

JOURNAL CLUB

Final Outcomes Summary: Live Webinar and Twitter Chat Journal Club

August 2021 – August 2022

Grant ID: 67929297

Supported by an Educational Grant from Insmmed.



**National Jewish
Health®**

Breathing Science is Life.®

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Executive Summary

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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.

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

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 Webpage

Launch Date: August 24, 2021

End Date: August 27, 2022

Activity Link:

<https://www.nationaljewish.org/ntmjournclub>

Target Audience & Accreditation

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

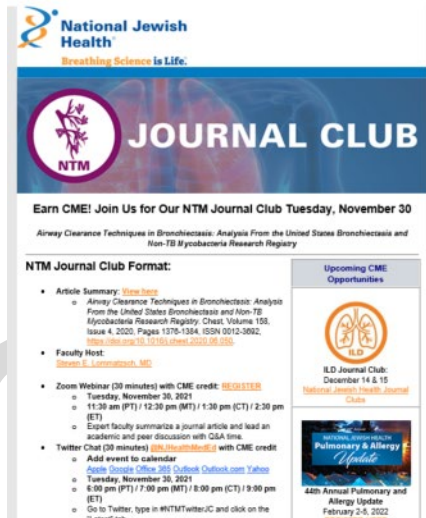
Accreditation: National Jewish Health is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians. *NJH designates each of the 24 live activities (12 live webinars, 12 live Twitter chats) for a maximum of 0.5 AMA PRA Category 1 Credit™.*

Audience Generation

Final Report: August 2021 – August 2022



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).



Personalized emails and e-newsletters



Social media ads and posts



Personalized + Customized Intelligent Marketing Platform



Branded Channel on VuMedi



CenterTable Twitter Follower & Advertising Campaign

National Jewish Health Monthly NTM Journal Club Activities



Article Summary

developed by NJH experts in NTM
endured on NJH Website



Article Summary

sent to target audience with registration links to Zoom and Twitter Journal Club



Live Webinar Journal Club via Zoom

30-minute discussion led by NJH NTM expert
(CME Credit)



Twitter Journal Club via Tweet Chat

(CME Credit)



Webinars Endured on Vu-Medi

12
article summaries developed

1,515
article summary downloads

276
webinar completers
(548 registrants)

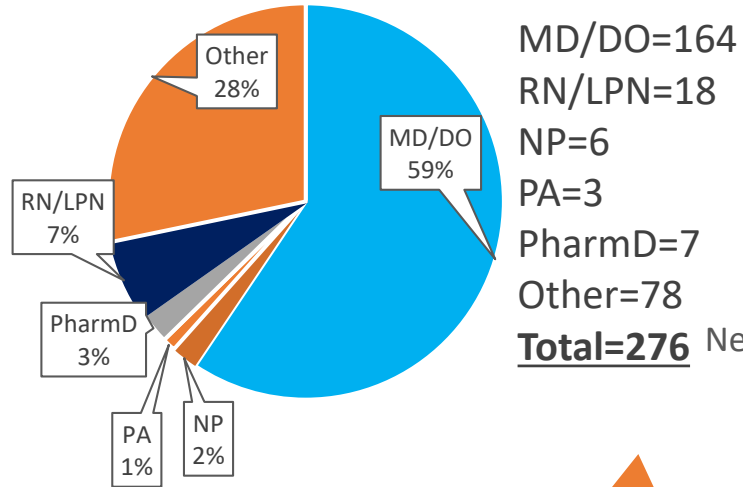
20,097
impressions

1,903
views on VuMedi

Quantitative Educational Impact Summary

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Webinar Participation



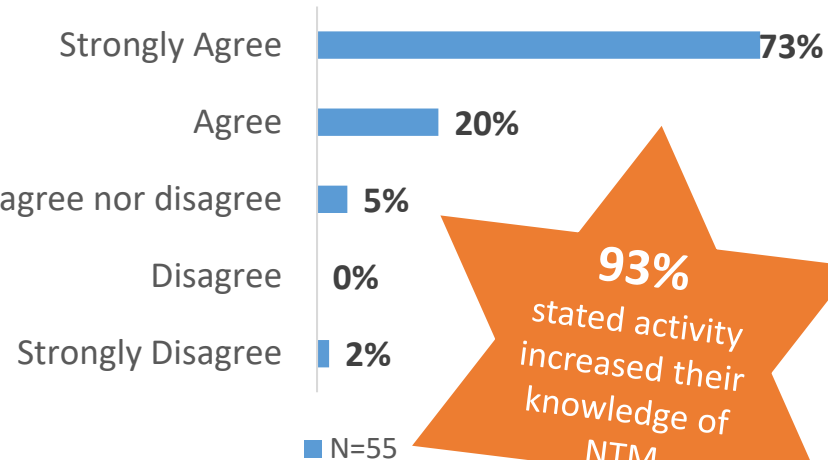
62% of learners were physicians and advanced practice providers

Patient Impact 10,868/Yr



Knowledge Gain: Self-reported

Webinar Participants Reported Activity Increased Knowledge of NTM



93% stated activity increased their knowledge of NTM

Twitter Chats: Summary August 2021 – August 2022

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

Confidence @ Post-Test



N=55

Qualitative Educational Impact Summary

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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)

Article Summary

Final Report: August 2021 – August 2022



JOURNAL CLUB
Article Summary by: David E. Griffith, MD

ARTICLE

Amikacin liposome inhalation suspension for Treatment-Refractory lung disease caused by Mycobacterium avium complex (CONVERT). A prospective, open-label, randomized study. *Am J Respir Crit Care Med* 2018; 198: 1559-1569.
https://www.atsjournals.org/doi/10.1164/rccm.201807-1318OC?url_ver=Z39.88-2003&rft_id=ori:rid:crossref.org/rft_id=cc:pub%20%20pubmed

CLINICAL QUESTION

For patients with treatment refractory Mycobacterium avium complex (MAC) lung disease, does the addition of amikacin liposome inhalation suspension to standard, guidelines-based therapy (GBT) improve microbiologic treatment outcome over continuation of the standard GBT alone?

SUMMARY

This was an international (127 clinical centers in 18 countries), multi-site, randomized open-label trial. Subjects were ≥ 18 years of age with active MAC lung disease as documented by MAC-positive sputum or bronchoscopy cultures within 6 months before screening and at screening. Eligible patients were MAC culture positive while on stable guidelines-based therapy (GBT) for at least 6 months or had stopped GBT less than 12 months before screening. Key exclusion criteria included cystic fibrosis, active pulmonary tuberculosis, immunodeficiency syndromes, MAC isolates with amikacin resistance on culture screening (MIC > 64 µg/ml) and active malignancies. Patients were randomly assigned in a 2:1 ratio to receive ALIS 590 mg by nebulizer once daily added to GBT (ALIS + GBT) or GBT alone (see Figure 1). The primary endpoint was the proportion of patients achieving culture conversion based on assessment of monthly sputum cultures from baseline through Month 6. Culture conversion was achieved if patients had three consecutive monthly negative sputum cultures, with all sputum samples collected at each visit required to be culture negative. To meet the primary endpoint, Month 4 was the latest visit at which a negative sputum culture could be first detected. Sputum analysis at each monthly clinic visit included sputum collection in triplicate. Secondary endpoints at 6 months were change in baseline in the 6-minute-walk test, time to culture conversion, and change from baseline in St. George's Respiratory questionnaire (SGRQ).

A total of 492 patients were enrolled, 336 were randomized (intention to treat), 224 to ALIS + GBT and 112 to GBT alone. More patients withdrew from the study in the ALIS + GBT arm (19.6%) than the GBT alone arm (8.9%). The most common reasons for study discontinuation in the ALIS + GBT arm were withdrawal by patient (8.5%), adverse event (3.6%), and death (1.1%). The study population was mean age 64.7 years, 69.3% female, mean BMI 21.70% white, 62.5% underlying lung disease (primarily bronchiectasis), 10.7% clarithromycin resistant, 10.7% current smoker. The primary endpoint of sputum culture conversion by Month 6 was achieved by significantly more patients in the ALIS + GBT arm (85/224 patients, 39%) versus 10/112 patients, 9.9%) in the GBT alone arm (p<0.001) (Figure 2). Only one patient with an amikacin MIC > 64 µg/ml converted sputum to negative. At baseline 73/335 patients (21.8%) had clarithromycin-resistant sputum cultures. The results of this study have been published in the September 2021 issue of the Journal of the American Medical Association (JAMA).

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JOURNAL CLUB
Article Summary by: David E. Griffith, MD

Since the advent of the macrolides for treatment of MAC infections in the 1990's, there have been significant advances in MAC therapy. MAC treatment success was significantly higher with macrolide-containing regimens. This study demonstrated that the addition of improved microbiologic treatment outcomes for treatment refractory MAC lung disease. This trial, along with a randomized placebo-controlled Phase II trial of ALIS for refractory MAC lung disease, formed the basis for the FDA to grant limited approval for ALIS for the treatment of refractory MAC lung disease. ALIS is indicated for MAC lung disease patients with active disease after at least 6 months of guidelines-based therapy. Administration of ALIS is contraindicated in patients with hypersensitivity to amikacin or other aminoglycosides. Most of the adverse events, primarily respiratory events, especially dyspnea. Most of the adverse events are manageable without discontinuation of ALIS. Serious adverse events such as hypersensitivity pneumonitis can also occur.

The results of this study have been published in the September 2021 issue of the Journal of the American Medical Association (JAMA).

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August 2021 Article Summary: Amikacin liposome inhalation suspension for Treatment-Refractory lung disease caused by Mycobacterium avium complex (CONVERT). A prospective, open-label, randomized study. *Am J Respir Crit Care Med* 2018; 198: 1559-1569.

