Incorporating Oral HCV Treatment in a Statewide System

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Faculty Disclosure

“We do not have any relevant financial relationships with any commercial interests.”
Educational Objectives

- Examine the cost modeling used to evaluate the feasibility of incorporating newer oral HCV medications

- Review the HCV treatment stratification incorporated into the new protocol

- Describe successes and challenges associated with offering the new oral HCV medications
The Maryland Division of Correction (DOC) operates the State prison system, and is the largest criminal justice agency in Maryland.

Baltimore City Jail, DOC, Parole and Probation make up the MD DPSCS system with,

- 12,000 employees
- A budget of 1.2 billion
- Dedicated professionals oversee 22 prisons and pre-release centers incarcerating approximately 22,000 statewide criminals statewide
How Maryland Got Here!

- Prison is an appropriate, even conducive setting for the treatment of HCV.
- Costs related to HCV treatment may avoid other costs related to inpatient care, end stage liver disease and/or liver transplant.
- Correctional health providers are on the front line in the diagnosis and management of HCV in the United States.
- Current trends or changes in HCV therapy is provided during the panel discussions.
- Litigation, Politics (立法性的利益)
Multi vendor model - medical, mental health, pharmacy, Utilization management, Dental approx. $160 million dollars

Medical contract component approx $116 million dollars

Approximately $5 million in HCV related cost

2100 inmates identified as HCV positive
How Maryland Got Here!

• Legislative HCV committee headed by state Health Dept.
• Legislator with relative with HCV
• Lobbyist for Interferon meeting with the Secretary
• Other states coming under HCV Litigation
• Funding for HCV previously turned down each year for 5 years!
PRISM Inmate advocacy agency paid for by the MD DPSCS to represent inmates with clinical concerns.

- 17 inmates with HCV seeking treatment with Interferon/Ribavirin kick started our program.

DPSCS developed HCV policy utilizing UMMS and Hopkins consultants, federal guidelines, and CDC

- HCV Policy was presented it to Federal Judge avoided suit

Secretary of Corrections requested 5 million dollars to treat based upon cost model presented and “Cloud of Consent Decree”
How Maryland Got Here!

- 2008 genotype 3 inmate litigation regarding HCV therapy post *second round of medication*-Jury trial 2 weeks

- Federal Judge ruling impacted DPSCS position on the HCV panel/protocol

- 2013 New HCV Therapies precipitate a revisit to the HCV model protocol and cost!
Hepatitis C Treatment In Maryland 2006-2015

- Population-23000-25000
- Known hepatitis infected people based on CC enrollment are 2300-2500 (HCV 9% prevalence)
- 91% male and 9% women
- No universals testing-High risk, self request, when clinically indicated
- Annually average 3500 tests – sero-postivity rate (23%)
ANNUAL HCV TEST

<table>
<thead>
<tr>
<th>Year</th>
<th>ANNUAL HCV TEST</th>
<th>HCV +</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>3881</td>
<td>886</td>
</tr>
<tr>
<td>2013</td>
<td>3582</td>
<td>838</td>
</tr>
<tr>
<td>2014</td>
<td>3298</td>
<td>755</td>
</tr>
<tr>
<td>2015</td>
<td>2092</td>
<td>483</td>
</tr>
</tbody>
</table>
Hepatitis C Protocol

- **Identification**
  - H&P, Education, Consent, Lab, CCC Enrollment, Twinrix, Psych Consultation

- **Follow-up/Referral**
  - Infectious Disease Consultant Review, Teleconference with site team, Case Review, Referral Consideration, Exclusionary criteria review, Patient Interview, Consent for Bx/Tx

- **Assessment**
  - Lab-HCV genotype, viral load, CBC, Chemistries, Thyroid panel, AFP, Ferritin, ANAPT/INR, Pregnancy test, A1c
Hepatitis C panel

- Approval for HCV Antiviral Therapy
  - Considering biopsy results
  - Considering genotype
  - Considering co-infection
  - Previous compliance with medical/mental health recommendations
  - No “dirty urine” custody screen
  - Mental health/medical non-compliance history

