PERSONALIZED MEDICINE IN SEVERE ASTHMA

Applying Emerging Data and Treatments to Everyday Clinical Practice
### Educational Objectives
1. Describe key concepts in the pathophysiology of severe asthma.
2. Analyze recent clinical data of current and emerging targeted therapies and potential biomarkers for severe asthma.
3. Select personalized treatment approaches for severe asthma best suited to various phenotypes and endotypes.

### Intended Audience
- Pulmonologists, allergists, and primary care physicians, as well as physician assistants and nurse practitioners

### Anticipated Reach: 270-360
- Actual Reach: 323

### Program Locations:
- Dallas, TX; Cleveland, OH; Chicago, IL; Dearborn, MI; Seattle, WA; San Jose, CA; Miami, FL; Tampa, FL; Raleigh, NC; Portland, OR

### Dates (Live Activity):
- 6/20/2017 – 11/14/2017

### Modality/# Activities:
- Live evening symposia consisting of interactive, case-based presentations

### Relevant Links:
- [https://www.nationaljewish.org/education-training/pro-ed/live-events/severeasthmapm](https://www.nationaljewish.org/education-training/pro-ed/live-events/severeasthmapm)

### Outcomes Levels:
- Level 1, Level 2, Level 3, Level 4, Level 5

### Outcomes Planning:
- Pre-test and post-test; program evaluation; 45-day follow up survey

### Summary:
The live portion of this educational initiative encompasses 10 meetings across the country featuring expert speakers, video patient cases, ARS polling and resources to help improve the knowledge and competence of pulmonologists, allergists and primary care physicians in the diagnosis, management, and treatment of severe asthma.
Personalized Medicine in Severe Asthma
Final Report - Dashboard
Program Impact: Live and Online Activity Aggregate Outcomes

3,951 Total Learners
70% Prescribers
- 48% MD/DO
- 22% NP/PA

Overall relative knowledge gain from pre- to post-test for all activities 50%

Estimated # of total patients impacted per month 75,542

89% Participants reporting they were somewhat – extremely likely to make changes to their practice.

93% Participants reporting they gained skills to overcome barriers to patient care

As a result of what they learned, Learners intend to make the following changes in their practice:

- 32% Change my screening/prevention practice
- 39% Incorporate different diagnostic strategies into patient evaluation
- 25% Use alternative communication methodologies with patients and families
- 40% Modify treatment plans

Participation: Top Specialties
- Primary Care 33%
- Pulmonology 11%
- Allergy 6%
Participants who reported that one or more of their patients benefitted from the information learned in the activity in a 45 day follow up.

Participants who reported that the activity addresses strategies for overcoming barriers to optimal patient care: 90%

Participants who intend to make changes in practice as a result of the activity: 91%

Participants who report that one or more of their patients benefitted from the information learned in the activity: 80%

Overall relative knowledge gain from pre- to post-activities: 36%

Learners (Live): 323
- Prescribers: 81%
  - 59% MD/DO
  - 22% NP/PA

Estimated # of patients impacted per month: 5,884
Overall relative knowledge gain from pre- to post activities 63%

86% of Learners reported that they intend to make changes in practice as a result of the activity
Live Activity
Final Outcomes Report
Background:
The live portion of this educational initiative encompasses 10 meetings across the country featuring expert speakers, video patient cases, ARS polling and resources to help attendees convert information into practice. The goal of this program is to improve the knowledge and competence of pulmonologists, allergists and primary care physicians, as well as physician assistants and nurse practitioners in the diagnosis, management, and treatment of severe asthma.

Learning Objectives:
1. Describe key concepts in the pathophysiology of severe asthma.
2. Analyze recent clinical data of current and emerging targeted therapies and potential biomarkers for severe asthma.
3. Select personalized treatment approaches for severe asthma best suited to various phenotypes and endotypes.
Accreditation Details: In support of improving patient care, NJH is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians. NJH is also accredited by the Accreditation Council for Pharmacy Education (ACPE) and the California Board of Registered Nursing (CBRN) to provide continuing education for the healthcare team. **NJH has designated the live evening symposia for a maximum of 2.0 AMA PRA Category 1 Credits™.**

Target Audience: Primary Care Physicians, Community Pulmonologists and Allergists are the primary target audience. Allied health professionals involved in the management of severe asthma are the secondary target audience. Anticipated reach includes approximately 270-360 attendees for the live series.

