Progress and Perspectives in the Management of Primary Immunodeficiency Disorders

Final Outcomes Report

Baxalta Educational Grant: BT15-29391
Progress and Perspectives in the Management of Primary Immunodeficiency Disorders
Overview:
This web-based digital classroom consists of three 20-minute modules comprised of didactic clinical review, faculty discussions, and interactive case studies. Each module provides clinicians with strategies to improve recognition, management, and treatment of patients with primary immunodeficiency disorders (PIDD).

Intended Audience:
This educational curriculum was designed for US immunologists, allergists and other clinicians involved in the management of patients with PIDD.

Release/Expiration: March 14, 2016 – March 14, 2017

Credit Per Module:
- Module 1 (Patient Case): 0.25 AMA PRA Category 1 Credit™
- Module 2 (Faculty Roundtable): 0.5 AMA PRA Category 1 Credit™
- Module 3 (Digital Academy): 0.5 AMA PRA Category 1 Credit™

Sponsored By:
The Academy for Continued Healthcare Learning

Funding:
Supported by an educational grant from Baxalta US, Inc.
Executive Summary

IMPACT
3315 Learners (2500 Guaranteed)
600 Evaluations (350 Guaranteed)

SPECIALITY
50% Physicians
15% Physician Assistants
13% Nurses
22% Other

COST PER LEARNER
$39

Icon made by FreePik from www.flaticon.com
Executive Summary

Satisfaction
94% of learners perceived no bias

Almost all learners (94%) would recommend the activity to a colleague

Learning Objectives
60% of learners strongly agree or agree that all learning objectives were met, with an average rating of 3.58

Patient Impact
Patient outcomes will be positively impacted as a result of this activity according to 78% of learners

Serial Learning
41% of learners participated in more than one module
Of clinicians were more knowledgeable/competent on:

98%

- When to employ IgG replacement therapy and,
- How to correctly select preventative vaccines for patients with PI.

147%

Average increase in learners confidence of screening and diagnosis procedures in PI.

63%

Average increase in learners knowledge related to the significance of IgG trough levels, and value of personalized treatments based on patient-specific factors.
Executive Summary

Future Educational Opportunities

- Analyze how genotypic information is utilized depending on PI subtype
- Comprehension of how the components of newer SC formulations (ie, enzyme-facilitated SC infusions) differ from conventional SC therapies
- Subtypes of PI (ie, CVID vs XLA), treatment and management strategies, and screening tools for PI
Faculty

Mark Ballow, MD
Professor of Pediatrics
Pediatrics, Division of Allergy and Immunology
University of South Florida
St. Petersburg, Florida

Ramsay Fuleihan, MD
Professor
Pediatrics, Division of Allergy and Immunology
Northwestern University Feinberg School of Medicine
Attending Physician
Ann & Robert H. Lurie Children’s Hospital of Chicago
Chicago, Illinois

Richard Wasserman, MD, PhD
Medical Director of Pediatric Allergy and Immunology
Medical City Children’s Hospital
Dallas, Texas
Level 1: Participation

Clinician Types

- Physicians: 50%
- Physician Assistants: 15%
- Nurses: 13%
- Nurse Practitioners: 8%
- Allied Health: 8%
- Pharmacists: 2%
- Other: 4%

<table>
<thead>
<tr>
<th>Module</th>
<th>Total Participants</th>
<th>Completers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1675</td>
<td>271</td>
</tr>
<tr>
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<td>689</td>
<td>166</td>
</tr>
<tr>
<td>3</td>
<td>951</td>
<td>163</td>
</tr>
<tr>
<td>Total</td>
<td>3,315</td>
<td>600</td>
</tr>
</tbody>
</table>

See appendix for module breakout
Level 1: Specialty

Specialties

- Family Practice: 17%
- Internal Medicine: 11%
- Allergy & Immunology: 6%
- Emergency Medicine: 13%
- Pediatrics: 5%
- Surgery: 5%
- Clinical (unspecified): 44%

See appendix for module breakout

N=390
### Level 2: Learning Objectives

Please rate the following objectives to indicate if you are better able to:

<table>
<thead>
<tr>
<th>Analysis of Responses</th>
<th>Rating Scale: 5=Strongly Agree; 1=Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify patients who may have a PIDD and utilize appropriate tests to diagnose the disease.</td>
<td>3.60</td>
</tr>
<tr>
<td>Compare and contrast modes of treatment for PIDD as well as methods to reduce disease related complications.</td>
<td>3.56</td>
</tr>
<tr>
<td>Discuss recent genetic advancements associated with PIDD.</td>
<td>3.59</td>
</tr>
<tr>
<td>Distinguish how the severity of comorbidities or the frequency of recurrent infections influences outcome in patients with PIDD.</td>
<td>3.59</td>
</tr>
</tbody>
</table>

94% of learners would recommend this activity to a colleague!

See appendix for module breakout
## Level 2: Overall Evaluation

Please evaluate by marking the appropriate response:

| Analysis of Respondents | Rating Scale:  
5=Excellent; 1=Poor |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of educational content</td>
<td>3.73</td>
</tr>
<tr>
<td>Scientific rigor</td>
<td>3.67</td>
</tr>
<tr>
<td>Level of instruction</td>
<td>3.70</td>
</tr>
<tr>
<td>Usefulness of educational material</td>
<td>3.66</td>
</tr>
<tr>
<td>Appropriateness and effectiveness of active learning strategies</td>
<td>3.71</td>
</tr>
<tr>
<td>Time allotted for presentation of information</td>
<td>3.69</td>
</tr>
</tbody>
</table>

See appendix for module breakout

N=591
Level 2: Objectivity & Bias

Did you Perceive Any Bias?

- Yes: 6%
- No: 94%

N=591

Activity was perceived as objective, balanced, and non-biased.

Rating of Objectivity & Balance

- Excellent: 42%
- Good: 22%
- Satisfactory: 14%
- Fair: 13%
- Poor: 10%

N=591

See appendix for module breakout
Module One Level 4: Pretest vs. Posttest

Overview of correct responses Module One (M1):

<table>
<thead>
<tr>
<th>Question</th>
<th>Topic</th>
<th>Pre</th>
<th>Post</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1, Q1</td>
<td>When to administer IgG replacement therapy</td>
<td>35%</td>
<td>98%</td>
<td>180%</td>
</tr>
<tr>
<td>M1, Q2</td>
<td>Vaccine administration in patients with a PI</td>
<td>60%</td>
<td>98%</td>
<td>63%</td>
</tr>
<tr>
<td>M1, Q3</td>
<td>Screening for a PI</td>
<td>31%</td>
<td>99%</td>
<td>219%</td>
</tr>
</tbody>
</table>

Average pre and post test scores were 42% and 98%, respectively, demonstrating an increase in clinicians' knowledge regarding screening and appropriate treatments for patients with PI.
Module 1, Question 1

Patients with common variable immunodeficiency (CVID) can present with significant decreases in IgG, IgA, or IgM and sometimes a complete absence of all 3 isotypes. Which of the following is true when administering IgG replacement therapy to a patient with either decreases in or a complete absence of all 3 immunoglobulin classes?

A. IgG replacement therapy is contraindicated in patients who exhibit a complete absence of IgA.
B. IgG replacement therapy may be given to a patient even if they have a complete absence of IgA.
C. IgG replacement therapy is contraindicated for patients who lack all 3 antibody classes.
D. IgM and IgA but not IgG replacement therapy may be given to patients with complete absence of all 3 isotypes.

As a result of this activity learners are better equipped to identify practice parameters for when it would be appropriate to administer IgG replacement infusions to patients with specific immunoglobulin deficiencies.
Some vaccines may be appropriate for patients with primary immunodeficiency disease (PIDD). Which of the choices would be acceptable for a patient with the specified PIDD?

