

The role of Hepatitis C core Antigen (HCV-cAg) in the era of hepatitis C Direct-Acting Antiretroviral (DAA)

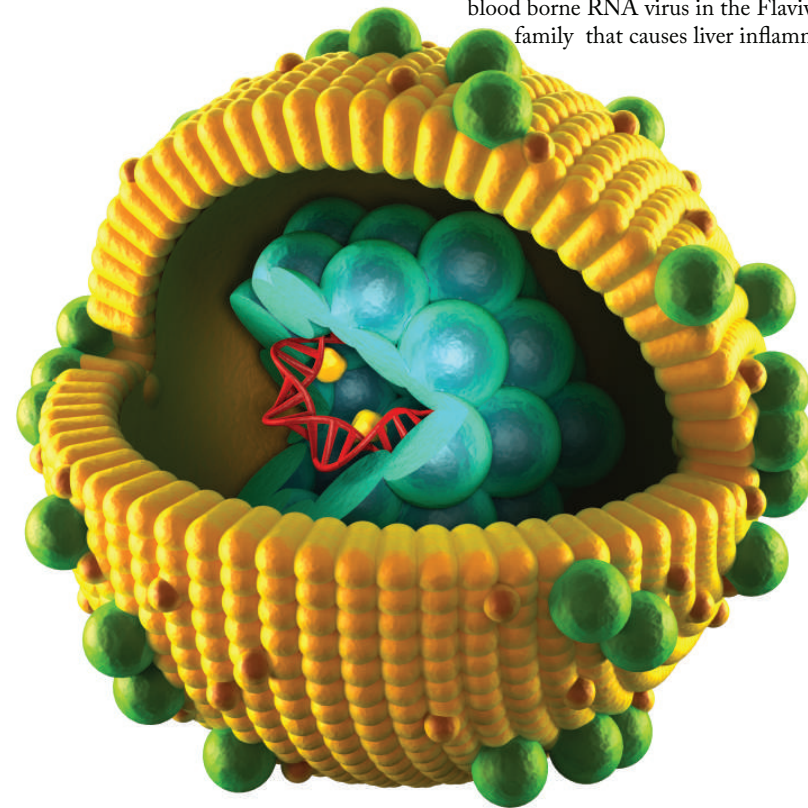
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214,000 chronically infected people
living with hepatitis C in the UK ²

