The Cherokee Nation HCV Elimination Program

Jorge Mera, MD, FACP
Whitney Essex, MSN, FNP-BC
Outline

• Overview of Cherokee Nation Health Services (CNHS)

• Overview of HCV Elimination

• Goals, barriers and lessons learned in the CNHS HCV elimination program

• Conclusions
Sovereign Nation within a Nation
One of the 566 Federally recognized tribes and 2\textsuperscript{nd} largest Indian Nation (~350,000 citizens)
Tripartite government
14 county area (over 9,200 sq mi.)
Capitol located in Tahlequah, Oklahoma
Largest Tribal Health System in the USA

One central hospital and 8 outlying clinics
Medically serves 130,000 AI/AN
Unified electronic health record.
80,928 unique patients ages 20-69 visit the health system in a 3 year period

AI/AN: American Indian/Alaskan Native  Source: Cherokee Nation Health Services, 2018
Poverty
Domestic Violence
Mental Illness
Historical Trauma*
Cultural Disconnection
IDU
HCV

Prevention
Screening
Linkage to Care
Quality of Care

THE CHEROKEE TRAIL OF TEARS
The forced removal of more than 15,000 Cherokee from the eastern U.S. to Oklahoma resulted in the deaths of thousands. Fort Armistead, near Coker Creek in Monroe County, was used as a collection point along the historic Unicoi Turnpike.

Source: National Park Service

*Maria Yellow Horse Brave Heart, Journal of Psychoactive Drugs Vol. 35, Iss. 1, 2003
# Feasibility Criteria for Elimination

<table>
<thead>
<tr>
<th>In General&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Hepatitis C Virus</th>
<th>Check list</th>
</tr>
</thead>
<tbody>
<tr>
<td>No non-human reservoir and the organism can not multiply in the environment</td>
<td>No non human reservoir</td>
<td>✓</td>
</tr>
<tr>
<td>There are simple and accurate diagnostic tools</td>
<td>Serology widely available</td>
<td>✓</td>
</tr>
<tr>
<td>Practical interventions to interrupt transmission</td>
<td>Treatment as prevention Needle and syringe programs Medication assisted programs</td>
<td>✓</td>
</tr>
<tr>
<td>The infection can in most cases be cleared from the host</td>
<td>Treatment is 95% curative</td>
<td>✓</td>
</tr>
</tbody>
</table>

Adapted from Hopkins D. *Disease Eradication*. N Engl J Med 2013;368:54-63
HCV Elimination: Definitions and Goals

**Definitions:**
- **Classic** \(^1\):
  - Zero disease in a defined geographic area as a result of deliberate efforts
  - Control measures needed to prevent reestablishment of transmission
- **New** \(^2\):
  - Elimination of hepatitis C as a *public health problem*

**Goals:**
- **National Viral Hepatitis Action Plan 2017-2020** \(^2\):
  - Decrease in new infections by 60% by the year 2020
  - Decrease in mortality by 25% by the year 2020
- **National Academy of Sciences** \(^3\):
  - Decrease the incidence of new infections by 90% by the year 2030
  - Decrease in mortality by 65% by the year 2030

---

2. [https://www.cdc.gov/hepatitis/hhs-actionplan.htm](https://www.cdc.gov/hepatitis/hhs-actionplan.htm)  
Key Concepts to Guide HCV Elimination

➢ Decrease the burden of HCV related liver diseases by treating the chronically infected population
  ➢ Birth cohort (patients born between 1945-1965/1975*)
  ➢ Anyone infected for 20+ years or with multiple liver comorbidities

➢ Decrease new infections by preventing transmission
  ➢ Mainly target the younger population who are PWID
    ➢ Treatment as prevention/MAT/Needle and syringe programs
  ➢ Address unsafe medical practices
  ➢ Address sexual transmission in MSM

*Shah H, Bilodeau M, et al. CMAJ June 04, 2018 190 (22) E677-E687

PWID: People Who Inject Drugs
MAT: Medication Assisted Treatment
MSM: Men who have Sex with Men
CNHS HCV Cascade of Care 2012

Number of Patients

- HCV RNA Estimate: 1892 (100%)
- HCV RNA Detected: 263 (14%)
- HCV Evaluation: 179 (9%)
- HCV Antiviral Treatment: 1 (1%)
CNHS HCV Cascade of Care 2015

CNHS HCV Cascade of Care 2017

Number of Patients

- HCV RNA Estimate: 1892 (100%)
- HCV RNA Detected: 1399 (74%)
- HCV Evaluation: 1046 (55%)
- HCV Antiviral Treatment: 743 (39%)

Cherokee Nation Health Services, 2018
How do we expand screening?

- EHR Reminder
- Provider Education

How do we expand clinical capacity?