[View Here](#)

September 2021 Article Summary: Phase 2 Trial of the DPP-1 Inhibitor Brensocatib in Bronchiectasis, *N Engl J Med* 2020; 383:2127-2137, DOI: 10.1056/NEJMoa2021713. [View Here](#)

October 2021 Article Summary: Amikacin Liposome Inhalation Suspension for Refractory Mycobacterium avium Complex Lung Disease: Sustainability and Durability of Culture Conversion and Safety of Long-term Exposure. Griffith DE, et al; CONVERT Study Group. *Chest*. 2021 Sep;160(3):831-842. DOI: 10.1016/j.chest.2021.03.070. [View Here](#)

November 2021 Article Summary: Airway Clearance Techniques in Bronchiectasis: Analysis From the United States Bronchiectasis and Non-TB Mycobacteria Research Registry. *Chest*, Volume 158, Issue 4, 2020, Pages 1376-1384, ISSN 0012-3692, <https://doi.org/10.1016/j.chest.2020.06.050>. [View Here](#)

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](#)

Article Summary

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February 2022 Article Summary: Mycobacteriophage-antibiotic therapy promotes enhanced clearance of drug-resistant Mycobacterium abscessus. Matt D Johansen, Matthéo Alcaraz, Rebekah M Dedrick, Françoise Roquet-Banères, Claire Hamela, Graham F Hatfull, Laurent Kremer. *s Model Mech.* 2021 Sep 1;14(9):dmm049159. [View Here](#)

March 2022 Article Summary: Pilot study to test inhaled nitric oxide in cystic fibrosis patients with refractory Mycobacterium abscessus lung infection. *J Cyst Fibros.* 2020 Mar;19(2):225-231. [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](#)

May 2022 Article Summary: Genomic Analysis of a Hospital-Associated Outbreak of Mycobacterium abscessus: Implications on Transmission. *J Clin Microbiol.* 2022 Jan 19;60(1):e0154721. [View Here](#)

June 2022 Article Summary: Host and pathogen response to bacteriophage engineered against Mycobacterium abscessus lung infection. *Cell.* 2022 May 26;185(11):1860-1874.e12. doi: 10.1016/j.cell.2022.04.024. Epub 2022 May 13. PMID: 35568033. [View Here](#)

July 2022 Article Summary: Consensus management recommendations for less common non-tuberculous mycobacterial pulmonary diseases. *Lancet Infect Dis.* 2022 Jul;22(7):e178-e190. doi: 10.1016/S1473-3099(21)00586-7. Epub 2022 Jan 25. Erratum in: *Lancet Infect Dis.* 2022 Mar;22(3):e73. PMID: 35090639. [View Here](#)

August 2022 Article Summary: Time to Positive Culture Detection Predicts Mycobacterium avium Pulmonary Disease Severity and Treatment Initiation. *Ann Am Thorac Soc.* 2022 Jun;19(6):925-932. doi: 10.1513/AnnalsATS.202107-765OC. PMID: 34851813. [View Here](#)



1515
total
article
downloads

Executive Summary – Live Webinars

Final Report: August 2021 – August 2022



Webinar Date	Article Title	Faculty	Registrations	Attendance
August 24, 2021	Amikacin liposome inhalation suspension for Treatment-Refractory lung disease caused by Mycobacterium avium complex (CONVERT). A prospective, open-label, randomized study.	David Griffith, MD	43	24
September 28, 2021	Phase 2 Trial of the DPP-1 Inhibitor Brensocatib in Bronchiectasis	Charles Daley, MD	26	13
October 26, 2021	Amikacin Liposome Inhalation Suspension for Refractory Mycobacterium avium Complex Lung Disease: Sustainability and Durability of Culture Conversion and Safety of Long-term Exposure	Shannon Kasperbauer, MD	28	18
November 30, 2021	Airway Clearance Techniques in Bronchiectasis: Analysis From the United States Bronchiectasis and Non-TB Mycobacteria Research Registry	Steve Lommatzsch, MD	50	33
January 25, 2022	Preliminary, Real-world, Multicenter Experience With Omadacycline for Mycobacterium abscessus Infections	Jared Eddy, MD	61	34

Executive Summary – Live Webinars

Final Report: August 2021 – August 2022



Webinar Date	Article Title	Faculty	Registrations	Attendance
February 22, 2022	Mycobacteriophage-antibiotic therapy promotes enhanced clearance of drug-resistant Mycobacterium abscessus	Michael Strong, MD	44	23
March 29, 2022	Pilot study to test inhaled nitric oxide in cystic fibrosis patients with refractory Mycobacterium abscessus lung infection	Jane E. Gross, MD, PhD	36	14
April 26, 2022	Mycobacterium abscessus biofilms have viscoelastic properties which may contribute to their recalcitrance in chronic pulmonary infections	Jennifer R. Honda, PhD	38	16
May 24, 2022	Genomic Analysis of a Hospital-Associated Outbreak of Mycobacterium abscessus: Implications on Transmission	Rebecca Davidson, PhD	38	14

Executive Summary – Live Webinars

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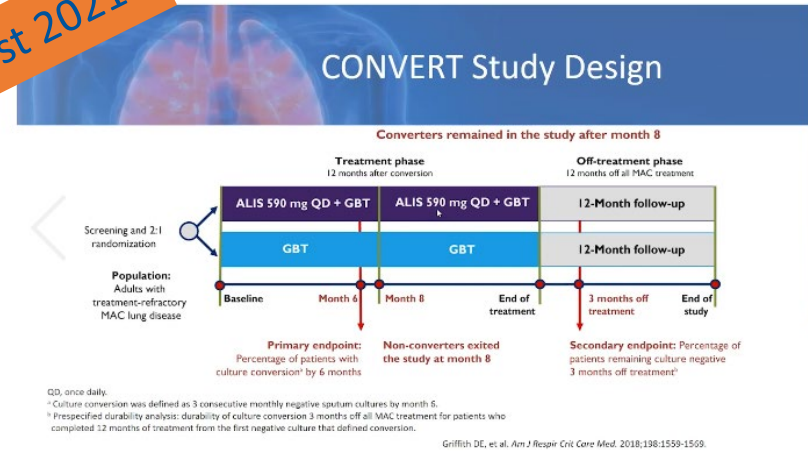
Webinar Date	Article Title	Faculty	Registrations	Attendance
June 28, 2022	Host and pathogen response to bacteriophage engineered against Mycobacterium abscessus lung infection	Jerry Nick, MD	52	23
July 26, 2022	Consensus management recommendations for less common non-tuberculous mycobacterial pulmonary diseases	Charles Daley, Md	73	36
August 23, 2022	Time to Positive Culture Detection Predicts Mycobacterium avium Pulmonary Disease Severity and Treatment Initiation	Shannon Kasperbauer, MD	59	28
Total August 2021 – August 2022			548	276



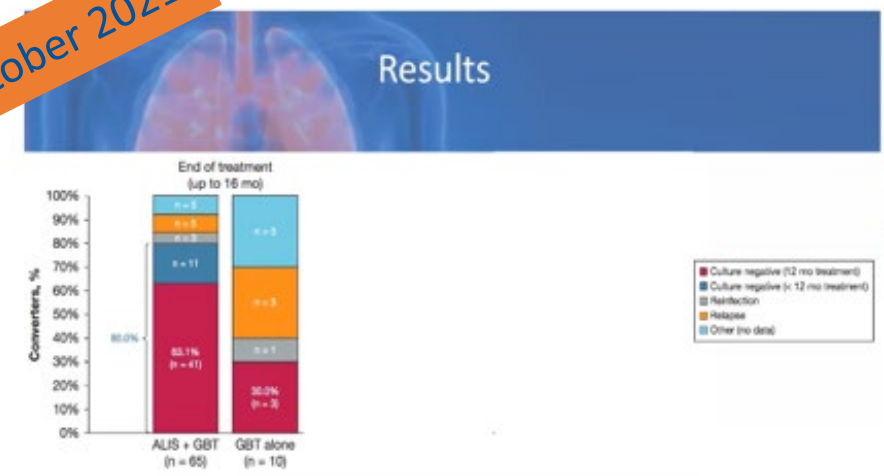
Executive Summary – Live Webinars

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August 2021



October 2021



September 2021

Summary of Findings

- Brensocatib met both primary and secondary outcomes
 - Primary: prolonged time to first exacerbation c/w placebo
 - Secondary: lower frequency of exacerbations, risk of exacerbations was approximately 40% lower than with placebo
 - There was no significant change in ppFEV1 or Respiratory Symptom domain of the QOL-B bronchiectasis questionnaire
- Overall, brensocatib was well tolerated
 - cough and dyspnea were more common in those who received brensocatib
 - skin and dental events, both AEs of special interest, were more common with brensocatib
- Brensocatib is currently being evaluated in a Phase 3 randomized, placebo-controlled study (ASPEN)

Chalmers JD, et al. N Engl J Med 220;383:2127-37



November 2021

Demographic Data

Variable	Data Available, No.	Overall Sample (N = 905)	Continuous Use of Airway Clearance at Baseline and Follow Up (n = 226; 25%)	Intermittent Use of Airway Clearance at Baseline and Follow Up (n = 351; 39%)	No Use of Airway Clearance at Baseline and Follow Up (n = 328; 36%)	P Value
Exacerbations in the past 2 y, No. (%)	772	---	---	---	---	< .0001
0	254 (33)	38 (20)	89 (31)	127 (43)		
1	151 (20)	44 (23)	58 (20)	49 (17)		
2	135 (18)	31 (17)	57 (20)	47 (16)		
≥3	232 (30)	75 (40)	83 (29)	74 (25)		
Hospitalized for pulmonary illness or exacerbation in the past 2 y, No. (%)	864	228 (26)	70 (32)	90 (27)	68 (22)	.001
Non-tuberculous mycobacteria at baseline, No. (%)	805	255 (32)	64 (30)	104 (33)	87 (32)	.674
Pseudomonas aeruginosa, No. (%)	717	293 (41)	95 (47)	117 (40)	81 (36)	.021