An estimated 40% remain
undiagnosed ²

The prevalence of HIV and HCV
coinfection is about 9% in the UK³

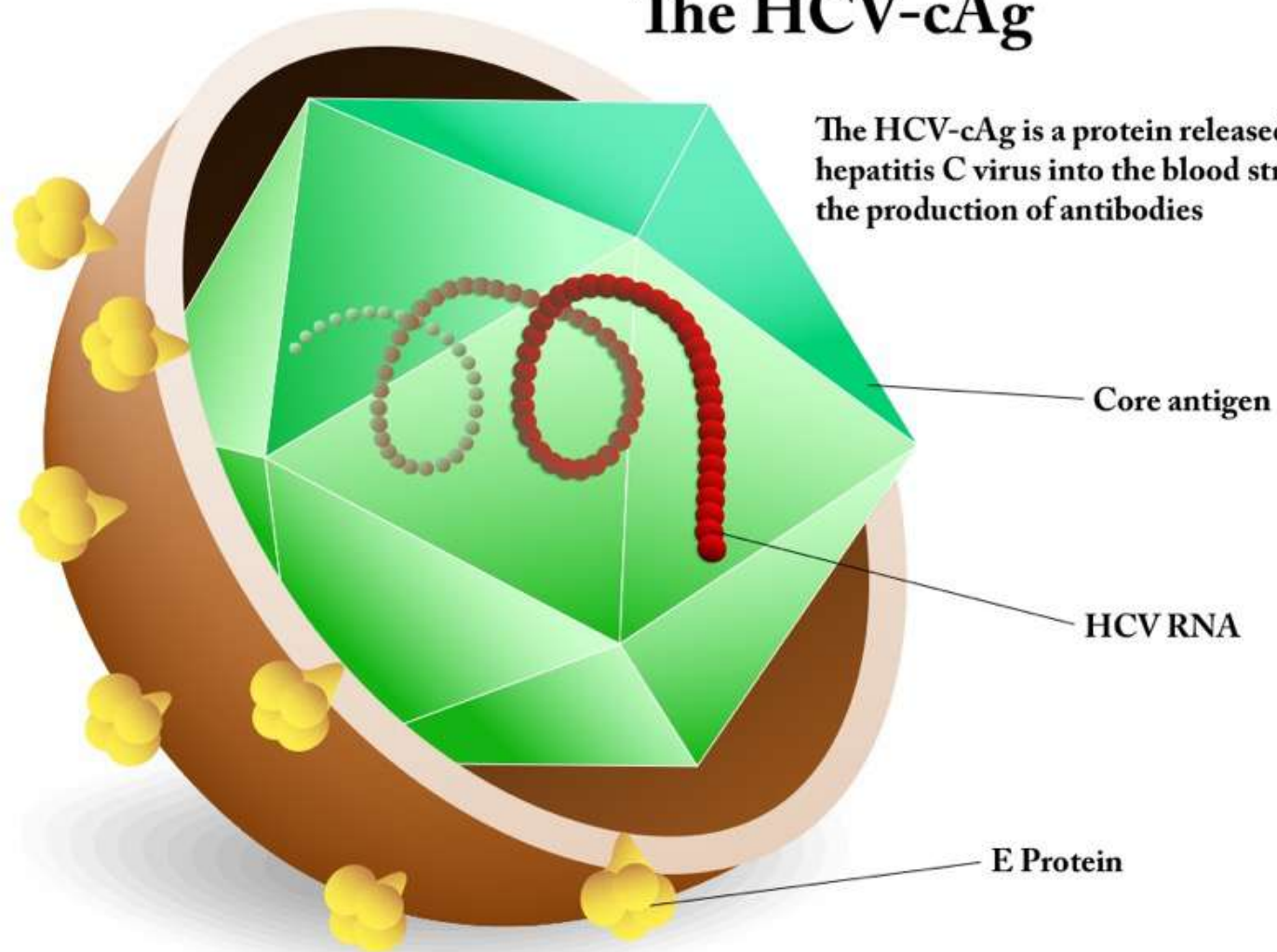
Hepatitis C virus (HCV) is a single stranded
blood borne RNA virus in the Flaviviridae
family that causes liver inflammation



