



# GAIN EUROPE

OUTCOMES REPORT  
February 2015

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**Table of Contents**

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- GAIN- Europe Executive Summary ..... 3**
  - Introduction.....3
  - Key Evaluation Findings.....4
  - Summary .....6
- I. Overview of the GAIN-Europe Curriculum ..... 7**
  - Overall Goals and Objectives.....8
  - Executive Committee .....9
  - Collaborators .....9
  - Additional Contributors.....9
  - Summit Sites.....10
- II. Instructional Design .....12**
  - Target Audience .....12
  - Summit Curriculum Development.....13
  - Faculty Development .....13
  - Summit Content .....13
  - GAIN-Europe Train- the- Trainer Program.....24
  - Outcomes Assessment .....24
- III. Outcomes Summary: General Results .....25**
  - Evaluation Model .....25
  - Structure of the Results Section .....25
  - Evaluation Results: Outcomes Levels 1 Through 4.....26
  - Conclusion .....56
- IV. Findings and Lessons Learned .....57**
  - Goal 1 .....57
  - Goal 2 .....59
  - Goal 3 .....60
- V. Conclusion .....62**
  - Strengths of the GAIN-Europe Education Program .....62
  - GAIN-Europe Challenges .....63
  - GAIN-Europe Summary .....64
- Appendices.....65**

# GAIN- Europe Executive Summary

## Introduction

*EnGAg*ing an *Inter-Disciplinary Team for NSCLC*, or GAIN-Europe, was an educational curriculum designed for European physicians to improve their knowledge, skills, and competence in the assessment and management of *non–small cell lung cancer* [NSCLC]. *GAIN-Europe* utilized diverse educational activities focused on enhancing cross-disciplinary collaboration among physicians to address clinical-practice gaps and barriers for effective NSCLC diagnosis, personalized assessment, and treatment. Specifically, the GAIN-Europe Live Summits featured a flipped classroom instructional design with pre-course learning activities and interactive, participatory group and team-based workshop sessions. After completing the summits, the GAIN-Europe participants could participate in a *Train-the-Trainer* program, an instructional strategy developed to broaden program impact on local NSCLC practice and healthcare systems *and* ensure GAIN-Europe program sustainability. GAIN-Europe, a collaboration of the American College of Chest Physicians (CHEST), the American Society for Clinical Pathology (ASCP), and The France Foundation, was implemented in twelve (12) European cities between February and November, 2014.

GAIN-Europe was guided by three overarching program goals:

1. To improve the knowledge/skills, competence, and performance of physicians involved in the assessment and management of NSCLC;
2. To increase the impact of the GAIN-Europe educational program on physician practice and patient care; and
3. To ensure the long-term sustainability of the GAIN-Europe educational program

In addition, six learning objectives, aligned with evidence-based NSCLC practice gaps, provided specific focus, purpose, and content for the flipped classroom and problem-based learning instructional design. The learning objectives were intended to increase participants' understanding of NSCLC among the multidisciplinary physician healthcare team. GAIN-Europe's six learning objectives were:

- 1) To define the optimal diagnostic strategies for patients with lung masses;
- 2) To determine cost-effective strategies for staging the mediastinum in suspected or confirmed NSCLC;
- 3) To justify the use of new NSCLC classification systems based on small-volume histology and cytology specimens;
- 4) To describe the rationale for using molecular markers in targeted NSCLC therapy, to describe specific targetable molecular pathways in NSCLC, and to identify specific predictors of response or resistance to targeted NSCLC therapy and chemotherapy;

- 5) To identify and apply optimal practices for acquisition and processing of small-volume specimens for lung-cancer diagnosis and subsequent management; to mention the assays that are currently used for clinically relevant molecular analysis; and
- 6) To outline the function of a multidisciplinary lung-cancer tissue-management team regarding diagnosis and treatment of lung cancer, communication, and patient-centric care.

The GAIN-Europe educational activities were developed to address these learning objectives.

### **Key Evaluation Findings**

The GAIN-Europe evaluation report provides summative information about the progress made on overall program goals during the course of the program. Based on the recent conclusion of activities under the program's initial educational component, this report incorporates Donald Moore's evaluation model for assessing outcomes for continuing medical education (CME) programs to assess program goals and impacts, within the overall program goals. GAIN-Europe evaluation activities produced the following six key findings:

#### **Goal #1: Improve the knowledge, skills, and competence of physicians involved in the assessment and management of NSCLC.**

1. **Two-hundred-fifty-three (253) physicians in twelve (12) cities participated in GAIN-Europe.** The most frequent characteristics of GAIN-Europe participants were that they practiced pulmonology, had more than 20 years of experience, and were responsible for managing 6 to 15 new patients with lung cancer per month.
2. **GAIN-Europe participants expressed a high level of satisfaction with the summits, and the multi-disciplinary teamwork components of the workshop.** Results of post-Summit assessments showed that 98-99% of participating physicians indicated that the summits met their educational needs; matched their current scope of practice; and were scientifically sound and free from commercial bias. The same percentage of respondents felt that the course material was useful and that the faculty-instructors were effective in its delivery. However, approximately half (48.9%) suggested that including more case-based presentations would improve the summit's format.

Post-summit surveys indicated that participants (97-99%) *"agreed"* or *"strongly agreed"* with the workshop helped them to understand the clinical relevance of a multidisciplinary approach to NSCLC; enhanced their critical thinking skills; and helped them as a practicing member of a multidisciplinary medical team. Ninety-eight per cent of survey respondents indicated that they would recommend the workshops to other physicians in their specialty area.

3. **Results of pre- and post-GAIN assessments indicate that participants' knowledge of NSCLC diagnosis and treatment increased significantly.** The overall mean score for the GAIN-Europe pre-test was 5.95 of 10.00. The overall mean score for the GAIN-Europe post-test was 7.14 of 10.0. This learning gain was statistically significant, based on the results of a paired samples *t*-test.

**Goal #2: Increase the impact of the GAIN-Europe educational program on physician practice and patient care.**

4. **GAIN-Europe participants showed statistically significant gains in their utilization of six features of the multidisciplinary team emphasized in the curriculum.** Based on the results of a paired samples *t*-test, the results for all tested features were statistically significant.
5. **Physicians who participated in the Problem-Based Learning (PBL) component of the GAIN-Europe curriculum demonstrated high levels of competence in key NSCLC multidisciplinary team work/practice areas.** Overall, the PBL teams adequately met more than half the assessment criteria. The competency areas with the highest percentage of objectives that were adequately met (or met more than adequately) were diagnosis strategy and staging strategy (95.2%) followed by specimen handling and team dynamics (92.9%). Faculty ratings provided additional evidence supporting improved participant competence in these areas. The highest mean score was in team communication (3.9); the lowest mean score was observed in the area of procedural strategies and procedural techniques and results (3.5). Overall, faculty assigned an average score of 65.5 of 100.0 points for all GAIN-Europe teams.

**Goal #3: Ensure the long-term sustainability of the GAIN-Europe educational program.**

6. **Nineteen (19) GAIN-Europe participants successfully completed the program's "Train-the-Trainer" component, and are now Certified Lung Cancer Educators.** A proctored online exam was administered to 25 GAIN-Europe Train the Trainer program participants. Nineteen examinees were given a passing score and are eligible to implement the program in their communities as certified Lung Cancer Educators. To complete their certification requirements, Lung Cancer Educator candidates will be required to implement a daylong summit in their local communities. The first of these programs will be implemented in Athens, Greece on March 28, 2015.

## Summary

The highly interactive GAIN-EU program provided a unique opportunity for a multidisciplinary group of physicians to improve diagnosis and treatment of NSCLC. The program provided a facilitated approach to improving knowledge/skills and competence of physicians involved in the assessment and management of NSCLC. Using a tumor board model, the program directly engaged physicians in multidisciplinary teamwork and problem-based learning. Furthermore, GAIN-Europe encouraged sustainability beyond program completion via the Lung Cancer Educator Certification. The short- and intermediate-term outcomes indicate that the program contributed to increased utilization of several features of a multidisciplinary team (e.g., tumor boards). These results are promising for realizing positive impact on NSCLC and lung cancer physician practice and patient care outcomes in the future.

## I. Overview of the GAIN-Europe Curriculum

GAIN-Europe (En**GA**ging an Inter-Disciplinary Team for **NSCLC** [non–small cell lung cancer] Diagnosis, Personalized Assessment, and Treatment) is an educational curriculum designed to improve the knowledge, performance, and competence of European physicians involved in assessing and managing NSCLC. Educational activities address clinical-practice gaps and barriers to achieving optimal care for patients with NSCLC. In addition, GAIN-Europe provides physicians with the resources needed to disseminate the NSCLC curriculum among their own local colleagues.

GAIN-Europe is a collaboration of the American College of Chest Physicians (CHEST), the American Society for Clinical Pathology (ASCP), and The France Foundation. The components of the GAIN-Europe curriculum are depicted below, in **Figure 1**.



Figure 1: Components of the GAIN-Europe Summit Curriculum. SEPAR (Sociedad Española de Neumología y Cirugía Torácica) indicates the Spanish Society for Pulmonology and Thoracic Surgery.

This report highlights the program outcomes of the GAIN-Europe educational curriculum.

## Overall Goals and Objectives

The GAIN-Europe curriculum supports the improvement of diagnosis and treatment of NSCLC because this disease is contextually relevant in European countries and healthcare systems. To this end, overall project goals include:

- To improve the knowledge/skills, competence, and performance of physicians involved in the assessment and management of NSCLC
- To increase the impact of the GAIN-Europe educational program on physician practice and patient care
- To ensure the long-term sustainability of the GAIN-Europe educational program

Specific learning objectives address evidence-based NSCLC practice gaps. The following objectives guided the development of the GAIN-Europe Summit content and evaluation tools:

- To define the optimal diagnostic strategies for patients with lung masses
- To determine cost-effective strategies for staging the mediastinum in suspected or confirmed NSCLC
- To justify the use of new NSCLC classification systems based on small-volume histology and cytology specimens
- To describe the rationale for using molecular markers in targeted NSCLC therapy, to describe specific targetable molecular pathways in NSCLC, and to identify specific predictors of response or resistance to targeted NSCLC therapy and chemotherapy
- To identify and apply optimal practices for acquisition and processing of small-volume specimens for lung-cancer diagnosis and subsequent management; to mention the assays that are currently used for clinically relevant molecular analysis
- To outline the function of a multidisciplinary lung-cancer tissue-management team regarding diagnosis and treatment of lung cancer, communication, and patient-centric care

The Train-the-Trainer curriculum contains additional learning objectives related to the dissemination of the GAIN-Europe curriculum. By the conclusion of participation in the Train-the-Trainer program, participants will be able to:

- Practice interactive teaching techniques
- Incorporate assessment tools into training programs
- Learn about various methods of adult learning
- Demonstrate the ability to organize structured, learner-centric training programs

The GAIN-Europe curriculum addresses these learning objectives by using a variety of instructional strategies.