Educational Outcomes Strategy: Outcomes will be measured via participation totals, specialty, designation, pre-test, post-test, interactive polling questions, evaluations and 45-day follow-up surveys. The metrics will demonstrate participation, satisfaction, learning, engagement and change in knowledge, competency, and self-reported performance to achieve Moore’s Level 4 outcomes.
Personalized Medicine in Severe Asthma
Final Report (10) Live Symposia
Faculty

Michael E. Wechsler, MD, MMSc
Co-Director, The Cohen Family Asthma Institute at National Jewish Health
Professor, Department of Medicine, Division of Pulmonary, Critical Care and Sleep Medicine
National Jewish Health, Denver, CO

Anthony Gerber, MD, PhD
Associate Professor, Department of Medicine, Division of Pulmonary, Critical Care and Sleep Medicine
Department of Biomedical Research
National Jewish Health, Denver, CO

Flavia Hoyte, MD
Associate Professor, Department of Medicine, Division of Allergy and Immunology
Director, National Jewish Health/University of Colorado Adult Allergy and Immunology Fellowship Training Program
National Jewish Health, Denver, CO
<table>
<thead>
<tr>
<th>City</th>
<th>Date</th>
<th>Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dallas, TX</td>
<td>6/20/2017</td>
<td>57</td>
</tr>
<tr>
<td>Cleveland, OH</td>
<td>7/27/2017</td>
<td>33</td>
</tr>
<tr>
<td>Chicago, IL</td>
<td>8/23/2017</td>
<td>38</td>
</tr>
<tr>
<td>Dearborn, MI</td>
<td>8/24/2017</td>
<td>29</td>
</tr>
<tr>
<td>Seattle, WA</td>
<td>9/27/2017</td>
<td>27</td>
</tr>
<tr>
<td>San Jose, CA</td>
<td>9/28/2017</td>
<td>27</td>
</tr>
<tr>
<td>Miami, FL</td>
<td>10/23/2017</td>
<td>32</td>
</tr>
<tr>
<td>Tampa, FL</td>
<td>10/24/2017</td>
<td>41</td>
</tr>
<tr>
<td>Durham, NC</td>
<td>11/7/2017</td>
<td>20</td>
</tr>
<tr>
<td>Portland, OR</td>
<td>11/14/2017</td>
<td>19</td>
</tr>
<tr>
<td><strong>Total Live Participation</strong></td>
<td></td>
<td><strong>323</strong></td>
</tr>
</tbody>
</table>
Level 1 Outcomes: Participation (10) Live Symposia

81% of all participants in the live activities are prescribers

N=323
Participants reported that the activity was “Good” to “Excellent” at:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improving your ability to treat or manage your patients</td>
<td>91.3%</td>
</tr>
<tr>
<td>Enhancing your ability to apply the learning objectives to practice</td>
<td>89.6%</td>
</tr>
<tr>
<td>Reinforcing and/or improving your current skills</td>
<td>93.5%</td>
</tr>
<tr>
<td>Meeting their educational needs</td>
<td>92.7%</td>
</tr>
</tbody>
</table>
**Question 1**
Which of the following clinical criteria factor into the “risk” aspect of classifying asthma control?
A.) Asthma Control Test (ACT) score  
B.) Number of prednisone bursts in the past year, frequency of nighttime awakenings  
C.) Frequency of albuterol use  
D.) Assessment of lung function (%predicted FEV1 or %personal best peak flow)

**Question 2**
Which of the following blood tests is a commercially available biomarker that is helpful in determining asthma phenotype/endotype?
A.) Absolute lymphocyte count  
B.) Periostin level  
C.) Total IgE level  
D.) DPP4 (dipeptidyl peptidase 4)  
E.) Exhaled nitric oxide

