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Prescribing direct-acting antivirals for hepatitis C treatment: a scoping review of factors that influence primary care providers

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Abstract

Background Hepatitis C is a significant public health challenge in Australia, particularly in diagnosis, treatment access, and ongoing care among people who inject drugs. Despite the availability of highly effective direct-acting antivirals and government subsidisation, treatment uptake has declined among this population in recent years, beyond what would be expected from the initial treatment of easier-to-reach patients.

Objectives This rapid scoping review aimed to identify barriers and enablers affecting primary care providers in prescribing direct-acting antivirals for hepatitis C treatment.

Eligibility criteria Studies were included if they: were published after 2014, focused on DAA treatment, included primary care provider perspectives, contained primary data, identified barriers/enablers to treatment, and were conducted in high-income countries.

Sources of evidence Two databases (Web of Science and Google Scholar) were searched for peer-reviewed articles. Primary care stakeholders were consulted through an online survey ($n = 10$) and telephone interviews ($n = 7$) to contextualise and validate findings.

Charting methods Data were charted using a standardised form capturing author, year, location, aim, participants, study details, and main findings. Analysis used a deductive approach to identify key themes.

Results Twenty-three articles, mostly quantitative studies, were included in the review. The analysis identified four key domains influencing direct-acting antiviral prescription: provider characteristics, healthcare systems and service delivery, models of care, and societal and structural issues.

Conclusions This review provides insights into contemporary challenges in hepatitis C care delivery models and highlights critical structural, sociocultural, and interpersonal factors affecting testing and treatment, particularly for people who inject drugs. These findings have implications for improving direct-acting antiviral prescription rates in primary care settings.

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Keywords Hepatitis C, Direct-acting antivirals, Injecting drug use, Primary care, General practice

Introduction

Viral hepatitis, in particular hepatitis C (HCV), is a significant health issue within Australia. There has been substantial progress in reducing the public and personal health impacts of viral hepatitis [1], with some success in reducing infection rates in the general population [2, 3]. A major contributor to this progress has been the transition from burdensome interferon-based treatments to more effective and well-tolerated direct-acting antivirals (DAAs). These expanded treatment options have formed a significant part of the work towards eliminating HCV as a public health issue within Australia [4]. However, key groups in the Australian context remain at significant risk for transmission and subsequent adverse health outcomes, particularly people who inject drugs (PWID) [5]. Similar challenges in HCV elimination efforts exist across many high-income countries, despite differences in healthcare systems and funding models [6].

Prevention strategies such as sterile needle and syringe programs work alongside treatment approaches like DAAs, which have demonstrated effectiveness in treating individuals with HCV [7]. DAA treatment is well-tolerated with benefits including better quality of life, reduced risk of liver damage and prevention of transmission to others. Notably, evidence shows that HCV cure rates for PWID are comparable to those in other populations, challenging previous assumptions about treatment efficacy in this group [7, 8]. Since federal government subsidisation of DAA treatment costs, uptake in Australia increased significantly [3, 9].

Despite initial success, the uptake rate of DAAs in Australia declined substantially after 2016, from more than 4,000 people accessing treatment per month in early 2016 to less than 1,000 people per month in early 2019 [3]. More recent data [10] shows encouragingly that 2023 marked the first year-over-year increase in treatment numbers since the initial implementation period, with prison-based initiations representing a significant proportion of new treatments. However, a substantial population remains untreated. HCV incidence shows mixed patterns, with population-specific declines in some groups but localised increases in others, particularly among young men [10]. These treatment gaps persist despite highly effective therapies, suggesting significant barriers continue to impede access. For patients, barriers include stigma, concern about treatment side effects, delays in treatment/care, competing priorities and co-morbidities, a perception that HCV is not urgent and a lack of information and support (see [11–18]).

Additionally, the administration of DAAs and other medical interventions has shifted from the realm of specialists to treatment available in non-specialist and primary care settings [19]. Research has indicated that the decentralisation of HCV DAA treatment delivery is relatively safe and effective [20–22] and likely to reduce some of the pre-existing barriers to treatment uptake amongst PWID [23–25]. As a result, there has been an increase in GP-prescribed DAA treatment over the last few years [4, 26–28], including an expansion of HCV treatment in more geographically remote locations where treatments may not have been previously available [28, 29]. However, there is a need to gain a better understanding of the experiences of non-specialist clinicians providing HCV treatments, many of whom have had minimal experience in working with HCV-positive patients, particularly patients who are also PWID. A scoping review was chosen to map the emerging evidence around primary care-based DAA prescription and capture diverse study designs examining barriers and enablers to treatment delivery. This review sought to address the following question: What are the key barriers and enablers that influence primary care providers' willingness and ability to prescribe DAAs for HCV treatment in high-income countries?

