Hepatitis C Virus Screening Strategies to Improve Early Identification & Treatment: A Scoping Review

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Purpose

- **To evaluate current evidence regarding the efficacy of existing screening strategies for early detection of the Hepatitis C Virus (HCV) and identify areas within the research that suggest a need for further study**

Specific Aims

- Identify current screening strategies in the inpatient and outpatient settings
- Evaluate the efficacy of different screening methodologies to increase screening, HCV testing, diagnosis, and linkage to care
- Compare screening strategies to determine the most effective methodology for improving early detection of HCV

Background

Epidemiology and Impact

- Most common blood borne pathogen in the US
- Adult prevalence of ~1%, with 75-80% of untreated adults developing chronic HCV
- Cost of chronic HCV estimated to be $1.5-1.7 billion annually
- HCV and its complications lead to approximately 400,000 deaths annually

Detection and Treatment

- Cure rate with early administration of direct-acting antivirals is over 95%
- HCV is undiagnosed in over half of those with chronic HCV
- Underdiagnosing leads to increased transmission and decreased treatment

Screening Background

Birth-Cohort Screening

- 2012 CDC/USPSTF Guidelines focused on one-time screening for those born between 1945 and 1965
- Also included specific risk factors: IV drug use, HIV infection, transfusion prior to 1992, known exposure
- Prevalence increased despite curative treatment and screening efforts

Universal Screening

- 2020 CDC/USPSTF Guidelines updated to focus on Universal Screening
- One-time screening for all adults ages 18 to 79 and during each pregnancy
- Repeat screening for those with specific risk factors: IV drug use, chronic hemodialysis, and unprotected sexual intercourse with multiple partners

Need for Improved Screening

- Only 14.1% of the 1945-1965 birth cohort has been screened
- Predicted vs actual prevalence suggests continued under-screening that may be due to:
  - Stigmatization surrounding HCV
  - Lack of adequate access to healthcare
  - Lack of provider knowledge of updated screening guidelines and treatment
  - Lack of patient education about HCV, risk factors, screening, testing, and treatment
- Indicates need to develop strategies to improve screening rates

Methods

Eligibility Criteria for Inclusion

- Published in a reputable journal within the last five years
- Utilized human participants
- Written in the English Language
- Approved by appropriate IRB

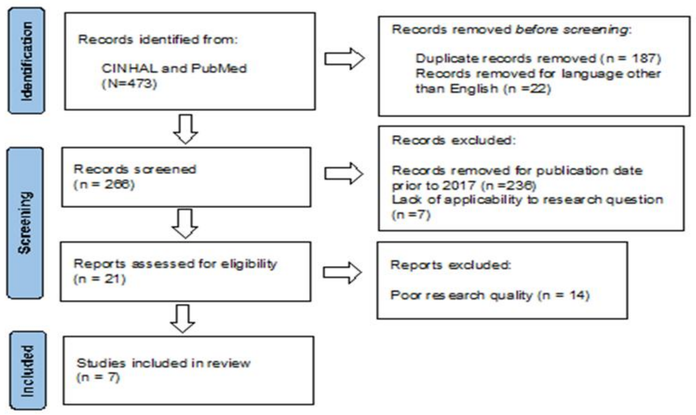
Required Study Design Characteristics

- Measured HCV Screening Rates
- Placed emphasis on interventions related to HCV screening rates
- Evaluated HCV screening methodology

Literature Search via CINAHL and PubMed

- Subject headings used:
  - "(hepatitis c) and (screening)"
  - "(hepatitis c) and (screening) and (birth cohort)"
  - "(hepatitis c) and (screening) and (CDC)"
  - "(hepatitis c) and (screening) and (electronic medical record)"
  - "(hepatitis c) and (screening) and (lifestyle risk)"
- Utilized Rapid Critical Appraisal tool to evaluate studies meeting all criteria

Flow Diagram of Selection Process



Levels of Evidence Synthesis Table

Levels of Evidence Synthesis Table	1	2	3	4	5	6	7
Level I: Systematic review or meta-analysis	X						
Level II: Randomized controlled trial		X	X				
Level III: Controlled trial without randomization				X			
Level IV: Case-control or cohort study					X	X	X
Level V: Systematic review of qualitative or descriptive studies							
Level VI: Qualitative or descriptive study, CPG, Lit Review, QI or EBP project							
Level VII: Expert opinion							

1 = Ledesma, F et al. (2020); 2 = Ludden, T et al. (2022); 3 = Mehta, S et al. (2022); 4 = Park, J et al. (2021); 5 = Wojcik, E et al. (2020); 6 = Geboy, A et al. (2019); 7 = Cowan, E et al. (2021)

Results

Universal Screening More Effective than Birth Cohort and Risk-Based

- Leads to increased HCV screening, testing, and diagnosis
- Decreases costs by reducing number of patients requiring treatment for HCV and its long-term complications

Interventions to Improve Screening

- EMR-based interventions, including BPAs and integrated order sets
- Provider education regarding screening guidelines and interventions trialed

Outcomes Synthesis Table	1	2	3	4	5	6	7
Outcome #1: Patients screened based on universal screening vs birth cohort screening	↑	NE	NE	NE	↑	NE	↑
Outcome #2: Patients screened based on universal screening vs risk based screening	↑	NE	NE	NE	↑	NE	↑
Outcome #3: Patients screened based on risk based screening vs birth cohort screening	NE	NE	NE	↑	↑	NR	↑
Outcome #4: Screening Rates secondary to EMR intervention	NE	↑	↑	↑	↑	↑	↑
Outcome #5: Screening rates secondary to provider education	NE	↑	NE	NE	NE	NE	NE
Outcome #6: HCV Antibody Testing Rate secondary to intervention	NE	NE	↑	↑	↑	↑	↑
Outcome #7: HCV Viral Load (RNA) testing rate secondary to intervention	NE	NE	↑	↑	↑	↑	↑
Outcome #8: Linkage to Care secondary to intervention	NE	NE	NR	↑	NE	↑	↑
Outcome #9: Cost-Efficiency of Universal Screening and Treatment vs Risk/BC Screening and Treatment	↑	NE	NE	NE	NE	NE	NE

SYMBOL KEY: ↑ = Increased, ↓ = Decreased, — = No Change, NE = Not Examined, NR = Not Reported
LEGEND: 1 = Ledesma, F et al. (2020); 2 = Ludden, T et al. (2022); 3 = Mehta, S et al. (2022); 4 = Park, J et al. (2021); 5 = Wojcik, E et al. (2020); 6 = Geboy, A et al. (2019); 7 = Cowan, E et al. (2021)
HCV= Hepatitis C Virus; BC= Birth Cohort; EMR= Electronic Medical Record

Implications for Practice

Further Study Needed

- Prior studies focused on efficacy of methodologies using Birth Cohort and Risk-Based Screening
- Studies implementing EMR-based interventions using Universal Screening are needed

Closing the Education Gap

- Providers & patients need education on current HCV guidelines, testing, & treatment
- Expected benefits include:
  - Increased HCV screening, testing, and diagnosis
  - Decreased healthcare costs
  - Less lives lost due to long-term complications of HCV
  - Possible eradication of HCV

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