Executive Summary – Live Webinars

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January 2022



- 7/12 isolates underwent subspeciation
 - Abscessus (6/7)
 - Massiliense (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 MICs but 11/12 reported tigecycline MICs
- All patients with 2 or more companion drugs: 8/12 amikacin, 5/12 imipenem, 5/12 linezolid/tedizolid, 4/12 azithromycin, 12 clofazimine, 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 (8/12)
 - Previous antibiotic failure (6/12)
 - Ease of administration (6/12)
 - Oral bioavailability (6/12)
- 3 adverse effects (all managed with drug retained)
 - Nausea/vomiting/diarrhea
 - Creatinine increase >0.5 mg/dL
 - AST/ALT >3x upper limit normal



March 2022

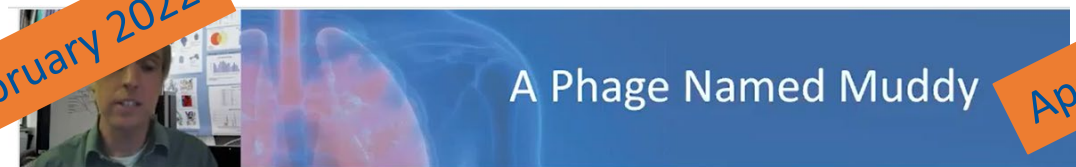


- INO Safety:**
- 0 iNO-related serious adverse events (SAEs).
 - 25 adverse events (AEs).
 - All iNO-related AEs were minor, transient, and self resolved.

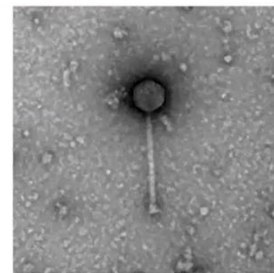
Event	n (pts) / n (event)	Comments
Common cold	1/1	
Pulmonary exacerbation	5/6	
Dizziness	1/2	Possibly NO-related, resolved
Dry mouth	1/1	Probably NO-related ^a , resolved
Hemoptysis	3/4	Possibly NO-related (n = 1), minor, resolved
Musculoskeletal pain	1/1	
Pain in extremity	1/2	
Headache	1/1	
Vomiting	2/2	
Fever	2/3	
MetHb elevation	1/1	Probably NO-related (7.1%)
Papilledema (blurred vision)	1/1	transient, resolved, SAE
Patients with probable/possible	3	minor, resolved



February 2022



Detailed Information for Phage Muddy	
Discovery Information	
Isolation Host	<i>Mycobacterium smegmatis</i> mc ¹¹⁵⁵
Found By	Lilli Holst
Year Found	2010
Location Found	Durban, South Africa
Finding Institution	University of Kwazulu-Natal
Program	Mycobacterial Genetics Course, Durban, South Africa
From enriched soil sample?	Yes
Isolation Temperature	Not entered
GPS Coordinates	29.8587 S, 31.0218 E Map
Discovery Notes	Muddy was the 1400th phage entered into the Mycobacteriophage DataBase! This sample was scraped from the underside of a partially decomposed aubergine and was therefore largely decomposed vegetable matter. The sample was dark, moist, and worms and other insects were present.

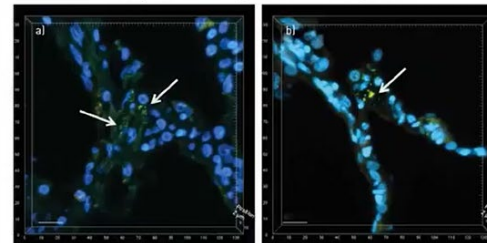


nhapesdb.org

April 2022

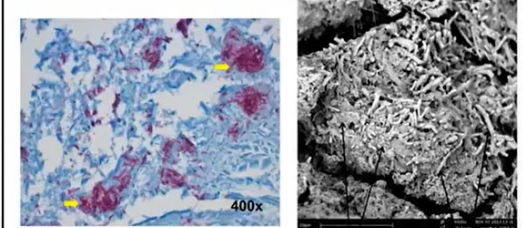


M. abscessus biofilms in the thickened alveolar walls of explanted lung tissue from a pwCF.



Qvist, et al., ERS J, 2015

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



Fennely, et al., AJRCCM, 2016

matrix bacilli

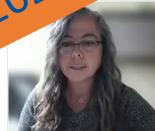




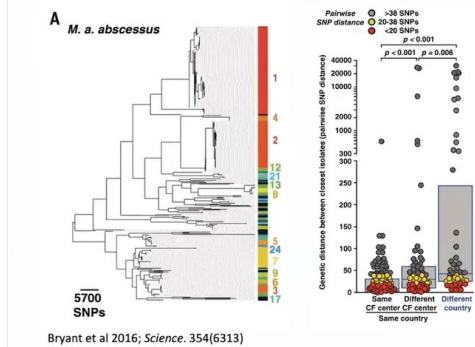
Executive Summary – Live Webinars

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May 2022



Whole Genome Sequencing (WGS) of NTM isolates



Population genomics studies of *M. abscessus* from persons with CF (pwCF) show highly similar genetic clones

- Outbreak clusters in a single CF center (UK) *Bryant et al 2013; *Lancet*. 381(9877)
- Genetic similarity defined in terms of single nucleotide polymorphisms (SNPs)
 - <20 SNPs – “probable” transmission
 - 20-38 SNPs – “possible” transmission*
- Person-to-person transmission*
- Direct or indirect?
- Clones originated from the same country and different countries

July 2022



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

Christoph Lange, Erik C Bottger, Emmanuelle Cambau, David E Griffith, Lorenzo Guglielmetti, Jalko van Ingen, Shandra L Knight, Theodore K Marras, Kenneth N Olivier, Miguel Santin, Jason E Stout, Enrico Tortoli, Dirk Wagner, Kevin Winthrop, Charles L Daley, on behalf of the expert panel group for management recommendations in 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

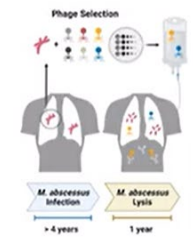
Lange C, et al. *Lancet Infect Dis* 2022;22.e178-90

June 2022

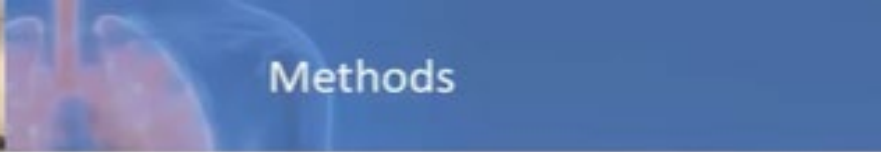
- 26 y/o male with Cystic Fibrosis
- *M. abscessus* in 2016
 - Enrolled in the PREDICT Trial
 - Met diagnostic criteria in early 2017
 - Enrolled in the PATIENCE Trial
 - Refractory to antibiotic treatment
 - Two effective phages identified
 - Initiated on phage therapy Sept 2020
 - Culture conversion January 2021
 - Lung Transplant October 2021
 - Completed phage (and antibiotics) March 2022



Host and pathogen response to bacteriophage engineered against *Mycobacterium abscessus* lung infection



August 2022



- Retrospective cohort study
 - Patients seen at the Toronto Western Hospital NTM clinic between January 1, 2015 through December 21, 2019.
- Two positive sputa for *M. avium*
 - Either expectorated or induced
 - “index” sputum (culture + for *M. avium* without treatment and recent CT)
 - There was no time limit between the two sputa and 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 tomographic (CT) imaging of the chest within six months of their index sputum result.

