectable long-acting regimens.

Method: Two separate online studies were completed with HCPs (n=120) and PLWHIV (n=698) in France, Germany, Italy and the United Kingdom.Data on comorbidities, treatment adherence, confidentiality concerns, and emotional well-being were collected. HCPs reported the number and percentage of their patients with challenges; unit of analysis among PLWHIV was the respondents (%). Descriptive analyses were performed with R 3.6.3.

Results: HCPs reported managing a mean (SD) of 299 (177) PLWHIV, of whom 85.7% (15.9) were currently on ART. Among PLWHIV, the mean (SD) age was 40.9 (12.0) years, 66.1% were males, and 98.6% were currently on ART. HCPs estimated that 10%-15% of their patients were affected by each medical condition identified as interfering with daily oral administration (Table P37.1). HCPs estimated that 33.6% of their patients were suboptimally adherent and that 15% participated in programmes to improve adherence. "Nonadherence for any nonmedical reason" was reported by HCPs as the primary cause of virologic failure.Of the interviewed PLWHIV, 43% reported hiding their medication and 30% kept their HIV infection secret. Finally, some PLWHIV suffered from adherence anxiety (27.3%) or saw their tablets as a daily reminder of HIV (45.1%).

Conclusion: A significant proportion of PLWHIV struggle with daily oral ARTs for medical and/or HIV-specific issues. Estimates reported by PLWHIV are usually higher than HCPs' perception of those issues. Providing alternatives to daily oral ARTs has the potential to improve treatment adherence and quality of life in PLWHIV.

Table P37.1. Medical needs alternatives to daily oral HIV treatments

1. Medical conditions interfering with oral administration	HCPs, mean (SD), %	Proportion of PLWHIV, %
Malabsorption	9.8 (13.4)	7.9
Gastrointestinal issues interfering with oral administration	10.4 (12.0)	15.4
CNS disorders	11.6 (13.2)	35.5
Change in regimen/monitoring because of potential drug-drug or drug-food interactions	15.3 (16.5)	26.5
Dysphagia or difficulty to swallowing	9.7 (12.7)	17.9
2. Suboptimal adherence to daily oral therapy		
Suboptimal adherence	33.6 (28.8)	23.8
Proportion enrolled in adherence programmes	15.2 (20.8)	14.7
3. Confidentiality concerns		
Proportion hiding their medication	28.7 (23.8)	43.3
Proportion who have not disclosed their HIV status to anyone	16.8 (14.4)	29.7
4. Impact on quality of life		
"Taking daily HIV treatment reminds me that I have HIV and/or of a mistake or bad memory from my past"	23.3	45.1
"Having to remember to take my HIV treatment at the right time every day causes me stress or anxiety"	16.7	27.3

For the HCP survey, the unit of analyses was the managed patients (number and mean of patients who met a characteristic of interest). All estimates from the PLHIV survey had the individual respondent as the unit of analysis, and, unless stated otherwise, all analyses were among those currently on ART (n=688). ART, antiretroviral therapy; CNS, central nervous system; HCP, health care professional; HIV, human immunodeficiency virus; PLHIV, people living with HIV; SD, standard deviation.

P38

Reported central nervous system (CNS) symptoms and viral load blips post cART switch from atazanavir boosted with ritonavir (ATZ/r) to cobicistat (ATZ/c) in people living with HIV (PLWH)

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Background: Cobicistat is a weaker inhibitor of the P-gp and BCRP efflux pumps expressed at the blood–brain barrier limiting the entry of protease inhibitors. Atazanavir penetration is low in CSF.Clinic experience of CNS symptoms and viral load blips post switch to ATZ/c triggered a review of our cohort. A retrospective review of DRV/r to DRV/c vs ATZ/r to ATZ/c with no change in NRTI backbone showed new observations of CNS symptoms and viral blips among the latter (PE2/47; EACS 2019).

Method: A retrospective, single centre analysis of PLWH switched from ATZ/r to ATZ/c with no change in NRTI backbone were reviewed.
Viral load blip defined as VL>50.

Results: A cohort of 178 patients were evaluated, 103 (58%) male; 75 (42%) female; median age 46 years, median baseline CD4: 248cells/μl with majority being on a gTruvada (71%) backbone.

CNS symptoms:: 9% (16/178) of patients reported CNS symptoms including headache (7), anxiety (5), low mood (4), nightmares (3), insomnia (3), tiredness (2), non-specific neuropathy (1), dizziness (1), uncontrollable sweating (1) and memory loss (1). 5 (31%) patients switched back to ATZ/r and achieved symptom resolution.Among those reporting CNS symptoms only 1 patient had low level viraemia at 3 month (VL:191) and 6 month (VL:104)) follow up.

Viral load blips:: 16% (29/178) of patients had viral load blips post switch to ATZ/c and of these.
62% (18/29) patients re-suppressed.
38% (11/29%) patients required modification to their ART. 2 patients acquired resistance whilst on ATZ/c; one on gTruvada/ATZ/c/RAL developed a minor integrase mutation (T97A) and one patient on gKivexa/ATZ/c developed M184V, both switched to DTG and re-suppressed.

Conclusion: CNS symptoms and viral load blips were observed in our cohort post ART switch to ATZ/c. Reported CNS symptoms were not associated with viral load blips. 2 out of 178 patients acquired resistance post switch to ATZ/c (M184V and T97A). ATZ/c switches were made to minimise pill burden however this can have an impact in some people with viral load blips and CNS symptoms.

P39

Comparative efficacy of dolutegravir relative to common core-agents in treatment-naïve patients living with HIV-1: a systematic review and network meta-analysis

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Background: A previous meta-analysis has demonstrated superior efficacy and comparable safety for DTG compared to other core-agents in treatment naïve HIV-1 infected patients upto 48 weeks. We extended this comparison upto 96 weeks(W96).
Method: A systematic review identified RCTs (upto July 2019) of treatment-naïve HIV-1 patients treated with an ARV core-agent as a 3-drug regimen. Outcomes assessed were viral suppression (VS; <50 copies/ml), CD4 change from baseline, discontinuations, adverse events (AEs) and serious AEs at W96. Bayesian network meta-analysis methodology was used to compare outcomes of nine core-agents: boosted-PIs (ATV/r, DRV/r, LPV/r), NNRTIs (EFV, RPV), and INSTIs (DTG, RAL, EVG/c, BIC), after adjusting for the effect of NRTI treatment-backbone (TD(A)F/FTC, ABC/3TC or other). VS was further analysed among patients with viral load (VL)>100,000 copies/ml or CD4≤200 cells/ml at baseline.
Results: Upto 17 trials were included in the analyses. DTG was superior in achieving VS at W96 compared to PIs, NNRTIs and EVG/c and comparable to RAL and BIC. DTG also achieved better VS than PIs and RAL in patients with baseline VL > 100,000 copies/ml. The odds of discontinuing DTG were comparable to BIC and RPV, and lower than other core-agents. Other endpoints of CD4 change, AEs and serious AEs were broadly similar between all core-agents with some significant differences (Table P39.1).

Table P39.1. Odds ratios and 95% credible intervals of comparator vs DTG on VS at W96

	General population (N=17)	Baseline VL > 100,000 copies/ml (N=11)	Baseline VL≤100,000 copies/ml (N=11)	Baseline CD4 > 200 cells/ml (N=4)	Baseline CD4≤200 cells/ml (N=4)
EFV	0.58 (0.44,0.77)	1.02 (0.54,1.9)	0.45 (0.28,0.72)	0.59 (0.27,1.32)	0.55 (0.05,5.29)
BIC	0.8 (0.57,1.12)	0.72 (0.34,1.51)	0.83 (0.56,1.22)	0.87 (0.55,1.37)	0.36 (0.04,1.83)
DRV/r	0.53 (0.41,0.69)	0.23 (0.1,0.53)	0.69 (0.42,1.13)	-	-
ATZ/r	0.37 (0.28,0.5)	0.18 (0.06,0.54)	0.63 (0.28,1.39)	-	-
EVG/c	0.53 (0.37,0.77)	0.93 (0.36,2.3)	0.63 (0.32,1.26)	-	-
LPV/r	0.29 (0.21,0.41)	0.13 (0.04,0.34)	0.49 (0.25,0.96)	-	-
Raltegravir	0.79 (0.62,1)	0.47 (0.26,0.85)	0.99 (0.65,1.51)	-	-
Rilpivirine	0.65 (0.46,0.92)	0.89 (0.43,1.79)	0.61 (0.34,1.06)	0.91 (0.38,2.2)	0.38 (0.03,4.15)

Bold=Statistically significantly different comparisons.

Conclusion: DTG is a very efficacious first-line therapy with a good safety and tolerability profile for the initial treatment of HIV-1 infection.

Basic science: immunology, virology and pathogenesis

P40

Indeterminate HIV status: a long haul

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Background: Fourth generation HIV tests are highly sensitive and specific but, like many serological tests, have cut-off values. We describe the story of a woman with persistently indeterminate HIV testing, whose status was ultimately resolved by a national research study.
Method: A 50-year-old Caucasian woman was tested for HIV by her General Practitioner in 2012. HIV-1 antibodies were detected at low levels, but above threshold for positivity in 3 assays. Repeat testing gave similar results, with HIV RNA undetectable on two occasions and CD4 count 1857 cells/μl.In view of these results, pro-viral DNA was tested and was also undetectable. Past medical history included osteoarthritis and irritable bowel syndrome. Her sexual history included two previous marriages (one ex-husband had tested negative for HIV) and later sex with a number of men of black African ethnicity. Reference laboratories were consulted but unable to resolve her HIV status at this time, despite persistent low-level positive antibodies.
In 2016, a repeat test confirmed HIV-1 antibody at low, but consistent, level since 2012, confirmed by Western blot. CCR5 was homozygous wild type with no deletion variants present. CD4 count was preserved, at 1926 cells/μl. Pro-viral DNA was detectable at the limit of detection in the reference lab in one of four aliquots only. Serology for human T-cell lymphotrophic viruses 1 and 2 was negative. The reference laboratory suggested sending 300 mls of blood for HIV culture, but the woman declined.
Results: Consultation was sought on a national level and in 2018 the woman was enrolled in the newly developed "IDRIS" (Indeterminate Retrovirus Infection Service) study, designed to investigate indeterminate HIV status.HIV RNA was detected at very low levels of 6 copies/ml, but pro-viral DNA was not detected using novel assays.
Conclusion: The IDRIS study facilitated resolution of indeterminate status, with trace viral genome detected and no disease progression. It is most likely that this represents an unusual degree of elite control, with consistent borderline antibody responses. Antiretroviral therapy has not been started. The woman did not report distress, although other individuals may experience this same situation differently.

P41

Unusual HIV serology in a patient following post-exposure prophylaxis

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Background: HIV testing in the UK is performed using fourth generation tests, which detect both p24 antigen and HIV antibodies. All positive results are confirmed by a second 4th generation assay and an assay which differentiates between HIV-1 and HIV- 2. Occasionally, serology can be difficult to interpret, and further testing may be required. This report describes a case of established HIV infection with unusual serology following the very early use of antiretroviral therapy.
Method: The individual was identified after transfer of their HIV care to our unit. Data was collated from the previous HIV units retrospectively. The abstract was prepared with patient consent.
Results: Unusual baseline HIV serology was found when testing a 32 year old man who had transferred his HIV care to our unit three years after his diagnosis. Fourth generation HIV antigen/antibody tests were only weakly positive and the BioRad Geenius HIV1/2 confirmatory assay showed no antibody bands to HIV-1 or HIV-2.
It was noted that the patient had experienced very early antiretroviral pressure, taken as post-exposure prophylaxis for sexual exposure (PEPSE) and was diagnosed with HIV prior to completing PEPSE. There were potential episodes where contact with HIV could have occurred in the preceding 6 – 8 weeks, including one episode 8 days prior to commencing PEPSE.
Conclusion: It is postulated that antiretrovirals taken as HIV post-exposure prophylaxis after sexual exposure (PEPSE) modified the serological response at the time of primary HIV infection. This case demonstrates the concern regarding interpretation of HIV serology in cases of early antiretroviral pressure. This may become more prevalent with the advent and increasing uptake of HIV pre-exposure prophylaxis (PrEP). It also highlights challenges which may be faced if using antibody-only testing in these settings.

P42

Do immune checkpoint inhibitors deplete HIV reservoirs *in vivo*?

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Background: Immune checkpoint inhibitors including anti-PD1 antibodies and anti-CTLA4 antibodies are effective therapies for cancers. Latent reservoir cells infected with HIV express PD-1 and are potential targets for these antibodies. A recent publication reported a decline in total HIV DNA in a patient treated with nivolumab for HIV-associated lung cancer[1].
Method: Peripheral blood samples were collected from HIV-positive patients on antiretroviral therapy with undetectable plasma HIV RNA, who were receiving immune checkpoint inhibitor (ICI) therapy for cancer. Samples were collected before and after three cycles of ICI therapy (two months). HIV latent reservoirs were assayed by quantitative PCR for total HIV DNA and by Alu-gag PCR for integrated proviral HIV DNA. Anti-HIV T-cell responses were evaluated by interferon gamma ELISPOT.
Results: Three patients were enrolled (one melanoma, two NSCLC). The patient with melanoma was treated with a combination of ipilimumab (anti-CTLA4) and nivolumab (anti-PD1), whilst the other two patients were treated with pembrolizumab (anti-PD1). The baseline CD4 median was 376/mm^3 and all had undetectable plasma HIV viral loads. After three cycles of ICI therapy, no changes in CD4 counts or percentages were observed. Similarly, there were no significant changes in the HIV reservoirs as measured by total HIV DNA (per PBMC or per CD4 cell) and integrated HIV DNA (per PBMC or per CD4 cell). ELISPOT assays using patient PBMCs and pooled HIV-derived peptides will be presented.
Conclusion: Despite positive effects on HIV reservoirs reported elsewhere in one patient, we observed no significant effects on latent reservoirs in three patients.
Reference: 1. Guihot A, Marcelin AG, Massiani MA et al. Drastic decrease of the HIV reservoir in a patient treated with nivolumab for lung cancer. *Ann Oncol* 2018;29:517–518.

P43

Immune response regulation gene signatures predict time to viral rebound after antiretroviral treatment interruption in primary HIV infection

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Background: Antiretroviral therapy (ART) can maintain undetectable plasma HIV viraemia, but on stopping therapy HIV can be detected in the blood ('viral rebound'), generally within a few weeks. For some individuals, the time to rebound may be protracted – up to months or years – and in some 'post-treatment controllers' no rebound is reported.
Method: To explore the molecular differences between early and late rebounders, we present a longitudinal analysis of the host transcriptome that explores key genetic signatures associated with time to HIV rebound. We sequenced expressed host mRNA from South African women enrolled in the SPARTAC clinical trial, and who received treatment for up to 48 weeks, starting in primary infection. We studied CD4+ T-cells sampled at 'baseline' before ART initiation and again at treatment interruption (wk 48). We used R and limma with voom to quantify and transform our data and Gene Set Enrichment Analysis software with the Reactome database to identify putative genetic signatures associated with clinical outcomes
Results: We find statistically significant enrichment of over 20 gene sets when comparing different 'time to rebound' phenotypes. We show that gene sets involved in the regulation of the immune response, in particular the Interferon Type I and the Immunoregulatory interactions between lymphoid and non-lymphoid cells sets are up-regulated in late versus early rebounders as well as rebounders versuslikely elite controllers. Notably, pre- and post-ART samples seem to share pathway enrichment in the aforementioned gene sets.
Conclusion: These data suggest that specific components of the immune response may predict rapid rebound, post-treatment control,and elite control and may help discovery of prognostic biomarkers for time to rebound and new interventions targeted at drug-free HIV remission.

P44

HIV-1 next-generation sequencing: from pipe-dream to diagnostic pipeline

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Background: Sanger sequencing-based HIV-1 genotypic drug resistance mutation (DRM) testing has long remained the gold standard but has a limited detection threshold of 10–20% for low-frequency DRMs in viral quasi-species. Next generation sequencing (NGS) technologies such as Illumina shotgun sequencing are widely used in scientific research and hold the promise of greater sensitivity. However, the cost and complexity of applying NGS to rapid diagnostics has prevented widespread adoption. We have developed an NGS HIV-1 resistance assay with comparable cost, turnaround time and accuracy to Sanger sequencing.
Method: HIV-1 protease-reverse transcriptase domain amplicons were generated by RT-PCR from EQA and patient samples. Each amplicon was sequenced in parallel by Sanger and NGS, producing a Sanger consensus and list of NGS sequence variants. Sequence variants were filtered at a series of frequency thresholds from 1–100% and used to generate a set of NGS consensus sequences to identify which frequency threshold demonstrated the highest equivalence to Sanger sequencing. Consensus sequences produced by each method were interpreted using the Stanford HIV-1 drug resistance database and compared on the grounds of base identity, strain subtype and DRM profile.
Results: An NGS low-frequency variant threshold of 14% showed the highest equivalence with Sanger sequencing, which is consistent with the expected Sanger sensitivity of 10–20%. NGS consensus sequences at this threshold capture 99.7% of Sanger basecalls and show 100% concordance with Sanger subtypes and DRM profiles. Increasing the NGS variant sensitivity from 14% to 1% yielded an additional approximate 1.6 DRMs per sample, suggesting that the NGS assay is indeed capable of capturing low-frequency mutations in viral quasi-species in the diagnostic setting.
Conclusion: Our NGS HIV-1 resistance assay shows strong concordance with Sanger sequencing and we are confident that we can now offer this NGS-based assay as a diagnostic service. Although the clinical significance of low frequency DRMs has yet to be conclusively established, the adoption of NGS as a tool for clinical diagnostics offers us new opportunities for HIV-1 DRM screening and treatment.

P45

Forgiveness of antiretroviral regimens: *in vitro* HIV-1 viral breakthrough with two-drug versus three-drug regimens simulating variable adherence to treatment

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Background: Guidelines for modern treatment of HIV-1 infection recommend an integrase strand transfer inhibitor (INSTI) plus 2 nucleoside/tide reverse transcriptase inhibitors (NRTIs). Recently, controlled clinical studies have reported on the efficacy and safety of an INSTI+ 1 NRTI. To estimate regimen "forgiveness" for triple therapy versus 2-drug combinations, *in vitro* experiments monitoring viral breakthrough (VB) and resistance development were conducted under conditions simulating drug exposures at full adherence or suboptimal adherence to treatment. In addition, the role of pre-existing minority drug resistant variants was assessed.
Method: MT-2 cells were infected with wild-type HIV-1(IIIb) or HIV-1 with low-level (0.01–10%) pre-existing FTC/3TC-resistant M184V. Infected cells were cultured in the presence of fixed doses of bictegravir+emtricitabine+tenofovir alafenamide (BIC+FTC+TAF) or dolutegravir+lamivudine (DTG+3TC) and monitored for VB by cytopathic effect for up to 5 weeks. Constant drug concentrations were set at their

human plasma-free adjusted clinical trough concentrations (Cmin) or fixed at simulated Cmin after missing 1 to 4 consecutive doses. Emergent HIV-1 variants were characterised using standard genotyping methods.
Results: Using drug concentrations corresponding to full adherence (drug concentrations set at Cmin) and wild-type HIV-1, 0/24 replicates showed VB with either BIC+FTC+TAF or DTG+3TC through 5 weeks in culture. Using drug concentrations corresponding to two consecutive missed doses and wild-type HIV-1, 0/24 replicates showed VB with BIC+FTC+TAF through week 5 whereas 23/24 had VB with DTG+3TC as early as 2 weeks in culture. At breakthrough, HIV-1 lacked drug resistance mutations when analysed by population sequencing. Additional studies using a broader range of missed doses, other drug combinations, and pre-existing low-level M184V are on-going (Table P45.1).

Table P45.1

In Vitro Dosing BIC+FTC+TAF	Breakthrough Frequency (HIV-1 wild-type) DTG+3TC	
C_{min} (full adherence)	0% (0/24)	0% (0/24)
C_{min} (2 doses missed)	0% (0/24)	96% (23/24)

Conclusion: These preliminary *in vitro* VB results suggest that the higher potency provided by the BIC/FTC/TAF regimen may provide better long-term suppression of HIV-1 replication and therefore more robust prevention of potential drug resistance development compared to the 2-drug regimen DTG/3TC. These results highlight the importance of a third agent to prevent viral replication and evolution, particularly in the real world where imperfect drug adherence is frequent.

Behaviour, transmission and prevention

P46

Recreational drug use among HIV-negative and HIV-positive heterosexual men and women

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Background: This study addresses the lack of data on recreational drug use, including 'chemsex' drug use (mephedrone, methamphetamine and/or GHB/GBL), among HIV-negative and HIV-positive heterosexual men and women in the UK. The aims are to examine prevalence and correlates of drug use, and associations of drug use with measures of condomless sex (CLS) and mental health symptoms.
Method: Data are from the AURAH study of heterosexual men (N=470) and women (N=676) without diagnosed HIV attending GUM clinics across England (2013–2014) and the ASTRA study of HIV-positive heterosexual men (N=373) and women (N=637) attending HIV outpatient clinics in England (2011–2012). Prevalence of drug use in the past three months is presented standardised for age for the four study groups: heterosexual HIV-negative men, heterosexual HIV-positive men, HIV-negative women, and HIV-positive women. Modified Poisson regression was used to produce prevalence ratios (aPR) adjusted for age.
Results: Median age was 29 (IQR 25–37), 47 (IQR 41–53), 26 (IQR 22–32), and 42 (IQR 35–48) in the four study groups respectively. The prevalence of any drug use was 22.9%, 17.1%, 15.3%, and 7.1% respectively. In all groups, cannabis was the drug most commonly used (range from 4.7% to 17.9%) followed by cocaine (1.6% to 8.5%). The prevalence of chemsex drug use was very low among HIV-negative participants (1.0% heterosexual men, 0.2% women) and zero among HIV-positive participants. In the four study groups, factors linked to drug use overall and/or to cannabis and cocaine use specifically were; white ethnicity, lower socio-economic status, cigarette smoking, and higher risk drinking. Associations of drug use with CLS, depression, and anxiety were observed, but were particularly strong/apparent among women (for depression; any drug use aPR was 1.54 [95% CI: 1.02, 2.33] among HIV-negative women and 1.73 [95% CI: 1.25, 2.40] among HIV-positive women). It is possible that these associations operate in the opposite direction.
Conclusion: In these studies (from 2011–2014), a high prevalence of cannabis and cocaine use was observed. Providers need to be aware of drug use and its potential link with sexual activity and poor mental health symptoms among heterosexual men and women attending sexual health and HIV clinics.

P47

Scotland's HIV pre-exposure prophylaxis programme: findings from the first 20 years

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Background: At 30 June 2019, 5,484 individuals have been diagnosed and are living with HIV in Scotland, of whom almost three quarters identify as male. Condomless anal sexual intercourse among men who have sex with men (MSM) remains the main route of HIV acquisition. While uptake of antiretroviral therapy exceeds the World Health Organisation 90-90-90 targets, new transmissions are still occurring. Between July 2017 and June 2019, 413 first-ever HIV diagnoses were reported to Health Protection Scotland (the largest proportion (39%, 163/413) were in MSM); 21% (72/345) of these first-ever diagnoses, with avidity data available, had been acquired in the previous 12–16 weeks, highlighting the importance of sustaining prevention efforts. Scotland's national NHS-funded HIV pre-exposure prophylaxis (PrEP) programme was rolled out in sexual health services from 1 July 2017 providing PrEP to high-risk individuals, according to eligibility criteria.
Method: To monitor PrEP use across Scotland, PrEP clinical codes on eligibility and outcome, and prescription data, were extracted from the National Sexual Health IT System (NaSH) for the period 1 July 2017 to 30 June 2019. Data from non-NaSH using services were collected via a proforma.
Results: In the first two years of the programme, 3,354 individuals have been prescribed PrEP on one or more occasions in all mainland NHS boards. The majority of PrEP users are MSM (97%, 3,266/3,354) and over half (55%, 1,838/3,354) are of White Scottish ethnicity, eligible because of self-reported condomless penetrative anal intercourse with two or more partners in the last year. Among PrEP users, 59% (1,928/3,354) chose a daily regimen, 17% (573) event-based dosing, and 25% a combined regimen. By the end of Year 2, almost 1,000 individuals with no history of attending sexual health services were engaged with the programme. Fewer than five seroconversions in PrEP users have been reported; suboptimal adherence was a factor in all infections.
Conclusion: Scotland has implemented a successful PrEP programme, which has encouraged men at high risk of HIV to engage with sexual health services for the first time; however, uptake of PrEP in non-MSM remains very low. Current work aims to improve PrEP awareness among other high-risk groups and explore alternative service models.

P48

The representation of gender in HIV prevention guidelines: an analysis of UNAIDS prevention policy in sub-Saharan Africa

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Background: Gender is an important social determinant to acknowledge when trying to understand the evolution of the HIV pandemic. From the literature, it becomes apparent that men and women are commonly represented using both stylised and nuanced gender stereotypes that help to establish why individuals may or may not be at a higher risk of HIV. However, it remains unclear how men and women are discussed in other

aspects of the HIV pandemic, more specifically in HIV prevention initiatives, and if certain representations of men and women impact prevention policy guidance.
Method: UNAIDS prevention publications were analysed and selected as suitable based on specific criteria. In total, 34 documents were analysed to complete this research. Through analysis of these policy documents, this research explores specifically how men and women are portrayed and discussed in HIV guidelines and the implications that gender norms and stereotypes may have on the success of HIV programmes.
Results: This analysis revealed that stylised gender norms are often used when discussing an individual's HIV risk and prevention recommendations. There were also differences in how men and women were targeted for HIV prevention, one of the main findings being that men were often recommended biomedical interventions, with few guidelines recognising the need to address men's social behaviour. In addition, all of the documents focusing on men discussed the consequent impact they may have on a womans HIV risk. However, many publications aimed at women focus purely on 'empowerment' yet, often did not acknowledge the need to involve men in empowerment initiatives for successful HIV prevention.
Conclusion: The findings suggest that stylised gender stereotypes are embedded in UNAIDS HIV prevention, possibly impacting the effectiveness of these prevention programmes. Social norms held amongst men were often overlooked, which could be the result of policymakers considering biomedical programmes as less complex, power-neutral initiatives which are easier to implement on a wider scale. Men are also not often encouraged to engage in female prevention programmes, which raises the question of how successful can gender equality be if men are not educated alongside women on the importance of challenging social norms?

P49

HIV in the era of pre-exposure prophylaxis (PrEP): an evaluation of characteristics of people diagnosed with HIV before and after the implementation of an NHS-delivered PrEP programme in Scotland

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Background: The NHS Scotland HIV Pre Exposure Prophylaxis (PrEP) programme started in July 2017. Understanding changes in population demographics among those diagnosed with HIV in the era of PrEP is essential for equitable delivery and attaining "Zero HIV transmissions".
Method: We extracted data from the Health Protection Scotland Diagnosis Database and National Sexual Health IT System on all individuals diagnosed with HIV in Scotland between July 2015 and June 2018.
We used chi^2-tests to compare sociodemographic differences by 1) period of HIV diagnosis (Pre-implementation of PrEP Programme; July 2015 to June 2017 and Post-implementation; July 2017 to June 2018) and 2) whether infections were 'potentially-preventable' with the current Scottish PrEP model (attended sexual health services in the 12 months prior to diagnosis, met PrEP eligibility criteria and had negative HIV test within 12 months or avidity test consistent with recent acquisition).
Results: People diagnosed with HIV 'post-implementation' (n=197) were less likely to be male (72.1% vs 81.2%, $p<0.05$), White British (64.0% vs 78.2%, $p<0.001$), report transmission route as sex between men (41.1% vs 52.4%, $p<0.05$) and more likely to report transmission route as heterosexual sex (38.6% vs 27.3%, $p<0.05$) and have acquired HIV outside Scotland (42.1% vs 27.8%, $p<0.001$) compared with those diagnosed 'pre-implementation'(n=418).
Among the 615 HIV diagnoses, 49 (8%) were in individuals fulfilling the 'potentially-preventable' definition, with the proportion reducing each year. This proportion was higher (49/170, 28.8%) for recently acquired infections (negative test within 12 months or avidity test consistent with recent acquisition).
Individuals with 'potentially-preventable' infections were more likely to be male (100% vs 76.9%, $p<0.001$), aged <40 years (75.5% vs 54.2%, $p<0.05$), report transmission route as sex between men (100% vs 44.3%, $p<0.001$), have previously had post-exposure prophylaxis (24.5% vs 1.2%, $p<0.001$) and less likely to be Black African (0% vs 11.8%, $p<0.05$) than those not meeting the definition.
Conclusion: The proportion of infections meeting our definition for potentially-preventable with the current Scottish PrEP model is low suggesting that current models are not sufficient to prevent all new infections. Ways to extend the reach of PrEP need to be considered as part of a wider HIV combination-prevention strategy.

P50

Audit of patient retention in pre-exposure prophylaxis (PrEP) services in an integrated sexual reproductive health service setting

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Background: Pre-exposure prophylaxis (PrEP) for HIV in our area was launched in July 2017. We set up a PrEP service delivered via our integrated sexual reproductive health service covering a wide geographical area with both rural and urban areas. Local Public Health data show a 22% 'lost to follow-up' rate amongst PrEP patients.
Method: We audited PrEP delivery, focusing on patient retention rates over the first 18 months. Data were collected over the first 18 months of PrEP delivery from July 2017 to January 2019 from our electronic patient record (EPR) system, including regimen, adherence, reported online purchases of PrEP or record of PrEP obtained from other services, booked appointments, prescription numbers and lengths, age, health board of residence, side effects, substance misuse, mental health issues, physical illness, new diagnoses of STIs and reported reasons for disengagement.
Results: Over 18 months, 278 patients booked into our PrEP clinics. Of these, 275 were men who have sex with men (MSM). 193 patients commenced PrEP, 5 were diagnosed with HIV at baseline, 42 did not attend their first appointment. The remainder declined PrEP. Of those commenced on PrEP, 51.7% had reduced clinic attendances; all were MSM. Patients with reduced attendances were more likely to be younger (mean age 33 vs. 37 years), reside outside our catchment area (56.4% vs. 49.6%) and have mental health issues (28.6% vs. 18.8%), but were less likely to disclose substance misuse (24.2% vs. 27.1%) than those attending in line with operational guidance. Of the 63 patients who stopped attending the PrEP clinic, 32.3% (21) had documented reasons, the most common being reduced self-perceived risk.
Conclusion: This is the first evaluation of reasons why patients stop attending as well as risk factors associated with those lost to follow-up in PrEP services. Given these findings, we propose implementation of retention strategies including text reminders to encourage restarting PrEP following detection of overdue appointments and booking PrEP appointment for patients within consultations instead of at clinic reception. Patients who are younger, attend from further away or have mental health and/or substance misuse issues may benefit from further social and psychological support.

P51

Mind the gap: shifting the focus from 90:90:90 to the 10:10:10

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Background: In 2017, London exceeded the UNAIDs 90:90:90 targets. We aim to identify and review those under care but not taking antiretroviral therapy (ART) successfully as a step towards the new target of "zero new HIV infections, zero preventable deaths and zero HIV related stigma and discrimination, aiming to wipe out AIDS by 2030".
Method: Retrospective electronic case note review of all individuals accessing care in a large UK centre not established on suppressive ART.Patients were classified as on ART (consistently undetectable, recently started ART or confirmed low level viraemia) or not on ART (declining ART or prescribed ART but monitoring not correlating with consistent use). We then reviewed the clinical record and demographics to identify factors associated with not taking ART.
Results: In our cohort of 3203 patients, 95% were on ART. Of the 5% classified 'not on ART', 18% declined (50% of whom were long-term non-progressors/elite

controllers) and 79% were prescribed ART but not consistently suppressed. The 'not on ART' cohort was 46% female (cf 25% of total); 23% perinatally-acquired HIV (PAHIV) (cf 5% of total) and 31% men who have sex with men (MSM) (cf 55% of total).See Table P51.1 for additional data.

Table P51. 1 Results summary

	NOT on ART	Total Cohort
Gender Identity		
Female	46%	25%
Male	54%	75%
Route of Transmission		
MSM	31%	55%
Sex between men and women	35%	31%
PAHIV	23%	5%
Contact with blood products	0%	0%
Injecting drug use	1%	0%
Unknown	10%	8%
Ethnicity		
White – British	9%	24%
White – Other	16%	23%
Black	46%	28%
Asian	2%	4%
Any other Ethnic group	27%	20%
Age		
<25	13%	3%
25–39	36%	20%
40–64	49%	67%
65–79	1%	8%
80+	1%	1%
Country of Birth		
UK	32%	32%
Other	15%	24%
Europe	15%	19%
Africa	39%	26%

Conclusion: Declining ART is rare in our cohort. A larger number of patients accept prescriptions of ART but do not achieve consistent use. Factors associated with unsuccessful ART included female gender, black ethnicity, young age and PAHIV. We recommend further study to identify barriers for these groups to help improve individual and population health outcomes.

P52

The power of U=U: an online survey of how people living with HIV hear the message and the impact on their lives

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Background: The Undetectable = Untransmittable (U=U) message significantly impacts on the lives of people living with HIV (PLWHIV), and is an incentive to encourage testing, engagement in care, and adherence. BHIVA recommends that healthcare professionals (HCPs) inform PLWHIV about U=U using definitive language about the zero risk of transmission. However, recent UK surveys of HCPs demonstrate a lack of consistency about how the U=U message is shared or if it is shared at all. We aimed to better understand the patient perspective about U=U, how they heard the message, and its impact.
Method: We designed an online survey for PLWHIV; collecting quantitative and qualitative data. It was live for four weeks and promoted via social media and UK-CAB.
Results: 309 PLWHIV completed the survey. 81% of respondents were male/trans male, 16% female/trans female and 2% non-binary. 71% were gay/lesbian, 18% heterosexual and 7% bisexual. 66% were white British and 11% black African. 49% were diagnosed >11 years ago and 32% were diagnosed in the last 5 years. 95% had an undetectable viral load. All respondents knew about U=U. 27% heard about U=U from their HIV specialist, 16% from an HIV charity, with others reporting a wide range of sources. Only 39% reported that their HCP said that an undetectable viral load meant a zero risk of transmission.
The impact of the message varied between groups: 91% of newly diagnosed (ND) said they could have sex without worrying about transmission compared to 80% of the long term diagnosed (LTD). 74% of ND said it motivated them to take treatment compared to just 49% of LTD. Only 41% of both LD and STD said it gave them the confidence to disclose.
Conclusion: Our work demonstrates the impact of the U=U message and the value of multiple sources of information. An individualised approach to messaging may be important for different groups. Whilst it is reassuring that all respondents knew about U=U, the apparent continued lack of consistency and definitive language around U=U is concerning and should be addressed by better information and training for HCPs.

P53

A PrEP access fund for people with no or low income

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Background: In England, access to free pre-exposure prophylaxis (PrEP) is only available through the Impact Trial. Since 2015, people have purchased generic PrEP on the internet, but this is not affordable to all. PrEP is therefore restricted to those able to get a place on the Impact Trial or those who can afford to self-source.
Method: We designed a fund to support people in England and Northern Ireland with no or low or income, who do not have access to PrEP. Individuals apply online and have to meet three criteria: unable to access NHS PrEP, clinically eligible and financially eligible. Successful applicants are then sent a discount code by SMS to 'purchase' 3-months' PrEP online. Successful applicants were sent a follow up questionnaire. We present our data from October 2018 – January 2020.
Results: 359 applications were received and 299 (83%) approved. 346 (96%) were cis-men, 273 (77%) were white and 347 (97%) identified as MSM. 122 (33%) applications were from London, 60 (17%) from the North West and 50 (14%) from the South East. 139 (39%) applicants were aged 25–34 and 66 (18%) were aged 18 – 24. 61/224 (27%) people responded to the user survey with the majority (93%) saying the fund was "very easy" or "easy" to use. 77% used daily dosing, 13% 'on demand' and 7% 'Ts and Ss' (4 pills a week). Only one person stated they did not have a baseline HIV test and 13 (21%) people did not have baseline renal testing. 22 (85%) had a full sexual health screen every three months. 47 (77%) had no previous PrEP use. Reported barriers to accessing PrEP included: difficulty getting an appointment, cost of travel to the clinic and nearest clinic being too far away. The survey revealed some complex cases with some users experiencing significant mental health issues.
Conclusion: There remains unmet need and demand for PrEP which must be addressed. Our user survey highlights that clinic capacity and accessibility remain barriers to PrEP and future commissioned services should also deliver PrEP outside of 'traditional' sexual health services e.g. with community based or online provision.

P54

Understanding patterns of early viral rebound in the current ART era: the UK CHIC study

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Background: Whilst a low rate of viral load (VL) rebound is reported among individuals with sustained VL suppression receiving antiretroviral therapy (ART), less is known about VL rebound following an initial VL<50 copies/ml after starting ART. A low rebound rate would provide reassurance that the U=U message can be safely applied to those starting ART who have achieved a single supressed VL with good adherence. We determined the risk of VL rebound in the first year following an initial (single) VL<50 copies/ml compared to the year following a second VL<50 copies/ml amongst men who have sex with men (MSM).
Method: MSM starting first-line ART between 2015–2016 with a CD4 count >350 cells/mm^3, >6 months follow-up and >1 VL<50 copies/ml within 12 months of ART initiation were included. We considered the rate of confirmed virological failure (2 consecutive VL > 50 copies/ml) after a) a first VL<50 copies/ml (follow-up censored at the earliest of a subsequent suppressed VL, 12-months after initial VL < 50 copies/ml, death or end of follow-up) and b)

the second of two consecutive VL < 50 copies/ml (follow-up censored at 12-months, death or end of follow-up).
Results: The 1,042 MSM included had a first VL < 50 after a median of 2.5 (interquartile range: 1.1–4.3) months post-ART initiation, and a second VL assessment 2.8 (0.9–4.5) months later. Sixteen men experienced confirmed virological rebound in the first year after their first VL < 50 copies/ml over 5,366 person-months (rate [95% confidence interval]: 2.98 [1.83–4.87] /1,000 person-months). Twenty-five of the 1505 MSM with a second VL-<50 experienced virological failure in the year after the second VL < 50 copies/ml over 16,478 months (1.52 [1.03–2.25]).When analyses were repeated using a threshold of 200 copies/ml for virological rebound, rates were 0.64 [0.21–1.97] (n=1,638) and 0.62 [0.34–1.12] (n=1,581) for the two analyses respectively.
Conclusion: The VL rebound rate is low among individuals after their first suppressed VL measurement post-ART initiation and is similar to that after the second suppressed VL measurement. As reasons for VL rebound are unknown, findings may over-estimate the risk of rebound in the context of good adherence.