## Executive Committee

An Executive Committee, chaired by Dr. Eric Edell of the Mayo Clinic and co-chaired by Dr. Septimiu Murgu of The University of Chicago Medicine, guided the content and educational format of the GAIN-Europe curriculum. The Executive Committee was also responsible for developing the questions used on the Lung Cancer Educator Examination, with help from Applied Measurement Professionals (AMPs). (See **Appendix A** for Executive Committee.)

## Collaborators

GAIN-Europe was developed and implemented based on collaboration between three organizations. These organizations and their primary project responsibilities are as follows:

### **American College of Chest Physicians (CHEST)**

- Oversight of curriculum
- Organization and management of Executive Committee
- Design and management of pulmonology simulation equipment and other hands-on tools
- Oversight and development of Lung Cancer Educator Certification Examination

### **American Society for Clinical Pathology (ASCP)**

- Design of pathology content
- Management of pathology breakout sessions
- Development of systems-based survey
- Collection and analysis of outcomes data

### **The France Foundation (TFF)**

- Collaborator management
- Organization and management of Executive Committee
- Organization, management, and implementation of Summits

## Additional Contributors

Along with the grant collaborators, there were also two additional contributing organizations that provided supplemental expertise in continuing medical education curriculum and certification test development.

### **Alliance for Continuing Education in the Health Professions**

Assistance with designing the list of targeted learner competencies was provided by the Alliance for Continuing Education in the Healthcare Professions (ACeHP) Foundation. This assistance included:

- Ensuring the integration of the Alliance's revised learning competencies into the GAIN-Europe curriculum, including Summits and the Train the Trainer program, as it relates to the interdisciplinary care of patients with NSCLC

- Reviewing the GAIN-Europe assessment and evaluation tools to assess their consistency with the outcome levels designed by Donald Moore, including an assessment of the general logic model that links measurement tools, level of outcomes, and data interpretation

### **Applied Measurement Professionals**

Applied Measurement Professionals, Inc. (AMP) provides “certification organizations, governmental agencies, associations, and private industry with psychometric consultation, testing and measurement, association management and publishing services that meet the highest professional and ethical standards, tailor these services to fulfill the unique requirements of each client; and personalize the delivery of these services by providing innovative and accessible professional and managerial staffs serving client organizations throughout all phases of the program.”<sup>1</sup>

AMP supported the development and calibration of the Lung Cancer Educator Examination for the GAIN-Europe program.

- Examination design working sessions with the GAIN-Europe Executive Committee
- Post-exam calibration to set examination passing score;

### **Summit Sites**

Twelve GAIN-Europe summits were conducted from February 24, 2014- November 22, 2014. Host sites were selected for GAIN-Europe Summits based on regional prevalence of lung cancer (**Appendix C**). **Figure 2** shows the locations and dates of the GAIN-Europe Summits.

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<sup>1</sup> About Applied Measurement Professionals. Applied Measurement Professionals. <https://www.goamp.com/Pages/About-AMP.aspx>. Accessed February 20, 2015.

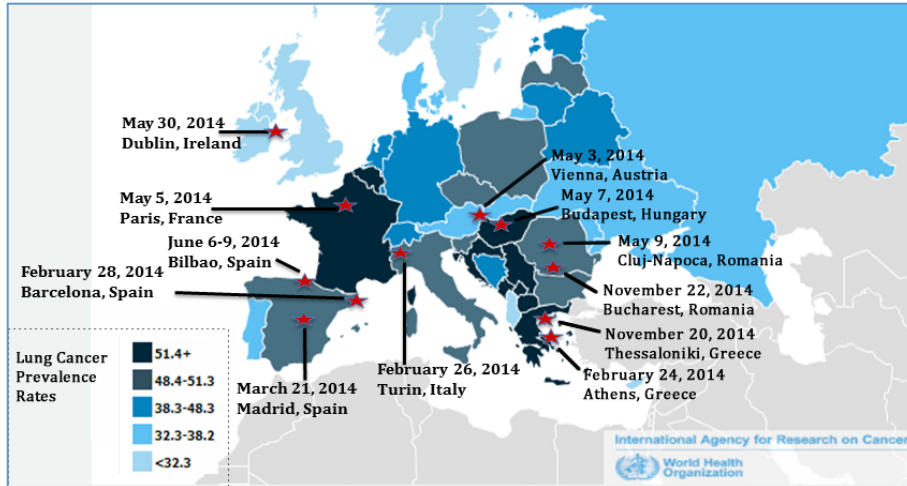


Figure 2: Location and Dates of GAIN-Europe Summits

Local faculty promoted learner attendance at each summit site. Two to 3 members of the Executive Committee traveled to each summit to provide consistent oversight of the program. Additional local faculty members were recruited by the European local Chairperson to assist with the breakout sessions and PBLs. (A full-listing of faculty from each summit site is located in Appendix C.)

## II. Instructional Design

Lung cancer is the most common type of cancer world-wide, resulting in 1,375,000 deaths annually. Five-year survival after a diagnosis of lung cancer is a dismal 16%. Regions with particularly high rates of lung cancer include Central-Eastern and Southern Europe, North America, and East Asia. In men, the highest annual lung-cancer-incidence rates are in Central and Eastern Europe and North America (65.7 per 100,000 and 61.2 per 100,000, respectively). In women, the lung-cancer-incidence rates are highest in North America and Northern Europe (35.6 per 100,000 and 21.3 per 100,000, respectively). In addition to smoking, family history and environmental factors also influence the risk of lung cancer.<sup>2</sup> Lung cancer is the leading cause of cancer death in men who reside in Europe; in the next several years, according to current estimates, it will overtake breast cancer to become the leading cause of cancer death in women who reside in Europe. NSCLC is the most common cell type, accounting for approximately 82% of all lung cancers, with an average 5-year survival rate of approximately 15%, despite current diagnostic and therapeutic efforts.<sup>3,4,5</sup> New models of targeted therapies and personalized care are being developed; however, their use is impeded by gaps in knowledge and practice related to anatomic staging and assessment of genetic molecular markers of specific cancers. The GAIN-Europe program provided continuing medical education for diagnosing, staging, and treating lung cancer-- specifically NSCLC-- among healthcare providers.

### Target Audience

The GAIN-Europe curriculum targeted healthcare professionals involved in lung cancer management and treatment. Identified target audiences for the program included:

- Academic and community pulmonologists/ respirologists
- Thoracic surgeons
- Pathologists
- Medical oncologists
- Allied healthcare professionals

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<sup>2</sup> Alberg AJ, Brock MV, Ford JG, Samet JM, Spivack SD. *Diagnosis and Management of Lung Cancer* 3rd ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines. *CHEST*. 2013;143(suppl 5):e1S-e29S.

<sup>3</sup> Montesinos J, Bare M, Dalmau E, et al. The changing pattern of non-small cell lung cancer between the 90th and 2000th decades. *Open Respir Med J*. 2011;5:24-30.

<sup>4</sup> Lung cancer survival statistics. Cancer Research UK Web site. <http://www.cancerresearchuk.org/cancer-info/cancerstats/types/lung/survival/lung-cancer-survival-statistics#one>. Accessed January 26, 2015.

<sup>5</sup> American Cancer Society. Global cancer facts and figures. 2011. <http://www.cancer.org/acs/groups/content/@epidemiologysurveillance/documents/document/acspc-027766.pdf>. Accessed January 26, 2015.

## **Summit Curriculum Development**

A beta version of the summit attended by Executive Committee members was held in January 2014. Based on faculty and staff experience and learner feedback from the beta summit, refinements were made to the breakout sessions and PBL session before the first European summit. Executive summaries of the GAIN-Europe summits were translated into the local language(s) of each Summit site visited, and these translated versions were provided to all attendees.

## **Faculty Development**

Faculty members attended an orientation session moderated by an Executive Committee member the day before the each Summit. The agenda for each Summit and faculty roles at the Summit were reviewed, and updates were made to the tumor-board slides to fit the needs of the local healthcare community. Based on the program instructional design, the instructional role of the faculty during the program was:

- To facilitate participants' questions concerning their cases/assignments but not lead any discussions
- To ensure that participants stay on track with the case and not stray from case discussion
- To create a learning environment that encourages open dialogue and discussion
- To allow participants to come to their own conclusions based on their discussions, rather than giving hints or clues to guide them
- To complete an assessment checklist concerning group communication

At this session, faculty were also briefed on educational procedures for appropriately facilitating the breakout and PBL sessions based on their instructional role. Faculty members were also assigned to their PBL discussion groups during this session.

## **Summit Content**

The primary educational intervention of GAIN-Europe was a 6-hour highly interactive live meeting focused on enhancing cross-disciplinary collaboration among physicians for effective NSCLC diagnosis, assessment, and treatment. The live education featured a flipped classroom with on-line pre-work, hands-on breakout sessions, and an interactive problem-based learning case featuring simulation of a multidisciplinary tumor board. A sample of the Summit Agenda is provided below:

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## Summit Agenda

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8:30–9:00 AM	Registration & Breakfast
9:01–9:15 AM	Welcome, Introductions, & Summit Overview
9:16–10:00 AM	Tumor-Board Presentation/Discussion of Cases
10:01–10:15 AM	Break
10:16–11:15 AM	Breakout Session #1: Mediastinal Anatomy Breakout Session #2: 15 Steps of EBUS [Endobronchial Ultrasound] Breakout Session #3: Slide Preparation Breakout Session #4: Slide Analysis
11:16 AM–12:15 PM	Breakout Session #1: Mediastinal Anatomy Breakout Session #2: 15 Steps of EBUS Breakout Session #3: Slide Preparation Breakout Session #4: Slide Analysis
12:16–1:00 PM	Lunch
1:01–2:00 PM	PBL [Problem-Based Learning] Workgroup Discussion & Presentation Preparation
2:01–3:00 PM	PBL Presentations from Workgroups/Q&A
3:01–3:15 PM	Summit Wrap-up

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### Pre-work

A “flipped classroom” model was implemented for the GAIN-Europe Summits. This model required learners to go online before each GAIN Summit to learn new content by viewing e-lectures, PowerPoint presentations, and other materials on their own Internet-enabled devices. As a result, instructors could focus classroom time on applying the concepts learned in the pre-course material, through simulation of real-life medical techniques and cases. Thus, faculty could offer more personalized guidance and interact with participants, rather than lecturing. One week before each scheduled summit, participants were asked to complete the following pre-class work via the CHEST Learning Management System:

- Demographics survey
- Systems survey
- Knowledge pre-test

- Viewing four didactic lectures:
  - “Tumor Biomarkers and Targeted Therapy for Non–Small Cell Lung Cancer”
  - “Specimen Collection and Assays for Molecular Targets: Challenges for an Interdisciplinary Lung-Cancer Team”
  - “Mediastinal Staging”
  - “Barriers to Pathology”

### **At the Summit**

Upon arriving at the summit, attendees were assigned to groups based on specialty. Each group included members who were pulmonologists/thoracic surgeons, pathologists, and oncologists. The summit began with a mock tumor board modeling session conducted by the faculty. A patient case was presented and discussed in the context of a multidisciplinary lung-cancer-management team. Questions were posed to the team of learners throughout the presentation, utilizing an audience-participation system (ARS) moderated by recognized experts. The use of ARS allowed anonymous individual responses to instructor prompts. The displayed responses allow faculty to gauge both group and individual learning needs. It also provided an opportunity for faculty and learners to clarify uncertainty and disagreements.