Methods

A rapid scoping review was conducted using Arksey and O'Malley [30] guidelines and the PRISMA Extension for Scoping Reviews (PRISMA-ScR) [31]. The review used the following steps: (1) identifying the research question; (2) identifying relevant studies; (3) study selection; (4) charting data; (5) collating, summarising, and reporting results; and (6) consultation.

Identifying the research question

The broad aim was to identify barriers and enablers affecting primary care providers in prescribing DAAs for hepatitis C treatment. An initial literature search generated several studies exploring factors that may influence providers' willingness and ability to prescribe DAA treatment from their perspective [8, 32–41], as well as a recent systematic review [18]. Based on the initial review, the following list of inclusion and exclusion criteria was generated (Table 1). For this review, 'standard model of care' refers to treatment delivered through established healthcare settings such as hospitals, primary care clinics, and community health centres, excluding experimental or highly specialised models such as those delivered exclusively through prison health services, mobile units, or other non-traditional delivery systems.

Table 1 Inclusion and exclusion criteria

	CRITERIA
Studies were included if they:	were published after 2014 (when DAAs became widely available globally^)
	focused on DAAs as the treatment being evaluated
	included primary care provider perspectives
	primary study of survey/interview/focus group data
	identified barriers and/or enablers to treatment
	were conducted in high-income countries (defined based on the World Economic Situation and Prospects 2018 Report).
Studies were excluded if they:	evaluated Interferon-based treatment
	were published in a language other than English
	related to treatment in 'closed' or specific settings or with specific sub-populations (e.g. prisons, US veterans, Indigenous communities)
	related to barriers and enablers to hepatitis C testing or screening only (not treatment)
	involved a model of care outside standard model of care
	review articles

^ While DAAs became commercially available in many high-income countries from 2014, government subsidisation varied by country (e.g., 2016 in Australia)

Table 2 Database search terms

	Search Terms
Concept 1	"hepatitis C" OR HCV OR "direct-acting antivirals" OR DAA
Concept 2	treatment OR prescri*^
Concept 3	"general practice" OR "general practitioner" OR "family medicine" OR "primary care" OR provider OR "community clinic" OR clinician OR physician OR "nurse practitioner" OR "nurse-led"
Concept 4	barriers OR facilitators OR enablers OR challenges

^ The asterisk denotes truncation in the search term to capture variations (e.g., prescri* captures prescribe, prescribing, prescription)

Identifying relevant studies

Web of Science and Google Scholar were searched for peer-reviewed articles. For Google Scholar, we exported the first 100 results for each time period (2014–2018, 2019–2022, and 2023–2024) to ensure feasibility while capturing the most relevant articles as a supplementary source [42] to the database search. A combination of keyword and subject heading/MESH heading terms was identified (see Table 2).

Study selection

Articles were managed and stored using EndNote 21 [43]. Duplicates were removed, and article titles were reviewed to exclude irrelevant articles from initial search results (e.g., those not related to hepatitis C or primary care). Article titles and abstracts were screened against inclusion criteria by one researcher who met with the research team to discuss sample articles. A consensus panel of the research team mediated reviewer disagreements. Article titles meeting inclusion criteria were exported into Rayyan [44] (a web-based application for systematic review screening and collaboration) and underwent abstract and full-text screening. For final included articles, backwards and forwards citation searching was undertaken. A flow chart for the selection of included articles (Fig. 1) is outlined below:

Charting data, collating, summarising, and reporting the results

The following variables were extracted from each study: author(s), publication year, study location, study aims/objectives, participant characteristics (type and number of providers), methodology (study design, data collection methods), and key findings related to barriers and enablers of DAA prescription. Findings from individual studies were initially summarised narratively through the charting process (see supplementary Table 3) to capture the range and nature of reported barriers and enablers. The data were then synthesised thematically using a deductive approach to identify overarching domains. Initial themes were developed by one researcher and refined through team discussion until consensus was reached. Stakeholder consultation findings were then used to validate and contextualise the identified themes.

