ACHIEVING MEASURABLY BETTER HEALTHCARE PERFORMANCE

Identifying Untreated Hepatitis B and Hepatitis C via Opt-out Screening Program in Urban ED Settings

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Hepatitis B (HBV) and C (HCV) virus infections are major public health problems worldwide causing 1.34 million deaths in 2015.[1] Hepatitis infections are often asymptomatic and therefore under treated. The World Health Organization estimates that only 9% of HBV-infected persons and 20% of HCV-infected persons have been diagnosed, with even fewer treated appropriately.[1] It is thought that this is in part because a significant proportion of people who inject drugs (PWID), baby boomers and individuals born in high prevalence countries are unaware they are infected with Hepatitis B or C. Additionally, infections disproportionately affect those without access to primary health care providers and may only access emergency care services. Lack of awareness and access to appropriate care has led to an estimated 40% of HCV diagnoses in Europe being delayed until the chronic sequalae are manifest.[2]

Countries globally are struggling to make people aware of the epidemic and identify individuals before onset of late stage cirrhosis and fibrosis of the liver. With that, the 2016 Global Viral Hepatitis Strategy prioritised the need for innovative testing strategies integrated with rapid and efficient engagement to care pathways in order to eliminate viral hepatitis as a public health threat by 2030 — a goal that is mirrored by the World Health Organization[1] and Public Health UK.[3] Given the burden of HBV/HCV and the goals set out by Public Health England, the National Health Service is seeking to be the first to eliminate Hepatitis C.[4] The Vir**A&E**mi**C** group is a collaborative care project encompassing Infectious diseases, Virology, Hepatology, Emergency Department physicians, Epidemiologists, Laboratory sciences, Informatics personnel, and Gilead Sciences Ltd targeting unselected populations of patients attending the Emergency Departments (ED) in London as candidates for blood borne viral screening and access to care. Implementation of an opt-out strategy for hepatitis screening in the ED has increased uptake of testing from 0-1% prior to implementation to 70%, increased rates of diagnosis of previously unknown HBV and HCV infections by 26% and 15% respectively, halted disease progression and ultimately reduced terminal stage expenses (40% improvement), saving approximately 33% annually per patient with acute infections.[5]

PATIENT

CLINICIAN

HOSPITAL ADMINISTRATION

PAYOR

VirA&EmiC

The Vir**A&E**mi**C** group is a joint working group between Gilead Sciences Ltd, National Infection Service of Public Health England, Guy's and St Thomas' NHS Foundation Trust and Lambeth CCG co-ordinating a screening service for blood borne viruses among patients attending Guy's and St Thomas' Emergency Department.

KEY PARTNERS / STAKEHOLDERS

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IDENTIFYING UNTREATED HEPATITIS B AND HEPATITIS C VIA OPT-OUT SCREENING PROGRAM IN URBAN ED SETTINGS

SITUATION ANALYSIS

- Despite significant therapeutic advances in the management of Hepatitis C (HCV) and B (HBV), many patients remain untreated, either due to a lack of diagnosis or due to logistical barriers to accessing care
- Lack of early diagnosis and treatment can result in advanced liver disease, which is the third most common cause of pre-mature mortality in the world and specifically in the UK[7]
- Mortality rates from liver disease have increased 400% since 1970 in the UK with Hepatitis C and B viruses as major contributors to disease progression[7]
- Missed or delayed opportunities to manage liver disease in the early stages can lead to liver cirrhosis, hepatocellular carcinoma and death

DISCOVERY

The prevalence of HCV and HBV from increased transmission rates among IV drug users and populations from different countries of origin[6] has triggered national movements to eliminate HCV and HBV infections by global health organizations. The Vir**A**&**E**mi**C** team at Guy's and St Thomas' Hospital in the UK recognized gaps locally with an opportunity to diagnosis and treat new and previously undiagnosed hepatitis infections. With approximately 8,400 patients/month presenting to the ED, large opportunities existed to screen patients from a wide variety of disease states, ethnicities and socio-economic backgrounds for improved detection and better care.

HYPOTHESIS

Significant clinical and logistical hurdles have reduced the likelihood of hepatitis screening in primary care and/or through blood banks, which has created the necessity for alternate and innovative screening approaches. Introduction of an education and opt-out pathway can effectively reduce the hurdles in accessing timely care for all patients presenting to the emergency department. When HBV and HCV screening is initiated early in the disease process the appropriate treatment options can reduce liver cirrhosis, mortality, and cost on the health care system.

