Implementation Strategies and the Uptake of Hepatitis C Treatment in VA

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The Team
Presentation Outline

• Hepatitis C in VA

• Hepatitis C Innovation Team (HIT) Collaborative

• Implementation strategies and HCV treatment

• Future work
Poll Question #1

• How would you characterize yourself (check all that apply)
  – Clinician without HCV focus
  – Clinician with HCV focus
  – Clinical researcher
  – Implementation scientist
  – Other
Hepatitis C Virus

- 200 million worldwide
- >200,000 Veterans
State of HCV Care in VA 2013

Number of Veterans

- 218,109 Positive HCV Antibody
- 208,891 Received confirmatory testing
- 181,168 HCV viremic (chronic infection)
- 39,388 Ever prescribed therapy
- 15,938 Achieved cure (SVR)
Clinical Innovation

<table>
<thead>
<tr>
<th>Interferon Administration</th>
<th>Injection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration</td>
<td>48 weeks</td>
</tr>
<tr>
<td>Side Effects</td>
<td>+++++++</td>
</tr>
<tr>
<td>Cure Rates</td>
<td>&lt;50%</td>
</tr>
</tbody>
</table>
Curing HCV
VA created a **national learning collaborative** for improving HCV care cascade through quality improvement & system redesign

- VISN-based Hepatitis C Innovation Teams with system redesign and clinical members
- Promote collaboration across regions & hospitals to spread best practices
- Ongoing support
  - Face-to-face national meetings
  - Site visits
  - Regular calls
  - Tools and materials (dashboard, reminders), education
  - Funding to teams for staffing, travel, and supplies
Hepatitis C Innovation Team (HIT) Collaborative Structure

Office of Strategic Integration

Veterans Engineering Resource Center (VERC)
William Lukesh
Angela Park

VACO-Office of Patient Care Services

HIV, Hepatitis and Related Conditions Program (HHRC)
David Ross & Maggie Chartier

National Hepatitis C Resource Center (HCRC)
Tim Morgan
Rachel Gonzalez

HIT Collaborative Leadership Team

VISN Teams
Leaders
Members
Motivation

• HIT Collaborative is the first of its kind in VA (VISN-based teams)

• HCV treatment over the past 4 years has been a tremendous success for VA

• Need to understand this success and what components can be replicated in other clinical contexts
Implementation Strategies

“Methods or techniques used to enhance adoption, implementation, and sustainability of a clinical program or practice.” (Proctor, Powell, & McMillen, 2013)

HIT and Implementation

- Expert Recommendations for Implementing Change (ERIC)

Sources: Powell et al. 2015. A refined compilation of implementation strategies: results from the Expert Recommendations for Implementing Change (ERIC) project. Implement Sci. 10(21).
Clusters of Implementation Strategies

Source: Waltz et al. 2015. Use of concept mapping to characterize relationships among implementation strategies and assess their feasibility and importance: results from the Expert Recommendations for Implementing Change (ERIC) study. Implement Sci. 10(1).
Evaluation Methods

• **Data Collection**: Annual survey

• **Sample**: HCV providers at VA hospitals, FY15 & FY16

• **Primary outcome**: HCV treatment starts per year

• **Analysis**:
  – “Traditional” statistics
  – Qualitative Comparative Analysis (QCA)
8. In FY15 did your center use any of these infrastructure changes to promote HCV care in your center?

<table>
<thead>
<tr>
<th>Change physical structure and equipment (e.g., purchase a FibroScan, expand clinic space, open new clinics)</th>
<th>Did you implement this strategy in FY15?</th>
<th>If implemented in FY15, was it attributable to the HIT?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change the record systems (e.g., locally create new or update to national clinical reminder in CPRS, develop standardized note templates)</td>
<td>➡️</td>
<td>➡️</td>
</tr>
<tr>
<td>Change the location of clinical service sites (e.g., extend HCV care to the CBOCs)</td>
<td>➡️</td>
<td>➡️</td>
</tr>
<tr>
<td>Develop a separate organization or group responsible for disseminating HCV care (outside of the HIT Collaborative)</td>
<td>➡️</td>
<td>➡️</td>
</tr>
</tbody>
</table>
## Respondent Characteristics

- **Response rate**
  - Y1: 62% (N=80)
  - Y2: 81% (N=105)

