

ORIGINAL ARTICLE

Provider-related barriers and enablers to the provision of hepatitis C treatment by general practitioners in Scotland: A behaviour change analysis

David Whiteley¹  | Elizabeth Speakman¹  | Lawrie Elliott²  | Katherine Davidson³ | Emma Hamilton⁴ | Helen Jarvis^{5,6}  | Michael Quinn⁷ | Paul Flowers⁸ 

¹School of Health and Social Care, Edinburgh Napier University, Edinburgh, UK

²Department of Nursing and Community Health, School of Health and Life Sciences, Glasgow Caledonian University, Glasgow, UK

³Department of Pharmacy, NHS Lothian, Edinburgh, UK

⁴Scottish Drugs Forum, Glasgow, UK

⁵Population and Health Sciences Institute, Newcastle University, Newcastle, UK

⁶West Road Medical Centre, Newcastle, UK

⁷Craigmillar Medical Group, Edinburgh, UK

⁸School of Psychological Sciences and Health, University of Strathclyde, Glasgow, UK

Correspondence

David Whiteley, School of Health and Social Care, Edinburgh Napier University, Edinburgh, EH11 4BN, UK.
Email: d.whiteley@napier.ac.uk

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Abstract

The ease of direct-acting antiviral (DAA) medications for hepatitis C virus (HCV) has provided an opportunity to decentralize HCV treatment into community settings. However, the role of non-specialist clinicians in community-based pathways has received scant attention to date. This study examined barriers and enablers to expanding the role of general practitioners (GPs) in HCV treatment provision, using simple behaviour change theory as a conceptual framework. A maximum variation sample of 22 HCV treatment providers, GPs and HCV support workers participated in semi-structured interviews. Data were inductively coded, and the resulting codes deductively mapped into three principal components of behaviour change: capability, opportunity and motivation (COM-B). By this process, a number of provider- and systemic-level barriers and enablers were identified. Key barriers included the pre-treatment assessment of liver fibrosis, GP capacity and the 'speciality' of HCV care. Enablers included the simplicity of the drugs, existing GP/patient relationships and the provision of holistic care. In addition to these specific factors, the data also exposed an overarching provider understanding of 'HCV treatment' as triumvirate in nature, incorporating the assessment of liver fibrosis, the provision of holistic support and the treatment of disease. This understanding imposes a further fundamental barrier to GP-led treatment as each of these three components needs to be individually addressed. To enable sustainable models of HCV treatment provision by GPs, a pragmatic re-examination of the 'HCV treatment triumvirate' is required, and a paradigm shift from the 'refer and treat' status quo.

KEYWORDS

general practitioners, hepatitis C, therapeutics

Abbreviations: BCW, Behaviour Change Wheel; BNF, British National Formulary; COM-B, Capability, Opportunity and Motivations model of Behaviour change; DAA, Direct-acting antiviral; GP, General practitioner; HCV, Hepatitis C virus; NHS, National Health Service; PWID, People Who Inject Drugs; SIMD, Scottish Index of Multiple Deprivation.

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1 | INTRODUCTION

Scotland's hepatitis C virus (HCV) strategy aims to achieve elimination of the virus as a major public health concern by 2024 at the latest.¹ To enable this, health boards have been encouraged to expand their models of care beyond traditional, specialist-led hospital settings and into the community, adopting more eclectic patient pathways.^{1,2} This decentralization of HCV care has been catalysed by the availability, and increased affordability, of direct-acting antiviral (DAA) medications. These simple, effective and well-tolerated drugs no longer pose the extensive risk of harms associated with previous incarnations of HCV treatment.³ As such, they present an opportunity to deliver an efficacious cost-effective HCV cure, in diverse non-specialist settings.⁴⁻⁶

In Scotland, injecting drug use continues to be the most important risk factor for HCV infection. Surveys of people who inject drugs (PWID) suggest over half are HCV antibody positive, with almost a third having evidence of current infection.⁷ The importance of decentralized HCV treatment in community locations is widely recognized as a key component to increasing treatment uptake, particularly among PWID.^{1,2} However, the role of non-specialist clinicians in prescribing that treatment has received scant attention to date. Community-based pathways in Scotland function as 'outreach' models of care, relying on specialist clinicians prescribing DAA treatments in non-specialist settings.⁸ Such specialist clinicians comprise hospital-based doctors, nurses and pharmacists working in hepatology or infectious diseases. This presents a potential barrier to maximizing treatment uptake, as engagement with specialist clinicians necessitates additional steps in patient pathways, presenting avoidable opportunities for disengagement. The capacity of these specialist teams may also be limited.⁹

Theoretically, general practitioners (GPs) have the authority to prescribe DAAs in Scotland. However, the ability to do so in practice is encumbered by fiscal considerations, as budgets for these drugs currently lie within specialist care, with area drug and therapeutics committees and National Health Service (NHS) formulary committees imposing local prescribing restrictions to 'specialist use' alone.^{10,11} In addition, while GPs *could* prescribe DAAs, there is debate around whether they *should*, located within narratives of clinical expertise, responsibility and liability.^{12,13}

In primary care settings around the globe, reported GP (or primary care provider) roles in HCV treatment vary considerably. For example, GPs have been the initiator of referrals into co-located services provided by specialist teams¹⁴; a shared care partner alongside specialist clinicians in task-sharing collaborations¹⁵; and independent HCV practitioners following comprehensive task-shifting from specialist care.¹⁶ Globally, therefore, GP involvement in HCV treatment is a broad church, and while diverse models have demonstrated some success in other countries, the factors underpinning the success of such complex interventions are rarely established. As such, the optimal nature and extent of an expanded GP role are unclear.