P55

Pre-exposure prophylaxis (PrEP): review of current clinical practice

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Background: PrEP has been shown to reduce HIV transmission by 86% and has been provided in our service since July 2017. In the 2018 PrEP BHIVA/BASHH guidelines PrEP is recommended for HIV negative men who have sex with men (MSM) and trans women who have had condomless anal sex in the previous 6 months and ongoing and those who have a partner with HIV not on antiretrovirals or on them for less than 6 months and have a viral load of >200 copies/ml. PrEP is also advised for those who have other risk factors that put them at high risk of HIV. It is important to review PrEP in clinical practice to monitor for any related issues.
Method: 214 patients who have been started on PrEP in our clinic were reviewed. This included whether they had any sexually transmitted infections (STIs) at first attendance and whilst they were taking PrEP. It was also reviewed whether they stopped PrEP for any reason or if they did not attend for follow-up.
Results: Of the 214 patients, 92% are MSM, 6% are bisexual, 1% are heterosexual but have sexual partners from a high risk country for HIV and in 1% sexuality was not documented. 13% of patients had an STI when first attended and 20% of patients had an STI whilst taking PrEP. 16 patients have stopped PrEP though 4 have since restarted. 4 patients stopped due to being in monogamous relationships, 6 due to renal problems including low eGFR, haematuria and renal cancer, 3 due to non renal side effects and for 3 no reason was recorded. 96 patients have not attended their follow-up appointments.
Conclusion: PrEP is useful to help reduce the HIV epidemic. At present in our service it does not appear many taking PrEP have had side effects, though there has been a slight rise in other STIs. Several patients attending for PrEP have also otherwise not attended for several years, which is important for other health promotion, including offering Human papillomavirus and Hepatitis B vaccination. Text messages are sent as appointment reminders however we will assess if there are further ways we can improve follow-up rates and ask patients to inform the clinic if they are stopping PrEP so their notes can be amended.

P56

Missed opportunities: ongoing HIV transmission and late diagnoses in a high-prevalence urban borough

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Background: In recent years there has been a decline in new and late HIV diagnoses in the UK, particularly in younger white MSM. Our level 3 sexual health service is situated in an ethnically diverse town north of London, with relatively high rates of deprivation. The late HIV diagnosis rate in our cohort remains high, and the number of new HIV diagnoses in our service rose from 19 in 2018 to 24 in 2019.
Method: All new HIV diagnoses in our service between 1/1/2018 and 31/12/2019 were reviewed, including stage at diagnosis and missed opportunities for HIV testing.
Results: Of 43 new HIV cases, two have not attended for assessment and were therefore excluded from the analysis. 26/41 (63%) were late diagnoses (Table P56.1).

Table P56.1

Stage of diagnosis	Heterosexual men (n = 12)	Women (n = 15)	MSM (n = 14)	Total (n = 41)
Primary HIV	1 (8%)	2 (13%)	1 (7%)	4 (10%)
CD4 > 350	2 (17%)	4 (27%)	5 (36%)	11 (27%)
CD4 200–349	3 (25%)	5 (33%)	2 (14%)	10 (24%)
CD4 <200	6 (50%)	4 (27%)	6 (43%)	16 (39%)
Median age, years	38	45	37	39
Age range, years	23–70	17–60	21–65	17–70

Missed opportunities: Two patients had indicator conditions which could have prompted HIV testing in primary care (lymphopenia and thrombocytopenia), and one in secondary care (reactive lymphadenopathy on biopsy). All three had a baseline CD4 count <200. Two patients were likely mother to child transmission, although at the time of diagnosis both were sexually active. Their mothers were under our care and child testing procedures were not followed. A further two patients had HIV positive sexual partners but partner notification had not been pursued by the index patient's clinic. No patients in the cohort had a history of PrEP use.
Conclusion: Lack of access to self-funded PrEP among MSM in low-income groups, and lack of awareness of PrEP among high-risk heterosexuals, may be contributing to ongoing HIV transmission. There are potential missed opportunities for HIV testing on GP registration, in those with HIV indicator conditions, and in partners and children of people living with HIV.

P57

The role of conditional cash transfers for people living with HIV/AIDS: a systematic review

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Background: The HIV pandemic remains one of the most catastrophic global health burdens, with nearly 39 million people living with HIV/AIDS (PLWHIV). The advent of highly active anti-retroviral therapy and its subsequent rollout around the world have been extremely effective in reducing morbidity and mortality and preventing transmission. Recent evidence has suggested that conditional cash transfers (CCTs), whereby cash is paid to individuals when a specific condition is met, can improve social and clinical outcomes for various diseases through incentivizing and enabling positive behaviour change. However, the role of CCTs in addressing the HIV epidemic is ill-defined.
Method: We did a systematic literature review of the role of CCTs for PLWHIV. Methods used to conduct the review were in line with PRISMA collaboration guidance. The search term used was "HIV/AIDS" and "Conditional Cash Transfers" and inclusion criteria included free access and publication within 25 years. Databases searched included Pubmed and Google Scholar. Non-academic "grey literature" including reports by relevant organisations such as the International Labour Organisation and World Health Organisation were also reviewed.
Results: Eight published papers met inclusion criteria for review. The review demonstrated that HIV-related CCT interventions to date could broadly be categorized into in interventions that: 1) focused on reducing population risk factors for HIV, including poverty alleviation and improving access to education or school attendance; and 2) provided cash on meeting the condition of receiving education about HIV prevention and subsequently completing HIV testing. This review finds that there is significant evidence that CCTs can have a positive impact on sexual behaviors and subsequent HIV outcomes.

Conclusion: Our review showed that CCTs have the potential to contribute to reducing rates of HIV transmission through incentivization of behavioral change. However, the optimal design and implementation of CCT programs to achieve the greatest impact, cost-effectiveness, and sustainability for PLWHIV remains unknown. Further implementation research is required to establish the most favorable size, delivery method (e.g. bank, cash, in-kind transfer), duration, and conditioning (e.g. unconditional versus conditional) of CCT interventions in order to improve their translation into meaningful policy change.

P58

U=U patient perspective: 3 years on, the stigma persists

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Background: Since 2016, the Undetectable = Untransmittable campaign (U=U) has been endorsed by scientific and medical organisations from over 34 countries worldwide. However, the dissemination of this information to both the general public and people living with HIV (PLWH) has been variable, and it is unclear how many of our patients are aware of this message.
Method: All patients attending HIV clinic in December 2019, within a large teaching hospital in England, were invited to participate in an anonymised survey. Additionally, case notes of all patients attending HIV clinic during a 2 week period in September 2019 were reviewed for evidence of U=U documentation.
Results: 88% of respondents had heard of U=U, with the majority reporting that a healthcare professional had informed them during their current or previous HIV appointment. However, the case note review identified that only 38% had documented discussions of U=U. There was uncertainty over the timings required, with 31% identifying that the viral load should be undetectable for 6 months to meet U=U criteria. 34% believed U=U applied from the time of their first undetectable viral load, with a further 20% being unsure. Positively, just over half of respondents felt that U=U had impacted on their life and changed their behaviour, with 44% stating that they were more likely to have sexual relationships because of this knowledge. 65% felt that the U=U campaign had helped reduce stigma around HIV, although most felt that more public awareness was needed.
Conclusion: Considerable work has been done to improve the knowledge and awareness of U=U. However, we must ensure patients are given clear information to avoid misunderstandings. Furthermore, documentation of this discussion in clinical notes must be improved. Unfortunately, PLWH still feel a large burden of stigma and this can only be improved by increasing public knowledge and awareness of both modern HIV treatment and U=U. Although U=U is now common knowledge within sexual health services, further work is required to disseminate the message to non-specialist clinicians and the general public.

P60

Who disengages from HIV care? The experience of an inner-city HIV clinic with high rates of late diagnosis

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Background: Since the advent of effective antiretroviral therapy (ART), life expectancy of people living with HIV has improved. Effective engagement in HIV services reduces morbidity and mortality.
Our aim was to identify factors associated with disengagement in care in patients attending our HIV clinic.
Method: We analysed all 1,770 patients with at least one care episode at our clinic 2014–2018. Patients were categorised as actively engaged (time since last attendance (TSLA) < 8 months), partially engaged (TSLA >8 months and <12 months) or disengaged (TSLA >12 months).
Stata (v15) was used to conduct two-way tests of association of demographic and clinical variables with level of engagement (Kruskal-Wallis for continuous, Pearson's Chi-squared for categorical variables).
Results: People of white ethnicity were more likely to have disengaged (20% vs. 8% Black African), as were men (16% vs. 8% females) and people who likely acquired HIV through injecting drug use (IDU) (41% vs. 16% men who have sex with men) (all $p<0.001$).
Nearly a third (31%) who had received psychiatric care had disengaged, compared with 12% who had not ($p<0.001$) and 28% patients with a disability were disengaged compared with 7% without ($p<0.001$).
The median CD4 at last contact was 544cells/μl in those actively engaged and 443cells/μl in those disengaged ($p<0.001$).
Only 36% of people recorded as not on ARTs at last contact were actively engaged, compared with 80% of people on their first ART regimen and 89% of people on their 2nd or subsequent ($p<0.001$).
A fifth of patients who withheld consent for information sharing with primary care were disengaged, compared with 11% who had given consent ($p<0.001$).
No difference was found between the median age of individuals in the three engagement categories ($p=0.14$).
Conclusion: Factors associated with disengagement were white ethnicity, being male, history of IDU, mental health issues and disability in univariable analysis. People who disengaged had lower CD4 count and were less likely to be on ART at last contact. These findings help us to identify people at risk of disengagementso a multidisciplinary approach can be taken to improve retention in care.

P61

High prior pre-exposure prophylaxis (PrEP) use in MSM attending for sexual post-exposure prophylaxis (PEPSE)

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Background: PrEP is an effective HIV prevention resource in MSM although there are concerns about poor adherence, PrEP fatigue and limited PrEP availability particularly in England (trial enrolment, online self-procurement or NHS additional private care). This leads some PrEP users to access PEPSE and therefore we analysed the rates of recent PrEP exposure in MSM attending for PEPSE.
Method: All MSM starting PEPSE at 56 Dean Street in September-October 2019 were included in the survey. We collected baseline characteristics and clinical data (past PrEP exposure, its sourcing and discontinuation reasons, PrEP uptake following PEPSE termination).
Results: 363 PEPSE courses were administered to MSM: median age 31(IQR 26–37); 47% UK-born. PEPSE was recommended according to BASHH guidelines in 95% of cases where it had been administered. 60% had PEPSE prior to this occasion, 17% practised chemsex leading to HIV risk-exposure. 27% had been on PrEP previously and 19% had PrEP exposure in the 90 days prior PEPSE (54% on a daily regimen). PrEP was sourced mainly as an online purchase (41%) or via trial enrolment (34%) and failed as an HIV prevention strategy mainly due to supply issues (47%), unplanned sex (36%), incorrect dosing (9%). 134 individuals completed an 8 weeks post-exposure HIV test (all negative). Of these, 67% of them started PrEP after PEPSE (74% via trial enrolment, 23% via NHS additional private care). 88 had never taken PrEP before.
Conclusion: Over a quarter MSM accessing PEPSE had previous PrEP exposure. This highlights the need to simplify PrEP access for users including guaranteeing adequate medication supply and support education towards correct PrEP use and PrEP discontinuation in high-risk individuals.

P62

HIV in Manchester's homeless population

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Background: With treatment, patients diagnosed with HIV now have a normal life expectancy. However, for homeless patients there are a number of barriers to receiving therapy such as mental health problems and substance abuse. A community outreach clinic run by HIV specialist nurses and an infectious diseases consultant is held at a local GP practice which serves a large proportion of Manchester's homeless population. Their multidisciplinary team approach allows homeless patients living with HIV to receive treatment, regardless of their attendance at clinic.
Method: We reviewed the electronic patient records of 15 patients who attend the HIV clinic at a GP practice in Manchester. Data was collected on

sex, homeless situation (rough sleeping, hostel, sofa-surfing), whether the patient was a current or previous intravenous drug user, if they were or had been co-infected with another communicable disease, the number of admissions to hospital and the number of "did not attend" appointments.
Results: Twelve patients were male and three were female. Fourteen patients were rough sleeping and one was living in a hostel. Nine patients were currently injecting drugs.13/15 patients were co-infected with hepatitis C infection. Three patients had hepatitis C and syphillis. The mean number of admissions whilst under the care of the HIV team was 2.5. Six patients had no admissions and one patient had ten. The mean number of "did not attend" appointments was 4. Three patients did not attend one appointment and one patient did not attend 12. 8/15 (53%) patients had an undetectable viral load.
Conclusion: The homeless population which was examined had high levels of previous or current intravenous drug use and also co-infection with other communicable diseases. They frequently did not attend outpatient appointments and also had frequent inpatient admissions. However over half were undetectable and overall had a high CD4. The use of accessible HIV community clinics with a multidisciplinary team can help to provide the continuity of treatment required to effectively manage HIV.

P63

Greater focus on incident HIV infections is required to end the HIV epidemic

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Background: To move towards zero new infections by 2030, efforts must be concentrated on the prompt treatment of incident HIV and effective partner notification (PN). In this centre in a Fast Track City outside London, new infections are monitored in 'real-time'.
Method: New diagnoses of HIV in 2019 were identified through a data search. Clinical data were collected from electronic patient records.
Results: In 2019 there were 42 new HIV diagnoses, 9 (21%) of whom were incident infections based on avidity testing, evolving serology or a negative test in the 4 months prior. 8 (89%) were in men who have sex with men (MSM); 7 (78%) were from the UK. The median age was 39 (range 28–47). The median baseline viral load (VL) was 272 302 copies/ml (range <40–20,719,616) and the median CD4 count was 650 cell/mm^3 (range 332–980). 8 (89%) reported seroconversion symptoms; 2 (22%) were hospitalised, 5 (56%) had a sexually transmitted infection at diagnosis (2 campylobacter, 1 chlamydia, 1 syphilis and 1 gonorrhoea); 2 (22%) reported chem use.1 was on post exposure prophylaxis (PEPSE); 1 was on pre-exposure prophylaxis (PrEP) but reported suboptimal adherence; 2 were on the IMPACT waiting list and 1 patient had been advised to buy PrEP.
The median time to starting treatment was 11 days (range 1–55). In the case of 55 days, the baseline VL was undetectable, it was rechecked and resistance results were awaited before treatment. 5/9 are already undetectable after a median 58 days.
PN based on patient supplied information revealed 14 total contacts; a median of 1/patient (range 0–3). 11 were contactable (4 did not respond) and 9 were of known status/on PrEP or PEPSE. No new HIV infections were diagnosed from PN
Conclusion: As new HIV diagnoses fall, it is critical to monitor new infections contemporaneously, ensure rapid treatment offer to limit transmission and to identify undiagnosed/untreated HIV infection swiftly with PN. Alongside more frequent testing and expanding PrEP access, we hope these will result in zero new infections in this city in years to come.

P64

Reducing the prevalence of smoking in PLWHIV: the next target?

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Background: People living with HIV (PLWH) are more likely to smoke, develop smoking related diseases and are less likely to quit. This is of increasing importance as PLWH live longer in the advent of early antiretroviral treatment and smoking remains a major contributor to avoidable deaths
Method: Work was conducted at a centre in a city of high HIV prevalence outside London.A sample of clinic visits from 29/11/19–29/01/20 was taken and smoking data were collected from electronic patient records (EPR). Patients were coded as smokers, ex-smokers, occasional smokers, only smoking when drinking alcohol, vaping and non-smokers.
Results: This two month sample provided visit data on 1093 patients. 311 (28%) did not have smoking data. Of those that did, 29% were current smokers, 3.5% occasional smokers and 1% smoke when drinking alcohol (total 33.5% smokers). 39% were non-smokers, 21% had stopped more than 1 year prior and 3.5% in the last year. Just 3% used electronic cigarettes. Compared to data from 2012 and 2015 where smoking prevalence was 43% and 38% respectively in this cohort, this sample demonstrates a continued decline to 33.5%.
Conclusion: The proportion of HIV patients that smoke in this centre has reduced by 9.5% over 7 years. The reduction is due in part to the centre's cessation tools; a designated nurse trained in carbon monoxide monitoring, which helps motivate individuals by demonstrating smoking detriment and charts progress as they reduce and stop, staff education on smoking counselling at appointments and pharmacy advice on nicotine replacement therapy.An ageing cohort may passively observe a reduction in smoking due as lifestyle alters, but the median age of the sample audited in 2015 was 49 and is 50 now.The apparent reduction in proportion with smoking data reflects the move from paper (where many did have a smoking history recorded) to EPR. The introduction of EPR is an an opportunity to record history more systematically and target those for intervention;
More PLWH in this cohort smoke (29%) compared to national PHE figures for adult smokers; 13.7–17.3%. Electronic cigarettes are not popular despite being cheaper and PHE advice that they are less harmful. Increasing smoking cessation from 24.5% is essential to reduce smoking related morbidity and mortality which disproportionately affects PLWH.

P65

U equals U discussions: documentation, awareness and missed opportunities

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Background: BHIVA has endorsed the "undetectable equals untransmittable" (UequalsU) message since July 2017. Clear documentation of discussions is essential to ensure awareness and understanding among people with HIV (PWH). We evaluated documentation of UequalsU discussions in HIV clinic letters and assessed knowledge of UequalsU in a selection of PWH with no prior documented discussion to inform future practice.
Method: We performed a retrospective review of HIV clinic letters from 50 randomly selected PWH due to attend for review from 21–25 January 2020. We recorded demographic information and searched all letters from July 2017 until Jan 2020 for any mention of the UequalsU message. Following this, 10 patients with no evidence of previous discussion were highlighted to their clinician. We asked them to discuss UequalsU in their next consultation and to assess prior knowledge of UequalsU, where they learned about it and degree of understanding.
Results: Of the 50 PWH included, 11 (22%) were female; median age 48 (range 23–70). Median time since HIV diagnosis was 14 years (range 0–33). 16 (32%) were men who have sex with men (MSM). 35 (70%) had no documentation of UequalsU discussion in any clinic letter. Among 15 with a documented discussion the median time between the BHIVA statement and first mention of UequalsU was 18 months (range 8–27).
Of the ten patients highlighted to clinicians, nine attended. Five had not heard of UequalsU; Four Black African heterosexual men, one Black African heterosexual woman, one white British MSM. Four knew about UequalsU (two had learned about it in clinic, one from a friend, one from an HIV charity). Of those who had heard of UequalsU, all were reported to have good understanding of the message.
Conclusion: There was poor documentation of UequalsU discussions and low awareness in half of those without documented discussion. Extrapolating the results of this small sample to our clinic population of 2700 PWH could mean that 1,000 PWH do not know about UequalsU. Further interventions are required to ensure widespread knowledge of this important message with the aim of improving quality of life and reducing stigma.

P66

Co-infections in pregnancies in women living with HIV in the UK

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Background: Sexually-acquired and blood-borne co-infections are frequent among people living with HIV. In pregnancy, co-infections may place women and their infants at increased risk for adverse outcomes, including vertical/congenital infection, with potential implications for management during pregnancy and beyond.
Method: Public Health England's Integrated Screening Outcomes Surveillance Service (ISOSS) conducts population-level surveillance of pregnancies in women living with HIV (WLWH), syphilis and Hepatitis B virus (HBV) and their children, and of congenital rubella. Data on infections screened for in pregnancy (HBV and syphilis) and Hepatitis C (HCV) are collected. We describe the current picture regarding these coinfection(s) among WLWH in 2009–2018, reported by December 2019.
Results: There were 11,494 pregnancies in the study period, with information on coinfections reported in 83% (9536). Overall 6.9% (658/9536) of pregnancies had HBV, HCV and/or syphilis coinfection reported, with prevalence of HBV, HCV and syphilis respectively of 4.4% (95%CI: 4.0, 4.8); 1.4% (95% CI: 1.2, 1.7) and 1.3% (95%CI: 1.1, 1.5). 21 pregnancies had ≥1 coinfection.
Prevalence of coinfection was higher among women diagnosed during pregnancy (8.2% vs 6.6% diagnosed before (p=0.032)), and higher among women born abroad (7.6% vs 3.3%), p<0.001.Three-quarters (468/653) of pregnancies with coinfection were to women from sub-Saharan Africa and 13% (87) from Eastern Europe (accounting for 50% (67/135) HCV co-infection).
Coinfection prevalence among injecting drug users was 59% compared to 6.4% who acquired HIV heterosexually (p<0.001), and prevalence was higher among white women vs Black African (9.1% vs 6.7%, p<0.001).Among 603 infants reported born to mothers with coinfection, 5 (0.8%) had a congenital infection.
Conclusion: One in 14 pregnancies in WLHW occur in in women coinfected with HBV, HCV and/or syphilis, underscoring the need for ongoing awareness of sexual health in pregnancy. Vigilance during pregnancy allows for effective interventions to prevent vertical transmission of HBV and syphilis, whilst access to treatment postpartum for women with HCV coinfection remains important. ISOSS is uniquely placed to monitor the management and outcomes of all the screened for infections in pregnancy, including the impact of inequalities on access to care, as well as the opportunity to track other coinfections (including HCV).

P67

Use of dolutegravir in women of child-bearing potential

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Background: Data presented at the International AIDS Conference (IAS) 2018 showed concerns over the safety of dolutegravir (DTG) use in pregnancy. Clinicians were asked to discuss current evidence with all women of child bearing potential receiving DTG and record the outcome of the consultation on a paper-based form.
Method: All women living with HIV aged 16–55 years receiving DTG who attended the clinic between 01/02/2019 and 05/08/2019 were included. Electronic patient records and paper copies of DTG forms were reviewed.
Results: Of the 3250 cohort of people living with HIV attending our service, 114 women met criteria for inclusion. The mean age was 46 years of age (IQR 42–52), 79% were black African, and 95% were virally suppressed (HIV-1 <40 copies/ml) at their last visit. Half of patients were receiving a standard 3-drug regimen and a quarter of patients were receiving a standard 2-drug regimen. Twenty-four per-cent of patients were defined as 'complex' i.e. receiving DTG with boosted protease inhibitor or other/multiple drug regimen.
Of the 114 records reviewed: 54 had a DTG audit form completed and an additional 5 were counselled regarding DTG risks according to patient notes. Two women were previously identified as postmenopausal and 12 women were a new patient or had been switched to DTG at their last appointment and therefore not eligible for form completion. No record of DTG discussion was identified for the other 41 women.
Of the 59 women with documented consultation (either by DTG form or patient notes) 7% (N=4/59) decided to switch from a DTG-based regimen. Of the 55 women that continued DTG, 65%(36/55) were on sufficient contraception and 24% (13/55) were post-menopausal or unable to conceive. One woman was in her third trimester of pregnancy. No reason was provided for continuing DTG in 7 patients.
Conclusion: Of the 114 patients identified, 100 were eligible for form completion. Of those eligible 59% (59/100) patients had a documented consultation. All women that switched drug regimen were hoping to conceive. For the other patients, reasons for not switching drug regimen included sufficient contraception, post-menopausal/not able to conceive and pregnancy.

P68

Fertility evaluation in adults with perinatally acquired HIV-1 infection: a cross-sectional observational study

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Background: Limited data exists on the reproductive health of adults with perinatally acquired HIV (PaHIV). The current cohort of adults with PaHIV are the first generation to reach reproductive age and many have experienced poor health, immune dysfunction and exposure to antiretroviral therapy (ART) through puberty. We aimed to evaluate feasibility, acceptability and outcomes of fertility investigations in a cohort of PaHIV adults.
Method: A UK single-centre cross-sectional observational study evaluating fertility in consenting PaHIV adults aged >18 years was undertaken between February 2018 and July 2019. Individuals with a pre-defined genital or gonadal abnormality as deemed by the investigator to potentially interfere with fertility were excluded. Sperm functional assessment (SFA) was performed in males and transvaginal ultrasound scanning (TVUSS) paired with anti-Mullerian hormone (AMH) testing was performed in females. Significant abnormal findings were referred to NHS services. Fisher's exact test was used to determine non-random associations between study results and WHO reference values for the general population.
Results: 36 PaHIV individuals were recruited. 16 (76%) females and 9 (60%) males completed the study, median (IQR) age 25 (21–29), 22 (88%) of Afro-Caribbean descent. In female participants, mean (SD) serum AMH level was 19.4 (9.5) pmol/l. No significant pathologies impairing fertility were identified on all TVUSS. Mean (SD) antral follicle count (AFC) was 23 (9) follicles. 8 (89%) males had SFA results below the 5th centile for at least one parameter compared to the general population (pooled results from Australia, UK, USA, Chile and Germany). 7 (78%) males had sperm morphology normal forms (percentage) below the 5th centile for the general population (p<0.0000005) with 4 (44%) having no normal forms.
Conclusion: This is the first study to report results of fertility investigations in adults with PaHIV. We observed a higher than expected prevalence of teratospermia in this small group of men with PaHIV. Although mean serum AMH was lower than expected for women of this age, our sample size was too small to conclude that ovarian reserve may be impaired. A larger study with an age and ethnically matched control group is needed to verify our findings.

P69

Age of ART initiation correlates with neurocognitive impairment (NCI) in patients with perinatally acquired HIV (PAHIV)

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Background: NCI among young adults with PAHIV has been observed in various studies. Most children achieve more than 90% of biological brain growth before

the age of five years. Early initiation of ART in infancy was known to be neuroprotective. We conducted a retrospective cohort study exploring the association between age of ART initiation and symptomatic NCI among young adults with PAHIV attending a dedicated young adult HIV service.
Method: A retrospective electronic case note review was conducted.Data on demographics, ART, age at ART initiation, CD4 count and comorbidities including NCI and mental health diagnoses were collected.
Results: 43 [Male 17, Female 26; Mean age 24 years] patients with PAHIV were included. All were on ART, 29 (67%) had a recent viral load <50 copies/ml. 20 (46%) had a CD4 count less than 350 cells/ul. 22 (51%) had archived drug resistant virus. 21 (48%) had a mental health diagnosis and 7 (16%) had symptomatic NCI.
22/43 (51%) initiated ART before 5 years of age. Of these, 1 (4%) had symptomatic NCI at adulthood, 12 (55%) had a mental health diagnosis, 8 (36%) had AIDS defining illness, 1 (4%) had CNS infection, 7 (32%) had poor adherence to ART and 4 (18%) reported using recreational drugs.
21/43 (49%) were started on ART after 5 years of age.Of these, 6 (29%) had symptomatic NCI at adulthood. 9 (43%) had a mental health diagnosis, 8 (38%) had an AIDS defining illness, 2 (10%) had CNS infection, 7 (33%) had poor adherence to ART and 1 (5%) reported using recreational drugs.
Relative risk of symptomatic NCI in those who initiated ART after 5 years of age, versus those who initiated ART before 5 years of age was 6.28; 95% CI : 0.82 to 47.90; p-value: 0.04.
Conclusion: In our cohort, initiation of ART after 5 years of age is associated with a higher reporting of symptomatic NCI at adulthood among young adults with PAHIV. This effect appears to be independent of CNS infections, mental health diagnoses, and recreational drug use.

Comorbidities, co-infections and HIV/ART complications

P70

Modelling endothelial function *in vitro* and via blood sampling to evaluate cardiovascular risk in people living with HIV

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Background: Cardiovascular (CV) disease, which is driven in part by endothelial and platelet dysfunction, is more prevalent among people living with HIV (PLWH) and has been associated with some antiretroviral (ARV) use. Determining effects of ARVs upon platelet function via blood sampling is commonplace; however, examining the impact on endothelial cells without invasive sampling methods is more complex. We evaluated *in vitro* models of endothelial dysfunction and developed methods to isolate and phenotype endothelial-derived microparticles (EMP) and endothelial 'progenitor' cells (endothelial colony-forming cells, ECFCs), both of which can be isolated from blood to allow for detailed analysis of endothelial function in patients or clinical trial participants.
Method: Human coronary artery endothelial cells (HCAEC) were treated with plasma C_{max} concentrations of abacavir sulphate (ABC) or tenofovir disoproxil fumarate (TDF), stimulated with TNF-alpha to mimic inflammation, and inflammatory and pro-thrombotic properties assessed by flow cytometry. EMP were isolated from cell culture supernatants and plasma from human subjects and characterised using flow cytometry. ECFCs were isolated in the presence of ARVs using whole blood of healthy subjects taking PrEP in order to establish protocols in a relevant population exposed to daily ARVs. Statistical significance was determined by one-way ANOVA with Tukey's multiple comparison test.
Results: ABC enhanced TNF-alpha-induced inflammatory ICAM-1 and pro-thrombotic TF expression in HCAEC compared to TDF (+1.9- and +1.2-fold, $p<0.05$). ABC treatment also increased ICAM-1^+ and TF^+ EMP generated by HCAEC compared to TDF (+2.1- and +3.3-fold, $p<0.05$), and EMP from the blood of human subjects taking ARVs at therapeutic doses were successfully isolated and their inflammatory and thrombotic properties determined. ARV exposure did not affect the isolation of viable ECFCs, as we observed similar numbers in PrEP users compared to those obtained from ARV-naïve donors in earlier studies.
Conclusion: ABC enhanced the inflammatory and thrombotic properties of cultured HCAEC suggesting that this model may be used predictively to evaluate the CV risk profile of ARVs. In the context of clinical studies, EMP and ECFCs can be useful tools for determining the effects of ARVs and HIV infection *per se* upon vascular endothelial thrombo-inflammatory properties and therefore CV health.

P71

Antiretroviral therapy choices for hepatitis B virus non-immune HIV patients

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Background: BHIVA guidelines recommend that people living with HIV should be immunised against Hepatitis B virus (HBV).For patients who are non-responders to HBV vaccination, i.e. where Hepatitis B surface antibody (HBsAB) levels are <10 IU/l after at least one full series of vaccinations, BHIVA guidelines recommend annual serological Hepatitis B surface antigen (HBsAg) testing.In addition, EACS guidelines recommend either tenofovir disoproxil (TDX) or tenofovir alafenamide (TAF) for prevention of HBV infection.We reviewed the HIV cohort at our central London clinic to assess if non-responders to HBV vaccination had been tested for HBsAg and were on a tenofovir-containing ART regimen.
Method: We reviewed electronic records of 4933 registered patients over a 15 month period from 1st October 2018 to 31st Dec 2019, for HBsAb test results with the result of <10 IU/l.For each patient with this outcome, we reviewed the most recently prescribed ART regimen. For those who were not on a tenofovir-containing regimen, we reviewed the immunisation history and regimen choice.
Results: 2414 HBsAb tests were performed, of which 330 yielded results <10 IU/l.
255 (77%) non-immune patients were on a tenofovir-containing regimen (190 TDX, 65 TAF), 70 were on an ART regimen not containing tenofovir, and 5 were not on ART (4 declined and 1 newly diagnosed).56/255 patients had been tested for HBsAg in the previous year (all negative).
Of 75 patients not on a tenofovir-containing ART: 12 patients were non-responders after two vaccination series, 16 patients were non-responders after one series and had started a second,21 had started a first vaccination series and 26 had either no documented vaccination (24) or declined (2).16/75 had been tested for HBsAg in the previous year (all negative).
Conclusion: 72 (21.8%) non-immune patients had tested for HBsAg in the previous year.
28 (8.5%) of patients were confirmed non-responders to at least one full HBV vaccine series and not on tenofovir-containing therapy.
Additionally, 26 (7.9%) HBV non-immune patients were neither on tenofovir nor vaccinated.
In the era of non-tenofovir-based two drug regimens, consideration of ART protection against HBV is important for HBV non-immune individuals. We recommend, in accordance with EACS guidelines, patients who are non-responders to two series of HBV vaccination course are offered tenofovir-containing ART, as well as annual HBsAg testing.

P72

Mapping care pathways in the UK for older people living with HIV

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Background: Effective antiretroviral therapy has led to people living with HIV in the UK now experiencing near-normal life expectancy; the mean age of the UK HIV cohort is 50 years and rising. Compared to the general population, there is an increased risk for and difficulty in treating conditions associated with ageing, including cardiovascular disease, diabetes and osteoporosis. It is unknown how clinical services are responding to these challenges, and if lifestyle is being addressed. We aimed to map any specific services established in the UK for patients aged 50 years or older.

Method: Using clinical networks and snowballing techniques we contacted all HIV clinics in the UK providing specialist services for patients aged 50 years and older. We conducted face to face or telephone interviews with clinicians and patient representatives at identified clinics. Process mapping was used to define care pathways, checking with clinicians to ensure accuracy.
Results: Six specialist services for older people living with HIV had been set up at four different centres across the UK. All six services reported high demand for appointments. These services screened for conditions associated with ageing, devised care plans, and treated conditions either in-house or via onward referral to specialists depending on local resources and expertise. The overarching aims of clinical management differed between services according to perceived local needs, with the six services focusing on one of: menopause; multimorbidity; polypharmacy; frailty; and rehabilitation. All six services were led by HIV specialist physicians, with four including dietitians and pharmacists, three physiotherapists and two occupational therapists. Clinical outcomes did not appear to be measured systematically across the six services.
Conclusion: A range of approaches to management of comorbidities associated with ageing has been developed, responding to local demographics but also dependent on local expertise and resources. We recommend that specialist services systematically measure a range of outcomes in order to assess quality of care as well as impact on health economics. Additionally, future research should explore both the patient and clinician experience of specialist services, as well as views of those in areas without such services.

P73

Mapping care pathways in South Africa for older people living with HIV

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Background: Almost five million South Africans living with HIV are now treated with antiretroviral therapy.
Compared to the general population, there is a significantly increased risk for and difficulty in treating conditions associated with ageing, including cardiovascular disease, diabetes and osteoporosis. It is unknown how clinical services in South Africa are responding, and if lifestyle interventions are being addressed. We aimed to map specific services established in South Africa for patients aged 50 years or older.
Method: Using clinical networks and snowballing techniques we contacted HIV clinics in the Western Cape and in Gauteng provinces. We conducted face to face or telephone interviews with clinicians at identified clinics. Process mapping was used to define care pathways, checking with clinicians to ensure accuracy.
Results: We were unable to identify any HIV-specific services in South Africa for older patients. General rehabilitation services for older people may contain significant numbers of HIV patients, although specialist treatment is not provided. The focus of management of HIV care in South Africa is supporting the enormous number of patients, and care is increasingly delivered in groups known as treatment clubs. Once patients are stable on antiretrovirals their care is transferred from the HIV clinic to the community club network. Each club of around 20 patients meets bimonthly, and is facilitated by a healthcare support worker who checks adherence and side effects, as well as administering prepackaged antiretrovirals and arranging six-monthly phlebotomy. One treatment centre had initiated clubs for HIV patients also living with diabetes or hypertension, although outcomes were not being measured. Dietitians, physiotherapists, diabetes nurses or other specialists were not reported to be involved in any club network.
Conclusion: Few approaches to management of conditions associated with ageing in HIV have yet been developed in South Africa. The club system offers an opportunity to tailor membership according to comorbidity status, facilitating both targeted treatment as well as peer support. There is an urgent need to test lifestyle interventions within the club system to assess impact on both prevention and treatment of comorbidities.

P74

Metabolic comorbidities: developing a care pathway

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Background: People living with HIV (PLWH) have a normal life expectancy with effective antiretroviral therapy (ART). As PLWH age, the risk of developing comorbidities increases; multi-morbidity risk increases compared to age-matched HIV negative populations. We aimed to develop a holistic service in partnership with patients, the *Living Well* clinic, to meet the complex needs of this growing cohort.
Method: Patient focus groups informed service redesign. We introduced HIV-specific patient-reported outcome measures (PROMs) to direct consultations and measured patient activation (PAM) which guided interventions. A link to online questionnaires was texted to patients 7–14 days prior to attending. A portfolio of interventions was developed to meet patients' needs. Demographic data was collected from patients attending between September and December 2019, as well as questionnaire outcomes, and details of interventions deployed.
Results: Of the 72 patients, 68% were male, 51% White, 32% Black African, and 10% Black Caribbean. Mean age was 48.6 $\pm$10.2 years, with 7% aged 18–29 years. Mean initial BMI was 33.5 $\pm$4.9 kg/m^2, with 71% obese. Most common primary reasons for referral were increased cardiovascular risk, weight gain associated with ART, and osteopenia/osteoporosis. Regarding PROM and PAM questionnaires 10% were completed online prior to attending, 51% in clinic on the day, and 39% of patients declined to complete them. Non-completion prior to attending was due to fear of disclosure of HIV through observation by others, or confusion regarding the purpose of the forms. Interventions guided by the multidisciplinary team (MDT) assessment and questionnaires were: ART switch; prescription of adjuvant medicines; behaviour change through motivational interviewing, mindfulness and goal-setting to facilitate smoking cessation, dietary change and increased physical activity (with provision of wearable fitness trackers and in-house gym classes); monitoring hepatic steatosis by fibroscan; and onward referral to specialist care for psychology, dyslipidaemia, diabetes, osteoporosis and bariatric surgery.
Conclusion: HIV patients living with comorbidities highly value an MDT approach. PROMs have enhanced patient-clinician interactions, and PAMs guided achievable interventions. However, HIV stigma negatively impacts completion of questionnaires prior to attending. Long-term data is required to confirm intervention effectiveness. Continued co-design of this service is planned; we recommend this approach elsewhere.

