Final Outcomes Summary: Live Webinar and Twitter Chat Journal Club
August 2021 – August 2022
Grant ID: 67929297
Supported by an Educational Grant from Insmed.
Table of Contents
Final Report: August 2021 – August 2022

• Executive Summary (slide 3)
• Audience Generation (slide 4)
• Activity Format (slide 5)
• Educational Impact Summaries (slides 6-7)
• Program Insights (slide 8)
• Article Summaries (slides 9-10)
• Executive Summary – Live Webinars (slides 11-16)
• Level 1 – Live Webinars Participation (slides 17-20)
• Level 2 & 3 – Live Webinars Satisfaction & Knowledge (slide 21)
• Level 4 – Live Webinars Competence (slides 22-25)
• Live Webinars Evaluation (slides 26-31)
• VuMedi Recordings - Live Webinars (slides 32-33)
• Twitter Chat Outcomes (slides 34-49)
• Accreditation (slide 50)
Executive Summary
Final Report: August 2021 – August 2022

Program Overview
This pilot NTM Journal Club program was delivered via Twitter, live webinar, and endured online. The multimedia NTM Journal Club sessions were developed and moderated by NJH faculty on a monthly basis, with downloadable article summaries that provided the key points of recently published articles in NTM and a group opinion developed by the National Jewish Health Infectious Disease Physicians Group. Each article summary issue is archived on a dedicated webpage. Every month, a thirty-minute live webinar led by expert NJH faculty provided a succinct article summary and engaged participants in academic and peer discussion. The recording of each live webinar is endured on VuMedi and made available for a year. A 30-minute structured Twitter chat based on the same article was also offered each month, providing another forum for live interaction with peers and expert faculty, as well as ongoing Tweet exchange for those that could not attend the live portion.

Learning Objectives
- Apply critical thinking for research analysis in the review of new data and guidelines in NTM.
- Utilize increased awareness and understanding of research, evidence and best practices to inform clinical practice in NTM.
- Support an online community of practitioners to share key insights, latest research, and treatment strategies for patients with NTM.

Program Chairs
Charles Daley, MD
Chief, Division of Mycobacterial and Respiratory Infections
National Jewish Health

Shannon H. Kasperbauer, MD
Associate Professor, Division of Mycobacterial and Respiratory Infections
National Jewish Health

Program Webpage
Launch Date: August 24, 2021
End Date: August 27, 2022
Activity Link: https://www.nationaljewish.org/ntmjournalclub

Target Audience & Accreditation
Target Audience: Pulmonologists, Infectious Disease Physicians, Primary Care/Family Medicine Physicians, Physician Assistants, and Nurse Practitioners.

Accreditation: National Jewish Health is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians. NJH designates each of the 24 live activities (12 live webinars, 12 live Twitter chats) for a maximum of 0.5 AMA PRA Category 1 Credit™.
Personalized targeting tools across numerous tactics reach HCPs by leveraging demographic data (such as location, profession, specialty) and behavioral data (such as learner participation history, areas of interest).
Activity Format
Final Report: August 2021 – August 2022

12 article summaries developed
1,515 article summary downloads
276 webinar completers (548 registrants)
20,097 impressions
1,903 views on VuMedi
Quantitative Educational Impact Summary
Final Report: August 2021 – August 2022

Webinar Participation

- MD/DO=164
- RN/LPN=18
- NP=6
- PA=3
- PharmD=7
- Other=78
Total=276

62% of learners were physicians and advanced practice providers

Knowledge Gain: Self-reported

Webinar Participants Reported Activity Increased Knowledge of NTM

- Strongly Agree: 73%
- Agree: 20%
- Neither agree nor disagree: 5%
- Disagree: 0%
- Strongly Disagree: 2%

Twitter Chats: Summary
August 2021 – August 2022

- Calendar Adds: 397
- Tweets: 404
- Impressions: 20,097
- Hashtag Usage: 404
- Replies: 71
- Likes: 192
- Engagements: 600

Confidence @ Post-Test

<table>
<thead>
<tr>
<th>Very Confident</th>
<th>Somewhat Confident</th>
<th>Neutral</th>
<th>Not Confident</th>
</tr>
</thead>
<tbody>
<tr>
<td>38%</td>
<td>36%</td>
<td>22%</td>
<td>4%</td>
</tr>
</tbody>
</table>

N=55
## Qualitative Educational Impact Summary

### Final Report: August 2021 – August 2022

#### Patient Impact
- **55** Evaluation respondents
- Who see **209** NTM Patients Weekly
- Which translates to **10,868** Patient Visits Annually

#### Educational Impact

**Knowledge and Satisfaction: Self-reported**
- **93%** stated activity increased their knowledge of NTM [N=55]
- **96%** indicated the learning objectives of the activity were met [N=55]
- **82%** said the activity improved their ability to treat or manage patients [N=55]

#### Practice Change
- **91%** Reported intent to change their practice as a result of what they learned in the activity [N=45]

**Top Intended Practice Changes**
- Incorporate omadacycline into the management of M. abscessus patients
- Emphasize the importance of airway clearance
- Implement the use of ALIS
- Implement screening tools to identify this disease

*“The addition of the Twitter discussions is a great option!”*  
- NTM Journal Club Attendee
In this pilot program, we found that most participants are not seeking credit for webinars or Twitter chats, though they are engaging with the content.

Article downloads and endured video views are high, indicating high levels of participation in the educational content beyond the live activities.

It appears not all Twitter chat participants are “active” in the live activity. However, based on data for engagements and likes, there are many viewers consuming the education presented without posting comments and actively contributing to the discussion.

“Our goal was to bring quality CME activities to colleagues and foster discussion over the latest studies and trials in nontuberculous mycobacteria. The Twitter Journal Club was a fun way to push the envelope and offer free open access medical education to an even broader audience. We were grateful for the opportunity to share in learning with colleagues from around the country and world.”