This study aims to investigate context-specific barriers and enablers to an expansion of the role of GPs in the treatment of HCV

in Scotland. In doing so, we employ behaviour change theory as a conceptual framework, understanding that the implementation of new ways of working, or alteration of existing practice, necessitates changes in individual and collective behaviours.¹⁷

2 | METHODS

2.1 | Conceptual framework

The COM-B model developed by Michie and colleagues describes three interdependent components which interact to produce behaviour (B): capability (C), opportunity (O) and motivation (M).¹⁸ The model proposes that to enact a particular behaviour, an individual must be capable of doing so, be offered the opportunity to do so and be more motivated to do so than not at a particular time and place. The components influence one another, so that broadly speaking, an increase in capability or opportunity also increases motivation (Figure 1). The COM-B understanding of behaviour lies at the heart of the Behaviour Change Wheel (BCW), which offers a toolkit for designing behaviour change interventions¹⁹ (Figure 2). The centre of the BCW demonstrates how these three broad domains of capability, opportunity and motivation include cognitive, affective, social and environmental influences. Capability incorporates psychological (knowledge) and physical (skills) elements, opportunity manifests in both social (societal influences) and physical (environmental resources) spheres, and motivation encompasses both automatic (emotion) and reflective (beliefs and intentions) constituents.^{18,19} As such, COM-B provides valuable insight, and a solid foundation for theoretically informed intervention development. We present our analysis through this lens.

2.2 | Setting and sampling

The study was primarily located within the two NHS board areas in Scotland with the highest number of new HCV diagnoses in 2018.²⁰ As the focus of the study was the provision of HCV

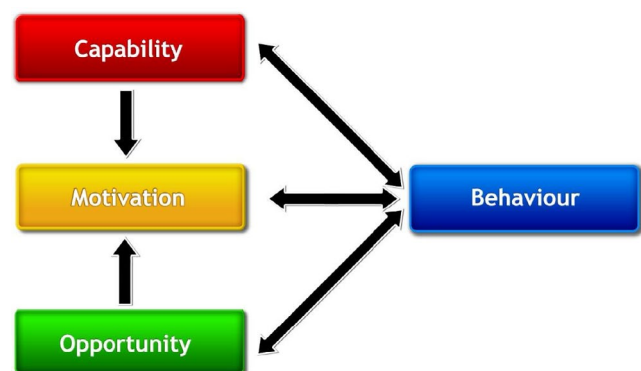


FIGURE 1 The COM-B system, a framework for understanding behaviour by Michie et al¹⁹

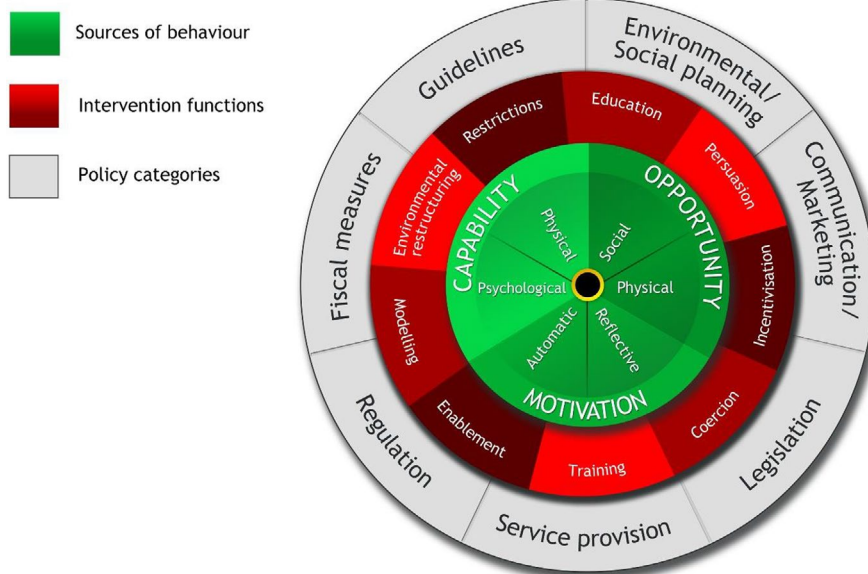


FIGURE 2 The behaviour change wheel by Michie et al¹⁹

treatment, target participants were care providers currently engaged in that behaviour, and potential adopters of that behaviour.¹⁷ The decentralization of HCV treatment has implications for diverse stakeholders, and a purposive maximum variation sample was therefore applied to gain multiple perspectives from assorted participants. This sampling approach aims to ensure representativeness and diversity and emphasizes the significance of shared themes emerging from, and cutting across, participant heterogeneity.²¹ The sample comprised specialist HCV doctors, nurses and pharmacists working in hepatology and/or infectious diseases; GPs with an interest in HCV providing care for PWID; and staff from third-sector agencies supporting PWID onto and through HCV treatment. Third-sector agencies include non-governmental and not-for-profit organizations such as charities, advocacy and voluntary groups.

2.3 | Participant recruitment

HCV specialists were recruited using the existing networks of DW and KD, who identified key clinicians in the two NHS boards. These clinicians were approached and invited to participate directly. GPs were recruited via two routes. First, the NHS Research Scotland Primary Care Network advertised the study in a monthly newsletter sent to all GPs within individual NHS boards, with GPs invited to contact the study team if interested in participating. GP recruitment by this method was expanded to other NHS boards following study inception. Second, the study team also used the Scottish Index of Multiple Deprivation (SIMD) to identify key GP practices within each NHS board. The SIMD identifies small area concentrations of significant deprivation by amalgamating data from seven domains: income, employment, education, health, housing, access to services and crime.²² Publically available email

addresses were then used to contact GPs directly inviting them to participate. Third-sector organizations were identified by EH, ES and DW and were also approached directly, with the most appropriate potential participants within these organizations identified collaboratively.