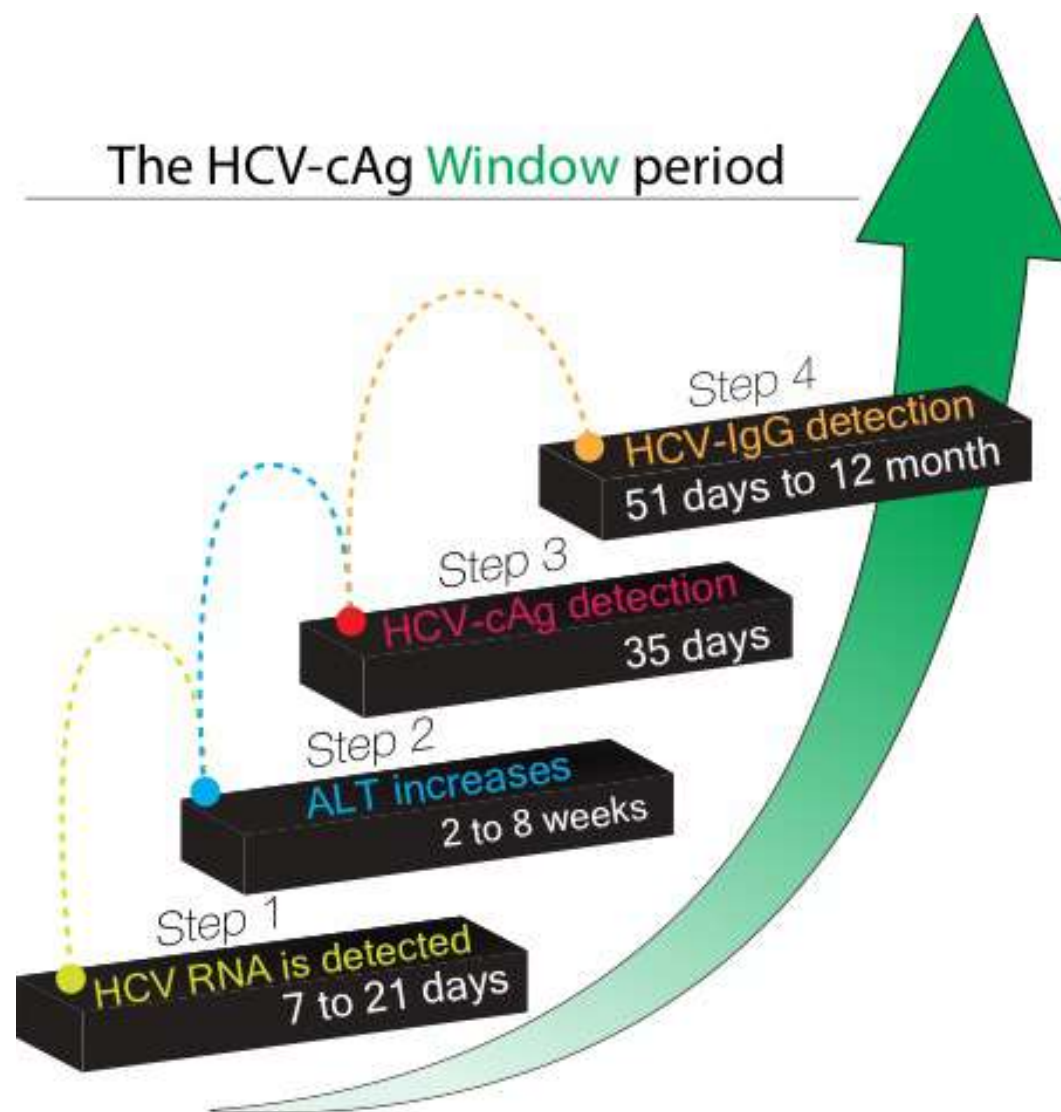
1. Costella, A., Goldberg, D., Harris, H., Hutchinson, S., Jessop, L., Lyons, M., Mandal, S., Ramsay, M. & Salmon, J. [Public Health England] (2016) *Hepatitis C in the UK - 2016 report*. Strategy Retrieved from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/565459/Hepatitis_C_in_the_UK_2016_report.pdf on 17 January 2017.
2. Harris H, Costella A, Goldberg D, et al. Hepatitis C in the UK 2015 report https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/448710/NEW_FINAL_HCV_2015_IN_THE_UK_REPORT_28072015_v2.pdf (2015, accessed 29 March 2017).
3. Turner J et al. *The prevalence of hepatitis C virus (HCV) infection in HIV-positive individuals in the UK – trends in HCV testing and the impact of HCV on HIV treatment outcomes*. J Viral Hepat, 17: 569-77, 2010

The HCV-cAg

The HCV-cAg is a protein released by the hepatitis C virus into the blood stream before the production of antibodies