– Charles Daley, MD (NTM Journal Club Program Co-Chair)


January 2022 Article Summary: Preliminary, Real-world, Multicenter Experience With Omadacycline for Mycobacterium abscessus Infections. *Open Forum Infectious Diseases*, Volume 8, Issue 2, February 2021, ofab002. [View Here](#)


April 2022 Article Summary: Mycobacterium abscessus biofilms have viscoelastic properties which may contribute to their recalcitrance in chronic pulmonary infections. Sci Rep. 2021 Mar 3;11(1):5020. doi: 10.1038/s41598-021-84525-x. PMID: 33658597. View Here


## Executive Summary – Live Webinars

**Final Report: August 2021 – August 2022**

<table>
<thead>
<tr>
<th>Webinar Date</th>
<th>Article Title</th>
<th>Faculty</th>
<th>Registrations</th>
<th>Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 24, 2021</td>
<td>Amikacin liposome inhalation suspension for Treatment-Refractory lung disease caused by Mycobacterium avium complex (CONVERT). A prospective, open-label, randomized study.</td>
<td>David Griffith, MD</td>
<td>43</td>
<td>24</td>
</tr>
<tr>
<td>September 28, 2021</td>
<td>Phase 2 Trial of the DPP-1 Inhibitor Brensocatib in Bronchiectasis</td>
<td>Charles Daley, MD</td>
<td>26</td>
<td>13</td>
</tr>
<tr>
<td>October 26, 2021</td>
<td>Amikacin Liposome Inhalation Suspension for Refractory Mycobacterium avium Complex Lung Disease: Sustainability and Durability of Culture Conversion and Safety of Long-term Exposure</td>
<td>Shannon Kasperbauer, MD</td>
<td>28</td>
<td>18</td>
</tr>
<tr>
<td>November 30, 2021</td>
<td>Airway Clearance Techniques in Bronchiectasis: Analysis From the United States Bronchiectasis and Non-TB Mycobacteria Research Registry</td>
<td>Steve Lommatzsch, MD</td>
<td>50</td>
<td>33</td>
</tr>
<tr>
<td>January 25, 2022</td>
<td>Preliminary, Real-world, Multicenter Experience With Omadacycline for Mycobacterium abscessus Infections</td>
<td>Jared Eddy, MD</td>
<td>61</td>
<td>34</td>
</tr>
</tbody>
</table>
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<tbody>
<tr>
<td>February 22, 2022</td>
<td>Mycobacteriophage-antibiotic therapy promotes enhanced clearance of drug-resistant <em>Mycobacterium abscessus</em></td>
<td>Michael Strong, MD</td>
<td>44</td>
<td>23</td>
</tr>
<tr>
<td>March 29, 2022</td>
<td>Pilot study to test inhaled nitric oxide in cystic fibrosis patients with refractory <em>Mycobacterium abscessus</em> lung infection</td>
<td>Jane E. Gross, MD, PhD</td>
<td>36</td>
<td>14</td>
</tr>
<tr>
<td>April 26, 2022</td>
<td><em>Mycobacterium abscessus</em> biofilms have viscoelastic properties which may contribute to their recalcitrance in chronic pulmonary infections</td>
<td>Jennifer R. Honda, PhD</td>
<td>38</td>
<td>16</td>
</tr>
<tr>
<td>May 24, 2022</td>
<td>Genomic Analysis of a Hospital-Associated Outbreak of <em>Mycobacterium abscessus</em>: Implications on Transmission</td>
<td>Rebecca Davidson, PhD</td>
<td>38</td>
<td>14</td>
</tr>
</tbody>
</table>
## Executive Summary – Live Webinars

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<tr>
<td>June 28, 2022</td>
<td>Host and pathogen response to bacteriophage engineered against Mycobacterium abscessus lung infection</td>
<td>Jerry Nick, MD</td>
<td>52</td>
<td>23</td>
</tr>
<tr>
<td>July 26, 2022</td>
<td>Consensus management recommendations for less common non-tuberculous mycobacterial pulmonary diseases</td>
<td>Charles Daley, Md</td>
<td>73</td>
<td>36</td>
</tr>
<tr>
<td>August 23, 2022</td>
<td>Time to Positive Culture Detection Predicts Mycobacterium avium Pulmonary Disease Severity and Treatment Initiation</td>
<td>Shannon Kasperbauer, MD</td>
<td>59</td>
<td>28</td>
</tr>
</tbody>
</table>

**Total August 2021 – August 2022**

<table>
<thead>
<tr>
<th>Registrations</th>
<th>Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>548</td>
<td>276</td>
</tr>
</tbody>
</table>
Executive Summary – Live Webinars
Final Report: August 2021 – August 2022

Summary of Findings

- Brenoscatib met both primary and secondary outcomes
  - Primary: prolonged time to first exacerbation c/f placebo
  - Secondary: lower frequency of exacerbations, risk of exacerbations was approximately 40% lower than with placebo
  - There was no significant change in pEFV1 or Respiratory Symptom domain of the QOL-8 bronchectasis questionnaire

- Overall, brenoscatib was well tolerated
  - Cough and dyspnea were more common in those who received brenoscatib
  - Skin and dental events, both AEs of special interest, were more common with brenoscatib

- Brenoscatib is currently being evaluated in a Phase 3 randomized, placebo-controlled study (ASPEN)

Executive Summary – Live Webinars
Final Report: August 2021 – August 2022

Results (2)

7/12 isolates underwent subspeciation
• Abcessus (6/7)
• Maissilense (1/7)
• Functional erm gene in 6/9

10/12 had antibiotics prior to omadacycline: median 4.7 months (IQR 3.4-12.7) (no data 1 patient)
6/9 had positive cultures when omadacycline was initiated (missing data)
Only 1 patient omadacycline NCs but 11/12 reported tigecycline +/− 2
All patients with 2 or more companion drugs: 8/12 amikacin, 5/12 linezolid, 5/12 linezolid/teิดozolid, 4/12 azithromycin, 1/12 doxiflumine, 2/12 tigecycline

• Median duration of omadacycline 6.2 months (IQR 4.2-11.0) [all oral therapy]
• Median duration of follow-up 5.1 months (IQR 3.4-7.2)
• Clinical success in 9/12 (75%)

Why omadacycline was used:
• Resistance to previous antibiotics (9/12)
• Previous antibiotic failure (6/12)
• Ease of administration (6/12)
• Oral bioavailability (6/12)
3 adverse effects (all managed with drug retained)
• Nausea/vomiting/nausea
• Creatine increase h0.4 mg/mL
• AST/ALT >2x upper limit normal

INo Safety:
• 0 INO-related serious adverse events (SAEs).
• 25 adverse events (AEs).
• All INO-related AEs were minor, transient, and self resolved.