NTM Journal Club Webpage

<https://www.nationaljewish.org/ntmjournalclub>



**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

How to Participate in a Journal Club Twitter Chat



Respiratory Medicine Updates: A Virtual Clinical Community

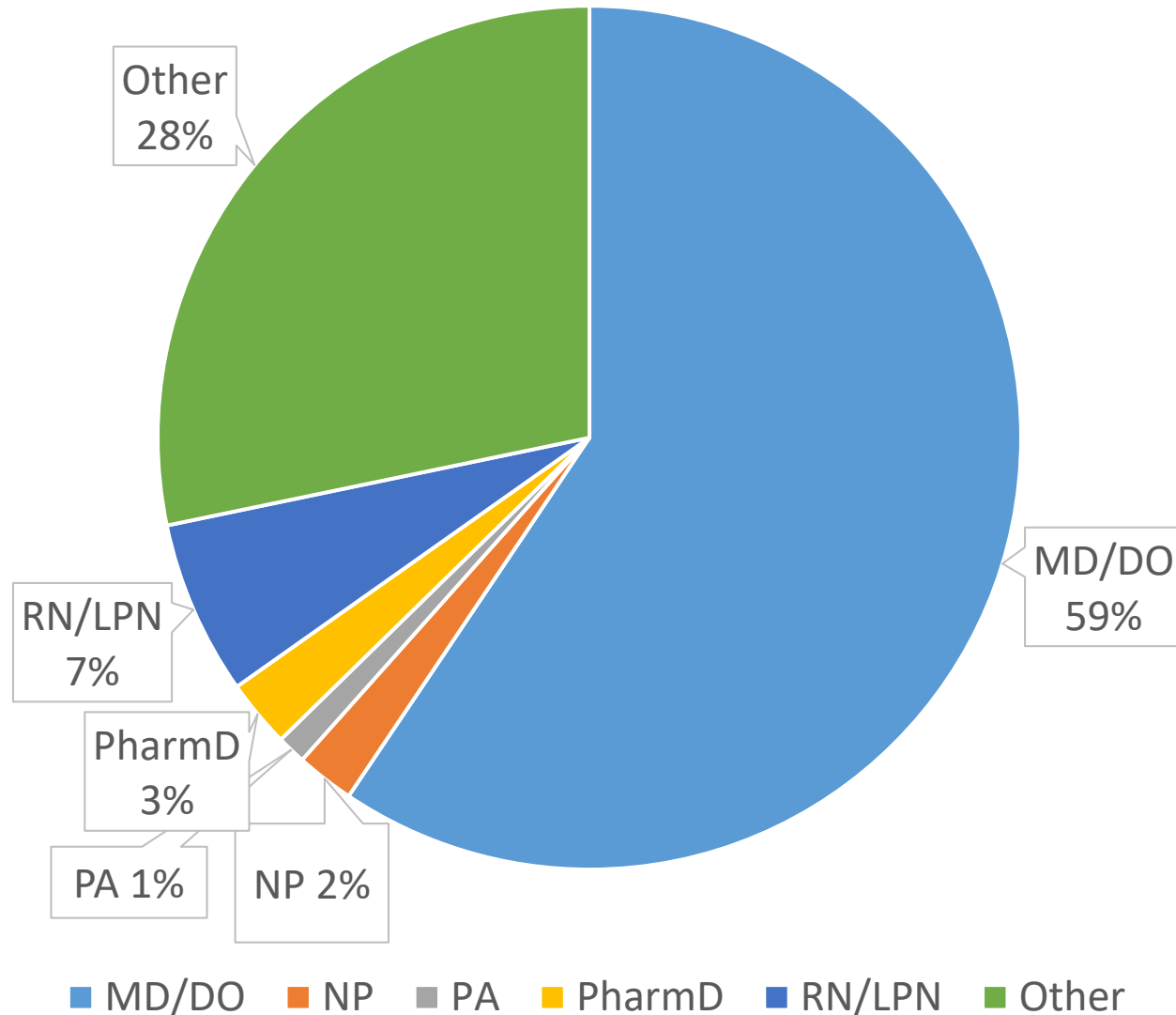
Our Next Session is August 23-24, 2022 • CME Credit for Zoom Webinar and Twitter Chat Participants

Article: Time to Positive Culture Detection Predicts *Mycobacterium avium* Pulmonary Disease Severity and Treatment Initiation. Ann Am Thorac Soc. 2022 Jun;19(6):925-932. doi: 10.1513/AnnalsATS.202107-765OC. PMID: 34851813.



Level (1) Outcomes: Live Webinars Participation: By Degree

Final Report: August 2021 – August 2022

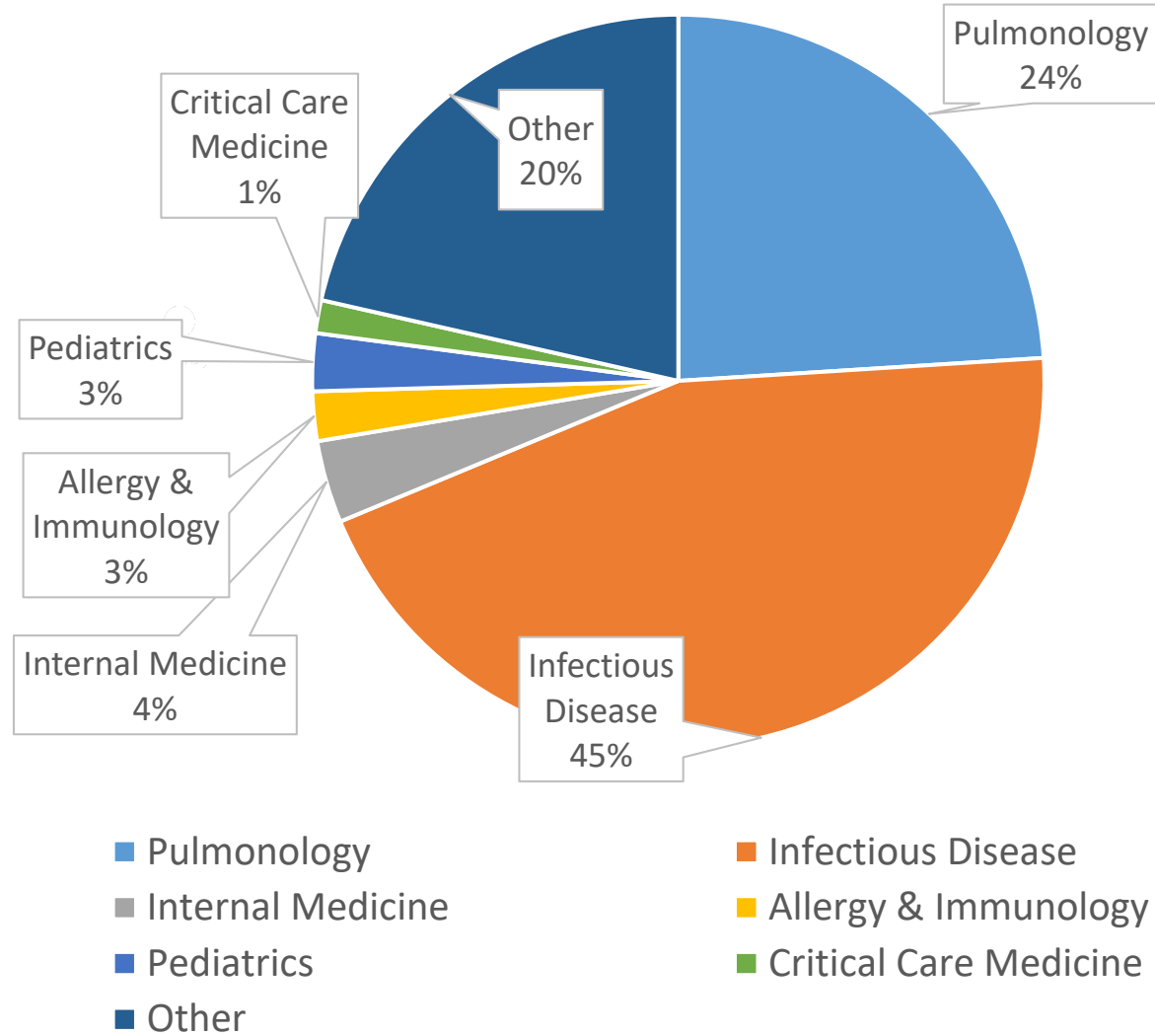


Degree	Completer #s
MD/DO	164
RN/LPN	18
NP	6
PA	3
PharmD	7
Other	78
Total Completers	276



Level (1) Outcomes: Live Webinars Participation: By Specialty

Final Report: August 2021 – August 2022

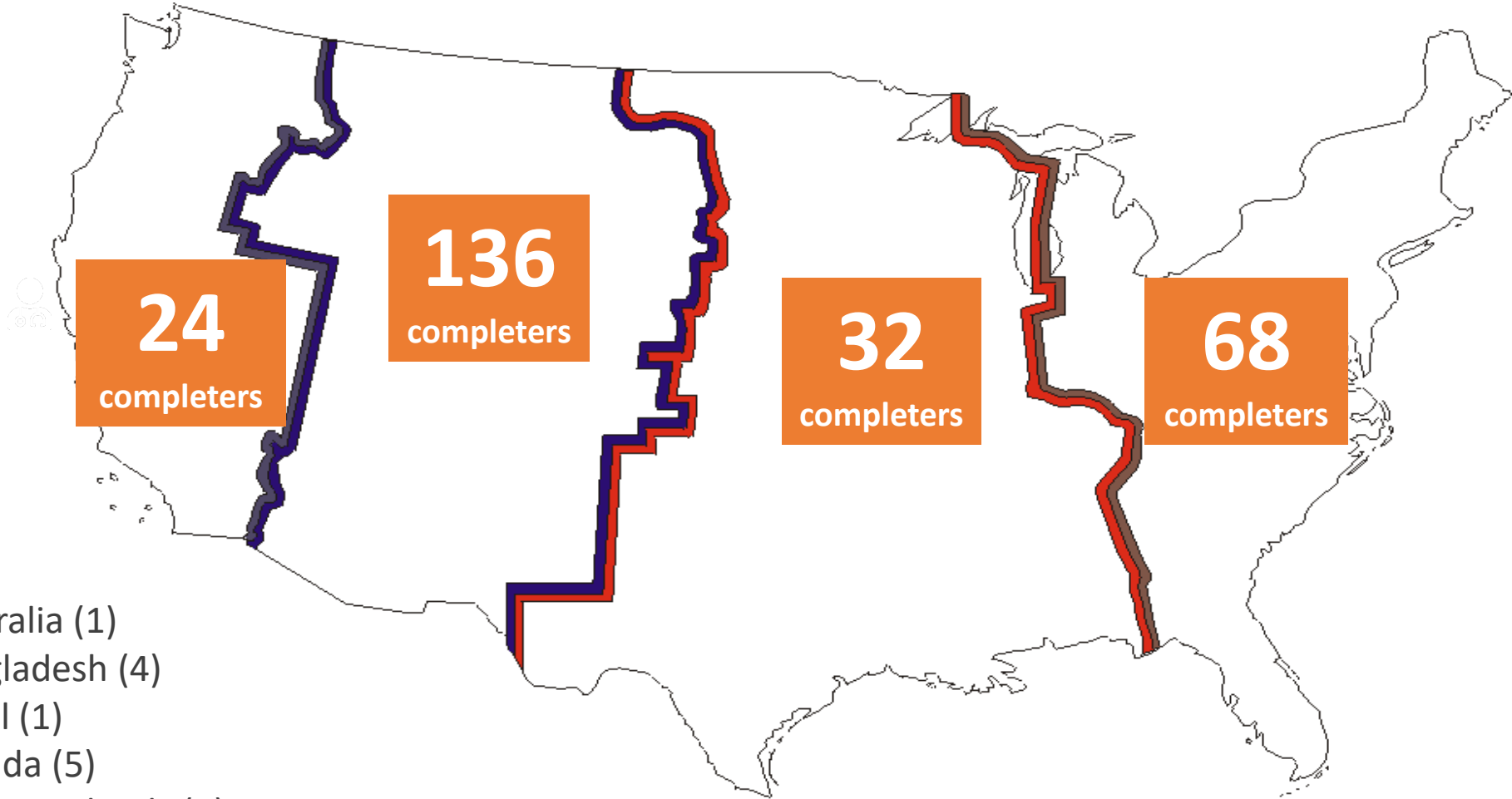


Specialty	Completer #s
Infectious Disease	123
Pulmonology	66
Internal Medicine	10
Allergy & Immunology	6
Pediatrics	7
Critical Care Medicine	4
Other	60
Total Completers	276