2.4 | Data generation

Data were generated with participants through semi-structured interviews held between October 2019 and March 2020. The majority of interviews were conducted in person by ES, although one interview employed teleconferencing software. Interviews lasted between 31 and 68 min, with a mean duration of 52 min. During interviews, topic guides were used to focus conversation, which consisted of open-ended questions relating to the domains of the COM-B model.^{18,19} Examples of questions included 'what skills would a GP need to prescribe HCV treatment safely?' (capability/physical); 'what systems would need to be in place to enable GPs to prescribe HCV treatment safely?' (opportunity/physical); 'if an expansion of GP-led HCV treatment was to go ahead, what would be the benefits and costs?' (motivation/reflective). Topic guides were developed by DW, ES, LE and PF. While offering structure, interviews were conducted with a fluidity and flexibility that enabled the natural flow of conversation. Interviews with participants from different stakeholder groups were purposefully interspersed with one other, allowing initial insights gained to be explored from different perspectives. For example, potential barriers identified by one stakeholder could be followed up and contextualized from a different viewpoint fostering depth within the data. All interviews were recorded on an encrypted audio-recorder, and transcribed verbatim, after which identifiable participant information was removed or obscured from the narrative.

2.5 | Analysis

Analysis was a two-step process. Initially, an established process of thematic analysis guided coding of the data.²³ ES and DW read and reread the transcripts, which were then inductively coded using NVivo v.12 software to manage the data. While depicted as a linear process, interviewing and coding were conducted in parallel, with each task informing the other. This aided the identification of data sufficiency, as coding of the final transcripts aligned to codes already developed offering no fresh insight. During this early analysis, coding was regularly discussed and reviewed by DW and ES. Secondly, a deductive framework analysis was performed, where coded data were aligned with the three overarching components of the COM-B model (capability, opportunity and motivation). This stage of analysis was audited by PF, an HCPC Registered Health Psychologist, who interrogated the initial alignments, and provided a robust review of their coherence. Some coded data were realigned following this process. Within each component, key subthemes were identified relevant to the behaviour in question: the provision of HCV treatment by GPs.

3 | RESULTS

Seventeen healthcare providers and five third-sector workers were recruited and interviewed. Two third-sector workers were interviewed together at their request; all other interviews were conducted individually. Participant characteristics are presented in Table 1.

3.1 | Capability

The majority of participants considered contemporary DAA therapies as requiring few skills and limited knowledge to prescribe. Despite this, the importance placed on training within the narratives was evident. Training was constructed as a necessity to increase confidence, familiarity and raise awareness among GPs, although the content and nature of such training were less well defined. While drug interactions and serology interpretation were flagged as important by specialists, GP and third-sector workers discussed training in relation to risk awareness and HCV case finding, as well as enhancing GPs' soft skills to help broach the topic with potentially at-risk individuals:

We might not always be aware of the risk. And if they've come in about something completely different, I think there's potentially a bit of an issue with not necessarily routinely asking...it's difficult to bring it into conversation....

(GP)

TABLE 1 Characteristics of the 22 study participants

Characteristic	Number
Professional role	
General practitioner	8
Specialist	9
Consultant physician	4
Hepatology	2
Infectious diseases	2
HCV Nurse	3
Hepatology	1
Infectious diseases	2
HCV pharmacist	2
Third-sector workers	5
Experience in the field	
General practitioner	
<10 years	2
>10 years	6
Specialists	
<10 years	1
>10 years	8
Third-sector workers	
<10 years	2
>10 years	3
Gender	
Female	17
Male	5
Ethnicity	
White	22
Other	0

Potential GP knowledge deficits were buffered by the concept of 'shared care' between GPs and specialist services. Examples of shared care, such as the prescription of disease-modifying anti-rheumatic drugs and opioid substitution therapy, were presented as recognized collaborations between GPs and specialist teams, establishing ability by precedent. While the construction of shared care ranged from paternalistic supervision to more remote consultative guidance, it consistently acted as an enabler of proficiency, providing a reservoir of expertise to draw upon when required:

As a GP I'm comfortable that I don't know everything. I'm quite happy that I can approach other people who have more day-to-day technical knowledge when I'm unsure about what's required. So I don't feel the need to know [everything], I just know that I can ask somebody else.

(GP)

All groups of participants expressed concerns over the need for venous blood draws during HCV testing and treatment. Participants positioned venepuncture on PWID living with HCV as a challenging and labour-intensive pursuit, founded in narratives of 'difficult veins' and often doubt in personal technical ability. However, venepuncture was rarely the routine domain of GPs, with the experience and expertise of practice nurse and phlebotomist colleagues more commonly employed. While practical from a provider perspective, this collaborative working often necessitated additional appointments, thereby generating further obstacles to the engagement of PWID in HCV care. Although positioned within the narratives as gold standard, some participants questioned the need for venepuncture at all, suggesting essential results indicating proof of active HCV infection could be better obtained by other methods:

Because you can do dry blood spot tests and you can get a PCR and antigen and if you just want to do the basics, that's fine.