P75

Investigating risk factors for non-viral liver disease in people living with HIV: an update on the HeAL (HIV non-virAl liver disease) study

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Background: Given recent advances in viral hepatitis treatment, future chronic liver disease (CLD) in people living with HIV (PLWH) is likely to be due to non-viral aetiologies. Risk factors include alcohol, metabolic syndrome (MS) and antiretrovirals (ARV). Early recognition of CLD is important to prevent long-term morbidity and mortality. This prospective cross-sectional study investigates prevalence and predictors of CLD in PLWH with abnormal liver function.
Method: Inclusion criteria were PLWH, negative viral hepatitis serology and elevated transaminases over 6 months. Consenting individuals completed an Alcohol Use Disorders Identification Test (AUDIT), underwent MS assessment and transient elastography. Study definitions: hepatic steatosis (HS) – controlled attenuation parameter (CAP) $\geq$237dB/m; clinically significant hepatic fibrosis (CSHF) and cirrhosis – liver stiffness measurement $\geq$7.1 kPa and $\geq$11.5 kPa respectively.
Results: 251 individuals have been recruited. The mean age was 52.3$\pm$9.7years, 92.0% were male, 96.0% with undetectable HIV viral load, median years since HIV diagnosis: 15 (IQR 10–20). Overall prevalence of HS and CSHF was 63% (n=158) and 21% (n=52) respectively. Of those with CSHF (n=52), 75% (n=39) had HS and approximately one third (35%, n=18) had

cirrhosis. In multivariate analysis CSHF was significantly associated with hypertension (AOR2.9, 95%CI: 1.3–6.6, p-value 0.04) while BMI>30 (AOR4.1 95%CI:1.7–10.0, p-value <0.001) and HDL (AOR 6.7 95%CI 1.9–23.8, p-value<0.001) were associated with HS. No risk factors were identified in 10 (19%) individuals with CSHF. These individuals were significantly younger and had shorter HIV duration (Table P75.1).

Table P75.1. Differences between individuals with and without risk factors for CSHF

	Had no risk factors for CSHF (n=10)	Had risk factors for CHSF (n=42)	p-value*
Mean age (years)	46.4 (±9.6)	54.9 (±8.1)	0.006
Median years since HIV diagnosis	8 (6–11)	16 (112–22)	0.003
Median CD4 baseline (10^6/l)	479.5 (126–595)	318.0 (194–448)	0.40
Median ALT peak (iu/l)	64.5 (59–107)	60.5 (47–81)	0.08

*Age – T test; Years since HIV diagnosis, CD4 baseline, ALT peak – Mann-Whitney Test

Conclusion: There is a high CLD burden in PLWH, MS risk factors being independent predictors for both HS and CSHF. About 20% with CSHF have no identifiable risk factors, suggesting a potential direct effect of the HIV infection. Our study highlights the need to implement screening strategies for non-viral CLD in this population.

P76

Use of dual X-ray absorptiometry (DEXA) scanning in a London HIV clinic

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Background: National guidelines exist for assessing osteoporosis and fracture risk in persons living with HIV (PLWH). We examined our cohort to assess DEXA scan requests, action taken on results, and auditing against BHIVA/NICE standards.
Method: Notes review of PLWH attending our clinic with first/follow up DEXA 4th April – 30th July 2018.We collected demographic data (gender/ethnicity/age), year of HIV diagnosis, CD4, viral load, antiretroviral therapy, osteoporosis risk factors. We assessed whether DEXA requests met guidelines for indication, follow-up scan interval, outcomes and action taken when osteoporosis confirmed.
Results: 179 DEXAs were requested. 52/179 were excluded (31 DNA, 20 research scans; 1 duplicate). 127 were analysed: 54 (43%) female; mean age 55 years (30–80); 46 black, 61 white, 7 Asian, 4 mixed, 2 'other'. Mean CD4 603 (58–1343); 120 (95%) HIV <40c/ml (Table P76.1).
50 (39%) were 'first' scan and 77 (61%) repeats.
27 patients had confirmed osteoporosis; 3 (11%) were referred to rheumatology; 2 were already under rheumatology.
18 first DEXAs had no clear indication. 14 (77%) were on tenofovir (TDF); mean duration TDF 10 years, mean age 46y. 11 had repeat DEXA scan without clear indication, all on TDF. Mean TDF duration 9y; mean age 42y.In those on TDF 24 (96%) had normal DEXA; 1 osteoporosis. 4 not on TDF all had normal DXA.

Table 76.1

	N	N (%) with clear indication	N (%) without indication	N (%) rpt DEXA within window	N (%) normal	N (%) osteopenia	N (%) osteoporosis	N (%) osteoporotic on treatment post scan	N (%) osteoporotic not on treatment post scan
1st DEXA	50	32 (64%)	18 (36%)	N/A	32 (64%)	8 (16%)	10 (20%)	5 (50%)	5 (50%)
Rpt DEXA	77	66 (85%)	11 (15%)	47 (62%)	29 (38%)	31 (40%)	17 (22%)	16 (94%)	1 (6%)
All DEXA	127	98 (77%)	29 (23%)	N/A	61 (48%)	39 (31%)	27 (21%)	21 (78%)	6 (22%)

Conclusion

We request DEXA scans according to national guidance in majority (77%) of cases. Repeat DEXA scans were performed within appropriate time period (3–5 years for normal/osteopaenia; 2 years for osteoporosis) for most (62%).

Appropriate therapeutic intervention for people with confirmed osteoporosis was provided in >75% PLWH. Of 6 patients where not, 1 had ART change to non-TDF regime; 5 had no documented management plan.

23% of DEXAs were performed without clear risk factor/indication. All but 4 were on TDF (presumed indication for DEXA).

In our audit, only 2 people had pre-procedural FRAX score. Our intention is to better reinforce FRAX scoring as part of our annual screen assessment to reduce unnecessary scanning.

P77

The first case series of denosumab biologic therapy for treatment of osteoporosis in people living with HIV in the UK

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Background: Osteoporosis is a common co-morbidity in people living with HIV (PLHIV). A significant proportion of individuals, with or without HIV infection, do not tolerate or fail to respond to first-line bisphosphonate therapy for osteoporosis. Increasingly denosumab, a biologic monoclonal antibody, is being used to treat osteoporosis in such individuals. Efficacy and safety studies of denosumab excluded PLHIV. Bacterial infective complications are recognised and caution is advised using denosumab in people with immunocompromise. Despite this, anecdotally denosumab is commonly used to treat osteoporosis in PLHIV. This case series is the first to describe the use of denosumab in PLHIV in the UK.
Method: All denosumab prescriptions within the Royal Free Hospital between December 2014 and December 2019 were identified through pharmacy databases. All PLHIV who had received denosumab were identified and retrospective data collection performed from patient records and pathology databases.
Results: Five individuals living with HIV received denosumab treatment for osteoporosis. The cohort were predominantly male (4/5, 80%), white British (4/5, 80%), with a median age of 57 years (55 – 65 years). The median duration of HIV infection was 17 years (9 – 30 years). All individuals were virologically suppressed on anti-retroviral therapy at the time of denosumab treatment with median CD4 counts of 879 cells/mm^3 (596–1,190 cells/mm^3). The median spinal and femoral neck T scores prior to denosumab were −3.1 (−2.0 to −6.0) and −2.8 (−1.5 to −4.3). Two patients have had repeat DEXA scans following denosumab and both showed radiological improvement. One individual required two outpatient courses of antibiotics for pyelonephritis attributed to denosumab. No patients underwent infection screening prior to biologic therapy.
Conclusion: Despite no formal studies and no published surveillance data, denosumab is being used in the UK to treat PLHIV for osteoporosis. Further multi-centre studies are required to better characterise the efficacy and safety of this biologic therapy in PLHIV for which this dataset is a platform. It is salutary to note that at least one individual developed a significant infective complication attributed to denosumab.

P78

Bone health in perinatal HIV: the BONDY study

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Background: There is a paucity of data on bone health in adolescents and young adults living with perinatally acquired HIV (AYAPaHIV) with peak bone

mass occurring around 25 years. Additional risk factors for reduced bone mineral density (BMD) in AYAPaHIV include HIV, antiretroviral therapy (ART), tenofovir disoproxil fumarate (TDF), impaired growth, delayed puberty and reduced mobility; a consequence of infantile HIV encephalopathy.
Method: Cross-sectional observational study evaluating bone health in AYAPaHIV aged 15–19 years (n=50), 20–24 (n=50) and 25+ (n=30) by: Dual-energy X-ray absorptiometry with vertebral fracture assessment (DEXA-VFA), bone biochemistry and turnover markers, vitamin D and parathyroid hormone (PTH). Factors associated with BMD (normal v osteopenia/osteoporosis) were explored by chi-square and Mann-Whitney U tests as appropriate.
Results: 75/130 (58%) were female, 106 (82%) of black ethnicity, median age 21 (IQR 18–24) years. Abnormal BMD (osteopenia/osteoporosis) matched for age sex and ethnicity at L2-4 and/or femur was reported in 16 (32%) age 15–19 years, 28 (56%) 20–24 years and 19 (63%) 25+. Vitamin D deficiency (<70 nmol/l) was documented in 46 (92%), 43 (86%) and 22 (73%) with a raised PTH (>7.2 pmol/l) in 12 (24%), 24 (48%) and 11 (37%) respectively. Predictive factors for abnormal BMD included older age (p=0.037), current vitamin D deficiency (p=0.002), family history of bone disease (p=0.035), impaired mobility (p=0.037), body mass index (p=0.049) and any alcohol use (p=0.019). No association was seen for previous CDC C/CD4 nadir <200 cells/ul or <25% in infants (p=0.85), smoking (p=0.29), current physical activity (p=0.76), current ART regimen (boosted protease /integrase/non-nucleoside) (p=0.26) or TDF exposure ever (p=0.34). Median cumulative TDF exposure with normal BMD was 1.5 years (IQR 0.0, 5.0) vs. abnormal BMD of 3.0 years (IQR 0.0, 7.0), (p 0.11).
Conclusion: Prevalence of abnormal BMD on DEXA approached 50% in AYAPaHIV, associated with traditional risk factors but not with severity of HIV disease or ART, although a trend was seen with prolonged exposure to TDF. Vitamin D supplementation and lifestyle modification are suggested. Bone mass accrual in those under 25 years will be reported in year 2 of the study.

P79

Fibroscans in youth with perinatal HIV

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Background: Rates of hepatic fibrosis and steatosis are poorly documented in youth with perinatally acquired HIV (YPaHIV). Transient elastography (TE) is a tolerable non-invasive procedure that can be performed by trained clinical staff within outpatients. We analysed the introduction of TE in selected YPaHIV.
Method: TE (Fibroscan™) was performed by trained paediatric nurse specialists at routine HIV appointments for YPaHIV with ≥ 1 indicator: persistent raised alanine aminotransferase (ALT >36 u/l); dyslipidaemia; Body Mass Index (BMI) ≥25/91st centile; hepatitis B/C(HBV/HCV) co-infection, chronic liver disease or excess alcohol. Fibrosis and Controlled Attenuated Parameter (CAP) scores were recorded, with demographics including BMI; ALT; lipid profile; antiretroviral regime and viral load (VL). Data were anonymised and analysed in Excel. BMI was categorised as normal/overweight/obese by age-adjusted WHO definition.
Results: 50/247 YPaHIV met the criteria for TE. All consented and all scans met the manufacturer's requirements for validity with size selected probe. Primary indication: elevated ALT; 19 (38%), raised BMI; 13 (26%), hepatitis co-infection; 8 (16%), dyslipidaemia; 6 (12%), other 4 (8%). 2 YP had Fibrosis Scores >7kPa, with non-cirrhotic portal hypertension (1) and disseminated *Mycobacterium Simiae* (1). 24 (48%) had moderate steatosis (CAP scores >243dB/m), of whom 7 (14% of scanned cohort) had severe steatosis (CAP > 305dB/m). The characteristics of the YPaHIV with CAP scores < and > 243db/m are described in Table P79.1.

Table P79.1

	Scanned cohort (%)	CAP<243dB/m	CAP>243dB/m
N	50(100)	26(52)	24(48)
Median age (range)	21(10–34)	24 (11–34)	18(10–31)
Male	32(64)	16(61)	16(66)
Black African	40(80)	21 (82)	19(79)
BMI Overweight/obese	32(64)	11(42)	21(88)
Median CAP(dB/m)	241	206	265
Median ALT(U/l)	31	28	45
Raised ALT	24(48)	10(42)	14(58)
Protease Inhibitor	19(38)	11(42)	8(33)
Integrase Inhibitor	20(40)	10(38)	10(42)
HIV VL <50 c/ml	41(82)	20(77)	21(88)

Conclusion: TE incorporated into routine follow-up was highly acceptable. Whilst rates of fibrosis were reassuringly low, steatosis, linked to obesity was present in almost half.Regular CAP monitoring could provide an opportunity for additional targeted health promotion for YPaHIV, within routine care.

P80

Associations between widespread pain and sleep quality in people with HIV

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Background: Widespread pain is frequently described in people with HIV (PWH) and has been reported negatively impact on sleep.We investigated the association between widespread pain and sleep quality among people with HIV (PWH) and HIV-negative controls in the POPPY-Sleep study.
Method: Self-reported pain information was collected at the baseline POPPY visit through a pain mannikin identifying affected body sites: pain was classified as widespread if reported in >4 of 5 body regions and in >7 body sites or regional otherwise.In the POPPY-SLEEP sub-study (median: 3.2 years later), sleep quality was assessed through a wrist actigraph (7-nights) and through the insomnia severity index (ISI), the International Restless Legs Syndrome Study Group questionnaire and the Patient-Reported Outcomes Measurement Information System questionnaires for sleep disturbance (PROMIS-SD) and sleep-related impairment (PROMIS-SRI). Univariate (Chi-squared/Kruskal-Wallace tests) and multivariable (linear/logistic) regression considered associations with pain extent.
Results: Of the 414 participants with pain information, 310 (74.9%) were PWH, 71 (17.2%) were female, 104 (25.1%) acquired HIV through heterosexual sex, and the median (inter-quartile range) age was 54 (50–60) years.Seventy-four participants (17.9%) reported widespread and 189 (45.7%) regional pain.Whilst there were few clear associations between actigraphy and pain extent, those with widespread and regional pain consistently reported poorer sleep quality on all self-reported measures than those with no pain. Median (interquartile range) ISI, PROMIS-SD and PROMIS-SRI scores were 12 (7–16), 55.3 (48.0–58.9) and 57.2 (48.9–61.3) respectively for those with widespread pain, 8 (4–13), 51.2 (45.5–58.3) and 50.3 (43.6–56.1) for those with regional pain, and 5 (2–9), 47.9 (42.9–54.3) and 45.5 (41.4–50.3) for those with no pain (all p-values 0.0001). Twenty-five (35.2%), 35 (19.1%) and 14 (9.5%), respectively, met criteria for insomnia (p=0.0001). These associations generally remained strong, even after adjustment for HIV status and other confounders, and were reduced but remained significant, after adjustment for depressive symptoms.Associations were similar in the subgroup of PWH.
Conclusion: Whilst widespread pain was not associated with objective sleep measures, it was strongly associated with self-reported assessments of sleep quality in PWH.Both pain and sleep quality must be part of routine clinical assessment for PWH in order to achieve optimal quality-of-life.

P81

Comorbid conditions among women living with HIV aged 45–60: results from the Positive transitions through the menopause (PRIME) study

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Background: Two-fifths of women living with HIV in the UK in 2018 were of menopausal age (aged 45–56).Menopause is associated with an increased risk of long-term conditions such as cardiovascular disease and osteoporosis but there is a paucity of data on this in HIV.We describe co-morbid conditions among midlife women living with HIV in the PRIME study (Positive tRansItions through the Menopause).
Method: The PRIME study comprised questionnaires and semi-structured interviews with women living with HIV aged 45–60 attending one of 21 HIV clinics in England.In 2016–2017 we recruited 869 participants, supplementing questionnaires with clinical data on co-morbidities.We used Stata 14.0 to conduct descriptive analysis of the baseline sample.
Results: Median age was 49 (interquartile range 47–52.5); nearly 75% (n=607) were black African.Based on available data, 60% (n=333/560) had a nadir CD4 count <200 cells/mm3; however nearly 70% (n=519/761) had CD4 >500 cells/mm3 on their latest test.Almost all were prescribed antiretroviral therapy (97.6%, n=815); one-in-ten (n=82) had a detectable HIV viral load.
There was low prevalence of hepatitis B (4.4%, n=26) and C (2.4%, n=14) co-infection.Over half reported ≥1 co-morbid condition (55%, n=466).The most common were hypertension (documented history of hypertension, 16.5%) hypercholesterolaemia (documented to be on a statin and/or last TC:HDL > 6 mmol/l, 7.3%), diabetes (6.8%) and osteoporosis (6.3%).Of those with hypertension, 19 (33.9%) were not on anti-hypertensives; 76.9% (n=40) of those with either raised TC:HDL and/or TC (>6 mmol/l) were not on statins.
Among those reporting ≥2 co-morbid conditions (n=160, 19.0%), two-fifths (n=38) had been diagnosed with hypertension, followed by 11.6% (n=11) with osteoporosis.The most common cluster of co-morbidities among those with ≥2 conditions was hypertension and diabetes (31.6%, n=12).
Conclusion: In this ethnically diverse sample of women living with HIV aged 45–60, over half reported a co-morbid condition, the most common being hypertension which was under-treated. One-fifth reported multi-morbidity with hypertension and diabetes the most common cluster. This emphasises the importance of screening for and optimising management of co-morbidities among midlife women living with HIV in order to safeguard long-term health and wellbeing.

P82

A review of mortality in patients with HIV in a north-east treatment centre

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Background: We conducted the first review of HIV-related deaths in our treatment centre, adapting the criteria proposed by the London HIV Mortality Review Group. The aim was to understand what our patients were dying from and what reversible factors there were.
Method: Retrospective data of 51 deceased HIV-positive patients from hospital-based records were analysed, with deaths recorded from 2014–2019. GP practices were then contacted in an attempt to complete any missing information.
Results: 90% of patients were male, the majority in the age group 50–59 years (35%), followed by 40–49 years (27%). Median time from diagnosis to death was 11 years (5 months–33 years), with 48/51 having a determinable cause of death. Deaths were attributed to malignancy 23% (63% non-AIDS-related), infection (19%), cardiovascular-related disease (17%) and other organ-related disease (21%). 55% of deaths with a cause were potentially preventable, of which 8% were HIV-related and 92% non-HIV-related, including suicide, substance misuse,pneumonia, cardiovascular and other organ-related deaths.
The most prevalent comorbidity was mental health (67% to only 53% had accessed mental health services), followed by cardiovascular-related disease (53%). Notable risk factors included smoking (49%) and excessive alcohol consumption (45%). 96% were on anti-retroviral therapy (ART) with a median time of 10 years (3 months–26 years). Patients were relatively immunosuppressed with 49% having a CD4 count of <350 cells/mm^3 at time of death and 12% with a viral load of ≥200 copies/ml. 47% had an AIDS-defining illness over their lifetime.
Conclusion: This is the first review of HIV-related deaths in our centre. Deaths were frequently due to non-AIDS conditions (90%). The majority had evidence of significant immunosuppression at either death or diagnosis, with around half having a reported late diagnosis, suggesting more could be done to diagnose patients earlier, which may have an impact on mortality. Only 17% were cardiovascular-related, despite this being the second most common comorbidity. This may reflect the younger age of death than seen in the general population, with most being under 60, likely due to the overall younger age of the whole cohort. Risk reduction strategies for cardiovascular risk factors and addressing psychological needs should be more strongly promoted.

P83

Retrospective cross-sectional study of hyperferritinaemia in people living with HIV

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Background: Haemophagocytic lymphohistiocytosis (HLH) is a syndrome of systemic immune activation associated with high morbidity and mortality. HIV infection and associated immunocompromise are recognised risk factors for secondary HLH. Diagnosis of HLH remains understudied in all settings. Consensus guidelines advocate use of the composite 'H score' as a diagnostic framework. This tool has not been formally studied in people living with HIV (PLHIV). High serum ferritin levels are a hallmark of HLH and component of the 'H score'. However high ferritin levels are common in PLHIV. This retrospective cross-sectional study describes the prevalence of HLH in PLHIV with persistently elevated serum ferritin levels and the utility of the 'H score' to exclude HLH in this population.
Method: We retrospectively reviewed all PLWH registered with our institution with ferritin >500 ng/ml detected on two consecutive results within one month between January 2017–2020. For each, we reviewed notes and pathology data.
Results: 70 patients were identified with persistently elevated serum ferritin, predominantly male (53/60, 88%), Black African or Caribbean (30/60, 42%), and median age 56 years (29 – 78 years). Forty individuals (40/60, 67%) were virologically suppressed at the time of peak ferritin with a median CD4 count of 218 × 10^6 cells/l (0–1054 × 10^6 cells).13 patients demonstrated both hyperferrtinaemia and bicytopaenia (12/60, 20%). 4 were managed as HLH (5/60, 8%). Infection was the trigger for HLH in 3 cases (3/5, 60%). 1 HLH case died.
Conclusion: These results highlight that extremely high ferritin levels alone are likely useful as a screening test for HLH. In contrast bicytopaenia is highly non-specific. However more longitudinal studies are required in PLHIV to test the sensitivity and specificity of the 'H score' for this population. In our cohort of PLWH, HLH infection was correlated with low CD4 counts and infective triggers.

P84

Hypertension in people of African ancestry with HIV in the UK

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Background: Due to a combination of pathophysiological and socio-economic risk factors, hypertension is common in people of African ancestry. There are limited data looking at hypertension specifically in people of African descent

Factors	Unadjusted OR (95% CI)	P-value	Adjusted OR (95% CI)	P-value
Male Sex	1.62 [1.35, 1.96]	<0.0001	**1.85 [1.47, 2.32]**	**<0.001**
Age per 5 year increase	1.50 [1.42, 1.60]	<0.0001	**1.39 [1.31, 1.49]**	**<0.001**
Region of Origin				
East Africa	1			
South Africa	1.03 [0.79, 1.33]	0.64		
West Africa	1.11 [0.86, 1.44]			
Caribbean	0.93 [0.68, 1.28]			
Time since HIV diagnosis, years	1.02 [1.00, 1.03]	0.01	1.00 [0.98, 1.02]	0.83
Time since starting ART, years	1.03 [1.01, 1.04]	0.003	1.00 [0.98, 1.02]	0.65
AIDS	1.57 [1.17, 2.10]	0.002	1.13 [0.80, 1.61]	0.49
CD4 nadir <200	1.30 [1.07, 1.57]	0.007	1.03 [0.82, 1.29]	0.79
CD4 current <200	0.91 [0.61, 1.36]	0.65		
HIV RNA <50	1.11 [0.88, 1.39]	0.38		
Hepatitis B surface Ag +	0.76 [0.53, 1.11]	0.15		
Hepatitis C Ab +	0.87 [0.39, 1.92]	0.72		
Diabetes Mellitus	4.47 [3.15, 6.34]	<0.0001	**2.20 [1.48, 3.27]**	**<0.001**
Cardiovascular Disease	4.59 [2.60, 8.11]	<0.0001	**3.05 [1.62, 5.73]**	**0.001**
Current Smoker	0.80 [0.59, 1.09]	0.16		
eGFR <60	9.58 [5.17, 17.73]	<0.0001	**4.36 [2.22, 8.56]**	**<0.001**
Urine PCR >15	2.58 [2.04, 3.25]	<0.0001	**1.80 [1.38, 2.36]]**	**<0.001**
BMI >30	1.83 [1.51, 2.22]	<0.0001	**1.98 [1.57, 2.49]**	**<0.001**

with HIV, and the GEN-AFRICA cohort, enrolled in UK clinics, enables the study of prevalence and risk factors for hypertension in black populations with HIV in the UK.

Method: GEN-AFRICA participants without end stage renal failure and whose parents were born in East, Southern or West Africa, or the Caribbean were included. Hypertension was defined as self-reported diagnosis of hypertension, receiving treatment for hypertension or a clinic blood pressure (BP) reading >140/90. A descriptive analysis was undertaken, and logistic regression models were applied to explore for demographic, HIV-associated and co-morbid factors associated with hypertension.

Results: A total of 1834 individuals (mean age 48 years, 42.6% male, median BMI 28.7 [IQR 25.3, 32.8], median current CD4 560 [IQR 410, 728] cells/mm3, 78.6% with HIV RNA <50 c/ml) were included in the analysis, of whom 777 (42.4%) had hypertension. 579 (74.5%) were identified as being hypertensive by self-reporting, whilst 198 (25.5%) were identified by clinic BP reading. The prevalence of hypertension increased with advancing age, from <20% in those under 40 to >70% in those over 60 years. Hypertension was found to be associated with male sex, older age, self-reported diabetes mellitus, self-reported cardiovascular disease, markers of kidney disease and obesity (Table P84.1). No association was observed with HIV-associated characteristics or region of ancestry.

Table P84.1. Factors associated with hypertension

Conclusion: The prevalence of hypertension in people of African ancestry is high and is strongly associated with increasing age. As such it is important to monitor for hypertension in this population, particularly in those over 40. As this is a cross-sectional analysis it is difficult to determine the direction of any associations reported. Additionally, just over a quarter of the individuals were included based on a single BP reading and therefore the prevalence of hypertension may have been overestimated. Nevertheless, these readings are clinically significant and further investigation in these cases would be warranted.

P85

The prevalence of frailty in a cohort of HIV-positive patients aged 50 and over on combination antiretroviral therapy in northern Tanzania

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Background: There are over 3 million people in Sub-Saharan Africa (SSA) aged 50 and over with HIV. The rate of ageing is hypothesised to be accelerated in this population, due to the HIV virus and combined antiretroviral therapy (cART) exposure. This may increase the prevalence of premature frailty. There is a paucity of data on the prevalence of frailty in an older HIV+ population in SSA and screening and diagnostic tools to identify frailty in SSA.

Method: Patients aged 50 and over were systematically sampled from a government-run free of charge HIV clinic in Northern Tanzania. Frailty assessments were completed, using 3 diagnostic and screening tools: The Fried frailty phenotype (FFP), Clinical Frailty Scale (CFS) and Brief Frailty Instrument for Tanzania (B-FIT 2).

Results: The 145 patients recruited had a mean CD4+ of 494.84 cells/μl, 99.3% were receiving cART and 72.7% were virally suppressed. The prevalence of frailty by FFP was 4.13% and the prevalence of pre-frailty was 44.8%. The FFP found significant associations between frailty and female gender (p=0.005) and single martial status (p=0.006). The prevalence of frailty using the B- FIT 2 and the CFS was 0.68%. BMI correlated with the B-FIT 2 (r=−0.467, p=0.0001). Weight-loss was the most common FFP domain failure. The B-FIT correlated with CD4 count in females (r=−0.244 p=0.02). The CFS correlated weakly with the B-FIT 2 and FFP.

Conclusion: The prevalence of frailty appears substantially lower than reported in other clinical studies. This may be due to the high standard of HIV care at this Government clinic. Undernutrition may be an important contributor to frailty. It is unclear which tool is most accurate for detecting the prevalence of frailty in this setting as levels of correlation are low.

P86

Risk factors for osteoporosis in older patients living with HIV

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Background: Osteoporosis is an important comorbidity in patients living with HIV (PLHIV). We aimed to describe the characteristics of PLHIV considered to be at risk who had dual-energy X-ray absorptiometry (DEXA) scans.

Method: Retrospective reviewin a single centre of PLHIV who had DEXA scans as part of routine outpatient care. Exposure variables collected included: age, sex, smoking status, body mass index (BMI), hypoandrogenism, vitamin D deficiency, steroid use, previous fracture, significant renal disease, alcohol use, CD4 count, viral load (VL) and use of prior tenofovir disoproxil (TDF). The main outcome variables were osteopenia and osteoporosis as defined by the T-score at the femoral neck. T-scores at the anterior-posterior (AP) spine were also collected.

Results: Of 104 patients who had DEXA scans, median age (interquartile range, IQR) 54 (50–60), most (65%) were male. Most (99%) had an undetectable VL; the median CD4 count was 605, IQR: 425–805 cells/mm^3. Over half (56%) of patients had decreased bone density; 31(30%) were osteopenic and 27 (26%) were osteoporotic. Most (76%) had received prior TDF therapy; the median duration of TDF use was 20 months (IQR 4–44 months).

On univariable analyses, patients with lower bone density had a greater number of risk factors – including higher BMI and a higher prevalence of hypoandrogenism and vitamin D deficiency. On multivariable linear regression, hypoandrogenism was the only variable that was associated with worse T-scores, at both the femoral (coefficient −1.83, 95% confidence intervals, CI −3.12 to −0.54, p=0.01) and AP (coefficient −1.25, 95%CI −2.54 to 0.04, p=0.06) levels.

Conclusion: Osteopenia and osteoporosis are highly prevalent amongst older PLHIV. Hypoandrogenism is a strong, yet under-tested risk factor for osteoporosis in this cohort.

P87

Reviewing the management of hepatitis B co-infectedpatients at a diverse HIV clinic

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Background: Hepatitis B virus (HBV) is one of the world's most important infectious diseases. It is a major health challenge, affecting 325 million people globally. Chronic HBV advances faster to cirrhosis in people with HIV/HBV co-infection than in people with only HBV infection. However, chronic HBV

doesn't appear to cause HIV to advance faster in people with HIV/HBV co-infection. The British HIV Association (BHIVA) has provided guidance on best clinical practice in the treatment and management of adults with HIV and viral hepatitis co-infection. The aim of the audit is to determine whether patients were managed in accordance to guidelines.
Method: All HIV positive patients co-infected with hepatitis B were selected from records. In a cohort of 550 patients 30 were found to be co-infected. 8 of the patients left the service following diagnosis and were excluded. The following were recorded: demographics, length of diagnosis, CD4 count, viral load, Hep B DNA viral load, vaccinations, hep D infection, fibroscan and antiretroviral treatment.
Results: Of the 22 patients audited 50% were female, 9 (40%) were ages 44–54).The majority1 3 (59%) were of Black African origin. 12 (54%) had HIV for more than 10 years, whilst 5 (23%) between 5–10 years and 5(23%) 1–5 years.13 (59%) for > 10years. At the time of HIV diagnosis 10(45%) patients were found to be co-infected. 9(40%) had a CD4 count of <500 at the time of hep B diagnosis,11(50%) >500 and in 2 (9%) cases not recorded. 4 (18%) had Hep B DNA levels of >2,000 and 6(28%) <2,000. No levels were found for 12 (54%) patients. 10(45%) were screened for Hep D, 3 (15%) not performed and the remainder 9(40%) not documented. In 20 (91%) patients no clear documentation of vaccinations.18 (82%) were on a Tenofovir based regimen, the other 4 (18%) were on entecavir.Fibroscans were done in 14 (64%) patients.
Conclusion: Despite small numbers of HIV/HBV co-infection in the cohort, management was not very clear with inconsistencies between clinicians. This audit highlights the need for improved documentation and frequent discussions of co-infected patients.

P88

Diabetes in people of African ancestry with HIV in the UK

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Background: The majority of studies of diabetes mellitus (DM) in people with HIV predominantly included Caucasian populations. The GEN-AFRICA cohort provides an opportunity to study the prevalence and risk factors for DM in people of African ancestry with HIV.
Method: African and Caribbean individuals with HIV were recruited from HIV clinics across the UK to study genetic risk factors for chronic kidney disease. Those without end-stage kidney disease and both parents born in East, Southern, West Africa or the Caribbean were included. Logistic regression models were used to analyze factors associated with DM; demographic, HIV-associated factors (including HIV risk, time since diagnosis and treatment, AIDS defining illness, previous TB, CD4, viral load, hepatitis co-infection and antiretroviral regimen) and DM-associated co-morbidities (hypertension, cardiovascular disease, current smoking, alcohol, BMI>30 and renal impairment) were included in multivariable models if $p<0.1$ in univariable analysis.
Results: A total of 1801 individuals (mean age 48.4 [SD: 9.9] years, 42% male, median nadir CD4 199.5 [IQR 78, 331] cells/mm3, median current CD4 560 [IQR 410, 728] cells/mm^3, 78.3% with HIV RNA < 50 c/ml) were included, of whom 172 (9.6%) had DM (94.7% type II). The prevalence of DM ranged from less than 2% in those <40 years to >20% in those >60 years and was greater in men vs. women between the ages of 40–60 years (13.6 vs. 7.3% respectively). In multivariable analyses, DM was associated with age (aOR 1.06 [1.04, 1.09] per 5-year increase), male sex (aOR 2.08 [1.40, 3.09]), hypertension (aOR 2.56 [1.69, 3.87]), proteinuria >15 mg/mmol (aOR 2.23 [1.49, 3.35]) and BMI>30 (aOR 1.59 [1.08, 2.34]), while current non-nucleotide reverse transcriptase inhibitor use (aOR 0.55 [0.35, 0.88]) and smoking (aOR 0.38 [0.16, 0.91]) were protective ($p<0.05$ for all). Region of ancestry was not associated with DM.
Conclusion: The prevalence of DM in people of African ancestry with HIV is high and increases with age. As participants were not systematically screened for DM, the observed rates may be an underestimate. These data highlight the importance of DM screening in people of African ancestry aged >40 years, particularly in men and in those with hypertension and obesity.

P89

Community-acquired bloodstream infections in patients living with HIV in the post cART era

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Background: Following the introduction of combined antiretroviral therapy (cART) there has been a dramatic reduction in AIDS related death and opportunistic infection. Despite this, HIV positive patients remain a vulnerable population for community acquired bloodstream infections (CABSI). We conducted a retrospective cohort study exploring the common pathogens and clinical characteristics associated with higher incidence of BSI in HIV positive patients presenting to a central London hospital.
Method: Using BSI data prospectively collected by the Department of Infection, HIV positive patients presenting with CABSI between January 2008 and December 2018 were identified. Mycobacterial BSIs were excluded. A retrospective review of electronic notes and routine investigations was conducted. Data on demographics, cART, CD4 count, medical co-morbidities and social risk factors were collected.
Results: 141 episodes of BSI in 131 HIV positive patients [85 male, 51 female, mean age 42 years] were identified. 24 (18%) patients were newly diagnosed with HIV during their BSI episode and of these 12 (50%) presented with an HIV indicator condition. On admission 79 (60%) patients were taking anti-retroviral therapy and of those 46 (58%) had a VL <50 copies/ml.Median CD4 count was 253 cells/ul [IQR 56–445 cells/ul] and 60 (46%) had a CD4 count less than 200 cells/ul.
Of the microorganisms identified (n=141), *Streptococcus pneumoniae* (n=37), *Escherichia coli* (n=28) and *Staphylococcus aureus* (n=22) were the most common pathogens. *Cryptococcus neoformans* accounted for 6% (n=12) of all BSIs over the 11-year period.
The most common underlying risk factors associated with BSI were a history of injecting drug use (n=49) and hepatitis co-infection (n=50). 42 (32%) had a previous AIDS defining illness. Median length of hospital stay was 11 days (IQR 5–21). Overall in-hospital mortality was low (n=10) with an even distribution over the 11-year period.
Conclusion: Despite the great success of cART, incidence of BSI remains high in HIV positive patients. Injecting drug use and hepatitis co-infection remain leading risk factors for CABSI highlighting the need to address these risk factors in the community.

P90

HCV re-infection among MSM living with HIV in a large cohort in London: a chemsex issue

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Background: The theoretical possibility of eradicating HCV infection might be hindered in high risk subgroups of individuals. We aim to describe the characteristics of HIV-positive MSM (HIVMSM) who become re-infected.
Method: We retrospectively surveyed electronic records of HIVMSM in care in a large London centre. HCV related-data and risk factors for HCV were collected. Results were expressed in median (interquartile range, IQR) or absolute number and percentage.
Results: Among 6477 (5,888–6,686) HIVMSM in follow up each year, 367 had acute HCV, with 76 (47–98) new diagnosis per year. 49/367 (13%) had at least another previous episode of HCV infection. The proportion of HCV reinfections did not change significantly over years ($\chi 2$, p=0.99). There were 9 (6–13) reinfections was per year, occurring after 70 (42–211) weeks post clearing the previous infection. 10/49 (20%) were diagnosed with more than 3 episodes of HCV infection. Characteristics of subjects with HCV reinfection are shown in Table P90.1.

Table P90.1

	Reinfection (last episode of HCV recorded)	Previous episode of HCV
	Total subjects re-infected = 49	
Age	41 (37–50)	
HCV Genotype (G)	G1 = 29(59)	Concordance between
	G2 = 2(4)	previous infection and reinfection
	G3 = 2(4)	Same G = 28(57)
	G4 = 9(18)	Different G = 11(22)
	Unknown = 4	Unknown = 10(20)
Risk factor		
Chemsex, except IVDU	12 (24)	
Chemsex, including IVDU	12 (24)	
IVDU, not chemsex-related	2 (4)	
Deny chem sex/IVDU	16 (33)	
Unknown	7 (14)	
Management		
Spontaneous clearance	4 (8)	9 (18)
Interferon-based treatment	13 (26)	30 (61)
DAA Interferon-free treatment	16 (33)	2 (4)
Private purchase DAA	5 (10)	2 (4)
Clinical trial	5 (10)	0 (0)
Unknown	6 (12)	6 (12)
Number of reinfections (percentage of acute infections that are reinfections)		
2013–2014	12 (16)	
2014–2015	9 (13)	
2015–2016	15 (16)	
2016–2017	7 (16)	
2017–2018	6 (16)	

Median (interquartile range) or number (%).
IVDU, intravenous drug use; DAA, direct acting antiviral.