Learners then moved into one of four rotating small-group breakout sessions that emphasized gaining hands-on experience relevant to:

- Mediastinal staging
- Endobronchial ultrasound–guided transbronchial needle aspiration (EBUS-TBNA) specimen retrieval and processing techniques
- Quality and quantity of acquired small specimens
- Cytohistologic and downstream molecular analysis

The concluding exercise was a problem-based (PBL) learning session with the participants working in small multidisciplinary teams to develop optimal diagnostic and management strategies for patients with advanced NSCLC. These PBL exercises were based on the 4-box conceptual approach used in pulmonology for “thinking-through” a patient-based clinical simulation scenarios. Feedback was provided immediately after the activity both by discussing the presentations within the entire group and by applying specifically designed assessment tools based on this conceptual model (Refer to **Figure 3: Four-box Approach for NSCLC Assessment**).

### **Description of Tumor Board**

Learners divided into multidisciplinary groups in which they took part in a mock tumor-board session. The session began with a patient case presented and discussed in the context of a

multidisciplinary lung-cancer-management team. Questions were posed to the attendees throughout, using an audience-participation system moderated by recognized experts in NSCLC. Faculty encouraged additional comments and questions from the attendees.

#### **Description of Four Breakout Sessions**

Learners divided into multidisciplinary breakout groups and rotated through the four breakout sessions, led by Executive Committee and local European faculty. The breakout sessions were designed to be hands-on and focused on team interactions. The next several pages of this report (pp.16-21) detail the Summit learning activities.



## Breakout Session 1: Mediastinal Anatomy

### Learning Objectives:

**At the conclusion of this breakout session, participants will be able to:**

- Define the correlations between computed tomography (CT) scanning planes and EBUS images for mediastinal and hilar lymph nodes, based on the revised International Association for the Study of Lung Cancer (IASLC) system
- Integrate CT data with EBUS findings for planning EBUS-TBNA
- Recognize the surrounding structures for a particular hilar or mediastinal lymph node

### Tools:

1. Video illustrating EBUS patterns for lymph nodes
2. Video illustrating the EBUS and CT images correlation
3. Anatomy flashcards
4. Handouts (See Appendix J)

### Steps:

1. Attendees watched two short videos on the EBUS lymph-node map and EBUS-CT-Bronchoscopy correlation
2. Attendees played an anatomy flashcard game with the other members of the breakout group



Faculty members provide immediate feedback to attendees during a flashcard exercise.

## Breakout Session 2: 15 Steps of EBUS

### Learning Objectives:

**At the conclusion of this session, participants will be able to:**

- Demonstrate a stepwise approach to the EBUS-TBNA [endobronchial ultrasound-guided transbronchial needle aspiration] procedure
- Examine a stepwise approach to the EBUS-TBNA procedures.

### Tools:

1. Bronchoscopy task-trainer tool (developed by the CHEST simulation team)
2. 15-step Checklist Handout (See Appendix J)

### Steps:

Each attendee practiced using the task-trainer tool, alone and with assistance from team members.



**Faculty observed and provided feedback and guidance to attendees performing the 15-step EBUS-TBNA process. Attendees also assessed and provided feedback to each other using the 15-step checklist .**

## Breakout Session 3: Slide Preparation

### Learning Objectives:

**At the conclusion of this breakout session, participants will be able to:**

- Demonstrate correct specimen placement on the slides provided
- Demonstrate two correct slide-preparation techniques
- Assign the specific specimen type—cell block, smears—to the appropriate analytical modality (immunohistochemistry, molecular analysis)

### Tools:

1. Video about smear preparation techniques that involve using glass slides, swabs of materials consistent with tissue consistency (i.e. toothpaste, cottage cheese, etc.), and rubbing alcohol
2. Handouts (See Appendix J)

### Steps:

1. Attendees watched a short video about smear preparation.
2. Attendees moved to tables to practice performing slide preparation.
3. While performing slide preparation, different example specimen images were projected onto the screen. Attendees then interpreted the adequacy of the sample and also pointed out cell types seen on screen.



Faculty members observed attendees' performance of specimen placement on slides and provide immediate feedback.

## Breakout Session 4: Slide Analysis

### Learning Objectives:

**At the conclusion of this breakout session, participants will be able to:**

- Recognize the relevance of histologic subtypes of NSCLC
- Apply biomarker tests to the diagnosis and monitoring of patients with NSCLC recurrence and disease progression
- Identify mutations associated with NSCLC, to guide proper use of biomarker tests and targeted therapies to personalize care for patients with NSCLC

### Tools:

1. Case examples
2. Sample slide images
3. Handouts (See Appendix J)

### Steps:

Faculty provided case examples and example slide images for the attendees to analyze.



Faculty encouraged interaction by posing questions to attendees, asking them to analyze slide content, and providing simultaneous feedback.

## PBL Workgroup Discussion & Presentation Preparation

**Goal:** To encourage teamwork in diagnosis and management of NSCLC-related clinical problems

**Learning Objectives Addressed During the PBL Session:**

- To compare/contrast ideas and strategies for diagnosis
- To create patient-care strategies and treatment plan based on the case studied
- To enhance communication skills among medical professionals from different specialties

**Tools:**

1. Problem-Based Scenarios
2. PowerPoint Templates
3. Problem-Based Learning (PBL) Assessment Tools

**Steps:**

Participants were assigned to small groups (4-6 people); group members faced each other around a round table, to encourage enhanced communication. The small groups were carefully organized to include a mix of pulmonologists, pathologists, and others in attendance. The groups had 60 minutes to each participate in a tumor-board experience using one of the three real-life case descriptions provided. Participants were asked to create a PowerPoint presentation describing their tumor board’s decisions and recommendations, using the following four-box approach:

**Figure 4: Four-box Approach for NSCLC Assessment**

<p style="text-align: center;"><b>Initial Evaluation</b></p> <ol style="list-style-type: none"> <li>1. Physical examination, complementary tests, and functional-status assessment</li> <li>2. Patient’s significant co-morbidities</li> <li>3. Patient’s support system (including family)</li> <li>4. Patient preferences and expectations (including those of family)</li> </ol>	<p style="text-align: center;"><b>Procedural Strategies</b></p> <ol style="list-style-type: none"> <li>1. Indications, contraindications, and expected results</li> <li>2. Operator and team experience and expertise</li> <li>3. Risk-benefit analysis and therapeutic alternatives</li> <li>4. Respect for persons (informed consent)</li> </ol>
<p style="text-align: center;"><b>Procedural Techniques and Results</b></p> <ol style="list-style-type: none"> <li>1. Anesthesia and other perioperative care</li> <li>2. Techniques and instrumentation</li> <li>3. Anatomic dangers and other risks</li> <li>4. Results and procedure-related complications</li> </ol>	<p style="text-align: center;"><b>Long-Term Management Plan</b></p> <ol style="list-style-type: none"> <li>1. Outcome assessment</li> <li>2. Follow-up tests, visits, and procedures</li> <li>3. Referrals to medical, surgical, or palliative/end-of-life subspecialty care</li> <li>4. Quality improvement and team evaluation of clinical encounter</li> </ol>

Teams had the option to address one or more issues in greater depth and were required to justify their opinions using peer-reviewed literature and selected references. Faculty acted as facilitator to guide participants in their discussion, and assessed quality of discussion communications using participant rubrics. After preparing the case, a representative from each group presented the group's case to all participants. Presentations were assessed by all faculty.



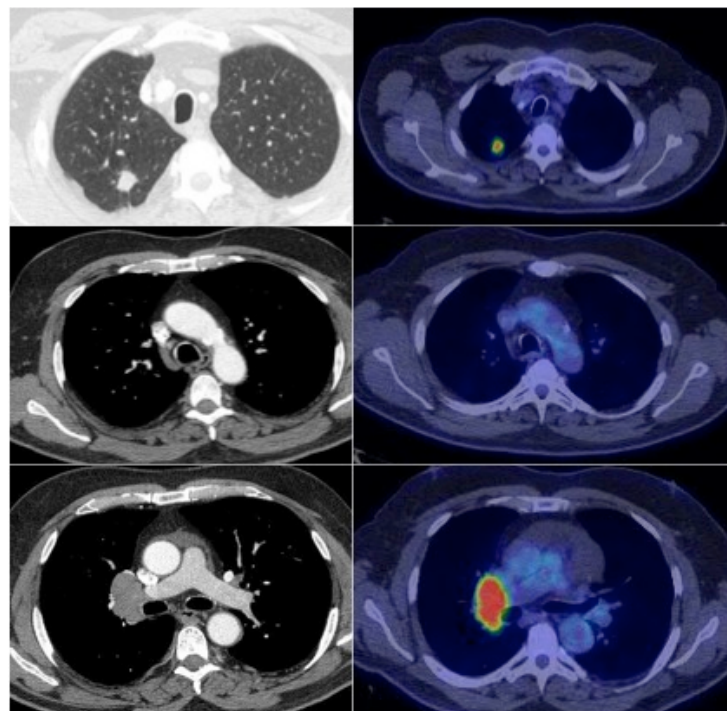
**Participants worked with colleagues and faculty to discuss and develop their PBL Case presentations in small groups.**



**Faculty provided case feedback to participants during their large-group PBL Case presentations.**

### Problem-Based Learning: Case Scenario 1

Mr. AA is a 67-year-old never-smoker who presented to his primary-care physician complaining of cough of several weeks' duration. He had no dyspnea or other symptoms. His pulmonary function testing was relevant for FEV<sub>1</sub>, at 2.68 L, his DLCO, 78%. He works as a mechanic in a body shop and states he does get exposed to "fumes." Chest radiograph and subsequent chest CT and integrated PET-CT are shown below.



Additional case scenarios can be found in **Appendix B**.

### **After the summit**

At the completion of the summit, attendees were provided with NSCLC resources including articles and e-learning cases for individual study. Attendees were also asked to complete a knowledge post-test, course evaluation, and satisfaction survey. Furthermore, GAIN-Europe participants were invited and encouraged to participate in the GAIN-Europe Train the Trainer program.

### **GAIN-Europe Train- the- Trainer Program**

Two Train-the-Trainer sessions were held for participants who had successfully completed the GAIN-Europe Summits. The intent of the Train-the-Trainer summits was to provide participants with the knowledge and tools to host one or more GAIN-Europe summits in their own communities. These live day long training sessions, held in Bilbao, Spain and Thessaloniki, Greece, focused on the instructional design and curriculum models for the GAIN-Europe program. At the conclusion of each Train-the-Trainer program, participants were asked to complete an examination to obtain certification as a Lung Cancer Educator. The Alliance for Continuing Education in the Health Professions Foundation provided experts to help in the curriculum development for the Train-the-Trainer. The Lung Cancer Educator exam was developed in conjunction with Applied Measurement Professionals (AMP) , Inc. who provided exam development and psychometric-based scoring services. Participants who completed the Train-the-Trainer program and obtained a passing score on the Lung Cancer Educator exam are considered to be certified to implement GAIN-Europe Summits in their own communities.

