Interventions to enhance testing and linkage to treatment for hepatitis C infection: a systematic review and meta-analysis

Evan B Cunningham, Alice Wheeler, Behzad Hajarizadeh, Clare French, Rachel Roche, Alison Marshall, Guillaume Fontaine, Anna Conway, Braulio M Valencia, Sahar Bajis, Justin Presseau, John W. Ward, Louisa Degenhardt, Gregory J Dore, Matthew Hickman, Peter Vickerman, Jason Grebely

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Disclosures

Nothing to disclose

Background/rationale

- Despite the goal set by the WHO to eliminate HCV as a public health threat globally, HCV testing and treatment remains low
- Interventions have been implemented to improve HCV care
- Few systematic reviews have assessed the impact of these interventions with limited data for meta-analyses
    - Limited to the interferon era
    - Focus on specific populations
    - Few studies identified
    - Few randomised controlled trials

Aim

Evaluate the impact of interventions to improve HCV antibody testing, RNA testing, linkage to HCV care, and HCV DAA treatment initiation

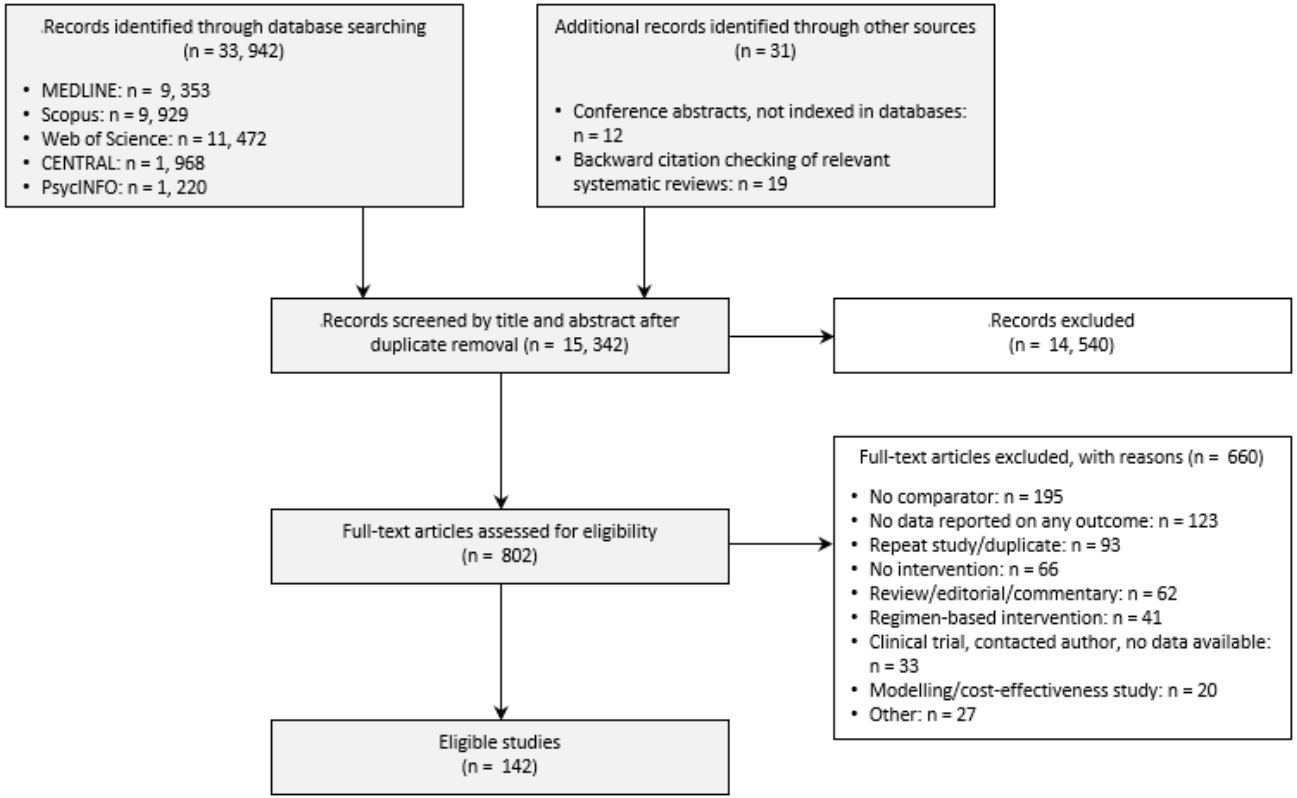
Methods

- Literature searches were performed in PubMed, Scopus, Web of Science, Cochrane CENTRAL, and PsycINFO, key conferences, and ClinicalTrials.gov

- Search performed in July 2020, including combinations of search terms relating to 1) HCV testing (antibody and RNA), 2) Linkage to HCV care, 3) HCV treatment initiation, and 4) Treatment outcomes
- No restrictions were placed on study year, population, or setting
- Studies were excluded if they lacked a comparator
- All study authors contacted for additional data

- Interventions were categorized according to primary intervention type and the effect (odds ratio) of the intervention was pooled through meta-analyses.