A. Both live attenuated and inactivated influenza vaccines for a patient with CVID
B. Live attenuated influenza virus vaccine for a patient with SCID
C. Inactivated influenza virus vaccine for a patient with B cell disorders such as X-linked agammaglobulinemia (XLA) or CVID
D. Live attenuated virus vaccine for a patient with severe T (but not B cell) disorders

Learner knowledge of guideline-endorsed vaccines for patients with PIDD increased by 63% after participation in this module. This increased knowledge corresponds with the potential to better prevent recurrent infections in patients who are immunocompromised, thereby improving health outcomes.
Module 1, Question 3

Which of the following are signs and/or symptoms of CVID?

A. Recurrent, afebrile wheezy pneumonia in a 16-year old boy
B. Chronic rhinitis with nasal stuffiness and rhinorrhea in a 50-year old man
C. Frequent urinary tract infections in a 35-year old woman
D. Bronchitis, with sputum production three times a year for three years in a 40-year old non-smoker

Following the post-test, three times more learners correctly answered this question related to screening and diagnosis of a specific PI (CVID). Thus, learners are more aware of the signs and symptoms associated with this disease and potentially can more readily identify patients who would require further diagnosis, thereby reducing morbidity and mortality associated with CVID.
Module Two Level 4: Pretest vs. Posttest

Overview of correct responses Module Two (M2):

<table>
<thead>
<tr>
<th>Question</th>
<th>Topic</th>
<th>Pre</th>
<th>Post</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>M2, Q1</td>
<td>Management of recurrent pneumonia</td>
<td>53%</td>
<td>73%</td>
<td>38%</td>
</tr>
<tr>
<td>M2, Q2</td>
<td>Utilizing genotypes</td>
<td>41%</td>
<td>53%</td>
<td>29%</td>
</tr>
<tr>
<td>M2, Q3</td>
<td>Diagnosing a PI</td>
<td>54%</td>
<td>94%</td>
<td>74%</td>
</tr>
</tbody>
</table>

Participants knowledge and competence increased from pre to post-test by an average of 47% with respect to diagnosis, interpretation and use of genetic findings, and techniques to manage recurrent infections in patients with PI.
John is a 14-year old who has had recurrent bouts of pneumonia over the last 10 years. He was diagnosed with CVID when he was 6. Over the years, his bronchi have thickened and he frequently experiences mucus build-up in his lungs. Which is the best course of treatment for his bronchiectasis?

A. IgG replacement therapy during an exacerbation would help John help resolve these exacerbations.

B. Regular IgG replacement therapy has no impact on bronchiectasis and should be abstained from during periods of exacerbation.

C. Bronchiectasis can be managed with antibiotics alone, including macrolides and mucus thinning medications.

D. Regular IgG replacement therapy, antibiotics, and airway clearance techniques would help to keep John’s bronchiectasis in from progressing.

Although the number of correct responses increased by 38% on the post-test, 27% of participants still incorrectly answered this question. This signifies an opportunity to further educate clinicians on complementary methods in addition to IgG replacement therapy (which will help to lessen infection frequency) to help control chronic inflammation and infection in the lungs.
Module 2, Question 2

Categorizing patients with primary immunodeficiencies by lymphocyte phenotyping or genotyping may help to:

A. Correlate a clinical phenotype with a cellular profile or genotype
B. Determine the dose of IgG therapy
C. Is almost never worth the time or expense as it often does not result in a change of management strategy
D. Guide the management strategy (stem cell replacement vs IgG replacement therapy)

Performance on this question demonstrates that learners are still unaware that the clinical application of genetics is in its infancy. There are very specific circumstances where genetics can guide diagnosis (ie, newborn screening for SCID), but to date, the expense (ie, not always covered by insurance) and the ambiguity concerning the exact function of a gene, has led to using genetics in patients with PI more as a means of disease classification rather than guidance for treatment strategies.
Module 2, Question 3

To make a diagnosis of a PIDD, many factors need to be taken into consideration. Which set of factors below would lead clinicians to consider a diagnosis of PIDD?