Removing Obstacles to Patient Care

- ED clinician recognises risk factors for Hepatitis C and initiates assessment for testing requirement
- ED clinician provides adequate information to gain consent from patient to be tested based on risk factors
- Patient understands information and consents to test
- ED physician selects correct Hepatitis C tests from a panel of potential requests
- ED physician checks result, in most situations after the patient has left the department
- ED physician locates valid patient contact information and communicates result to patient (very time consuming)
- GP requests they return for a Hepatitis C viral load and orders the test
- Patient attends GP surgery or phlebotomy services for "hepatitis C RNA" testing
- Lab performs and results Hepatitis C load
- GP checks Hepatitis C viral load result
- GP communicates the result to the patient and refers the patient to Hepatitis Service
- Patient attends Hepatitis service (first point at which treating service takes an active role in engaging with patient)
- Patient initiates treatment
- Patient completes treatment and attend post treatment follow up to confirm cure

CURRENT APPROACH – **14 STEPS**

- ED physician informs patient that Hepatitis C testing is routine component of testing panel, information available on leaflets posters if required, notes any objection from patient
- Correct order set of hepatitis tests (C and B) is included with all other ED blood order sets by default
- Lab notifies linkage team (cross specialty group of Infectious Diseases, ED and Hepatitis team) of all positive hepatitis results
- Linkage team focus resources on identifying Hepatitis C antigen positive patients (hepatitis C antibody positive and antigen negative results are managed as routine notification (letter) to GP)
- Linkage team coordinate referral and appointment in Hepatitis Services most suitable for patient
- Linkage team can bring in peer support, alcohol and drug misuse services as needed at this stage to support attendance
- Linkage team support throughout treatment to last attendance to confirm cure

VIRAEMIC APPROACH – **7 STEPS**

PARTNERS

Virologist and epidemiologists collaborated with ED physicians, laboratory manager and pathologists to change guidelines and develop the new pathway for screening the ED population with a high sensitivity and quick turnaround assay. The partnership of public private group allowed for highly skilled entities from each discipline to weigh in on critical points of the process and optimize it for the unique Urban ED setting which is highly crowded, short on time and resources.

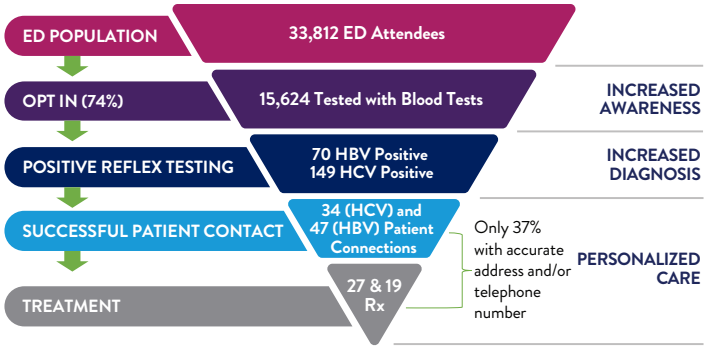
Key enablers for success of this project was involvement of IT connecting patient opt-out selections directly to laboratorians and physicians. Additionally, activation of a community follow-up nurse and the linkage to care coordinator enabled a more effective linkage process and improved treatment/follow-up.

IDENTIFYING UNTREATED HEPATITIS B AND HEPATITIS C VIA OPT-OUT SCREENING PROGRAM IN URBAN ED SETTINGS

EXECUTION

Guidelines outlined below helped broaden the reach of the physicians to detect a high prevalence subpopulation of Hepatitis infections, allowing for earlier detection of disease and quicker linkage to care.

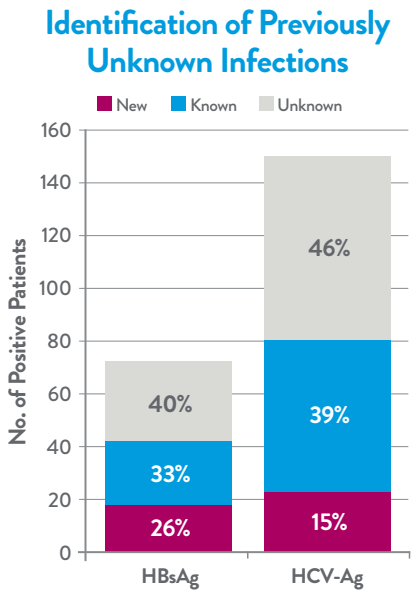
- All individuals attending ED (aged 16 years or above) requiring blood investigations are verbally consented for HIV, HBV and HCV testing
- An electronic blood order set developed with preselected request for HBV surface antigen (HBsAg) and HCV antibodies (including a confirmatory HCV antigen test when positive) for all the blood test requests
- A dedicated linkage to a care coordinator who contacts those with a positive result directly to organise rapid access to clinic
- Linkage to care (LTC) was defined as attending a minimum of one face to face outpatient appointment

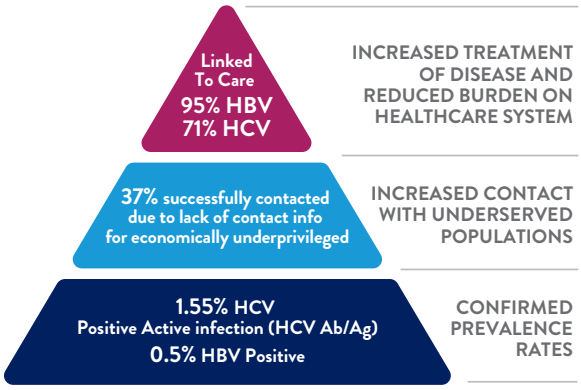


NOTE: Numbers summarized from a four-month period from Oct 2016 to Feb 2017.