<table>
<thead>
<tr>
<th>Event</th>
<th>n (pts)</th>
<th>n (event)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cough</td>
<td>1/1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulmonary congestion</td>
<td>5/6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diarrhea</td>
<td>1/2</td>
<td></td>
<td>Readily 30% related, resolved</td>
</tr>
<tr>
<td>Dry mouth</td>
<td>1/1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Headache</td>
<td>1/1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vomiting</td>
<td>1/1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fever</td>
<td>2/6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stiffness/abdominal</td>
<td>1/2</td>
<td></td>
<td>Readily 30% related, (1/10)</td>
</tr>
<tr>
<td>Pneumonia (Hospitalization)</td>
<td>1/1</td>
<td></td>
<td>treated, resolved, all</td>
</tr>
<tr>
<td>Patients with respiratory failure</td>
<td>1</td>
<td></td>
<td>resolved, unresolved</td>
</tr>
</tbody>
</table>

M. abscessus lung biofilms

M. abscessus biofilms in the thickened alveolar walls of explanted lung tissue from a pXCF.

1st report of M. abscessus biofilms in a human lung cavity.

Qunit, et al., 2015

Fernely et al., 2016

A Phage Named Muddy

Detailed Information for Phage Muddy

<table>
<thead>
<tr>
<th>Isolate Host</th>
<th>Mycobacterium smegmatis mc²155</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty</td>
<td>L94 Host</td>
</tr>
<tr>
<td>Viral Host</td>
<td>2019</td>
</tr>
<tr>
<td>Location Host</td>
<td>University of Toronto</td>
</tr>
<tr>
<td>Strain Name</td>
<td>Mycobacterium</td>
</tr>
<tr>
<td>Isolates</td>
<td>5,120</td>
</tr>
<tr>
<td>Discovery Method</td>
<td>Phage 105, May 2020</td>
</tr>
<tr>
<td>Discovery Mots</td>
<td>NaCl 140 g, 30°C</td>
</tr>
</tbody>
</table>

Muddy was the 14th phage isolated into the Mycobacterium SMegMots Database.
This sample was isolated from the underside of a partially decomposed rabbit and was therefore largely decomposed vegetable matter. The sample was dark, moist, and warm and other insects were present.
Executive Summary – Live Webinars
Final Report: August 2021 – August 2022

Consensus management recommendations for less common non-tuberculous mycobacterial pulmonary diseases

Today’s Article
Presented by: Charles L. Daley, MD
Consensus Management Recommendations for Less Common Non-tuberculous Mycobacterial Pulmonary Diseases

Methods

- Retrospective cohort study
- Patients seen at the Toronto Western Hospital NTM clinic between January 1, 2015 and December 31, 2019.
- Two positive sputum for M. avium
  - Either expected or unexpected
  - *Index* sputum (culture + for M. avium without treatment and recent CT)
  - There was no time limit between the two sputa only the index isolate was required to meet criteria for study inclusion.
  - If multiple sputa met criteria for the index, only the earliest sample was chosen.
  - No active or prior treatment within the last six months.
  - Patients had computed tomography imaging of the chest within six months of their index sputum result.
Level (1) Outcomes: NTM Journal Club Webpage
Final Report: August 2021 – August 2022

NTM Journal Club Webpage
https://www.nationaljewish.org/ntmjournalclub

Page Views 7,288
Unique Page Views 3,067
Article Downloads 1,515

*Data from 7/29/21 – 9/7/2022

National Jewish Health Journal Clubs
- COPD Journal Club
- ILD Journal Club
- NTM Journal Club
- PH Journal Club

Respiratory Medicine Updates: A Virtual Clinical Community
Our Next Session is August 23–24, 2022 • CME Credit for Zoom Webinar and Twitter Chat Participants

Level (1) Outcomes: Live Webinars Participation: By Degree
Final Report: August 2021 – August 2022

- **MD/DO**: 59%
- **NP**: 2%
- **PA**: 1%
- **PharmD**: 3%
- **RN/LPN**: 7%
- **Other**: 28%

**Degree Completer #s**
- MD/DO: 164
- RN/LPN: 18
- NP: 6
- PA: 3
- PharmD: 7
- Other: 78

**Total Completers**: 276
Level (1) Outcomes: Live Webinars Participation: By Specialty
Final Report: August 2021 – August 2022

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Completer #s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infectious Disease</td>
<td>123</td>
</tr>
<tr>
<td>Pulmonology</td>
<td>66</td>
</tr>
<tr>
<td>Internal Medicine</td>
<td>10</td>
</tr>
<tr>
<td>Allergy &amp; Immunology</td>
<td>6</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>7</td>
</tr>
<tr>
<td>Critical Care Medicine</td>
<td>4</td>
</tr>
<tr>
<td>Other</td>
<td>60</td>
</tr>
<tr>
<td><strong>Total Completers</strong></td>
<td><strong>276</strong></td>
</tr>
</tbody>
</table>
Level (1) Outcomes: Live Webinars Participation
Final Report: August 2021 – August 2022

N=276

Other
- Australia (1)
- Bangladesh (4)
- Brazil (1)
- Canada (5)
- Cayman Islands (2)
- India (1)
- Iraq (1)
- Malaysia (1)

24 completers
136 completers
32 completers
68 completers
## Evaluation respondents “Strongly Agree” or “Agree” that:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content presented was evidence-based and clinically relevant</td>
<td>98%</td>
</tr>
<tr>
<td>Activity increased my ability to treat or manage my patients</td>
<td>82%</td>
</tr>
<tr>
<td>Learning objectives of this activity were met</td>
<td>96%</td>
</tr>
<tr>
<td>Activity increased my knowledge of NTM</td>
<td>93%</td>
</tr>
<tr>
<td>Material was presented in an objective manner and free of commercial bias</td>
<td>96%</td>
</tr>
</tbody>
</table>

N=55
Evaluation respondents report they are “very confident” to “somewhat confident” in their ability to integrate the findings of the research article into clinical practice:

- **67% Relative Confidence Gain**
- **30% Absolute Confidence Gain**

45% Before Webinar (N=134)  
75% After Webinar (N=55)
## Level (4) Outcomes: Live Webinars Competence