A. Myalgias, malaise, low levels of IgE
B. Recurrent infections, short-lived responses to antibiotics, low levels of Ig classes
C. Recurrent respiratory infections before the age of 4 years and high levels of IgE
D. Low levels of IgE, fever, and rashes

As a result of the activity 74% more learners were better able to identify patients who exhibit signs and symptoms indicative of a PI.
Overview of correct responses Module Three (M3):

<table>
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<th>Question</th>
<th>Topic</th>
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<th>Post</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>M3, Q1</td>
<td>Personalizing therapy</td>
<td>47%</td>
<td>80%</td>
<td>70%</td>
</tr>
<tr>
<td>M3, Q2</td>
<td>Personalizing therapy</td>
<td>60%</td>
<td>93%</td>
<td>55%</td>
</tr>
<tr>
<td>M3, Q3</td>
<td>Enzyme-facilitated IgG replacement therapy</td>
<td>41%</td>
<td>67%</td>
<td>63%</td>
</tr>
<tr>
<td>M3, Q4</td>
<td>PI-associated complications</td>
<td>34%</td>
<td>87%</td>
<td>156%</td>
</tr>
</tbody>
</table>

86%

Participants knowledge and competence increased from pre to post-test by an average of 86% with respect to newer SC formulations, personalized therapy approaches and improvements in QoL and compliance.
What is the significance of the so-called biological trough level of IgG during immunoglobulin replacement therapy?

A. The biological trough level is the serum IgG level that helps a particular patient remain infection-free and healthy

B. Because the biological level of IgG varies from patient to patient a standard dose for all patients is necessary for clinicians to gauge whether or not treatment is effective in preventing recurrent infections

C. The biological trough level of an antibody is a patient’s baseline level of IgG following an infusion of IgG and can be used to determine the effectiveness of treatment

D. Increases in IgG levels are non-linear even with subcutaneous infusions and especially with IV infusions; therefore, they are not an objective measure for the clinician to use when correlating dose with infection prevention

Performance on this question showed an increase of 70% from pre to post-test. The biological level of IgG needed to keep a patient infection free reflects personalized treatment as this value can vary from one patient to the next, and even in the same patient across time, given changes in body weight, pregnancy status or the development of comorbidities. Therefore, periodic monitoring of a patient’s infections/recurrences may help clinicians adjust trough levels over time.
Module 3, Question 2

Which factors would influence a clinician to consider subcutaneous IgG therapy over intravenous therapy for a particular patient?

A. Young age and/or poor venous access
B. An increased risk of infusion site reactions
C. Patients’ desire to be out of the house/interact with clinical staff
D. Extreme susceptibility to infections rendering central vein access ideal

As new formulations of IgG enter the market, it becomes even more important for clinicians to address how treatments can be personalized to their patients. Performance on this question demonstrates that clinicians are now more aware that specific formulations may benefit some patients over others, dependent on patient preferences and lifestyles.
Module 3, Question 3

Hyaluronidase catalyzes the breakdown of hyaluronan, a carbohydrate copolymer, in the subcutaneous tissue allowing patients to inject larger volumes of IgG solutions in a single infusion site. Which of the following is true regarding human recombinant hyaluronidase that is included as part of enzyme facilitated subcutaneous IgG infusions?

A. The half-life of hyaluronidase is long, enabling the patient to infuse IgG less frequently.
B. Hyaluronidase, in addition to causing a catalysis of collagen, causes a decrease in synthesis of hyaluronan, thus imparting a therapeutic effect in addition to the IgG contained in an infusion.
C. Although hyaluronidase catabolizes hyaluronan within the extracellular matrix of subcutaneous tissue, the effects are short-lived and do not cause permanent changes to skin tissue.
D. Because of its short half-life, IgG therapies containing hyaluronic acid must be injected frequently in order to maintain a constant IgG serum level.

33% of learners are still unsure of how hyaluronan works in enzyme-facilitated SC infusions (ie, participants have misconceptions of the role of hyaluronanidase [answer choice B]), signifying an opportunity for further education on how this specific formulation compares with both conventional SC as well as IVIG formulations.
Module 3, Question 4

One complication that may be associated with PIDD is autoimmune disease. What should clinicians watch for in a patient who may be susceptible?

