# Diagnostic testing strategies to enhance diagnosis and treatment of hepatitis C virus infection in Australia: a model-based cost-effectiveness analysis

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**Background:** Understanding the optimal testing interventions to enhance timely treatment of HCV infection is critical to support elimination. This study evaluated the cost-effectiveness of HCV testing strategies compared to laboratory-based testing in standard-of-care.

**Methods:** Cost-effectiveness analyses were undertaken from the perspective of Australian Governments as funders by modelling testing strategies compared to standard-of-care in community settings in Australia. Study settings included drug treatment clinics, needle/syringe programs, homelessness settings, and community corrections. Data on HCV prevalence and treatment initiation were from the Australian Hepatitis C Point-of-Care Testing Program, NSW Dried-Blood-Spot Program, and the published literature. Testing strategies included: a) laboratory-based antibody testing with reflex HCV RNA testing; b) point-of-care antibody testing with reflex point-of-care HCV RNA testing; c) point-of-care antibody testing with laboratory-based reflex HCV RNA testing; d) dried-blood-spot collection with HCV RNA testing; e) point-of-care HCV antibody testing with reflex dried-blood-spot collection and HCV RNA testing; f) point-of-care HCV RNA testing.

**Findings:** The average costs per HCV treatment initiation for standard of care was $1,721 for community corrections, $1,958 for needle/syringe programs, $2,283 in drug treatment clinics, and $2,643 for homelessness services (Table 1). The testing strategies more cost-effective than standard of care across all settings were point-of-care HCV antibody testing with reflex point-of-care HCV RNA testing ($1,324-$1,822), point-of-care antibody testing with laboratory-based reflex HCV RNA testing ($1,448-$2,006), laboratory-based antibody testing with reflex HCV RNA testing ($1,654-$2,411), and point-of-care HCV antibody testing with reflex dried-blood-spot collection and HCV RNA testing ($1,655-$2,306).

**Interpretation:** Reflex testing strategies combining point-of-care, dried-blood spot, and laboratory testing are more cost-effective than standard of care for populations at risk of HCV. Testing strategies combining different testing interventions incorporating reflex testing are likely to be cost-effective, with the choice of testing strategy dependent on the specific setting.

**Table 1. Average cost per treatment initiation for different HCV testing strategies across different community-based settings**

| Testing strategy | Antibody | RNA | Drug treatment | NSP | Homelessness | Community corrections |
|---|---|---|---|---|---|---|
| Standard of Care | Venepuncture | Venepuncture | $2,283 | $1,958 | $2,643 | $1,721 |
| Point-of-care antibody testing with reflex point-of-care HCV RNA testing | Point-of-care | Point-of-care | $1,822 | $1,468 | $1,798 | $1,324 |
| Point-of-care antibody testing with laboratory-based reflex HCV RNA testing | Point-of-care | Venepuncture | $1,968 | $1,606 | $2,006 | $1,448 |
| Laboratory-based antibody testing with reflex HCV RNA testing | Venepuncture | Reflex | $2,148 | $1,839 | $2,411 | $1,654 |
| Point-of-care HCV antibody testing with reflex dried-blood-spot collection and HCV RNA testing | Point-of-care | DBS | $2,306 | $1,846 | $2,302 | $1,655 |
| Point-of-care HCV RNA testing | NA | Point-of-care | $2,676 | $2,652 | $3,861 | $2,426 |
| Dried-blood-spot collection with HCV RNA testing | NA | DBS | $3,416 | $3,384 | $4,981 | $3,087 |

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