(HCV specialist nurse)

3.2 | Opportunity

The assessment of liver fibrosis was positioned as a pre-treatment prerequisite by all groups of participants, with treatment initiation contingent on its completion. While serologic tests were vulnerable to the vagaries of venepuncture, the ability of GPs to perform transient elastography was also constrained, by the logistics and costs to GP practices of obtaining, maintaining and training on the equipment. However, while the importance of fibrosis staging was unanimously acknowledged, a few participants questioned whether the treatment of HCV, and the assessment of fibrosis, need necessarily be so inexorably entwined:

I think what confuses people is that there is treatment of the virus, and then there is assessment and follow-up of liver disease. At the moment we do a bit of both...and I think this is historical. If the aim is elimination of hepatitis C then just give everybody [names drug] for twelve weeks and you will achieve it.

(HCV specialist physician)

All participants theorized that the physical location of GPs, at the heart of their communities, made them a convenient port of call for people who found engaging with geographically distant specialist care services difficult. Some noted that the 'general' in general practitioner afforded a degree of anonymity, as reasons for attendance could be easily disguised. For many, the opportunity to combine HCV treatment with other services provided by some GPs, notably the provision of opioid substitution therapy, made them well placed to engage:

I think the huge benefit is that the GP's very accessible, people are often coming regularly for other

reasons which is, you know, often prescriptions for their drug scripts...it's that regular contact that makes a GP a really ideal place, because people are coming in anyway.

(GP)

In addition, GP participants emphasized how they developed therapeutic relationships over time with those in their care, with episodic contact slowly building trust and familiarity. Such utopian insights into the GP/PWID relationship were not universally shared, however, with some participants offering a note of caution:

I hear it time and again - the GP's probably the last person they want to go and speak to. They've been judged in the past due to their behaviours, you know, addiction being one. Their self-esteem, their confidence, self-worth have been trampled over time and time again. Would you go back?

(Third-sector worker)

While the majority of participants positioned their narrative in relation to people who currently use drugs, some also noted that GPs were well placed to engage with other at-risk groups. However, despite their enabling geographic credentials, the constrained capacity of GPs was a powerful and recurrent theme. Time was a valuable and limited commodity, necessarily rationed to cope with competing demands. Where would HCV treatment fit within already overflowing clinics? Reluctance to take on the 'additional work' of HCV treatment was rooted in an already onerous workload, and contextualized within a growing recruitment crisis in primary care:

It has to be seen within the context of where we are at the moment. There's a huge workforce crisis in general practice so retention of GPs has become a huge problem. General practice is creaking at the seams. You've got GPs doing 13-hour days. I mean, that's why they're leaving the profession in droves, that's why you can't recruit GPs.

(GP)

Movement of financial resource from specialist to primary care was a commonly cited solution to issues of capacity, theoretically releasing GP time to offer longer and dedicated HCV appointments. However, such a compartmentalized HCV service was already established in many GP practices, run successfully by HCV nurses providing outreach from their hospital base. The benefit of GPs providing HCV treatment was therefore located in their ability to do so on an ad hoc basis within the confines of routine clinics. Such an undertaking would require a treatment pathway of utmost simplicity:

I almost think primary care could sit on its own and manage hep C treatment...it would be like going to your GP with a sore throat or something like that,

you've got hepatitis C, quick look on the thing, I'll get your treatment, there you go, come back and see me in eight weeks once it's finished.

(HCV specialist physician)

While idyllic, such simplistic notions were blighted with concerns over how GP prescribed HCV treatment could be dispensed, paid for and monitored. Current practice necessitated DAA prescriptions were initiated within specialist care, often by a practitioner who had never seen or engaged with the prescription's intended recipient. Specialist participants positioned this remote prescribing practice as a result of complex budgetary, governance and logistical requirements, all of which introduced inherent lag in the system; a prescription could not be written and filled on the same day. A key overseer was also required, usually the specialist HCV pharmacist, to expedite the process, liaise with community pharmacies, and collect data on treatment numbers. Such '*behind the scenes*' work was positioned as an essential part of ensuring the viability of any GP treatment model.

3.3 | Motivation

The simplicity of contemporary HCV treatment was extolled by most participants as the greatest enabler of GP provision. The drugs were understood as safe and straightforward, with little need for monitoring or medical input. To the majority, HCV treatment was just another tablet:

I explained to my colleagues, look, it's a tablet for eight weeks and there are no side effects; you just prescribe it. There's no reason you can't just look it up in the BNF [British National Formulary] the way we do for anything else and just prescribe it.

(GP)

That said, the long history of HCV treatment as the domain of specialist care, constructed a belief in some third-sector and GP participants that it remained a 'specialist disease'. For these individuals, HCV treatment was a complicated pursuit requiring specific expertise, and an unfamiliar extension of 'generalist' work. As such, faith in ability and intention to treat were reduced:

I don't see it as something that every GP would just feel they could do like they write prescriptions for an antibiotic for a urinary tract infection, because it's clearly more specialist than that. It's not simple.

(GP)

Incentivization of GPs with payment was a frequently mentioned motivator to HCV treatment provision. However, the delivery of holistic, person-centred care was also a key enabler within the narratives. All groups of participants emphasized GPs' focus on patient priorities, their familiarity with the populations they serve, and their expertise at

building relational capital to address broader concerns over time. HCV was '*part of the job*', and should not be treated in isolation:

...if you start segregating parts of the job off, it isn't general practice to my mind anymore. If you don't do the complete package, then you're definitely discriminating against some of your patients....