### Final Report: August 2021 – August 2022

<table>
<thead>
<tr>
<th>Month</th>
<th>Article Title</th>
<th>Intended Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 2021</td>
<td>ALIS for Treatment-Refractory Lung Disease Caused by MAC</td>
<td>• Implement the use of ALIS (3 responses)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Utilize strategies to manage side effects</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Provide motivation to patients</td>
</tr>
<tr>
<td>September 2021</td>
<td>Phase 2 Trial of the DPP-1 Inhibitor Brensocatib in Bronchiectasis</td>
<td>• Use strategies to identify these patients in practice</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Implement screening tools to identify this disease</td>
</tr>
<tr>
<td>October 2021</td>
<td>ALIS for Refractory MAC Lung Disease: Sustainability and Durability of Culture Conversion &amp; Safety of Long-term Exposure</td>
<td>• Use ALIS as a treatment for longer (2 responses)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Utilize testing/screening to select patients who would benefit from this treatment</td>
</tr>
<tr>
<td>November 2021</td>
<td>Airway Clearance Techniques in Bronchiectasis: Analysis from the US Bronchiectasis and Non-TB Mycobacteria Research Registry</td>
<td>• Emphasize and educate patients on the importance of airway clearance (5 responses)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Use strategies to evaluate patients for symptoms of bronchiectasis</td>
</tr>
<tr>
<td>January 2022</td>
<td>Multicenter Experience with Omadacycline for Mycobacterium abscessus Infections</td>
<td>• Utilize omadacycline as part of treatment strategy (5 responses)</td>
</tr>
<tr>
<td>February 2022</td>
<td>Mycobacteriophage-antibiotic therapy promotes enhanced clearance of drug-resistant Mycobacterium abscessus</td>
<td>• Evaluate CF patients for NTM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Include phage therapy as first option when possible</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Apply animal model evidence in antibiotic selection</td>
</tr>
</tbody>
</table>

An analysis of open-ended comments demonstrates the following changes completers intend to make:
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<table>
<thead>
<tr>
<th>Month</th>
<th>Article Title</th>
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</tr>
</thead>
</table>
| March 2022  | Pilot study to test inhaled nitric oxide in cystic fibrosis patients with refractory Mycobacterium abscessus lung infection | • Consider NO as a therapeutic modality for patients with CF or CFTR-related disorder  
• Study this subject further |
| April 2022  | Mycobacterium abscessus biofilms have viscoelastic properties which may contribute to their recalcitrance in chronic pulmonary infections | • Use a lower treatment threshold for Mabs patients                               |
| May 2022    | Genomic Analysis of a Hospital-Associated Outbreak of Mycobacterium abscessus: Implications on Transmission | • Be aware of the limitations of WGS in evaluating M. abscessus outbreaks          |
| June 2022   | Host and pathogen response to bacteriophage engineered against Mycobacterium abscessus lung infection | • Discuss article with our contracted ID specialist  
• Consider submitting sputum to my refractory cases for phage consideration |
An analysis of open-ended comments demonstrates the following changes completers intend to make:

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<thead>
<tr>
<th>Month</th>
<th>Article Title</th>
<th>Intended Changes</th>
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</table>
| July 2022   | Consensus management recommendations for less common non-tuberculous mycobacterial pulmonary diseases                                           | • Empiric therapy based on species  
• Reinforced current management. Also will consider use of inhaled tobramycin for M. chelonae pulmonary  
• Increase knowledge of NTM to help with TB differential |
| August 2022 | Time to Positive Culture Detection Predicts Mycobacterium avium Pulmonary Disease Severity and Treatment Initiation                           | • Consider submitting sputum to my refractory cases for phage consideration.  
• Discuss article with our contracted ID specialist  
• Pay closer attention to the time to sputum culture positivity  
• Ensure I evaluate the amount of airway clearance my patients are doing  
• Keeping time to positivity in mind when looking at sputum cx for MAC |

Evaluation respondents intend to make changes in practice as a result of the activity: 91% (N=45)
Outcomes: Live Webinars
Final Report: August 2021 – August 2022

**August: ALIS for Treatment-Refractory Lung Disease Caused by MAC (CONVERT Study)**

**Key Takeaways**
- Strong evidence for the use of ALIS
- Use ALIS for treatment-refractory disease (3 responses)

**Questions**
- I’ve had a couple of patients with dysphonia that resolved after cessation of ALIS for a few days and curiously did not recur when they resumed the medication. I cannot explain this...
- May not be related to trial, but wondering whether there is any data/evidence in using ALIS as a third drug along with macrolide and rifampin in ethambutol intolerant patients with nodular MAC?
- IV amikacin is given thrice weekly...do you think this might work just as well since amikacin is a concentration dependent antibiotic?

**September: Phase 2 Trial of the DPP-1 Inhibitor Brensocatib in Bronchiectasis**

**Questions**
- What were the reasons for more females in the trial?
- If brensocatib is put on the market, what steps will patients need to take to prevent the dental events?
- How do you see placement of this drug in the management of bronchiectasis? Will it be primary therapy or as a complement to airway clearance and other standard approaches?
- Was there any difference in outcomes between smokers and nonsmokers?

**Future Topics**
- Emerging therapies for NTM
- Phage Therapy
- Use of macrolides
Outcomes: Live Webinars
Final Report: August 2021 – August 2022

October: ALIS for Refractory MAC Lung Disease: Sustainability & Durability of Culture Conversion & Safety of Long-term Exposure

Key Takeaways
• ALIS has a durable and sustained response
• Safe and effective to give ALIS longer
• ALIS helps with culture conversion

Questions
• Why did the study randomize in a 2:1 ratio? Did the low number of non-ALIS patients possibly affect the outcomes?
• Does the fact that good outcomes were seen even for some patients who did not complete 12 months argue that we could shorten treatment duration?
• Was ototoxicity assessed objectively? If so, I assume there was no difference in this side effect between ALIS+GBT vs GBT?

November: Airway Clearance Techniques in Bronchiectasis: Analysis from US Bronchiectasis & Non-TB Mycobacteria Research Registry

Key Takeaways
• Emphasis on keeping up airway clearance over time
• Mucus clearance techniques
• ACT does not seem to have a global positive impact
• A patient’s use of ACTs can tell you a lot about their disease course and symptoms

Questions
• Are you aware of any prospective studies evaluating the effect of ACT or pulmonary rehab on exacerbation rate / clinical decline in recently diagnosed NCFBE patients?
• Does ACT reduce pseudomonal airway colonization?
• What about prospective studies on mucolytic therapies and exacerbations in conjunction with ACT?
Outcomes: Live Webinars
Final Report: August 2021 – August 2022

**January:** Preliminary, Real-world, Multicenter Experience With Omadacycline for Mycobacterium abscessus Infections

**Key Takeaways**
- Potential activity of omadacycline for M. abscessus
- Omadacycline is promising
- Small study, but effective and well-tolerated in the follow-up period.
- Omadacycline has some data behind its use in M. abscessus and that PO omadacycline is an appropriate choice.