- **Repeat Responders**
  - 66% sites
  - 68% respondents

<table>
<thead>
<tr>
<th>Years in VA</th>
<th>Y1 %</th>
<th>Y2 %</th>
<th>Specialty</th>
<th>Y1 %</th>
<th>Y2 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 3</td>
<td>16%</td>
<td>22%</td>
<td>GI/Hepatology</td>
<td>41%</td>
<td>40%</td>
</tr>
<tr>
<td>4 to 9</td>
<td>31%</td>
<td>30%</td>
<td>Infectious disease</td>
<td>21%</td>
<td>20%</td>
</tr>
<tr>
<td>10 to 19</td>
<td>31%</td>
<td>36%</td>
<td>Pharmacy</td>
<td>16%</td>
<td>30%</td>
</tr>
<tr>
<td>&gt; 20</td>
<td>21%</td>
<td>12%</td>
<td>Primary Care</td>
<td>10%</td>
<td>3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Other</td>
<td>11%</td>
<td>8%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Degree</th>
<th>Y1 %</th>
<th>Y2 %</th>
<th>Site Complexity</th>
<th>Y1 %</th>
<th>Y2 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>PharmD</td>
<td>44%</td>
<td>33%</td>
<td>1a – Most</td>
<td>33%</td>
<td>32%</td>
</tr>
<tr>
<td>NP</td>
<td>16%</td>
<td>20%</td>
<td>1b</td>
<td>18%</td>
<td>14%</td>
</tr>
<tr>
<td>MD</td>
<td>14%</td>
<td>13%</td>
<td>1c</td>
<td>15%</td>
<td>15%</td>
</tr>
<tr>
<td>PA</td>
<td>6%</td>
<td>3%</td>
<td>2 – Moderate</td>
<td>18%</td>
<td>18%</td>
</tr>
<tr>
<td>RN</td>
<td>3%</td>
<td>8%</td>
<td>3 – Least</td>
<td>15%</td>
<td>20%</td>
</tr>
<tr>
<td>Other</td>
<td>18%</td>
<td>24%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Strategies Endorsed Across Survey

Year 1 Overall Strategy Use

- Range 1-59, mean 25±14

- HCV treatment starts associated with total number of strategies (0.43, p<0.01)

- Top quartile of treatment starts median of 33 strategies vs. 15 in lowest quartile (p<0.01)

- Regression: facility complexity and number of strategies associated with treatment starts (Adjusted $R^2 = 30\%$)
Individual Strategies Year 1

• Most frequently used
  – Dashboard/data warehousing (n=68, 85%)
  – Intervening with patients to promote adherence (n=57, 71%)
  – Changing the record system (n=57, 71%)

• **28 strategies** were significantly associated with treatment starts in FY15

• Sites (n=20) using ≥15 significant strategies had increased median treatment starts (320 vs. 177, p<0.001)
Treatment Starts by Strategies Used

Low Treating Sites

High Treating Sites

Strategy 1 to 73
Treatment Starts by Strategies Used

Strategy 1 to 73
### High vs. Low Treating Sites

<table>
<thead>
<tr>
<th>High Treating</th>
<th>Low Treating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revise professional roles</td>
<td>Mandate changes</td>
</tr>
<tr>
<td>Champions</td>
<td>Change formulary</td>
</tr>
<tr>
<td>Preparing patients</td>
<td>Data Review</td>
</tr>
<tr>
<td>Tailor strategies to deliver HCV care</td>
<td>Ongoing consultation</td>
</tr>
<tr>
<td>Change record system</td>
<td>Reminder systems</td>
</tr>
</tbody>
</table>
Poll Question #2

• How familiar are you with qualitative comparative analysis (QCA)?
  – Extremely familiar
  – Very familiar
  – Somewhat familiar
  – Slightly familiar
  – Not at all familiar
QCA Methods

1. Collect and calibrate data, construct truth table
   - Condition/Factor: absence = 0, presence = 1
   - Outcome: HCV treatment number ≥200 = 1 and <199 = 0

2. QCApro in R (Thiem, 2016) consistency >0.80

3. Boolean minimization

4. Iterate steps 1-3

5. Address model ambiguity
n OUT = 1/0/C: 22/58/0
  Total : 80

M1: S24 + S54*S70 + S55*S70 => TX

<table>
<thead>
<tr>
<th></th>
<th>incl</th>
<th>cov.r</th>
<th>cov.u</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>S24</td>
<td>1.000</td>
<td>0.300</td>
</tr>
<tr>
<td>2</td>
<td>S54*S70</td>
<td>1.000</td>
<td>0.250</td>
</tr>
<tr>
<td>3</td>
<td>S55*S70</td>
<td>1.000</td>
<td>0.300</td>
</tr>
</tbody>
</table>

M1  1.000  0.550

- 4-strategy solution
- 100% consistency
- 55% coverage
High Treatment Solution

• S24 OR S70 AND (S55 OR S54)

• “local technical assistance”

• OR

• the combination of “activate patients”

• AND

• (“learn from early adopters”

• OR

• “partner with a university to share ideas” )
## Two Combinations of Strategies

<table>
<thead>
<tr>
<th>LOCAL Combination</th>
<th>COLLABORATIVE Combination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local technical assistance</td>
<td>Centralized external facilitation</td>
</tr>
<tr>
<td>Engage in efforts to prepare patients to be active participants in HCV care</td>
<td>Create new clinical teams</td>
</tr>
<tr>
<td>Identify and learn from early adopters</td>
<td>Identify and prepare champions</td>
</tr>
<tr>
<td>Develop academic partnerships</td>
<td>Recruit, designate, and/or train leaders</td>
</tr>
</tbody>
</table>
Mapping our QCA Solution: High Treatment

Utilize financial strategies
Support clinicians
Provide Interactive Assistance
Train and educate stakeholders
Develop stakeholder interrelationships
Use evaluative and iterative strategies
Engage consumers
Change Infrastructure