(GP)

However, HCV treatment was positioned as more complex than simply removing the virus. Treatment of physical disease was often couched as a secondary outcome, with the opportunity to address other physical, mental and social comorbidities a common motivating factor. Why treat the virus without tackling the causes? This rationale was not only rooted in a desire to improve quality of life, but also founded in concerns of HCV reinfection. Participants eulogized the role HCV nurses currently played in holistic assessment, and expressed concern that this facet of HCV treatment was at risk:

...the success of hepatitis C treatment has been the support, or additional psycho-social care, and links that the specialist nurses have provided...and sometimes I think we're in danger of throwing the baby out with the bathwater, because we're so focused on, oh, it's just so easy, and actually are the patients losing the holistic care that specialist nurses bring?

(HCV pharmacist)

That said, the rarity of treating physical disease rather than managing chronic illness was repeatedly emphasized as a powerful motivator by GP participants. The professional satisfaction and novelty of curing an illness were recurrently described:

...as a GP you hardly ever get to cure anything, you know? I mean, we don't get to do that with asthma or mental health problems or anything. So that is really rewarding, to say I've cured you. It's kind of why, in your fantasies, you went to medical school in the first place.

(GP)

Such patient-centred motivators formed a robust theme within the data from all participants. While public health targets were alluded to, these remained the concern of HCV specialists alone, notably HCV specialist physicians.

4 | DISCUSSION

The application of simple behaviour change theory (COM-B) provides a useful lens through which provider- and systemic-level barriers and enablers to GP provision of HCV treatment in Scotland can be explored. Figure 3 emphasizes that identified barriers to

treatment primarily related to resources and the environmental context, predominantly located within the opportunity domain of COM-B. However, motivation also showed importance when identified enablers of the behaviour were considered. While provision of HCV treatment by GPs is the focus of this study, that behaviour must be considered within the HCV care cascade. Implicit in our findings was an understanding that HCV treatment is inextricably tied to HCV testing, and Figure 3 also details barriers and enablers to *this* behaviour identified in a recent review for context.²⁴ When coupling the COM-B model with the wider BCW¹⁹ (Figure 2), our analysis, and the review findings,²⁴ suggests interventions to expand the role of GPs in HCV testing should draw primarily upon functions of 'education' and 'training'. Future intervention functions in relation to HCV treatment should address key areas such as 'environmental restructuring', 'modelling' and 'enablement'.

Expanding the role of GPs in relation to HCV treatment aims to capitalize on interventions designed to systematically identify and test individuals in primary care, closing gaps in the care cascade. For example, the HepCATT study in England demonstrated the effectiveness of a low-cost intervention (which included key education/training elements) to increase HCV diagnoses in general practice.^{25,26} However, the model relied on subsequent engagement with specialist services to translate this into improved treatment numbers. This cavity in the care cascade has also been demonstrated in other studies,^{27,28} and an expansion of GP practice to initiate HCV therapy could help facilitate its closure.²⁹

While our study was located within Scotland, the results align with findings from across the globe. Similar barriers and facilitators to GP prescribing have been reported from other countries,³⁰⁻³⁴ emphasizing obstacles to sustainable models of GP-led treatment endure in the face of simple, effective DAA regimens. However, this study also contributes new knowledge to the field by disentangling commonplace understandings of 'HCV treatment', and illuminating the complex and multifaceted nature of the task. Our participants constructed 'HCV treatment' as much more than virus removal, revealing a perception that was triumvirate in nature. This triumvirate incorporated, sequentially; the assessment of liver fibrosis, the provision of holistic support and the treatment of disease. This trinity arose from necessity in the interferon era and continued through the evolution of DAA therapy,³⁵ but imposes a fundamental barrier to contemporary GP-led treatment: there are three tasks to accomplish, rather than one.

With this in mind, the constraints on GP time and capacity demand a pragmatic re-examination of this 'HCV treatment triumvirate' in order to address obstinate barriers to change, rather than attempting to replicate existing provision. For example, the assessment of liver fibrosis for people living with HCV forms an integral and vital component of their care, but can present a significant barrier to treatment initiation in primary care settings.^{31,33,34} Historically, the importance of fibrosis staging informed not only ongoing follow-up and monitoring for cirrhosis and hepatocellular carcinoma, but was also predictive of treatment success, designating it a *pre-treatment*