A. Patients are particularly at risk for gastrointestinal autoimmune events that clinicians should look for regularly
B. New symptoms that may arise; monitoring for symptoms of cytopenias (pallor and fatigue, abscesses, bleeding)
C. An approximate 20% of patients with CVID develop autoimmune disorders; because such a low percentage of patients develop autoimmune complications, clinicians do not need to regularly monitor patients for new symptoms
D. Endocrine disorders predominate among autoimmune complications associated with PIDD. Therefore, clinicians need to regularly monitor hormone levels via lab work-ups.

Autoimmune cytopenias are one of the more common complications of PIDD occurring in about 11-12% of patients. Following the activity, 87% of clinicians (53% increase from pre to post) were aware that if new symptoms arose in patients with a PIDD, further testing should be performed to help stem disruptions to other cell types and continue to ensure good health.
### Activity Impact

<table>
<thead>
<tr>
<th>Activity Impact</th>
<th>Yes (%)</th>
<th>No (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>This activity will improve my knowledge:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes: 90%</td>
<td>No: 10%</td>
</tr>
<tr>
<td>This activity will improve my competence:</td>
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<td></td>
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<tr>
<td></td>
<td>Yes: 83%</td>
<td>No: 17%</td>
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<tr>
<td>This activity will improve my performance:</td>
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<td></td>
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<tr>
<td></td>
<td>Yes: 79%</td>
<td>No: 21%</td>
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<tr>
<td>This activity will improve my patient outcomes:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes: 78%</td>
<td>No: 22%</td>
</tr>
</tbody>
</table>

78% of learners indicated that their performance and patients’ outcomes would improve.

See appendix for module breakout

N=591
How Will You Change Your Practice?

Select all that apply:

- Change the management and/or treatment of my patients (35%)
- Create/revise protocols, policies, and/or procedures (20%)
- Other changes (34%)
- This activity validated my current practice, no changes will be made (45%)

55% of learners intend to change their practice!

See appendix for module breakout

N=591
Do you actively screen for PIDD in patients who present with more than the normal amount of infections in a year/or with an exceeding amount of recurrent infections?

If no, how will you change your practice?

- I will start by ordering IgG and IgM levels on the patients that do constantly seem to have sinus and bronchitis infections then refer off to the proper specialists.
- Gives me confidence to order IgG infusions for appropriate pts
- Look for recurrent infections
- Offer option for sub-cutaneous therapy
- Test more frequently for IgG
- Using recombinant hyaluronidase as adjuvant in subcutaneous lg.
- Check IgG levels
- Refer to immunology

N=591
How do patients perceive IgG replacement therapy as impacting their quality of life?

Select all that apply:

My patients note improvements in:

- Physical health (reduced infections, less fatigue, more energy) 49%
- Social involvement (increased participation with peers, leisure activities) 24%
- Emotional health (less depressed and/or anxious) 21%
- N/A 37%
- Other: 1%

IgG replacement therapy clearly improves patient morbidity as 49% of clinicians noted that their patients have remarked on how treatment has improved their physical health (reduced recurrent infections, more energy), social involvement, and/or emotional health.

See appendix for module breakout

N=591
Clinicians indicated cost (41%) and lack of experience (21%) as the two most common barriers to implementing changes in their practice.

N=109
Barriers

Will you attempt to address these barriers in order to implement changes in your performance, and/or patients’ outcomes?

Yes: 70%  
No: 30%

Yes, how?

- Counseling and patient education sessions will be offered
- Devoting additional time to consider differential diagnosis
- Devoting adequate time to consider CVID.
- Encourage and educate patients to continue treatment regimens
- I work for VA so will most likely have to refer to specialty or infectious disease but at least if I have the basic testing this will give credence for the specialty to follow my initial evaluation
- Order more frequent IgG testing
- There may be some patients that would benefit from treatments and not have to use as many antibiotics.
- Use drug companies to help obtain needed meds and funding sources from community
- When clinical suspicion exists in a patient with PIDD, taking additional time to ensure that patient is evaluated.
- Will attempt to garner administrative support
- With social, family and insurance-collaborative support.