**Question 3**
Which of the following biologic agents are approved for the treatment of severe persistent asthma characterized as Th2 high?
A.) Mepolizumab  
B.) Lebrikizumab  
C.) Dupilumab  
D.) Benralizumab  
E.) Tralokinumab
<table>
<thead>
<tr>
<th>Question 4</th>
<th>Question 5</th>
<th>Question 6</th>
<th>Question 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Which of the following is NOT a criterion for the diagnosis of asthma?</td>
<td>Which of the following does NOT represent an airway abnormality in asthma?</td>
<td>Which of the following describes an asthma endotype?</td>
<td>Which of the following is NOT a FDA approved biologic agent</td>
</tr>
<tr>
<td>A.) History of symptoms consistent with intermittent airway obstruction</td>
<td>A.) Increased mucus secretion</td>
<td>A.) Asthma in the elderly</td>
<td>A.) Omalizumab</td>
</tr>
<tr>
<td>B.) Physiologic testing confirming airway</td>
<td>B.) Thickening of the basement membrane in airways</td>
<td>B.) Obese asthma</td>
<td>B.) Mepolizumab</td>
</tr>
<tr>
<td>C.) Peripheral eosinophilia</td>
<td>C.) Reduced number and size of airway smooth muscle cells causing “floppy airways”</td>
<td>C.) IL_5 mediated asthma</td>
<td>C.) Dupilumab</td>
</tr>
<tr>
<td>D.) Hypertrophy and hyperplasia of the smooth muscle cells</td>
<td>D.) Hypertrophy and hyperplasia of the smooth muscle cells</td>
<td>D.) Nocturnal asthma</td>
<td>D.) Reslizumab</td>
</tr>
<tr>
<td></td>
<td></td>
<td>E.) Occupational asthma</td>
<td>E.) Tralokinumab</td>
</tr>
</tbody>
</table>
Level 3 and 4 outcomes were measured by comparing participants’ pre- and post-test answers. Attendees’ responses to these questions demonstrated that participants gained knowledge as a result of the activity.

Overall relative increase from pre- to post-activity: 36%
Average relative change in knowledge and competence: 37% increase from baseline to post-test. Since Question 4 saw a decrease from pre to post-test, the faculty have modified the question to make it more clear.
Average relative change in knowledge and competence: 36% increase from baseline to post-test. Since Question 1 saw a decrease from pre to post-test, faculty worked to address the content more clearly during their presentation.
### Personalized Medicine in Severe Asthma

**Final Report**

#### Pre- to Post-Test Analysis: Chicago (10) Live Symposia

**Average relative change in knowledge and competence:** 30% increase from baseline to post-test.

<table>
<thead>
<tr>
<th>Question</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 1</td>
<td>39%</td>
<td>40%</td>
</tr>
<tr>
<td>Question 2</td>
<td>48%</td>
<td>73%</td>
</tr>
<tr>
<td>Question 3</td>
<td>30%</td>
<td>73%</td>
</tr>
<tr>
<td>Question 4</td>
<td>30%</td>
<td>40%</td>
</tr>
<tr>
<td>Question 5</td>
<td>70%</td>
<td>79%</td>
</tr>
<tr>
<td>Question 6</td>
<td>78%</td>
<td>82%</td>
</tr>
<tr>
<td>Question 7</td>
<td>52%</td>
<td>68%</td>
</tr>
</tbody>
</table>

**Pre-test (n=23)**

- Question 1: 39%
- Question 2: 48%
- Question 3: 30%
- Question 4: 30%
- Question 5: 70%
- Question 6: 78%
- Question 7: 52%

**Post-test (n=28)**

- Question 1: 40%
- Question 2: 73%
- Question 3: 73%
- Question 4: 40%
- Question 5: 79%
- Question 6: 82%
- Question 7: 68%
Average relative change in knowledge and competence: 57% increase from baseline to post-test.
**Personalized Medicine in Severe Asthma**

**Final Report**

**Pre- to Post-Test Analysis: Seattle (10) Live Symposia**

<table>
<thead>
<tr>
<th>Question</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 1</td>
<td>24%</td>
<td>36%</td>
</tr>
<tr>
<td>Question 2</td>
<td>48%</td>
<td>71%</td>
</tr>
<tr>
<td>Question 3</td>
<td>57%</td>
<td>80%</td>
</tr>
<tr>
<td>Question 4</td>
<td>57%</td>
<td>100%</td>
</tr>
<tr>
<td>Question 5</td>
<td>50%</td>
<td>93%</td>
</tr>
<tr>
<td>Question 6</td>
<td>50%</td>
<td>86%</td>
</tr>
</tbody>
</table>

Average relative change in knowledge and competence: 29% increase from baseline to post-test.
Average relative change in knowledge and competence: 22% increase from baseline to post-test.
Average relative change in knowledge and competence: 19% increase from baseline to post-test.
Pre- to Post-Test Analysis: Miami, FL (10) Live Symposia