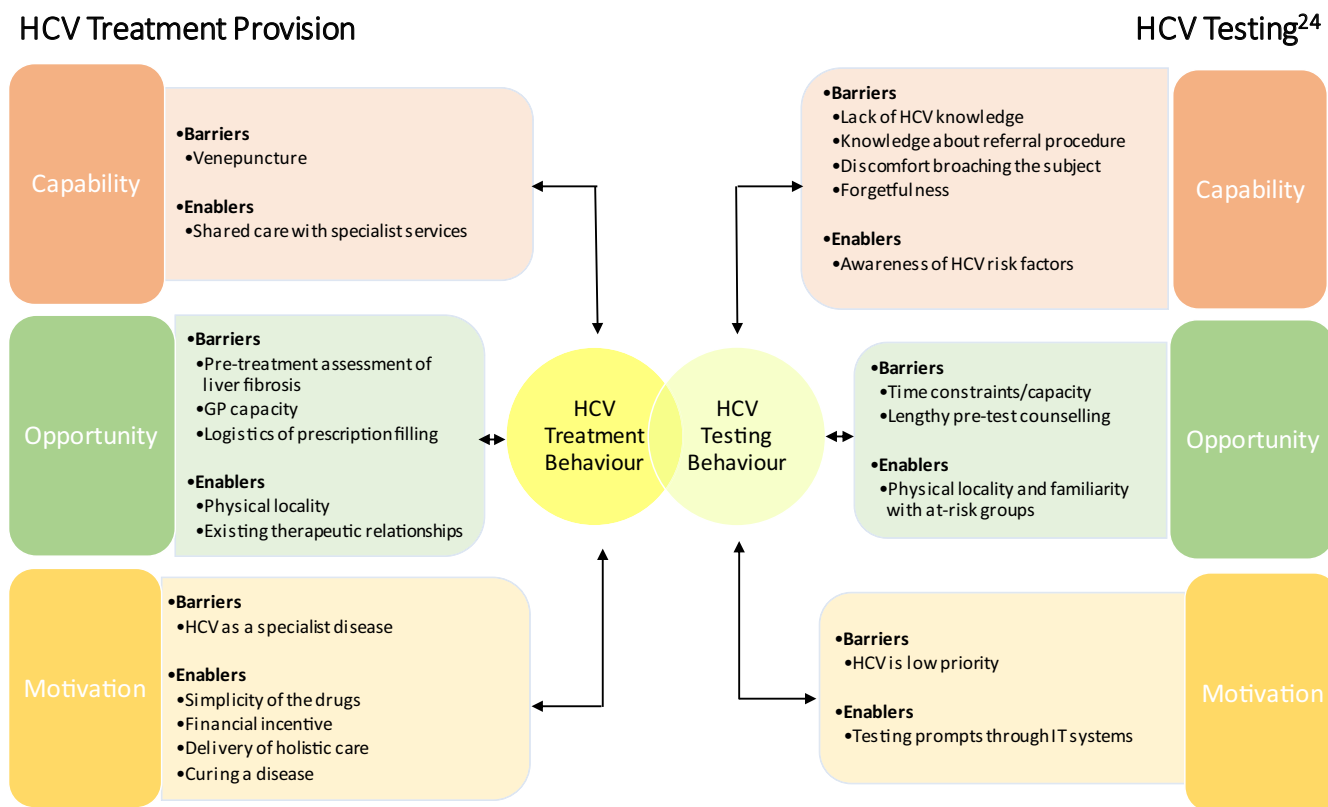


FIGURE 3 Provider-related barriers and enablers of HCV treatment provision by GPs stratified by COM-B, contextualized by a scoping review of barriers and enablers of HCV testing²⁴

necessity.³⁶ However, the availability of pangenotypic DAA regimens, efficacious and safe in both the presence and absence of compensated cirrhosis,³⁷ questions not the absolute importance of fibrosis assessment, but offers flexibility in the timing of its provision. Contemporary DAA treatment allows the dogmatic *pre*-treatment assessment of liver fibrosis to be rethought, and a simpler pathway to treatment initiation forged. GP provision of HCV treatment may benefit from a 'treat and refer' model of care, rather than the 'refer and treat' status quo of many community-based pathways.⁸

A sole focus on the medical aspects of HCV therapy ignores the importance of holistic care, which resonated through our findings. Although DAAs exhibit few side effects,³⁷ and appear forgiving in terms of adherence,³⁸ care providers recognized the significance of ongoing person-centred social support as a vital component of HCV treatment. This is unsurprising, as the burden of HCV infection in Scotland is disproportionately felt within disenfranchised, vulnerable and underserved communities, for who, in the right environment, the treatment of HCV may have transformative potential.³⁹ However, social support should not be positioned as providing 'additional benefit' during the treatment of physical disease, but as an integral part of the process. A recent systematic review emphasized how peer support and connection to relevant services bolsters community-based HCV treatment initiation and completion.⁴⁰ Indeed, factors such as housing, finances, legal difficulties and drug use have repeatedly been cited as barriers for people living with HCV to engaging with care.^{28,41-43} As part of the HCV treatment triumvirate, the provision of holistic support is therefore indispensable, and integrating that support into increasingly simplified and shortened treatment pathways will be an essential challenge moving forward. The lives of people living with HCV remain complex in the era of simple HCV therapies.

Our study has a number of strengths and limitations. First, our sample provided a multidisciplinary, inter-speciality insight from healthcare providers into barriers and enablers of HCV treatment provision by GPs. To focus the study, we purposefully recruited individuals involved in the provision of healthcare; however, some third-sector workers also had lived experience of HCV and its treatment which informed their narrative. Second, GP participants were self-selected, recruited in response to an advert or direct approach. As such, they represent a particularly motivated group with a specific interest in the topic, and may not be representative of Scottish GPs as a whole. The majority of GP participants also had some experience of involvement in shared care for HCV through local arrangements with HCV specialists. GPs providing care for PWID but who had no experience in HCV care were therefore an under-represented group. Third, the majority of participants were from two large urban centres in Scotland, and the barriers and enablers identified may not fully embody the experience of healthcare provision in more rural localities.

5 | CONCLUSION

The modern era of DAA therapy provides opportunity to decentralize HCV care, with GP-led treatment a crucial strand in the battalion of

community-based pathways aimed at viral elimination. However, to facilitate the provision of HCV treatment by GPs, simplicity and pragmatism are essential to overcome significant limitations on GP capacity. While not advocating the sacrifice of either liver fibrosis evaluation or the provision of support from the HCV treatment triumvirate, contemporary therapy offers the possibility of reimagining how these pieces fit together, challenging the 'refer and treat' status quo. To enable a streamlined, sustainable and effective pathway to HCV treatment provision by GPs, the treatment model must be reimagined, rather than simply relocated from specialist care. Within this paper, we have used COM-B and alluded to the Behaviour Change Wheel to sketch the likely direction of future interventions to implement GP provision of HCV treatment. Within subsequent work, we will examine these issues in more detail and articulate specific ways forward.