Consultation

We engaged stakeholders in consultation to contextualise and validate findings using an online Qualtrics [45] survey ($n = 10$) and qualitative, semi-structured interviews conducted by telephone ($n = 7$). All stakeholders engaged in this consultation were from Western Australia (WA), where HCV prevalence patterns are higher than national trends [9], though treatment uptake has been lower than the national average [3]. Participants were identified

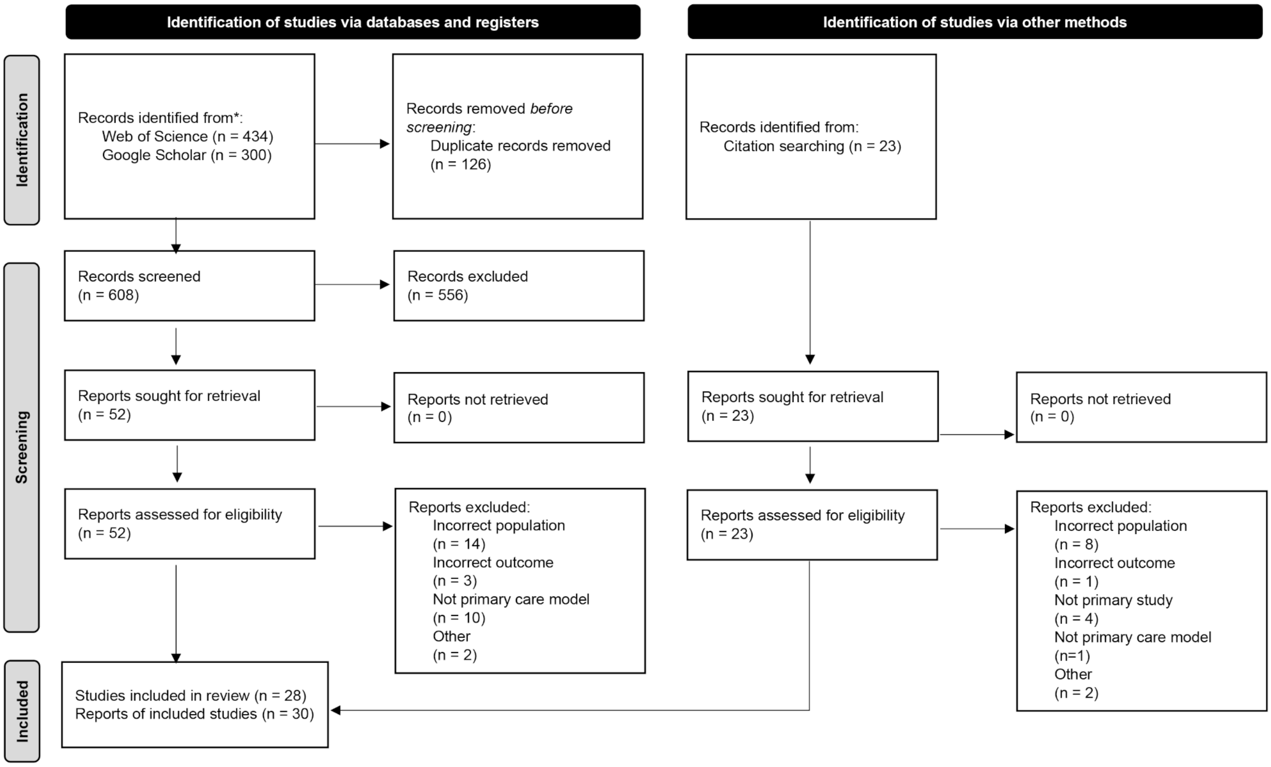

Fig. 1 Flowchart of study selection

through purposive sampling in collaboration with the peak non-government organisation (NGO) for hepatitis in WA. We sought participants with direct experience in HCV management within primary care settings, including those with and without DAA prescribing experience. Recruitment occurred through email invitations sent to the organisation's professional network, with follow-up phone calls to increase participation. Survey instrument questions included primary care setting characteristics, existing prescribing and treatment approaches, usefulness and impact of the existing support models, and barriers and enablers to prescribing DAAs. Open-ended responses were exported into Microsoft Excel for qualitative content analysis.

Telephone interviews were undertaken with clinicians ($n=4$) and WA NGO staff ($n=3$). Clinicians who had worked with the WA NGO were contacted via email and invited to participate. Interviews explored experiences and reflections on types of support required for effective models of DAA prescribing (e.g. nurse-led models), types of support previously used, reflections on support efficacy and potential changes required to improve future iterations of support models, and participant-identified barriers and enablers to utilise support models and resources. WA NGO staff interviewed were those involved in implementing a nurse-led program to increase DAA prescribing and were asked about their experiences supporting primary care providers, including challenges and perceived benefits. We used a deductive approach to qualitative content analysis to uncover themes. While our scoping review excluded studies of non-standard models of care, we intentionally included questions about effective models in our stakeholder consultation to contextualise our findings and identify potential innovations that could be transferred to standard care settings. This complementary approach provided practical implementation insights while maintaining focused review criteria.