Conclusion: HIVMSM are at risk of acquiring HCV multiple times and requiring treatment. Chemsex is the major risk factor for HCV reinfection in our cohort. We highlighted the need to offer chemsex counselling to all HCV-infected subjects to prevent new infections and successfully eradicate HCV.

P91

Myocardial abnormalities in people living with HIV (PLWH): insights from cardiovascular magnetic resonance imaging (CMR)

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Background: PLWH on antiretroviral therapy (ART) may develop significant comorbidities as they age, including high rates of cardiovascular disease (CVD) such as sub-clinical evidence of myocardial inflammation, myocardial infarction,heart failure and sudden cardiac death. Overall, ART treated patients are at increased CVD risk with some studies quoting a 2.2-fold relative risk.
Method: This study assessed structure, function and tissue characterisation changes in PLWH using CMR with multiparametric mapping.
39 PLWH (34 men, mean age 55.8±10.9, mean duration of HIV 17.8±9.29 years) and 29 healthy volunteers (20 men, mean age 45.1±8.3) underwent CMR with T1 mapping, T2 mapping and late gadolinium enhancement (LGE) imaging.
Results: Only 7 scans(18%) were normal in PLWH. LV ejection fraction (LVEF%) was significantly lower and LV mass significantly higher compared to controls. Native T1, marker of diffuse fibrosis/increased myocardial water content was no different between the groups. T2, more specific marker of myocardial oedema, was elevated in PLWH. Sixteen PLWH (41%) had evidence of LGE including 8 an ischaemic pattern (7 sub-endocardial; one transmural) and 8 non-ischaemic pattern (5 mid-wall enhancement; 3 RV insertion point LGE). None of the controls had evidence of LGE (Table P91.1).

Table P91.1

		LVEF (%)	T1	T2	ECV	LGE	LVM Idx (g)
PLWH	(n)	42	36	33	8	21	40
	Mean	59.4 ±15.6	1023.4±56.9	48.3 ±3.7	0.3 ±0.1	16	80.0 ±23.8
Control	(n)	31	39	39	26	36	31
		64.7 ±5.3	1001.1 ±40.9	45.9 ±3.2	0.28 ±0.03	0	59.7 ±13.0
Student T-test	p value	<0.05	0.053	<0.01	0.241		<0.01

Conclusion: This study identifies a number of cardiac changes associated with chronic HIV and prolonged ART. Elevated LV mass may be associated with longstanding hypertension, commonly found in PLWH. Elevated myocardial T2 may be due to chronic inflammation associated to prolonged exposure to HIV. There was no evidence of diffuse fibrosis rather focal areas of non-ischaemic scar, a common finding perhaps relating to previous myocarditis or HIV-related cardiomyopathy. A fifth of PWLH had evidence of previous myocardial infarction.
We propose to image asymptomatic PLWH to further classify, diagnose and treat a vulnerable group of patients who are now described as having a normal life expectancy.

P92

Coronary artery disease in people living with HIV (PLWH) and underestimation of global registry of acute coronary events (GRACE) risk stratification tool on 5-year mortality

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Background: The global burden of cardiovascular disease (CVD) in PLWH has tripled over the past 2 decades. There is a paucity of data on Coronary Atherosclerosis (CA) and cardiac death in PLWH in the UK. This study aims to assess survival after CA diagnosis and compare it to the general population.
Method: A retrospective analysis from a large metropolitan hospital, of PLWH with a confirmed diagnosis of CA on invasive coronary angiography. Information from the HIV and coronary angiogram database were combined. Electronic patient records were checked and mortality data was obtained from the NHS spine.
The Global Registry of Acute Coronary Event (GRACE) risk scores were calculated at the time of CA diagnosis and survival rates were calculated using Kaplan–Meier analysis. These results were compared to those from the UK-Belgium GRACE registry.
Results: We identified 52 PLWH who were diagnosed with CA based on angiography.48 (92%) were men, mean age at time of procedure 50.7 (SD±9.3) years. Half (26/52)were virologicaly suppressed(viral load<40 copies/

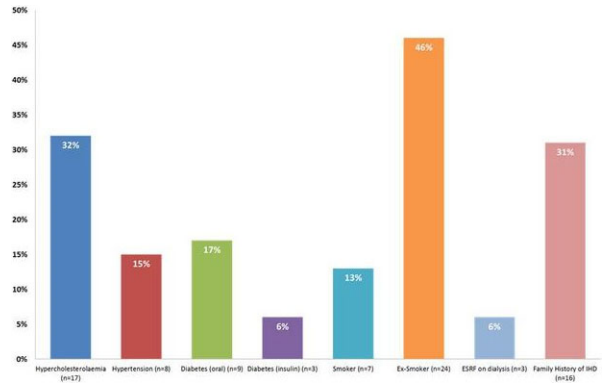

Figure P92.1. Distribution of cardiovascular risk factors (n=52)

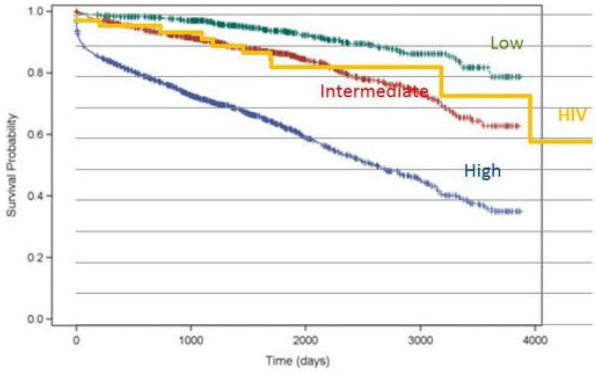

Figure P92.2. Survival according to GRACE score. Low-, intermediate- and high-risk categories as in ESC guidelines <108, 109–140, >140; solid line=HIV cohort

ml), 8 were detectable with a median viral load 7, 277 (IQR 7525- 34, 750) million copies, median Nadir CD4 count 133 (69–197).
Risk factors are described in Figure P92.1. Elective coronary angiogram was performed on 24 (46%), 13 (25%) had NSTEMI, 15 (29%) STEMI.
Among 28 with Acute Coronary Syndrome (ACS) the mean GRACE score was 80.7 (±19.6); 25 were categorised as low risk, 3 as intermediate risk and none as high risk patients, 8 died over a mean period of 2.4 years (Figure P92.2.)
Conclusion: GRACE risk scoring underestimates survival in people living with HIV. Despite a low average GRACE risk score on admission, the observed survival rates over 5 years is comparable to that of an intermediate risk group from the general population. Low GRACE score is likely driven by younger age at presentation and other unidentified factors which increase risk including the impact of anti-retroviral medications, sub-optimal secondary prevention due to drug interaction and non-cardiovascular comorbidity.
We propose that PLWH are at increased risk, with a pro-inflammatory state and should be treated aggressively for CA if identified. Further work is required to understand causative factors conferring this increased CVD risk.

P93

High blood pressure in HIV and comparison to other high cardiovascular risk groups

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Background: The global burden of cardiovascular disease (CVD) in people living with HIV (PLWH) has tripled over the past 2 decades. The American College of Cardiology (ACC) updated guidelines in 2018 to recommend a lowered blood pressure (BP) treatment threshold of 130/80 from 140/90mmHg. UK guidelines published in 2019, are more conservative.
This study compares blood pressure differences in PLWH with patient cohorts accessing other healthcare settings (renal clinic and general practice (GP).
Method: Prospective data was collected from 4 HIV units, a GP surgery serving an elderly population, and a renal unit (CKD stage 3–5 excluding dialysis patients) over a one week period. Data regarding age, sex, BP, BP medication, previous heart attack (MI) or stroke (CVA), years on antiretroviral therapy (ART) were collected.
Results: The study population (n=431) included, 271 PLWH (mean age 47SD±10.7 years, mean duration on ART 11.6 ±7.1 years), 41 from GP (58.9 ±15.5 years) ($p<0.001$), 119 from a renal unit (56.4 ±14.4 years) ($p<0.001$). There were 265 (61%) male, 166 (39%)female. 235 (54%) white, 137 (32%) Black African/Caribbean, Asian 35 (8%).
Mean systolic BP in PLWH 132.5mmHg; comparable to GP (134.4mmHg; $p=0.78$) but lower than renal (139.4 mmHg; $p<0.01$) (Table P93.1).

Table P93.1. Different hospitals/centres and average blood pressures for each unit over a 1 week period

Centre	Number of Pts	Mean Systolic BP (mmHg)	SD	Mean Diastolic BP (mmHg)	SD
St Bartholomew	70	133.5	±19.9	83.2	±11.3
Lewisham	50	132.4	±21.1	81.9	±12.1
Royal Free	70	128.7	±18.2	82.3	±11.2
St. Thomas'	81	134.2	±17.0	82.2	±12.5
GP Surgery	41	134.4	±15.9	81.4	±10.5
Renal Unit	119	139.4	±18.8	76.1	±11.7

Conclusion: PLWH represent a vulnerable group of younger patients with an increasing incidence of cardiovascular risk. They have high prevalence of undiagnosed hypertension and, of those on BP treatment, a significant number were uncontrolled. We advocate using the ACC guidelines to diagnose and treat PLWH to reduce cardiovascular morbidity and mortality.

P94

HIV inpatient admissions and antiretroviral treatment interventions

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Background: The nature of inpatient admissions in people living with HIV (PLWH) has noticeably changed due to effective antiretroviral (ARV) treatment and so has the need for involvement of the specialist HIV team in their care. A review was undertaken at a large inner city hospital of the reasons for admission of PLWH and the types of intervention in ARV treatment required.
Method: The database of PLWH inpatient admissions between Jan 2018 – Dec 2019 was analysed for reason of admission and type of intervention in ARV treatment made.
Results: There were a total of 373 admissions over the 2-year period, involving 253 patients. 21 (8.3%) were new diagnoses, 171 (67.6%) were stable on treatment and 20 (7.9%) were defaulters (Table P94.1).
19 (7.5%) had AIDs-defining illnesses; of which 14 (73.7%) were opportunistic infections; 4 (21.1%) were lymphomas. 33 (8.8%) admissions were related to alcohol and substance misuse involving 20 (7.9%) patients.
87 interventions in ARV treatment were made in 75 patients. 18 (20.7%) started ARV, while 20 (23%) restarted treatment. 13 (14.9%) treatment changed due to drug interaction with other concurrent medication. 5 (5.7%) changed treatment due to adherence issues.

Table P94.1. Reasons for ARV intervention

Reasons	Number of interventions n (%)
Adherence	5 (5.7)
Bone health	2 (2.3)
Drug-drug interaction	13 (14.9)
High cardiovascular risk	1 (1.1)
Nil by mouth/swallowing problems	7 (8)
Renal impairment	11 (12.6)
Re-starting treatment	20 (23)
Starting treatment	18 (20.7)
Others	10 (11.5)

Conclusion: The majority of HIV inpatient admissions are non-HIV related. Whilst the specialist HIV team may not be the primary team responsible for the patient's care, this review highlights the importance of their involvement. Alcohol & substance misuse, and retention in care also pose an increasing challenge in improving the outcomes for PLWH.

P95

Delayed transaminitis secondary to dolutegravir use

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Background: Dolutegravir is a second-generation integrase inhibitor increasingly used in the management of HIV infection. In large clinical trials, dolutegravir was associated with alanine aminotransferase (ALT) elevations greater than 3 times the upper limit of normal (ULN) in 2–5% of patients, but this was comparable with other ARVs. There have been post-marketing case reports of dolutegravir associated hepatitis, with an onset of liver injury between 1 and 8 months. We describe a case series of dolutegravir discontinuations due to transaminitis.
Method: Patients were identified using electronic patient records between April 2011 and July 2018. Clinical notes, imaging and pathology results were used to inform the clinical picture. Transaminitis was defined as an ALT three times the ULN.
Results: Of the 2543 patients prescribed dolutegravir during the 7.5 year period, 10 patients discontinued dolutegravir due to transaminitis. One patient had acute hepatitis C co-infection and thus was excluded from the analysis. Of the 9 patients remaining, 8 (89%) were male and the median age was 41 (34–65). All patients were virologically suppressed at time of LFT derangement and had a CD4 count above 350 (median 661).
The median peak ALT was 596 (144–1319) and median time to peak ALT following dolutegravir initiation was 155 days (34–451). 6/9 patients also had GGT elevations and 3/9 patients had an elevated bilirubin. All patients were asymptomatic.Ultrasound imaging was carried out in 7/9 patients: six patients had a normal ultrasound and one had mild fatty liver. Transaminitis resolved in 8/9 (89%) cases following drug discontinuation, with 5/8 patients switching to raltegravir. The median time to resolution post-switch was 109 days.
Conclusion: Dolutegravir can be associated with rare but marked transaminitis occurring up to one year after drug initiation. When assessing LFT abnormalities, clinicians should be aware of the possibility of delayed drug-induced liver injury. Switching to an alternative ART combination led to resolution of transaminitis in the majority of cases. Based on our small cohort we found no evidence that transaminitis persisted when switching within the integrase inhibitor class.

P96

White matter abnormalities in people with HIV on effective cART are associated with demyelination and neuronal injury

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Background: White matter abnormalities are frequently reported in people living with HIV (PLWH) though the relevance of these findings to cognitive deterioration and neuronal injury has not yet been determined. Diffusion. We use diffusion tensor imaging (DTI) and neurite orientation dispersion and density imaging (NODDI) to characterize microstructural white and grey matter abnormalities (axonal microstructure and fiber geometry) and their association with clinical, cognitive and neuronal injury parameters in PLWH with cognitive symptoms
Method: Neuropsychological testing using the RBANS battery, plasma neurofilament light (NFL), NODDI and DTI scans were obtained from 12 people with HIV on cART (HIV RNA<40 copies/ml). Whole brain voxel-wise maps of the following measures: Fractional anisotropy (FA), mean diffusivity (MD), neurite density (ND), and orientation dispersion index (ODI) for white and deep grey matter and the corpus callosum were obtained. Voxelwise statistical analysis was carried out using FSL randomise tool.Statistical images were thresholded at p<0.05 (corrected for multiple comparisons).
Results: All participants were male of white ethnicity with a median age (IQR) of 62 (15) years. Median (IQR) CD4 count were 507 (539) and CD4/CD8 ratio 0.6 (0.61). Median plasma concentration of NFL was 14.3 pg/ml (15). 8 patients had cognitive impairment based on the Frascati criteria.All participants reported white matter hyperintensities on clinical T2 MRI scans.

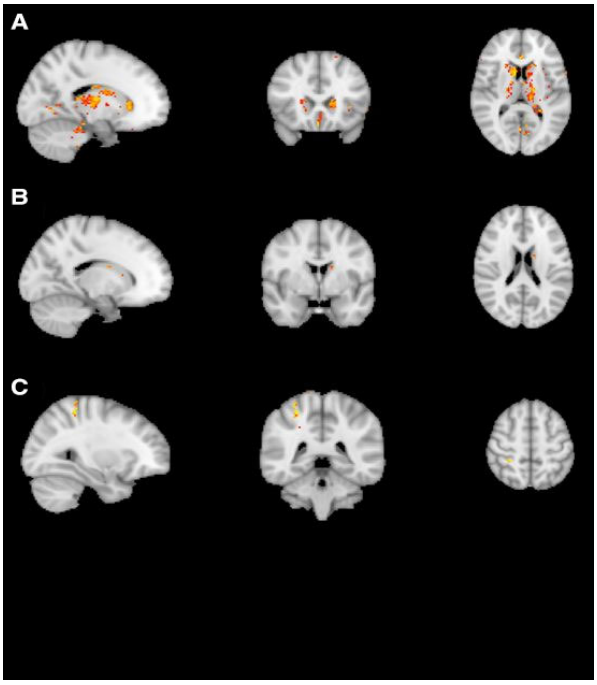

Figure P96.1. (A) correlation between CD4/CD8 ratio MD in the thalamus and caudate; (B) correlation between tests for memory and ODI in caudate; (C) correlation between NFL and ODI. p<0.05 FWE corrected for all images.

Reduced CD4/CD8 ratio was associated with an increase in MD and reduction in ND in the caudate and thalamus indicating cellular breakdown (Figure P96.1). Increased plasma NFL levels were associated with a reduction in ODI in the right cerebral cortex and cerebral white matter suggesting axonal injury related to demyelination. Reduced ODI was also associated with poorer global and memory cognitive scores. No other associations between imaging and HIV parameters were observed.
Conclusion: In PLWH with cognitive symptoms on cART white matter abnormalities were associated with demyelination, neuronal injury and poorer cognitive performance. The clinical implications of these findings require further validation.

P97

Clinical utility of β-amyloid PET imaging in people living with HIV with cognitive symptoms

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Background: Imaging with β-amyloid (Aβ) PET has the potential to aid the diagnosis of cognitive impairment affecting people living with HIV (PLWH) when neurodegenerative disorders are considered as part of the differential diagnosis. We evaluated the clinical utility of ^{18}F florbetaben (FBB) PET tracer in PLWH with cognitive symptoms attending a HIV memory clinic
Method: Imaging with FBB PET was performed in 20 patients with subjective cognitive complains. Neuropsychological testing, plasma neurofilament light protein (NFL), plasma Aβ40 and Aβ42 were obtained during the clinical assessment. CSF Aβ42, tau, and HIV RNA were available for 13 patients that consented to LP. FBB PET images were assessed visually by three readers blinded to the clinical diagnosis, and quantitively by obtaining a composite cortical to cerebellar cortex standardized uptake value ratios (SUVRs) using the cerebellum as reference. FBB SUVRs from 10 aged-matched healthy controls

were compared to SUVRs of PLWH. Positive FBB (FBB+) were either visually or quantitatively defined by a composite SUVR >1.3. Cognitive impairment was defined using the Frascati criteria.
Results: Most participants were male (90%) of white ethnicity (90%) with a median age (IQR) of 59 (13) years. Median CD4 count was 651 (314) and CD4/CD8 ratio 0.7 (0.6). All patients were on cART with a plasma HIV RNA<40 copies/ml. Median (IQR) plasma levels (pg/ml) of NFL, Aβ40 and Aβ42 were 12.1 (5), 263 (111), and 17 (5). Median CSF Aβ40 and tau levels (pg/ml) were 312 (539) and 333 (161). All patients had a CSF RNA <40 copies/ml. 14 patients had objective cognitive impairment including 2 with a clinical diagnosis of suspected dementia. No significant differences in composite SUVRs between PLWH and controls [mean(SD): 1.18(0.03) vs 1.16(0.09); p=0.3]. Four patients were FBB+. Regionally, the greatest SUVRs were observed in the posterior cingulate and superior temporal and frontal superior lobe. Increased composite SUVRs was associated with a reduced Aβ40/Aβ42 ratio (r=−0.4, p<0.41). No other associations with SUVRs were observed (Table P97.1).
Conclusion: ^{18}F florbetaben amyloid B PET has potential as an adjunct tool in the management of PLWH with cognitive impairment. Further research is needed to establish its role in the diagnostic algorithm of HIV associated cognitive impairment.

Table P97.1. Clinical characteristics and biomarkers of FBB positive patients

Age (years)	Gender	Clinical diagnosis	Composite SUVr	Visual PET diagnosis	Plasma Aβ40/Aβ42 ratio	CSF Aβ40/tau ratio	NFL (Pg/mL)	Other imaging
60	Female	Mild cognitive impairment	1.31	Positive	0.062	1.79	7.20	Brain MRI: cortical white matter hyperintensities
79	Male	Mild cognitive impairment	1.81	Positive	0.065	1.53	24	Brain MRI: Aged related cortical atrophy
68	Male	Dementia suspected AD	1.41	Positive	0.05	0.98	9.4	MRI: Cortical atrophy, FDG PET CT: posterior cortical hypometabolism
62	Male	Dementia suspected AD	1.27	Positive	0.066	3.8	29	MRI: amyloid angiopathy

P98

Correlation between cerebrospinal fluid (CSF) and plasma concentrations of neurofilament light protein (NFL) in treated HIV infection in the COmorBidity in Relation to AIDS (COBRA) study

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Background: Cerebrospinal fluid (CSF) neurofilament light protein (NFL) is an established biomarker of central nervous system neuro-axonal injury. A novel ultra-sensitive assay can determine plasma NFL, avoiding invasive CSF collection via lumbar puncture. In untreated people with HIV (PWH), CSF and plasma NFL are strongly correlated. We assessed this correlation in antiretroviral therapy (ART)-treated PWH and lifestyle-similar HIV-negative controls, and determined factors associated with CSF and plasma NFL.
Method: Differences in paired CSF (sandwich ELISA, UmanDiagnostics AB) and plasma (Simoa digital immunoassay, Quanterix™) NFL between PWH and HIV-negative controls enrolled into the COmorBidity in Relation to AIDS (COBRA) study were tested for significance using Wilcoxon's test; associations between the values (after log-transformation) were assessed using Pearson's correlation. Log-transformed CSF and plasma NFL, standardised to Z-scores, were included as dependent variables in linear regression models to identify factors independently associated with values in PWH and HIV-negative controls; factors significant (p<0.05) in univariable analyses for either outcome were included in the multivariable models.
Results: We included 132 PWH (median age 56 years, 94% male, 88% white, 100% plasma HIV-1 RNA <50 copies/ml) and 79 HIV-negative controls (median age 57 years, 92% male, 97% white). Neither CSF (median 570 vs 568 pg/ml, p=0.37) nor plasma (median 10.7 vs 9.9 pg/ml, p=0.15) NFL differed significantly between the groups. CSF and plasma NFL correlated moderately, with no significant difference by HIV status (PWH: rho = 0.52 (95% confidence interval (CI) 0.38–0.63); HIV-negative controls: rho = 0.47 (95% CI 0.27–0.62), p (interaction) = 0.63). In multivariable regression, older age and higher CSF protein were each associated with higher CSF NFL Z-scores. While older age remained independently associated with higher plasma NFL Z-scores, higher serum creatinine emerged as an independent predictor of higher plasma NFL Z-scores in both PWH and HIV-negative controls (Table P98.1).
Conclusion: In PWH on suppressive ART, the correlation between CSF and plasma NFL is weaker than previously described in untreated PWH but similar to that observed in lifestyle-similar HIV-negative controls. Consideration of renal function may be required when utilising plasma NFL.

Table P98.1. Results from multivariable linear regression to identify and compare factors significantly associated with CSF and plasma NFL[1, 2] in PWH and HIV-negative controls

		PWH, n=132		HIV-negative controls, n=79	
Dependent variables	Independent variables	Parameter estimates (95% CI)	p-value	Parameter estimates (95% CI)	p-value
Log_{10} CSF NFL Z-score	Age (/10 years older)	0.69 (0.50, 0.89)	<0.001	0.74 (0.48, 1.00)	<0.001
	CSF protein (/1g/l higher)	1.43 (0.61, 2.25)	0.002	1.83 (0.49, 3.17)	0.010
Log_{10} plasma NFL Z-score	Age (/10 years older)	0.64 (0.46, 0.82)	<0.001	0.71 (0.45, 0.98)	<0.001
	Serum creatinine (/10 μmol/l higher)	0.11 (0.04, 0.18)	0.004	0.19 (0.09, 0.29)	0.001

Note[1]Parameter estimates reflect the associated impact (measured in standard deviations) of each independent variable in the model on the dependent variable.
[2]Variables included in the multivariable linear regression models were age, weight, serum creatinine, plasma albumin, CSF protein, male gender, being on antihypertensive medication, duration diagnosed with HIV infection, duration on ART. Only results for variables significantly associated with both CSF and plasma NFL are presented.

P99

Plasma anti-CMV IgG concentrations are not associated with short-term progressive brain injury in virally suppressed people with HIV

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Background: People with HIV (PWH) have a higher CMV seroprevalence than HIV-negative individuals. Higher anti-CMV IgG concentrations in plasma have been associated with poorer cognitive function in cross-sectional studies of PWH. We aimed to determine the longitudinal relationships between anti-CMV IgG and biomarkers of brain injury.
Method: CMV-seropositive, PWH with viral suppression on antiretroviral therapy (ART) and HIV-negative controls from the COBRA study were included. The relationships between plasma anti-CMV IgG titres with cognitive function (standardised T-scores measured with a six-domain cognitive battery), and MRI biomarkers (volumetric and diffusion) measured at baseline and after two years, were determined using rank regression adjusted for potential confounders. Additionally, the associations between anti-CMV IgG titres with clinical parameters and CSF biomarkers at baseline were also determined.
Results: 130 PWH (median age 57, 15 years since HIV diagnosis, 30% prior AIDS, current [nadir] CD4 603 [180] cells/ml) and 61 demographically comparable HIV-negative controls were included. PWH had higher anti-CMV IgG titres than controls (median 51.2 vs. 22.0 AU/ml, $p<0.001$). Anti-CMV IgG was not associated with time since HIV diagnosis, prior AIDS, current or nadir CD4 cell count. However, anti-CMV IgG was negatively correlated with CD4:CD8 ratios ($rho_{adj} = -0.22$ [−0.38, −0.02], $p=0.02$).
Across the whole cohort *cross-sectionally*, higher anti-CMV IgG was associated with poorer global cognitive function and in the domains of processing speed, executive and motor function. This was only observed in PWH (largest effect size motor function: $rho_{adj} = -0.20$ [−0.34, −0.07], $p<0.01$) although there were no statistically significant interactions between HIV-status and anti-CMV IgG.
Anti-CMV IgG were associated with a greater CSF kynurenine:tryptophan ratio ($rho_{adj} = 0.22$ [0.08, 0.36], $p<0.01$) but no other CSF inflammatory markers (Table P99.1) or neuroimaging and CSF biomarkers of brain injury (Table P99.1). *Longitudinal r*elationships between baseline anti-CMV IgG and changes in cognitive function and neuroimaging biomarkers were weak ($rho_{adj}<0.15$ for all, Table P99.1).
Conclusion: In PWH with viral suppression on ART, higher anti-CMV IgG titres were associated with poorer cognitive function at baseline but not with neuroimaging evidence of progressive brain injury over two years follow-up. Cross-sectional associations suggest higher anti-CMV IgG and static brain injury in PWH having a shared historic pathogenesis.

Table P99.1. Rank regression of total anti-CMV IgG with neuroimaging and CSF biomarkers for whole cohort (n=191)

	Cross-sectional			Longitudinal		
Biomarker	**rho_{adj} (95% CI)**	**p**	**HIV-interaction p**	**rho_{adj} (95% CI)**	**p**	**HIV- interaction p**
Grey matter volume	0.00 (-0.10, 0.10)	0.97	0.74	0.10 (-0.04, 0.23)	0.15	0.93
White matter volume	0.00 (-0.09, 0.09)	0.95	0.06	-0.01 (-0.14, 0.11)	0.85	0.08
Cortical thickness - Left	0.00 (-0.08, 0.09)	0.93	0.11	0.05 (-0.09, 0.18)	0.49	0.57
Cortical thickness - Right	-0.09 (-0.22, 0.05)	0.21	0.43	0.03 (-0.11, 0.16)	0.70	0.54
Whole brain FA	-0.06 (-0.18, 0.06)	0.34	0.40	0.06 (-0.07, 0.18)	0.37	0.79
Whole brain MD	0.08 (-0.03, 0.19)	0.15	0.18	0.05 (-0.09, 0.19)	0.48	0.35
sCD14	-0.13 (-0.27, 0.01)	0.08	0.60	CSF data only available at baseline		
sCD163	-0.12 (-0.25, 0.02)	0.09	0.59			
Neopterin	0.08 (-0.05, 0.22)	0.21	0.49			
Kynurenine:tryptophan	0.22 (0.08, 0.36)	<0.01	0.93			
Abeta 42	0.07 (-0.07, 0.21)	0.31	0.78			
t-Tau	-0.02 (-0.15, 0.11)	0.77	0.92			
p-Tau	-0.02 (-0.15, 0.11)	0.75	0.85			
NFL	-0.01 (-0.13, 0.11)	0.84	0.99			

Abbreviations: FA – fractional anisotropy; MD – mean diffusivity, NFL – neurofilament light chain
Neuro-imaging measures are adjusted for age, ICV, scanner and history of cardiovascular disease
CSF biomarkers are adjusted for age, gender and ethnicity

P100

Markers of iron metabolism in HIV/HCV co-infection

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BHIVA Research Awards winner 2017, Kate Childs

Background: Hepcidin regulates body iron and is increased during inflammation contributing to anaemia seen during HIV infection. In the context of Hepatitis C (HCV) it is decreased and associated with iron overload. We aimed to measure hepcidin gene expression in HIV/HCV and the impact of HCV clearance on serum markers.
Method: RNA was extracted from liver biopsies of patients with HIV/HCV and HCV mono-infection. Using the Nanostring platform, expression of the hepcidin gene, HAMP was quantified. In a separate prospective cohort of patients undergoing DAA mediated HCV clearance, markers of inflammation and iron metabolism were measured.
Results: Gene expression data was available on 5 patients with untreated HIV/HCV, 16 patients with HIV/HCV on ART and 20 with HCV. Mean HAMP expression was 1017 (sd729) in untreated HIV/HCV, 814 (834) in HIV/HCV on ART and 977 (586) in HCV (p=ns). There was no correlation between HAMP and either TNF/IL-6/interferon stimulated gene expression.
In the treatment cohort, following HCV eradication, ferritin fell in both HIV/HCV and HCV groups. TIBC increased in the HIV group only resulting in decline in Tr saturation. The co-infected group also experienced a decrease in TNFα (Table P100.1).

Table P100.1

	HIV/HCV pre-treatment	HIV/HCV post-treatment	p-value	HCV pre-treatment	HCV post-treatment	p-value
Iron(umol/l)	13.8 (8.2, 22.5)	12.3 (8, 16.7)	0.1	21.4 (15.7, 31.8)	20 (13.4, 24.7)	0.3
TIBC(umol/l)	103 (63, 145)	117 (101, 145)	0.013	116 (91, 131)	106 (93, 141)	0.9
Ferritin(μg/l)	127 (54, 226)	70 (44, 98)	0.004	301 (94, 579)	85 (49, 179)	0.003
Transferrin Saturation	15% (10, 17)	10% (6, 14)	0.03	19 (14, 25)	18 (12, 26)	0.4
TNF(ng/l)	0.81 (0.61, 1.25)	0.6 (0.59, 1.1)	0.007	0.81 (0.59, 1.7)	0.7 (0.59, 1.2)	0.13
CXCL-10(ng/l)	346 (248, 500)	165.4 (96, 226)	0.0001	381 (196, 487)	141 (123, 185)	0.001

Conclusion: There was no difference in hepatic hepcidin gene expression between HIV/HCV patients on ART and HCV patients. HCV clearance in the HIV/HCV group resulted in decreased transferrin saturation. This could be due to increased hepcidin or increased transferrin, a negative acute phase protein.Differential iron metabolism between HIV/HCV and HCV could aid understanding of iron metabolism and anaemia of chronic disease in HIV mono-infection.

P101

'Healthy consultations': HIV in the over 60s

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Background: In the modern era of effective antiretroviral therapy (ART), people living with HIV (PLWH) aged over 50 comprise one third of all patients living with HIV in the UK.Older people are also acquiring HIV as they maintain sexually active lifestyles which results in more complex needs and service provision. Older PLWH are more likely to experience comorbidities and thus at risk of polypharmacy.In our cohort of 830 PLWH, we aimed to review our patients over 60 mainly to assess their co-morbidities and ongoing medical, psychological and social needs, to make feasible changes in our consultations and to improve the quality of care.
Method: We reviewed all PLWH aged over 60 in a busy teaching hospital.Qualitative and quantitative data were collected in an excel spreadsheet focusing on demographics, co-morbidities, ART, virological suppression, social support and mental health.
Results: Of the 96 patients, 77% were men.52% of the patients were aged between 60 and 64, with 40% of patients aged between 65 and 74.Interestingly, the majority (80%) of patients were diagnosed at age 45 and above. In terms of virological control, 97% of patients had an undetectable HIV viral load whilst 67% of patients had had a switch in their antiretrovirals in the last 2 years because of comorbidities.A significant proportion of patients suffer from more

than 2 comorbidities (41%), 25% were diagnosed with a mental health condition and 24% take 6 or more co-medications.61% of patients did not have a calculated FRAX score in the last 3 years whilst close to 50% of those aged over 60 had a calculated cardiovascular risk score during the same period.70% of patients had a recorded sexual health discussion whilst 59% had their mental health addressed.

Conclusion: Our ageing cohort has excellent virological control and treatment switches to minimize metabolic disease. Our ageing population has an increasing need of social, physical and mental support. HIV consultations in this age-group need to steer towards a 'life course' approach with multidisciplinary involvement. Close liaison with other specialties and primary care are essential to ensure a holistic delivery of medical and psychosocial needs.

P102

Analysis of platelet and endothelial function after daily doravirine in HIV-negative volunteers

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Background: Cardiovascular disease is the leading cause of death for people living with HIV (PLWH). Some antiretrovirals, such as abacavir sulphate, can increase cardiovascular risk by affecting platelet and endothelial function, but the cardiovascular risk profile of newer antiretrovirals remains unclear. Doravirine (DOR), is a non-nucleoside reverse-transcriptase inhibitor that has recently been approved for the management of HIV. Thus, we determined the effect of DOR on platelet and endothelial function in HIV-negative volunteers enrolled in a Phase I clinical pharmacokinetic study.

Method: HIV-negative volunteers were enrolled in a Phase I clinical trial (NCT03894124) and blood samples were collected at baseline (pre-drug; day 0), following 7 days of DOR (100mg, QD) and after 7 days of washout. Platelets were isolated and aggregation responses measured, and real-time expression of platelet activation markers determined by flow cytometry following stimulation by platelet agonists ADP, collagen or thrombin receptor activating peptide (TRAP). Microparticles derived from platelets and endothelial cells were isolated from plasma and enumerated. Intra-subject analyses were performed, and statistical significance was determined by ANOVA.

Results: Platelet aggregation responses to intermediate concentrations (1 μg/ml and 3 μg/ml of collagen were reduced in subjects receiving DOR for 7 days ($P<0.01$). Additionally, TRAP-mediated aggregation responses were reduced in the presence of DOR ($P<0.05$). These effects were reversed following the drug washout period. We did not observe any changes in platelet GPIIb/IIIa activation, however the extent of TRAP6-evoked alpha granule release was greater in subjects receiving DOR ($P<0.01$) and was reversed following washout. There were no changes in the number of platelet- or endothelial-derived microparticles in the subjects across the study period ($p>0.05$).

Conclusion: Our data suggest that daily DOR influences platelet activation and highlights a complex cardiovascular risk profile, which warrants further investigation. Interestingly, effects were reversed following drug washout, which is indicative of an underlying pharmacological mechanism. Future studies should be extended to *invitro* and *in vivo* studies that explore the effects of DOR on platelet and endothelial cell function. Our study demonstrates that platelet and endothelial analyses can be incorporated into clinical trial protocols to predictively evaluate the relative cardiovascular impact of antiretrovirals.

P103

Measles, rubella and varicella IgG seroprevalence in a London HIV clinic

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Background: Immunity to previously common childhood viral infections is topical due to the rise in vaccine scepticism and the loss of the UK's measles elimination status in 2018. We audited completion of screening for immunity to measles, rubella & varicella in our adult HIV cohort compared to the 2015 BHIVA vaccination guidelines.

Method: Data was extracted from the Trust data warehouse for all current HIV+ patients in our adult clinic; including demographics, ARV treatment status, viral load, nadir & current CD4 counts. Data was also requested from the pathology department regarding any patient from our clinic with a measles, varicella and/or rubella serology result. Data was analysed in Excel.

Results: 3619 patient records were analysed. Only 20% (732 patients) had been tested for measles IgG; 19% of those tested were not immune. Among those screened, likelihood of measles immunity varied by country of origin: with patients from South America, the Caribbean and Eastern Europe less likely to be immune, but those from UK, Western Europe and Oceania more likely. Mean age of patients immune to measles was 47.1, but mean age of those non-immune was 35.9. In a multivariate model, independent predictors of measles negativity were birth year after 1971 (OR 4.4; 95%CI 2.7–7.1) and Brazilian (4.1; CI 2.5–6.9) or Polish (7.2; CI 2.3–22.5) country of birth. No independent association was found with current or nadir CD4 count, gender or HIV risk factor.

Among women of childbearing age, 35 (7%) were tested for rubella immunity. More tests (69) were performed on patients not at risk, but those at risk were still more likely to have been tested (chi-sq; $p<0.001$).

712 patients (19.6%) had varicella serology and of those tested, 4% were non-immune. Non-immune patients were significantly younger (mean 37 versus 46 years; p-0.0004).

Conclusion: Contrary to BHIVA guidelines the serostatus of the majority of our HIV cohort for these infections is unknown. Our data support initially focussing screening on specific high risk groups: younger patients in general, and also for measles, patients born after 1971 or from high risk countries, and for rubella, women of childbearing age.

P104

Hepatitis C infection and treatment outcomes in the DAA era

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Background: Despite major advances in the treatment of Hepatitis C (HCV) infection in recent years, it remains a major public health concern in the United Kingdom. With unrestricted access to direct-acting antiviral (DAA) therapy from 2016, HCV elimination should be achievable.