### **Outcomes Assessment**

A variety of tools were used to evaluate the Summits. Some of these tools were specific to the individual participant(s) and some were specific to the teams working together during the PBL session. A summary of the tools may be found in **Appendix D**. A full description of the project outcomes is provided in Section III of this report.

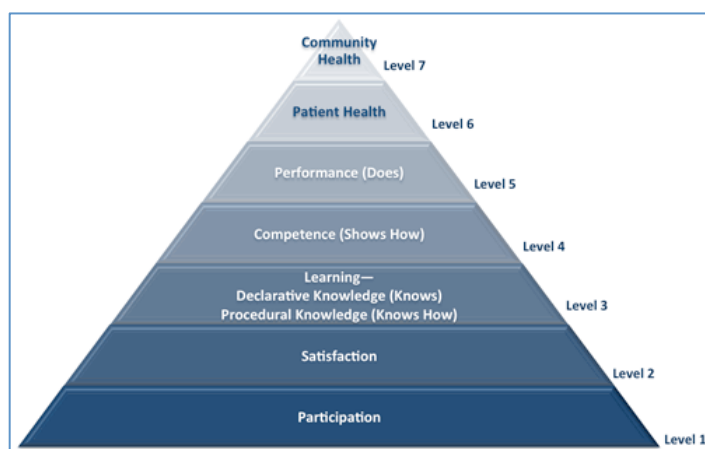


### III. Outcomes Summary: General Results

The GAIN-Europe Logic Model (**Appendix E**) provides a visual description of the program’s goals, interventions, evaluation, outcomes, and impact. This evaluation report will focus on short- and intermediate-term outcomes, which are measurable within six months of the conclusion of the intervention. The relationship between program impact, goals, and outcomes is depicted in the GAIN-Europe Logic Model Outcomes Chart (**Appendix F**).

#### Evaluation Model

This GAIN-Europe evaluation uses the Moore outcomes levels for continuing medical education. The Moore evaluation model, shown in **Figure 3**, depicts increasingly broad outcomes/impacts of continuing medical education (CME) programs, starting with participation and progressing to community health.



**Figure 3. Levels of Outcomes for Continuing Medical Education, Developed by Donald Moore**

To evaluate the GAIN-Europe program, the Moore evaluation levels were applied across the various interventions of the GAIN education initiative. Certain activities were measured at distinct levels, using several different evaluation tools developed for the initiative. The indicators and data that have been collected provide programmatic results from Moore’s Level 1: Participation through Level 4: Competence. Performance (Level 5) data were collected for 8 physicians who completed the CheckPath and AQUIRE performance improvement products, but there was not sufficient data to enable performance comparisons.

#### Structure of the Results Section

As described in the GAIN-Europe Logic Model (**Appendix E**), the primary program goal of GAIN-Europe is to “support the improvement of NSCLC diagnosis and treatment as it is contextually relevant in European countries and healthcare systems.” To this end, the three program objectives of the GAIN-Europe program were to:

- Increase physician knowledge, skills, and competence in NSCLC management and assessment
- Increase the impact of the GAIN-Europe educational program on physician practice and patient care
- Ensure the long-term sustainability of the GAIN-Europe educational program

A chart describing the relationship between program goals, educational objectives, evaluation levels, program interventions, and data tools/instruments is offered in **Appendix G: Data Collection Tools and Interventions**. This document describes each of the three program goals and the evaluation tools developed and utilized to assess the GAIN-Europe program.

The GAIN-Europe program is a complex medical educational program implemented to achieve several goals and utilizes diverse educational interventions/activities to achieve them. As components of this complex educational program, individual GAIN-Europe interventions have been assessed at distinct levels of the Moore model, based on their intended role in the program. For example, the GAIN Satisfaction Survey data provide information about attendee satisfaction with the Summit program (Level 2). Also, the pre-test and post-test analysis provides information about participant knowledge and skill level (Level 3) and the breakout and PBL sessions provide insights into physician competence (Level 4). Although Level 5 activities were implemented, they did not provide adequate data for reporting performance.

In the remainder of this section, relevant outcomes for the GAIN-Europe program are organized by project goals and, where applicable, by the appropriate Moore outcome level for the program intervention. The GAIN-Europe outcome indicators and program data are current as of January 14, 2015, unless otherwise indicated.

### **Evaluation Results: Outcomes Levels 1 Through 4**

This evaluation of the GAIN-Europe program presents an assessment of progress made toward the three main educational goals of the program. The main program intervention of this project was the *GAIN-Europe Summit series*. A beta test of the GAIN curriculum was conducted in January 2014 in Chicago, IL with United States–based physicians. This test allowed for refining and updating of the breakout sessions before the series was implemented in Europe. The GAIN-Europe Summit intervention consists of three instructional components: the GAIN-Europe pre-summit coursework and assessments, interactive activities at the GAIN-Europe Summits, and the GAIN-Europe post-summit coursework and assessments.

**Goal 1: Increase physician knowledge, skills, and competence in NSCLC assessment and management**

This section presents information on outcomes related to GAIN-Europe Goal 1 ascertained using data collected from the live program summits and pre- and post-summit assessments. Table 1 provides completion figures for each of the pre-summit and post-summit assessment tools.

**Table 1: Pre- and Post-Summit Assessment Completion<sup>6</sup> by Summit Location**

Summit Location	No. of Summit Attendees Who Completed Assessment					
	Pre-Summit			Post-Summit		
	Knowledge Pre-Test	Demographics Survey	Systems Survey	Knowledge Post-Test	Satisfaction/Confidence Survey	Course Evaluation
Athens, Greece	22	13	12	15	15	13
Turin, Italy	25	21	22	25	23	20
Barcelona, Spain	23	22	17	16	18	17
Madrid, Spain	10	8	5	6	4	5
Vienna, Austria	10	9	6	2	5	4
Paris, France	18	15	14	9	6	4
Budapest, Hungary	20	16	12	6	8	6
Cluj-Napoca, Romania	32	29	19	26	25	22
Dublin, Ireland	11	11	13	5	6	6
Bilbao, Spain	15	13	15	11	13	12
Bucharest, Romania	31	36	12	19	15	21
Thessaloniki, Greece	19	24	5	11	8	11
<b>Total</b>	<b>236</b>	<b>217</b>	<b>152</b>	<b>151</b>	<b>146</b>	<b>141</b>

<sup>6</sup> Count does not include assessments that were in progress at the time of data collection.

### Level 1: Participation

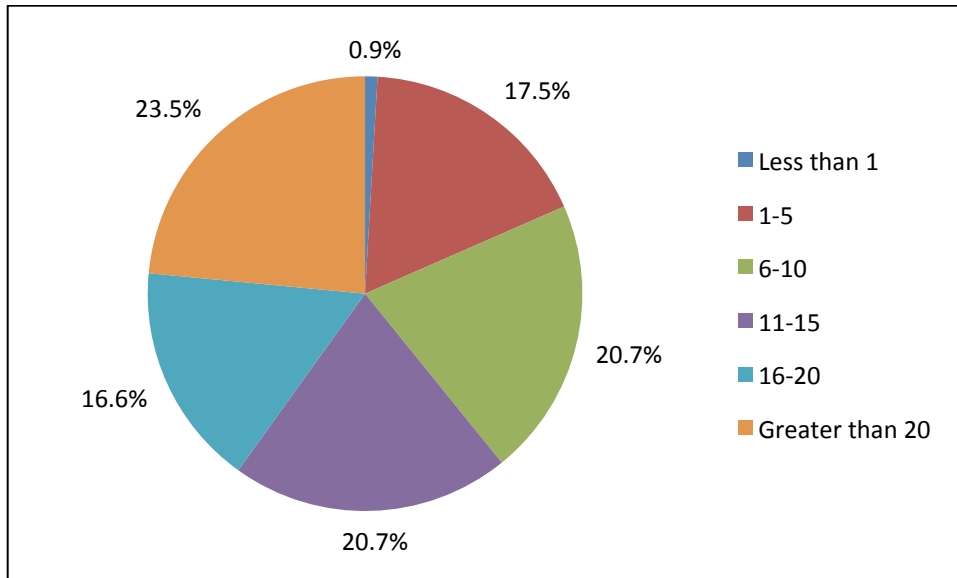
Twelve GAIN-Europe Summits were conducted from February 24, 2014, through November 22, 2014. Table 2 presents the dates, registrations, attendance, and number of persons claiming CME credit, as provided up to the present time for each summit location.

**Table 2: Gain Europe Summit Registration, Attendance, and CME Credits Claimed**

Summit Location	Summit Date, in 2014	Summit Registrants	Summit Participants	Persons Claiming CME Credit
Athens, Greece	February 24	31	30	10
Turin, Italy	February 26	31	26	0
Barcelona, Spain	February 28	25	24	6
Madrid, Spain– World Congress of CHEST Physicians (pulmonology conference)	March 21	11	9	1
Vienna, Austria	May 3	12	8	0
Paris, France	May 5	27	18	0
Budapest, Hungary	May 5	25	19	0
Cluj-Napoca, Romania	May 9	32	29	12
Dublin, Ireland	May 30	22	20	0
Bilbao, Spain–SEPAR (Spanish Society of Pulmonology and Thoracic Surgery)	June 6	28	16	4
Bucharest, Romania	November 22	34	34	20
Thessaloniki, Greece	November 20	30	20	13
<b>Total</b>	<b>February 2- November 22</b>	<b>308</b>	<b>253</b>	<b>66</b>

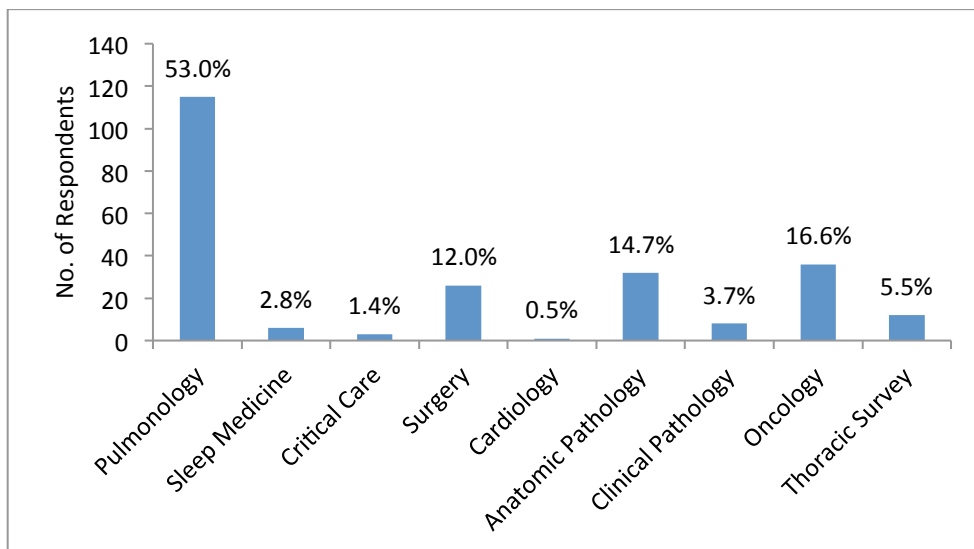
According to GAIN-Europe staff and faculty, the key factors influencing participation were the direct involvement of local faculty and the reputation of the lead faculty member(s). As many as 5.75 American Medical Association (AMA) Physician’s Recognition Award (PRA) Category 1 Credits were offered to physician participants who completed all their post-summit work. However, most European participants did not claim these credits.