- Approved for Liver biopsy, No biopsy HIV co-infection and genotype 2,3, FibroSURE, Treatment deferred f/u in CCC, Referred to hematology

10/7/2015
HCV Treatment Protocol

- Peg-interferon and Ribavirin were only treatment options available
  - Genotype 1 & 4: 48 weeks of treatment
  - Genotype 2 & 3: 24 weeks of treatment
  - Co-infected HIV/HCV: 48 weeks of treatment

- Monthly Provider visits, Lab education to nursing staff provided by Pharm-D
Summary of HCV Treatment 2006 to 2015

- 1176/1637 (72%) approved for biopsy/RX
- 1133 (96%) male and 43 (4%) female.
- 461 (28%) deferred by the Hepatitis panel because they did not meet the criteria for treatment due to release, clinical, mental health instability and other issues.
- 939 (80%) were genotype 1
- 237 (20%) were genotypes 2 or 3.
- Median age for the treatment group was 46 (range 22-71).
### DEMOGRAPHICS DATA IN MD DOC

<table>
<thead>
<tr>
<th></th>
<th>Request for bx/Rx /Denied n=461</th>
<th>Request for Tx/On Tx Approved=1176</th>
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</thead>
<tbody>
<tr>
<td><strong>Mean age, Range,</strong></td>
<td>46 (24-71)</td>
<td>46 (22-72)</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>448 (97%)</td>
<td>1133 (96%)</td>
</tr>
<tr>
<td>Female</td>
<td>13 (3%)</td>
<td>43 (4%)</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black, not Hispanic</td>
<td>229 (50%)</td>
<td>576 (49%)</td>
</tr>
<tr>
<td>White</td>
<td>209 (45%)</td>
<td>502 (43%)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>3 (0.7%)</td>
<td>2 (0.1%)</td>
</tr>
<tr>
<td>Unknown</td>
<td>19 (4.1%)</td>
<td>96 (8%)</td>
</tr>
<tr>
<td>Asian</td>
<td>1 (0.2%)</td>
<td></td>
</tr>
<tr>
<td><strong>HCV genotype</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Genotype 1</td>
<td>420 (91%)</td>
<td>939 (79%)</td>
</tr>
<tr>
<td>Genotype 2 &amp; 3</td>
<td>36 (8%)</td>
<td>237 (21%)</td>
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</table>
NUMBER OF BX APPROVED PER CALENDAR YEAR

<table>
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<tr>
<th></th>
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<th></th>
</tr>
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<tbody>
<tr>
<td># of bx approved</td>
<td>217</td>
<td>152</td>
<td>131</td>
<td>69</td>
</tr>
<tr>
<td># bx done</td>
<td>164</td>
<td>141</td>
<td>118</td>
<td>35</td>
</tr>
</tbody>
</table>
# LIVER BIOPSY BASED ON FIBROSIS

## Liver Bx finding 2006 to 2015

<table>
<thead>
<tr>
<th>Fibrosis</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>S 0-1</td>
<td>76</td>
<td>9%</td>
</tr>
<tr>
<td>S -2</td>
<td>489</td>
<td>59%</td>
</tr>
<tr>
<td>S-3</td>
<td>230</td>
<td>28%</td>
</tr>
<tr>
<td>S- 4</td>
<td>27</td>
<td>3%</td>
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</table>
**Virologic Response Genotype 1**

<table>
<thead>
<tr>
<th>EVR among all treated subjects</th>
<th>Genotype 1</th>
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</thead>
<tbody>
<tr>
<td>Completed 12 weeks of Rx</td>
<td>900</td>
</tr>
<tr>
<td>EVR</td>
<td>671 (75%)</td>
</tr>
<tr>
<td>Non-Responder</td>
<td>198</td>
</tr>
<tr>
<td>Released before completing 12 weeks</td>
<td>3</td>
</tr>
<tr>
<td>Stopped Rx due to adverse effects</td>
<td>22</td>
</tr>
</tbody>
</table>
## Virologic Response Genotype 1