**Questions**
- Do you think it is necessary to test for omadacycline susceptibility or is tigecycline susceptibility adequate to presume susceptibility?
- Thoughts about dosing omadacycline at 150 mg bid vs 300 mg daily impact on PK/PD and tolerability?
- Any guidance on what range of tigecycline MIC would be acceptable to use omadacyline?

**February:** Mycobacteriophage-antibiotic therapy promotes enhanced clearance of drug-resistant Mycobacterium abscessus

**Key Takeaways**
- Phage therapy holds promise in the field of treating NTM infectious disease
- Tools for mycobacterial genetics
- Being informed how effective therapy is
- In the zebra fish model, phage therapy seemed to have some benefit though not enough to reverse mortality trends. There was an enhanced benefit in zebra fish with the CF mutation, though the mechanism of this benefit was unclear to me.

**Future Topics**
- More skin diseases
- Prevention for those infections
- A journal club about using beta lactam/beta lactamase inhibitors in patients with MAb would be helpful. Other articles on treatment resistant NTM and also surgical journal clubs.
- Role of PK monitoring
Outcomes: Live Webinars
Final Report: August 2021 – August 2022

March: Pilot study to test inhaled nitric oxide in cystic fibrosis patients with refractory Mycobacterium abscessus lung infection

Key Takeaways
• Nitric oxide may be a potential future drug for NTM
• NO may be an additional therapy for my NTM patients
• NO as an NTM treatment is a topic that is new for me and I have to read more about it
• Importance of having a larger sample size during studies

Questions/Comments
• What about airway clearance as a confounding factor?
• Early phase study recruiting in Australia using the home NO system (LungFit) for treatment of NTM in CF and non CF patients
• NO was being given for its direct effect on the NTM

April: Mycobacterium abscessus biofilms have viscoelastic properties which may contribute to their recalcitrance in chronic pulmonary infections

Key Takeaways
• The reasons that airway clearance may be limited for Mabs patients

May: Genomic Analysis of a Hospital-Associated Outbreak of Mycobacterium abscessus: Implications on Transmission

No qualitative data available for May
June: Host and pathogen response to bacteriophage engineered against Mycobacterium abscessus lung infection

Key Takeaways
- Phage therapy can be effective to help treat M. abscessus in some patients.
- Increased knowledge of TB differentials/NTM
- Phage may have a significant use in the treatment of bacterial disease, but MUCH more data is needed
- With appropriate treatment we can help clear patients of NTM and allow for better quality of care.
- Usefulness of bacteriophage

Questions/Comments
- Did you find any mutations in the post phage treatment persisters that may be associated to this resistant phenotype?

July: Consensus management recommendations for less common non-tuberculous mycobacterial pulmonary diseases

Key Takeaways
- Education about this published guideline
- Not much published research on NTMs, rely on expert consensus.
- The identification for treatment pathways is not always necessary

Questions/Comments
- For rapid growers, do you suggest omadacycline at any point in treatment?
- Is the mechanism for synergy between clofazimine and macrolide known?
- I have several patients treated for pulmonary MAC who have M. lentiflavum on surveillance sputum cultures. Is this likely an environmental phenomena? They are asymptomatic.
- For dosing ranges, for clofazimine and doxycycline how do you determine the dose? Body weight? Or when to use clofazimine 100 vs 200?
- Any experience using inhaled tobramycin for m. cholonae pulmonary infection?
Outcomes: Live Webinars
Final Report: August 2021 – August 2022

August: Time to Positive Culture Detection Predicts Mycobacterium avium Pulmonary Disease Severity and Treatment Initiation

Key Takeaways
• Time to sputum culture positivity is important
• May be a good tool for the future
• Time to positivity may be helpful to look at, however it is hard to base any decisions off of it

Questions/Comments
• What are the main environmental sources of MAC?
• Does that include hot tubs and swimming pools? Does chlorine kill MAC?
• How effective are surface disinfectants like peroxide?
• Any extra tools to help make decisions?
• What group (mild/moderate) would you pick to study?
• Did you do a comparison with Jacko's (Netherlands) article to this one?
• Comment on airway clearance on time to positivity?
Outcomes: VuMedi Webinar Recordings
Final Report: August 2021 – August 2022

National Jewish Health VuMedi Channel:
https://www.vumedi.com/channel/national-jewish-health/tab/journal-club/

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Data from 8.21.21 to 9.12.22
Outcomes: VuMedi Webinar Recordings
Final Report: August 2021 – August 2022

National Jewish Health VuMedi Channel:
https://www.vumedi.com/channel/national-jewish-health/tab/journal-club/

About VuMedi
- Nearly 14,000 registered pulmonary specialists and over 96,000 primary care physicians (over 600,000 total)
- Distribution of video content to reach a large physician audience
- Analytics dashboard that shows video views, impressions, geolocation of viewers

Note: Heat map encompasses all 4 NJH Journal Clubs from 8/1/21-9/12/22
# Executive Summary – Twitter Chats

## Final Report: August 2021 – August 2022

<table>
<thead>
<tr>
<th>Twitter Date</th>
<th>Article Title</th>
<th>Faculty</th>
<th>Calendar Adds</th>
<th>Tweets</th>
<th>Retweets</th>
<th>Likes</th>
<th>Hashtag Usage</th>
<th>Impressions</th>
<th>Engagements</th>
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<tr>
<td>September 29, 2021</td>
<td>Phase 2 Trial of the DPP-1 Inhibitor Brensocatib in Bronchiectasis.</td>
<td>Charles Daley, MD</td>
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<td>ALIS for Refractory MAC Lung Disease: Sustainability and Durability of Culture Conversion and Safety of Long-term Exposure.</td>
<td>Shannon Kasperbauer, MD</td>
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<td>November 30, 2021</td>
<td>Airway Clearance Techniques in Bronchiectasis: Analysis From the United States Bronchiectasis and Non-TB Mycobacteria Research Registry.</td>
<td>Steve Lommatzsch, MD</td>
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<td>January 26, 2022</td>
<td>Preliminary, Real-world, Multicenter Experience With Omadacycline for Mycobacterium abscessus Infections.</td>
<td>Jared Eddy, MD</td>
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# Executive Summary – Twitter Chats