Level (1) Outcomes: Live Webinars Participation

Final Report: August 2021 – August 2022



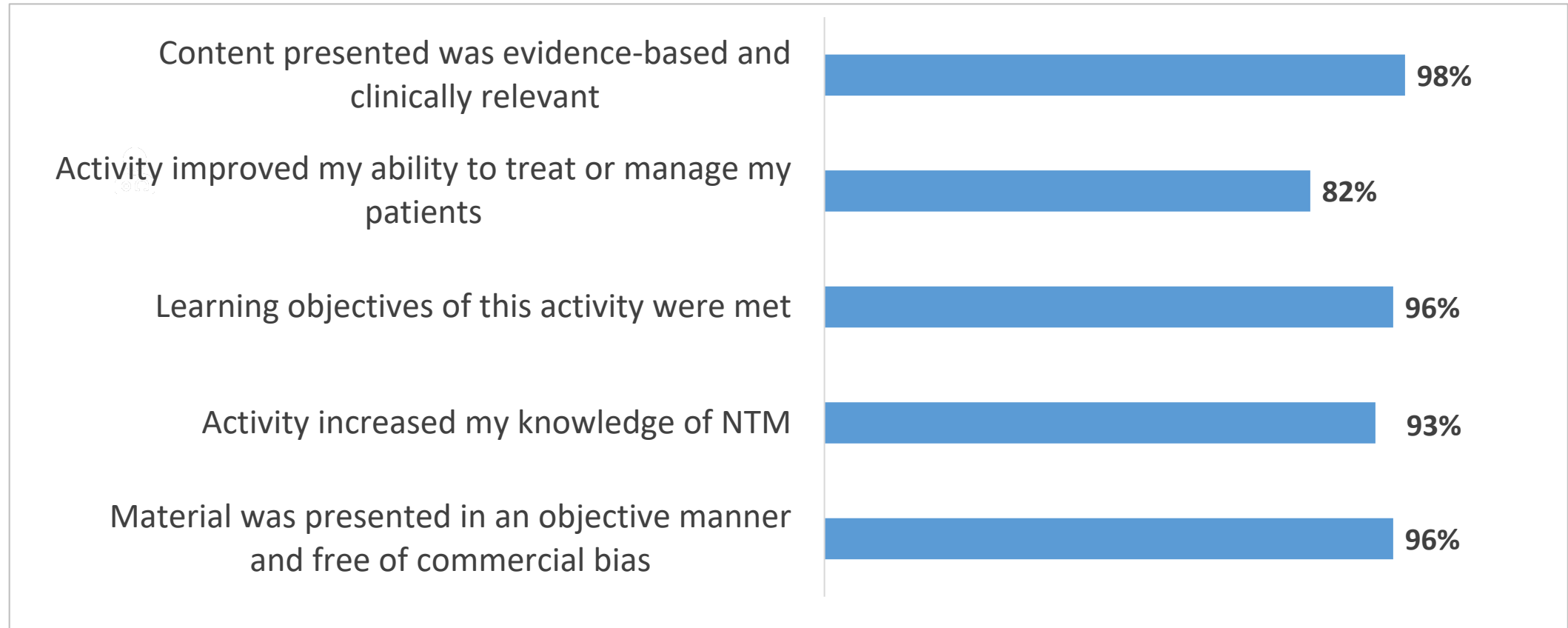
Other

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

N=276



Evaluation respondents “Strongly Agree” or “Agree” that:



N=55



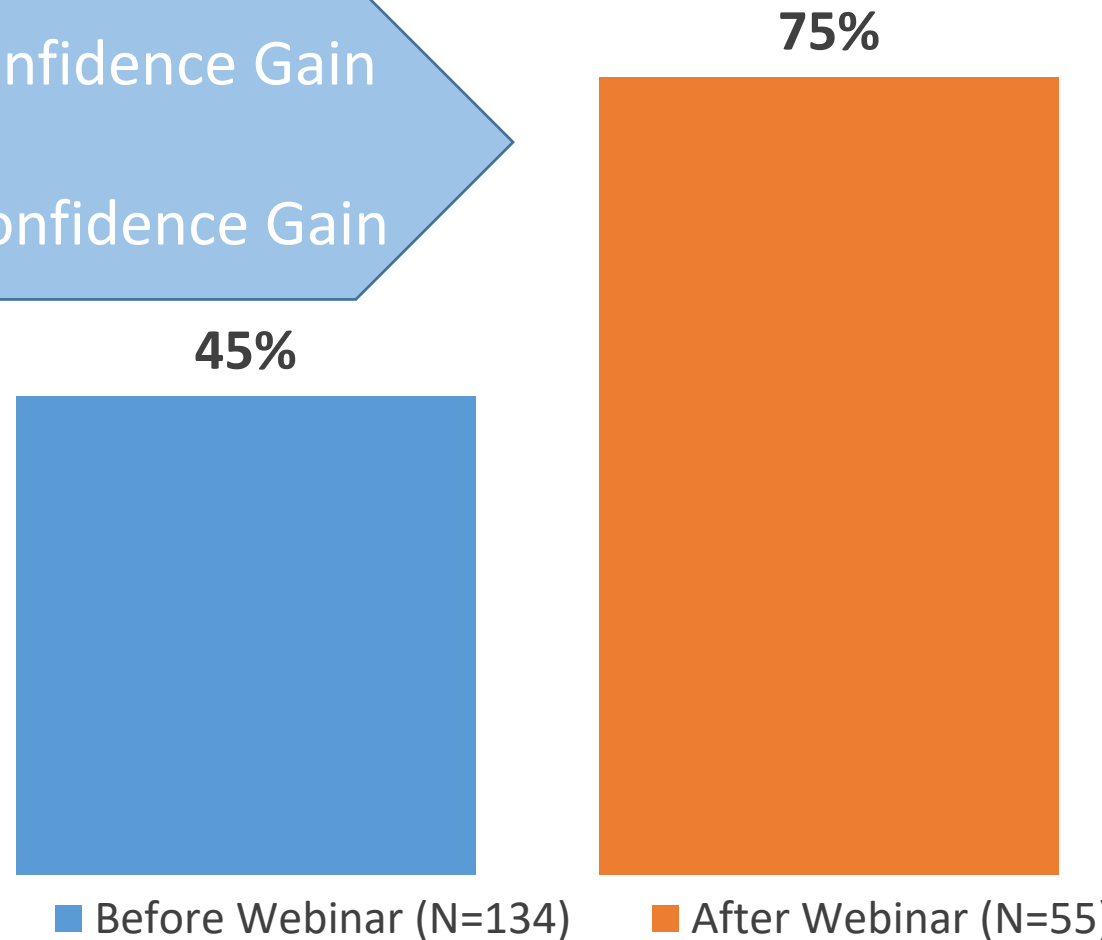
Level (4) Outcomes: Live Webinars Competence

Final Report: August 2021 – August 2022

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





Level (4) Outcomes: Live Webinars Competence

Final Report: August 2021 – August 2022



An analysis of open-ended comments demonstrates the following changes completers intend to make:

Month	Article Title	Intended Changes
August 2021	ALIS for Treatment-Refractory Lung Disease Caused by MAC	<ul style="list-style-type: none"> • Implement the use of ALIS (3 responses) • Utilize strategies to manage side effects • Provide motivation to patients
September 2021	Phase 2 Trial of the DPP-1 Inhibitor Brensocatib in Bronchiectasis	<ul style="list-style-type: none"> • Use strategies to identify these patients in practice • Implement screening tools to identify this disease
October 2021	ALIS for Refractory MAC Lung Disease: Sustainability and Durability of Culture Conversion & Safety of Long-term Exposure	<ul style="list-style-type: none"> • Use ALIS as a treatment for longer (2 responses) • Utilize testing/screening to select patients who would benefit from this treatment
November 2021	Airway Clearance Techniques in Bronchiectasis: Analysis from the US Bronchiectasis and Non-TB Mycobacteria Research Registry	<ul style="list-style-type: none"> • Emphasize and educate patients on the importance of airway clearance (5 responses) • Use strategies to evaluate patients for symptoms of bronchiectasis
January 2022	Multicenter Experience with Omadacycline for Mycobacterium abscessus Infections	<ul style="list-style-type: none"> • Utilize omadacycline as part of treatment strategy (5 responses)
February 2022	Mycobacteriophage-antibiotic therapy promotes enhanced clearance of drug-resistant Mycobacterium abscessus	<ul style="list-style-type: none"> • Evaluate CF patients for NTM • Include phage therapy as first option when possible • Apply animal model evidence in antibiotic selection



Level (4) Outcomes: Live Webinars Competence

Final Report: August 2021 – August 2022

An analysis of open-ended comments demonstrates the following changes completers intend to make:

Month	Article Title	Intended Changes
March 2022	Pilot study to test inhaled nitric oxide in cystic fibrosis patients with refractory Mycobacterium abscessus lung infection	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• Use a lower treatment threshold for Mabs patients
May 2022	Genomic Analysis of a Hospital-Associated Outbreak of Mycobacterium abscessus: Implications on Transmission	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• Discuss article with our contracted ID specialist• Consider submitting sputum to my refractory cases for phage consideration



Level (4) Outcomes: Live Webinars Competence

Final Report: August 2021 – August 2022

An analysis of open-ended comments demonstrates the following changes completers intend to make:

Month	Article Title	Intended Changes
July 2022	Consensus management recommendations for less common non-tuberculous mycobacterial pulmonary diseases	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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

91%

N=45

Evaluation respondents intend to make changes in practice as a result of the activity



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 Brensocaticib in Bronchiectasis

Questions

- What were the reasons for more females in the trial?
- If brensocaticib 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 effect 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 omadacycline?