No, why not?

- Administration is not likely to assist with remedies
- There are no barriers
Topics of Interest

What topic areas would you like to see in future activities?

Select all that apply:

- Activity on specific type of PIDD: 31%
- Treatments/management strategies for PIDD: 35%
- Comorbidities/complications of PIDD: 24%
- Screening tools for PIDD: 37%
- Patient compliance: 20%
- Other: 4%

Other topics identified: B cell phenotyping, neurosurgical, ankylosing spondylitis and acquired immune deficiencies

Screening tools for PIDD was rated with highest interest for future education followed by treatment/management strategies and education on specific types of PIDD.

N=591
Contact Information

• For questions, please contact:

  Brittany Puster  
  Director, Education Development  
  Academy for Continued Healthcare Learning (ACHL)  
  E: bpuster@achlcme.org  
  P: 773-714-0705 ext. 134
Appendix
Level 1: Participation

Clinician Types

<table>
<thead>
<tr>
<th>Clinician Types</th>
<th>Module 1</th>
<th>Module 2</th>
<th>Module 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physicians</td>
<td>43%</td>
<td>49%</td>
<td>51%</td>
</tr>
<tr>
<td>Physician Assistants</td>
<td>15%</td>
<td>12%</td>
<td>13%</td>
</tr>
<tr>
<td>Nurses</td>
<td>12%</td>
<td>12%</td>
<td>9%</td>
</tr>
<tr>
<td>Nurse Practitioners</td>
<td>6%</td>
<td>5%</td>
<td>6%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module</th>
<th>Total Participants</th>
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<tbody>
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<td>951</td>
<td>163</td>
</tr>
<tr>
<td>Total</td>
<td>3,315</td>
<td>600</td>
</tr>
</tbody>
</table>
Level 1: Specialty

Specialties

- Family Practice: 10% (Module 1), 14% (Module 2), 13% (Module 3)
- Internal Medicine: 7% (Module 1), 10% (Module 2), 10% (Module 3)
- Allergy & Immunology: 6% (Module 1), 7% (Module 2), 7% (Module 3)
- Emergency Medicine: 6% (Module 1), 6% (Module 2), 6% (Module 3)
- General Practice/Primary Care: 5% (Module 1), 5% (Module 2), 4% (Module 3)
- Other: 45% (Module 1), 47% (Module 2), 54% (Module 3)
- Unknown: 13% (Module 1), 13% (Module 2), 13% (Module 3)
### Level 2: Learning Objectives

Please rate the following objectives to indicate if you are better able to:

*Rating Scale: 5=Strongly Agree; 1=Strongly Disagree*

<table>
<thead>
<tr>
<th>Objective</th>
<th>Module 1</th>
<th>Module 2</th>
<th>Module 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify patients who may have a PIDD and utilize appropriate tests to diagnose the disease.</td>
<td>3.67</td>
<td>3.72</td>
<td>3.36</td>
</tr>
<tr>
<td>Compare and contrast modes of treatment for PIDD as well as methods to reduce disease related complications.</td>
<td>3.61</td>
<td>3.68</td>
<td>3.37</td>
</tr>
<tr>
<td>Discuss recent genetic advancements associated with PIDD.</td>
<td>3.66</td>
<td>3.71</td>
<td>3.33</td>
</tr>
<tr>
<td>Distinguish how the severity of comorbidities or the frequency of recurrent infections influences outcome in patients with PIDD.</td>
<td>3.63</td>
<td>3.70</td>
<td>3.40</td>
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N=591
## Level 2: Overall Evaluation