Figure 4 describes the participants’ self-reported number of years in practice.



**Figure 4. Reported Years in Practice (n=197)**

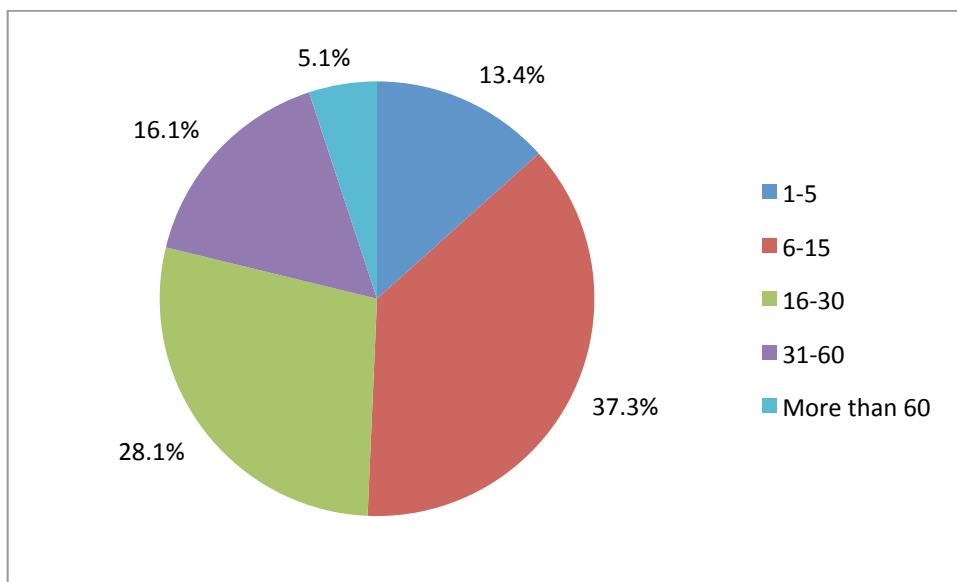
The largest group of GAIN-Europe participants (23.5%) reported more than 20 years in practice, and 20.7% of participants each reported between 6 and 10 years and 11 to 15 years in practice. In addition, the GAIN-Europe Demographic Survey asked respondents to identify their medical specialty/practice area. **Figure 5** shows the medical specialties reported by the respondents.



**Figure 5. Medical Practice Area of GAIN-Europe Participants (n=217)**

Pulmonology (53.0%) and oncology (16.6%) were the most frequently cited specialties among the respondents, followed by anatomic pathology (14.7%) and thoracic surgery (5.5%).

GAIN-Europe participants were asked to disclose how many patients with lung cancer they treated per month. **Figure 6** shows those numbers.



**Figure 6. Patients with Lung Cancer Treated per Month by GAIN-Europe Participants (n=217)**

Most GAIN-Europe participants reported that they managed the treatment of a large number each month of patients with lung cancer. Approximately 37% of participants reported that they manage between 6 and 15 such patients per month; an additional 28.1% reported managing between 16 and 30 such patients per month.

### Usefulness of GAIN-Europe Resource Materials

GAIN-Europe participants engaged in several education activities before the Summits. The participants indicated the usefulness of various GAIN-Europe resource materials in their current NSCLC practice. These materials were accessed in the CHEST Learning Management System. Table 3 details the responses of GAIN-Europe participants:

**Table 3: Usefulness Ratings Given by GAIN-Europe Summit Participants Regarding Resource Materials**

GAIN-Europe Resource Materials	Rating		No. of times accessed
	Percent indicating "somewhat useful" and "extremely useful"	Percent indicating "I did not utilize this resource in my practice."	
<b>ACCP 2013 LCIII Executive Summary</b>	89.3%	5.4%	Not available
<b>Clinical Lung Cancer 2013</b>	92.9%	5.4%	468
<b>Clinical Summary</b>	91.1%	7.1%	Not available

<b>GAIN-Europe Resource Materials</b>	<b>Rating</b>		<b>No. of times accessed</b>
<b>E-learning case: Tumor Biomarkers</b>	91.1%	1.8%	333
<b>E-learning case: Specimen Collection</b>	83.9%	5.4%	309
<b>E-learning case: Mediastinal Staging</b>	92.9%	1.8%	322
<b>E-learning case: Barriers to Pathology</b>	89.3%	3.6%	422
<b>CheckPath/ AQUIRE</b>	85.7%	5.4%	12

Overall, respondents found each resource material to be somewhat or extremely useful. The Clinical Lung Cancer 2013 resource and the E-Learning case on Mediastinal Staging received the highest ratings.

### **Level 2: Satisfaction**

Participant satisfaction with the GAIN-Europe Summit was assessed using the Course Evaluation Survey and the Satisfaction Survey. These assessments were administered through the CHEST online Learning Management System and completed by GAIN-Europe participants as a part of their post-Summit coursework and assessments. The Course Evaluation Survey was completed by 141 GAIN-Europe participants. The Satisfaction Survey was completed by 146 participants.

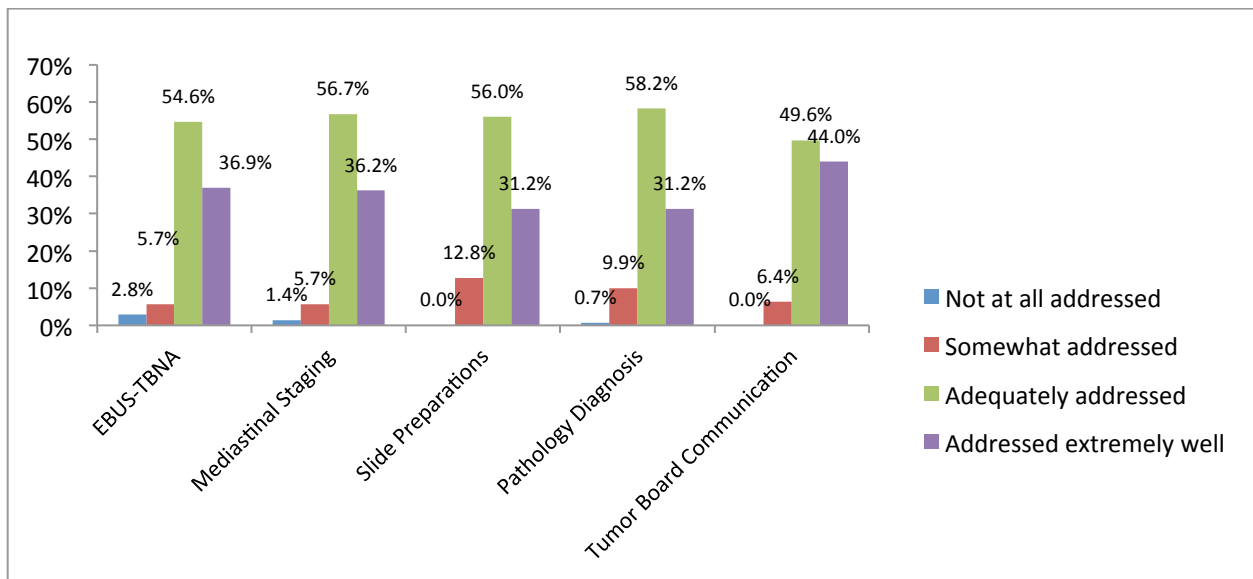
Overall, the participants expressed satisfaction with the GAIN-Europe summits. **Table 4** details the responses of Summit participants about their satisfaction with the Summits.

**Table 4.** Overall Satisfaction with the GAIN-Europe Summits (n=146)

<b>Satisfaction Statement</b>	<b>No. Participants Indicating Agreement</b>	<b>% of Participants Indicating Agreement</b>
<b>The summit met my educational needs.</b>	138	97.9%
<b>The summit matched my current scope of practice.</b>	140	99.3%
<b>The summit was scientifically sound and free from commercial bias.</b>	136	96.5%
<b>The course materials were useful.</b>	138	97.9%
<b>The faculty was effective in the delivery of content.</b>	140	99.3%

Summit participants were asked whether the instructional format was appropriate. Approximately half (44.0%) indicated that the instructional format was appropriate and that no changes were needed. Also, approximately half (48.9%) suggested that including more case-based presentations would improve the format, and 24.1% of participants suggested that additional hands-on instructional components would improve the summit format. Several participants suggested additional time for practice, particularly for TBUS-EBNA. Also, they were

asked if the Summit adequately addressed the major curriculum-content areas. **Figure 7** details participant responses to this inquiry.

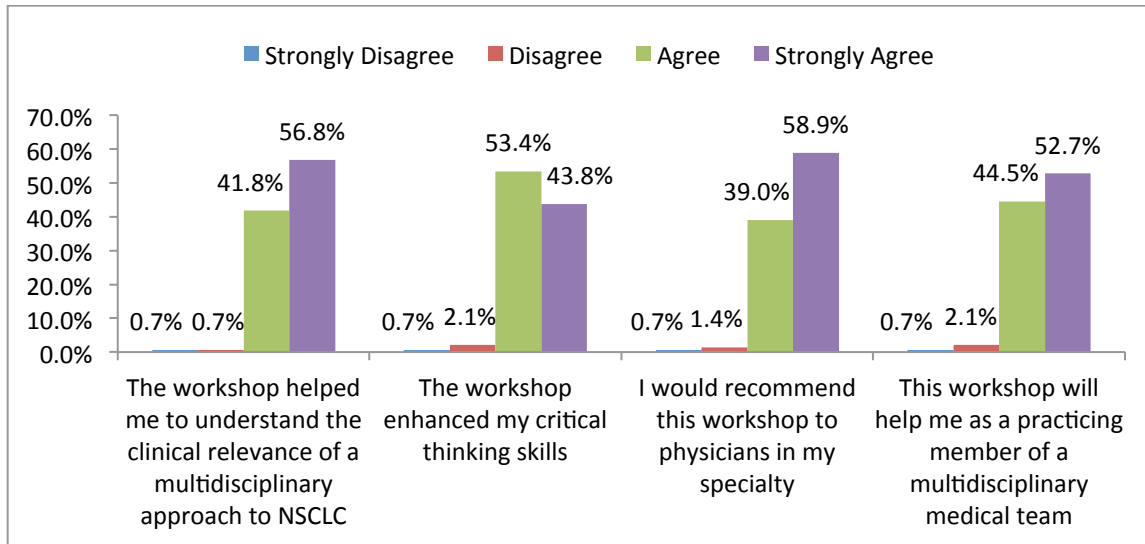


**Figure 7. Perceptions among Participants in GAIN-Europe Summit Components Regarding Adequacy of Presentation of Content Areas (n=141)**

Overall, participants felt that the content areas were addressed adequately to extremely well at the in-person summit. The content area of Slide Preparation received slightly lower ratings overall, which could have happened as a result of the large percentage of attendees who specialized in pulmonary and thoracic surgery, relative to pathologists and oncologists.