## Final Report: August 2021 – August 2022

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<th>Impressions</th>
<th>Engagements</th>
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<tbody>
<tr>
<td>February 23, 2022</td>
<td>Mycobacteriophage-antibiotic therapy promotes enhanced clearance of drug-resistant Mycobacterium abscessus.</td>
<td>Michael Strong, MD</td>
<td>14</td>
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<td>March 30, 2022</td>
<td>Pilot study to test inhaled nitric oxide in cystic fibrosis patients with refractory Mycobacterium abscessus lung infection.</td>
<td>Jane E. Gross, MD, PhD</td>
<td>46</td>
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<td>April 27, 2022</td>
<td>Mycobacterium abscessus biofilms have viscoelastic properties which may contribute to their recalcitrance in chronic pulmonary infections.</td>
<td>Jennifer R. Honda, PhD</td>
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<td>May 25, 2022</td>
<td>Genomic Analysis of a Hospital-Associated Outbreak of Mycobacterium abscessus: Implications on Transmission.</td>
<td>Rebecca Davidson, PhD</td>
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<td>June 29, 2022</td>
<td>Host and pathogen response to bacteriophage engineered against Mycobacterium abscessus lung infection.</td>
<td>Jerry Nick, MD</td>
<td>8</td>
<td>31</td>
<td>5</td>
<td>2</td>
<td>31</td>
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Executive Summary – Twitter Chats
Final Report: August 2021 – August 2022

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<th>HashTag Usage</th>
<th>Impressions</th>
<th>Engagements</th>
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<tbody>
<tr>
<td>July 27, 2022</td>
<td>Consensus management recommendations for less common non-tuberculous mycobacterial pulmonary diseases.</td>
<td>Charles Daley, MD</td>
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<tr>
<td>August 24, 2022</td>
<td>Time to Positive Culture Detection Predicts Mycobacterium avium Pulmonary Disease Severity and Treatment Initiation.</td>
<td>Shannon Kasperbauer, MD</td>
<td>12</td>
<td>31</td>
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<td>7</td>
<td>31</td>
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<td><strong>Total August 2021 – August 2022</strong></td>
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<td><strong>192</strong></td>
<td><strong>404</strong></td>
<td><strong>20,097</strong></td>
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</table>
Q2: How is “treatment-refractory MAC lung disease” defined and what is the rationale for that designation?

A1: amikacin and a macrolide. Important because the other MICs don’t matter! #NTMTwitterJC

81 Engagements

3,302 Impressions

Q3: Do you counsel patients about potential adverse reactions from inhaled steroids prior to starting an ICS? #COPDTwitterJC

Yes: 83.3%
No: 16.7%

6 votes - Final results
NTM Journal Club: September Twitter Highlights

Final Report: August 2021 – August 2022

Q3: If you make a diagnosis of COPD and then spirometry improves to normal, is the diagnosis still accurate? #COPDTwitterJC

Very Important: 80%
Somewhat Important: 20%
Neutral: 0%
Not Important: 0%

Q4: How would you diagnose a patient with emphysema and normal spirometry? Type your response starting with A4 and use #COPDTwitterJC

National Jewish Health Medical Education @NJHealthMedEd: Sep 8

Jake Woodrow @jakeWoodrowJC: Sep 8

A4: There is controversy here but in my opinion emphysema by itself without demonstrable airflow limitation is not COPD. Important because these patients are not enrolled in COPD trials so I don’t know if they benefit from therapies or not. #COPDTwitterJC

Engagements: 57

Likes on Tweets: 38

National Jewish Health Medical Education @NJHealthMedEd - Sep 8

Q2: What do you value more when making a COPD diagnosis, sensitivity or specificity? #COPDTwitterJC

Sensitivity: 50%
Specificity: 50%

4 votes - Final results

National Jewish Health Medical Education @NJHealthMedEd - Sep 8

Jake Woodrow @jakeWoodrowJC: Sep 8

A3: This is a tough question but I think if spirometry becomes normal then airflow disease is reversible and not consistent with COPD. #COPDTwitterJC

Patricia George, MD @PGeorgeMD - Sep 8

A3: Question about this: what if they had abnormal spirometry and DLCO, and the spirometry improved to > 0.70 but DLCO still abnormal, and they have emphysema on CT scan. Could you label them as COPD or emphysema with an reactive airflow component? #COPDTwitterJC

Jake Woodrow @jakeWoodrowJC: Sep 8

A3: I have had patients like this and I don’t think we should be afraid to diagnose people with Asthma + Emphysema. #COPDTwitterJC

Patricia George, MD @PGeorgeMD - Sep 8

Thank you for an informative #COPDTwitterJC. @jakeWoodrowJC and @NJHealthMedEd

Engagements: 57

Likes on Tweets: 38

National Jewish Health Medical Education @NJHealthMedEd

If the results are confirmed in the ongoing Phase 3 ASPEN study, we may have our first drug for treatment of bronchectasis! #NTMTwitterC
NTM Journal Club: **October Twitter Highlights**

**Final Report: August 2021 – August 2022**

Q1: Treatment refractory disease is defined as persistently positive cultures after:

- 6 months of therapy: 33.3%
- 12 months of therapy: 66.7%

3 votes - Final results

Q2: The most common adverse events related to ALIS in the CONVERT study were:

- Auditory related: 0%
- Respiratory related: 100%

2 votes - Final results

Q3: Will this study change your practice? #NTMTwitterJC

For those who answered “yes,” could participants share specific examples for the discussion?

| Yes | 100% |
| No  | 0%   |

1 vote - Final results

Q4: What do you think of the efficacy results in this trial? Type your response starting with A4 and use #NTMTwitterJC

shannon @kasperbauermd - Oct 27

Here are the results at the end of treatment. 80% of converters in the ALIS arm remained culture negative at the end of treatment. #NTMTwitterJC

shannon @kasperbauermd - Oct 27

Here is the study design. Reminder this is an exploratory analysis of the outcomes in “converters.” All patients who remained culture positive after the study at month 8. #NTMTwitterJC
NTM Journal Club: November Twitter Highlights
Final Report: August 2021 – August 2022

Q1: What is the best way to make a diagnosis of bronchiectasis? #NTMTwitterJC
- Physical exam: 0%
- Bronchoscopy: 50%
- Chest CT scan: 50%
2 votes - 6 days left

Q2: Which of the following Airway Clearance Techniques (ACTs) has been proven most beneficial? #NTMTwitterJC
- Postural drainage: 50%
- Flutter valve: 50%
- VEST: 0%
2 votes - 6 days left

Q3: Will this study change your practice? Yes/No #NTMTwitterJC
- For those who answered “yes,” could participants share specific examples for the discussion?