Review process and study selection



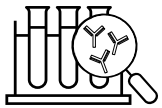
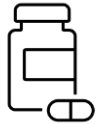
Characteristics of included studies

	HCV antibody testing (K=87)		HCV RNA testing (K=25)		Linkage to care (K=37)		Treatment initiation (K=41)	
	K (%)	n	K (%)	n	K (%)	n	K (%)	n
Study design								
Randomised controlled trial	17 (20)	58,634	1 (4)	12,386	9 (24)	2,402	9 (22)	2,097
Cluster randomised controlled trial	14 (16)	192,999	3 (12)	401	3 (8)	5,220	4 (10)	5,654
Non-randomised controlled trial	8 (9)	296,051	2 (8)	941	4 (11)	608	4 (10)	661
Historically controlled study	44 (51)	1,466,279	16 (64)	48,552	17 (46)	16,408	16 (39)	7,711
Cohort study	0 (0)	0	2 (8)	885	3 (8)	1,310	6 (15)	75,312
Controlled before and after study	3 (3)	132,414	0 (0)	0	1 (3)	571	1 (2)	571
Interrupted time series study	1 (1)	393,517	0 (0)	0	0 (0)	0	0 (0)	0
Non-randomised cluster controlled study	0 (0)	0	1 (4)	1,671	0 (0)	0	1 (2)	1,228
Study setting								
Primary care/general practice	43 (49)	1,234,190	10 (40)	17,906	10 (27)	6,579	5 (12)	44,520
Hospital outpatient/tertiary clinic	6 (7)	76,500	1 (4)	4,002	5 (14)	7,785	16 (39)	6,646
Drug treatment	5 (6)	3,615	1 (4)	257	5 (14)	1,995	6 (15)	2,334
Population-based	4 (5)	709,286	3 (12)	12,659	7 (19)	7,394	4 (10)	36,948
Emergency department	4 (5)	72,051	2 (8)	1,372	1 (3)	295	0 (0)	0
Hospital (inpatient)	3 (3)	211,965	1 (4)	702	1 (3)	93	0 (0)	0
Prison	7 (8)	124,122	4 (16)	16,653	0 (0)	0	2 (5)	281
Other	15 (17)	108,165	3 (12)	11,285	8 (22)	2,378	8 (20)	2,505

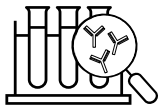
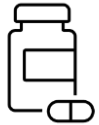
Characteristics of included studies

	HCV antibody testing (K=87)		HCV RNA testing (K=25)		Linkage to care (K=37)		Treatment initiation (K=41)	
	K (%)	n	K (%)	n	K (%)	n	K (%)	n
Population								
General population	10 (11)	854,606	7 (28)	14,535	13 (35)	15,334	14 (34)	41,376
Birth cohort	35 (40)	731,507	4 (16)	15,834	3 (8)	1,243	0 (0)	0
People receiving OAT	5 (6)	4,540	1 (4)	114	2 (5)	408	2 (5)	478
People in prison	7 (8)	124,122	4 (16)	16,653	0 (0)	0	2 (5)	281
People who inject drugs	6 (7)	37,393	2 (8)	1,753	4 (11)	6,179	6 (15)	7,554
People who use drugs	1 (1)	162	1 (4)	107	3 (8)	118	2 (5)	200
People attending drug/alcohol service	2 (2)	375	2 (8)	9,764	1 (3)	1,008	2 (5)	1,345
Mixed	2 (2)	12,402	0 (0)	0	2 (5)	472	3 (7)	551
Other	19 (22)	774,787	4 (16)	6,076	9 (24)	1,757	10 (24)	41,449
Country income status			0 (0)					
Low income	0 (0)	0	0 (0)	0	0 (0)	0	0 (0)	0
Lower-middle income	0 (0)	0	0 (0)	0	1 (3)	5,118	2 (5)	6,331
Upper-middle income	0 (0)	0	2 (8)	11,887	1 (3)	7,410	2 (5)	2,688
High income	87 (100)	2,539,893	23 (92)	52,949	35 (95)	13,991	37 (90)	84,215

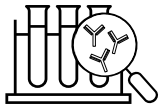
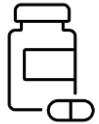
Interventions to simplify testing