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



Outcomes: Live Webinars

Final Report: August 2021 – August 2022

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. chelonae 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/>

Month	Impressions	Video Page Views	Unique Page Viewers	Starts	Unique Starts
August	2917	284	203	118	101
September	2260	257	177	132	102
October	2556	131	99	59	52
November	2443	284	188	155	116
January	1333	139	102	61	53
February	4986	150	104	73	52
March	1966	105	90	28	23
April	1795	104	84	31	25
May	4746	113	92	36	32
June	1179	103	70	40	32
July	342	225	161	103	82
August	156	8	5	5	4
Total	26,679	1,903	1,375	841	674

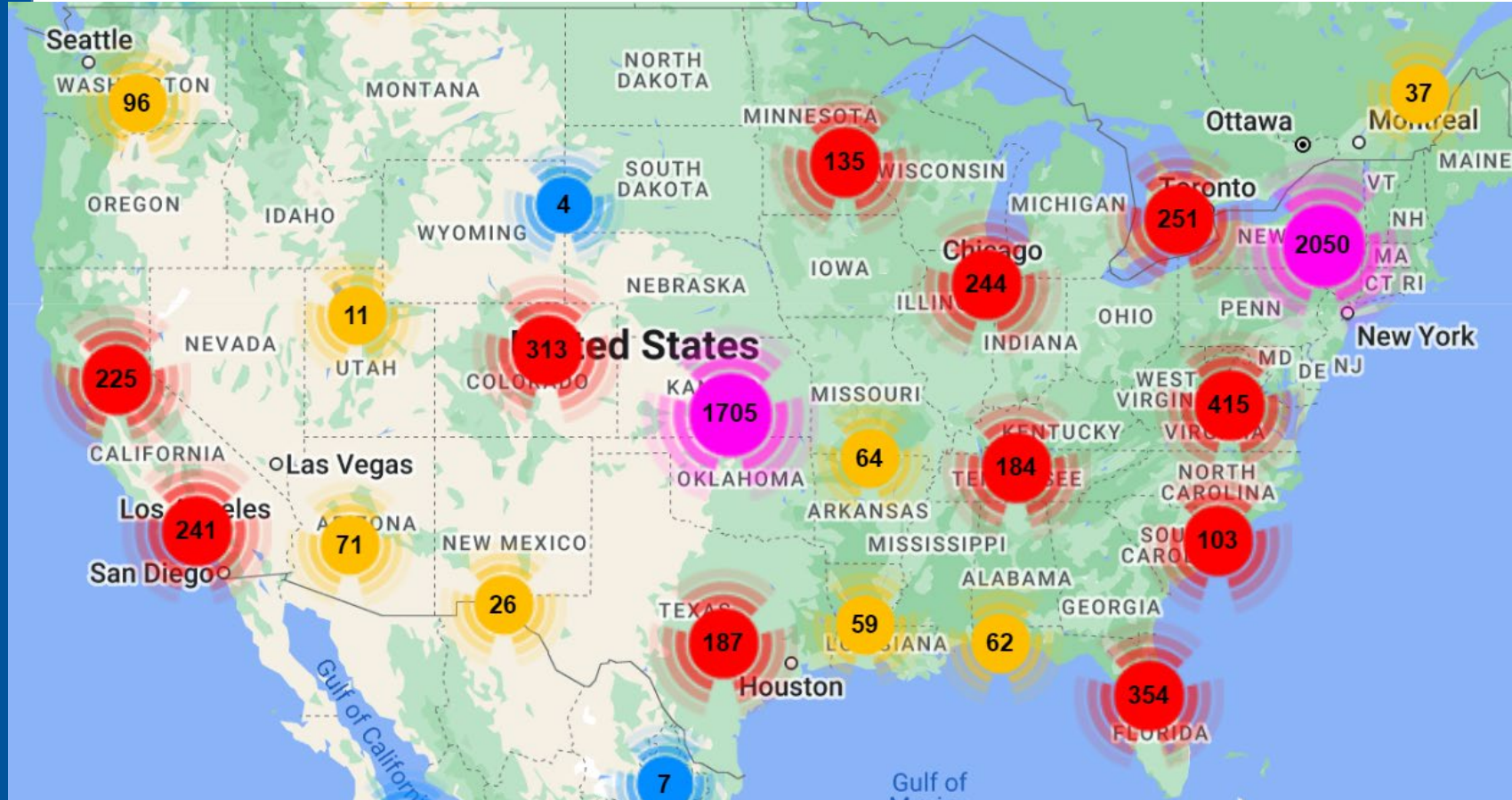
Data
from
8.21.21
to
9.12.22

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



The screenshot shows the Twitter profile page for National Jewish Health Medical Education. At the top, the header banner features the text "Medical Education for Health Care Providers" on the left and the National Jewish Health logo with the tagline "Breathing Science is Life." on the right. Below the banner is a circular profile picture containing the same logo. To the right of the profile picture is a button labeled "Edit profile". The profile name is "National Jewish Health Medical Education" with the handle "@NJHealthMedEd". The bio reads: "The leading respiratory hospital provides continuing medical education, research insights, and best practices for patient care. | For patients, follow @NJHealth". Below the bio, it shows the location "Denver, Colorado", the website "njhealth.org/CME", and the date "Joined June 2021". At the bottom, it displays "296 Following" and "461 Followers". A yellow arrow points to the "461 Followers" text.

**Twitter Handle:
@NJHealthMedEd**

**Hashtag:
#NTMTwitterJC**



Executive Summary – Twitter Chats

Final Report: August 2021 – August 2022



Twitter Date	Article Title	Faculty	Calendar Adds	Tweets	Retweets	Likes	Hashtag Usage	Impressions	Engagements
August 25, 2021	ALIS for Treatment-Refractory lung disease caused by MAC (CONVERT). A prospective, open-label, randomized study.	David Griffith, MD	45	33	1	25	33	3,302	81
September 29, 2021	Phase 2 Trial of the DPP-1 Inhibitor Brensocatib in Bronchiectasis.	Charles Daley, MD	24	40	6	38	40	1,846	57
October 27, 2021	ALIS for Refractory MAC Lung Disease: Sustainability and Durability of Culture Conversion and Safety of Long-term Exposure.	Shannon Kasperbauer, MD	56	36	1	0	36	1,430	33
November 30, 2021	Airway Clearance Techniques in Bronchiectasis: Analysis From the United States Bronchiectasis and Non-TB Mycobacteria Research Registry.	Steve Lommatzsch, MD	29	38	1	42	38	2,500	90
January 26, 2022	Preliminary, Real-world, Multicenter Experience With Omadacycline for Mycobacterium abscessus Infections.	Jared Eddy, MD	16	34	0	2	34	924	36



Executive Summary – Twitter Chats

Final Report: August 2021 – August 2022



Twitter Date	Article Title	Faculty	Calendar Adds	Tweets	Retweets	Likes	Hashtag Usage	Impressions	Engagements
February 23, 2022	Mycobacteriophage-antibiotic therapy promotes enhanced clearance of drug-resistant Mycobacterium abscessus.	Michael Strong, MD	14	52	5	6	52	979	24
March 30, 2022	Pilot study to test inhaled nitric oxide in cystic fibrosis patients with refractory Mycobacterium abscessus lung infection.	Jane E. Gross, MD, PhD	46	21	6	8	21	1,544	52
April 27, 2022	Mycobacterium abscessus biofilms have viscoelastic properties which may contribute to their recalcitrance in chronic pulmonary infections.	Jennifer R. Honda, PhD	13	29	4	3	29	1,298	35
May 25, 2022	Genomic Analysis of a Hospital-Associated Outbreak of Mycobacterium abscessus: Implications on Transmission.	Rebecca Davidson, PhD	114	30	4	26	30	2,680	67
June 29, 2022	Host and pathogen response to bacteriophage engineered against Mycobacterium abscessus lung infection.	Jerry Nick, MD	8	31	5	2	31	1293	38



Executive Summary – Twitter Chats

Final Report: August 2021 – August 2022



Twitter Date	Article Title	Faculty	Calendar Adds	Tweets	Retweets	Likes	Hashtag Usage	Impressions	Engagements
July 27, 2022	Consensus management recommendations for less common non-tuberculous mycobacterial pulmonary diseases.	Charles Daley, MD	20	29	2	33	29	1,489	67
August 24, 2022	Time to Positive Culture Detection Predicts Mycobacterium avium Pulmonary Disease Severity and Treatment Initiation.	Shannon Kasperbauer, MD	12	31	2	7	31	812	20
Total August 2021 – August 2022			397	404	37	192	404	20,097	600

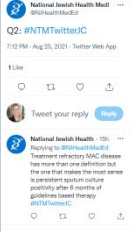


NTM Journal Club: August Twitter Highlights

Final Report: August 2021 – August 2022



Q2: How is “treatment-refractory MAC lung disease” defined and what is the rationale for that designation?