Q4: What do you think of the efficacy results in this trial? Type your response starting with A4 and use #NTMTwitterJC
NTM Journal Club: January Twitter Highlights
Final Report: August 2021 – August 2022

Jared James Eddy @JaredJamesEddy1 - Jan 26
Insurance coverage can be difficult for omadacycline; many of our patients may not be able to access it. #NTMTwitterJC

Jared James Eddy @JaredJamesEddy1 - Jan 26
Some patients were treated with tedizolid in combination with omadacycline, a newer drug for which we also have limited data in NTM infections. #NTMTwitterJC

Jared James Eddy @JaredJamesEddy1 - Jan 26
Many of these patients had ILD, some had cancer, 2 had disseminated infection; details about the amount and duration of immune suppression are missing. #NTMTwitterJC

QUESTION: What additional information would you have liked to have had addressed in the paper (e.g., confounding factors for effectiveness)?
#NTMTwitterJC

Jared James Eddy @JaredJamesEddy1 - Jan 26
Replying to @JaredJamesEddy1
Many of these patients had ILD, some had cancer, 2 had disseminated infection; details about the amount and duration of immune suppression are missing. #NTMTwitterJC

Michael Strong @StrongLabNIH - Jan 26
Replying to @JaredJamesEddy1
Co-infection? Length of infection?

Jared James Eddy @JaredJamesEddy1 - Jan 26
Replying to @JaredJamesEddy1
Do you think the patients with pulmonary NTM had a sufficient number of cultures for follow up? Might this have impacted "clinical success"? #NTMTwitterJC

Jared James Eddy @JaredJamesEddy1 - Jan 26
Replying to @JaredJamesEddy1
Some patients were treated with tedizolid in combination with omadacycline, a newer drug for which we also have limited data in NTM infections. #NTMTwitterJC

Jared James Eddy @JaredJamesEddy1 - Jan 26
Source control is key for these infections, especially when extrapolmonary; effectiveness will be limited without source control no matter the regimen. #NTMTwitterJC
## NTM Journal Club: **February Twitter Highlights**

### Final Report: August 2021 – August 2022

<table>
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<tr>
<th>Michael Strong  @StrongLabNJH</th>
<th>Feb 23</th>
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<tr>
<td>Question for the audience: Did you know prior to the journal club yesterday, that zebrafish could be used as a model system to study bacterial host-pathogen interactions? #NTMTwitterJC</td>
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<tr>
<td>Yes</td>
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<tr>
<td>No</td>
<td>100%</td>
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<td>3 votes - 1 day left</td>
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**National Jewish Health Medical Education** @NJJHealthMeMe ...

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<tr>
<td>Q2: What do you think of the results of this study? Type your response starting with A2 and use #NTMTwitterJC</td>
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**National Jewish Health Medical Education** @NJJHealthMeMe ...

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<tr>
<td>Q1: Will this study change your practice? #NTMTwitterJC</td>
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<tr>
<td>Yes</td>
<td>0%</td>
</tr>
<tr>
<td>No</td>
<td>0%</td>
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<tr>
<td>0 votes - 1 day left</td>
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**Michael Strong** @StrongLabNJH ...

- The research community needs effective screening mechanisms to better identify and understand successful phage-bacteria pairings and to study the mechanisms of interaction in vivo. A topic the Johansen et al paper addresses. #NTMTwitterJC
- In theory, phage therapy has the potential to be highly specific toward a particular bacterial pathogen without adversely affecting the host or host commensal microbiome. #NTMTwitterJC
- The Dedrick et al. 2019 case study, utilized a phage cocktail to treat the NTM infection in the individual with CF, and the compassionate use treatment including a phage called Muddy, which is the phage tested in the paper we are discussing today. #NTMTwitterJC
- The research paper of Johansen et al builds upon a previous compassionate use study, which demonstrated clinical improvement of a young CF patient with a disseminated M. abscessus subspecies massiliense (strain GD01) infection. (Dedrick et al., 2019). #NTMTwitterJC
- In vivo models, including non-mammalian models like the zebrafish, can be leveraged to study host-pathogen interactions and to evaluate new treatment ideas and combinations in an efficient manner. #NTMTwitterJC

---

**Hashtag Usage**: 52

**Impressions**: 979
NTM Journal Club: March Twitter Highlights
Final Report: August 2021 – August 2022

Do you have any safety concerns regarding iNO? #NTMTwitterJC

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<th>Yes</th>
<th>100%</th>
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<tbody>
<tr>
<td>No</td>
<td>0%</td>
</tr>
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</table>

1 vote - 2 days left
7:18 PM - Mar 30, 2022 - Twitter Web App

Q4: Do you think that your cystic fibrosis patients would want to take iNO if it were FDA approved? #NTMTwitterJC

Yes 100%
No 0%
Unsafe 0%

1 vote - 2 days left
7:22 PM - Mar 30, 2022 - Twitter Web App

Jane Gross MD @JaneGrossMD - Mar 30
All inhaled nitric oxide at high dose requires a significant level of monitoring both during delivery and after. This may make high dose inhaled NO only suitable in an inpatient setting. #NTMTwitterJC

Jane Gross MD @JaneGrossMD - Mar 30
Let's look at efficacy – measured by FEV1, FVC, and 6MWD. Mean FEV1, FVC, and 6MWD increased at the completion of treatment (week 3), but were not sustained at follow up. #NTMTwitterJC

Jane Gross MD @JaneGrossMD - Mar 30
Let's look at the primary outcome - safety. All nine enrolled patients completed iNO treatment and there were no iNO-related serious adverse events. Treatment-related adverse events included dryness, dry mouth, hypoxemia, and methemoglobinemia. #NTMTwitterJC

Jane Gross MD @JaneGrossMD - Mar 30
This was a multicenter pilot study to test the safety and efficacy of intermittent high-dose iNO as an adjunctive treatment for refractory Mycobacterium abscessus lung infection in patients with cystic fibrosis. Primary outcome was safety and tolerability. #NTMTwitterJC

Jane Gross MD @JaneGrossMD - Mar 30
An intermittent iNO delivery protocol (30 min of iNO q4-h) was reduced to detect toxicity associated with methemoglobinemia and was safe and well tolerated in healthy adults and CF patients. #NTMTwitterJC

Jane Gross MD @JaneGrossMD - Mar 30
In patients with CF, elevation of arterial NO is associated with improvement in lung function and high doses (160-20 ppm) has demonstrated antimicrobial activity in drug-resistant pathogens. Appears that iNO has potential to be a therapeutic agent. #NTMTwitterJC