Results

Overview

From an initial 608 articles identified through database searches, 556 were excluded during title/abstract screening, and a further 22 were excluded during full-text review, leaving 30 articles that met our inclusion criteria covering 28 unique studies (see Fig. 1). Quantitative studies ($n=15$) were either cross-sectional surveys administered via mail ($n=3$) [33, 40, 46], online ($n=10$) [47–56] or not further described ($n=2$) [38, 57]. Qualitative articles ($n=15$) used semi-structured interviews ($n=13$) [8, 32, 34, 36, 37, 39, 41, 58–63], with one combining focus groups and interviews [32] and nominal groups ($n=2$) [35, 64]. The sample sizes ranged from six [61] to 925 [33]. Participants included primary care physicians or general practitioners (*n* = 8) [33, 36, 38, 46, 51, 56, 57, 60] and those with a specific interest in HCV (*n* = 8) [34, 35, 41, 47, 48, 60–62], substance use disorder providers or physicians who prescribed Opioid Agonist Treatment (OAT) (*n* = 5) [34, 50, 52, 53, 62], experts in HCV care or research (*n* = 2) [8, 58], or a combination of primary care providers (such as nurses and physician assistants) (*n* = 8) [35, 37, 41, 48, 49, 54, 55, 63], as well as providers and patients (*n* = 2) [32, 59]. All studies were conducted in high-income countries: USA (*n* = 14) [46–51, 54–56, 58–61, 64], Australia (*n* = 8) [32, 34, 36–38, 40, 62, 63], Canada (*n* = 3) [8, 35, 57], New Zealand (*n* = 1) [33], Scotland (*n* = 1) [41], or a combination of countries (*n* = 2) [52, 53]. One study did not report ethical approval [38]; four were reportedly exempt [47, 48, 52, 53].

Studies described factors that affected providers' willingness and ability to prescribe DAA treatment. These were conceptualised as assessing or understanding providers' knowledge, attitudes, self-efficacy and/or behaviour (*n* = 10) [38, 46, 47, 49–52, 55, 56, 63] or exploring barriers and enablers (*n* = 17) [32–36, 39–41, 48, 53, 54, 57–61, 64]. Three studies sought to describe structural and/or implementation factors related to treatment [8, 37, 62]. Results were categorised into four key domains of influencing factors, discussed below: provider characteristics; healthcare systems and service delivery; models of care; and societal and structural issues.

Provider characteristics

Twenty-seven articles [32–39, 41, 46–52, 54, 56–65] described provider-related factors that affected their ability to prescribe DAA. Broadly, these factors related to competency in HCV treatment and attitudes towards both HCV and patients.

Competency in DAA treatment enabled providers to continue to treat patients [32, 48, 63]. Providers with experience considered the process 'simple' and 'easy' [32, 58, 63], with high cure rates and limited patient side effects [32, 34, 36, 41]. Provider competency was enhanced when they had opportunities to build knowledge networks with both clinical and lived experience peers [32] and receive training that took a structural approach to HCV (e.g. discussing the roles of power, marginalisation, and cultural differences) and challenged stigmatising viewpoints [36, 66]. Providers who developed strong competency often became treatment champions, actively contributing to knowledge sharing and patient advocacy [32, 36, 37, 40, 49]. Stakeholder perspectives also emphasised the importance of HCV champions within practices, and highlighted how provider confidence and knowledge regarding testing and treatment processes contributed to successful treatment delivery.

Individual provider approaches and attitudes significantly influenced treatment delivery. A person-centred, community-oriented, and quality-of-life-focused approach towards DAA treatment was viewed positively [34, 35, 41]. This included provider perceptions that patients (including PWID) deserved treatment [52], that their profession has a moral obligation or a duty to treat [34], and feeling a sense of pride in their work [60]. Providers also described competency in working with PWID, particularly providers who provided OAT [32, 41]. Also noteworthy, was the belief that effective HCV treatment helps build trust between clinicians and patients [32, 34, 58, 61], particularly patients whom clinicians perceived as 'motivated' [36].