National Jewish Health Medical Education @NJHealthMed... · Aug 4 ...
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



shannon
@skasperbauermd

A1 amikacin and a macrolide. Important bc the other MICs don't matter! #NTMTwitterJC

7:13 PM · Aug 25, 2021 · Twitter for iPhone



Tweet your reply

Reply



National Jewish Health Medical Education @NJHealthMedEd · 16h ...
Replying to @skasperbauermd

A critical aspect of recognizing that macrolide and amikacin MICs matter is that they are vulnerable to acquired mutational resistance and must have adequate companion antibiotics #NTMTwitterJC



National Jewish Health Medical Education @NJHealthMedEd · 16h ...
Replying to @skasperbauermd

Thank you Shannon, succinct and to the point! #NTMTwitterJC



81 Engagements

3,302 Impressions



National Jewish Health Medical Education @NJHealthMedEd · 16h ...
Results: Treatment associated adverse events (TEAEs) 98.2% ALIS + GBT, 91.1% GBT alone. Most events respiratory (dysphonia 45.7%, cough 37.2%) and mild to moderate in severity. Underlying disease exacerbation and hospitalization more common in ALIS + GBT group #NTMTwitterJC



National Jewish Health Medical Education @NJHealthMedEd · 16h ...
Results: Sputum culture conversion (3 consecutive monthly negative sputum cultures by month 6) achieved by significantly more patients in the ALIS + GBT group (29%) than the GBT alone group (8.9%). #NTMTwitterJC



National Jewish Health Medical Education @NJHealthMedEd · 16h ...
Methods: Treatment refractory MAC lung disease patients randomized to ALIS plus guidelines-based background therapy (GBT) (#224) vs GBT alone (#112). Primary endpoint was the percent of patients with sputum culture conversion to negative by month 6. #NTMTwitterJC



National Jewish Health Medical Education @NJHealthMedEd · 16h ...
Background: No major change in MAC lung disease therapy since the early 1990's. Amikacin liposome inhalation suspension (ALIS) is the first major advance in MAC therapy since the macrolides based on promising Phase II study results. #NTMTwitterJC

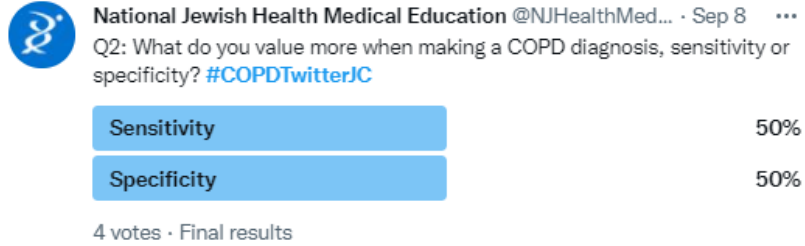
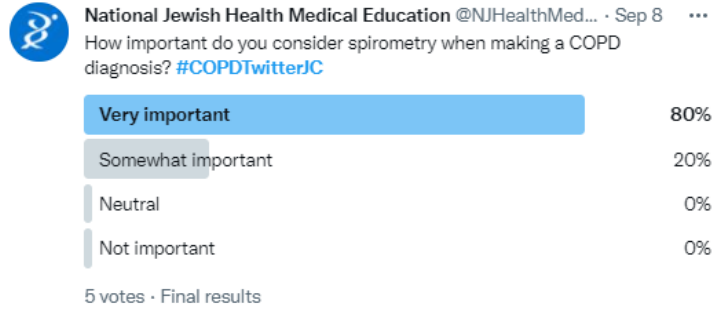




NTM Journal Club: September Twitter Highlights



Final Report: August 2021 – August 2022



National Jewish Health Medical Education @NJHealthMed... · Sep 8

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

Jake Woodrow @JakeWoodrow3 · 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

Patricia George, MD @PGeorgeMD · Sep 8

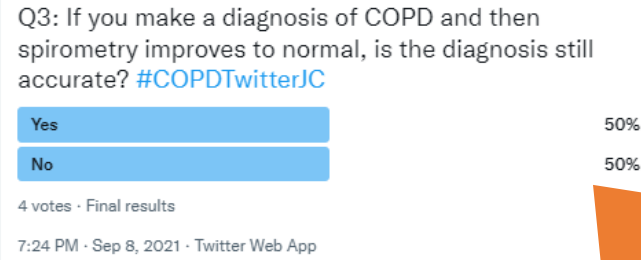
Replying to @JakeWoodrow3 and @NJHealthMedEd

Ah this makes sense. I appreciate your thoughts. #COPDTwitterJC

Patricia George, MD @PGeorgeMD · Sep 8

Replying to @NJHealthMedEd

Thank you for an informative #COPDTwitterJC, @JakeWoodrow3 and @NJHealthMedEd



View Tweet activity

National Jewish Health Medical Education @NJHealthMed... · Sep 8

Replying to @NJHealthMedEd

For those who answered, could participants share why or why not for the discussion? #COPDTwitterJC

Jake Woodrow @JakeWoodrow3 · Sep 8

Replying to @NJHealthMedEd

A3 This is a tough question but I think if spirometry becomes normal then airways 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 abnml, and they have emphysema on CT scan. Could you label them as COPD? Or emphysema with a reactive airways component? #COPDTwitterJC

Jake Woodrow @JakeWoodrow3 · Sep 8

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!

38
Likes on Tweets

57
Engagements

Charles Daley @CLDaleyMD

If the results are confirmed in the ongoing Phase 3 ASPEN study, we may have our first drug for treatment of bronchiectasis! #NTMTwitterJC

0:00 164 views MY HAPPY DANCE

7:21 PM · Sep 29, 2021 · Twitter Web App

4 Retweets 20 Likes

Patricia George, MD @PGeorgeMD · Sep 29

Replying to @CLDaleyMD

Exciting! Which dose did they choose to use in the current phase 3 study? #NTMTwitterJC

Charles Daley @CLDaleyMD · Sep 29

A1 - Good question! The two doses were so similar they are using both again.

Debidoo @Debb63 · Oct 2

Replying to @CLDaleyMD

So exciting! This is a common disease and I'm sure will be more so in the future #longcovid

BE Clear with bronchiectasis @beclaratoday · Oct 2

Replying to @CLDaleyMD

Fingers crossed Dr. Daley! I didn't qualify for the study, but I am hopeful for the future.



NTM Journal Club: October Twitter Highlights

Final Report: August 2021 – August 2022

National Jewish Health Medical Education @NJHealthMe... · Oct 27 ...
Q1: Treatment refractory disease is defined as persistently positive cultures after:
[#NTMTwitterJC](#)



3 votes · Final results



1,430 Impressions

National Jewish Health Medical Education @NJHealthMe... · Oct 27 ...
Q4: What do you think of the efficacy results in this trial? Type your response starting with A4 and use [#NTMTwitterJC](#)



National Jewish Health Medical Education @NJHealthMe... · Oct 27 ...
Q3: Will this study change your practice? [#NTMTwitterJC](#)

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



1 vote · Final results

33 Engagements

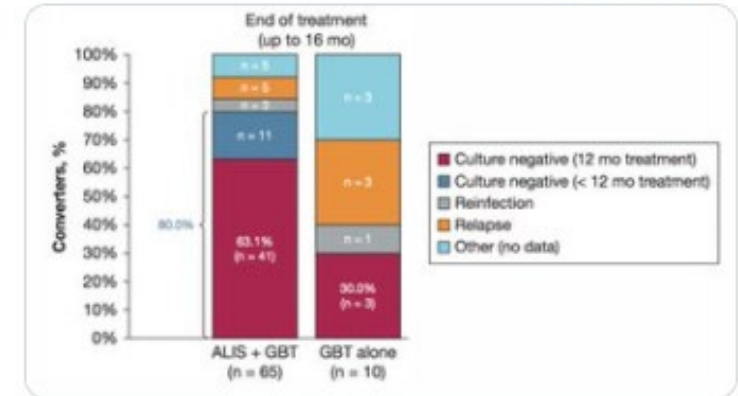
National Jewish Health Medical Education @NJHealthMe... · Oct 27 ...
Q2: The most common adverse events related to ALIS in the CONVERT study were:
[#NTMTwitterJC](#)



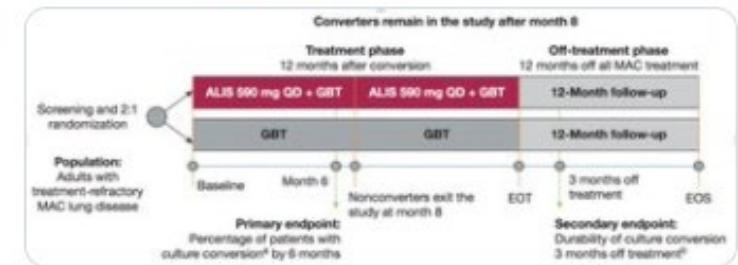
2 votes · Final results



shannon @skasperbauermd · 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 @skasperbauermd · Oct 27 ...
Here is the study design. Reminder this is an exploratory analysis of the outcomes in "converters". All patients who remained culture positive exited the study at month 8. [#NTMTwitterJC](#)





NTM Journal Club: November Twitter Highlights

Final Report: August 2021 – August 2022



National Jewish Health Medical Education @NJHealthMedEd · 14h ...

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

1 Like

2,500
Impressions

National Jewish Health Medical Education @NJHealthMedEd · 14h ...

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

1 Like

42
Likes on
Tweets

National Jewish Health Medical Education @NJHealthMedEd · 14h ...

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

1 Like

National Jewish Health Medical Education @NJHealthMedEd · 14h ...

Q3: Will this study change your practice? Yes/No [#NTMTwitterJC](#)

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

1 Like

National Jewish Health Medical Education @NJHealthMedEd · 14h ...