Jane Gross MD @JaneGrossMD - Mar 30
Thank you so much for the introduction! I'm excited to chat tonight about the research article. Pilot study to test inhaled nitric oxide in cystic fibrosis patients with refractory Mycobacterium abscessus lung infection. Published in Journal of Cystic Fibrosis 2020. #NTMTwitterJC

National Jewish Health Medical Education
@NJHhealthMedEd

1,544 impressions
NTM Journal Club: *April Twitter Highlights*

**Final Report: August 2021 – August 2022**

**35 Engagements**

**National Jewish Health Medical Education @NJHealthMedEd · 19h**

What are your thoughts regarding how higher “stiffness” may impact clearance of rough M. abscessus biofilms in the lung? Type your response starting with A2 and use #NTMTwitterJC

**National Jewish Health Medical Education @NJHealthMedEd · 19h**

Let’s look at the stiffness of M. abscessus biofilms. While biofilms of smooth and rough variants showed equal thickness, biofilms of rough M. abscessus were stiffer than the smooth M. abscessus variant. #NTMTwitterJC

**National Jewish Health Medical Education @NJHealthMedEd · 19h**

Now let’s look at biofilm clearance from the lung. Frequency sweep analyses were correlated with the mucociliary and cough clearance indices showing M. abscessus resisted clearance from the lung compared to P. aeruginosa. #NTMTwitterJC

**National Jewish Health Medical Education @NJHealthMedEd · 20h**

For tonight’s #NTM journal club series, we will be discussing, “Mycobacterium abscessus biofilms have viscoelastic properties which may contribute to their recalcitrance in chronic pulmonary infections.”

pubmed.ncbi.nlm.nih.gov/33658897/ #NTMTwitterJC

**1,298 Impressions**
<table>
<thead>
<tr>
<th>Q6: Does this journal club article improve your understanding of genomic comparisons of M. abscessus isolates to infer transmission?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Yes</strong></td>
</tr>
<tr>
<td><strong>No</strong></td>
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</tbody>
</table>

3 votes · Final results

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**Rebecca Davidson, PhD @RMD_PhD · May 25**

I'm curious how many of you have used WGS to compare NTM strains. 
#NTMTwitterJC

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**National Jewish Health Medical Educa... @NJHealthMed... · May 25**

Q5: What are your thoughts about the observation of highly similar clones of M. abscessus in different regions of the world? Type your response starting with A5 and use #NTMTwitterJC

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**National Jewish Health Medical Educa... @NJHealthMed... · May 25**

Q4: What genetic tools are available to researchers or clinical labs to compare bacterial strains from a suspected outbreak? Type your response starting with A4 and use #NTMTwitterJC

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**National Jewish Health Medical Educa... @NJHealthMed... · May 25**

Q3: Do you think it is feasible and/or practical to use whole genome sequencing of bacterial isolates to investigate potential outbreaks of NTM? Type your response starting with A3 and use #NTMTwitterJC

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**National Jewish Health Medical Educa... @NJHealthMed... · May 25**

Q2: What genetic tools are available to researchers or clinical labs to compare bacterial strains from a suspected outbreak? Type your response starting with A2 and use #NTMTwitterJC

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**National Jewish Health Medical Educa... @NJHealthMed... · May 25**

Q1: Where do you think people acquire NTM infections and M. abscessus specifically? Type your response starting with A1 and use #NTMTwitterJC

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We will now start posting discussion questions. To respond, reply directly to the discussion question post, include A1 for Q1, A2 for Q2 and so on, and use #NTMTwitterJC
NTM Journal Club: June Twitter Highlights
Final Report: August 2021 – August 2022

38 Engagements

Q6: Why does phage therapy fail in some cases? Type your response starting with A6 and use #NTMTwitterJC

Q5: Why does it appear that 3 months of phage therapy is needed before microbiological improvement is detected? Type your response starting with A5 and use #NTMTwitterJC

Q4: Should phage therapy be given earlier in the course of infection? Type your response starting with A4 and use #NTMTwitterJC

1,293 Impressions
| National Jewish Health Medical Educati... @NJHealthMed... · Jul 27   | ⋮ | Q5: M. szulgai, named after T. Sulga, a Polish microbiologist, can be cured. M. gordonae, named after Ruth Gordon, an American bacteriologist, does not need treatment. Which one would you rather have named after you? Type your response starting with A5 and use #NTMTwitterJC | 1 | 2 |  ||
| National Jewish Health Medical Educati... @NJHealthMed... · Jul 27   | ⋮ | Q4: When isolated, M. simiae is usually nonpathogenic. So why is it so difficult to treat? Type your response starting with A4 and use #NTMTwitterJC | 1 | 1 |  ||
| National Jewish Health Medical Educati... @NJHealthMed... · Jul 27   | ⋮ | Q3: Has anyone seen a case of M. genavense pulmonary disease? Type your response starting with A3 and use #NTMTwitterJC | 2 |   |  ||
| National Jewish Health Medical Educati... @NJHealthMed... · Jul 27   | ⋮ | This year, members of the expert panel published a consensus statement on how to manage less common NTM. Systematic reviews were performed on seven species including 2 rapid growers and 5 slow growers and the results led to consensus treatment recommendations #NTMTwitterJC | 2 |   |  ||
| National Jewish Health Medical Educati... @NJHealthMed... · Jul 27   | ⋮ | In 2020 the NTM tx guidelines were revised by a multi-society panel of experts that decided to focus on the most common NTM to cause pulmonary disease in adults without cystic fibrosis or immunosuppression. They included MAC, M. kansasii, M. xenopi, and M. abscessus #NTMTwitterJC | 4 |   |  ||
NTM Journal Club: August Twitter Highlights
Final Report: August 2021 – August 2022

31 Tweets

National Jewish Health Medical Educ... @NJHealthMed... • Aug 24
Was time to positivity associated with markers of disease severity? If so, what were the markers of disease severity? 1. Pulmonary disease 2. Smear positive 3. Initiation by 3 and 6 months
Type your response starting with A2 and use #NTMTwitterJC

National Jewish Health Medical Educ... @NJHealthMed... • Aug 24
Q1: In this study did a shorter time to positivity predict M. avium pulmonary disease?
Type your response starting with A1 and use #NTMTwitterJC

National Jewish Health Medical Educ... @NJHealthMed... • Aug 24
We will now start posting discussion questions. To respond, reply directly to the discussion question post, include A1 for Q1, A2 for Q2 and so on, and use #NTMTwitterJC

812 Impressions
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**Live Twitter Chats**
National Jewish Health designates each Other activity (social media discussion) for a maximum of 0.5 *AMA PRA Category 1 Credit™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.