- ProjectECHO

Number of Patients

- HCV RNA Estimate: 1892
- HCV RNA Detected: 263
- HCV Evaluation: 179
- HCV Antiviral Treatment: 0

ECHO: Extended Community Health Outcomes
EHR: Electronic Health Record
Cherokee Nation Health Services, 2018
Impact of Electronic Health Record Reminder and Provider Education on HCV Screening in CNHS: 2012-2015

Baby Boomers Screened

<table>
<thead>
<tr>
<th>Clinic 1</th>
<th>Clinic 2</th>
<th>Clinic 3</th>
<th>Clinic 4</th>
<th>Clinic 5</th>
<th>Clinic 6</th>
<th>Clinic 7</th>
<th>Clinic 8</th>
<th>Hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>11%</td>
<td>11%</td>
<td>12%</td>
<td>9%</td>
<td>9%</td>
<td>8%</td>
<td>12%</td>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td>42%</td>
<td>46%</td>
<td>36%</td>
<td>42%</td>
<td>57%</td>
<td>43%</td>
<td>50%</td>
<td>13%</td>
<td>29%</td>
</tr>
<tr>
<td>69%</td>
<td>68%</td>
<td>58%</td>
<td>42%</td>
<td>76%</td>
<td>50%</td>
<td>68%</td>
<td>29%</td>
<td>63%</td>
</tr>
</tbody>
</table>

GPRA Measures

July 1, 2012 - June 30, 2013

July 1, 2013 - June 30, 2014

July 1, 2014 - June 30, 2015
ECHO*: Moving Knowledge Instead of Patients

The *ECHO model improves CAPACITY and ACCESS simultaneously
CNHS HCV Cascade of Care 2015

Secure political commitment

Expand the screening program

Expand clinical capacity

Decrease new infections
Goal #1: Secure Political Commitment

HCV Awareness Day  
October 31, 2015

HCV Elimination Awareness Day  
October 31, 2017

“As Native people and as Cherokee Nation citizens, we must keep striving to eliminate hepatitis C from our population.”
Chief Bill John Baker
Patients who were evaluated for treatment at CNHS (2012)
Goal #2: HCV Screening Expansion

Screen 85% of Target Population (80,928 AI/AN)

Universal Screening
- Ages 20-69

Non-Traditional Screening Sites
- Emergency Department
- Urgent Care
- Dental Clinics
- OBGYN

Screening Modalities
- EHR Reminders
- Point of care antibody test
- Lab Triggered screening

Cherokee Nation Health Services, 2018
Why Universal HCV Screening?

80,928 AI/AN
Ages 20-69
that access CNHS

HCV (+) PWiD
Transmitting the Infection

Medication Assisted Treatment
Prison
Needle and Syringe Programs
Services Not Available at CNHS

Universal Screening

Cherokee Nation Health Services
PWID: People Who Inject Drugs
AI/AN: American Indian/Alaskan Native
Impact of Expanded HCV Screening and Lab Triggered Screening: 8/2015 – 12/2017

Number of Patients Tested

Cherokee Nation Health Services, 2018
Patient Location During Lab Triggered Screening: 12/2015 - 2/2017

97 patients with new positive HCV antibody screen at WW Hastings Hospital

- Urgent Care: 34%
- Emergency Department: 33%
- Primary Care: 14%
- Women's Clinic: 3%
- Podiatry Clinic: 2%
- Orthopedic Clinic: 1%
- Surgery Clinic: 1%
- Behavioral Health: 1%
- Infectious Diseases: 1%
- Dental Clinic: 2%

67% of patients were detected in the Urgent Care/Emergency Department
## Goal #2: HCV Screening Expansion
### Interventions and Outcomes

<table>
<thead>
<tr>
<th>Period</th>
<th>Interventions</th>
<th>Number of Unique Patients Screened (% seropositive)</th>
<th>Number of Patients Screened per month</th>
<th>% HCV Seropositive Patients Born after 1965</th>
</tr>
</thead>
</table>
| 1/2006 - 9/2012 | ➢ High Risk Patients  
➢ Patients with cirrhosis  
➢ Patients with elevated LFT’s | 5,425 (10.8%) | 57 | ? |
Goal #3: Link to Care, Treat, and Cure

Before HCV Evaluation

Patient Navigator
Medication Procurement Specialist
Public Health Nurse
- Link the patient to the clinic for appointment with HCV Provider
- Initial point of contact between the clinic and the patient

During Evaluation

Licensed Drug and Alcohol Counselor
- If substance use disorder is present, appropriate referrals are made (MAT, Counseling, Psychiatry, etc.)