Average relative change in knowledge and competence: 34% increase from baseline to post-test.
### Pre- to Post-Test Analysis: Raleigh, NC (10) Live Symposia

**Average relative change in knowledge and competence:** 62% increase from baseline to post-test.

<table>
<thead>
<tr>
<th>Question 1</th>
<th>Pre-test (n=15)</th>
<th>Post-test (n=10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 2</td>
<td>38%</td>
<td>80%</td>
</tr>
<tr>
<td>Question 3</td>
<td>50%</td>
<td>90%</td>
</tr>
<tr>
<td>Question 4</td>
<td>50%</td>
<td>100%</td>
</tr>
<tr>
<td>Question 5</td>
<td>63%</td>
<td>70%</td>
</tr>
<tr>
<td>Question 6</td>
<td>67%</td>
<td>80%</td>
</tr>
<tr>
<td>Question 7</td>
<td>40%</td>
<td>90%</td>
</tr>
<tr>
<td>Question 8</td>
<td>67%</td>
<td>90%</td>
</tr>
</tbody>
</table>

**Bar Chart**

- **Pre-test (n=15)**: 53%
- **Post-test (n=10)**: 86%
Average relative change in knowledge and competence: 37% increase from baseline to post-test.
91% of participants report that they intend to make changes as a result of this activity. Those changes include:

<table>
<thead>
<tr>
<th>Change in Practice</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modify treatment plans</td>
<td>51.6%</td>
</tr>
<tr>
<td>Use alternative communication methodologies with patients and families</td>
<td>25.4%</td>
</tr>
<tr>
<td>Incorporate different diagnostic strategies into patient evaluation</td>
<td>52.8%</td>
</tr>
<tr>
<td>Change my screening/prevention practice</td>
<td>32.8%</td>
</tr>
</tbody>
</table>
91% of participants reported that they intend to make changes in practice as a result of this activity.

99% of participants reported that the content presented was evidence-based and clinically relevant.

90% of participants reported that the activity addresses strategies for overcoming barriers to optimal patient care.
Personalized Medicine in Severe Asthma
Final Report
Feedback (10) Live Symposia

Key Lessons Learned

- Targets for different biologics
- Workup of refractory asthma
- Biologic medication management
- Importance of biomarkers in asthma diagnosis/management
- Treatment of refractory asthma
- New IL5 agents
- The changing paradigm for classifying asthma
- Looking at phenotypes and endotypes of asthma

Needs for Additional Education

- GERD
- Spirometry technique
- TB and other lung infections
- COPD

- Use of biological agents in children
- Asthma phenotypes
- Pediatric asthma
- The biological marker

What Attendees are Saying

“I enjoyed the conference very much, the staff was friendly and efficient with registration, the venue was great and the speaker was knowledgeable.”

“It was a well balanced and informative presentation.”

“Best presentation I have attended this year.”
80% report that one or more of their patients have already benefited from the information learned in the educational activity.

The top two changes respondents have made or intend to make (for those that had not seen any patients in that target therapeutic area within the 45-day time period) are:

- Change my screening/prevention practice (42%)
- Modify treatment plans (54%)
Based on this clip, how would you classify the patient’s asthma using ERP-3 criteria from the most recent NHLBI guidelines published in 2007?

<table>
<thead>
<tr>
<th></th>
<th>A. Mild intermittent</th>
<th>B. Mild persistent</th>
<th>C. Moderate persistent</th>
<th>D. Severe persistent</th>
</tr>
</thead>
</table>

Based on what you know of our patient, which endotype or phenotype would best characterize our patient?

<table>
<thead>
<tr>
<th></th>
<th>A. Late-onset asthma</th>
<th>B. Th2 high</th>
<th>C. Th2 low</th>
<th>D. Neutrophilic asthma</th>
</tr>
</thead>
</table>

What is the next best step for the patient in our video?

<table>
<thead>
<tr>
<th></th>
<th>A. Omalizumab</th>
<th>B. Mepolizumab</th>
<th>C. Bronchial thermoplasty</th>
<th>D. Reslizumab</th>
<th>E. Continue current therapy and reassess in 8 weeks</th>
</tr>
</thead>
</table>

*This question does not have just one answer and was used as a pool question to promote discussion amongst the audience.*
Based on this clip, how would you classify the patient’s asthma using ERP-3 criteria from the most recent NHLBI guidelines published in 2007?