<table>
<thead>
<tr>
<th>End of Rx Virologic response and SVR all treated subjects</th>
<th>Genotype 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed Therapy</td>
<td>541</td>
</tr>
<tr>
<td>ETR</td>
<td>472</td>
</tr>
<tr>
<td>SVR</td>
<td>271</td>
</tr>
<tr>
<td>Relapsed</td>
<td>148</td>
</tr>
<tr>
<td>ETR Pending Result</td>
<td>78</td>
</tr>
<tr>
<td>SVR Pending Result</td>
<td>157</td>
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</tbody>
</table>
### Virologic Response Genotype 2 & 3

<table>
<thead>
<tr>
<th>EVR among all treated subjects</th>
<th>Genotype 2 &amp; 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed 12 weeks of Rx</td>
<td>221</td>
</tr>
<tr>
<td>EVR</td>
<td>202 (91%)</td>
</tr>
<tr>
<td>Non-Responder</td>
<td>7</td>
</tr>
<tr>
<td>Released before completing 12 weeks</td>
<td>0</td>
</tr>
<tr>
<td>Stopped Rx due to adverse effects</td>
<td>3</td>
</tr>
<tr>
<td>End of Rx Virologic response and SVR all treated subjects</td>
<td>Genotype 2 &amp; 3</td>
</tr>
<tr>
<td>----------------------------------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Completed Therapy</td>
<td>180</td>
</tr>
<tr>
<td>ETR</td>
<td>167</td>
</tr>
<tr>
<td>SVR</td>
<td>111</td>
</tr>
<tr>
<td>Relapsed</td>
<td>23</td>
</tr>
<tr>
<td>ETR Pending Result</td>
<td>29</td>
</tr>
<tr>
<td>SVR Pending Result</td>
<td>48</td>
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</table>
## Comparison with other DOC studies

<table>
<thead>
<tr>
<th>Study Place/Reference</th>
<th>Year</th>
<th>Number of patients treated</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhode Island DOC, J. Clin GI, J Clin GE 2009;43:686-691</td>
<td>2000-2004</td>
<td>71</td>
<td>Over all SVR(28%) Genotype 1 (18%), Genotype 2&amp;3(60%)</td>
</tr>
<tr>
<td>Connecticut DOC, Yale Study, CID 2008:47:952-61</td>
<td>2002-2006</td>
<td>68</td>
<td>Over all SVR(47.1%) Genotype 1 (43%), Genotype 2&amp;3(59%)</td>
</tr>
<tr>
<td>Maryland DOC(unpublished)</td>
<td>2006-2015</td>
<td>1176</td>
<td>Over all SVR(53%) Genotype 1 (50%), Genotype 2&amp;3(62%)</td>
</tr>
<tr>
<td>DAAR-New Regimen</td>
<td></td>
<td></td>
<td>&gt;90%</td>
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Limiting Factors of Peg-Interferon & Ribavirin

- High failure rate
- Limited response among co-infected with HIV
- Unable to treat cirrhosis and advanced liver cases
- The need for long and close monitoring during and after treatment
Time for Newer Treatment Direct-Acting Antivirals

- Newer treatments are of shorter duration, have fewer side effects, and have higher cure rates.

- Treatment regimens can achieve SVR in over 90 percent of HCV-infected patients.
Time for Newer Treatment Direct-Acting Antivirals

- Attaining an SVR has been associated with decreases in all-cause mortality, liver-related death, need for liver transplantation, hepatocellular carcinoma rates, and liver-related complications, even among those patients with advanced liver fibrosis.
DECIDING WHOM AND WHEN TO TREAT?

