Hepatitis C Virus Diagnosis and the Holy Grail

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KEYWORDS

• HCV • Diagnostics • Simplified • Rapid • Point-of-care • Test and treat
• Models of care • HCV elimination

KEY POINTS

- Innovative strategies to provide access to existing HCV diagnostic assays are an immediate priority.
- Decentralized models of care to diagnose HCV infection and confirm cure within community health care settings are critical to achieve HCV elimination by 2030.
- High quality, simple, affordable and rapid diagnosis of active infection at the point-of-care will be central to achievement of HCV elimination.
- Global partnerships and funding mechanisms are required to stimulate investment in the development of the holy grail - the ideal point-of-care diagnostic test.

HEPATITIS C VIRUS DIAGNOSTICS ARE ESSENTIAL TO ACHIEVE GLOBAL ELIMINATION

It is not often the world has the opportunity to turn a public health crisis into a good news story.[1,2] The development of oral, highly effective, pangenotypic direct-acting antivirals (DAAs) has now paved the way to cure the 71 million people estimated to be living with chronic hepatitis C virus (HCV) infection globally.[3–6] Unfortunately, fewer than 20% of those living with HCV are aware of their infection, and the challenge now is to engage, screen, and diagnose everyone in need of treatment.[7,8] While the world has focused its attention on the final steps within the cascade of care to develop and increase access to DAAs over the last decade,[9–11] considerably less investment has been made to ensure accurate and affordable diagnostic tools[10] are available to make wide-scale global treatment a reality (**Fig. 1**). Ironically, in many settings,

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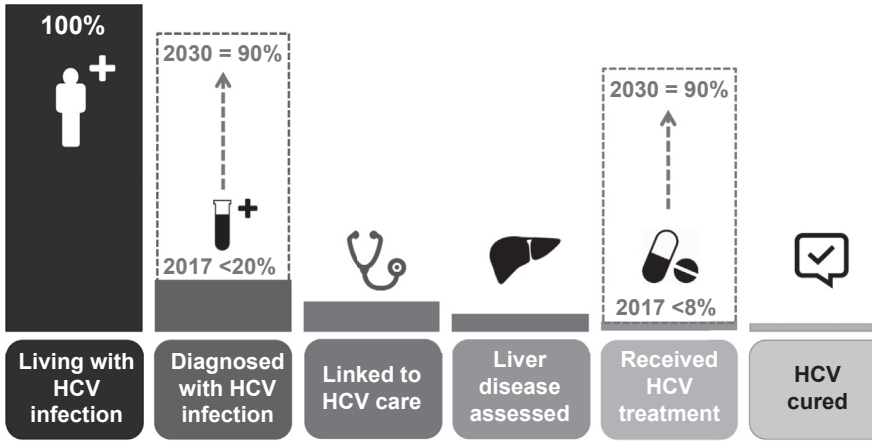

Fig. 1. Cascade of care for hepatitis C virus (HCV), indicating global gaps to reach World Health Organization 2030 elimination goals.[26] (*Adapted from* Grebely J, Bruggmann P, Treloar C, et al. Expanding access to prevention, care and treatment for hepatitis C virus infection among people who inject drugs. Int J Drug Pol 2015;26(10):893–8; with permission.)

prohibitively high costs of HCV diagnostics often now exceed the cost of curative therapy.[12] Improving access to rapid, simple, and affordable HCV diagnostics is critical to achieve global HCV elimination.[13–15]

The high efficacy and low toxicity of the new DAAs provide an exceptional opportunity to greatly simplify HCV diagnosis and care. Recently approved pangenotypic DAA regimens no longer depend on quantitative HCV RNA or genotype data to stratify the duration of treatment,[16–18] and many international clinical trials and demonstration studies are underway to generate evidence of the efficacy of a simplified approach to diagnosis and treatment monitoring (eg, in Cambodia, India, Iran, Rwanda, Nigeria, Mozambique, Myanmar, Pakistan, and Uzbekistan[19]). Likewise, excellent safety profiles, potent efficacy, and limited potential drug–drug interactions also negate the need for intensive on-treatment monitoring.[20,21]

From a public health perspective, HCV diagnosis and care could be simplified to just two visits: (1) diagnosis of active HCV infection and standardized treatment regardless of disease stage, and (2) confirmation of cure posttreatment completion (**Fig. 2**A). Considering the high rate of cure, experts in the field are currently debating if confirmation of cure may also be considered unnecessary in the near future. Although liver disease stage restrictions for treatment access are being removed globally,[22–24] liver assessment is important to inform treatment duration for some regimens and for monitoring patients with cirrhosis.[25–27] A lack of access to liver disease assessment, however, should not be considered a barrier and treatment should be provided to all. The integration of noninvasive liver assessment into a 30-minute visit in the primary care setting would require the development of an as yet unavailable, rapid, point-of-care (POC) test to measure aspartate aminotransferase and platelet count to calculate the aspartate aminotransferase to platelet ratio index[28–31] or a transient elastography machine, such as the Fibroscan,[32] that is markedly more affordable than current options (**Fig. 2**B). The integration of liver assessment into a single 2-hour visit in a tertiary health care setting and centralized laboratory, however, is entirely feasible using current laboratory-based technologies (**Fig. 2**C).