A. Mild intermittent
B. Mild persistent
C. Moderate persistent
D. Severe persistent

*Due to the low correct response rate, the presenters have made sure to cover this question thoroughly immediately following the responses to address the demonstrated gap. At the direction of the faculty, we added a slide after each of the ARS questions that helps facilitate the table discussion further before they select their answer as a group.
Based on what you know of our patient, which endotype or phenotype would best characterize our patient?

A. Late-onset asthma
B. Th2 high
C. Th2 low
D. Neutrophilic asthma

*The majority of attendees answered this question correctly (B); therefore, the presenters were able to go more in depth on the topic as the baseline knowledge was higher. At the direction of the faculty, we added a slide after each of the ARS questions that helps facilitate the table discussion further before they select their answer as a group.
ARS Question 3

What is the next best step for the patient in our video?
A. Omalizumab
B. Mepolizumab
C. Bronchial thermoplasty
D. Reslizumab
E. Continue current therapy and reassess in 8 weeks

<table>
<thead>
<tr>
<th>Option</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>19.6%</td>
</tr>
<tr>
<td>B</td>
<td>50.0%</td>
</tr>
<tr>
<td>C</td>
<td>2.2%</td>
</tr>
<tr>
<td>D</td>
<td>19.6%</td>
</tr>
<tr>
<td>E</td>
<td>10.3%</td>
</tr>
</tbody>
</table>

*This question does not have a “right” answer. It was used to spark discussion amongst the audience. At the direction of the faculty, we added a slide after each of the ARS questions that helps facilitate the table discussion further before they select their answer as a group.
Online Activity
Final Outcomes Report
Launched June 2, 2017
### Educational Objectives
1. Describe key concepts in the pathophysiology of severe asthma.
2. Analyze recent clinical data of current and emerging targeted therapies and potential biomarkers for severe asthma.
3. Select personalized treatment approaches for severe asthma best suited to various phenotypes and endotypes.

### Intended Audience:
Pulmonologists, Allergists, Primary Care Physicians and other health care professionals who treat patients with severe asthma.

### Anticipated Reach:
1,100 completers and 4,800 learners

### Program Locations:
N/A

### Dates (Enduring Activity):
June 2, 2017 – June 2, 2018

### Relevant Links:
https://severeasthmapm.njhealtheducation.org/

### Outcomes Levels:
Level 1, Level 2, Level 3, Level 4

### Outcomes Planning:
Pre-test and post-test; program evaluation

### Summary:
The online portion of this educational initiative encompasses three modules featuring expert speakers and interactive polling and feedback, as well as a clinical reference aid and downloadable resources to help improve the knowledge and competence of pulmonologists, allergists and primary care physicians in the diagnosis, management, and treatment of severe asthma.
Background:
The online portion of this educational initiative encompasses three interactive modules featuring expert speakers in severe asthma. The goal of this program is to improve the knowledge and competence of pulmonologists, allergists and primary care physicians, as well as physician assistants and nurse practitioners in the diagnosis, management, and treatment of severe asthma.

Learning Objectives:
1. Describe key concepts in the pathophysiology of severe asthma.
2. Analyze recent clinical data of current and emerging targeted therapies and potential biomarkers for severe asthma.
3. Select personalized treatment approaches for severe asthma best suited to various phenotypes and endotypes.
Accreditation Details: In support of improving patient care, NJH is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians. NJH is also accredited by the Accreditation Council for Pharmacy Education (ACPE) and the California Board of Registered Nursing (CBRN) to provide continuing education for the healthcare team. **NJH has designated the online program for a maximum of 1.75 AMA PRA Category 1 Credits™.**

Target Audience: Primary Care Physicians, Community Pulmonologists and Allergists are the primary target audience. Allied health professionals involved in the management of severe asthma are the secondary target audience.

Educational Outcomes Strategy: Outcomes will be measured via participation totals, specialty, designation, pre-test, post-test, interactive polling questions, and evaluations. The metrics will demonstrate participation, satisfaction, learning, engagement and change in knowledge, and competency to achieve Moore’s Level 4 outcomes.
Online Metrics
Completers: 2,441
- 37% MD/DO
- 22% NP/PA

Total Learners: 3,628
Total Participants: 7,287
Total Certificates: 2,374
Asthma: Symptoms to Pathophysiology (Module 1):

- Completers: 1,195
- Total Learners: 1,929
- Total Certificates: 1,162
- Completion Rate: 62%

Module 1: Pathophysiology
CME Credit: .50

Learn about the key concepts in the pathophysiology of severe asthma.