ACKNOWLEDGEMENTS

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CONFLICT OF INTEREST

DW has received speaker's honoraria from Gilead and Janssen and funding for attendance at conferences and educational meetings from Janssen, MSD and BMS. KD has received speaker's honoraria from Abbvie, Gilead, Janssen and MSD and funding for conferences and educational meeting attendance from Abbvie, BMS, Gilead, Janssen and MSD. The remaining authors have nothing to declare.

ETHICAL APPROVAL

A favourable ethical opinion was given by the West of Scotland Research Ethics Committee 3 (19/WS/0068). A written record of informed consent was obtained prior to interview with all participants. GPs were compensated £80 for their time, in line with the service support cost rate agreed by the study funder. Other participants received no financial recompense.

DATA AVAILABILITY STATEMENT

The full dataset will be stored on the Edinburgh Napier University open access research repository within 3 months of the end of the study grant.

ORCID

David Whiteley  <https://orcid.org/0000-0001-9589-8893>

Elizabeth Speakman <http://orcid.org/0000-0002-4405-0670>

Lawrie Elliott  <https://orcid.org/0000-0001-7727-231X>

Helen Jarvis <http://orcid.org/0000-0001-5039-0228>

Paul Flowers  <https://orcid.org/0000-0001-6239-5616>

REFERENCES

- Health Protection Scotland. Scotland's Hepatitis C Action Plan: Achievements of the First Decade and Proposals for a Scottish Government Strategy (2019) for the Elimination of both Infection and Disease: Taking Advantage of Outstanding New Therapies. https://hpspubsrepo.blob.core.windows.net/hps-website/nss/2840/documents/1_hcv-elimination-Scotland-v2.pdf. Accessed April 2, 2020.
- World Health Organisation. Guidelines for the care and treatment of persons diagnosed with chronic hepatitis C virus infection July 2018. <https://apps.who.int/iris/bitstream/handle/10665/273174/9789241550345-eng.pdf?ua=1>. Accessed April 8, 2020
- Zoratti MJ, Siddiqua A, Morassut RE, et al. Pangenotypic direct acting antivirals for the treatment of chronic hepatitis C virus infection: a systematic literature review and meta-analysis. *EClinicalMedicine*. 2020;18:100237.
- Radley A, Robinson E, Aspinall EJ, Angus K, Tan L, Dillon JF. A systematic review and meta-analysis of community and primary-care-based hepatitis C testing and treatment services that employ direct acting antiviral drug treatments. *BMC Health Serv Res*. 2019;19:765.
- Wade AJ, Doyle JS, Gane E, et al. Outcomes of treatment for hepatitis C in primary care, compared to hospital-based care: a randomized, controlled trial in people who inject drugs. *Clin Infect Dis*. 2020;70(9):1900-1906.
- Palmer AY, Wade AJ, Draper B, et al. A cost-effectiveness analysis of primary versus hospital-based specialist care for direct acting antiviral hepatitis C treatment. *Int J Drug Policy*. 2020;76:102633.
- Public Health England. Hepatitis C in the UK 2019. Working to eliminate hepatitis C as a major public health threat. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/831155/Hepatitis_C_in_the_UK_2019_report.pdf. Accessed September 15, 2020.
- Hickman M, Dillon JF, Elliott L, et al. Evaluating the population impact of hepatitis C direct acting antiviral treatment as prevention for people who inject drugs (EPIToPe) – a natural experiment (protocol). *BMJ Open*. 2019;9:e029538.
- Fox R. Going viral: why eliminating the burden of hepatitis C requires enhanced cooperation between specialists and primary care providers. *Dig Dis Sci*. 2016;61:3381-3383.
- Healthcare Improvement Scotland. Area drug and therapeutics committee collaborative (ADTC Collaborative). http://www.healthcareimprovementscotland.org/our_work/technologies_and_medicines/adtc_collaborative.aspx. Accessed September 22, 2020.
- NHS Greater Glasgow and Clyde Area Drug and Therapeutics Committee. Greater glasgow and clyde prescribing: antiviral drugs. <http://www.ggcprescribing.org.uk/formulary/infections/antiviral-drugs/>. Accessed September 22, 2020.
- British Medical Association. Prescribing in general practice: April 2018. <https://www.bma.org.uk/media/1563/bma-prescribing-in-general-practice-april-2018.pdf>. Accessed September 22, 2020.
- Crowe S, Tully MP, Cantrill JA. The prescribing of specialist medicines: what factors influence GPs' decision making? *Fam Pract*. 2009;26(4):301-308.
- Francheville JW, Rankin R, Beck J, et al. Early success in an open access provincially funded hepatitis C treatment program in Prince Edward Island. *Ann Hepatol*. 2017;16(5):749-758.
- Wade AJ, McCormack A, Roder C, et al. Aiming for elimination: Outcomes of a consultation pathway supporting regional general practitioners to prescribe direct-acting antiviral therapy for hepatitis C. *J Viral Hepat*. 2018;25:1089-1098.
- Kattakuzhy S, Gross C, Emmanuel B, et al. Expansion of treatment for hepatitis C virus infection by task shifting to community-based nonspecialist providers. *Ann Intern Med*. 2017;167:311-318.
- Atkins L, Francis J, Islam R, et al. A guide to using the Theoretical Domains Framework of behaviour change to investigate implementation problems. *Implement Sci*. 2017;12:77.
- Michie S, Atkins L, West R. *The Behaviour Change Wheel: A Guide to Designing Interventions*. Bream, Gloucester: Silverback Publishing; 2014:329.
- Michie S, van Stralen MM, West R. The behaviour change wheel: a new method for characterising and designing behaviour change interventions. *Implement Sci*. 2011;6:42.
- Health Protection Scotland. Surveillance report: Surveillance of hepatitis C testing, diagnosis and treatment in Scotland, 2019 update. https://hpspubsrepo.blob.core.windows.net/hps-website/nss/2834/documents/1_hcv-testing-diagnosis-treatment-scotland-2018.pdf. Accessed April 16, 2020.
- Palinkas LA, Horwitz SM, Green CA, Wisdom JP, Duan N, Hoagwood K. Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Adm Policy Ment Health*. 2015;42(5):533-544.
- Scottish Government. Scottish index of multiple deprivation 2020. <https://www.gov.scot/collections/scottish-index-of-multiple-deprivation-2020/>. Accessed September 15, 2020.
- Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol*. 2006;3(2):77-101.
- Shehata N, Austin T, Ha S, Timmerman K. Barriers to and facilitators of hepatitis C virus screening and testing: a scoping review. *Can Commun Dis Rep*. 2018;44(7-8):166-172.
- Horwood J, Clement C, Roberts K, et al. Increasing uptake of hepatitis C virus infection case-finding, testing, and treatment in primary care: evaluation of the HepCATT (Hepatitis C Assessment Through to Treatment) trial. *Brit J Gen Pract*. 2020;70(697):e581-e588. <https://doi.org/10.3399/bjgp20X708785>
- Roberts K, Macleod J, Metcalfe C, et al. Cost effectiveness of an intervention to increase uptake of hepatitis C virus testing and treatment (HepCATT): cluster randomised controlled trial in primary care. *BMJ*. 2020;368:m322.
- Boucher LM, Bayoumi AM, Mark AE, et al. Hepatitis C testing, status and treatment among marginalized people who use drugs in an inner city setting: an observational cohort study. *Subst Use Misuse*. 2019;54(1):18-30.
- Lambert JS, Murtagh R, Menezes D, et al. 'HepCheck Dublin': an intensified hepatitis C screening programme in a homeless population demonstrates the need for alternative models of care. *BMC Infect Dis*. 2019;19(1):128.
- Goodyear T, Lianping T, Carrieri P, Small W, Knight R. "Everybody living with a chronic disease is entitled to be cured": Challenges and opportunities in scaling up access to direct-acting antiviral hepatitis C virus treatment among people who inject drugs. *Int J Drug Policy*. 2020;81:102766.
- Richmond JA, Wallace J. Implementation of hepatitis C cure in Australia: one year on. *J Virus Erad*. 2018;4:115-117.
- Johnson S, Aluzaitė K, Taar A, Schultz M. Identifying barriers to treatment of HCV in the primary care setting. *Hepatol Int*. 2019;13:58-65.
- Doshi RK, Ruben M, Drezner K, et al. Knowledge, attitudes, and behaviors related to hepatitis C screening and treatment among health care providers in Washington, DC. *J Community Health*. 2020;45:785-794.
- Pourmarzi D, Smirnov A, Hall L, Thompson H, FitzGerald G, Rahman T. Enablers and barriers for the provision of community-based HCV treatment: a case study of a real-world practice. *J Viral Hepatitis*. 2020;27(5):484-496.
- Marshall AD, Grebely J, Dore GJ, Treloar C. Barriers and facilitators to engaging in hepatitis C management and DAA therapy among general practitioners and drug and alcohol specialists – The practitioner experience. *Drug Alcohol Depend*. 2020;206:107705.