PROOF OF VALUE

By utilizing the HCV Ag test the team was able to identify the subset of infected population with an active HCV viral infection and focused their resources on these individuals. By targeting this population and linking them to care there is a significant impact (33% reduction of cost) on future stages of cirrhosis and progression of liver disease to more costly and hard to treat stages.





SUCCESS FACTORS

- HCV Ab/Ag and HBsAg immunoassays are highly sensitive assays with short turnaround time enabling communication of results at the time of screening
- Pathways that employ education and opt-out strategies for additional HBV and HCV screening increase diagnosis and likelihood of linkage to treatment
- Cross disciplinary involvement in viral screening in the ED, increases rates of follow up and treatment for HBV and HCV reducing overall progression of disease
- Non-targeted screening for HCV and HBV in an urban Emergency Department (ED) could play an important role in reaching otherwise underserved groups and linking them to appropriate care

SPOTLIGHT ON STAKEHOLDER SUCCESS

PATIENT	INCREASED **PATIENT AWARENESS**	70% of patients not previously concerned with HBV/HCV became aware of the risk and were concerned enough to opt in to the screening program.
	DIAGNOSIS OF **UNKNOWN INFECTIONS**	• Greater than 26% of newly diagnosed HBV patients in the ED department were previously unaware of their disease • Greater than 15% of newly diagnosed HCV patients in the ED department were previously unaware of their disease
	PERSONALIZED CARE	Linkage to clinical treatment and care of 95% of HBV and 71% of HCV patients.*
CLINICIAN	IMPROVED **CLINICIAN SATISFACTION**	"By screening in the ED department we have the satisfaction of caring for people who are underserved and who typically do not receive care till it's a much later stage of liver disease and almost irreversible." — *Laura Hunter, MBChB (Consultant in Emergency Medicine)*
	INCREASED **CLINICIAN EFFECTIVENESS**	74% of ED physicians at Guy's and St Thomas' NHS Trust indicated that the opt-out program was extremely effective with 26% rating it as effective at identifying HCV/HBV and overcoming obstacles to patient care.
HOSPITAL ADMINISTRATION	ENHANCED **ADMINISTRATION SATISFACTION**	"The 'HCV Opt Out program' is being used to inform the national strategy for HCV elimination. As part of our involvement at the forefront of this important project benefitting our local community, the diagnostic advances and expertise that has been developed at GSTT, gives us a great sense of professional reward and pride." — *Dr. Nicholas M. Price, FRCP, Ph.D, DTM&H (Director of Infection | Consultant Physician Guy's and St Thomas' NHS Foundation Trust)*
PAYOR	LOWER **HEALTHCARE COSTS**	Reduced disease progression with mitigation of terminal stage expenses (40% improvement), saving approximately 33% annually per patient with acute infections.[5]

*Requiring care and contactable.

1. World Health Organization. (2017). Global hepatitis report 2017: executive summary. World Health Organization. http://www.who.int/iris/handle/10665/255017. License: CC BY-NC-SA 3.0 IGO
2. HCV-related burden of disease in Europe a systematic assessment of incidence, prevalence, morbidity and mortality. Nikolai Mühlberger, Ruth Schwarzer, Beate Lettmeier, Gaby Sroczynski, Stefan Zeuzem, and Uwe Siebert. *BMC Public Health*. 2009;9:34.
3. "Eliminating Hep C APPG", All-Party Parliamentary group on liver Health Inquiry Report, March 2018.
4. "Hepatitis C in the UK: 2018 report" Public Health England, Published August 2018 PHE publications, gateway number: 2018310, Editor Dr Helen Harris.
5. Numbers based on Henry Ford Health System. "Economic cost of advanced liver disease." *ScienceDaily*. 7 November 2011. <www.sciencedaily.com/releases/2011/11/111107160142.htm>
6. Public Health England. Hepatitis C in the UK. 2017. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/565459/Hepatitis_C_in_the _UK_2016_report. pdf
7. https://www.gov.uk/government/publications/liver-disease-applying-all-our-health/liver-disease-applying-all-our-health