Method: A retrospective case note review of all patients diagnosed with Hepatitis C in a sexual health service from 2016 to 2019 was performed. Data included HIV status, acute or chronic infection, genotype, treatment regimen and outcomes.

Results: A total of 125 patients were included compiling 128 episodes of infection. 106 (84.8%) were male with a median age of 37 (range 20–69). 75 (60.0%) were HIV co-infected with a median CD4 and HIV viral load of 606 cells/mm^3 (range 48–1,315) and <50 copies/ml (<50–2,410,000) respectively. Of the 77 (61.6%) men who have sex with men, 37 were intravenous drug users (IDU) compared with 31 (67.3%) of 46 heterosexuals. 57 (44.5%) were acute infections. 17 (13.8%) were re-infections. 26 (20.3%) cleared the infection spontaneously. The most common HCV genotype was 1a (n=46). 22 (16.8%) lost to follow up, and 2 (1.6%) declined treatment. Of those who accepted treatment 100/101 were treated with DAAs, 18 were referred to other services for treatment. 15 are either currently on treatment or waiting for treatment outcomes. Of the information available, 65/67 (97%) had sustained virological response (SVR).One had re-infection soon after completing treatment and one did not complete treatment due to non-adherence. There is a steady increase in the number of acute infections from 5 in 2017, 11 in 2018 and 19 in 2019.

Conclusion: Our study indicates that HCV treatment is effective, irrespective of HIV co-infection. Lack of engagement is a common finding which not only results in poorer health outcomes but facilitates onward transmission. Despite the availability of DAAs,we have observed a steady increase in the number of acute infections. Increased screening opportunities, improved re-engagement, and treatment for acute infections are useful strategies to reduce the pool of infection and contribute to theHCV elimination.

P105

HIV and menopause consultations: assessment of our peri-menopausal cohort

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Background: Women living with HIV (WLWH) comprise one third of the HIV population and a third of women living with HIV are aged 50 and over. In current era ofrobust antiretroviral therapy,the consultations of a HIV clinician are steered towards managing co-morbidities and empowering patients to a healthy and normal lifestyle. Women of peri-menopausal age form a significant part of the HIV cohort and hence it is important to assess the menopausal signs, risk factors and provide the patients with appropriate support and knowledge. We aim to review our peri-menopausal women aged 45–56 years who attended our service in the last year, with a view to identify their needs and improve the quality of menopause consultations.
Method: Consultations of all women between the age 45 and 56 were reviewed by a clinician. The following were assessed: Documentation of contraception, sexual health, menopausal symptoms, documentation of life style factors (smoking, alcohol, recreational drugs) FRAX and QRisk in the last 3 years, polypharmacy, co-morbidities, their current regimen and whether they benefit from treatment switch.
Results: 195/ 1133 (17%) of women were in the age group 45–56.Our study looked at HIV women managed by sexual health team.12.5% (104/830) of the study cohort were women in the above age group. One patient excluded as she was recently diagnosed. 96% had undetectable viral load. 87% of were Black African origin (Table P105.1).

Table P105.1

Consultation/documentation Index	Percentage
Contraception discussion	88%
Mental health discussion	90%
Menopause symptoms discussion	74%
Smoking documentation	76%
Alcohol documentation	76%
Recreational drugs documentation	75%
Smear documentation	95%
Q risk	36%
FRAX	38%
Sexual Health screen discussion	70%

45% had less than 2 co-morbidities while 7% had more than 2 co-morbidities. 60% had one or more co-medications, while 11% had their regimen changed in the last 2 years in view of co-morbidity.4 women were on HRT.
Conclusion: WLWH, although aware of menopause. are not equipped well with information or resources to manage their symptoms.It is important that clinics streamline specialist menopause consultations and work closely with General Practitionersto ensure WLWH receive appropriate management of their co-morbidities, including discussion and initiation of HRT (Harmone replacement therapy) if needed and maintaina healthy lifestyle.

P106

Does HIV status influence outcome in Kaposi sarcoma?

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Background: Kaposi Sarcoma (KS) is classified into 4 epidemiological subtypes: classical, endemic, AIDS associated & iatrogenic, along with a recently recognised 5th form, affecting HIV negative men who have sex with men (MSM).
Method: We prospectively collected data on 662 individuals with biopsy proven KS since 2,000 at the National Centre for HIV Malignancy, London. We compared clinicopathological variables & overall survival of 572 HIV+ve KS patients with 90 HIV-ve patients (including21 classical KS, 14 endemic KS, 17 iatrogenic KS & 38 HIV-ve MSM with KS).
Results: There was no difference in gender (both >90% male, p=0.17), but HIV+ individuals were more often white (p<0.0001) &younger (median age 41 vs 60 years, p<0.0001). There was no difference in the frequency of visceral (16%, p=0.99), pulmonary (10%, p=0.89), or gastrointestinal involvement (8%, p=0.31), tumour ulceration (11%, p=0.85) or tumour associated oedema (16%, p=0.25).However, both the CD4 & CD4% were significantly lower & the CD8 & CD8% significantly higher in HIV+ve (all p<0.0001).Mean CD4 count (range) & percentage (range) at diagnosis was 207 cells/μl (0–1,850) & 16% (0–55) in HIV+ve group vs 701 cells/μl (39–1,899) & 42% (5–79) in HIV-ve group. Mean CD8 count (range) & percentage (range) was 782 cells/μl (0–3,457) & 59% (0–90) in HIV+ve vs 602 cells/μl (61–9,090) & 29% (10–87) in HIV-ve.
After a median follow-up of 4.8 years (range 0–20), 64 patients have died. There is no difference in overall survival between the HIV+ve & HIV-ve individuals (logrank p=0.51). 5 year overall survival from KS diagnosis was 93% for HIV+ve KS (95% confidence interval [CI] 89–94%) & 87% for HIV- KS patients (95% CI 78–100%).
Conclusion: In the era of effective antiretroviral therapy, clinical characteristics and extent of KS at presentation are not significantly different between HIV+ve & HIV-ve patients. Whilst immunological parameters at the time of KS diagnosis are significantly worse in HIV+ve individuals, the immune restoration following cART may offset this and has led to a dramatic improvement in outcomes, such that there is no difference in overall survival from KS according to HIV serostatus.

P107

Non-AIDS defining malignancy and immune status: data from 634 cases

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Background: The incidence of non-AIDS defining malignancies (NADM) has steadily risen since the era of combination antiretroviral therapy (cART) and a spectrum of malignancies has been observed in cohorts that may reflect the aetiology of malignancy in the immunosuppressed.
Method: We have prospectively collected clinical data including non-AIDS defining malignancy in a prospective database for our cohort of patients since 1986.For this analysis we included all patients diagnosed since 1996 with NADM excluding patients with non-melanoma skin cancers.
Results: We identified 634 patients (89% male, mean age 50 years) diagnosed with NADM since 1996. At the time of NADM diagnosis, 36% had a prior AIDS diagnosis and 83% were established on cART. At the time of NADM diagnosis, the mean duration of living with HIV was 12.2 years and of being on cART was 7.0 years. The mean CD4 cell count was 452/mm^3 (range: 4–3,352) and 57% had CD4 counts over 350/mm^3. Of the 83% established on cART, 87% of patients on cART had an undetectable plasma HIV viral load. Despite the good immunological parameters, oncogenic viruses and bacteria could account for up to 47% of these NADM, compared to 3.6% cancers in the UK general population. The 5 year overall survival is 65% (95% confidence interval: 60–69%) compared to 54% for the UK adult general population with cancer.
Conclusion: The increasing burden of NADM has been well documented and we confirm this in our sizeable cohort. The majority of patients were established on cART with undetectable HIV viral loads and high CD4 cell counts at the time of NADM diagnosis. Despite the good immune status, almost half of the NADM were attributable to oncogenic infections.

P108

Cellular and molecular assessment of muscle function as a predictor of ageing phenotype in older PLWH

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Background: Despite successful viral suppression through ART, some PLWH exhibit phenotypes of accelerated ageing. This can be characterised by reduced physical function and an increased prevalence of frailty, sarcopenia and other age-related comorbidities. The underlying pathological mechanisms remain poorly understood, although mitochondrial dysfunction is suspected to play a

role. We therefore performed comprehensive analyses of skeletal muscle from older HIV+ and HIV- individuals, in parallel with assessments of physical function, frailty and sarcopenia, with the aim of better defining the pathological basis for ageing phenotypes in PLWH.
Method: A cohort of 45 age-matched males ≥50 years old (30 HIV+, 15 HIV-) was established. All HIV+ subjects were on suppressive cART. Tibialis anterior biopsies were obtained, and subjects underwent standardised physical function and frailty testing, and DXA for body composition.
Quantitative cellular assessments were performed on skeletal muscle cryo-sections, including multiplex fluorescence immunohistochemistry for: quantification of mitochondrial respiratory chain complexes I and IV (CI, CIV) and mitochondrial mass; satellite cells; fibre type proportions; intramyocellular lipid accumulation (IMCL), and fibrosis.
Results: Compared with the HIV- group, HIV+ subjects had a significantly higher proportion of myofibres with CI defects (p=0.05) and CIV defects (p=0.0011).
Apart from age (r=0.311; p=0.038), there were no associations between mitochondrial defects and HIV-related clinical characteristics, anti-retroviral treatment, or body composition.
In the HIV+ group, 13% were classified as frail and 50% as pre-frail. None of the HIV- group were classified as frail and 53% as pre-frail. 17% of the HIV+ group were characterised as sarcopenic, whereas all the HIV- group had normal muscle function. There was a significant association between CI defects and frailty (p=0.028), as well as IMCL and frailty (r=0.3; p=0.046).
HIV+ subjects had a significantly higher level of fibrotic muscle tissue compared to HIV- subjects (p<0.0001). Fibrosis was significantly associated with CIV defects (r=0.21; p=0.016), although not CI defects. Similarly, higher levels of CIV but not CI deficiency was associated with an increased frequency of satellite cells (r=0.36; p=0.016).
Conclusion: Older PLWH had a higher proportion of myofibres with mitochondrial defects compared to HIV- individuals. Mitochondrial defects were independently associated with both age and HIV status, but surprisingly not with prior exposure to "mitochondrially-toxic" NRTIs. Mitochondrial defects were associated with 'low' physical performance capability and frailty, suggesting a potential causal link with aging phenotypes.

P109

Dolutegravir and weight gain in a large London cohort

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Background: Dolutegravir (DTG) has been widely prescribed as the third agent within antiretroviral therapy (ART) in the UK since 2015. Recent data from two large African studies showed significant weight gain on DTG especially when combined with Tenofovir Alafenamide (TAF)/Emtricitabine (FTC). We sought to establish whether these findings were replicated in a large London cohort.
Method: All patients prescribed dolutegravir from January 2018-March 2019 were included and demographics, ART combination, CD4 count and HIV-1 viral load on initiation of dolutegravir were collected. Weight (kg) and BMI on initiation of DTG were compared with most recent weight and BMI whilst taking DTG.
Results: 773 patients were prescribed DTG, 155 were excluded due to incomplete weight data. 618 patients were included, 172(28%) females, 446 (72%) males. 150(24%) were of Black African ethnicity, 232 (38%) were Caucasian, 236 (38%) were of other ethnicity. The mean age was 46 years, nadir CD4 was 289 cells/mm^3 (2–1,232) and median CD4 count on initiation of DTG was 511 (12–1,617). 109/618 patients were starting DTG-based ART as their first regimen. 365(59%) were on abacavir(ABC)/lamivudine(3TC) backbone, 89(14%) were on tenofovir disoproxil(TDF)/FTC, 44(7%) on TAF/FTC and 120(20%) were on other regimens or switched during DTG treatment. Median time on DTG was 2.9 years.
The mean weight gain in our cohort was 1.35kg per year; 1.85kg for women and 1.16kg for men. Black African patients gained a mean weight per annum of 1.79kg vs. 1.28kg for Caucasian patients. By backbone: ABC/3TC 1.09kg; TDF/FTC 0.82kg and TAF/FTC 3.99kg. 120 patients were on other regimens or switched backbone. When excluding those with CD4<200 (N=59) to account for the return to health effect, the mean weight gain for our cohort overall was 1.11kg per year of whom 46 patients gained >10 kg since initiation of DTG.
Conclusion: The weight gain demonstrated in our cohort was less than previously reported in other studies. However, women, Black African patients and those on a TAF/FTC backbone appeared to gain the most weight. Limitations of this study include lack of comparative data for patients on other regimens within this cohort.

P110

Clinical outcomes and bed occupancy costs for people living with HIV diagnosed with PML

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Background: Progressive multifocal leukoencephalopathy (PML), caused by the John Cunningham virus (JCV) usually occurring in immunosuppressed patients, is rare, and has high morbidity and mortality. PML-immune reconstitution inflammatory syndrome (PML-IRIS) is a worsening of PML following antiretroviral therapy (ART) initiation. This study reviewed a case series of HIV+ individuals diagnosed with PML 1 year after diagnosis.
Method: A retrospective case note review of all HIV+ individuals diagnosed with PML on neuro-imaging at 6 UK hospitals between 1/1/2018 and 31/12/2019.PML-IRIS was diagnosed by negative JCV in the presence of neurological decline. Data collected included demographics, CD4 count, JCV, clinical outcomes, HIV viral load and NHS costs as bed days using standard NHS cost coding.
Results: 19 persons were diagnosed with PML according to our definition during the study period.16 (82%) were male with a mean CD4 132cells/ul, 3/19 (16%) had HIV viral load <20 copies RNA/ml at PML diagnosis. Of 19 CSF tests done, 14 (74%) had detectable JCV. Recorded outcomes included; 8 (42%) died, 3 (16%) neurologically deteriorated, 2 (10%) stable and 1 improved clinically. PML-IRIS was diagnosed in 6/19 (31%), PML clinical progression 5/19 (26%), Pneumocystis pneumonia 1 and seizure 1. 6/19 received immunosuppressive drugs at or prior to commencement of ART, of which only 1/6 (17%) developed PML IRIS. 5/13 (38%) not receiving immunosuppressive therapy developed PML-IRIS.
Initial admission at PML diagnosis were for a mean of 27 days between 6–81 days. 11/19 (58%) were re-admitted for a mean number of 22 days, between 1–75.The total cost of bed occupancy for this cohort during the study period was estimated at £264,250.
Conclusion: Despite access to ART in the UK the burden of PML and PML-IRIS both in terms of poor patient outcomes and financially on inpatient bed use is significant. In this small cohort the use of immunosuppressive therapy appeared to reduce the risk of development PML-IRIS.

P111

Managing non-communicable comorbidity in people with HIV: how much is there and who is managing it? A retrospective case-record review in Sheffield

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Background: Non-communicable comorbidities (NCC) are common in PLWH. Many of these are ordinarily diagnosed and managed in primary care but will also present in the HIV specialist clinic so optimal management needs good communication and appropriately shared care. The extent to which this is happening is unclear.We aimed to estimate the prevalence of diagnosed and undiagnosed NCCs, and then describe the circumstances of diagnosis, current management and communication between services.
Method: Retrospective case-record review of a random sample from Sheffield Teaching Hospitals' ~1,000 patient HIV service.
Results: 240 patients were included, median age 50.2 years, 45% female, 50% African and 42% British ethnicity, 93% had undetectable viral load, median CD4 627 cells/mm^3, 18% were smokers, 58% had a body mass index >25 kg/m^2.
54% had at least one NCC, 25% 2 or more, for a median 7 years since diagnosis; the most prevalent were hypertension (23%), mental health disorders (22%),diabetes mellitus (9%), non-infectious liver disease (8%), cardiovascular disease (7%), renal disease (5%) and COPD/asthma (5%).
Of 209 with available data, 93 (44%) had uncontrolled BP (at least 2 of last 3 systolic BP>140), of whom 55 had no recorded hypertension diagnosis. For 94 (39%), all of the last 3 recorded estimated-Glomerular Filtration Rates were <90 mL/min/1.73m^2(median 70.5) but only 14 had any renal disease diagnosis.

Of 210 hepatitis B and C negative patients with available data, 12 had abnormal transaminases on all their last 3 visits yet 9 had no recorded diagnosis or investigation of liver disease.
Among a sub-sample of 60 NCCs, 28% were diagnosed in the HIV service, 17% in primary care, 20% in another specialist clinic or as inpatients but for 33% undeterminable. 80% were treated pharmacologically,12% with non-pharmacological therapy. 18% had specialist review and 10% hospitalization in the last 3 years. Over this period a median 1 letters specifically referring to the management of each NCC were sent from the HIV service to primary care, while only 3 letters in total were received from primary care.
Conclusion: NCCs are common and likely underdiagnosed in this cohort. There is little communication and insufficient clarity as to how the responsibility for managing these co-morbidities is shared between services.

P112

Bictegravir: worth the weight? Weight gain associated with bictegravir in the real-world setting

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Background: Bictegravir is a novel second-generation integrase strand transfer inhibitor (INSTI) available onlyin a fixed dose combination (Biktarvy) with Emtricitabine (FTC) and Tenofovir Alafenamide (TAF).
Recent data have raised concerns that INSTIs may be associated with greater weight gain compared to other drug classes such as non-nucleoside reverse transcriptase inhibitors (NNRTIs). We sought to determine changes in weight in patients initiating bictegravir compared to a control group initiating the NNRTI Rilpivirine.
Method: Patients initiating Biktarvy and Odefsey (TAF/FTC/rilpivirine) at the University Hospital Wales and Cardiff Royal Infirmary clinics were identified. The electronic and paper notes were reviewed and baseline and sequential weight measurements from routine visits as well as demographic data were recorded. A longitudinal mixed-effects model, adjusted for potential confounders was used to determine if the change in weight over time differed between drug combinations in a real world setting.
Results: 69 patients who had at least two weight measurements after initiating Bictegravir (n=42) or Rilpivirine (n=27) were identified (median 52.0 years, 57 [83%] male, 10 [14%] Black-African, median CD4 530 cells/uL). The groups did not differ in terms of age, gender and ethnicity. Individuals who initiated Bictegravir were more likely to be antiretroviral naïve (12/42 vs. 1/27, p=0.02) and have shorter follow up (median 177 vs. 317 days, p<0.01).
Participants starting Bictegravir gained more weight both as an absolute measure (median [IQR] 2.6 [6.9] kg vs. 1.3 [3.9] kg) and as a percentage change (of 3.2% [8.6%] vs. 1.4% [5.4%]) compared to Rilpivirine respectively. Using a longitudinal mixed-effects model, accounting for time of follow-up and indication, Bictegravir was associated with an additional 2.58 (0.54–4.63) kg weight gain over the follow-up period (p=0.01). Two patients who had switched from TDF/FTC/Efavirenz discontinued TAF/FTC/Bictegravir due to weight gain (one 12kg in 90 days and the other 8.5kg in 112 days).
Conclusion: Despite the small sample size, our data suggest that Bictegravir may be associated with excess weight gain compared to Rilpivirine. However, this data is observational and therefore subject to bias. Longer follow-up and study of metabolic measures in this cohort are underway.

P113

HIV-related admissions to a London specialist unit: who, what and why?

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Background: Despite London achieving 95-95-95 on the UNAIDS targets, rates of late HIV diagnosis, the most important predictor of HIV-related morbidity and mortality remain high. We reviewed HIV-related admissions to our specialist HIV inpatient unit to determine the 'who, what and why?' of HIV inpatient care in London in 2018/9.
Method: We investigated 100 consecutive HIV-related admissions from November 2018 – September 2019 for clinical data and outcomes. Results were compared to a review of 100 admissions from 2016/7.
Results: See Table P113.1
The 100 admission episodes involved 75 patients. Fifty-three percent presented with opportunistic infections (OIs) or AIDS-defining events (ADE) (median CD4 count 65 cells/mm^3); most commonly TB (10%), HIV encephalopathy (HIVE, 9%), *Pneumocystis jirovecii* pneumonia (PCP, 8%) and progressive multifocal leucoencephalopathy (PML, 6%). Lower respiratory tract infections and sepsis predominated in the remaining 47% (median CD4 count 221 cells/mm^3). Eighteen patients were newly diagnosed (median CD4 count 25 cells/mm^3); 17 (94%) late (CD4 count <350 cells/mm^3) and 89% had an OI/ADE. Disengaged patients accounted for 23 admissions; median CD4 count 66 cells/mm^3 and 12 (52%) had an OI/ADE. Fifty-nine admissions were patients engaged in care, but only 37 had HIV VL <200; median CD4 count was 284 cells/mm^3 and 25 (42%) had an OI/ADE. Comparing to 2016/7, the cohort in 2018/9 was older with more females and more patients were engaged in care and taking ART. Despite this, the majority were viraemic. We saw less PCP in 2018/9 (8% vs 11%) and more PML and HIVE (15% vs 5%).
Conclusion: Most admissions were patients who had disengaged from care and those in care but not virally suppressed, highlighting the need for resources to better support adherence and keep people in care. We are seeing more OIs/ADE associated with prolonged viraemia as opposed to immunosuppression (particularly neurological disease), with significant associated morbidity and mortality. However, these observations are trends, and do not reach statistical significance.

Table P113.1. Inpatient characteristics

	2016/7 (n=100)	2018/9 (n=100)	P value
Female (%)	34	45	
Age (median, IQR)	46 (39-50)	49 (37-53)	
New/disengaged/engaged (%)	25/26/49	18/23/59	
ART on admission (%)	49	60	
CD4 cell count, cells/mm^3 (median, IQR)	70 (25-307)	142 (31-372)	0.11
HIV VL <200 (%)	23	37	
HIV VL, copies/ml (median, IQR)	21,174 (363-233,000)	2,840 (61-177,579)	0.44
Presence of OIs/ADE (%)	48	53	
HDU/ITU admission (%)	13	10	
Number of deaths in audit period	7	13	
Duration of admission, days (median, IQR)	14	11	

P114

Hospitalisation across the ages: transitioning young people with perinatally acquired HIV (PaHIV)

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Background: Antiretroviral therapy (ART) has dramatically improved survival and consequently reduced rates of hospitalisation for people living with HIV (PLWH). Complex challenges including ART-adherence amongst perinatally infected (PaHIV) cohorts may impact hospitalisations. We explored trends in hospitalisation in a PaHIV cohort post-transition from paediatric care.
Method: A retrospective observational cohort study of all PaHIV aged 15+ years attending a specialist centre between 1st September 2016–31st August 2019. The primary outcome was admission to hospital.Day, maternity, psychiatric and admissions to other hospitals were excluded. Demographic and clinical data were collected at baseline and at each admission from the electronic patient record: cause, frequency/duration of hospitalisation, plasma HIV VL and CD4 lymphocyte count. Stratified incidence rates of admission per 100 person years at risk (95% CI) were calculated by age group (15–19, 20–24 and 25–35 years) and gender. Stata™ 15 was used for all analyses.
Results: 206 PaHIV contributed 608 person-years of follow up. 89 (43%) male, 156 (78%) black/mixed ethnicity, median age at study entry was 20.5 years (IQR 18–23). A total of 65 admissions occurred amongst 38 (18%) of individuals. There was a total of 534 nights, with a median duration of stay 5 nights (IQR 2–9). One person died. 58% of all 65 admissions were due to a CDC C-diagnosis; 60%, 62% and 50% for age groups 15–19, 20–24 and 25–35. Primary admission diagnosis was infection in 60%, 75% and 61% respectively. Other causes included respiratory (bronchiectasis, asthma) 7%, malignancy-related 6% and HIV-morbidity (e.g. wasting syndrome) 4%. Of participants admitted, the viral load was <200 copies/ml in 25% at study entry.
Crude incidence of admission (95% CI) was 4.5 (2.4–8.8), 13.8 (10.0–19.2) and 13.1 (8.5- 20.4) per 100 person-years (PY) for age groups 15–19, 20–24 and 25–35. Admission rate (95% CI) for males was 8.5 (5.6–12.9)/100 PY and for females 12.2 (9.1–16.5)/100 PY.

Conclusion: This vulnerable group of adults with PaHIV have high rates of hospitalisations with very different outcomes from the overall adult PLWH population. These findings highlight the impact of challenges for young adults post-transition suggesting enhanced multi-disciplinary support is needed.

P115

Falls and frailty are associated with negative perceived ageing and lower quality of life in people living with HIV using the EmERGE mHealth platform

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Background: As we streamline long-term HIV care through novel service models, emerging concerns including age-related issues must be addressed. We aimed to evaluate frailty, falls and perceptions of ageing among stable individuals with HIV engaged with remote healthcare delivered via a novel smartphone application.

Method: Cross-sectional, questionnaire-based sub-study of EmERGE participants. Frailty assessment used the FRAIL scale, a five-item screening tool. Present criteria were summed and categorised: 0=robust, 1–2=pre-frail, 3–5 frail. Falls history and EQ-5D-5L quality of life tool were completed. Participants were asked: how old they felt & personal satisfaction with ageing.

Results: 1373 individuals participated across five European sites. Mean age was 45 (SD 9.8), 93% were male. 1310/1373 (96%) had full frailty data. 74% were robust; 24% pre-frail; and 2% frail. Those exhibiting any frailty characteristics (pre-frail/frail) had greater female representation (p=0.025), higher multimorbidity (p<0.001), and greater falls risk (p<0.001) compared to robust individuals.

165/1331(12%) had fallen in the last year, 59% of whom fell recurrently. Fallers were older than non-fallers (p=0.003), with greater proportion aged>50 (p<0.001). Fallers were more likely to be multimorbid and have prefrailty/frailty (p<0.001). All data shown in Table P115.1.

1016/1330 (76%) were satisfied with how they were ageing.75% of participants felt younger than their actual age (by 8 years; IQR 4–12), with 13.5% feeling older (by 5 years; IQR 3–9). Pre-frail/frail individuals were more likely to feel older than their chronological age and less likely to report that they were ageing well than if robust. Similarly, fallers felt older and were less frequently ageing well than non-fallers (p<0.001).

Pre-frail/frail individuals and fallers reported lower subjective general health scores and more problems on all dimensions of the EQ-5D-5L (p<0.001). Over half reported pain or anxiety/depression, and a third problems with mobility and day-to-day tasks. Around 10% in each group had problems with self-care.

Conclusion: Ageing issues were relatively uncommon, though 12% had fallen and 26% had at least one marker of frailty. Falls and frailty were interrelated and associated with multimorbidity, functional problems, and poorer perceptions of health and ageing. Identifying and tackling ageing concerns should be retained within any mHealth delivered care.

Table P115.1. Relationship between frailty, falls, and ageing parameters in EmERGE participants

		Frailty status			Falls		
		Robust (n=964) N (%)	Pre-frail/Frail (n=346) N (%)	p [a]	No Fall (n=1166) N (%)	Faller (n=165) N (%)	p [a]
Mean age (SD)(years)		45 (9.6)	45 (10.5)	0.962[b]	44.7 (9.6)	47.1 (11.4)	0.003[b]
Aged over 50		313 (32.5)	115 (33.2)	0.794	360 (30.9)	74 (44.8)	<0.001
Female		62 (6.4)	35 (10.1)	0.025	85 (7.3)	15 (9.1)	0.411
Comorbidity	None	663 (68.8)	193 (55.8)		775 (66.8)	85 (51.8)	
	Single	241 (25)	98 (28.3)		296 (25.5)	49 (29.9)	
	Multimorbidity	60 (6.2)	55 (15.9)	<0.001	89 (7.7)	30 (18.3)	<0.001
Falls		81 (8.4)	79 (22.8)	<0.001	–	–	–
Recurrent falls		34 (43)	58 (77)	<0.001	–	–	–
Frailty	Robust	–	–	–	881 (76.7)	81 (50.6)	
	Pre-Frail	–	–	–	254 (22.1)	79 (41.3)	
	Frail	–	–	–	13 (1.1)	13 (8.1)	<0.001
Ageing well		769 (80.1)	232 (67.2)	<0.001	905 (78)	106 (64.6)	<0.001
Felt age	Feels younger	749 (79.7)	201 (59.8)		862 (76.3)	101 (62)	
	Feels age	105 (11.2)	50 (14.9)		136 (12)	19 (11.7)	
	Feels older	86 (9.1)	85 (25.3)	<0.001	132 (11.7)	43 (26.4)	<0.001
EQ-5D-5L	Health today median (IQR)	90 (80–95)	80 (70–90)	<0.001[c]	89 (80–95)	75 (65–90)	<0.001[c]
	Mobility problems	54 (5.6)	96 (28.2)	<0.001	102 (8.8)	55 (33.2)	<0.001
	Self-care	7 (0.7)	34 (10)	<0.001	22 (1.9)	21 (12.9)	<0.001
	Usual activities	45 (4.7)	101 (29.7)	<0.001	95 (8.2)	55 (33.5)	<0.001
	Pain/discomfort	238 (24.8)	175 (51.2)	<0.001	323 (27.9)	101 (61.6)	<0.001
	Anxiety/depression	342 (35.7)	223 (65.4)	<0.001	474 (41)	98 (59.8)	<0.001

[a]p-value derived from chi-squared unless stated, [b] p-value from t-test, [c] p-value from Mann-Whitney-U test

P116

Detection of HPV vaccine-specific antibodies in young women with perinatally acquired HIV: an observational cross-sectional cohort study

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Background: Women living with HIV are at increased risk of persistent HPV infection and its complications. People living with perinatally acquired HIV (PaHIV) have sub-optimal immune maturation and frequently mount reduced responses to vaccination. In 2008 HPV vaccination was introduced in the UK to school age girls regardless of HIV status. The HPV vaccine is highly efficacious, but the data in PaHIV are sparse. In this pilot study, we measured HPV 16/18 antibody titres in a small cohort of women with PaHIV.

Method: This was a cross-sectional observational pilot study amongst young women with PaHIV attending a specialist clinic. Serum samples from eligible consenting women were assessed for HPV-16 and -18 antibody titres by ELISA. Data collated from electronic records included; demographics, CD4 count, HIV-1 viral load, and HPV vaccination and cervical screening history where available.

Results: Nineteen women were included with a median age of 24 years (range 19 – 31), median CD4 was 695 cells/μl (range 96 – 1416), and 18/19 (95%) had HIV-1 RNA of <50 copies/ml. 7/19 (37%) had no detectable antibodies to either HPV-16 or HPV-18. 6/19 (31%) had detectable antibodies to HPV-16 only (median titre 162), 1/19 had antibodies to HPV-18 only (titre 140), and the remainder (5/19) had antibodies to both HPV16 and HPV-18 (median titres to HPV-16: 3032, and HPV-18: 1009).

HPV vaccination history was available for 8/19 women; 6/8 of which had received HPV vaccination. Of these six, the median antibody titres were 425 (range 82–1,136) for HPV-16 and 25 (range 25 – 204) for HPV-18, with 4/6 being below the level of detection for HPV-18. 10/19 women had a previous smear or colposcopy of which two were abnormal: (1) low grade HPV changes, (2) CIN1, VIN2 and recurrent genital warts.

Conclusion: HPV persistence and poor responses to HPV vaccination might be a problem in this cohort. Of those who have documented HPV vaccination, antibody titres were low and below the limit of detection for HPV-18 in 4/6. The clinical implications of this are yet to be established, and further work in this cohort is planned with support from a BHIVA research award.

P117

The majority of HIV inpatient admissions in south London occur in previously diagnosed patients: is poor engagement in care the final hurdle?

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Background: London has exceeded UNAIDS 95-95-95 targets yet HIV related inpatient admissions remain common. The Fast Track cities (FTC) initiative aims to end preventable deaths, improve wellbeing, prevent stigma and increase HIV diagnoses in people living with HIV. We aimed to characterize our inpatient population to inform strategy to reduce HIV linked morbidity and mortality.
Method: The most recent 100 inpatients admitted under the HIV team were reviewed in December 2019, including demographics, HIV risk factor, CD4 count, viral load, and diagnosis. We categorised each patient into five groups describing level of engagement in care (EIC): HIV new diagnosis, HIV viral load <20 and currently EIC, VL>20 and currently EIC, VL>20 and poor EIC, and lost to follow up for >1 year. Continuous variables expressed as median (range).
Results: 100 patients had 186 admissions and a further 116 A&E attendances over an 18 month period.The average stay was 7 (1–156) days. Table P117.1 shows demographics, clinical presentations and EIC. 88 had an HIV-related diagnosis of which 37 were ADI's. 7 patients died. Of 86 previously diagnosed patients, most were viraemic with poor EIC or lost to follow up. The cohort utilised 841 HIV outpatient appointments during the time period, 638 were attended. 17 patients did not attend outpatients at all.

Table P117.1

Characteristic	n=100
Age	47 (22–81)
Gender	45 Female, 55 Male
Ethnicity	
Black African	42
Black Caribbean	20
Caucasian	26
Other	12
Clinical Presentations	
CNS Infection	27
Lymphoproliferative disorder/KS/Castlemans	9
TB	8
PCP	6
Respiratory Presentation	19
CD4 cells/μl	120 (5–1,097)
HIV RNA copies/ml	21,220 (<20–7,155,919)
Engagement in care	
New diagnosis	14
VL< 20 and EIC	23
Viraemia and EIC	14
Viraemia and poor EIC	26
Viraemia and LTFU>1 year	23

Conclusion: Most HIV inpatient admissions and AIDS defining illnesses occur in previously diagnosed patients with poor EIC. This cohort utilises significant resources with poor outcomes.
Engaging patients with low EIC represents the greatest challenge to improving HIV related outcomes in South London. These data indicate that this group should be a priority target for FTC initiatives. Novel strategies are required to engage this population.

P118

Testing for latent tuberculosis in people living with HIV: evaluation of local performance and comparison of old and new guidelines in a tertiary infectious diseases centre

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Background: People with HIV are more likely to progress from latent tuberculosis infection (LTBI) to active tuberculosis (TB) than those without HIV. Guidelines recommend testing for LTBI in patients with epidemiological or clinical risk factors.
We evaluated our compliance with LTBI testing guidelines (*2011 BHIVA guidelines for the treatment of TB/HIV coinfection*) for patients diagnosed with HIV between January 2017 and July 2018. We explored the potential impact of the new guideline (G*uidelines for the management of tuberculosis in adults living with HIV 2018–2019 interim update*) on testing practice and explored local barriers to testing.
Method: All patients seen in the infectious diseases clinic for newly diagnosed HIV between 1/1/2017 and 30/6/2018 were included. We retrospectively collected demographic and clinical data from medical records. We assessed compliance with the 2011 guidelines, which were valid during this period. We then used these data to determine which patients met criteria for testing based on the 2019 guidance. Following presentation of results locally, clinicians were asked for feedback on barriers to testing.
Results: Seventy-seven patients were identified. Eight had active TB at the time of HIV diagnosis and were excluded from further analysis. Of the remaining 69 patients 17 (25%) were female; median age was 41 (range 17–68). None had a personal history of TB/LTBI treatment. Four had documented exposure history to TB. Thirteen (19%) were from countries with high TB incidence. The median CD4 count was 173cells/μl (range 2–1,074); 39/69 (57%) <200 cells/μl, 8 (12%) 200–350 cells/μl and 22 (32%) >350 cells/μl. Forty-seven (68%) patients had at least one other risk factor for TB.
Forty-six (67%) met criteria for LTBI testing by 2011 guidelines. Of these, 8 (17%) were tested. Using 2019 guidelines, the number fulfilling criteria for LTBI testing rose by 11 (24%) to 57 (83%). Feedback from clinicians highlighted logistical issues with interferon-gamma release assays and complexity of the 2011 testing algorithm as causes of poor compliance.
Conclusion: Testing for LTBI in this cohort of patients was poor. The number meeting criteria for testing using 2019 vs 2011 guideline increased by 24%.Interventions to improve uptake and remove local logistical barriers to testing are required.

P119

Tenofovir disoproxil fumarate (TDF) to tenofovir alafenamide (TAF) switches: real-world observation of impact on lipid profiles

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Background: Tenofovir alafenamide (TAF) has a beneficial renal and bone safety profile compared to tenofovir disoproxil-fumarate (TDF) but early licencing trials of TAF reported adverse effects on lipid profiles, potentially affecting cardiovascular risk. It is unclear if such changes are clinically significant in 'real world' cohorts.
Method: Patients switching from TDF to TAF containing regimens during an 8 month period (January –August 2017) were identified from pharmacy records. Data on reason for switch, renal and lipid parameters pre and post switch (up to 2 years), and use of lipid lowering therapy (LLT) were collected from patient and laboratory records retrospectively and prospectively.
Results: The cohort comprised 52 patients, 11/52 (11%) female, median age 55 years (range 33–83). Patients were switched for chronic kidney disease (CKD) $\geq$ Grade 3: n=23 (44%), CKD Grade 1–2: n=22 (42%), osteopenia/osteoporosis/FRAX score >10%: n=7 (13%).Pre switch, 19/52 (36%) were on LLT, of those not on LLT, 18/ 33 had healthy LDL-Cholesterol levels ($\leq$ 3.0 mmol/l). Two year post switch data was available on 43/52 (83%). No significant rise in any lipid parameters was seen, but a further 6 patients had started LLT, including 4 of 16 (25%) with healthy pre switch LDL. Serum creatinine significantly improved (Table P119.1).

Table P119.1. Categorical variables presented as no. (%) and analysed using chi^2. Continuous variables presented as mean (SD) and compared to baseline using paired t-test.

	Pre-switch	6 months	24 months	p values
Serum creatinine	100.8 (27.5)	92.4 (21.2)	90.2 (20.1)*	<0.01, <0.01
Total cholesterol	5.5 (1.1)	5.3 (1.0)**	5.5 (1.3)	0.75, 0.52
LDL cholesterol	3.2 (0.9)	3.2 (0.9)***	3.3 (1.1)	0.93, 0.63
Triglycerides	2.2 (1.3)	2.1 (1.3)	2.0 (1.4)	0.76, 0.05
Total:HDL ratio	4.6 (1.6)	4.5 (1.2)	4.4 (1.5)	0.93, 0.10
On LLT	19(36%)		25(58%)	

*missing in 3, **missing in 13, ***missing in 15.