*Data as of 6/28/18*
Current and Emerging Asthma Therapies (Module 2):

- Completers: 799
- Total Learners: 1,077
- Total Certificates: 780
- Completion Rate: 74%

Module 2: Current and Emerging Asthma Therapies

CME Credit: .50

Learn about recent clinical data of current and emerging therapies and potential biomarkers for severe asthma.

*Data as of 6/28/18*
Module 3: Roundtable Discussion on Personalized Treatment Approaches

CME Credit: .75

We pull together information from the first two modules using a multidisciplinary roundtable discussion with key opinion leaders.

*Data as of 6/28/18*
Total Participants | Total Learners | Completers | Certificates
--- | --- | --- | ---
4,017 | 1,195 | 1,162 | 447
1,929 | 1,077 | 799 | 432
2,010 | 780 | |
Participants demonstrated a 63% relative gain in knowledge and competence as a result of this activity.
Personalized Medicine in Severe Asthma
Final Report - Online Enduring Program – (3) Modules
Asthma: Symptoms to Pathophysiology (Module 1): Learners

Module 1 Metrics:
✓ Completed: 1,195
Total Learners: 1,929

- MD/DO: 36.5%
- PA: 16.5%
- NP: 5.7%
- RT: 4.2%
- PharmD: 1.3%
- Nurse: 13.0%
- Other: 22.2%

Other: Researcher, Social Worker/Case Manager, MedTech, Student, Resident, Discharge Planner

N=1,929
Asthma: Symptoms to Pathophysiology (Module 1): Learners

- Primary Care/Internal Medicine: 52%
- Allergy: 4%
- Pulmonary: 9%
- Pediatrics: 5%
- Other: 31%

*Other: Emergency Medicine, Cardiology, Geriatrics, Occupational Health, Orthopedics, Anesthesiology, Surgery, Neurology, ENT, Hematology/Oncology

N=1929
Module 2 Metrics:
✓ Completed: 799
Total Learners: 1,077
Personalized Medicine in Severe Asthma
Final Report - Online Enduring Program – (3) Modules
Current and Emerging Asthma Therapies (Module 2): Learners

- Primary Care/Internal Medicine: 50%
- Allergy: 29%
- Pulmonary: 5%
- Pediatrics: 10%
- Other: 6%

*Other: Emergency Medicine, ENT, Occupational Health, Cardiology, Surgery, Anesthesiology, Cardiopulmonary Rehab, Critical Care, Radiology

N=1077
Module 3 Metrics:
✓ Completed: 447
Total Learners: 622

- MD/DO: 36.0%
- NP: 5.0%
- PA: 17.5%
- Nurse: 12.5%
- PharmD: 1.0%
- RT: 6.9%
- Other: 21.1%

*N=622

*Other: PT, Technologist, Student, Resident, Faculty/Educator
Roundtable Discussion on Personalized Treatment Approaches (Module 3): Learners

- Primary Care/Internal Medicine: 48%
- Allergy: 27%
- Pulmonary: 6%
- Pediatrics: 12%
- Other: 7%

*Other: Cardiology, Orthopedics, Emergency Medicine, Anesthesiology, Urgent Care, Geriatrics, Critical Care, Neurology, Gastroenterology

N=622
Module 1
Participants demonstrated a 35% increase in knowledge and competence from pre-test to post-test.
Module 1 Question 1

Participants demonstrated a 65% relative gain in knowledge and competence from pre-test to post-test.

Diagnosis of asthma requires which of the following?

A. History of symptoms consistent with intermittent airway obstruction
B. Physiologic testing confirming airway hyperresponsiveness or a response to bronchodilator
C. Peripheral eosinophilia
D. A and B
E. A, B, and C
Module 1 Question 2
Participants demonstrated a 5% relative gain in knowledge and competence from pre-test to post-test.

2. All patients with asthma have evidence of allergy based on history or lab testing

1) True
2) False
Module 1 Question 3
Participants demonstrated a 5% relative gain in knowledge and competence from pre-test to post-test.

