Monoclonal Antibody Therapy in Michigan: A Preliminary Analysis of the First 1500 Patients

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Disclosures and Conflicts

• **Disclosures**
  • Western Michigan University Homer Stryker MD School of Medicine
    • Professor of Emergency Medicine
    • Chief, Division of EMS and Disaster Medicine
  • Kalamazoo County Medical Control Authority
    • EMS Medical Director

• **Conflicts**
  • No known conflicts
Methods

• mAb therapy is allocated by HHS to the States (and others)
• mAb therapy is allocated from the states to healthcare facilities
• Michigan initially supplied exclusively hospitals as community “depot”
  • Supply intended for hospital use but also for broad community
  • Since, expanded direct allocation to others (LTC pharmacies, infusion clinics)
• State’s concerns: Equity, Safety, and Efficacy
• Electronic Patient Profile Form submitted for each patient treated
• Electronic Follow-up Form for admissions/deaths within 14 days of mAb
• Follow-up brief phone interviews to evaluate post-mAb course
mAb in Michigan – Supply >>> Demand

mAb Therapy Allocated to Michigan (19,002 Total) vs. Patients Treated with mAb Therapy (N=1,506) 11/9/2020 to 1/5/2021

~8% mAb Allocated has Reportedly Been Used

*Partial week  **Source: HHS/ASPR www.phe.gov
Hospital Use (or Lack There of)

- Use reported by 50 of 138 (36%) hospitals
- 221 (15%) patients at one hospital
- 10 hospitals treated ~60% of patients
  - 12 hospitals treated 1% of patients
- Detroit (91) vs. Upper Peninsula (157)
- Smaller vs. larger hospitals
  - Level 1/2 trauma centers: 20
  - Non-level 1/2 trauma centers: 30
- Medication used
  - Bamlanivimab: 97%
  - Casirivimab/Imdevimab: 3%
Demographics

mAb by Age Group - N=1506

- Mean Age: 63.7
- Median Age: 65
- Range: 15 to 104
- IQ Range: 55 to 74

mAb by Race - N=1506

- White: 80%
- Black or African American: 9%
- American Indian or Alaska Native: 1%
- Asian: 1%
- Hispanic or Latino: 3%
- Native Hawaiian or Other Pacific Islander: 0%
- Unknown: 6%

- 51% Female
- 10% Healthcare Workers
Days to mAb Therapy

Median (IQ range) Symptoms to mAb: 5 (3,7) Days
Median (IQ range) Test to mAb: 2 (1,4) Days
Risk Factors for Disease Progression and Signs and Symptoms

mAb Therapy by Risk Factors for Disease Progression  N=1,506

Qualifying Signs and Symptoms (N=1,506)
- Dyspnea: 48.1%
- Tachypnea/Tachycardia: 10.0%
- Other Symptoms: 96.7%

Age >64 YO Age 55 to 64 with Risk Factors BMI >34 Chronic Kidney Disease Diabetes Immunosuppressive Disease Immunosuppressive Treatment No Risk Factors

936 251 423 86 255 70 64 1
mAb Infusion Location and post-mAb Destination

mAb by Infusion Location N=1,506
- Infusion Center (COVID-19 specific): 30%
- Infusion Center (general): 16%
- Home: 1%
- Outpatient Clinic: 6%
- Long Term Care Facility: 6%
- Hospital IP for Infusion: 1%
- Hospital IP for Non-COVID-19 Condition: 2%

Post-mAb Infusion Destination N=1,506
- Home: 1341, 89%
- Homeless: 4, 0%
- LTC, Other: 18, 1%
- LTC, SNF: 95, 7%
- Prison: 1, 0%
- ED, Not Admitted: 3, 0%
- Hospital Admission: 44, 3%
- Emergency Department: 38%
- Infusion Center (COVID-19 specific): 30%
- Infusion Center (general): 16%
- Long Term Care Facility: 6%
- Hospital IP for Infusion: 1%
- Hospital IP for Non-COVID-19 Condition: 2%
Safety: mAb Infusion Related Problems

mAb Therapy Infusion Related Symptoms  N=1,506

- Fever or Chills: 25
- Nausea: 22
- Headache: 11
- Hypotension: 4
- Rash: 3
- Pruritis: 1
- Dizziness: 6
- Altered Mental Status: 2
- Other, Non-Severe: 12

94.8% report no problems
No severe adverse events
No reported anaphylaxis
## Efficacy: Post mAb Admission Rate

<table>
<thead>
<tr>
<th>Total</th>
<th>Age &gt;64 YO</th>
<th>Age 55-64 w/RF</th>
<th>BMI &gt;34</th>
<th>CKD</th>
<th>DM</th>
<th>Immuno-Suppress Disease</th>
<th>Immuno-Suppress Treatment</th>
<th>Sx to mAb &lt;6 Days</th>
<th>Sx to mAb &gt;5 Days</th>
<th>Dyspnea</th>
<th>Increase RR or HR</th>
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</thead>
<tbody>
<tr>
<td>772</td>
<td>457</td>
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<td>3</td>
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<td>18</td>
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<td>5.1%</td>
<td>4.8%</td>
<td>1.8%</td>
<td>3.6%</td>
<td>7.7%</td>
<td>5.9%</td>
<td>0.0%</td>
<td>10.0%</td>
<td>4.5%</td>
<td>5.8%</td>
<td>6.4%</td>
<td>2.6%</td>
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</table>

<table>
<thead>
<tr>
<th>Population</th>
<th>Outcome</th>
<th>mAb</th>
<th>Placebo</th>
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</thead>
<tbody>
<tr>
<td>Michigan</td>
<td>All High Risk</td>
<td>5%</td>
<td>N/A</td>
</tr>
<tr>
<td>Bamlanivimab (FDA)</td>
<td>All High Risk</td>
<td>3%</td>
<td>10%</td>
</tr>
<tr>
<td>Bamlanivimab (NEJM)</td>
<td>Age &gt;65/BMI &gt;35</td>
<td>4%</td>
<td>15%</td>
</tr>
<tr>
<td>Casirivimab/Imdevimab</td>
<td>All High Risk</td>
<td>3%</td>
<td>9%</td>
</tr>
</tbody>
</table>
Operation Holiday Delivery

• Rapid Response to SNFs with 3 outbreaks (19, 20, and 8 patients)
• Resources: State Mobile Nursing Crisis Teams + Local EMS/Paramedics
• Outcomes: 47 patients, 2 admits, 1 death
Summary

• mAb therapy is underutilized in Michigan
• mAb supply far exceeds current demand
• mAb (bamlanivimab) has been found to be safe
• mAb use in long term care settings to treat large numbers of patients can be safely and efficiently accomplished with multi-disciplinary teams
• Ability of mAb to reduce subsequent hospitalizations remains to be determined but preliminary experience is encouraging
Thanks

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