The GAIN-Europe Satisfaction Survey (n=146) assessed participants' perceptions of their overall experience and the benefits of the summit. This survey also includes an assessment of the multidisciplinary approach used during the workshop. **Figure 8** shows the percentage of participants who agreed with various statements regarding overall satisfaction with the workshop.





**Figure 8. Gain Europe Participant Satisfaction with Summits (n=146)**

Similar to the course-evaluation results, the overwhelming majority of the GAIN-Europe participants who completed the satisfaction survey agreed or strongly agreed that their experience at the summit would enhance their critical-thinking skills and multidisciplinary-team participation.

### Level 3: Declarative and Procedural Knowledge

To measure whether physician knowledge improved because of the GAIN-Europe program, the GAIN-Europe Summit pre-test and post-test were administered via the Learning Management System provided by CHEST; the results are shown in **Table 5**. Of 236 total attendees, 186 completed the pre-test<sup>7</sup> and 151 completed the post-test<sup>8</sup>. Among the participants who completed both the pre-test and post-test, the average score for completed pre-tests was 5.95 (SD=1.57) out of 10.00; the average score for completed post-tests was 7.14 (SD=1.76) out of 10.00, showing an improvement of 1.19. These results do not include the five participants whose score change exceeded two standard deviations (i.e. “Outliers”).

<sup>7</sup> Count does not include 6 pre-tests that were in progress.

<sup>8</sup> Count does not include 3 post-tests that were in progress.

**Table 5.** Matched Pre-Test and Post-Test Scores by Summit Location<sup>9</sup>

Summit Location	No. of Matched Pre-Test/Post-Tests <sup>10</sup>	No. of Summit Participants	Percentage of Attendees with Matched Tests
Athens, Greece	13	30	43.3%
Turin, Italy	10	26	38.5%
Barcelona, Spain	12	24	50.0%
Madrid, Spain–World Congress of CHEST Physicians (pulmonology conference)	6	9	66.7%
Paris, France	8	18	44.4%
Budapest, Hungary	6	19	31.5%
Cluj-Napoca, Romania	16	29	55.2%
Dublin, Ireland	5	20	25.0%
Bilbao, Spain–SEPAR (pulmonology conference)	10	16	62.5%
Bucharest, Romania	17	20	85.0%
Thessaloniki, Greece	11	34	32.4%
<b>Total</b>	<b>114</b>	<b>253</b>	<b>58.4%</b>

SEPAR (*Sociedad Española de Neumología y Cirugía Torácica*) indicates the Spanish Society for Pulmonology and Thoracic Surgery.

Across all GAIN-Europe Summits, 114 participants (58.4%) completed both the pre-test and post-test. The highest completion of pre-test/post-test pairs was noted in Bucharest, where 90.0% of attendees completed both tests. The lowest completion rates were in Dublin, where only 25% of participants completed both tests. .

Data for the pre- and post-test changes were averaged by location. **Table 5** shows the difference in mean pre-test and post-test scores by location.

**Table 6.** Change in Mean Pre-test and Post-test Scores by Location

Summit Location	No. of Participants	Average Pre-Test Score	Average Post-Test Score	Change in Scores
Athens, Greece	13	6.85	7.69	0.85
Turin, Italy	10	6.10	8.00	1.90

<sup>9</sup> One outlier was eliminated from Athens, Vienna, Cluj-Napoca, Bucharest, and Paris

<sup>10</sup> Some pre-test completers did not complete the post-test and some post-test completers did not complete the pre-test, resulting in n=127 matched pre- and post- tests.

Summit Location	No. of Participants	Average Pre-Test Score	Average Post-Test Score	Change in Scores
Barcelona, Spain	12	7.42	7.58	0.17
Madrid, Spain	6	5.83	7.17	1.33
Paris, France	8	5.63	6.75	1.13
Budapest, Hungary	6	4.83	8.17	3.33
Cluj-Napoca, Romania	16	5.63	6.43	0.81
Dublin, Ireland	5	5.00	6.20	1.20
Bilbao, Spain	10	5.70	7.40	1.70
Bucharest, Romania	17	5.00	6.00	1.00
Thessaloniki, Greece	11	6.64	7.91	1.27
<b>Total</b>	<b>114</b>	<b>5.95</b>	<b>7.14</b>	<b>1.19</b>

There was an overall increase in test scores and an increase by location for most summit locales. The results of a paired samples *t*-test for the pre-test and post-test are provided in **Table 6**.

**Table 6.** Significance Testing Results: Pre-test and Post-test Scores

Variable	Mean (of 10)	No.	Standard Deviation	Standard Error Mean
Pre-test	5.95	114	1.57	0.15
Post-test	7.14	114	1.76	0.18

The results showed a significant increase ( $t = -6.84$ ,  $df = 113$ ,  $P < 0.001$ ) between the overall pre-test and post-test scores. Due to the low number of matched tests for several Summit locations, analyses of the results by summit location are omitted herein.

An analysis of participant performance on the GAIN-EU post-test indicates that post-test items Q3 (40% answered incorrectly), Q6 (37% answered incorrectly), and Q9 (51% answered incorrectly) offer opportunities for additional education. See **Appendix I** for post-test question descriptions.

### **Problem-Based Learning (PBL) Assessments**

The purpose of the PBL Assessments was to evaluate the performance of physicians in the NSCLC Tumor Board Simulation Discussion and Case Presentation exercises during the GAIN-Europe Summit. Local and United States–based summit faculty members, all of whom had received specific training on the assessment protocols during the pre-Summit faculty-development meeting, facilitated all PBL Assessments.

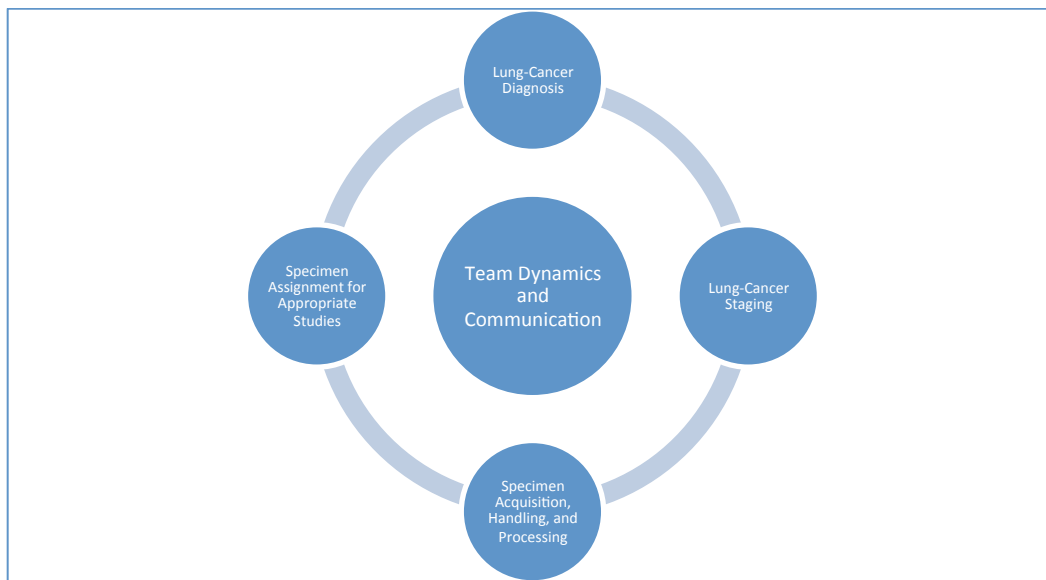
The PBL assessments were observational protocols based on two distinct conceptual models; these protocols were further modified to reflect the multidisciplinary team-based approach of the GAIN-Europe program. The first protocol, the Problem-Based Learning 5-Point Checklist, focused on attendee competencies as they related to the team-based learning objectives. This checklist was used by the faculty lead for each team to assess discussion and teamwork during the tumor-board simulation exercise as the teams each worked through and prepared their cases. The second observational protocol, Problem-Based Learning: A 5-Point Team Assessment Tool, utilized a modified version of the four-box practical approach format used by faculty to assess the case presentation by the team(s) to the entire group.

#### **PBL 5-Point Checklist: Tumor-Board Team Discussion**

The PBL 5-Point Checklist was based on the learning objectives for the GAIN-Europe program and the contents of the hands-on breakout sessions. The learning objectives for the GAIN-Europe Summit Breakout Sessions were modified into a conceptual tool for this assessment instrument. These learning objectives were assessed using the following metrics:

- 1) Lung-cancer-diagnosis strategies
- 2) Lung-cancer-staging strategies
- 3) Knowledge of pathology-specimen acquisition, handling, and processing
- 4) Knowledge of pathology-specimen assignment for cytological and histological diagnosis, molecular testing, and ancillary studies

To align with GAIN-Europe instructional design, an additional category of Team Communication was added to the assessments, for a total of five assessment categories. The PBL 5-Point Checklist conceptual model is outlined in **Figure 9**.



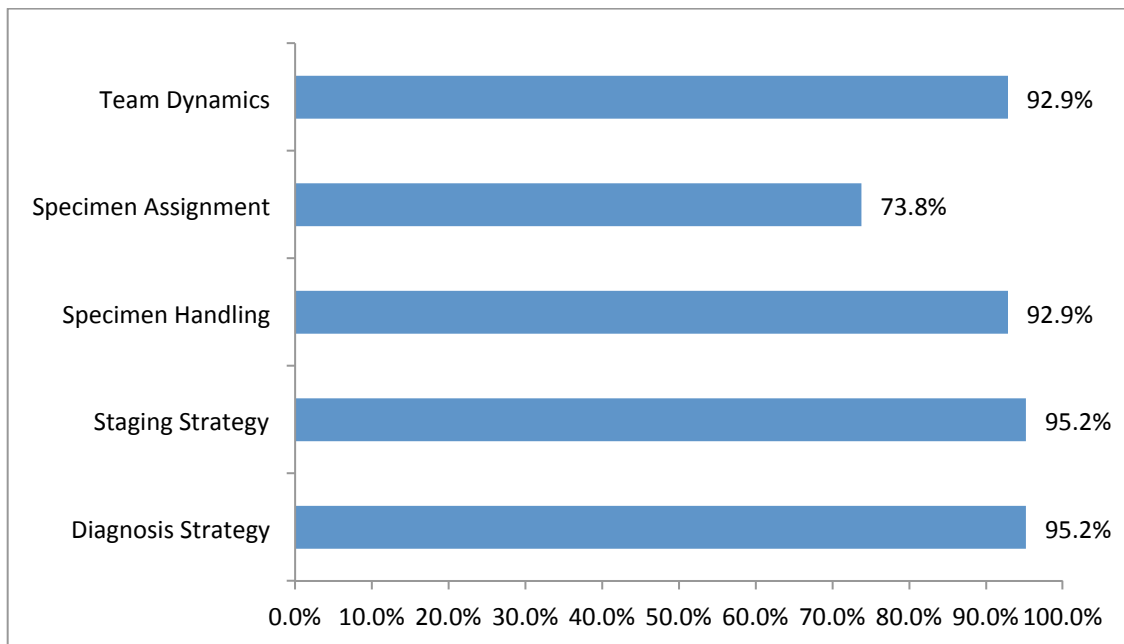
**Figure 9. PBL 5-Point-Checklist Conceptual Model**

A total of 42 PBL 5-Point Checklists were completed for the 40 teams participating in the GAIN-Europe PBL session. Multiple faculty members assessed each team in Dublin and Vienna (i.e., two faculty members completed a Checklist Assessment for each team in Vienna and three faculty members completed a Checklist Assessment for each team in Dublin). In addition, approximately 7.7% of the PBL checklist data was missing from the assessment forms.