However, providers' knowledge gaps and personal beliefs could create significant barriers to treatment delivery. There were primarily two significant issues: a lack (or a perceived lack) of knowledge and training around current HCV treatment approaches [32, 33, 35–39, 41, 46, 47, 50–52, 57]; and, in many instances, a lack of awareness that HCV could be treated within primary care, particularly amongst those who had out-of-date knowledge of HCV treatment and eligibility, particularly for PWID [38, 40, 46, 56]. Lack of capacity and proper training for treating patients with substance use disorders was also a reported barrier in one study [54].

Additionally, certain providers' beliefs were significant barriers to effective DAA treatment. These included: that HCV treatment is not a priority, particularly where it was asymptomatic [33, 34, 36] or where there were other acute medical needs [59, 64], or a general lack of interest in the issue [33, 34, 36, 47, 48, 63]; that HCV treatment was a specialist domain and not appropriate for primary care [33, 36, 41, 48, 49, 51, 60]; and that HCV is complex or burdensome [41] (particularly if their perception was affected by experience or knowledge of treatment in the interferon era [33]). Some providers were reluctant to prescribe treatment for patients reporting active injecting drug use [49, 54, 64], or they perceived that their patients would not adhere to treatment regimens [38, 39, 48, 49, 58, 64]. Additionally, stigma about people with HCV and the populations most affected by HCV (such as PWID and Aboriginal and Torres Strait Islander peoples) was a significant barrier to clinicians' willingness to take on people living with HCV as patients [35, 36, 38, 39, 48].

Stakeholder perspectives reinforced many of these findings about provider-level factors that influenced HCV treatment delivery. Positive provider factors included: confidence and knowledge regarding testing and treatment processes; existing trusting relationships with patients; and providers being motivated by the relatively high cure rate of the DAA treatment. However, stakeholders also identified provider-level barriers including: GP misinformation or lack of knowledge or interest around contemporary HCV treatment approaches; negative stigma around HCV and injecting drug use from clinicians and other practice staff (i.e. non-clinical administrative personnel, practice managers, and allied health professionals working within primary care settings who may have roles in patient engagement, appointment scheduling, or other aspects of the care pathway); GP hesitancy to engage in discussions with patients that may feel confronting, uncomfortable or sensitive (i.e., injecting drug use); and GP tendency to refer HCV patients onto specialists rather than providing in-clinic care.

Healthcare systems and service delivery

Twenty-six studies identified systemic and delivery-based factors that enabled or inhibited appropriate primary care for HCV [8, 32, 34–36, 38, 39, 41, 47–50, 53–55, 58–64, 67–69]. Key enabling system-level features included: clear primary care HCV treatment guidelines and resources [39, 63];

comprehensive training programs [25, 33, 35, 63]; access to specialist support [34, 36, 39–41, 62, 63] and specialist consultations [65], in particular, remote consultation pathways [33, 34, 39–41, 62]. Supportive senior management [62] and clear guidelines and processes [40] were also identified as crucial. Stakeholder consultation reinforced and expanded on these findings, particularly emphasising the clarity and accessibility of current guidelines and other resources (i.e. The Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine (ASHM) and/or Gastroenterological Society of Australia (GESA)) and highlighting the value of HCV-specific support organisations as both knowledge resources and referral points. These system-level supports were considered essential for building provider competency and confidence.

The literature identified additional enabling factors in healthcare systems, including: efficient pharmacy services [60]; availability of necessary testing services within primary care clinics [59, 63], ideally at low or no cost to patients [32]; the use of reflex testing to reduce the delay between HCV antibody and HCV RNA testing [35, 60]; less invasive blood-drawing methods [41]; access to interpreters [60]; point-of-care (as opposed to off-site); flexible timing for assessments such as liver fibrosis [8, 41]; and system-level support for building staff competency through upskilling and educating clinical and support staff to build a more cohesive clinical environment [36]. Healthcare systems that implemented HCV-specific practice routines and inclusion in daily tasks (e.g. prompts in patient management software) [32, 39, 49] showed improved treatment delivery. Stakeholders particularly highlighted the value of onsite and rapid testing options, clear structured processes for HCV testing and treatment, and the potential to reduce delay times due to the GP prescription model.