This demonstrates the significant treatment fatigue with ACTs & the need for providers to continue to educate/encourage patients on the importance of adherence if benefits are going to be observed. [#NTMTwitterJC](#)

1 Like

[Show this thread](#)

National Jewish Health Medical Education @NJHealthMedEd · 14h ...

The most significant finding of the study was that 58% of patients who were enrolled as using ACT at baseline were not using any method at the 1-year assessment. [#NTMTwitterJC](#)

1 Like

[Show this thread](#)



NTM Journal Club: January Twitter Highlights

Final Report: August 2021 – August 2022



924 Impressions

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 N infections. #NTMTwitterJC

Show this thread

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

Show this thread

34 Hashtag Usage

Thread

Jared James Eddy @JaredJamesEddy1

#NTMTwitterJC

Table 1. Clinical Characteristics of Patients Treated With Descriptive for Human *Mycobacterium abscessus* Infections

Age Group	Sex	Median Age (range)	Median Duration of Illness (range)	Median Time to Diagnosis (range)	Median Time to Treatment (range)	Median Time to Resolution (range)	Median Time to Death (range)	Median Time to Relapse (range)	Median Time to Recurrence (range)	Median Time to Hospitalization (range)	Median Time to Intubation (range)	Median Time to Mechanical Ventilation (range)	Median Time to ICU Admission (range)	Median Time to Death (range)	Median Time to Relapse (range)	Median Time to Recurrence (range)
18-64	Male	55 (35-75)	12 (6-24)	18 (12-24)	24 (12-36)	36 (24-48)	48 (36-60)	60 (48-72)	72 (60-84)	84 (72-96)	96 (84-108)	108 (96-120)	120 (108-132)	132 (120-144)	144 (132-156)	156 (144-168)
65-84	Female	72 (65-84)	18 (12-24)	24 (18-30)	30 (24-36)	36 (30-42)	42 (36-48)	48 (42-54)	54 (48-60)	60 (54-66)	66 (60-72)	72 (66-78)	78 (72-84)	84 (78-90)	90 (84-96)	96 (90-102)

7:23 PM · Jan 26, 2022 · Twitter Web App

Tweet your reply

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

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

:18 PM · Jan 26, 2022 · Twitter Web App

Tweet your reply

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 @StrongLabNJH · Jan 26
Replying to @JaredJamesEddy1
Co-infection? Length of infection?

Jared James Eddy @JaredJamesEddy1 · Jan 26
Good points that could have an impact on effectiveness; I also saw that while 5/12 patients had a surgical intervention, it was unclear when that was in relation to omadacycline

Jared James Eddy @JaredJamesEddy1 · Jan 26
Source control is key for these infections, especially when extrapulmonary; effectiveness will be limited without source control no matter the regimen #NTMTwitterJC



NTM Journal Club: February Twitter Highlights

Final Report: August 2021 – August 2022



Michael Strong @StrongLabNJH · Feb 23

Question for the audience: Did you know prior to the journal club yesterday, that zebrafish could be used a model system to study bacterial host-pathogen interactions? #NTMTwitterJC

Yes 0%

No (✓) 100%

3 votes · 1 day left

Michael Strong @StrongLabNJH · Feb 23

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

Michael Strong @StrongLabNJH · Feb 23

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

Michael Strong @StrongLabNJH · Feb 23

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

Michael Strong @StrongLabNJH · Feb 23

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

Michael Strong @StrongLabNJH · Feb 23

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

979 Impressions

National Jewish Health Medical Education @NJHealthMe... · Feb 23

Q2: What do you think of the results of this study? Type your response starting with A2 and use #NTMTwitterJC

National Jewish Health Medical Education @NJHealthMe... · Feb 23

Q1: Will this study change your practice? #NTMTwitterJC

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

Yes 0%

No 0%

0 votes · 1 day left

52 Hashtag Usage



NTM Journal Club: March Twitter Highlights

Final Report: August 2021 – August 2022



52 Engagements

National Jewish Health Medical Education @NJHealthMedEd

Do you have any safety concerns regarding iNO? #NTMTwitterJC



1 vote · 2 days left

7:18 PM · Mar 30, 2022 · Twitter Web App

View Tweet activity

Tweet your reply

Reply

Jane Gross MD @JaneGrossMD · Mar 30
Replying to @NJHealthMedEd

A2 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 dizziness, dry mouth, hemoptysis, and MetHb elevation. #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 adjuvant treatment of refractory M. abscessus lung infection in people with cystic fibrosis. Primary outcome was safety and tolerability. #NTMTwitterJC

Jane Gross MD @JaneGrossMD · Mar 30
An intermittent iNO delivery protocol (30 min of 160 ppm iNO q4 hours) was developed to reduce 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 airway 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 @NJHealthMedEd

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



1 vote · 2 days left

7:22 PM · Mar 30, 2022 · Twitter Web App

View Tweet activity

Tweet your reply

Reply

Jane Gross MD @JaneGrossMD · Mar 30
Replying to @NJHealthMedEd

A4 I think many of my patients with refractory M. abscessus would welcome a novel, safe, well tolerated alternative to current NTM therapies #ntmtwitterJC

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 resists 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/33658597/ #NTMTwitterJC



pubmed.ncbi.nlm.nih.gov
 Mycobacterium abscessus biofilms have viscoelas...
 Mycobacterium abscessus is emerging as a cause of recalcitrant chronic pulmonary infections, ...
- 
Michael Strong @StrongLabNJH · 19h ...
 Replying to @NJHealthMedEd
 Innovative #NTMTwitterJC

1,298 Impressions



NTM Journal Club: May Twitter Highlights

Final Report: August 2021 – August 2022



67 Engagements

National Jewish Health Medical Educa... @NJHealthMed... · May 25 ...
Q6: Does this journal club article improve your understanding of genomic comparisons of M. abscessus isolates to infer transmission?
[#NTMTwitterJC](#)



3 votes · Final results



Rebecca Davidson, PhD @RMD_PhD · May 25 ...
Replying to @NJHealthMedEd
I'm curious how many of you have used WGS to compare NTM strains.
[#NTMTwitterJC](#)



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](#)



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](#)



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](#)



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](#)



National Jewish Health Medical Educa... @NJHealthMed... · May 25 ...
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](#)



2,680 Impressions



NTM Journal Club: June Twitter Highlights

Final Report: August 2021 – August 2022




38 Engagements






 **National Jewish Health Medical Educat...** @NJHealthMed... · Jun 29 ...


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






 **National Jewish Health Medical Educat...** @NJHealthMed... · Jun 29 ...


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](#)






 **National Jewish Health Medical Educat...** @NJHealthMed... · Jun 29 ...


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






 **National Jewish Health Medical Educat...** @NJHealthMed... · Jun 29 ...


Control of M. abscessus allowed for a successful lung transplant after a year of treatment. The explanted lungs did not culture M. abscessus and there was no evidence of post-transplant infection. Phage and antibiotic were continued through day 500 of treatment. [#NTMTwitterJC](#)






 **National Jewish Health Medical Educat...** @NJHealthMed... · Jun 29 ...

Anti-phage neutralizing antibodies are a potential cause of phage therapy failure. In this subject, antiphage-neutralizing antibodies titers developed gradually against only one phage, indicating different within-subject immune response to specific phages. [#NTMTwitterJC](#)

  1   

 **National Jewish Health Medical Educat...** @NJHealthMed... · Jun 29 ...

Culture-independent markers were used to track the infection combined with standard airway cultures. These markers strongly supported the conclusion of significant decrease in M. abscessus burden with [#phage](#) treatment. [#NTMTwitterJC](#)

   1  

1,293 Impressions




NTM Journal Club: July Twitter Highlights

Final Report: August 2021 – August 2022




67 Engagements

 **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 ↗ ||

 **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 ...


For *M. chelonae*, suggest $\geq 2-3$ drugs with imipenem, tobramycin plus azithromycin, clofazimine, moxifloxacin, or linezolid. Same for *M. fortuitum* except amikacin instead of tobramycin, no azithromycin and additional drugs include cefoxitin, trim/sulfa and doxycycline [#NTMTwitterJC](#)

 ↻ ❤️ 1 ↗ ||

 **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 ↗ ||

1,489 Impressions




NTM Journal Club: August Twitter Highlights

Final Report: August 2021 – August 2022




31
Tweets

 **National Jewish Health Medical Educat...** @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](#)

1 ↻ 1 ↗ ||

 **National Jewish Health Medical Educat...** @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](#)

↻ 1 ↗ ||

 **National Jewish Health Medical Educat...** @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](#)

↻ 1 ↗ ||

 **National Jewish Health Medical Educat...** @NJHealthMed... · Aug 24 ...

A threshold of 10 days or less was associated with disease, smear status and treatment by 3 and 6 months. After 3 and 6 months of treatment the median change in TTP was 8 ($P < 0.001$) and 7 ($P = 0.00$) days respectively. [#NTMTwitterJC](#)

Table 4. Threshold of time to positivity as a marker of disease severity

	<10 Days (n = 36)	>10 Days (n = 89)	P Value*
Disease presence	29 (80.6)	52 (58.4)	0.02
Smear positive	30 (83)	18 (20)	<0.001
Treatment initiation at 3 mo	14 (38.9)	12 (13.5)	0.003
Treatment initiation at 6 mo	17 (47.2)	17 (19.1)	0.003

*Definition of abbreviation: AFB = acid fast bacilli.

Values indicate n (%).

*Fisher's exact test (two-sided).

↻ 1 ↗ ||

812
Impressions

Accreditation

Final Report: August 2021 – August 2022

National Jewish Health is accredited with Commendation by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians. The NJH Office of Professional Education produced and accredited this program and adhered to the updated ACCME guidelines.

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National Jewish Health designates each live activity 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.

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.

