Assessment of the challenges associated with communication between different healthcare professionals in the care of patients with Hepatitis C and the impact of using mobile application technology to address it: a feasibility study

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Background

Chronic hepatitis C (CHC) is a principle cause of chronic liver disease (CLD), and is a leading indication for liver transplantation. CLD is the only one of the top 5 causes of mortality in the UK that is increasing, and strategies to improve patient outcomes are critical to reduce the healthcare burden.

Major advances in the therapeutic options for CHC and the development of new drugs make this one of the most dramatically changing fields in medicine. The aim of current treatment strategies is to use effective and safe drugs to cure all patients and eradicate disease. However there are obstacles to overcome if CHC is to be eradicated. For example, it is estimated that only 50% of prevalent cases have been identified so far. Additionally, many patients present with decompensated or advanced liver disease that has a dramatic impact on prognosis and treatment efficacy.

Public health strategies aim to improve detection of disease and provide curative treatment to reduce incidence of liver cirrhosis and the burden of CHC. Whilst CHC affects 0.69% of the UK general population (200,000 people), over 60% of CHC cases are people who inject drugs (PWID). Although often deemed "hard to reach" PWID are often engaged with community drug and alcohol services (CDAA), and contact with these services provides a valuable forum to discuss the risk of disease and offer subsequent testing of blood borne viruses including HCV. Diagnosis of HCV and CHC is made using blood tests that detect HCV viraemia. Patients diagnosed with CHC in these community services are usually referred to hospital services for fibrosis severity assessment and treatment evaluation and initiation.

Effective communication between different healthcare services is a mandatory requirement for the optimal care of any patient. Such communication requires clear transfer of patient personal details, contact details, medical details and results related to hepatitis C. However, with the current available tools, obstacles exist. Community and hospital services employ two separate electronic patient record (EPR) systems with little 'cross-talk' and so tracking patients from CDAA to secondary care is difficult. This barrier obstructs the delivery of good and efficient care.

Technology innovations can often overcome obstacles and improve service delivery. An innovative electronic case management system has been developed called 'I-count - HCV' incorporating sophisticated security and data capture technology which allows data to be recorded onto mobile devices (tablets and phones) and transferred between different healthcare professionals. This can be hosted on the NHS N3 secure network. The embedded workflow engine integrated into the application will enable transit and monitoring of patients through their HCV treatment journey and allow healthcare professionals facilitate the efficient delivery of care.

In this study, we aimed to evaluate the I-count tool by interviewing relevant specialists to explore the current challenges and difficulties regarding the transfer of information of patients with chronic hepatitis C between community drug and alcohol services and secondary care healthcare providers, and assessing the potential impact of I-count on this.

Methods

The I-count application was designed by information technology specialists with clinical input from local clinicians. It was introduced for clinical use for patients based at Camden Drug and Alcohol Service and referred to local specialists at University College London Hospital and Whittington Hospital.

Semi-structured face-to-face interviews were conducted with two drug and alcohol services based viral hepatitis nurses before implementation of the 'I count – HCV' application. Field notes were taken and interviews were audio recorded for analytical purposes. A topic guide based on key themes including current methods of communication between services, possible improvements and the requirements of the 'ideal' communication tool was developed and guided by the interview questions.

Initially, a formal re-interview was planned after implementation of the 'I-count – HCV' application to assess the impact of the application to delivery of hepatitis C care. However, given difficulties encountered with the application, informal feedback related to user experience of the application, led to the project being terminated.

Interviews were transcribed verbatim, and reviewed by AS and WMR.

Results:

Pre-implementation interviews:

The I-count application was designed by information technology specialists. It was designed to operate within the NHS N3 network to conform within NHS Information Governance (IG) rules.

The implementation of the application into local NHS IT systems at the Whittington and UCLH required additional IG approval and resulted in significant delays of more than 1 year before implementation.

Pre-implementation interviews were conducted with NG and VL. Communication between health professionals based at CDAA can be by email or formal letter, and usually both. The initial referral letter from CDAA is usually via a proforma, and so includes a brief patient history and psychosocial history, and baseline liver function tests and viral serology. The use of email as back up was deemed desirable as the paper counterpart would frequently not reach its secondary care destination, which would result in administrative delays. NHS.NET email accounts would be used to counter any security concerns. This system was described as working well, although emails would often get deleted with subsequent loss of information. Trawling for previous correspondence was identified as a problem and a central patient information base with all the important correspondence or information would be useful.

A dataset of critical information was identified. This included patient history, relevant past medical and past psychiatric history. Previous hepatitis C related information, including treatment status included blood test results for full blood count, liver function tests and liver synthetic function. Additionally specific information related to hepatitis C including viral load and genotype were deemed essential.

Chasing attendance and results of planned investigations was particularly time-consuming, and having an IT solution that would 'talk' to other hospital interfaces and communicate appointments, DNA's (do not attends) and results of investigations would be useful.

An essential attribute of the application would be facilitation of two-way access between the community and the hospital of relevant information

Post- implementation
In practice, the use of the application received negative feedback from users. The reliance on data transcription by the user from local electronic patient records (EPR) to the application was felt to be counter-productive, time-consuming and introduced an opportunity for errors in transcription. Key information including scan results (ultrasound, computed tomography etc) required input of text which took time and could introduce errors.

In response to these concerns the CNS identified alternative approaches to deal with communication barriers from the original root-cause. This involved mutual cross recognition of the healthcare professionals by all the participating organizations in the community and secondary care through the issuance of employment contracts; and negotiation with the organization's IG leads to acquire appropriate permissions to access their EPRs. The recommendation was that all relevant healthcare professionals involved in the care of patients moving between the services should have contracts with the community and secondary care organisations to allow remote access of tests and results, in the absence of an application that can fulfil auto-population and IG requirements.

"Its not very user friendly"

"quite labour intensive"

"I'm not really very happy that I have to, for example, type in an ultrasound result "

"There is risk of error"

Discussion:
An application that allows data linkage between primary and secondary care has been operated and the I-count application proves the concept is possible. However, there were significant concerns regarding safety of data transfer and at present this is considered unsafe and so prohibitive. To mitigate this, the application would have to capture and transfer results, both numerical and text, from one system for transfer to the other.

Alternative solutions to the problem need to be considered. This includes addressing the existing barriers to contracting of services allowing remote access of results at various NHS sites. IG regulations would need to be considered at NHS Trust level to allow applications such as I-count to be safe, useful and practicable.