The review identified multiple systemic factors inhibiting providers' capacity to provide DAAs. These included: the number of steps required to initiate treatment [8, 61, 64]; lack of necessary equipment for HCV assessment (e.g. FibroScan) and subsequent delays to treatment [8, 32–34, 36, 38, 40, 41, 54, 62, 64]; the lack of an alternative to blood draw resulting in patient reluctance due to negative previous experience and/or poor venous access related to injecting drug use [34, 41]; unnecessary treatment delays due to current assessment guidelines [34, 62] and insurance authorisation [55, 58, 59, 61, 64]; overworked staff and under-resourced clinics [8, 36, 41, 47, 48, 59, 69]; significant delays due to compulsory bureaucratic processes and paperwork [33, 35, 55]; abstinence from drug-use required for government reimbursement [53, 54]; lack of case managers and peer-support programs [53]; inadequate system-wide training resulting in lack of clinic staff support [8, 47, 48, 67]; limited access to medicine [50, 55]; siloed health services (i.e. drug and alcohol, mental health) [62]; and fee-per-service models which increase patient attrition due to unaffordability [8, 53, 55, 61].

Stakeholder consultation revealed additional system-level challenges, including: short duration of appointments; lack of onsite equipment and services for timely diagnosis; outdated primary care guidelines for HCV treatment; lack of funding for general practice clinics to provide HCV testing and treatment; and practical barriers such as the potential for errors in writing requisitions. Stakeholders also emphasised how system-level issues contributed to low caseload of HCV patients (including perceived caseload) and the tendency for GP referral of HCV patients to specialists rather than providing in-clinic care, highlighting the need for better support systems for primary care management of HCV.

Models of care

Fourteen studies reported factors relating to models of care that facilitate better HCV treatment [8, 33–37, 39–41, 58, 59, 64, 68, 70]. These enablers included: the availability of integrated medicine models and multidisciplinary teams, including mental health professionals, pharmacists, and other allied health workers [35, 39, 41, 58, 68]; co-located or integrated services (e.g. GPs attending community centres, support services being present in clinical settings) [34, 36]; inclusion of HCV-specific care in existing PWID services [8, 41]; utilising outreach, community-based, peer-led, and remote access frameworks for assessment and treatment delivery, particularly when working with populations such as people living remotely or experiencing homelessness [8, 35, 36, 40, 59]; and utilising nurse-led models, including outreach models [8, 40, 64]. Overall, diversifying points of access to HCV treatment reportedly improved the likelihood of treatment uptake and maintenance [37]. Further, models of care that used incentives [35] to enhance HCV testing and treatment uptake were suggested as beneficial [33, 64].

Societal and structural factors

Beyond healthcare delivery systems and provider factors, broader societal issues that created significant barriers to HCV treatment were identified by twelve studies [8, 35, 39, 41, 53–55, 58–61, 64]. Issues such as inadequate housing, criminalisation of drug use, stigma, chronic illness/co-morbidities, mental health issues, trauma, poverty and structural oppression can create competing priorities and impact the ability of individuals to initiate HCV assessment as well as begin and complete treatment [8, 35, 41, 53, 54, 58–60, 64]. Individuals facing challenges in meeting basic needs, such as food, transport and safe housing, may have limited capacity to engage with HCV treatment [59, 60], which often involves multiple appointments [35]. Competing priorities may also make navigating complex and rigid healthcare systems more challenging for patients [8, 55] who require effective support and interventions to optimise HCV treatment engagement and ensure equitable access [8, 39]. Additionally, the stigma [54, 60] and criminalisation of drug use impacts on people's ability and willingness to access health services, including presenting for HCV testing and treatment, and thus the ability of providers to prescribe. The decriminalisation of substance use was identified as just one example of law/social policy that could reportedly positively influence DAA treatment outcomes [8].

Geographical variation

While many barriers appeared consistent across countries, notable geographical distinctions emerged. In US-based studies, insurance authorisation requirements [55, 58, 61] were frequently cited barriers. Studies from the US also reported abstinence from drug use requirements for government reimbursement as a significant obstacle [53, 54]. The extensive paperwork required for treatment approval was raised by studies across the US [55], Canada [35] and New Zealand [33].

In contrast, Australian studies more commonly identified limited specialist support pathways [40] and siloed health services between drug and alcohol treatment and primary care [62] as key barriers. Studies from Scotland [41] and Australia [36] both highlighted lack of access to liver fibrosis assessment as a critical barrier, reflecting shared challenges in healthcare systems with centralised resource allocation.

Discussion and recommendations

Through a synthesis of findings from 30 peer-reviewed papers, and consultation with primary care providers, this review yields some insight into contemporary issues in the delivery of DAA treatment for HCV and revealed a variety of structural, sociocultural, organisational and individual issues which affect efficient and appropriate delivery of HCV testing and treatment. Consistent with previous literature, this review found numerous barriers at both the provider level and the healthcare system and service delivery level, suggesting opportunities to improve models of care and the primary care setting. Less reported on were barriers at the societal and structural level, likely owing to the complexity of issues including homelessness and drug use, mentioned here. The review reveals several recommendations broadly related to accelerating the time from testing to treatment, improving models of care, increasing provider education and addressing stigma.