Conclusion: In this 'real world' cohort with 36% already on LLT at baseline, switching from TDF to TAF did not significantly affect serum lipids over a 2 year period. A quarter of patients with prior healthy LDL levels started LLT post TAF switch.

P120

A 12-month review of prescribing Biktarvy: the patient and clinician's experience

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Background: Biktarvy® is a co-formulation of bictegravir, emtricitabine and tenofovir alafenamide (TAF) as a single-tablet, once-daily regimen for the treatment of HIV-1 infection in adults. It is a useful alternative for people with mild renal impairment or reduction in bone density. In addition, bictegravir's high barrier to resistance is a desirable feature. In September 2018 the Scottish Medicines Consortium advised that Biktarvy® would be available within NHS Scotland. The purpose of this review was to understand typical indications for Biktarvy use in our local clinics and to review patient experience.
Method: Patients who were prescribed Biktarvy® over a 12 month period were identified by searching the local HIV prescribing database. Retrospective baseline data for each patient was collated using the individual patient record; including sex, comorbidities, other medications, Biktarvy® start date, whether the patient was treatment experienced or naïve and their previous antiretroviral (ARV) regimen. Further data gathered included; the reason for switch to Biktarvy®, side effects of treatment, and measurement of estimated glomerular filtration rate (eGFR), lipids and weight.
Results: A total of 60 patients were identified across 2 clinical centres. Common reasons for switch to Biktarvy® included; declining eGFR, high cardiovascular disease (CVD) risk, side effects or drug-drug interactions with their previous ARV regimen. At the time of abstract submission, there did not appear to be any significant effect on eGFR or lipid levels. Whilst a small number of individuals appear to have increased weight since commencing Biktarvy®, statistical or clinical significance cannot be established due to missing data, for most patients, before and after starting Biktarvy®.
Conclusion: Biktarvy® appears to be a popular option for patients who have experienced declining renal function or interaction or intolerances with other ARV regimens. Our local clinics have had a positive experience with few patients discontinuing treatment with Biktarvy® and infrequent reports of side effects. It is important to acknowledge that some of the data relates to patients who have recently (less than 6 months) started Biktarvy® and therefore follow up information is limited.

HIV testing, epidemiology and surveillance

P121

Evaluation of the awareness, knowledge and use of HIV self-testing among men who have sex with men in southeast Nigeria

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Background: Despite global actions to end AIDS, gaps in HIV testing persist among minority populations which negatively affect our ability to reach 90-90-90. HIV self testing (HIVST) is an innovation that is intended to reduce gaps in HIV testing and could serve men who have sex with men (MSM) who because of privacy concerns, stigma, discrimination, or other barriers do not use facility-based, standard HIV testing. This study purpose is to understand knowledge, availability and uptake of HIVST, in order to maximize testing and especially the use of self-testing among MSM in Southeastern Nigeria.
Method: The study was conducted between March and September 2019 among 400 MSM in the 5 states (Abia, Anambra, Ebonyi, Enugu and Imo State) that makeup Southeastern region of Nigeria.
Participants were selected through respondent-driven sampling and were interviewed using a standard questionnaire about knowledge and use of HIVST. Data was analyzed using SPSS 23.0. Descriptive statistics were calculated and presented as frequencies and percentages.
Results: Of 400 study participants, 90% had no idea what HIVST is. Only 10% knew what HIVST is all about. Among these, only 6% have actually seen and used the HIVST Kit while 94% had no idea what it looks like. Also, 30% and 23% got the information about HIVST from friends and local NGOs respectively, whereas the remaining 47% were informed through social media.
In terms of willingness to use HIVST kits, 86% were willing to use this innovation because it is simpler and easier. The remaining 14% wouldn't use it because the test might not show the actual result or they would not be able to manage the test result on their own and would need a counselor to support them during the test.
Conclusion: MSM communities in southeastern Nigeria are not well informed about HIVST and should therefore be the focus of increased awareness to the minority populations. During the study, participants expressed concerns on the need for support at the time of testing. It is important that HIVST interventions also find ways to provide support to participants who test for HIV given their concerns about learning their results alone.

P122

Increasing routine blood-borne virus testing in an area of extremely high HIV prevalence

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Background: Diagnosed HIV prevalence in Manchester was 6.21/1,000 amongst those aged 15–59 in 2018. In the Regional Infectious Diseases Unit (RIDU), a quality improvement (QI) project was undertaken to assess practice against standard of universal blood borne virus (BBV) testing (HIV, Hepatitis B surface antigen and Hepatitis C antibody), and to identify trends and factors that affect delivery of testing.
Method: Using QI methodology, records of 50 consecutively admitted patients to RIDU in January and October 2019 were reviewed, including those discharged on the same day. From the first group we collected demographic information, record of test consent, sampling, testing outcome, result dissemination and test catchup in the case of missed testing. An electronic ward round document, recording and prompting BBV testing, was then introduced for patients with a length of stay greater than 1 day. From the second group the same data and use of the intervention were collected. Descriptive statistics were produced.
Results: In the pre-intervention group 28/50 (56%) had BBV screening compared to 43/50 (86%) in the post-intervention group, a 54% increase. 22/50 patients were intervention eligible and 14/22 (64%) received the intervention. 2/14 (14%) with prior testing were appropriately not retested and 11/12 (92%) with the intervention had BBV testing. 8/12 (67%) with the intervention had recorded consent and 9/12 (75%) had a record of sampling,

compared to 17% and 50% respectively of those not receiving the intervention, and 33% and 38% amongst intervention-ineligible patients. No new diagnoses were made. 24/29 (83%) of all missed tests were for people of white ethnicity (65/100 patients). 21/29 missed tests (72%) had had no testing at all. One patient in the pre-intervention group had had catchup testing. All patients identified with missed testing were contacted.
Conclusion: In the post-intervention group more BBV testing was performed, and the intervention appeared to be associated with improved record keeping and even greater proportions tested. The intervention was difficult to implement due to computer infrastructure. Lessons learnt from testing in a RIDU are important as HIV testing is performed more widely in broader healthcare settings. We continue to work towards testing 100% of patients on the RIDU.

P123

Opt-out HIV testing in a London Emergency Department

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Background: HIV prevalence in the Hospitals' catchment area is extremely high with a rate of 8.6 per 1,000 residents; 58% of new cases are diagnosed late.Since November 2018, routine HIV testing in the Emergency Department (ED) has been funded by a Social Impact Bond in partnership with Elton John AIDS Foundation and local Clinical Commissioning Groups.
Method: All adults (above 18years) attending ED and requiring blood tests are tested for HIV unless tested within the trust in the preceding year. A pop-up box appears on the patients' electronic record reminding clinicians to inform the patient. If the patient declines, they are opted out.
Results: 01/11/2018 – 31/12/2019 (Tables P123.1 and 2).

Table P123.1

Patients who met criteria	42,217
Tested	29,987 (71%)
Opted out	1,850 (4%)
No test (no valid reason)	10,437 (25%)

Table P123.2

	New Diagnoses=27	Disengaged 'people living with HIV' (PLHIV)=13
Gender		
Male	17 (63%)	9 (69%)
Female	10 (37%)	4 (31%)
Ethnicity		
White British	5 (19%)	2 (15%)
White – any other background	5 (19%)	3 (23%)
Black or Black British African	10 (37%)	4 (31%)
Black or Black British Caribbean	5 (19%)	2 (15%)
Age	(range=21–86 years, median=49 years)	
18–34	6 (22%)	5 (38%)
35–49	9 (33%)	5 (38%)
50–64	7 (26%)	3 (23%)
65–87	5 (19%)	0
CD4		
<350	20 (74%)	2 (15%)
of which <100	11 (41%)	6 (46%)
Mode of transmission		
Heterosexual sex	21 (78%)	6 (46%)
Men having sex with men (MSM)	6 (22%)	3 (23%)
People who inject drusg (PWID)	0	1 (8%)
Vertical	0	3 (23%)
Presentation		
HIV related	(3 seroconverters) 16 (59%)	7 (54%)
Non HIV related	(1 seroconverter) 9 (33%)	6 (56%)
Partner notification	2 (7%)	0
Outcome		
Engaged and on treatment	26 (96%)	9 (69%)
Engaged, not on treatment	1 (4%)	1 (8%)
Disengaged	0	3 (23%)

Conclusion: HIV testing in the ED identified 40 patients in need of HIV care and treatment giving a rate of 1.33 outcomes per 1,000 tests. It has picked up high numbers of very late diagnoses as well as diagnoses amongst older people; a significant proportion fall outside of traditional high-risk groups.

P124

Situational review of HIV self-testing availability in Europe

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Background: HIV self-testing (HIVST) has a crucial role in HIV epidemic as we move towards elimination. HIVST as a strategy has been shown to help increase uptake and frequency of testing especially among key HIV risk populations. While, HIVST has been available globally since 2012, there is a lack of evidence of the availability of HIVST in Europe. We carried out a desk review as part of INTEGRATE, an EU funded Joint Action, to understand access and implementation of HIVST in Europe.
Method: Data was compiled in November 2019, from published reports and online data sources about HIVST, for the 32 European Union/European Economic Area (EU/EEA) countries. Additionally, a grey literature search was carried out to identify recent news articles or press releases about HIVST. The retrieved information for each country was synthesised and categorised into either legal, policy or implementation.
Results: As of November 2019, 22 (69%) countries in EU/EEA had legalised HIVST; of these 11 (50%) have authorised its use, sale and distribution. Encouragingly, 14 countries have included HIVST in their national policy and a further 4 (13%) countries have an HIVST policy in development. 13 (41%) countries reported to have fully implemented HIVST as a national programme. Moreover, HIVST kits were available for purchase online or through pharmacies in several countries (n=15) and even in countries (n=6) with no official HIVST policy, making HIVST available in the majority (59%, n=19) of European countries overall. In contrast, over half (n=18, 56%) did not include HIVST in their national HIV testing policy/strategy and seven countries have no legislation for its use. Of the 13 countries where HIVST was not available, most were countries (n=9) in Eastern or Northern Europe.
Conclusion: This review found that the majority of EU/EEA countries have legalised HIVST and are implementing HIVST either as a national programme or available for private purchase. There are still several countries in Europe that have not adopted HIVST and are not currently planning its introduction. Therefore, it is imperative to improve access to HIVST by encouraging HIVST policy creation and amending legislation to legalise HIVST in countries where it is currently unavailable.

P125

Older adults with clinical indicator conditions are not being tested for HIV infection: a retrospective audit

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Background: Older adults are less likely to be offered HIV-testing and are more likely to be diagnosed late with HIV. Consequently, those with undiagnosed HIV are at greater risk of morbidity, mortality and onwards transmission. This audit evaluates HIV-testing practice in people aged ≥50 years presenting to secondary care with BHIVA-defined clinical indicator conditions (CICs) for HIV.
Method: Retrospective audit of hospital patients discharged between January 1st and July 31st 2019 who had an ICD-10 code corresponding to one or more CIC. Patient demographics and HIV-testing data (test date, department and result) were collected from clinical systems (excluding sexual health databases).
Results: 2,478 patients with a CIC were identified. 222 (9.0%) were tested for HIV within 31 days either side of discharge of which 1 (0.5%) returned positive (7 unknown, 3.2%). Those tested were significantly younger (mean 68.6 versus 75.3 years, p<0.001) and men were significantly more likely to undergo HIV testing than women (60.4% versus 39.6%, p=0.001). 32 CICs were present across 9 different disease systems. By system, those with a haematological CIC were significantly more likely to be tested compared with all other CICs combined (p<0.001). Of individual CICs, patients with Kaposi's sarcoma, hepatitis C, neutropenia, lymphadenopathy, pyrexia of unknown origin and

thrombocytopenia ($p<0.001$); and seborrhoeic dermatitis, hepatitis B, other unexplained blood dyscrasia, and non-Hodgkin's lymphoma ($p<0.05$) were more likely to be tested than those presenting with other CICs. Patients with dementia and lung cancer were less likely to be tested ($p<0.001$). Patients presenting with a greater number of CICs were more likely to undergo HIV testing ($p<0.001$). Those with AIDs-defining conditions were significantly younger than those with other CICs ($p=0.002$) and were also more likely to get tested ($p=0.012$).

Conclusion: Despite a large number of CIC events identified in a high HIV prevalence region, HIV-testing rates were low amongst this inpatient cohort aged ≥50 years. This is not in line with the BHIVA guidelines. Work is needed to improve clinicians' awareness of CICs, to improve testing practices, particularly around less well-known CICs.

P126

Characteristics of service users diagnosed with HIV infection via a large online sexual health service

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Background: Our e-service offers residents of a large city, free sexually transmitted infection (STI) testing. Service users (SU) order a kit online, complete a triage and return their samples by post for STI screening.

Method: The triage responses and e-notes were reviewed of all SU's with reactive HIV results, between 8.1.18 and 31.12.19, who also confirmed on testing within SHCs.

Results: Of 223782 e-kits successfully tested during the study period, 144 (0.06%) had a reactive HIV result. 64 (44.4%) confirmed HIV positive at SHCs, and 34 (53.1%) of these were SU with previously undiagnosed HIV. Of these new HIV infections: median age was 28 years (range 21–50 years); 94.1% (32/34) were male and two female; 88.2% (30/34) were homo/bisexual (all men) and four heterosexual; 64.7% had a HIV testing history prior to their diagnosis (range 18 days-3 years). SU-reported HIV risk factors are shown. 3/4 heterosexual SUs reported no HIV risk factors.

17 (50%) SU had concurrent STIs (24 infections): 9 chlamydia, 9 gonorrhoea, 4 syphilis and 2 hepatitis B. 12 (35.3%) SUs had used the e-service before their diagnostic screen and 11 (32.3%) continued to use it afterwards (Table P126.1).

Table P126.1

Time since last negative HIV test (months)	No SU	%	
0.5–1	2	5.9	
>1–3	2	5.9	
>3–4	5	14.7	
5–6	4	11.8	
7–12	6	17.6	
13–48	1	2.9	
36	2	5.9	
Never tested	3	8.8	
Unknown	9	26.5	
Attended SHC before	<1 year	>1year	Never
(of 20 SU asked)	13(65%)	2(10%)	5(25%)
HIV risk factors	No SU	%	
Contact of HIV <72 h	4	11.8	
Unprotected vaginal/anal sex <72 h	12	35.3	
Sex work*	2	5.9	
Injecting drug use*	3	8.8	
From HIV prevalent country*	3	8.8	
Fisting/Sex parties/Chemsex	5	14.7	
PREP user	3	8.8	
Hepatitis B immune	16	47.1	
*SU or partner			

Conclusion: Individuals testing HIV+ via the e-service are predominantly young men who have sex with men. A significant proportion (25%) of SUs with new HIV diagnoses had never attended a SHC before, suggesting the e-service may enable access for hard to reach groups. 75% heterosexuals testing HIV+ had no discernible risk factors for HIV acquisition.STI concurrency was surprisingly high given the e-service is reserved for asymptomatic SUs.

P127

Confirmatory HIV testing outcomes of persons using a large online sexual health service

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Background: Our e-service is a remote sexually transmitted infection (STI) testing service. It is commissioned by >85% local authorities (LA), from a large city and integrates with the participating LA's sexual health clinic(s) (SHC). Service users (SU) order their free kit online, complete a triage and return their samples by post for STI screening.

When a SU's initial HIV test is non-negative, the sample is re-tested using the same assay (Roche Elecsys HIV antigen/antibody Duo) and the SU signposted to a local SHC for confirmatory testing (CT). E-service non-negative results are categorised as *reactive* or *low reactive*. The threshold differentiating these categories is a cut-off index (COI) of 10:<10 low-reactive, and ≥10 reactive. We present the CT outcomes of SU with *reactive* HIV results.

Method: Since service launch, the e-notes were reviewed of SU's with reactive HIV results on initial and secondary e-service testing.

Results: Between 8.1.18 and 13.12.19, 378714 kits were ordered, and 304663 kits returned (260880 inclusive of blood). 228853/260880 (87.72%) kits were tested for HIV, yielding a successful result in 223782 (85.78%).

Of e-kits tested during the study period, the result was reactive in 144 and low reactive in 647 cases. The CT results of the reactive cases were: HIV positive 44.44% (64/144); HIV negative 47.2% (68/144); Unknown 8.33% (12/144).

46.88% (30/64) of those with confirmed HIV infection, had previously been diagnosed (and hadn't declared this on the e-triage). The remaining 34 (53.12%)SU were new HIV diagnoses, and all transferred to a SHC offering HIV outpatient services. Five individuals reported a history of serial false reactive results(Table P127.1).

Table P127.1

Communicating source of CT result	HIV negative	HIV positive (Previously undiagnosed)
Relayed by Patient	44.12% (30/68)	11.76% (4/34)
Relayed by SHC	55.88% (38/68)	88.24% (30/34)

Despite contact attempts twelve CT results remain unknown. However, seven attended a SHC and the others knew their result, but chose to progress care independently.

Conclusion: 44% of SUs with reactive e-service results confirmed in SHCs. We demonstrate evidence of successful integration of online and terrestrial SHCs, across a wide geographical area- all SU with reactive result received their result, 92% attended for CT and those with confirmed/new HIV diagnoses transferred to an HIV service.

P128

Acceptability of HIV self-testing in Lithuania: findings from a survey of clients of a Lithuanian non-governmental organisation

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Background: Uptake of HIV self-testing (HIVST) remains low in Europe, partly due to lack of published studies on the acceptability among HIV risk groups. In Lithuania, HIVST was introduced for private purchase for €25–30 in pharmacies in 2016 but has since had limited uptake. We conducted a survey as part of INTEGRATE, an EU funded Joint Action, to understand awareness of, attitudes toward and barriers to HIVST among Lithuanian clients of a non-governmental organisation (NGO).

Method: An online survey was carried out in November 2019. Survey participants were recruited from social media and the clients of a Lithuanian HIV NGO. Participants were asked about their HIV risk factors, testing history, knowledge of HIVST, preferences and concerns for their use, willingness to pay and information they would like about the test.

Results: 105 people completed the survey: 83% reported a risk factor for HIV and 23% had never tested for HIV before. Awareness was relatively high: 72% knew you could test for HIV using a self-test. Demand for self-testing was similar, 75% said they would likely buy and use a self-test in the future. However, preferred mode of testing was split, with 42% preferring a blood test, 22% would prefer a self-test and 36% were unsure. The top cited reasons people gave for using HIVST were privacy and confidentiality (71%) and quick result (60%). However, the main barrier was the price (59%); 23% would pay up to €5. Additionally, 45% were concerned they would do the test incorrectly, but 82% would believe the result.
Conclusion: This is the first survey of acceptability of self-testing in Lithuania. We demonstrated high acceptability and demand for HIVST, however participants cited concerns over the price of the test (15% were willing to pay at the current cost level) and whether they would carry out the test correctly. Indicating the need to offer self-tests at low a cost as possible and provide thorough information on how to take the test and pathways following a reactive result. In Lithuania, only health care workers can carry out an HIV test and HIVST could also help to remove the barrier of medicalised testing.

P129

Variation in time to treatment initiation among people newly diagnosed with HIV in England in 2018

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Background: BHIVA HIV treatment guidelines have recommended immediate initiation of treatment for all individuals regardless of CD4 count since 2015 and NHS funding for this became available from April 2018. We explored the variation in time from diagnosis to ART initiation.
Method: All adults (aged ≥15) newly diagnosed with HIV in 2018 resident in England were included. People who died within three months of diagnosis (n=108) and those accessing HIV care outside England (n=10) were excluded. The proportion of people starting ART within three months (91 days) of their diagnosis ("prompt treatment initiation") was calculated and stratified by key factors. A univariable logistic regression was used to assess significance differences in time to treatment initiation across groups.
Results: Of the 3,754 people newly diagnosed with HIV in 2018 who met the inclusion criteria, 3,265 (87%) were linked to HIV care and of those, 85% (2,761) initiated treatment within three months. Prompt treatment initiation was higher: in gay and bisexual men (89%) compared to people who inject drugs (81%) (p-value=0.038) and heterosexual men (82%) (p-value<0.001); in those of white ethnicity (87%) compared to black Africans (83%) (p-value=0.024); for those living outside London (86%) (and especially in the South West (92%)) compared to those living in London (83%) (p-value=0.048) and in those with a CD4 count <350 cells/uL (90%) compared to 86% in those with a CD4 count ≥350 (p-value=0.001). These differences persisted using a six-month treatment cut-off (overall 89% uptake). Time to treatment did not vary significantly by the number of new diagnoses seen at a clinic (range 84%–87%) using <10 vs ≥10 cut off (p-value=0.165).
Conclusion: Treatment uptake following linkage to care is high (>80%); however, there is evidence of some inequalities across regions, exposure groups and ethnicities. Local audits of delays in linkage to care, treatment offer and uptake among people newly diagnosed should be conducted to better understand the barriers to accessing care and initiating treatment.

P130

Comparison of patients' characteristics classified as HIV late diagnoses in a semi-rural area over a 2-year period

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Background: Commissioners have noted increased county rates of HIV late diagnoses (48.6%) in 2018 in comparison to both to national rates (42.5%) and local rates in 2016 (42%) A retrospective analysis was conducted comparing demographics, or missed opportunities for earlier diagnosis .
Method: HIV diagnosis data were analysed comparing 2016 and 2018 with respect to age, sex, sexual orientation, ethnicity, CD4 count, previous attendances at sexual health clinics and previous attendances in secondary care or Primary care (analysing the Summary Care Record).
Results: In 2016, there were 11 referrals to the HIV service. A transfer from another UK centre and was excluded. In 2018: there were 14 referrals to the service, (3 were UK transfers). In 2016 the average age of presentation was 42 the average in 2018 was 30.In 2016, 7/10 were males (5 were classified as Men having sex with Men (MSM)) In 20189/11 were MSM.In 2016 8/10 presented with a CD4 <350mm^3, in 2018 this figure was 7/11. In 2016 none with a late diagnosis had previously attended sexual health clinics.In 2018 one patient had attended 4 years previously. In 2016 an earlier diagnosis was possible in one patient presenting to primary and secondary care with recurrent chest infections over 1 year prior to diagnosis. In both years; there were 2 patients diagnosed outside the UK and aware of the diagnosis or diagnosed previously in the UK and had not disclosed their diagnosis
Conclusion: The small data set does not support the conclusion of significant change in late diagnosis rates. Whilstcurrent measures to reduce late diagnosis should continuee.g. 1)improvingHIV screening ratesin sexual health 2) annual HIV testing in MSM 3) educational initiatives for primary and secondary care, resources should also be directed to HIV testing of MSM outside sexual health settings egonline testing, outreach testing or via advertising on social media sites. It is noted that in this semi-rural setting with low numbers of new young MSM diagnoses, datamay be skewed in terms of relative percentage of late diagnosis in comparison to bigger urban conurbations which may be misleading bothfor commissioners andnational interpretation.

P131

Prevalence of HIV by indicator condition: a systematic review and meta-analysis

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Background: HIV testing is recommended in the UK for people attending general practice or admitted to hospital with indicator conditions (IC) that may indicate HIV infection. We set out to systematically review the 12-month prevalence of previously undiagnosed HIV by IC.
Method: Nine electronic databases (PROSPERO ID 106294) were searched for studies among adults attending non-sexual health settings in high income countries, published from 2,000 to 2016. A two-stage screening approach was employed (abstract/title and full text), with a second reviewer independently screening 20% of studies.Risk of bias was assessed using the NICE quality appraisal checklist for quantitative studies. Measures of effect were extracted, and a random effects model meta-analysis was carried out to estimate pooled effect sizes weighted by study population.
Results: From 2,684 screened titles/abstracts, 11 prospective cohort studies were included. The most common settings were hospitals (5 studies) and primary care centres (2 studies). One study was judged to be high quality for both internal and external validity; 5 were of acceptable quality.
All ICs with data available showed a prevalence of previously undiagnosed HIV greater than 0.1%,the threshold typically used for recommending HIV testing as a cost effectivepublic health measure.
Meta-analysis showed the highest pooled HIV prevalence among patients presenting with pneumocystis and other forms of pneumonia (40%; 95% CI 36–44%), followed by tuberculosis (7%; 95% CI 1–13%) and herpes zoster (3%; 95% CI 2–4%), with 2% prevalence for leukocytopenia/thrombocytopenia (95% CI 1–4%), mononucleosis-like symptoms (95% CI 1–3%) and hepatitis B or C (95% CI 0–3%). There was an HIV prevalence of 1% for sexually transmitted infections (95% CI 0–2%), and less than 1% for other IC (e.g. seborrheic dermatitis, cervical intraepithelial neoplasia).
Conclusion: All ICs met the prevalence threshold for cost effectiveness. Despite the recent decline in new diagnoses of HIV, rates of late diagnosis in the UK remain high and it will become more challenging to discover those living with undiagnosed HIV. Improved implementation of IC-guided testing, for example by prioritising ICs with the highest HIV prevalence, has potential to reduce the clinical and financial impact of late diagnosis.

Psychosocial issues and quality of life

P132

Using quality improvement methodology to introduce mental health screening in an urban HIV clinic

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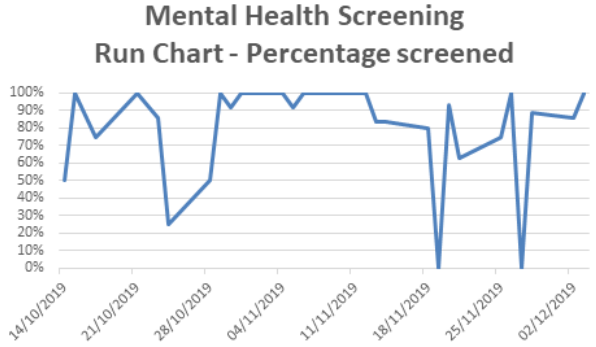
Background: A third to a half of patients living with HIV have a diagnosable mental health condition.In the 2017 BHIVA audit, in our patient cohort of 566 patients, we identified fewer (14.3% cf 19.7%) than the national average of individuals needing substantial support, or reporting significant levels of distress. The SMART aim was to implement annual anxiety and depression screening for 100% HIV patients attending the HIV department for clinician follow-up by the end of November 2019.
Method: Using QI methodology we identified:

1 Process measures – percentage of patients seen for clinical follow-up who had a mental health screening sheet completed
2 Outcome measures – percentage of patients screened who triggered on either the depression/anxiety screening questionnaires
3 Balancing measures – Percentage of patients referred to the health advisors for further support

Prior to implementation we developed a document for use by clinicians to allow signposting to relevant services and sources of self-help for those who triggered.
Patients without a pre-existing mental health diagnosis were screened with the GAD-2 and PHQ-2 questionnaires for anxiety and depression respectively.Those patients triggering on either questionnaire completed an in-depth depression (PHQ-9) or anxiety (GAD-7) questionnaire.
Results: 193 patients were seen by clinicians between 14/10/19 and 03/12/19.159 (82%) of the patients were screened for mental health problems. 25% of our cohort already had a mental health diagnosis e.g. depression or anxiety, and were under care for this.11% of patients without a current diagnosis triggered on the screening questionnaires.These figures are in keeping with national estimates of mental health conditions in people living with HIV.All patients who triggered were signposted to sources of support such as online resources, their GP, and talking therapies.
The run chart shows our process measures. This allowed us to identify where screening was dropping and change our approach in real time via PDSA cycles.



Conclusion: This was a successful implementation of mental health screening in an HIV clinic which had minimal impact on staff members' workload but increased our ability to identify and support patients experiencing poor psychological wellbeing.

P134

Improving health-related quality of life outcomes for women living with HIV in Manchester

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Background: In 2018 2,417 women were known to be living with HIV in the North West of England. Over 25% of these women are thought to live in Manchester alone. These numbers are likely to be higher when including women not accessing care or those undiagnosed. In view of the 4th 90, and considering quality of life (QoL) we chose to look into the experience of women within our services to see where improvements can be made. QoL is broadly defined as the personal perception of an individual's position in life, taking into consideration their physical, psychological and environmental factors.
Method: A Greater Manchester nurse led working group was created to develop a patient review proforma which focused on health-related outcomes for women living with HIV. The proforma was based on the BHIVA standards of care and research findings that highlighted key issues for women. A database was created to help with the collection of information generated by the patient review. Four out of the five sites across Manchester that provide care for women living with HIV took part in this process. A retrospective review of 69 women's case notes was undertaken.
Results: Data analysis of interest is as follows. 56.5% (N=39) of women were classified as having a late diagnosis, based on nadir CD4. Based on exclusions 58% (N=39) had documented discussion around menstruation or menopause.17% (N=12) of women had a recorded discussion around their psychological well being. 15.9% (N=11) had recorded discussions around their mental health. 9% (N=6) reported sexual or domestic violence.
Conclusion: Undertaking this audit highlighted areas in which staff were not having discussions with women around various aspects that affect QoL. As a result we undertook a series of educational workshops to improve knowledge and confidence in addressing these issues. We aim to research further into how we can improve health related QoL outcomes for women living in Manchester over the next 12 months.
This project has provided a platform for better inter-departmental working across the HIV services in Manchester, and a start for further collaborative working alongside primary care services.

P135

Disengagement from HIV care is driving morbidity and expenditure: interventions are needed to retain at-risk groups in care

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Background: Retaining people living with HIV (PLHIV) in care is imperative to prevent HIV-associated morbidity and transmission. This study aims to describe the population of PLHIV disengaged from care and assess the impact of poor engagement on morbidity and cost of healthcare.
Method: We conducted a retrospective electronic notes review of PLHIV admitted under the HIV team at a large urban hospital 1.8.2018 – 31.8.2019. Patients were classed as disengaged from care where they had been lost to follow-up (LTFU) for 12 months or missed multiple appointments and weren't virologically supressed (HIV viral load > 200 copies/ml).Data collected included demographics, clinic attendance, virological markers and psycho-social factors (drug and alcohol abuse, mental health and homelessness). The coding department provided costing for hospital admissions during this period.
Results: Of 100 HIV-related admissions between 1.8.2018 and 31.8.2018, only 11% (11/100) were new diagnoses and 48% (48/100) engaged in care. 41% (41/100) were identified as disengaged from care: Mean age 46 years (23–62), 73% (30/41) male, 44% (18/41) black ethnicity. 59% (24/41) were LTFU and 41% (17/41) had poor engagement with a mean of 3 missed appointments over the last 12 months. Mean CD4 147, HIV viral load 171,393 copies/ml, 12 (1–32) years since diagnosis. Mean length of admission was 15 days (1–95) versus 10 days for the engaged patient group. 76% (31/41) of admissions were HIV related and 46% (19/41) were re-admitted. 3 patients died.
37% (15/41) had mental health problems, 34% (14/41) used recreational drugs, 22% (9/41) alcohol abuse, 32% (13/41) were homeless and 63% (26/41)

had at least one psycho-social risk factor. Homelessness was significantly higher in the disengaged group (p=0.0022) versus the engaged patients (3/48, 6%).
The total cost for hospital admissions accumulated by PLHIV disengaged from care was £408,135.
Conclusion: Patients poorly engaged in HIV care accounted for 41% of admissions over a year. They are more likely to have longer hospital stays and pose a substantial financial impact on NHS services. Patients at risk of disengaging from care need to be identified and interventions implemented to improve patient health, reduce admission-associated costs and ultimately prevent onward transmission.

P136

Cognitive decline in people living with HIV: a pan-regional quality improvement project

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Background: Milder neurocognitive deficits remain a common complaint in people living with HIV (PLWHIV), despite the success of HIV treatments. Factors contributing to this include biological vulnerability to cognitive disorders in our ageing cohort, neuropsychiatric effects of medications, co-morbid psychiatric disorders as well as substance related disorders. BHIVA standard 6c recommends annual screening for cognitive symptoms.This project aimed to assess adherence to this guideline and to look at ways of better improving assessment and management of cognitive complaints in PLWHIV in our region.
Method: We conducted a baseline audit of all PLWHIV attending clinics for two consecutive weeks across all regional HIV departments. We reviewed annual review forms, handwritten notes and electronic clinic letters. Items recorded were assessment of cognition and mental health within the last year, concerns highlighted and action taken, if any.
Following multi-disciplinary discussion, and a literature review, a protocol for investigating cognitive complaints was designed.
Results: 116 patients included in analysis (Table P136.1).

Table P136.1

Cognition/Mental health					
Assessed		Concern highlighted		Action taken	
Number	%	Number	%	Number	%
93	80.2%	51	54.8%	41	80.4%

Conclusion: Our results showed 80.2% of our patients had cognition/mental health assessed annually. The audit was based on documentation, thus may be underestimating assessments done.
There was effective collaboration between the two sites and a similar performance in both.
However, there is room for improvement to meet BHIVA standards.
When concerns were raised the action taken varied between clinicians and departments. This highlights the need to implement protocolised multi-disciplinary management across units in order to optimise care.
Both units have access to specialist mental health teams, so we are equipped to deal with the high burden of concerns identified, especially as our population ages. Following advice from colleagues in Psychology and Care of the Elderly we will use the Montreal Cognitive Assessment to screen for cognitive impairment. Following training from our mental health team, our outpatient nursing and medical staff can carry out this questionnaire as part of our annual review tool kit.
The new protocol is being implemented at both sites and we expect this will improve adherence to standard 6c and holistic patient care.

P137

Loneliness and isolation among people living with HIV

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Background: Loneliness and isolation (L&I) negatively impacts on physical and mental health.This study reports the prevalence and associated factors of L&I in people living with HIV.
Method: Positive Voices is a cross-sectional, self-completed probability survey of 4,422 people attending for HIV care at 73 HIV clinics in England and Wales in 2017. Participants were asked if they needed help dealing with loneliness and isolation in the past year (L&I need).A weighted multi-variable logistic regression was used to identify risk factors associated with L&I need.
Results: One in 5 (20%, 841/4,130) of people with HIV needed help dealing with L&I in the past year. Of these, 75% did not receive the help they needed (54% sought help but couldn't get it and 21% didn't try to get help). L&I varied by clinics (range: 6%-37%). The factor most strongly associated with L&I was symptoms of depression/anxiety (EuroQol-5L) increasing with severity (range: 7% L&I need in those with no anxiety/depression vs 76% L&I need in those extremely anxious/depressed (aOR 31.1, CI_{95} 18.3–52.7 $p<0.0001$)). L&I was also associated with not having a main partner (aOR 2.6; CI_{95} 2.1–3.1 $p<0.0001$), internalised stigma (aOR 2.0 CI_{95} 1.6–2.4 $p<0.0001$), black African ethnicity (OR 2.4 CI_{95} 1.7–3.6 $p<0.0001$) being born abroad (aOR 1.4 CI_{95} 1.0–2.0 $p<0.035$) and mobility problems (aOR 1.7; CI_{95} 1.3–2.2 $p<0.0001$). L&I need was not associated with age, gender, or living rurally. In free-text, people associated L&I with stigma, feelings of depression and separation, and complex health problems.
Conclusion: Loneliness and isolation is common among people living with HIV and, in contrast to the general population, is reported by people of all ages; all genders and those living in urban as well as rural settings. Factors associated with L&I in people with HIV were more likely to be of a psychological rather than a physical nature. Three-quarters of people who needed help dealing with L&I did not get it. Interventions to reduce L&I should be considered including; clinicians actively identifying risks for L&I in patients, improving referral pathways for support with L&I, enhancing peer support and psychology services, and addressing HIV stigma.

P138

Overcoming shame and stigma as barriers to good treatment

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BHIVA Research Awards winner 2014, Phil Hutchinson

Background: HIV-related stigma has been identified as a significant barrier to good treatment of HIV, since the virus first came to the attention of Western public health agencies in the 1980s. While there is a recognition that Stigma is a problem, and there have been many articles on and many surveys of stigma, little progress has been made in combating HIV stigma. Moreover, there is little discussion of shame, as the emotional response to stigma.
Method: This was a mixed methods philosophical project. The project was framed by a Wittgensteinian philosophical approach, and employed ethnographic interview methods and deliberative fora.
The research and data gathering stage involved interviewing stakeholders: clinicians working in GUM and people living with HIV. The interviews with the people living with HIV were ethnographic interviews. The data from these interviews was used to design the second phase of the project: the deliberative fora implementation stage. We facilitated two deliberative fora in which the data from the research stage served as evidence and testimony in the fora.
Results: This was a piece of philosophical analysis and doesn't have 'results' like those produced by empirical research. However, the research produced the following results
1. Current methods employed in research on HIV-stigma and shame are inadequate. Survey methods will only tell us about the distribution of stigma, at best, at worst they will be misleading. Stigma is an abstract concept which denotes a category of social phenomena, produced through interaction (whether direct or via a medium, such as a news report).
2. A stigmatising act is a radically-indexical phenomenon, and therefore can be difficult to observe from the 3rd person perspective.
3. Shame is rarely discussed. Shame is the emotional response to stigmatisation. Sometimes a person living with HIV will not identify or

articulate an interaction as stigmatising but their shame testifies to stigmatisation.

Conclusion: We conclude:

1 Ethnographic methods need to be employed, and training in those methods offered to people living with HIV, so we can produce better data on HIV stigma.
2 Look for shame in addition to stigma
3 Employ, and roll-out as a CPD tool, deliberative fora as an enacted method of communicating the results of 1&2.