Each category will be discussed in subsequent pages.
Strategies by Method-Year 1

- Correlation
- QCA

- Prepare patients
- Use consumables
- Utilize financial strategies

- Change Infrastructure
- Champions
- Support clinicians
- Facilitation
- Technical Assistance
- Create new clinical teams

Develop stakeholder interrelationships
Use evaluative and iterative strategies
Adapt 68 to 70

Triangulating Results—Year 1

<table>
<thead>
<tr>
<th>Strategy</th>
<th>N</th>
<th>Corr</th>
<th>Regression</th>
<th>QCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Local technical assistance</td>
<td>12</td>
<td>+</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>• Centralized external facilitation</td>
<td>22</td>
<td>+</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>• Activate patients</td>
<td>50</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>• Create new clinical teams</td>
<td>37</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>• Identify and prepare champions</td>
<td>40</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>
### Year 2 Results

<table>
<thead>
<tr>
<th></th>
<th>Year1</th>
<th>Year2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean (SD)</strong></td>
<td>25±14</td>
<td>28±14</td>
</tr>
<tr>
<td><strong>Median (IQR)</strong></td>
<td>24 (14-36)</td>
<td>27 (19-38)</td>
</tr>
<tr>
<td>Strategies significantly associated with HCV treatment starts</td>
<td>28</td>
<td>26</td>
</tr>
<tr>
<td>HCV treatment starts associated with # of strategies</td>
<td>r=0.43, p&lt;0.01</td>
<td>r=0.33, p&lt;0.01</td>
</tr>
<tr>
<td>Highest vs. Lowest quartile # of strategies</td>
<td>33 vs. 15, p&lt;0.01</td>
<td>34 vs. 20, p&lt;0.01</td>
</tr>
<tr>
<td>Adjusted R²* for regression model</td>
<td>0.30</td>
<td>0.29 (0.46)</td>
</tr>
</tbody>
</table>

*models adjust for site complexity*
Significant Strategies in Both Years

Clustered together by physical proximity into categories. Each cluster will be discussed in subsequent pages.
Significant Strategies in Both Years

<table>
<thead>
<tr>
<th>Strategy</th>
<th>I</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conduct local consensus discussions</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Recruit, designate, and/or train leaders</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Build a local coalition/team to address challenges</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Identify early adopters</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Use modeling or simulated change</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Foster a collaborative learning environment</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Provide clinical supervision</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Change physical structure and equipment</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Change the location of clinical service sites</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Create new clinical teams</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Revise professional roles</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Audit &amp; feedback</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

Feasibility vs. Importance Matrix
Significant Strategies in Either Year 1 or Year 2

- Engage consumers
- Change infrastructure
- Utilize financial strategies
- Support clinicians
- Provide interactive assistance
- Train and educate stakeholders
- Use evaluative and iterative strategies
- Develop stakeholder interrelationships
Limitations

- Self-report
- Timing/sequencing
- Contextual factors
- Did not adjust for patient characteristics
- Continuous outcome was dichotomized for QCA
- Implementation mechanisms and intensity of strategies
Ongoing Analyses

- Years 2 and 3 and beyond

- Year 1 to Year 2 change scores/temporal associations

- Low treatment sites

- Using data to inform future initiatives
What’s Left To Do?

Barriers To HCV Treatment
n=13,980

- Patient Determinant 50%
- Unstable Comorbidity 31%
- Psychosocial 16%
- Deceased 3%

Data Source: Pamela Belperio and New England VERC. 2016
Barriers to Treatment

Patient Determinant

- Patient Deferred: 50%
- Patient Refused: 28%
- Non-Adherence: 16%
- Contacted but no f/u by patient: 3%
- Treatment outside VA: 3%

Psychosocial

- Alcohol and Substance abuse: 61%
- Unstable Housing: 18%
- Comorbid conditions: 19%
- Unstable Mental Health: 2%

Data Source: Pamela Belperio and New England VERC. 2016
Ongoing Barriers to Treatment: Provider Perceptions (n=100)
Advanced Liver Disease

Hepatic Innovation Team Collaborative

- Increasing team coverage
- Developing metrics and measures
Conclusions

- VA has created a highly-successful learning Collaborative that has facilitated tremendous clinical success.
- Novel data collection method and analysis approaches have uncovered strategies and combinations of strategies linked with high HCV treatment initiation.
- **Difference-making strategies** were oriented towards:
  - Multi-level relationship building and coordination
  - Creating structures to learn and problem-solve (e.g.; facilitation)
- Difference-making strategies changed over time.
- We are interested in operationalizing these strategies for replication.
Acknowledgements

• Vera Yakovchenko
• HIT Leadership Team (Rachel Gonzalez, Angela Park, Timothy Morgan, Bill Lukesh)
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• New England VERC
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• Byron Powell, Tom Waltz, Enola Proctor for collaboration
• Edward Miech from Indianapolis VA for help with QCA
• Other CHERP mentors (Drs. Fine, Gellad, Good, Gordon, Kraemer)
Questions/Comments?

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Citations for photos