Remove the gap between HCV testing and treatment initiation

Recent advances in HCV testing technologies combined with knowledge of DAA treatment efficacy present a significant opportunity to address barriers related to pre-treatment requirements and diagnostic equipment availability. Effecting changes that reduce the distance between testing and treatment, simplifying the DAA prescribing process, should be pursued. This may include point-of-care testing with immediate treatment initiation (i.e. same day test and treat [71]), mobile outreach programs that bring testing and treatment to underserved populations (e.g [72])., simplified diagnostic algorithms that reduce required visits [73], and co-location of testing and treatment services in settings already accessed by priority populations (e.g. a medically supervised injecting facility [74]). Beyond service delivery modifications, direct patient incentives have shown promise in increasing treatment uptake and completion. The Motivate C study [75] demonstrates how financial incentives may overcome practical barriers such as transportation costs and competing priorities, potentially offering a cost-effective approach to reach populations disconnected from care.

The goal is also for treatment initiation to be simple and convenient for providers [76]. For example, the literature and stakeholder consultation support adopting reflexive testing in contexts where this is not already in place [35, 60] and utilising rapid point-of-care testing rather than blood draws in settings where appropriate [77]. In addition, the review suggests that amending treatment protocols to allow treatment initiation before results from liver fibrosis assessment are received may be beneficial [8, 32–34, 36, 38, 40, 41, 54, 62, 64]. Structurally, general practice clinics require more directive funding and clear guidelines on managing HCV testing and supporting HCV positive patients. There is also a need to provide clinics with greater access to the necessary diagnostic tools required to assess and initiate treatment on-site to reduce delays.

Adopt contemporary models of care

There is a need to redistribute the clinical management of the assessment and treatment of HCV, as well as ensure healthcare systems provide adequate funding to cover diagnostic and treatment resources, reducing or eliminating out-of-pocket costs that can lead to patient attrition. Reorienting HCV treatment from a specialist domain to a function of primary care is well underway in many countries, including Australia [78] and includes not only shifting prescribing responsibilities to general practitioners but also leveraging the broader primary care workforce. Task-shifting to nursing staff represents a particularly promising approach [79], as nurses can support numerous aspects of the care continuum including patient education, testing coordination, treatment monitoring, and follow-up care—even in contexts where nurse prescribing is not yet permitted. Research suggests that further changes such as building capacity through reallocation of financial resources from specialist to primary care [80] and granting prescribing privileges to additional categories of healthcare professionals (e.g. registered nurses, pharmacists) offer opportunities to increase access to treatment, particularly for PWID [78, 80]. Simplification of treatment pathways has progressed significantly [81], with innovations including same-day diagnosis and treatment initiation, provision of complete medication courses at a single visit, reductions in standard SVR testing requirements, and removal of unnecessary pre-treatment assessments. These simplifications remove historical barriers that contributed to patient loss-to-follow-up between diagnosis and cure, and promotion of decentralised care models and workforce development can further support this [3, 13, 23, 41, 62], along with integrated and multidisciplinary models of care including targeted, community-based health care provision [35, 39, 41, 58, 68].

Increase provider education and training

The lack of confidence and knowledge reported by providers is a barrier highly amenable to change through provision of adequate, comprehensive, and ongoing training, consistent with other areas of primary care [32, 36, 37, 40, 49]. The high-quality educational and training resources offered by organisations such as ASHM combined with support through peer and specialist consultation can give providers the tools and information they need to confidently manage HCV treatment [25, 33, 35, 63]. Additional strategies to overcome barriers that may be beneficial include consideration of incentives for whole clinics to complete HCV education and training [34, 77], embedding social contexts of HCV into provider education and training (including stigma, colonisation, cultural safety) [32, 36, 66], and developing simple, concise resources with involvement of people with lived experience of HCV, PWID, and providers [34, 35, 41].