P139

Factors affecting loss to follow up (LFU) among people living with HIV (PLHIV) at two treatment centres in Western Province, Sri Lanka

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Background: Defaulting or lost to follow up (LFU) is identified as a challenge in the lifelong HIV care continuum. This will lead to an increase of PLHIV with unsuppressed viral loads, leading to adverse clinical and preventive outcomes. This study explores the social and clinical factors that contribute to this problem. The objective of this study is to describe factors affecting loss to follow up among PLHIV at two high-burden, treatment centers in the Western Province, Sri Lanka.

Method: A comparative cross-sectional study was conducted in STD clinics Colombo and Ragama which have the highest number of registered PLHIV in Sri Lanka. LFU was defined as failure to attend a given appointment for three months. PLHIV who were registered from February 2016 to February 2019 and were LFU at least once were chosen as the study population of defaulters. PLHIV who were less than 18 years were excluded. Thirty-seven PLHIV were LFU at least once during this period. 74 PLHIV who continuously retained in care, in the same time period, were chosen for comparison by systematic sampling.Socio-demographic, clinical and LFU data were collected as secondary data, using a pre-tested checklist and analyzed by SPSS.

Results: Income levels, proportions of key populations and vulnerable populations, WHO stage and performance scale at registration were similar among both groups.

A shorter distance from residence to ART center, unknown serostatus of the regular partner, non-disclosure and absence of a treatment supporter were significantly associated with loss to follow up in this study population.

Conclusion: It is important to consider modifiable factors such as non-disclosure, absence of a treatment supporter and awareness of partner's serostatus when addressing loss to follow up among PLHIV.

P140

To consent or not to consent, that is the question

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Background: HIV-related stigma can have a profoundly negative effect on the health and well-being of PLWH including reduced engagement in care, sub-optimal medication adherence and poor quality of life. We need to better understand which groups are most affected by HIV-related stigma in order to affect change. In October 2015 our GUM and ID HIV services merged and in line with national guidance we established a consent process in relation to HIV treatment and care information being incorporated into hospital records.

Method: In December 2019 we undertook a retrospective case note review of all 1626 patients who had been through our hospital records consent process. Demographic, sexual orientation and consent outcome data was collected and analysed.

Table P140.1. Analysed cohort (N=1626)

	Hospital records consent			
Yes	No			
Gender	Male	1052 (65%)	820 (78%)	232 (12%)
Female	574(35%)	341 (59%)	233 (41%)	
Sexuality	MSM	659 (41%)	546 (83%)	113 (17%)
Heterosexual	813(50%)	498 (61%)	315 (39%)	
	Other / not disclosed / not documented	154 (9%)	117 (76%)	37 (24%)
Ethnicity	White	823 (51%)	679 (83%)	144 (17%)
Black	647(40%)	378 (58%)	269 (42%)	
Other / not disclosed / not mdocumented	156(10%)	104 (67%)	52 (33%)	
Hospital records consent	Yes	1161 (71%)		
No	465(29%)			
GP communication consent	Yes	1432/1608 (89%)		
No	176/1608(11%)			
Not documented	18(removed)			

Men were more likely to consent than women (p<0.0001, OR2.42, 95% CI 1.93–3.01).

MSM were more likely to consent than heterosexual men (p<0.0001, OR 3.82, 95% CI 2.98–4.91).

Heterosexual men were more likely to consent than heterosexual women (p=0.006, OR 1.52, 95% CI 1.31–2.05).

Black ethnicity patients were less likely to consent than those of White ethnicity (p<0.0001, OR 3.36, 95% CI 2.64–4.26) (Table P140.1).

Results:

Conclusion: HIV de-stigmatisation requires improved public and health-care professional education. Our results suggest that heterosexual women and people of Black ethnicity perceive more barriers to disclosing their HIV status within secondary care than other PLWH. In addition, the fact that only 71% of our cohort consented to hospital records whilst 89% consented to GP communication further supports the argument that more needs to be done to address HIV discrimination within secondary care.

P141

Detectable viraemia in the era of successful antiretroviral therapy: engagement with multidisciplinary services

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Background: People living with HIV not willing to start antiretroviral therapy (ART) and those who fail to suppress their viral load whilst on ART may require additional support. The aim of this study is to determine current utilisation of in-house support structures to facilitate uptake and adherence to ART.

Methods: Individuals attending a large urban HIV clinic June 2018-May 2019, diagnosed >1 year with at least one viral load >200 copies/ml regardless of ART status were included. Characteristics at time of detectable viral load were summarised. A notes review of a random subset of 30 individuals was conducted to assess need for additional support services; whether referral to services was offered, and patient uptake.

Results: 3,184 people attended in period, 124 (3.9%) met inclusion criteria; 47 (38%) female, 75 (60%) gay/bisexual men; median age 49 years; median VL 5189 copies/ml. The majority (103/124, 83.1%) were receiving ART and 45 (21%) ever had an AIDS-defining illness. One or more in-house support services had been accessed by 89 (70%); 59 (48%) engaged with psychology/psychiatry services. The needs and usage of support services are shown in Table P141.1. There were a minority of cases who were detectable and not on ART (21/124 16.9%), 5 female (23.8%), 16 male (76.2%), 10 gay/bisexual men (47.6%), median age 48 years. Of those, 23.8% specifically refused treatment and did not take up services offered – details in Table P141.2.

Case note review indicated that all 30 individuals may have benefited from additional support, predominately adherence (80%) and psychological support (47%). Almost half (46%) were offered adherence support with 27% of those referred attending and 71% offered psychological support with 70% uptake.

Conclusions: Our findings indicate support needs to be better identified and use of support services promoted to facilitate engagement if viral suppression is to be achieved for all. Psychological services are not available in all clinics but our data suggest high need and uptake. The Positive Voices outcome data may help identification of unmet needs at clinic level.

Table P141.1. Documented need, linkage to and use of support services for individuals with detectable viraemia (n=30)

Support type	Need documented	Service Offered	Support uptake
Peer	1 (3%)	1 (100%)	0 (0.0%)
Adherence	24 (80%)	11 (46%)	3 (27%)
Assistance with transport (cost or arrangement)	1 (3%)	1 (100%)	1 (100%)
Psychological	14 (47%)	10 (71%)	7 (70%)
Psychiatric	7 (23%)	7 (100%)	5 (71%)
Drug and alcohol	9 (30%)	6 (67%)	2 (33%)
Support re housing, benefits or immigration status	10 (30%)	9 (90%)	6 (67%)
Community Nursing	6 (20%)	6 (100%)	5 (83%)

Table P141.2. Documented need, linkage to and use of support services for individuals with detectable viraemia and those who are not on ART (n=21)

Support type	Need documented	Service Offered	Support uptake
Peer	6 (28.6%)	6 (100%)	6 (100%)
Adherence	6 (28.6%)	6 (100%)	2 (33.3%)
Assistance with transport (cost or arrangement)	0 (0%)	0 (0%)	0 (0%)
Psychological	5 (23.8%)	5 (100%)	4 (80%)
Psychiatric	3 (14.3%)	3 (100%)	1 (33.3%)
Drug and alcohol	3 (14.3%)	1 (33.3%)	0 (0%)
Support re housing, benefits or immigration status	3 (14.3%)	3 (100%)	3 (100%)
Community Nursing	2 (9.5%)	2 (100%)	0 (0%)

P142

'Always on my mind': mental wellbeing remains high on the agenda for the fourth 90

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Background: Unmanaged mental health problems in people living with HIV (PLWH) may affect adherence to ART and reduce their quality of life. The aim of this project was to determine current utilisation of in-house psychology service and evaluate the benefits of delivering psychology workshops.
Method: Psychology referrals and support uptake within a large London HIV clinic from July 2018-July 2019 was audited. Subsequently, a patient survey was undertaken to explore psychological issues PLWH want support for, and three workshops were delivered on emotional wellbeing, ageing and living with HIV.
Results: Result 1 Audit: Between July 2018-July 2019, 280 patients were referred to the psychology service. 217 (77.5%) outpatient referrals; 33 (11.8%) inpatient, 12 (4.3%) neurocognitive, remaining 18 (6.4%) were support for families. 59.3% were offered psychological assessment and interventions and 13.9% were waiting to start therapy (see Figure P142.1).
Result 2 Clinical Survey and Response: N=60, 50% male, 20% female, 30% trans/unknown; median age 49 years. 61.6% were interested in attending a workshop. The most preferred workshops were ageing with HIV (58.3%), living well with HIV (53.3%) and improving emotional wellbeing (48.3%).
Result 3 Workshop: Three workshops were delivered. 11 patients attended, 81.9% male, 18.1% female, median age 60. 91% were very satisfied with the workshops and 100% would attend future workshops. The qualitative analysis shows that most valued the knowledge provided (72.7%). Overall, patients attending the workshop reported they were better able to cope with: depression (100%); anxiety, ageing and looking after their health (91%); living and adjusting to having HIV (82%); adherence (73%), and disclosure (36%) (see Table P142.1).
Conclusion: The results show that PLWH have high psychological needs, but these services are not widely available across HIV centres. Where psychological support is offered, the uptake for the service is high and shown to improve patients' HIV management and mental health. It was also found that all patients were interested in attending future workshops. As a result, routine workshops to compliment individual therapy, ensuring patient-centred care is at the core of HIV service provision will be introduced.

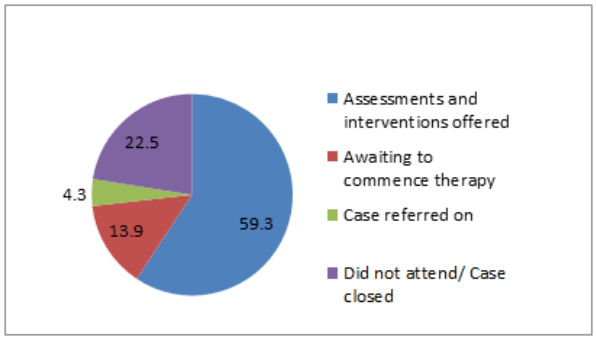

Figure P142.1. The percentage of psychology services referrals and uptake (n=280)

Table P142.1. The percentage of patients reporting to cope better following the workshop (n=11)

Coping better with:	No Changes	Some Change	Much Better
Depression	0	7/11 (64%)	4/11 (36%)
Ageing	1/11 (9%)	6/11 (55%)	4/11 (36%)
Anxiety	1/11 (9%)	7/11 (64%)	3/11 (27%)
Looking after health	1/11 (9%)	7/11 (64%)	3/11 (27%)
Living well with HIV	1/11 (9%)	6/11 (55%)	4/11 (36%)
HIV disclosure	7/11 (64%)	2/11 (18%)	2/11 (18%)
HIV adherence	3/11 (27%)	4/11 (36%)	4/11 (36%)
HIV diagnoses	2/11 (18%)	6/11 (55%)	3/11 (27%)

P143

Barriers to informing GPs about HIV

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Background: People living with HIV have a normal life expectancy. Different healthcare professionals may be involved in their care during their lifetime, with the potential for serious drug interactions. GP involvement should be encouraged in order to ensure safe, high quality care. However, stigma and discrimination still exist. Explicit consent is required before informing the GP. The aim of this work is to ascertain whether the reasons for withholding consent have been explored, as recommended in the 2018 BHIVA Standards of Care.
Method: The electronic patient database was searched to identify all cases of HIV. The records of those who declined GP communication were retrieved. Demographic data was obtained. The records were reviewed to identify whether the reasons for withholding consent had been explored over the previous 12 months.
Results: 196 HIV patients were identified, of which 7 patients (6 male and 1 female) had withheld consent to inform their GP. The age range was 28 to 51 years. 4 were white British, 2 Black African, 1 Black British. 4 were heterosexual and 3 MSM. The duration of diagnosis ranged from 3 months to 16 years. 6 of 7 were on ART with an undetectable viral load. 5 of 7 had co-morbidities and 4 were receiving other medication. 5 patients had documented evidence of attempts to explore their concerns; 3 stated that they knew people who worked at their GP practice, 1 preferred to "keep everything separate", and one was unable to give a specific reason.
Conclusion: 7 patients (3.5% of the total cohort) withheld consent to inform their GP of their diagnosis. HIV is still a very stigmatising condition and some patients are understandably concerned about sharing information. However, patient safety is of paramount importance, particularly in relation to allergies and drug interactions. It is important that the risks to the patient's safety are clearly explained, and their reasoning is explored periodically. If they continue to decline, their wishes should be respected. Urgent research is required to understand and address the stigma and discrimination that people living with HIV face, in order to eliminate barriers to integrated care.

P144

Investigating patient–HCP engagement for people living with HIV in the UK

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Background: The United Kingdom has one of the highest rates of linkage to care, with 98% of people living with human immunodeficiency virus (HIV; PLHIV) on treatment and 97% of those with undetectable viral loads. However, less is known about the impact of patient–health care provider (HCP) engagement on health-related quality of life (HR-QOL). We examined patient-reported communication with HCPs.
Method: Data from the 2019 'Positive Perspective Study' of 123 adult PLHIV were sampled UK-wide. Data were collected on perceived comfort discussing with HCPs and treatment satisfaction; patient engagement in care (low/moderate/high) was modified from the Observing Patient Involvement scale. Percentages were compared with chi-square tests.
Results: Mean age was 42.8 years; 46.4% had ≥1 non–HIV-related comorbidity. Sample composition was comparable with national distributions. Overall, optimal health was reported in 43.9%; mental/sexual/physical health were 45.5%/40.7%/48.0%, respectively. The percentage reporting no barriers in discussing health issues with HCPs was 30.9%, with the lowest among men who have sex with women (10.5% [2/19]) compared with men who have sex with men (MSM; 50.0% [27/54]); p=0.001). In general, MSM and women had the highest and lowest percentages, respectively, of those who felt comfortable discussing several treatment-related concerns with their HCPs spanning across several issues (Table P144.1). Overall, 69.1% reported their HCP had told them about "Undetectable equals Untransmittable" (U=U). Those informed of U=U were significantly more likely to report that their treatment needs were met (78.8% vs 57.9%; p=0.029). Treatment satisfaction was reported by 79.7% (Figure P144.1); those with the lowest patient–HCP engagement were least satisfied compared with those with moderate and high engagement: 61.3% [19/31], 84.3% [43/51], and 87.8% [36/41], respectively (all p<0.05). Those with the lowest engagement were significantly less likely to report optimal mental health or perceive treatment needs as met.
Conclusion: A significant proportion of PLHIV reported suboptimal HR-QOL and low/moderate patient–HCP engagement. Women had the lowest confidence in raising specific treatment concerns. Better patient–HCP engagement is warranted to improve HR-QOL outcomes to attain 4th "90" targets, and women may have the greatest unmet need.

Table P144.1. Percentage of PLHIV who reported being comfortable in discussing specific treatment concerns with their healthcare providers. Positive Perspective Study, UK (N=123)

Characteristic	Total (n = 123)	MSM (n = 54)	MSW (n = 19)	Women (n = 34)
HCP facilitation of patient involvement				
HCP prioritizes their concerns/needs	72.4	75.9	73.7	76.5
Level of information exchange				
Feel they understand enough about their treatment	71.5	75.9	63.2	64.7
HCP frequently inquiries about treatment concerns	69.1	70.4	73.7	61.8
HCP frequently asks them about side effects	65.9	72.2	68.4	55.9
HCP tells them about new treatment options	46.3	42.6	42.1	55.9
HCP has told them about (U = U)	69.1	72.2	68.4	61.8
No perceived barriers to discussing treatment concerns with HCP[a]	30.9	50.0	10.5	20.6
Patient participation in decision making				
HCP seeks their view before treatment	66.7	61.1	84.2	64.7
Want to be more involved in their care	56.1	50.0	68.4	55.9
Feel they have enough information to be involved in their care[a]	69.9	77.8	84.2	52.9
Percentage of PLHIV comfortable discussing specific treatment concerns with HCPs				
Impact of treatment[a]	53.7	68.5	52.6	35.3
Preventing HIV transmission[a]	65.0	75.9	57.9	44.1
Emotional concerns[a]	57.7	72.2	47.4	47.1
Privacy concerns[a]	55.3	68.5	57.9	41.2
Having children[a]	46.3	35.2	73.7	41.2
Managing illnesses caused by HIV[a]	60.2	74.1	63.2	32.4
Antiretroviral treatment side effects	65.9	74.1	68.4	58.8
Potential drug–drug interactions[a]	62.6	75.9	73.7	41.2
Potential damage to organs[a]	59.3	75.9	47.4	44.1
Missing medication doses	68.3	77.8	52.6	61.8

[a]Differences that were statistically significant overall by sexual orientation based on chi-squared tests. HCP, health care provider; HIV, human immunodeficiency virus; MSM, men who have sex with men; MSW, men who have sex with women; PLHIV, people living with HIV; U=U, "Undetectable equals Untransmittable."

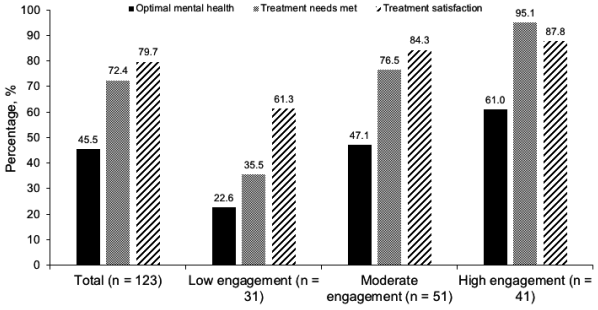

Figure P144.1. Prevalence of health-related quality of life measures by level of patient–provide engagement. Positive Perspective Study, UK (N=123)

Service development, education and training

P145

Junior doctors' knowledge and education needs in relation to the use of antiretroviral therapy (ART) in HIV prevention

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Background: ART effectively prevents HIV infection when used to treat those living with HIV (Treatment as Prevention, TasP), following potential HIV exposure (Post exposure prophylaxis PEP) and before potential HIV exposure (PreExposure Prophylaxis, PrEP). In Ireland antiretroviral therapy for HIV prevention is free to those living with HIV[i] and to those who meet clinical criteria for PEP[ii] and/or PrEP[iii].With the launch of Ireland's national PrEP Program in November 2019, we sought to assess knowledge and education needs amongst Junior Doctors on ART use in HIV prevention.
Method: We developed an anonymous survey via SurveyMonkey®. Ethical approval was granted. The survey was distributed via email through medical workforce in 17 hospitals and social media including Facebook® and WhatsApp®.
Results: 157 junior doctors responded, 91% completed the survey. 85(85%) were working in Dublin hospitals.
TasP: 66% (n=92) had heard of 'undetectable=untransmissible'; 85% (n=122) were aware that ART is initiated as soon as possible after HIV diagnosis.
PEP: 62% (n=70) were not aware of or did not know how to access (78%, n=86) national guidelines.33% (n=51) were aware that PEP is generally indicated if the estimated transmission risk is greater than 1 in 1,000. 90% (n=141) reported no training in prescribing or assessing PEP patients; 82% (n=127) did not feel comfortable making PEP prescription decisions.
PrEP: 90% (n=101) had heard of PrEP; 75% (n=82) correctly knew licensed PrEP medication; 10% (n=11) had prescribed PrEP and 23% (n=26) were aware of national guidelines.
Most respondents said that they would like additional teaching on TasP(89%), PEP(88%) and PrEP(92%).
Conclusion: This survey highlighted areas that need to be targeted in order to increase knowledge relating to ART in HIV prevention and awareness of available resources amongst junior doctors. There is a strong reported desire for training which should be harnessed to address knowledge deficits.

P146

How has Scotland's HIV PrEP programme impacted on sexual and reproductive health (SRH) services and what is the average cost of PrEP care?

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Background: Pre-exposure prophylaxis (PrEP) has been available through integrated SRH services across Scotland, as part of comprehensive HIV prevention services, since July 2017. This has increased overall SRH service demand. We aimed to determine the impact of PrEP rollout on provision of wider SRH services and to quantify the average SRH service resource use per person starting PrEP in the first year of the programme.
Method: Survey data from service leads of three NHS boards which accounted for 75% of people starting PrEP was combined with SRH service attendance and prescription data from the National Sexual Health database for all people who had their first PrEP attendance between July 2017 and June 2018. A model PrEP care pathway (assessment, initiation and ongoing monitoring) was constructed to estimate the resource required for PrEP-related attendances. Changes in SRH resource allocation, service provision and attendances, and concurrent pressures were identified.
Results: People starting PrEP (n=1,872) attended SRH services on a mean of 6.1 days in the first 12 months (1.5% of SRH service users, 4.9% of SRH attendances). Attendances on 3.8/6.1 days were for PrEP-related care, at an estimated cost of £384 per person (range between NHS boards: £362.8-£425.5) of which clinical staff time accounted for £98.7 (range: £77.7–£140.4) and laboratory testing for £285.1. Requirements for delivering PrEP care were largely met by reallocation of resources from other SRH services e.g. contraception and gay men's services. PrEP-related demand compounded pre-existing pressures on SRH services. All NHS boards reported increased waiting times for contraception services since implementation of PrEP.
Conclusion: PrEP services were delivered with low clinical staff costs, compared to reported trial data (PROUD). However, people using PrEP had a high number of annual attendances. Services addressed this demand by diverting staff time from other SRH services. This had a negative impact on a range of other SRH service elements, including access to contraception. PrEP services need appropriate resources to deliver high quality PrEP care and to avoid creating inequalities in access to SRH services for those with non-PrEP needs.

P147

The costs of hospital and community care for newly diagnosed people living with HIV in London, UK

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Background: Data are lacking on the use and cost of health and social services for newly diagnosed people living with HIV (ND-PLHIV).This is the first UK study investigating this group of patients at a large UK centre.
Method: 121 ND-PLHIV participants had routine information collected on inpatient days (IP), outpatient (OP) and dayward (DW) visits, tests and procedures, and antiretroviral drugs (ARVs) for a year: July 2017-October 2018. Use of community services were recorded using daily diaries. 2017/2018 prices were obtained from hospital departments, national NHS tariffs unit costs were used, and unit costs for community services from the *PSSRU Unit Costs of Health & Social Care 2017*. Annual costs were obtained by linking unit costs with mean per patient-year (MPPY) service use. Participants completed surveys at 1 and weeks 12, 36 and 48.
Results: ND-PLHIV generated 12.3 MPPY OP visits (95%CI 11.1–13.4), 0.14 IP days (95%CI 0.1–0.2), 0.9 DW visits (95%CI 0.8–0.9) and 4.7 MPPY (95% CI 3.5–5.9) community services. Annual cost was £11412 (95%CI 10,311–12,513). No differences were observed by age and being UK-born; White participants (n=86) had more DW visits but used fewer outpatient, inpatient and community services compared with non-White participants (n=35). Annual costs for the White ND-PLHIV was £10733 (95%CI £9590-£11876) and £13080 (95%CI £10566-£15594) for non-White ND-PLHIV. Participants with lower CD4 count generated higher median annual costs; inverse relationship observed of first CD4 count and annual median costs (r=−0.203). First CD4 count for White participants was 476 mm3 (95%CI 422–531) compared with 373 mm3 (95%CI 320–425) for non-White participants. Annual cost for use of community services was £291 (95%CI £218-£364) and ARVs was £7115 (95% £6340-£7890). Multivariate regression models indicated only first CD4 at diagnosis was significantly and inversely related to annual cost of services.
Conclusion: ART was the main cost driver and responsible for 62% of total costs.CD4 count inversely related with annual cost. White ND-PLHIV had higher CD4 count, used fewer hospital services compared with non-White participants but used more dayward and community services. Community services generated 3% of the total annual hospital and community services costs.

P148

Clinical experiences of carrying out antiretroviral treatment interruption within HIV cure trials

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Background: Increasingly, HIV cure trials require treatment interruption (TI) in order to evaluate the efficacy of interventions aiming to achieve sustained virological remission off antiretroviral therapy (ART). We participated in the first TI cure study in the UK; prospective interruption of therapy towards a cure for HIV (PITCH). As more TI studies are planned within the UK, we share our unique experience in carrying out such trials.
Method: Individuals who started ART at primary HIV infection (PHI), participated in the HEATHER cohort and had a HIV DNA level <3.25 log copies/million were recruited at two HIV centres. Upon ART cessation, bi-weekly VL monitoring was conducted. Following participant feedback, VL monitoring was reduced to weekly testing as this was considered more pragmatic and without any additional risk. The research team held weekly site meetings and monthly study calls to share experiences.
Results: Out of 78 eligible participants that were contacted (59 declined and 12 ineligible due to HIV DNA >3.25), seven (100% male, 100% MSM and mean age 35 years) were enrolled. The main barriers to recruitment were number of visits (n=36), concerns regarding onward HIV transmission (n=12), and perceived medical risk of stopping ART (n=11). Six participants had viral rebound and restarted ART within mean time of 56 days. One participant remains on TI after 148 days with a max VL of 90 copies/ml on fortnightly monitoring.
Nurses were extensively involved in communicating with participants, 2/7 required additional reminders to attend follow-up, 2/7 required additional visits and phone calls to manage anxiety surrounding TI and 2/7 had fear of seroconversion symptoms. Length of visits varied between 15 and 60minutes. Restarting ART relied on the patient's decision which they found difficult and required a lot of discussion with study team.
Conclusion: Treatment interruption studies are time and resource intensive. Multiple appointments mean that consideration of travel reimbursement and out of hour's visits is important. Protocols should provide clear parameters on when to restart ART so that the decision does not lie with participants. A good relationship between research staff and participants is the key to success in this type of study.

P149

Why are patients living with HIV still admitted to hospital?

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Background: Reasons for admissions to HIV specialist centres are continually changing with improved awareness and management of HIV. This study set out to assess the demographics of and reasons for inpatient admissions at a tertiary HIV care centre and the requirement for consultant specialisation to deliver optimal care.

Method: A retrospective review of inpatient admissions to a dedicatedHIV unit between 1st Aug 2018 to 31st July 2019, analysing the reason for admission, duration of stay and the average CD4 count and viral load (VL). This was compared with equivalent data collected between 1st Jan 2016 to 31st Dec 2016.
Results: During the study period there were 321 inpatient episodes (relating to 189 patients), compared with 255 episodes (168 patients) in 2016.
54% (n=172) of admissions were for conditions not directly related to HIV. The most common reasons for these admissions were infective (47%), gastro-intestinal (8%), and neurological (6%) presentations, compared with 2016, which infective (29%), respiratory (9%), and hepatic (8%). The percentage with an undetectable VL in this cohort of patients was similar between years (71% in 2016; 66% 2018–2019).
The main reasons for HIV-related admissions were oncological (65%), opportunistic infections (18%), and manifestations of HIV (6%), compared with 2016 data; oncological (51%), opportunistic infections (35%), and symptom investigation in patients with a CD4 <350 c/ml (8%). Current undetectable VL levels and CD4 counts in HIV-related oncological admissions fell compared to 2016 data (VL 78% to 27%; and CD4 221 to 170c/μl), with a reverse in non-oncological HIV-related admissions, (VL 37% to 84%; and CD4 62 to 134c/μl). Of the oncological admissions (n=97), 94% were for AIDS-defining malignancies, compared with 73% in 2016.
Conclusion: There has been an overall increase in inpatient admissions since 2016, with the majority being for conditions unrelated to HIV. Despite this, there is an also an increase in HIV-related oncological admissions, with an increase in admissions for AIDS-defining malignancies. Staffing of specialist HIV inpatient units should reflect the wide variety of medical presentations in this patient cohort, where consultants with a breadth of general medical expertise is desirable, with as-required input from HIV and oncological specialists.

P150

Perceptions of U=U across all staff groups: how confident are we in delivering this message?

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Background: The Prevention Access Campaign statement in 2016 delivered the message Undetectable=Untransmittable (U=U). Stating that a person with a sustained, undetectable level of HIV virus in blood cannot transmit HIV. This has been endorsed by BHIVA and more than 77 organisations across 95 different countries. The aim of this project was to gain insight into the confidence of communicating the U=U message in all staff working in an integrated sexual health service.
Method: All staff in the department were given a short questionnaire to complete. The respondents were grouped into doctor, nurse, health care assistant (HCA) and administration. The data was anonymised and recorded into an Excel spreadsheet for analysis.
Results: 26 respondents completed the questionnaire; doctor 23.1% (6), nurse 34.6% (9), HCA 7.7% (2) and administration 34.6% (9). 5/26 (3 doctors and 2 nurses) were directly involved in HIV clinical care, the remaining 21/26 (3 doctors, 7 nurses, 2 HCA's and 9 administration) were not. Those 5 involved in HIV care were asked further questions, these responses are demonstrated in Table P150.1.

Table P150.1

	Q1	Q2	Q3
Role	How often would you discuss the U=U message with the patients you see?'	How often would you document in the notes that you discussed U=U with the patient?	How confident would you feel discussing U=U with a patient? Whether it was a patient living with HIV or a patient attending to discuss this regardless of their HIV status?
Doctor	Most of the time	Most of the time	Very confident
Doctor	Most of the time	Sometimes	Very confident
Doctor	Always	Always	Very confident
Nurse	Always	Most of the time	Very confident
Nurse	Sometimes	Always	Confident

The 21 staff who were not involved in direct HIV clinical care were only asked the last question, the responses recorded were 'very confident' 19% (4), 'confident' 33.3% (7), 'unsure' 33.3% (7) and 'not confident' 14.3% (3).

Conclusion: Variability in confidence levels of delivering the U=U message is highlighted in this project. Ensuring focused education and training within our departments will reduce stigma, increase awareness of U=U and ultimately improve this aspect of clinical care.

P151

Managing frailty in people living with HIV: establishing and reviewing a new clinical service

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Background: The advancements in the care of people with living with HIV have resulted in more people living into older age. By 2030 more than 70% of people living with HIV will be over fifty years old. HIV services must either adapt with the expectation of managing frailty or conversely Geriatricians must become more familiar with HIV care.
A monthly multi-disciplinary clinic was established to help manage frailty syndromes in patients already known to our HIV service. Patients were identified from frailty scoring (Fried Criteria) at their annual reviews or referred in by their regular physician or specialist nurse.
Six patients can be seen monthly in a carousel format of 3x30 minute assessments. These comprise: HIV/geriatric medicine specialist, occupational/physiotherapist, and dedicated HIV nurse/specialist pharmacist review. Patients were sent questionnaires (PHQ9, GAD7, WHO QOL) to be completed prior to the appointment. Pre and post clinic meetings allowed discussion of need and development of a bespoke clinic report to support the patient via their regular HIV clinician, onward referral, and involvement of primary care physician when permitted.
Method: The records of all thirty-five patients attending the inaugural nine sessions were reviewed to ascertain demographic information, progress to date and issues identified
Results: Median age 67 (range 51–91). 77% male (22% female), 54.3% White (Black 28.6%, Mixed 2.9%, Other 5.7%, Not stated 8.6%). Median Fried score 4 (n=30 range 0–5).
Eighteen issues linked to frailty were identified. The five most common were: low mood (45.7%) [PHQ9 n=31, mean 10, range 0–24], memory problems (31.4%) [MoCA, n=7, mean 20, range 14–27), falls risk (31.4%), urinary symptoms (25.7%) and pain (22.9%). Other issues included bowel symptoms, weight loss, breathlessness and loneliness.
Conclusion: Early data demonstrates a high incidence of affective and cognitive symptoms within this cohort along with other elements of the frailty syndrome. Whilst the majority of patients had some aspects of frailty, some did not. A revised structure is planned for year two with a more detailed referral form allowing triage to either a medical or therapies focussed appointment. Follow up will also be possible and outcome data therefore more readily collected.

P152

Assessing impact of errors in HIV prescriptions for homecare service

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Background: Errors in anti-retroviral (ARV) prescriptions lead to delays for patients and increased costs where branded medicines are prescribed in place of generics. The HIV pharmacists screen prescriptions from both Infectious Diseases (ID) and Genitourinary Medicine (GUM). Electronic prescribing is not available for either service. GUM use pre-printed prescriptions, where the prescriber indicates by check-mark the drug and dose required, whereas ID use traditional handwritten prescriptions. This study aims to assess the number and nature of errors found by pharmacists and determine if these lead to processing delays.Furthermore, it aims to establish if pre-printed prescriptions reduce prescribing errors and increase prescribing of generic ARVs.
Method: During the study period (August to December 2019), all prescriptions for clinical check were logged by the pharmacists. Details recorded included prescription type, dates received/completed and any errors.

Errors were categorised, different cohorts were identified and processing time was analysed.
Results: 611 prescriptions were logged, 81 of which contained errors (2 had multiple errors).Prescribing of branded rather than generic ARVs accounted for 48% of errors.
49% of all prescriptions were pre-printed; these contained only 29% of errors. Using a one-tailed t-test of processing time, the erroneous prescriptions (M=1.31, SD=5.24) compared to the correct prescriptions (M=0.01698, SD=0.241) demonstrated significantly quicker processing times t(609)=5.66, p<0.0001.
Conclusion: The majority of prescribing errors found were attributed to prescribing branded rather than generic ARVs. Whilst almost half of prescriptions were pre-printed, they accounted for only a third of the brand/generic errors.Closer investigation reveals that in all cases these were the result of old pre-printed prescriptions used in error, and not due to prescriber fault. Pre-printed prescriptions had fewer errors than handwritten in all categories with the exception of 'wrong drug prescribed'.This occurred on 2 occasions and whilst serious, were easily identified at clinical check.
Evaluation of mean time taken to process prescriptions suggests that prescriptions with errors take significantly longer to check and process. Given that pre-printed prescriptions generally contain fewer errors, it is planned to roll out the use of pre-printed prescriptions across all outpatient HIV prescribing thus reducing errors and processing time.

P153

Impact of routine enquiry on disclosure rates of female genital mutilation in HIV positive women

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Background: Female genital mutilation (FGM) and HIV infection share overlapping geographical prevalence. FGM may be associated with HIV transmission. Proposed mechanisms include non-sterile instruments, blood transfusions, bleeding from traumatised tissues during intercourse and increased anal sex. Both FGM and HIV can be associated with sexual difficulties.
The prevalence and experience of women living with HIV and FGM in resource-rich settings is poorly characterised. New FGM questions were incorporated into HIV proformas in 2018 with the aim of more readily identifying and characterizing FGM amongst women attending for care within our services.
Method: Electronic patient records were interrogated to compare FGM detection rates 9 months before and 9 months after the introduction of FGM questions into HIV proformas.
Results: The proportion of women living with HIV asked about FGM between the two time periods increased and the detection rate of FGM doubled from 4 to 9 (Table P153.1).

Table P153.1

	Asked about FGM	Disclosed FGM
Before change	4/1271 (0.3%)	4 (0.3%)
After change	139/1315 (10.6%)	9 (0.7%)

The characteristics of the nine women with FGM are described below (Table P153.2):

Table P153.2

Patients identified with FGM	9
Demographic	
African origin	7
Previously disclosed FGM to our service	0
Impact	
Long-lasting functional impact	3
Urinary	1
Sexual	1
Psychological	1
Views	
Opinions against FGM	8
Not aware FGM illegal in UK	2
Safeguarding and follow-up	
Safeguarding concerns	0
Consent to GP letter	2

Conclusion: Following the introduction of FGM questions into HIV proformas, documented FGM enquiry increased, doubling the detection of FGM. FGM was often newly identified and one-third of women reported potentially treatable FGM complications. There is likely to be other unidentified survivors of FGM, in whom opportunities to treat complications and ensure adequate safeguarding can be enacted. These data have helped inform our decision to include baseline enquiry about FGM for all women with a new diagnosis or new to a service, and we call for national guidelines to recommend the same.

P154

The cost-effectiveness of the EmERGE pathway of care for people living with medically stable HIV in the UK

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Background: The EmERGE study evaluated a reduced visit pathway of care in which participants receive HIV treatment information on their smartphone. Data on cost effectiveness are presented here from the UK centre.
Method: The costing study focused on outpatient services in this medically stable population. Unit costs of outpatient visits were estimated by the hospital finance department and linked to mean outpatient visits per patient year (MPPY). Annual costs of HIV outpatient services for study participants were estimated one-year before and after the introduction of the mHealth pathway. 2019/20 costs, based on unit costs per outpatient visit, were calculated in UK pounds. CD4 count, viral load and out-of-pocket expenditures were also compared.
Results: 565 individuals enrolled at the UK site between April 2017 and October 2018: 523/565 (92.6%) were male; median age 47 (IQR 39–53); 384/548 (70.1%) had full-time employment (≥30 hours); 76/548 (14%) of participants received social services benefits. 202/565 (35.8%) were already using a reduced visit pathway via email.
Outpatient contacts decreased from 5.6 MPPY (95%CI: 5.4–5.8) to 5.1 (95%CI: 4.9–5.3): a reduction of 9%.Face-to-face visits decreased from 4.2 (95%CI: 4.0–4.4) to 3.0 MPPY (95%CI: 2.8–3.1), while virtual visits increased from 1.4 MPPY (95%CI: 1.3–1.5) to 2.1 MPPY (95%CI: 2.0–2.2) (Table P154.1).
CD4 counts did not differ significantly between periods and viral load remained undetectable in 523/525(99.6%).
An equivalent cost reduction of 10% can be inferred for the study population sub-set through reduced attendances: £751 (95%CI £722-£780) pre-mHealth to £678 (95%CI £653-£705) post-mHealth. Total costs of the service have remained static with capacity released for other patients.
82% of participants did not take a day off work for a clinic visit; median return travel to clinic appointment was 1.5 hours (IQR: 1–2 hours). Median cost of this return journey was £5 (IQR: £0-£6).
Conclusion: Introducing a novel pathway for people living with medically stable HIV allowed the clinic to manage capacity: freeing up resources that support services for people with more complexity. Patients using the platform remained engaged with care and clinically stable with undetectable viral loads. Further work is needed to assess impact in those with more complex health needs.