For the PBL checklist, GAIN-Europe faculty members provided scores to each team in the program for each of the five areas of learning competency described in the checklist. In the initial sessions, faculty provided a score of 1 if they considered that the team demonstrated adequate evidence of the learning objective during their team tumor-board discussion, or a score of 0 if the discussion was inadequate for the subject area or there was no evidence of the objective presented during the team discussion. In the latter sessions, a 3-point rating scale was used to indicate whether the team demonstrated each objective completely, adequately, or inadequately. These ratings were converted to a binary value (0 or 1) to indicate whether the discussion adequately met the corresponding objective. The fact that the data were binary enabled the calculation of the number and percentage of objectives that were adequately met in each discussion. On average, the discussions adequately met 11.5 of the 16 or 17 objectives<sup>11</sup>. Furthermore, scores in each competency area were computed by adding the

<sup>11</sup> An objective was added for Bucharest and Thessaloniki.

number of objectives that were adequately met (or more than adequately met). **Figure 10** shows the percent of ratings for the five assessed areas of competency.



**Figure 10. PBL 5-Point Checklist Score by GAIN-Europe Competency Area: Percentage of Meeting Objectives Met**

The competency areas with the highest percentage of objectives that were adequately met (or more than adequately met) were diagnosis strategy and staging strategy (95.2% each), followed by specimen handling and team dynamics (92.9% each). Although the objectives for diagnosis strategies were highly attained, three sets of comments by faculty members indicated that costs and benefits associated with CT and PET scanning were not discussed. Two sets of faculty comments indicated a similar condition for staging strategies. For specimen handling, the faculty comments noted that “cell blood technique was uniformly recommended [for this case]” and “[there were] no issues on this item.” For team dynamics, one faculty member noted that “[the team] actively engages according to their training and expertise,” whereas another stated that “[the] discussion was very interesting and different [team] members participated actively.”

The lowest percentages were noted in the assessment category of specimen assignment for cytological and histological diagnosis, molecular testing, and ancillary studies. In this category, 73.8% of the teams showed evidence of adequate to high functioning. One faculty member noted “good discussion about differential diagnosis, total blood count, [or] lymphoma.” However, more frequently, faculty noted lack of discussion about differential diagnosis and inadequate consideration of factors such as “smoking status/histology.” Still other faculty noted

that the participants “didn’t pay attention to technical pathology procedures,” ... “[did not discuss] alternative diagnosis,” or “...[did not] identify cell block for diagnosis.”

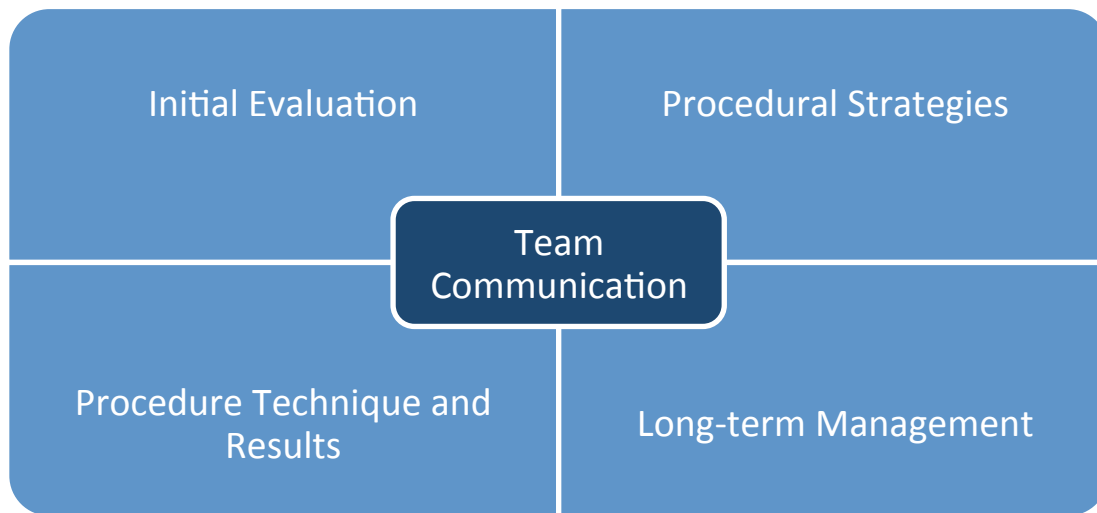
### PBL 5-Point Team-Assessment Tool

#### *Team-Assessment-Tool Conceptual Model*

The PBL 5-Point Team Assessment Tool was based on the four-part practical-format approach to case-based learning. Commonly used as an assessment strategy in pulmonology and thoracic-medicine training, this approach described the expected stages of progression of the PBL team discussion, including the following:

- 1) Initial evaluation
- 2) Procedural strategies
- 3) Procedural techniques and results
- 4) Long-term management

To align with GAIN-Europe instructional design, an additional category of Team Communication was added to the assessments, for a total of five assessment categories. The resulting conceptual model for the GAIN-Europe Team Assessment Tool is demonstrated in **Figure 11**.



**Figure 11. PBL 5-Point Team Assessment Model**

To date, a total of 231 PBL Team Assessments have been completed for the GAIN-Europe summits. **Table 7** shows the number of Team Assessments collected at each summit location.

**Table 7. PBL Team-Assessment Responses by Summit Location**

Summit Location	No. of Teams	No. of Returned Assessments Completed by GAIN Europe Faculty
Athens, Greece	7	42
Turin, Italy	5	23

Summit Location	No. of Teams	No. of Returned Assessments Completed by GAIN Europe Faculty
Barcelona, Spain	5	25 <sup>12</sup>
Madrid, Spain	2	13
Paris, France	4	27
Vienna, Austria	2	8
Budapest, Hungary	4	21
Cluj-Napoca, Romania	6	41
Dublin, Ireland	2	11
Bilbao, Spain	3	15
Bucharest, Romania	5	5
<b>Total<sup>13</sup></b>	<b>45</b>	<b>231</b>

Assessment tools were completed for 45 teams participating in the GAIN-Europe Team-Based Learning case presentations. However, approximately 5% of the PBL Team Assessment item data were missing across the completed assessment tools.

#### **Team-Assessment-Competence Scores**

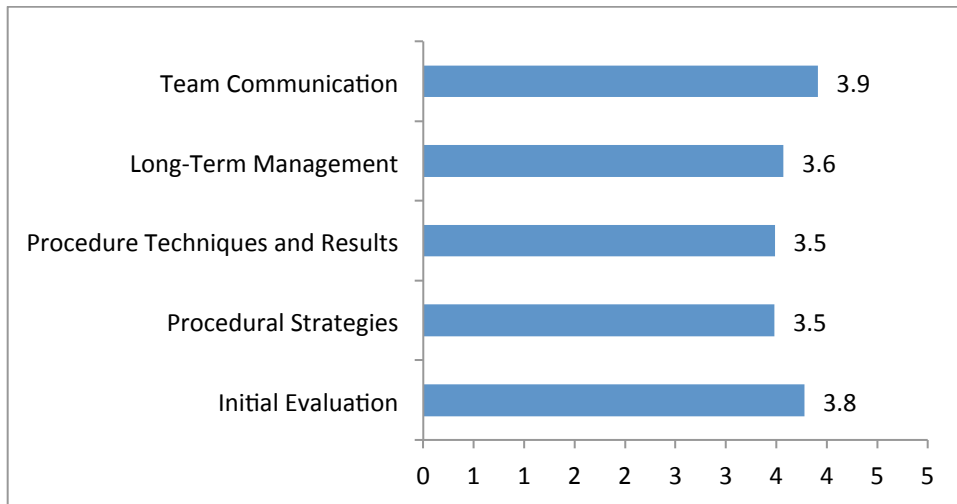
For the PBL team assessment, GAIN-Europe faculty provided scores to each team that presented a case for the five areas of learning competencies described in the checklist. Faculty members provided scores on a scale of 0 to 5, with 0 indicating lack of a given competency and 5 indicating an excellent demonstration of that competency. To analyze the tool, faculty members provided an overall assessment value based on their scores. Overall, faculty assigned an average score of 65.5 out of 100.0 points for all GAIN-Europe teams. An average rating on a 0-5 scale for each four-part-approach competency area is provided in **Figure 12**.

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<sup>12</sup> One survey was not included in the compiled data because of missing pages.

<sup>13</sup> Assessments were not returned from Thessaloniki.





**Figure 12. PBL Assessment Four-Box Approach Average Scores**

By assessment component, the highest average score of 3.9 of 5.0 was achieved for Team Communication. Faculty-member comments included “the presentations were in accordance with guidelines” and “great facilitation.” Still other faculty noted that the participants “functioned like an effective team.” The lowest average score (3.5 out of 5.0) was in the areas of Procedural Strategies and Procedural Techniques and Results. In Procedural Techniques, faculty noted that “there was unclear application in this area,” and “procedural techniques were not addressed [in the presentation].”

Overall, faculty members expressed support of the PBL and tumor-board simulation activities, indicating that the “[case] scenarios were fantastic” and lauding the “clear approach” taken by these activities. Other faculty noted that their teams took “different approaches” than expected and had a “great discussion” that had resulted in “improvement [in] knowledge about medical treatment.” Some faculty wrote that “informed consent,” as well as “support systems [and] the patient’s values and expectations,” should also be discussed during the activity.

**Goal 2: Increase the impact of the GAIN-Europe program on physician practice and patient care**

For the GAIN-Europe program, advancing patient care was inseparable from encouraging change in physician practice. Two GAIN-Europe program interventions were tied to the goal of increasing the impact of the GAIN-Europe educational program on physician practice and patient care. The first intervention, the GAIN-Europe Systems Survey, was conducted to understand the local context in which GAIN-Europe participants assess and care for patients with NSCLC. Problem-Based Intervention, the other presented intervention, is implemented in the second half of each GAIN-Europe Summit. This intervention encourages multidisciplinary

learning through the introduction of a problem-based tumor-board-simulation exercise. Two groups of data, corresponding with these two interventions, were presented as follows:

- 1) The Systems-Survey data provide information on the local context of the NSCLC program participants by presenting key indicators of physician performance compared with a peer group (Level 5).
- 2) The PBL Assessments—namely, the 5-point checklist and 5-point assessments—indicate physician competence in functioning as a member of a multidisciplinary NSCLC tumor-board team (Level 4). Together, these data provided baseline information on physician performance that may ultimately influence patient care, as shown in the GAIN-Europe Logic Model (**Appendix E**).