Utilize ECHO for Primary Care providers

After Treatment Initiation

Clinical Case Manager
Pharmacist
Community Health Worker
- Follow the patient during treatment to help ensure adherence and follow up to SVR
- Sometimes will include direct observed therapy (DOT)

Goals

Link to care 85%
Treat 85%
Cure 85%
**CNHS HCV Clinical Capacity Expansion 1/2014 – 6/2018**

*Producers included 1 Specialist, 8 Physicians, 8 Pharmacists and 7 Nurse Practitioners*

*Cure rates did not differ by provider type*

**Presence of Cirrhosis at Treatment Initiation**

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>23.8%</td>
</tr>
<tr>
<td>Born 1945-1965</td>
<td>33%</td>
</tr>
<tr>
<td>Born after 1965</td>
<td>13%</td>
</tr>
</tbody>
</table>

Cherokee Nation Health Services, 2018
HCV Treatment Outcomes of Pharmacist Managed Patients (5/2015-1/2017)

Pharmacy Managed | Non Pharmacy Managed
--- | ---
186 (64%) | 104 (36%)

### Intention to Treat (Including patients lost to follow up)

<table>
<thead>
<tr>
<th></th>
<th>Pharmacist-Managed</th>
<th>Non Pharmacist-Managed</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention to Treat</td>
<td>83.6%</td>
<td>73.1%</td>
<td>p = 0.041</td>
</tr>
<tr>
<td>Per Protocol (Excluding patients lost to follow up)</td>
<td>91.6%</td>
<td>93.2%</td>
<td>p = 0.8</td>
</tr>
</tbody>
</table>

Goal #4: Reduce the incidence of new HCV infections

Public and Provider Awareness
- Public Campaign
- Provider Training

Contact Tracing
- Acute HCV
- PWID

Harm Reduction
- Treatment as Prevention
- MAT
- NSP (NOT Available in Oklahoma)

MAT: Medication assisted treatment
NSP: Needle and syringe program
Syringes services programmes and opioid substitution therapy for preventing HCV transmission among people who inject drugs: findings from a Cochrane Review and meta-analysis

- Combined use of OST and high coverage of NSP associated with a 74% risk reduction in HCV acquisition
  - RR = 0.26
  - P = 0.007
CNHS HCV Cascade of Care 2017: Challenges

- Screening in Food Distribution Center,
- UC/ED
- Lab triggered screening

Why the Gaps? And...How can we fix them?

- Community Health Worker
- Study evaluating risk factors for non-adherence

HCV RNA Estimate: 1892
HCV RNA Detected: 1399
HCV Evaluation: 1046
HCV Antiviral Treatment: 743

Number of Patients

Cherokee Nation Health Services, 2018
*Preliminary data
The CNHS Comprehensive HCV Care Model

Universal Screening

Patient Navigator

HCV Evaluation

Non-Adherence Risk Assessment
- Nurse
- BH Counselor
- HCV Provider *Start MAT if needed*
- Case Manager *(DAA Procurement)*
- Pharmacist
- Community Health Worker

Treatment

Community Health Worker

DAA: Direct Acting Antiviral, MAT: Medication Assisted Therapy
Conclusions

• The CNHS HCV elimination program is based on
  – Universal Screening
  – Robust primary care work force (projectECHO)
  – Harm reduction interventions
    • Treatment as prevention/Medication assisted therapy

“Eradication and elimination are laudable goals, they are the ultimate goals of public health. These goals carry great responsibility and there is no room for failure. The question is whether these goals are to be achieved in the present or some future generation”

Walter R. Dowdle “The Principles of disease Elimination and Eradication”
MMWR December 31, 1999/48(SU01);23-7
Acknowledgements

Stephanie Hammons
Charles Grim
Casi Jennings
Robin Fishinghawk
R. Stephen Jones
Tara Ritter
Doug Nolan
Carla Carter
Sharon Spinks
Tamme Garrison
Kendra Round
Amy Meigs
Jana Smith
James Baker
Dwayne David
Nicole Gibe
Kellye Parker
Kathryn Holloway
Barbara Beach
Brian Hail
Jennifer Tredway
Gaye Wheeler
Amy Cook
Kaleb Chamberlain
April Haddock
Latosha Zugelder
Brittany English
Shawn Sanders
Gina Luginbill
Michael Vowell
Travis Fleming
Tony Gustin
James Stallcup
Deirdre McAuley
Lisa Ortiz
Jeffrey Gastorf
Melissa Gastorf
Adam Sprankell
Jonathan White
Destini Goins
Robin Stand
Hannah Hill
Katherine Bazin
Shane Dominick
Sharon Smallwood
Brooke Dill
Anna Miller
Sharon Smallwood
Natasha Barr
Kristen Walker
Kristen Adams
Jade Jordan

Centers for Disease Control and Prevention
Oklahoma State Department of Health
University of Oklahoma Health Sciences Center
Gilead Foundation