Table P154.1. Use of outpatient services before and after introduction of new pathway

	Pre-mHealth		Post-mHealth	
	MPPY	(95% CI)	MPPY	(95% CI)
Total outpatient contacts	5.60	(5.39 to 5.82)	5.06	(4.87 to 5.26)
Face to face clinician visit	4.19	(4.01 to 4.38)	2.96	(2.81 to 3.11)
Virtual clinician contact	1.41	(1.31 to 1.52)	2.10	(1.98 to 2.23)
Type of visit				
Routine bloods appointment	2.18	(2.05 to 2.32)	2.10	(1.98 to 2.23)
Routine doctor appointment (face to face)	1.72	(1.61 to 1.85)	0.73	(0.66 to 0.81)
Virtual doctor contact	0.43	(0.37 to 0.49)	1.42	(1.32 to 1.53)
Non-routine doctor appointment	0.07	(0.05 to 0.10)	0.06	(0.04 to 0.08)
Non-routine nurse contact	0.20	(0.16 to 0.24)	0.15	(0.12 to 0.19)
Non-routine ARV prescription	0.64	(0.57 to 0.72)	0.32	(0.27 to 0.37)
Other	0.35	(0.30 to 0.41)	0.28	(0.23 to 0.33)

P155

Research experience and training among genitourinary medicine trainees in the UK

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Background: Competencies in clinical research are outlined in genitourinary trainee doctors' current curriculum. However, UK wide research experience of trainees is not known. We set out to explore levels of current research experience and knowledge amongst trainees before the introduction of a new curriculum.
Method: UK Genitourinary trainees completed an online survey between October and December 2019. Questions were aligned to new curriculum guidelines and included demographics, research experience and knowledge.
Results: 31 respondents, representing 33% of current trainees, were received. 26 (84%) were female, 11 (35%) training in London, 4 (13%) in Scotland and 4 (13%) in the East Midlands. 13 (42%) were ST6. 5 (16%) had undertaken a research module. 27 (87%) had Good Clinical Practice (GCP) certification, 13 (42%) with experience consenting participants to an observational study and 18 (58%) to a clinical trial. 28 (90%) had referred a participant to a clinical trial and 22 (71%) were on a delegation log.13 (42%) had submitted an ethics application and 11 (36%) a grant application.
18 (58%) reported experience in writing manuscripts:17 (54%) analysing data and 16 (51%) reviewed literature for treatment guidelines.
Geographical variation in every variable was observed with London based trainees having more research experience than elsewhere: attending a critical appraisal course (London 91% vs Scotland 0% vs elsewhere 31%), ever consented a participant to an observational study (London 73% vs Scotland 0% vs elsewhere 25%).
22% thought their current training did not support gaining research competencies needed for consultancy and 81% thought that dual training with internal medicine would not support research training.
In structured questions, 94% correctly identified a serious adverse event, 61% an example of a qualitative study and 97% the difference between an observational and a clinical trial.
Conclusion: High levels of GCP training and referring to research were encouraging.However, approximately half of trainees did not have experience in carrying out research, writing literature reviews or manuscript publication. Geographical variation in research training and experience was observed. Focus should be on maintaining and improving research opportunities with the introduction of dual training with internal medicine.

P156

Patient-generated data in the management of HIV: a review

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Background: Patient-generated data (PGData) are self-collected data on a variety of health-related factors e.g. medication side effects, exercise or mood. Digital technologies such as wearable devices and mobile apps allow collection and tracking of PGData beyond clinical settings. Monitoring of such data by people living with HIV and their healthcare professionals (HCPs) may improve HIV care. We conducted a review of current literature on PGData use in HIV management.
Method: We conducted a systematic literature search within Embase, Medline, CINAHL Plus, Web of Science, Scopus, PsycINFO and Emcare in June 2019. We identified 2,353 articles; 11 papers of mixed methodologies met the inclusion criteria. We used Thematic Analysis to evaluate content, and assessed empirical rigour using the Mixed Methods Appraisal Tool.
Results: Studies were observational, predominantly concerned hypothetical or novel digital platforms, mainly conducted in high-income settings (10/11, with 8 conducted in North America), and had small sample sizes (range=10–160). There were multiple definitions of PGData. In the majority of studies (n=9) participants were people living with HIV, with a few including HCPs, informatics specialists, or mixed participant groups. Participants living with HIV were aged 30–50, mostly male, of diverse ethnicities, and had low educational, health literacy and income levels.
We identified four key themes: 1. Perceived acceptability, feasibility and usability of digital PGData platforms; 2. Perceived suitability of different patient groups; 3. Opportunities and barriers around PGData collection; and 4. Potential impact of PGData use upon patient-HCP relationships.
Conclusion: We present a critical synthesis of emergent literature on PGData use in HIV management. Use of such data in HIV warrants further study, especially with regard to digital inequalities, data privacy and security. There is a need for longitudinal data on facilitators and barriers to PGData use within HIV in a variety of settings with a broad range of users, as well as investigation of the impact on clinical outcomes. By addressing these gaps in this emergent and potentially important field, we can better understand the role that PGData may have in improving the health and wellbeing of people living with HIV.

P157

Evaluation of a local non-proprietary prescribing policy: removing Eviplera from the formulary

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Background: In the UK, 60–85% of NHS prescriptions are for generic medications. Many antiretroviral medications have now come off patent and NHS England has set out guidance for prescribing HIV medication with this in mind. At a large city hospital we wanted to review the impact of removing Eviplera, on 01/10/19, from our formulary.
Method: A retrospective case note review of patients who had received a prescription for Eviplera between October 2017 and September 2018 was performed.Outcomes for those patients were reviewed for the 6 months following their first appointment post 01/10/18.
Results: We identified 80 patients on Eviplera: 2 had transferred care prior to switch being necessary, 66 split to generic components: emtricitabine/tenofovir disoproxil & rilpivirine, 7 required a single tablet regimen (STR), 5 had clinical indications for a switch away from Eviplera components.
Of the 66 patients who split to generic components 62/66 (94%) remained suppressed, 3 (5%) had a viral load over 200 copies/ml but subsequently suppressed and1 patient transferred away. 95% (63/66) remained on split Eviplera components 6 months later.
Of the 12 patients who did not split to generic components, 7 needed an STR (5 to TDF/FTC/EFV, 2 to Triumeq), 4 had clinical reasons to switch regimen (2 had raised viral loads, 2 had deteriorating renal function) and 1 was concerned about side effects of Rilpiverine. 11/12 (92%) patients were suppressed 6 months later.
The additional cost of removing Eviplera from the formulary was calculated at £2,900 due to extra MDT discussions (9 wanting STR, 4 viraemic, 4 clinical reasons to switch regimen), 14 extra appointments and 14 extra viral loads. There were immeasurable costs: 1 patient transferred care and 7 patients experienced side-effects (3 on Eviperla components and 4 on efavirenz based regimens). The savings were calculated at £105,300 which overall gave a saving of £102,400 in the first 6 months post switch.
Conclusion: Overall we found that splitting to the generic components proved to contribute to waste reduction in the short term, but resulted in immeasurable costs with a patient transferring care and experiencing avoidable side-effects.

P158

An outreach sexual health adviser service for females who inject drugs living with HIV: an audit cycle

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Background: An outbreak of HIV amongst people who inject drugs (PWID) in Glasgow has been ongoing since 2014; the largest HIV outbreak in the UK to date, associated with homelessness and cocaine injecting. An outreach sexual health adviser (SHA) service was enhanced within the homeless health service to perform intensive contact tracing and education. Approximately one third of those diagnosed are female, and in line with BHIVA guidelines this dedicated service also provides a full sexual and reproductive health (SRH) service to these women. This audit cycle aimed to establish if the enhanced service successfully addressed the SRH needs of the female PWID living with

HIV. A secondary aim was to assess their engagement in HIV care, determined by HIV viral load (VL) measurements.
Method: On two time periods, one prior to the implementation of the service (30th June 2018) and again a year later (30th June 2019), data for each woman in the cohort on cervical screening history, sexual health screens (SHS), contraceptive needs assessment and HIV VL measurement was gathered using electronic patient records.
Results: Data was available for 40 women. Results for each audit cycle are shown in Table P158.1.

Table P158.1. Comparison of data between 2018 and 2019

	2018	2019
SHS in last year	12/40 (30%)	11/40 (28%)
Cervical screening in last year	19/40 (48%)	15/40 (38%)
Contraceptive needs assessed	17/40 (43%)	22/40 (55%)
Long Acting Reversible Contraception (LARC)	10/40 (25%)	14/40 (35%)
HIV VL checked in last 6 months	31/40 (78%)	36/40 (90%)
HIV VL undetectable in last 6 months	24/40 (60%)	31/40 (78%)

Conclusion: Providing an enhanced SHA service within a city centre homeless health service allows for accessible SRH care for female PWID living with HIV. Our service enhancement has improved the contraceptive needs of these women, evidenced by an increasing number of women having their needs assessed and more women accepting LARC. The cervical screening and SHS rates remain low, highlighting the recognised challenges of engaging this vulnerable group in intimate examinations and cervical screening. We plan to continue to provide this service and offer cervical screening at every visit to this cohort of women.

P159

Late diagnoses of HIV over one year in a regional infectious diseases centre

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Background: Late diagnosis of HIV is associated with poor outcomes. Nationally, 40% of diagnoses are late (first CD4 <350). From July to end December 2018, BHIVA piloted a national late diagnosis review process, evaluating the feasibility of this patient safety initiative. We continued to monitor new diagnoses in this very high prevalence area through 2019 to determine the project feasibility in the context of planned scale-up of HIV testing.
Method: For all new diagnoses in 2019, we documented setting and date of diagnosis, baseline demographics, initial CD4 count and viral load, presence of AIDS defining illnesses, level of harm suffered due to missed opportunities and whether the standard GP letter and/or a clinical incident report and root-cause analysis (if applicable) had been completed.
Results: There were 47 new HIV diagnoses during the study period. Of these, 76% were male, 53% British and 60% heterosexual. Diagnosis was late in 33/47 (70%) and 23 (49%) were diagnosed very late (CD4 count <200). Eighteen presented with an AIDS-defining illness, including one who died in hospital. There were no statistical differences in ethnicity, gender or sexuality between patients who were diagnosed very late and those who were not.
All those diagnosed late had a letter sent to their GP, requesting a 'look back' exercise to identify missed opportunities to test for HIV earlier. Where appropriate a clinical incident was reported- this was relevant in 4 cases and root cause analyses always recommended wider testing. We aimed to additionally complete an internal look back exercise with each patient. However, this was particularly challenging in our busy department with a large number of new diagnoses. In a retrospective analysis of hospital records, 13/22 (59%) with very late diagnoses had clear missed opportunities for testing according to their Emergency Department (ED) records or clinic letters, including indicator conditions at presentation to GP, ED and medical outpatient settings.
Conclusion: Our infectious diseases department receives a high number of late diagnoses due to our referral pathways; a number of whom experienced harm as a result of missed opportunities. A planned scale-up of HIV testing in hospital and primary care is much needed.

P160

Expanding virtual clinic (VC) options for stable HIV patients: demonstrating the feasibility of video clinics (VIDC)

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Background: Advances in healthcare for those living with HIV have resulted in an increased proportion of long-term stable patients. There is a need for HIV services to adapt, and provide suitable models of care for this cohort. As part of the digital transformation of the NHS, our service began to offer VC for stable patients through a successful nurse-led email clinic in 2016. This clinic is convenient for patients, utilises our specialist nurses and creates more time for complex patients in consultant-led clinics. Here we describe the feasibility of expanding our VC offer to include the use of VIDC.
Method: 11 patients already using the email clinic were recruited to take part in a pilot trial of VIDC.Patients were asked for feedback about video technology after their appointments, and completed a questionnaire to assess the acceptability of introducing more VC options. This questionnaire was later made available to all patients attending the HIV service for 2 days in January 2020. A qualitative staff survey was completed.
Results: 9/11 patients 'attended' their video appointment; 9/9 felt that it was as good or a better experience than face-to-face consultations. 2/9 experienced technical issues. 9/9 reported that they would be happy to have a video appointment again.
37 patients completed the acceptability questionnaire: 46% reported that they would regularly use VIDC; 57% reported that VIDC would save time; 43% cited a reduction in travel expenses; 35% reported that VIDC was not as personal as face to face; 30% would not prefer VIDC over a face to face appointment.
Staff conducting the VIDC trial stated they would like to use VIDC again, and cited interactivity and the ability to respond in real time as the main advantages.
Conclusion: We have shown that the introduction of a range of VC, including VIDC, to the HIV service is both feasible and desirable to many patients and staff. Moreover, its efficiency, when compared to face-to-face consultations for the stable patient, and scalability, when looking ahead, ensures that it also fits with the NHS Long Term Plan, which sets out aims for mainstreaming digitally-enabled care.

P161

Measuring HIV stigma and discrimination among healthcare workers in a London hospital

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Background: Previous surveys and anecdotal reports have suggested that people living with HIV (PLWHIV) can experience stigma and discrimination in non-HIV healthcare settings. We set out to measure this in our hospital.
Method: A brief 8 item survey developed in 2015 by the Health Policy Project was used. This survey has been validated globally in healthcare settings and has questions relating to fear of HIV transmission, witnessed discrimination in care, as well as attitudes towards PLWHIV. Healthcare staff from a variety of professions were invited to complete the survey at a stand for World AIDS day 2019. The responses were entered and analysed on a database.
Results: A total of 184 surveys were completed; not all questions were answered or applicable to the staff member. In caring for PLWHIV, a significant minority of respondents felt worried or very worried about dressing wounds (25/156, 16%) and taking blood (34/155, 22%). 11% of respondents said they would feel at least "a little worried" touching the clothes of PLWHIV. 11% reported avoiding physical contact and 20% wearing double gloves as infection control measures for PLWHIV. A significant minority said they had seen staff being unwilling to provide care for PLWHIV (16/119, 13%) or providing poorer care relative to other patients (17/117, 15%) at least some of the time. Most (162–165) answered questions about attitudes: 11% and 10% respectively agreed that PLWHIV "do not care if they infect other people" and that people get HIV from "irresponsible behaviours", while 4% said that PLWHIV should "feel ashamed of themselves". 12% disagreed that women living with HIV "should be allowed to have babies if they wish".
Conclusion: Most staff reported no evidence of stigmatising behaviour/attitudes. However, a significant minority were worried about care practices

that carry negligible or zero transmission risk with standard infection control protocol. An unacceptable number reported unnecessary infection control measures or witnessed discrimination in care. Attitudes towards PLWHIV were generally favourable, but small numbers were more negative. Limitations of the survey include lack of information on job or grade and difficulty inferring the reasons why people answered as they did.

P162

Embedding physiotherapy and occupational therapy into a multidisciplinary frailty service for people living with HIV

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Background: A monthly multidisciplinary clinic was started in response to growing evidence of earlier onset frailty in people living with HIV.The clinic provides a single, multidisciplinary assessment and appropriate signposting or referral for those developing frailty problems as they age. This paper presents the first year therapy experience in this service.
Method: Patients aged 50 and over were referred using the Fried Phenotypic Criteria.
The clinic was a 'carousel' with three 30 minute assessments::

1 HIV Consultant and Geriatric Consultant
2 Pharmacist and Clinical Nurse Specialist
3 Physiotherapist and Occupational Therapist

The physiotherapy assessment was developed to screen common issues (pain, falls, fractures), undertake the Short Physical Performance Battery (SPPB), collect self-reported measures of disability (WHODAS 2.0 12-item) and activity (Rapid Assessment of Physical Activity (RAPA)), and to discuss current physical activity and barriers.
The occupational therapy assessment used an initial interview structure to understand a patient's home environment, level of support, physical function including personal care and activities of daily living. Due to time constraints, observation and self-report of cognitive difficulties were relied on, rather than standardised assessments.
Sessions concluded with advice, signposting and/ or referral as appropriate.
Results: 33 patients (24% female) aged 52–91 (median age 67) were assessed in 8 clinics (March to November 2019). Median self-reported disability was 37.5% (IQR 20.83%–54.17%); SPPB score 6/12 (IQR 2–9); and RAPA aerobic score 3 (IQR 3–3).84.8% reported pain, 51.5% had a minimum one fall in last 6 months; and 26.7% reported a fracture. 76% had cognitive difficulties and 48.5% wanted to be more physically active.
Following assessment, 24.2% were provided with advice or information; 9.1% received a walking aid; 54.5% were referred onto other therapy services; 24.2% were referred onto social services; 12.1% were discussed regarding further medical investigation.
Conclusion: This pragmatic trial of therapists in a new HIV frailty clinic identified unmet needs. Phase 2 aims to triage patients into more medically or therapy focused assessment to avoid duplication. Future directions include more focus on cognition and the support for increasing physical activity levels.

P163

HIV drug treatment cost savings achieved in Scotland 2016–2019

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Background: In 2017, the Scottish HIV Clinical Leads, in collaboration with NHS National Procurement and the third sector, published 'Guidance for cost-sensitive HIV therapy prescribing guidance in NHS Scotland' detailing eight key strategies to increase cost-efficiency for antiretroviral treatment whilst maintaining excellent clinical outcomes. The guidance was updated in 2018 and a new version is in preparation.
Method: Framework agreements for generic HIV medicines, tendered by National Procurement deliver a single price for each medicine enabling a consistent approach to prescribing across NHS Scotland. A nationally agreed approach to use generic HIV therapy emphasises that cost and affordability of medicines are integral to prescribing decisions. Publicly-available guidelines therefore signal an appetite for generics to manufacturers and also provide a useful negotiation tool in discussions with suppliers of branded medicines.
Cost savings from March 2016 to March 2019 were quantified using centrally-held prescribing data from NHS National Procurement.
Results: Introduction of cost sensitive prescribing guidance in conjunction with a proactive procurement approach generated significant savings on HIV medicines for NHS Scotland. Beyond generics, negotiations with suppliers of branded medicines led to a price reduction of single tablet regimens.
The annual HIV treatment cost in NHS Scotland in the 3 years to March 2019 fell from £19.25 million to £7.45 million per year; a recurrent saving of £11.8 million. This represents a 61% saving on baseline HIV treatment expenditure in 2016, despite the number of individuals receiving antiretroviral treatment increasing by 11% during the period.
Building on this collaboration between HIV clinicians and Procurement, Scotland awarded a contract for generic emtricitabine/tenofovir from November 2017 supporting the NHS-funded pre-exposure prophylaxis programme at a significantly reduced cost. This produced estimated cost-avoidance of a further £7 million on HIV prevention drugs to 2019.
Conclusion: With the support of patients and the third sector, significant savings have been generated by collaborative working between clinicians and procurement professionals. NHS Scotland has maintained excellent HIV outcomes meeting including UNAIDS 90:90:90 targets. Where there are alternative positive treatment options, increased clinician awareness of drug costs has informed decision making. This methodology may be transferable to other therapeutic areas.

P164

Use of Achilles Insight to screen for osteoporosis in patients living with HIV

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Background: European Aids Clinical Society (EACS) and local guidance advise a dual energy X-ray absorptiometry (DEXA) for people living with HIV (PLHIV) age ≥50 years to monitor bone health. We introduced a rapid and in-clinic bone density screening service, using a quantitative ultrasound device called Achilles Insight (AI), to improve our monitoring rates amongst this group of patients. We aim to present the outcomes of this service.
Method: A retrospective case note review was performed to compare the proportion of PLHIV ≥50 years old who completed a DEXA scan pre-AI (1st February to 31st August 2018) against the proportion of PLHIV ≥50 years old who had a DEXA and/or AI scan (1st August to 31st September 2019). Variables on demographics, details of bone scans, DEXA result, AI result and outcomes of scans were recorded.
Results: Of the patients reviewed, 97.8% were male with a median age of 54 years (range 50–79 years). In 2018, 223 PLHIVA ≥50 years old attended clinic, of which 27% had a DEXA scan. In 2019, 95 PLHIV≥50 years old attended clinic; 41.1% had BMD scan, of which 35.9% were AI and 64.1% were DEXA. Of the AI performed, 2 scans (14.3%) had a T score of ≤ −2.5 indicating osteoporosis.
Conclusion: Introduction of AI is associated with an improved rate of BMD monitoring amongst over 50 year old PLHIV, and also provides in-clinic screening and results to manage patients immediately. Abnormal AI results require further investigation with a DEXA scan, however, can reduce our DEXA request costs. As the AI service develops we hope all patients will receive this scan as an initial screening service. This service could be replicated in other services and is important in the aging population of PLHIV. We recognise a major limitation is not having the availability of fracture risk assessment tool (FRAX) scores to compare.

P165

Patient experiences of a community HIV clinic: a qualitative evaluation

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Background: Historically, human immunodeficiency virus (HIV) outpatient care has taken place in hospital outpatient clinics and genitourinary medicine

(GUM) clinics. As a result of important medical advances in the treatment of HIV since the 1980s, the diagnosis of HIV has changed over time from being seen as a 'death-sentence' to being seen as a chronic disease requiring ongoing management, much like diabetes. As much as the treatments have evolved, until now, there has been little evolution in the setting of the delivery of outpatient HIV care in the United Kingdom (UK). A new model of outpatient care has been introduced by a hospital in a city in the UK. In this model, an Infectious Diseases (ID) consultant attends several General Practice (GP) surgeries in the city to run satellite outpatient HIV clinics. This study is a qualitative evaluation of one of these satellite clinics and aims to explore patients' experiences of attending it.
Method: A qualitative study using 8 semi-structured individual interviews. Convenience sampling was used. Interviews were digitally audio-recorded and 'intelligently' transcribed. Thematic content analysis was conducted and NVivo 12 was used to aid data management.
Results: Participants reported that attending the co-located clinic had improved their health and wellbeing through normalisation, reduction in stigma and reduction in treatment burden. Reduction in treatment burden was due to increased trust in the healthcare provider and decreased time-cost to the patient. Increased trust was mediated by better continuity of care and the perception of improved communication with healthcare professional and between healthcare professionals. The presence of a care-coordinating nurse was identified as the most important factor leading to increased trust. Decreased time-cost to the patient was mediated by shorter waiting times, convenience of location, easier access to clinicians and information and greater trust in the healthcare provider.
Conclusion: New models of HIV outpatient care may be beneficial to patients' day-to-day experiences of living with HIV. Further research is required in other patient groups and economic evaluation will be necessary to inform policy and planning of future HIV services.

P166

Antiretroviral wastage reduction through prescription management

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Background: In August 2013 a patient from our service requested more medication having received a 6 month supply only 3 months earlier. This led our HIV pharmacist to wonder whether other patients were also stockpiling medications either intentionally, as in this case, or unintentionally.
Method: In September 2013 we added an additional data column to our medication record sheet for homecare and clinic collect prescriptions to keep a running total of medications for each patient. These prescriptions account for 66% of all antiretroviral prescriptions written within our service. Stockpiling and medicines wastage is now minimised by, where appropriate, reducing prescription length during HIV pharmacist validation so patients only have enough medication to last until their next appointment plus one month in hand. Data on all of the prescriptions that have been reduced has been collected. This has enabled us to track the savings made based on antiretroviral costs at the time.
Results: This strategy started in the GUM HIV service (cohort ~1,000) in September 2013. Over the next three years we saved an average £101,600 per year. In 2016 our GUM and ID HIV services merged (cohort ~1,500) and that year we saved £269,000 using this strategy. In 2017 another ~400 patients joined our cohort and the subsequent two years saw an average saving of £183,000 per year. This year, to date, 139 prescriptions have been reduced by a total of 6,270 days of antiretroviral therapy equating to a reduction in expenditure of £49,000. Since we implemented this strategy 1,739 prescriptions have been reduced by a total of 65,142 days enabling savings of £961,000.
Conclusion: Through the introduction of this simple, efficient strategy we have avoided considerable medicines wastage and achieved significant savings on drug spend. Availability of generic medication is leading to reduced antiretroviral costs so future savings made by using this strategy may be less dramatic than previous years. However, this is an effective way of generating savings, reducing stockpiling of medicines and avoiding NHS resource wastage. We would, therefore, encourage other HIV units who do not already have this process in place to consider implementing a similar prescription management strategy.

P167

Test@Work: development and fidelity testing of a digital toolkit on workplace health checks and HIV testing for employers

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Background: In the UK, few employers offer general health checks for employees, and opt-in HIV testing is rarely included. There is a need to provide evidence-based guidance and support for employers around health checks and HIV testing in the workplace. An Agile approach was used to develop and evaluate a digital toolkit to facilitate employers understanding about workplace health screening.
Method: The Test@Work toolkit development included online survey (n=201), stakeholder consultation (n=19), expert peer review (n=24), and pilot testing (n=20). The toolkit includes employer guidance on workplace health promotion, workplace health screening, and opt-in HIV testing with signposting to resources. Pilot test included assessment of fidelity (delivery and engagement), and implementation qualities (attitudes, resources, practicality, acceptablity, usability and cost).
Results: Employers were satisfied with the toolkit content, usability and utility. The toolkit had high fidelity with regards delivery and employer engagement. Assessment of implementation qualities showed high usability and practicality, with low perceived burden for completion and acceptable cost implications. Very few resource challenges were reported, and the toolkit was considered to be appropriate for any type of organisation, irrespective of resources.
Conclusion: Employers perceived the Test@Work toolkit to be useful, meaningful and appropriate to their needs. This digital resource could be used to support employers to engage with health screening and opt-in HIV testing within the context of workplace health promotion.

P168

A specialist women's clinic provides more comprehensive care than routine HIV clinic for women living with HIV

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Background: One third of people living with HIV in the UK are women.A 2018 report by the Terrence Higgins Trust found women living with HIV (WLWH) frequently feel their views are not sought, nor their issues prioritised in the response to HIV.
Our department serves a predominantly MSM population, with only 15% of the cohort being female. A multidisciplinary clinic was started in 2016 to address issues specific to WLWH. We assessed the efficacy of our specialist women's clinic (Sunflower) versus standard HIV clinic in assessing HIV, contraception, bone mineral density (BMD), menopause and psychosocial health according to BHIVA national monitoring guidelines.
Method: Retrospective record review from 2016 to 2019 of all women who attended Sunflower and number matched records of women attending general HIV clinic. A database was created to collect demographic information and assessments of HIV, contraception, menopausal symptoms, BMD and psychosocial health.
Results: Median age was 49 years in women's clinic and 48 years in standard care with the majority being of black African ethnicity (53.4% and 45.6% respectively). More WLWH in Sunflower were virally supressed (viral load <40 copies/ml) on antiretroviral therapy (96.1% versus 86.3%). In Sunflower 54/55 (98.2%) of women aged 45 and older had formal assessment of BMD, as opposed to 32/49 (70.7%) in standard care. Women of menopausal age were assessed for menopausal symptoms in 53/54 (98.1%) in Sunflower and 19/43 (44.2%) in standard care. 72/79 women of childbearing age (91.1%) had contraception review in Sunflower and 43/72 (59.7%) in standard care. 93/103 (90.3%) had documented psychosocial review in Sunflower as opposed to 74/103 (71.8%) in standard care.
Conclusion: Sunflower women's clinic was more comprehensive in all assessments of HIV, reproductive, bone and psychosocial health.This may be due to time constraints in and reduced frequency of routine HIV appointments, and that more women seen in routine HIV care had detectable viral loads,

which may have diverted attention away from these issues. We recommend specialist clinics or multidisciplinary working for care of WLWH to ensure their needs are met.

P169

Keeping on track with medication reviews: a multi-site audit

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Background: The life expectancy of people living with HIV (PLWH) has dramatically improved due to advances in antiretroviral (ARV) therapy. Polypharmacy increasingly occurs in aging HIV populations with an estimated prevalence of clinically significant drug-drug interactions (DDIs) between 14% and 58%. Management of these DDIs is often the responsibility of the HIV clinician.
Aim: To assess compliance with the current British HIV Association (BHIVA) Standards of Care for documentation of a medication review over a 15-month period. We also aimed to review documentation of DDI management plans.
Method: Retrospective case note review was conducted on 171 patient consultations across four London clinics. The definition of medication review was discussed and locally agreed as 'an attempt at documenting drug history or review of current ARVs and/or co-medications'. Patients were excluded if newly diagnosed or had transferred their care in the last 15 months. The significance of DDIs was graded using the Liverpool HIV Drug Interaction traffic light system.
Results: Patients were predominantly male (92.4%) and Caucasian (71.9%) with a median age of 50. The median CD4 count was 720 cells/mm^3 and 95.3% of PLWH were virologically suppressed. Of the 171 patients, 150 (87.7%) had a documented medication review in the preceding 15 months.
Of the 90 PLWH (52.6%) taking co-medications, 1 'red' (when co-administration is not recommended) and 40 'amber' (potential) interactions were identified, affecting 15.8% of the audited population. However, only 36.6% (15/41) of the interactions and their management plans were documented.
Among the documented DDIs, the most common perpetrators were boosted PIs (20/41), followed by NNRTIs (16/41) and INIs (4/41). Documented management of DDIs included interventions such as monitoring clinical effects, adjusting dosages of co-medications and switching ARVs.
Conclusion: Overall, we demonstrated good adherence to BHIVA standards in documenting medication reviews. However, there was lack of documentation for both interactions and management plans. Recommendations to improve this include: creating an electronic HIV consultation template with a self-populated drug history once inputted and link to Liverpool HIV Drug Interaction website; prompting PLWH to bring current list of co-medications to their appointments.
Limitations include incomplete medication review on electronic patient records, therefore underestimating the prevalence of DDIs; lack of documentation of recreational drug use; possibility where successful interventions made by pharmacists were not documented.

P170

Pneumocystis jirovecii pneumonia PCR test on upper respiratory tract viral swab: experimental study for rapid diagnostic utility

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Background: Pneumocystis *jirovecii* pneumonia (PCP) is an opportunistic fungal infection with a high morbidity and mortality among people living with HIV. Local laboratory diagnosis of PCP involves obtaining a lower respiratory tract (LRT) secretion sample by induced sputum or bronchoalveolar lavage and testing the specimen for PCP using a multiplex tandem PCR-based assay (AusDiagnostics Pneumonia panel). PCP PCR has higher sensitivity and specificity than immunofluorescence and is now the only laboratory test offered in our hospital. Swab specimens from the upper respiratory tract (URT) are used for routine testing for viral pathogens for patients presenting with respiratory symptoms in our hospital. Aliquots of DNA extracted from URT specimens are retained in the laboratory for up to 18 months. We conducted a preliminary service improvement project to explore the utility of URT swabs for PCP diagnosis using realtime PCR.
Method: 9 URT specimens obtained from HIV positive patients diagnosed with PCP and having a positive AusDiagnostics test from LRT samples obtained during the same episode of illness were retrospectively identified. 9 control URT samples from HIV positive patients with a negative AusDiagnostics result in LRT samples were also identified. Stored aliquots of DNA extracted from these samples were retrieved and tested by an in-house realtime PCR for the presence of PCP DNA.
URT samples collected after PCP treatment initiation were excluded from analysis and one sample collected from a patient on pentamidine nebulization was excluded due to variability of drug penetration in lungs.
Results: 9 URT samples from PCP infected HIV patients and 9 URT samples from PCP uninfected HIV patients were tested for PCP by realtime PCR. The results obtained were identical to the result of the corresponding LRT specimen (i.e., Positive predictive value 100%; Negative predictive value 100%; 95% CI: 81.47% to 100.00%).
Conclusion: PCP realtime PCR results for swab from the upper respiratory tracthad equivalent performance to lower respiratory tract specimens. This has clinical implications with potential advantage of early diagnosis, faster turnaround time and avoidance of invasive procedures and additional hospital attendance for diagnostic investigations of PCP.

P171

Undetectable=untransmittable SMS service: an initiative for stigma alleviation

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Background: The BHIVA statement encourages universal promotion of undetectable=Untransmittable (U=U); however, this is a challenge to deliver in a targeted way. We therefore tested the utility of sending a short message service [SMS] with the undetectable HIV viral load results along with U=U information leaflet as a short link.
Method: A multi-stakeholder quality improvement (QI) project was undertaken at our HIV clinic at central London hospital to send SMS to patients who opted-in to use the service.The SMS: 'Your HIV viral load on dd/mm/yyyy was undetectable. For more information on U=U click: bit.ly/uequalu' was sent. The short link was created linking to the ibase U=U information webpage.The SMS had 'NHS-no-reply' as the sender information.
Results: A total of 250 HIV patients were offered during the QI project and120 people opted-in (48%) and received this SMS over 5 months from August 2019 to December 2019. Patient feedback [n=14] showed satisfactory results [Mean 5 out of 5 stars] for the service and patients comments reflected on its usefulness to show to their partner, helping awareness for U=U and reducing self-stigma and anxiety around HIV transmission.
Clinicians reported that people in sero-discordant relationship and those abstaining sex due to anxiety around transmission were helped by this service. This is now established as a routine care to our clinic patients, achieved at a minimum cost to the service.
Conclusion: SMS on undetectable HIV viral load results along with short link for U=U digital leaflet supports the targeted promotion of U=U. Patients living with HIV report that the message reduced stigma and anxiety around HIV transmission when their viral load information was delivered to their mobile phone along with the digital leaflet.More work is required to raise awareness about HIV treatment success, HIV testing and engagement in care to support 'getting to Zero HIV'.

Sexually transmitted infections, reproductive health, contraception and sexual dysfunction

P172

Audit of cervical cytology uptake in women living with HIV (WLWH)

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Background: BHIVA currently recommends annual smears for WLWH. In November 2019, our trust moved from cytology-based cervical screening to

primary HPV testing. Audit aims: to evaluate smear uptake and outcomes prior to the change to HPV testing, and to assess whether GP communication improved annual smear uptake in WLWH.
Method: All assigned female at birth patients attending the HIV clinic between 1/10/18–31/9/19 were identified using HARS. Exclusions: age <25 or >65; recent transfer; non-local GP. The first 300 patient records were reviewed.
Results: Median age 45 (IQR: 40 – 50). 100% Cisfemale. Ethnicity: 245/300 (81.7%) African, 27/300 (9.0%) White British. 286/300 (95.3%) on cART. 271/286 (94.8%) viral load <50. 214/300 (71.3%) CD4 >500. Total hysterectomy: 2/300 (0.7%). Documented smear at some point during their HIV care: 289/298 (97.0%). 241/289 (83.4%) smears were completed by the GP.
Smear in the last 13 months (local target 80%): 196/298 (65.8%). Previously abnormal smears in the last 3 years were associated with future abnormalities ($p<0.00001$).

Table P172.1. Cervical cytology outcomes of samples taken within the last 13 months (n=196)

Result	N (%)	HPV positive	Mean CD4 (cells/uL)	Previous abnormal smear in the last 3 years
Negative	178/196 (90.8%)	–	>500	11/178 (6.2%)
Borderline	7/196 (3.6%)	4/7 (57.1%)	>500	4/7 (57.1%)
Low Grade	7/196 (3.6%)	6/7 (85.7%)	351–499	3/7 (42.9%)
High Grade	3/196 (1.5%)	–	>500	2/3 (66.7%)
Inadequate	1/196 (0.5%)	–	201–350	0/1 (0%)

Of those with an outstanding annual smear, median interval since last smear was 32 months (IQR: 22–59). 214/265 (80.8%) of patients with GP communication had a letter within 15 months stating annual smears indicated (national target 95%). GP communication did not correlate with recent smear uptake ($p=0.25$).
Conclusion: Annual smear uptake was below standard, despite GP communication and local option of HIV service smear clinic. The overall prevalence of cervical abnormalities in our cohort was higher than UK background rate. However, abnormal cytology results were strongly associated with previous abnormality in the last 3 years, suggesting WLWH with repeatedly negative cytology benefit little from annual recall. Further data from HPV testing in WLWH should guide future practice.

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Annual cervical smear uptake amongst eligible women attending an HIV service: time to have a rethink?

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Background: In women living with HIV (WLHIV), the risk of developing cervical intraepithelial neoplasia is higher (20–40%) compared to in women without HIV (3%). These figures arise from data collected from women in the pre-HAART (Highly Active Antiretroviral Therapy) era.
UK National Health Service Cervical Screening Programme guidelines recommend annual cervical smears in all WLHIV between the ages of 25–65. Our aim was to assess cervical smear uptake and abnormal cytology prevalence in a cohort of eligible WLHIV attending a provincial HIV centre.
Method: Retrospective analysis of women aged between 25 and 65 was performed. Besides demographic data, details included cervical smear history, cytology results between July 2014 and July 2019, HIV treatment, pregnancy and hysterectomy status. Patients living out of area were excluded as their cervical screening information would have been unavailable. Data sources used are ICE and Lilie.
Results: There were 529 women in the cohort. Of these, 476 were eligible for analysis. 260 (54.6%) of smears were in line with the recommendation for annual smears. A further 163 (34.2%) recorded a smear within 5 years. 13 (3.1%) had abnormal cytology in the previous 5 years (10 low grade dyskaryosis and 3 high grade dyskaryosis). Over 95% of this cohort were on treatment with undetectable viral loads.
Conclusion: The cervical smear uptake (54.6%) was low in comparison to cervical smear uptake rates for England from January 2019 to March 2019 (70.2% amongst 25–49 years and 76.4% amongst 50–65 years).
However, there have been few abnormal cytology cases identified by cervical screening in the last 5 years in our cohort in comparison to a previous audit performed between January 2000 and January 2005 (3.1% versus 28.3%). This raises the question whetherthe recommendation for annual cervical smears amongst WLHIV has become less relevant in the HAART era. Further research would be required to determine this.
We recommend to our clinicians that they continue to include recommendations for annual smears in clinic letters at monitoring visits. Additionally to provide patients with specific notes explaining the need for annual cervical smear testing to assist patients in booking their yearly cervical smear tests.

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