35. Spearman CW, Dusheiko GM, Hellard M, Sonderup M. Hepatitis C. *Lancet*. 2019;94(10207):1451-1466.
36. Carmona I, Cordero P, Ampuero J, Rojas A, Romero-Gómez M. Role of assessing liver fibrosis in management of chronic hepatitis C virus infection. *Clin Microbiol Infect*. 2016;22(10):839-845.
37. Bourlière M, Pietri O. Hepatitis C virus therapy: No one will be left behind. *Int J Antimicrob Agents*. 2019;53(6):755-760.
38. Drysdale K, Ntuli Y, Bestwick J, et al. English hepatitis C registry data show high response rates to directly acting anti-virals, even if treatment is not completed. *Aliment Pharm Ther*. 2020;52:168-181.
39. Williams BE, Nelons D, Seaman A, et al. Life projects: the transformative potential of direct-acting antiviral treatment for hepatitis C among people who inject drugs. *Int J Drug Policy*. 2019;72:138-145.
40. Pourmarzi D, Hall L, Smirnov A, Hepworth J, Rahman T, FitzGerald G. Framework for community-based models for treating hepatitis C virus. *Aust Health Review*. 2020;44(3):459-469.
41. Falade-Nwulia O, Sacamano P, McCormick SD, et al. Individual and network factors associated with HCV treatment uptake among people who inject drugs. *Int J Drug Policy*. 2020;78:102714.
42. Morris L, Selvey L, Williams O, Gilks C, Kvassy A, Smirnov A. Hepatitis C cascade of care at an integrated community facility for people who inject drugs. *J Subst Abuse Treat*. 2020;114:108025.
43. Stagg HR, Surey J, Francis M, et al. Improving engagement with healthcare in hepatitis C: a randomised controlled trial of a peer support intervention. *BMC Med*. 2019;17(1):71.

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