	 Ab testing (OR)	 RNA testing (OR)	 Linkage to care (OR)	 Treatment initiation (OR)
Point-of-care antibody testing	21.05 (6.98-63.52) ④		1.70 (1.35-2.16) ③	2.10 (1.51-2.92) ①
Dried blood spot testing	2.42 (1.45-4.02) ③		91.00 (1.46-5656) ①	
Reflex RNA testing		9.31 (2.31-37.48) ③	2.72 (2.17-3.42) ①	
Opt-out screening	18.97 (1.91-188.61) ③			

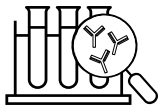
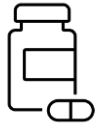
Improving patient engagement with care

	 Ab testing (OR)	 RNA testing (OR)	 Linkage to care (OR)	 Treatment initiation (OR)
Patient reminders for testing	9.76 (3.99-23.88) ⑨			
Patient navigation/care coordination			3.25 (2.31-4.57) ④	2.48 (1.26-4.88) ⑤
Patient education	4.18 (1.25-13.96) ⑥			

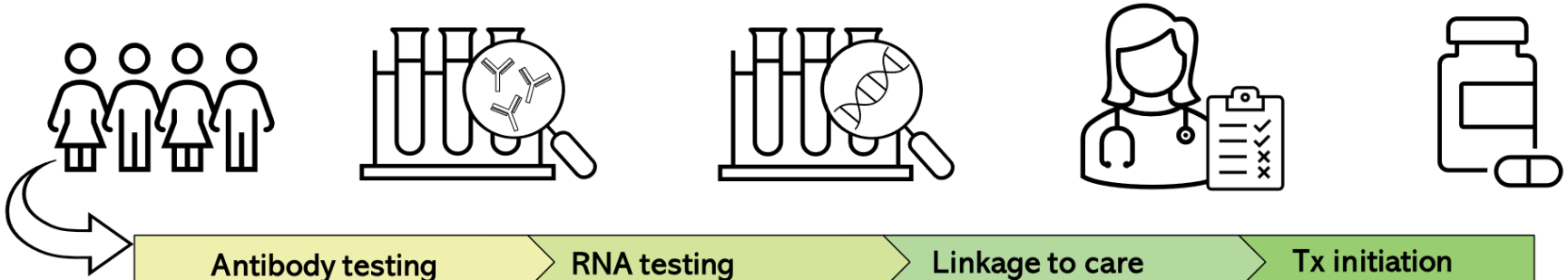
Improving provider engagement with care

	 Ab testing (OR)	 RNA testing (OR)	 Linkage to care (OR)	 Treatment initiation (OR)
Provider care coordination	3.68 (2.12-6.38) ②	4.56 (1.9-10.9) ①	3.26 (0.57-18.73) ②	
Medical chart reminders	6.75 (4.41-10.34) ㉕	3.87 (1.68-8.95) ④	2.81 (1.66-4.78) ④	1.90 (1.42-2.53) ①
Provider education	1.78 (1.49-2.14) ⑪	17.95 (10.4-30.85) ①	1.54 (1.12-2.13) ②	

Impacts across the cascade

	 Ab testing (OR)	 RNA testing (OR)	 Linkage to care (OR)	 Treatment initiation (OR)
Integrated care			3.82 (1.64-8.89) ④	8.53 (1.08-67.24) ③
Medical chart reminders	6.75 (4.41-10.34) ㉕	3.87 (1.68-8.95) ④	2.81 (1.66-4.78) ④	1.90 (1.42-2.53) ①
Provider education	1.78 (1.49-2.14) ⑪	17.95 (10.4-30.85) ①	1.54 (1.12-2.13) ②	

The take-away



Antibody testing	RNA testing	Linkage to care	Tx initiation
Medical chart reminders	Medical chart reminders	Medical chart reminders	Medical chart reminders*
Provider education	Provider education*	Provider education	Point of care Ab testing*
Point of care Ab testing		Point of care Ab testing	
Dried blood spot testing		Dried blood spot testing*	
Opt-out screening			
Patient reminders for testing			
Patient education			
Provider care coordination	Provider care coordination*		
Memory practice			
	Reflex RNA testing	Reflex RNA testing*	
		Integrated care	Integrated care
		Patient navigation	Patient navigation

Discussion

- Demonstrated a range of interventions to improve HCV care
- Models of care must be designed with the setting and population in mind
  - Address existing gaps in HCV care
  - Address the unique barriers faced in that setting/population
- Combinations of interventions which address different barriers to care may be most effective at improving ongoing care
- Further work, including randomised trials of interventions are needed in key populations to better understand the potential impacts of their implementation

Future work

- Interventions to improve treatment outcomes (adherence, completion, SVR)
- Population specific analyses
  - People who inject drugs
  - People in prison

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Everyone who provided input into the review

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