Address stigma

From a sociocultural perspective there is a need to address the persistent stigma around HCV and pathways of transmission, in particular injecting drug use [54, 60]. These stigmatising perspectives form a particularly significant barrier to appropriate treatment amongst prescribing GPs when coupled with the perceptions of HCV treatment that have endured from the 'interferon era' [33], which position HCV treatment as a difficult process requiring specialist intervention and off-site assessment and treatment [33, 36, 41, 48, 49, 51, 60]. There is a need to address the impact that these broader issues have on doctor-patient interactions [35, 36, 38, 39, 48], when patients may already be reluctant to seek testing and treatment or unaware of treatment availability [12, 66]. Some possible actions that are supported by the literature include promoting peer 'champions' [77] and fostering connections with specialists to mentor and train providers [34, 36, 39–41, 62, 63]. Primary care providers can benefit patients by acting as HCV advocates, directly challenging stigma and advocating for structural improvements which can positively affect patients' capacity and comfort to seek, initiate, and complete DAA treatment.

Implementation considerations

Translating these findings into routine primary care practice requires strategic approaches to integration. Targeted professional development for primary care providers should address identified knowledge gaps and build treatment confidence, particularly regarding contemporary DAA regimens. Establishing accessible specialist consultation pathways, including remote options, can provide necessary clinical support while maintaining primary care management. Electronic medical record modifications incorporating HCV screening and treatment prompts may facilitate appropriate testing and reduce missed opportunities for engagement. Funding mechanisms aligned with hepatitis C elimination targets could address resource constraints in time-limited consultation settings. Finally, comprehensive practice-level resources that engage the entire care team could standardise protocols and workflow integration, particularly beneficial in settings with limited hepatitis C experience. These implementation strategies acknowledge the multilevel factors identified in this review and offer practical approaches to enhance DAA prescribing in primary care.

Strengths and limitations

This review presents a unique snapshot of primary care providers' perspectives on barriers and enablers to DAA treatment in the peer-reviewed literature. A rapid scoping review was a useful strategy to quickly translate findings to end users. The inclusion of stakeholder consultation provided the opportunity to validate findings. As DAAs have been readily available and utilised in clinical spaces for more than a decade, there has been enough time for a body of knowledge to develop around provider experiences with delivering DAAs in primary care settings. However, it is still a relatively small body of knowledge compared to studies on interferon-based treatment, which had been the dominant form of treatment for HCV for several decades. This meant the research team had a relatively shallow pool to draw from for this review. The use of multiple search terms and broad timeframe provided expanded scope. However, the small number of databases, use of only peer-reviewed literature and inclusion of English-language only studies, meant it is possible that relevant literature may not have been identified and some publication bias occurred. Notably, our review included minimal European representation, which may reflect both English language as an inclusion criterion as well as regional differences in healthcare organisation and HCV funding models. Our findings could support the case for expanding primary care-led HCV treatment in European contexts, while acknowledging that implementation would need to address unique structural features of these healthcare systems not fully captured in the predominantly North American and Australian literature.

Conclusion

The government subsidisation of direct-acting antivirals to treat hepatitis C in Australia provides a valuable opportunity to address a significant public health issue. However, achieving global and national targets for hepatitis C treatment will require greater attention to addressing persistent barriers to access for priority populations. This review supports the evidence for the essential and expanding role of primary care providers in treating hepatitis C and the opportunities to improve service delivery, particularly for priority populations such as people who inject drugs. Careful and considered investment in strategies to improve models of care is required to address identified structural, sociocultural, and interpersonal barriers and deliver on aspirations in Australia to eliminate hepatitis C transmission.

Abbreviations

ASHM	Australasian society for HIV, viral hepatitis and sexual health medicine
DAA	Direct-acting antivirals
GESA	Gastroenterological society of Australia
GP	General practitioner
HCV	Hepatitis C virus

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12875-025-02865-3.

Supplementary Material 1

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Author contributions

JH, GC, TP and CG developed and implemented the search strategy. TP and CG conducted title/abstract and full-text screening, and performed data extraction and analysis. TP, JH, SR, CG and GC drafted the manuscript. RL contributed to data synthesis and interpretation and provided substantial revisions to the manuscript. All authors participated in developing the research questions and inclusion criteria, and read and approved the final manuscript.

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Data availability

The majority of data that support this study are available in the article. Some data that support this study cannot be publicly shared due to ethical or privacy reasons and may be shared upon reasonable request to the corresponding author if appropriate.

Declarations

Ethical approval and consent to participate

Approval to conduct this study was granted by the Curtin University Human Research Ethics Committee (HRE2021-0632) in accordance with the Declaration of Helsinki and the National Health and Medical Research Council's *National Statement on Ethical Conduct in Human Research*. The research was undertaken with the informed consent of participants. Clinical trial number: not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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