3. Which Of The Following Comorbid Conditions Can Make Asthma More Difficult To Treat?

A. Esophageal Reflux
B. Sinusitis
C. Allergic bronchopulmonary aspergillosis
D. A and C
E. All of the above
Module 1 Question 4
Participants demonstrated a **70% relative gain in knowledge and competence** from pre-test to post-test.

4. Airway abnormalities in asthma can include:

A. Increased mucus secretion  
B. Thickening of the basement membrane in airways  
C. Reduced number and size of airway smooth muscle cells causing “floppy airways”  
D. All of the above  
E. A and B
Module 2
Participants demonstrated a 66% relative increase in knowledge and competence from pre-test to post-test.
Module 2 Question 1
Participants demonstrated a 40% relative gain in knowledge and competence from pre-test to post-test.

1. Which of the following describes an asthma endotype?
   A. Asthma in the elderly
   B. Obese asthma
   C. IL-5 mediated asthma
   D. Nocturnal asthma
   E. Occupational asthma
Module 2 Question 2
Participants demonstrated a **37% relative gain in knowledge and competence** from pre-test to post-test.

2. Which of the following is NOT a FDA approved biologic agent?
   
   A. Omalizumab  
   B. Mepolizumab  
   C. Dupilumab  
   D. Reslizumab  
   E. Tralokinumab
Module 2 Question 3
Participants demonstrated a **77% relative gain in knowledge and competence** from pre-test to post-test.

3. Which of the following monoclonal antibody targets is incorrect?

A. Tralokinumab IL17
B. Mepolizumab IL5
C. Dupilumab IL4/13
D. Reslizumab IL5
E. Benralizumab IL5R
F. Omalizumab IgE
Participants demonstrated a **164% relative gain in knowledge and competence** from pre-test to post-test.

4. Which of the following is an eosinophil:

1) Image #1  
2) Image #2  
3) **Image #3**  
4) Image #4  
5) Image #5  
6) Image #6  
7) Image #7  
8) Image #8
Module 3
Participants demonstrated a 107% relative increase in knowledge and competence from pre-test to post-test.
Module 3 Question 1
Participants demonstrated a 362% relative gain in knowledge and competence from pre-test to post-test.

1) How Would You Classify The Patient’s Asthma Using EPR-3?
   A. Mild Intermittent
   B. Mild Persistent
   C. Moderate Persistent
   D. Severe Persistent

Pre-test (Avg N=499) Post-test (Avg N=465)
Module 3 Question 2

Participants demonstrated a **133% relative gain in knowledge and competence** from pre-test to post-test.

2) Which Of The Following Clinical Criteria Factor Into The “Risk” Aspect Of Classifying Asthma Control?

A. Asthma Control Test (ACT) score  
B. **Number of prednisone bursts in the past year**  
C. Frequency of nighttime awakenings  
D. Frequency of albuterol use  
E. Assessment of lung function (%predicted FEV1 or %personal best peak flow)

---

![Graph showing pre-test and post-test results]

<table>
<thead>
<tr>
<th></th>
<th>Pre-test (Avg N=499)</th>
<th>Post-test (Avg N=465)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Asthma Control Test (ACT) score</strong></td>
<td>21.0%</td>
<td>49.0%</td>
</tr>
</tbody>
</table>

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*National Jewish Health*
Module 3 Question 3
Participants demonstrated a 47% relative gain in knowledge and competence from pre-test to post-test.

3) Which Of The Following Blood Tests Is A Commercially Available Biomarker That Is Helpful In Determining Asthma Phenotype/Endotype?

A. Absolute lymphocyte count  
B. Periostin level  
C. Total IgE level  
D. DPP4 (dipeptidyl peptidase 4)  
E. Exhaled nitric oxide

Pre-test (Avg N=499): 62.0%  
Post-test (Avg N=465): 91.0%
Module 3 Question 4

Participants demonstrated a **72% relative gain in knowledge and competence** from pre-test to post-test.

4) Based On What You Know Of Our Patient, Which Endotype Of Phenotype Would Best Characterize Our Patient?

1) Late-onset asthma
2) Th2 high
3) Th2 low
4) Neutrophilic asthma

**Pre-test (Avg N=499)**

- Th2 high: 54.0%

**Post-test (Avg N=465)**

- Th2 high: 93.0%
Module 3 Question 5
Participants demonstrated a 109% relative gain in knowledge and competence from pre-test to post-test.