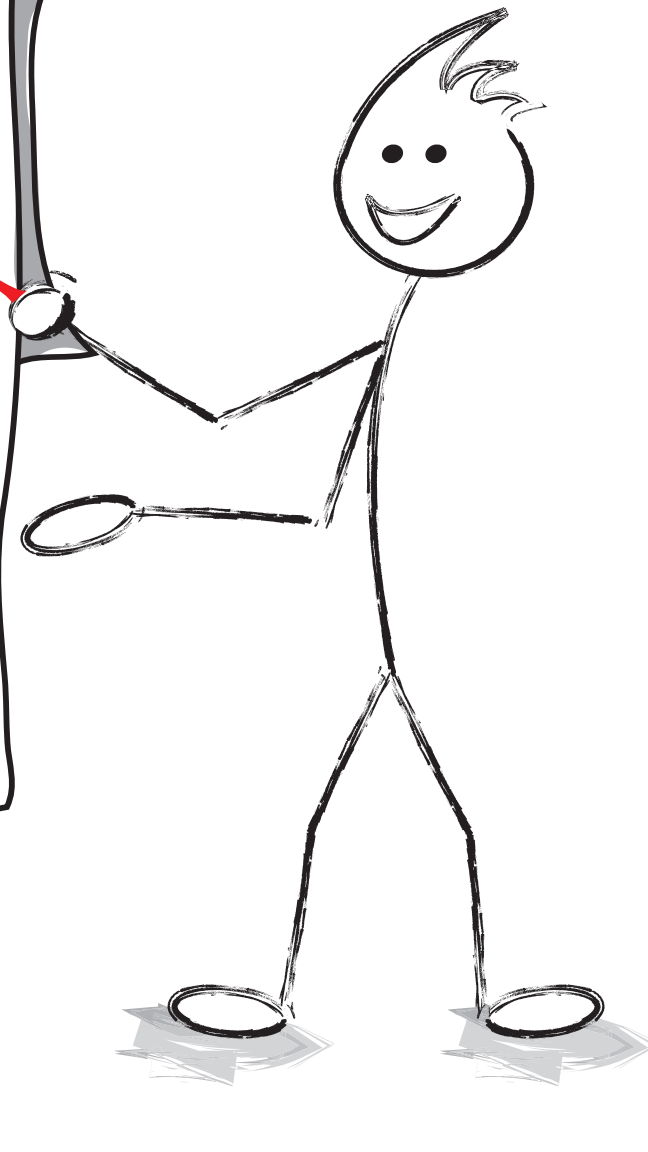


The HCV-cAg **Window** period



AIMS

HCV-cAg assay as an
alternative to
HCV RNA
in monitoring
sustained
virological
response (SVR)



Background

- Hepatitis C core antigen (HCVc-Ag) could be a cost effective alternative to hepatitis C RNA.
- Currently the cost of one HCV-RNA test is £76 whereas HCV-cAg test is predicted to be less at £16 (variable).
- HCV-cAg testing takes 60 minutes, decreasing the turnaround time ¹.

1. Abbott. HCV Ag, http://www.illexmedical.com/files/PDF/HCVAg_ARC.pdf (accessed 20 February 2017).

Background – Clinical

- More than 90% HCV cure rate using DAAs.
- Monitoring on DAAs treatment includes:
 - HCV RNA at baseline
 - On treatment: week 4, 8, 12
 - Post treatment: SVR4, 12 and 24
- Long term monitoring for HCV reinfection ¹.

1. WHO. Guidelines for the screening care and treatment of persons with chronic hepatitis C infection. Updated version, April 2016, http://apps.who.int/iris/bitstream/10665/205035/1/9789241549615_eng.pdf?ua=1 (accessed 20 February 2017).