<table>
<thead>
<tr>
<th></th>
<th>Module 1</th>
<th>Module 2</th>
<th>Module 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of educational content</td>
<td>3.67</td>
<td>3.82</td>
<td>3.73</td>
</tr>
<tr>
<td>Scientific rigor</td>
<td>3.63</td>
<td>3.74</td>
<td>3.68</td>
</tr>
<tr>
<td>Level of instruction</td>
<td>3.63</td>
<td>3.80</td>
<td>3.71</td>
</tr>
<tr>
<td>Usefulness of educational material</td>
<td>3.62</td>
<td>3.74</td>
<td>3.66</td>
</tr>
<tr>
<td>Appropriateness and effectiveness of active learning strategies</td>
<td>3.65</td>
<td>3.78</td>
<td>3.72</td>
</tr>
<tr>
<td>Time allotted for presentation of information</td>
<td>3.64</td>
<td>3.77</td>
<td>3.67</td>
</tr>
</tbody>
</table>

*Rating Scale: 5=Excellent; 1=Poor*

N=591
This activity, overall, was perceived as objective, balanced, and non-biased.
## Activity Impact

### This activity will improve my knowledge:

<table>
<thead>
<tr>
<th>Module</th>
<th>Yes (%)</th>
<th>No (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module 1</td>
<td>92%</td>
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<td>Module 2</td>
<td>86%</td>
<td>14%</td>
</tr>
<tr>
<td>Module 3</td>
<td>91%</td>
<td>9%</td>
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</table>

### This activity will improve my competence:

<table>
<thead>
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<th>Module</th>
<th>Yes (%)</th>
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### This activity will improve my performance:

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### This activity will improve my patient outcomes:

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How Will You Change Your Practice?

Select all that apply:

- Change the management and/or treatment of my patients
- Create/revise protocols, policies, and/or procedures.
- Other changes.
- This activity validated my current practice, no changes will be made.

N=591
How do patients perceive IgG replacement therapy as impacting their quality of life?

Select all that apply:

My patients note improvements in:

- Physical health (reduced infections, less fatigue, more energy)
- Social involvement (increased participation with peers, leisure activities)
- Emotional health (less depressed and/or anxious)
- N/A
- Other:

Analysis

N=591
Activity Impact

If you indicated this activity will improve your knowledge, competence, performance and/or patient outcomes, please specify below:

- How to diagnosis and type of vaccine given
- *PIDD is apparently a rare disorder. However, the discussion has alerted my awareness*
- I learned about memory switch cells
- *I’m ID IG-A, it was wonderful to have my diagnosis better explained. Thank You!! I will be MORE compliant in therapy.*
- Help me a lot in dealing with patient with immunodeficiency syndrome
- Although full of non-specific recommendations, the physicians suggested places and practices to consider - especially for CVID.
- I will evaluate even older individuals’ now
- Improved treatment modalities and preventive health for those with immunodeficiency
- This help me to learn about other type of coding and peaks my interest in adventuring out of my comfort zone.
- Current and clear concepts, better screening and treatment.
- This has definitely increased my knowledge. I am currently in pain management but have an interest in autoimmune deficiencies
- Identifying CVID
- *Increased knowledge and understanding of PIDD and CVID, how to identify and diagnosis criteria*
- It will help me to understand and take care better a patient with some sort immunodeficiency issues.
- Encouraging early identification
- Awareness of CVID.
If you indicated this activity will improve your knowledge, competence, performance and/or patient outcomes, please specify below:

- Relation between phenotyping and treatment
- Will try to identify pts with recurrent infections that may be IgG deficient
- *Screen for IgG deficiency more closely*
- Increasing IgG usage and testing
- Academic education enhances my practice which benefit patient’s outcome
- *The knowledge of the sub-cutaneous types of IgG is useful when discussing subjects who may need IgG.*
- Look for recurrent infections
- As an anesthesiologist I was impressed with the presentation And knowledge of theses gentleman. My direction is to expose material for better understanding of patients medical! Issues and treatment they receive.
- Yes, because I will be injecting this into my thought process when evaluating pts with frequent sinus or bronchial infections.
- Choosing between IV and sq administration
- Increase IgG therapy knowledge
- Reaffirm usage of currently used meds
- Better awareness of possible CVID in patients with known autoimmune disease such as MS but have recurrent UR symptoms
- Awareness, asking the right questions and adding to the differential
- The explanations provided in the question-answers, regarding certain practice details, were informative.
- Will do more in depth studies in suspected cases