5) Which Of The Following Biologic Agents Are Approved For The Treatment Of Severe Persistent Asthma Characterized As Th2 High?

1) Mepolizumab
2) Lebrikizumab
3) Dupilumab
4) Benralizumab
5) Tralokinumab
As a result of what I learned, I intend to make changes in my practice:

<table>
<thead>
<tr>
<th></th>
<th>Extremely Likely</th>
<th>Somewhat Likely</th>
<th>Not At All Likely</th>
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<tr>
<td>37%</td>
<td>45%</td>
<td>10%</td>
<td></td>
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</table>

As a result of what I learned, I intend to make the following changes in my practice:

- Modify treatment plans: 31%
- Use alternative communication methodologies with patients: 27%
- Incorporate different diagnostic strategies into patient evaluation: 36%
- Change my screening/prevention practice: 32%

Module 1: 82% of Participants reported that they were somewhat or extremely likely to make a change in their practice (average N= 1107)
### Evaluation (Module 1)

- 99% of participants report the activity was presented without commercial bias
- 99% of participants report the activity was evidence-based and clinically relevant
- 92% of participants report the activity addressed strategies for overcoming barriers to optimal patient care

<table>
<thead>
<tr>
<th>Objective</th>
<th>Score</th>
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<tbody>
<tr>
<td>Improved your ability to treat or manage your patients</td>
<td>96.2%</td>
</tr>
<tr>
<td>Enhanced your ability to apply the learning objectives to your practice</td>
<td>96.8%</td>
</tr>
<tr>
<td>Reinforced and/or improved your current skills</td>
<td>97.5%</td>
</tr>
<tr>
<td>Met your educational needs</td>
<td>98.4%</td>
</tr>
<tr>
<td>Met the learning objectives</td>
<td>99.4%</td>
</tr>
</tbody>
</table>

Average n=1107
As a result of what I learned, I intend to make changes in my practice:

<table>
<thead>
<tr>
<th>Rating</th>
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<tbody>
<tr>
<td>Extremely Likely</td>
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<tr>
<td>Somewhat Likely</td>
<td>50%</td>
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<tr>
<td>Not At All Likely</td>
<td>14%</td>
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</table>

Module 2: 86% of Participants reported that they were somewhat or extremely likely to make a change in their practice (average N=790)

As a result of what I learned, I intend to make the following changes in my practice:

- Modify treatment plans: 40%
- Use alternative communication methodologies with patients and...: 26%
- Incorporate different diagnostic strategies into patient evaluation: 33%
- Change my screening/prevention practice: 29%
Participants report that the activity was ‘Excellent’ to ‘Good’ at:

- Improved your ability to treat/manage patients: 92%
- Enhanced your ability to apply the LOs to practice: 93%
- Reinforced and/or improved your current skills: 94%
- Met your educational needs: 96%
- Met the LOs: 96%

Evaluation (Module 2)

- 99% of participants report the activity was presented without commercial bias
- 99% of participants report the activity was evidence-based and clinically relevant
- 93% of participants report the activity addressed strategies for overcoming barriers to optimal patient care
As a result of what I learned, I intend to make changes in my practice:

<table>
<thead>
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<th>Likelihood</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Extremely Likely</td>
<td>42%</td>
</tr>
<tr>
<td>Somewhat Likely</td>
<td>47%</td>
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<tr>
<td>Not At All Likely</td>
<td>11%</td>
</tr>
</tbody>
</table>

As a result of what I learned, I intend to make the following changes in my practice:

- Change my screening/prevention practice: 35%
- Incorporate different diagnostic strategies into patient evaluation: 35%
- Use alternative communication methodologies with patients and families: 22%
- Modify treatment plans: 37%

Module 3: 89% of Participants reported that they were somewhat or extremely likely to make a change in their practice (average N= 425)
Participants report that the activity was ‘Excellent’ to ‘Good’ at:

- Improved your ability to treat or manage your patients: 97%
- Enhanced your ability to apply the learning objectives to your practice: 97%
- Reinforced and/or improved your current skills: 98%
- Met your educational needs: 98%
- Met the learning objectives: 98%

Evaluation (Module 3)

- 99% of participants report the activity was presented without commercial bias
- 99% of participants report the activity was evidence-based and clinically relevant
- 96% of participants report the activity addressed strategies for overcoming barriers to optimal patient care

Average N=425
Thank you for your support of this educational initiative!