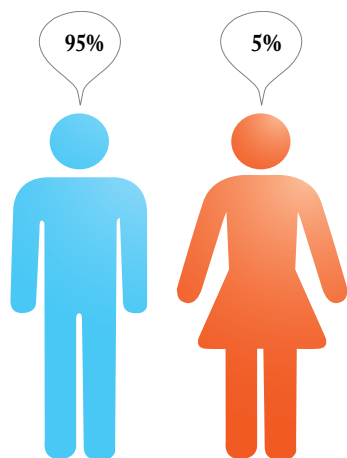
Methods

- Retrospective data collection (February 2016 to March 2017)
 - Demographics, HCV RNA and genotype
 - Liver Fibrosis assessment - FibroScan.
- HCV RNA samples were retested using the **Abbott Architect HCV antigen assay**.
 - a chemiluminescent microparticle immunoassay for the quantitative determination of core antigen to HCV in human serum and plasma, with a manufacturers **sensitivity report of 97.8%** and **specificity of $\geq 99.5\%$** ¹.
- Result interpretation use for the HCV-cAg.
 - Negative = less than 3 fentomol (fmol/L)
 - Equivocal = between 3 to 10 fmol/L
 - Positive = more than 10 fmol/L

1. Abbott. HCV Ag, http://www.ilxmedical.com/files/PDF/HCVAg_ARC.pdf (accessed 20 February 2017).

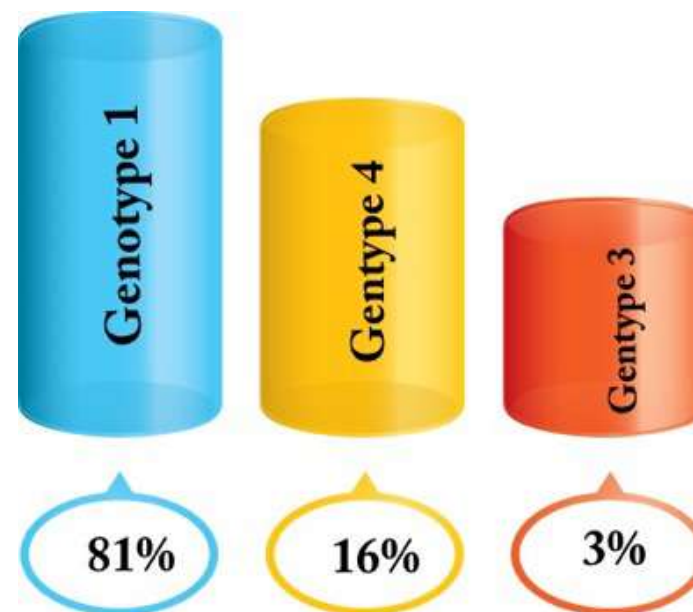
Results 1: Demographics

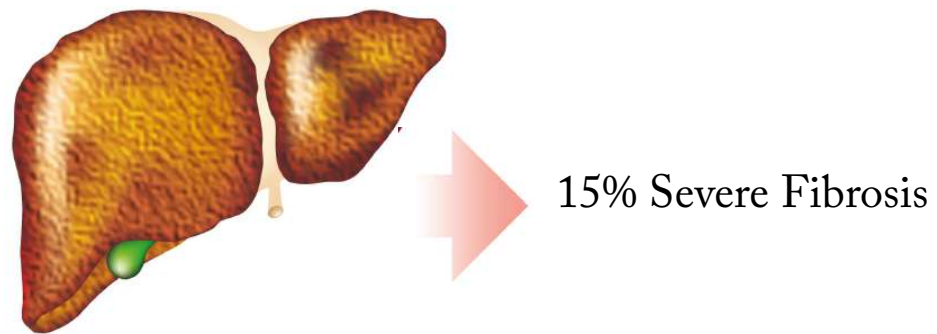
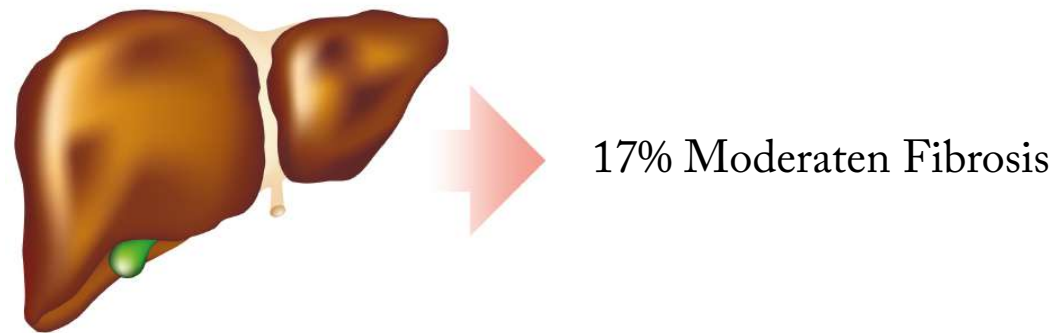
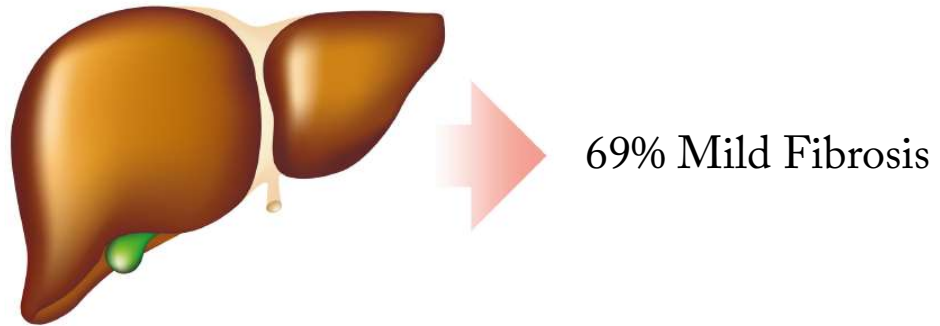
65 HIV / HCV patients
Median age of 44 - IQR: 36 - 50
85% MSM