- Limited Financial resources - Financial resources preclude more widespread delivery of antiviral therapy - Prioritization

- WHOM AND WHEN TO TREAT?
MD DPSCS HCV Protocol Revision

• In early 2015, DPSCS began restructuring HCV protocol to incorporate newer DAA agents
• Significant changes to existing HCV Protocol was required
  – Areas of Change
    • Route to HCV panel for prior treatment failures**
    • Addition of Prioritization
    • Alterations in monitoring parameters
    • Inclusion of a statement addressing deferred treatment
    • Special Considerations
      – Drug-drug interactions
      – Warnings and Contraindications
MD DPSCS HCV Protocol Revision

- AASLD HCV treatment priority classifications were adopted to guide panel determinations
  - Highest Priority
    - F4 and F3 (cirrhosis – compensated/decompensated)
    - Organ Transplant
    - Type 2 or 3 mixed cryoglobulinemia with end organ manifestations
    - Proteinuria, Nephrotic Syndrome, etc.
  - High Priority
    - Co-infection HCV
Medicaid Restrictions of Sofosbuvir for HCV

MD DPSCS HCV Policy Revision

• Patients who meet criteria for highest priority are further evaluated for treatment.

• DAA Pre-treatment evaluation includes:
  – Medical evaluation including documentation of clinical symptoms of HCV infection
  – Comprehensive chemistry
  – Pregnancy test (if female)
  – Mental health consultation
  – Calculated Child-Pugh Score
MD DPSCS HCV Policy Revision

• Current Exclusions to HCV Therapy with DAAs
  – Failure to comply with medical treatment plan
  – Noncompliance with chronic care medications (>80%)
  – Sentenced time less than 2 years

• Potential Exclusions to HCV Therapy
  – Decompensation (evaluated on a case by case basis)
Questions to be Addressed with New HCV Protocol

• How to reroute HCV treatment failures within the system back to the HCV panel for consideration of treatment?
• Should decompensated patients receive treatment with a DAA?
• What is the minimum sentence time an inmate must have in order to qualify for treatment?
• Will interferon and ribavirin be eliminated completely or not?
• Should preference be given to a single DAA agent?
GenoType 2 & 3 Decision Tree Analysis

*Analysis only applies to treatment naive

- **62% Achieve SVR:** $27,000
- **93% Achieve ETR:** $27,000
- **91% DAA w Peg/Riba 12 wk:** 
  - $13,500
  - $68,281.5
- **9% DAA w Peg/Riba 12 wk:** 
  - $97,500
  - $111,000
- **7% NO ETR:** 
  - $0
  - $11,000
- **100% DAA w Peg/Riba 12 wk:** 
  - $0
  - $124,500
- **100% DAAs w Peg/Riba 12 wk:** 
  - $97,500
- **100% Cure:** 
  - $0
  - $97,500

Total Costs:

- **$97,500**
- **$124,500**
- **$111,000**
- **$12,126**

Note: The diagram and data provided are for illustrative purposes and may not reflect actual costs or outcomes.
DAA Selection and Treatment Options

• DPSCS new HCV Protocol does not restrict use of any available DAA medications.

  – Advantages
    • Removes need for specific changes as more DAAs enter the market
    • The most cost-effective regimen based on patient specific factors will be used

  – Disadvantages
    • Lose contracting advantage of exclusivity
    • Healthcare team must be knowledgeable about several DAA agents versus mastery of single DAA
Incorporation of Child-Pugh Scores

- CTP scores are used to evaluate priority amongst patients within the highest priority category.
- Factors disease severity by assessing presence and severity of factors that correlate with liver disease severity: Encephalopathy, Ascites, Bilirubin, Albumin, and INR.
- CTP Classifications: Class A, Class B and Class C.
MD DPSCS HCV Protocol Revision

• Restructuring of HCV Panel
  – Medical directors take a more active role in presenting a comprehensive review of patient health status to the panel
  – Panel decision is to approve or defer treatment
  – Approved patients receive a chart review by Clinical PharmD and regimen selection and patient visits are conducted.
HCV Protocol Revision

• Summary of New Protocol
  – DAA use is prioritized based on presentation and prior treatment experience (genotype 2&3 only)
  – Currently the HCV panel continues to meet weekly
    • Possible reduction in panel meetings to Q2W
  – Panel determinations may include:
    • Treatment deferred, approved, or biopsy
    • Deferred decisions are followed in chronic care
Future Areas of Focus

• Alternative to biopsies for HCV staging
  – Fibroscan, Fibrosure

• Possible revision of 2 year incarceration requirement

• Evaluation of DAA SVR rates within DPSCS
Questions

• Thank you!