Ethnicity

80% White
7% Black
13% Asian





The HCV-cAg Results

52 negative
100% specificity
95%CI - 89% to 100%
SVR 24

44 negative
100% specificity
95%CI - 92% to 100%
SVR 12

37 negative
100% specificity
95%CI - 90.5% to 100%
SVR 4

35 negative
100% specificity
95%CI - 90% to 100%
Week 12

50 negative
100% specificity
95%CI - 93% to 100%
Week 8

52 negative
100% specificity
95%CI - 93% to 100%
Week 4

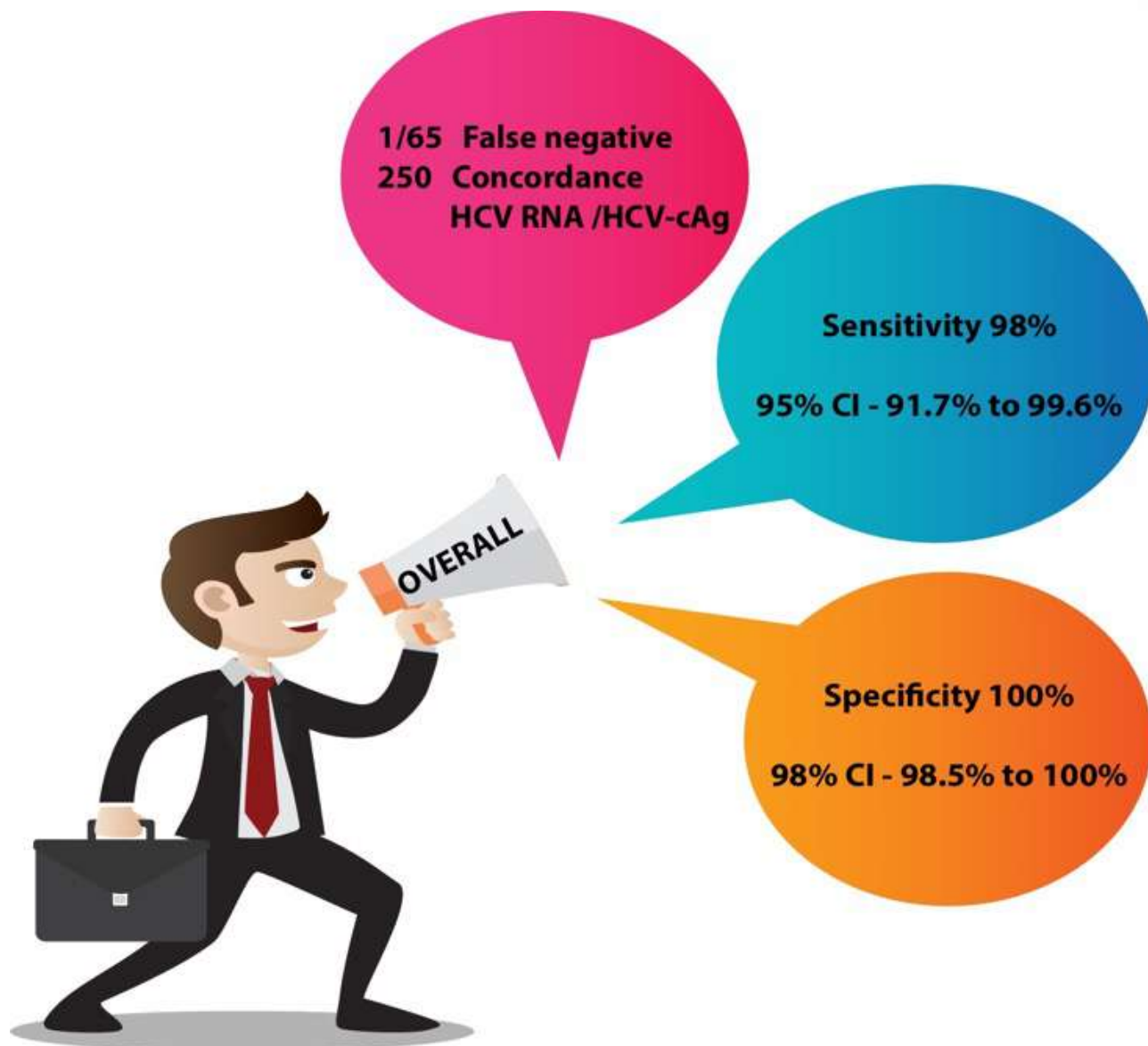
65 positive
1 false negative
98% sensitivity
95%CI - 92% to 100%
Baseline

1,231,457 9,772,684 1,166
Median HCV RNA Max HCV RNA Min HCV RNA

HCV RNA
1,166 IU/ml

HCV-cAg negative





Discussion

HCV core antigen testing (HCV-cAg)
can be used in the following situations:

To identify active infection.

To monitor treatment response.

To monitor long term sustained virological response (SVR).

To detect re-infection.

Discussion

- In this cohort we found one HCV-cAg false negative, with a HCV RNA of 1,166 IU/ml.
- A systematic review and meta-analysis showed a good correlation with HCV RNA greater than 3,000 IU/ml¹.

1. Freiman JM, Tran TM, Schumacher SG, White LF, Ongareello S, Cohn J, et al. Hepatitis C Core Antigen Testing for Diagnosis of Hepatitis C Virus Infection: A Systematic Review and Meta-analysis. *Ann Intern Med.* 2016;165:345-355. doi: 10.7326/M16-0065

Conclusion

- In this cohort HCV-cAg testing is a reliable test with 99.6% negative predicted value (NPV) and 100% positive predicted value (PPV).
- HCV-cAg testing could be a cost effective alternative to HCV-RNA for monitoring SVR.
- £9,880 for 65 patients having twice a year HCV RNA monitoring
- £7,800 saving if HCV-cAg is done instead of HCV RNA

The HCV-cAg team:
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Catherine Lewis, Jane Mullen, Gaia Nebbia, Terry Wong
& Ranjababu Kulasegaram

Abbvie for contributing for the HCV-cAg testing cost