### **GAIN-Europe Systems Survey**

The purpose of the GAIN-Europe system survey is to provide just-in-time data to help participants:

- 1) Define the local context in which European clinicians who treat NSCLC operate
- 2) Assess short- and intermediate-term changes in clinician practice during the GAIN-Europe program
- 3) Compare the performance of clinicians who complete the GAIN-Europe program on key NSCLC indicators.

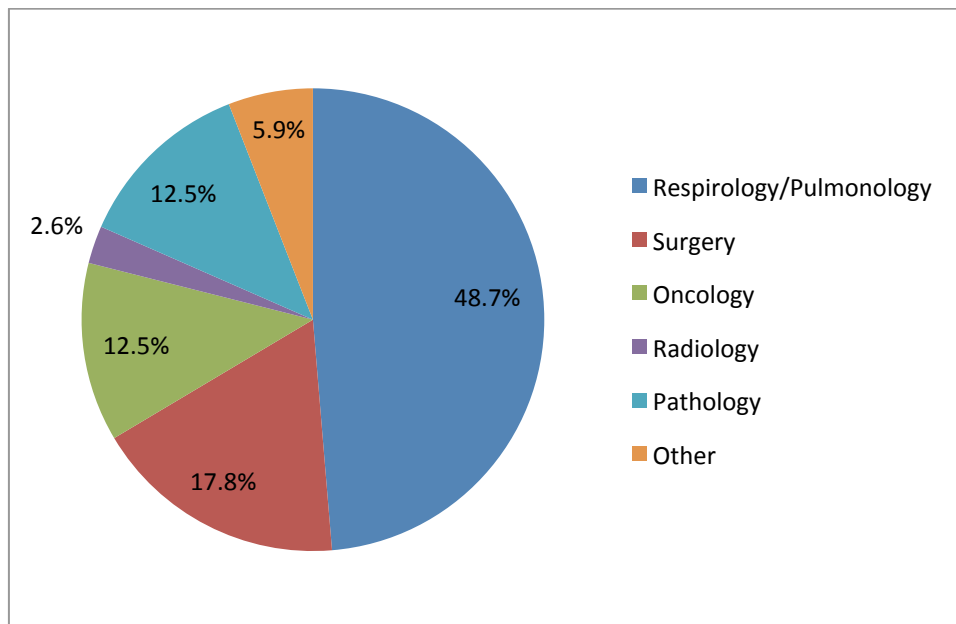
Two versions of the survey were administered to European clinicians. The first survey, the Local GAIN-Europe Systems Survey, was completed by summit participants. A second survey, the GAIN-Europe Control Group Survey, was administered to European clinicians who did not participate in the Summits. Both surveys gathered data about variation in local practice patterns, hospital-system capabilities, patient identification, collection and analysis of tissue specimens, processing of specimens, and the use of the multidisciplinary team approach in practice. The main difference between the two surveys was the addition of a question on the Control Group version to opt respondents out of the survey if they were not involved in the diagnosis, staging, and treatment of lung cancer.

A total of 152 surveys were completed by summit participants. The surveys were administered from February 6, 2014, until January 7, 2015. The surveys were provided to participants in the CHEST Learning Management System as part of pre-course work and also via an e-mail link. Non-completing participants were tracked and sent reminders to complete the survey after the summit was completed. Survey completion and response rates are provided in **Table 8**.

**Table 8.** System-Survey Completion by Summit Location

Summit Location	No. of Survey Completions	No. of Summit Participants	Percentages
Athens, Greece	12	30	40.0%
Turin, Italy	22	26	84.6%
Barcelona, Spain	17	24	70.8%
Madrid, Spain	5	9	55.6%
Vienna, Austria	6	8	75.0%
Paris, France	14	18	77.8%
Budapest, Hungary	12	19	63.2%
Cluj-Napoca, Romania	19	29	65.5%
Dublin, Ireland	13	20	65.0%
Bilbao, Spain	15	16	93.8%
Bucharest, Romania	12	34	35.3%
Thessaloniki, Greece	5	20	25.0%
<b>Total</b>	<b>152</b>	<b>253</b>	<b>60.1%</b>

The highest survey completion rate was seen in Bilbao and the lowest in Thessaloniki. Additionally, survey respondents were asked to indicate their primary role/medical specialty in the diagnosis of NSCLC. **Figure 13** shows the specializations of the systems-survey respondents.

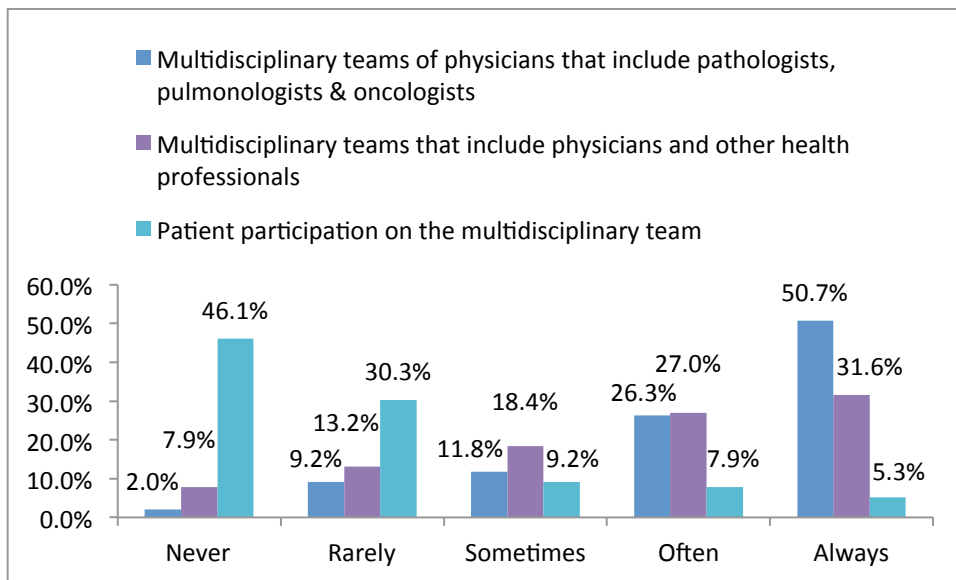


**Figure 13.** Medical Specialization of System-Survey Respondents (n = 152)

Almost half (48.7%) of the System-Survey respondents were pulmonologists or respirologists. Thoracic surgeons represented another 17.8% of the survey respondents. Pathologists (12.5%) and oncologists (12.5%) were approximately equally represented in the sample. The Other category (5.9%) included pulmonary oncologists, academics, and respiratory technicians. Survey respondents reported working with an average of 23 specimens per month from patients with lung cancer and an average of 22 specimens per month of patients with NSCLC.

### Multidisciplinary NSCLC Teams

Most respondents use a multidisciplinary approach to manage treatment for their patients with NSCLC. Approximately 15.8% reported never or rarely having regular meetings of the pulmonary/respirology, pathology, and oncology NSCLC team. **Figure 14** shows the frequency with which multidisciplinary physician teams (pulmonologists/pathologists/oncologists) are used in the respondents' medical practice.



**Figure 14. Percentage of Respondents Utilizing Multidisciplinary Teams**

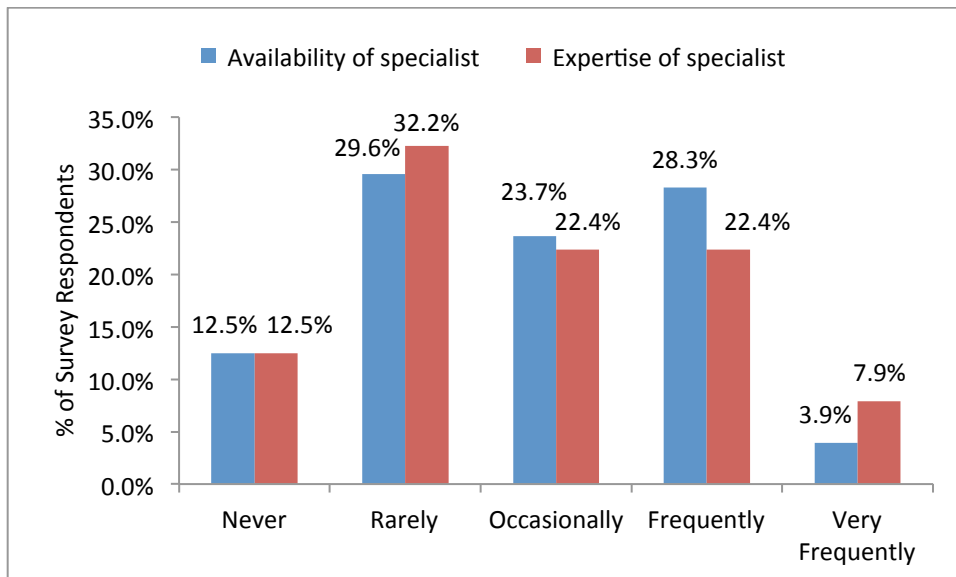
Multidisciplinary physician teams that include pathologists, pulmonologists, and oncologists are utilized to manage NSCLC most of the time (77.0% reported “always” or “often” using the approach). Additionally, multidisciplinary teams of physicians and other healthcare providers are also frequently used (58.6% reported often or always employing the approach). However, only 13.3% of respondents reported including patients in these teams. Responses noted that a cohesive multidisciplinary approach, as demonstrated in the GAIN-Europe summits, was less common in some localities. A few respondents indicated that “better collaboration with pathologists” or “a readily available radiologic unit to perform TBNA” was needed at their site.

### Technology/Equipment Availability

The availability of technology and equipment was a concern. Several biopsy-assessment techniques were unavailable to some GAIN-Europe Survey respondents. For example, 58.6% (n=89) of respondents reported that their institution did not perform reflex testing [e.g., *EGFR* and *ALK* at the time of tissue acquisition]. Similarly, 55.3% (n=89) reported that rapid on-site cytological examination (ROSE) and other fine-needle aspiration techniques were not available in their area. Further, approximately 10% of respondents indicated that molecular testing was unavailable in their area.

### Communication and Expertise

Communication among specialists involved in the treatment of NSCLC was also noted as a barrier to the optimal evaluation and diagnosis of patients for suspected NSCLC. Approximately one-third of the respondents (33.6%) reported that communication among the patient-care team frequently or very frequently posed a challenge to the optimal evaluation of patients for suspected NSCLC. Overall, a little more than one-fourth (25.7%) of the System-Survey respondents indicated that communication with patients' healthcare teams was frequently or very frequently a barrier to optimal evaluation and diagnosis. As shown in **Figure 15**, almost one-third of survey respondents reported frequent or very frequent difficulty with the availability or expertise of NSCLC specialists in their area.



**Figure 15. Frequency of Respondent Difficulty with Availability and Expertise of NSCLC Specialists**

In addition, 31.6% (n=48) of the survey respondents believed that the medical record system was frequently or very frequently a barrier to care for their patients.

The results of the GAIN-Europe Systems Survey indicate that multidisciplinary team instruction, equipment/technology, and communication support are important considerations when designing programs for European NSCLC healthcare providers. These findings have been incorporated into the instructional design for the GAIN-Europe Summits and the Lung Cancer Educator Train the Trainer program.

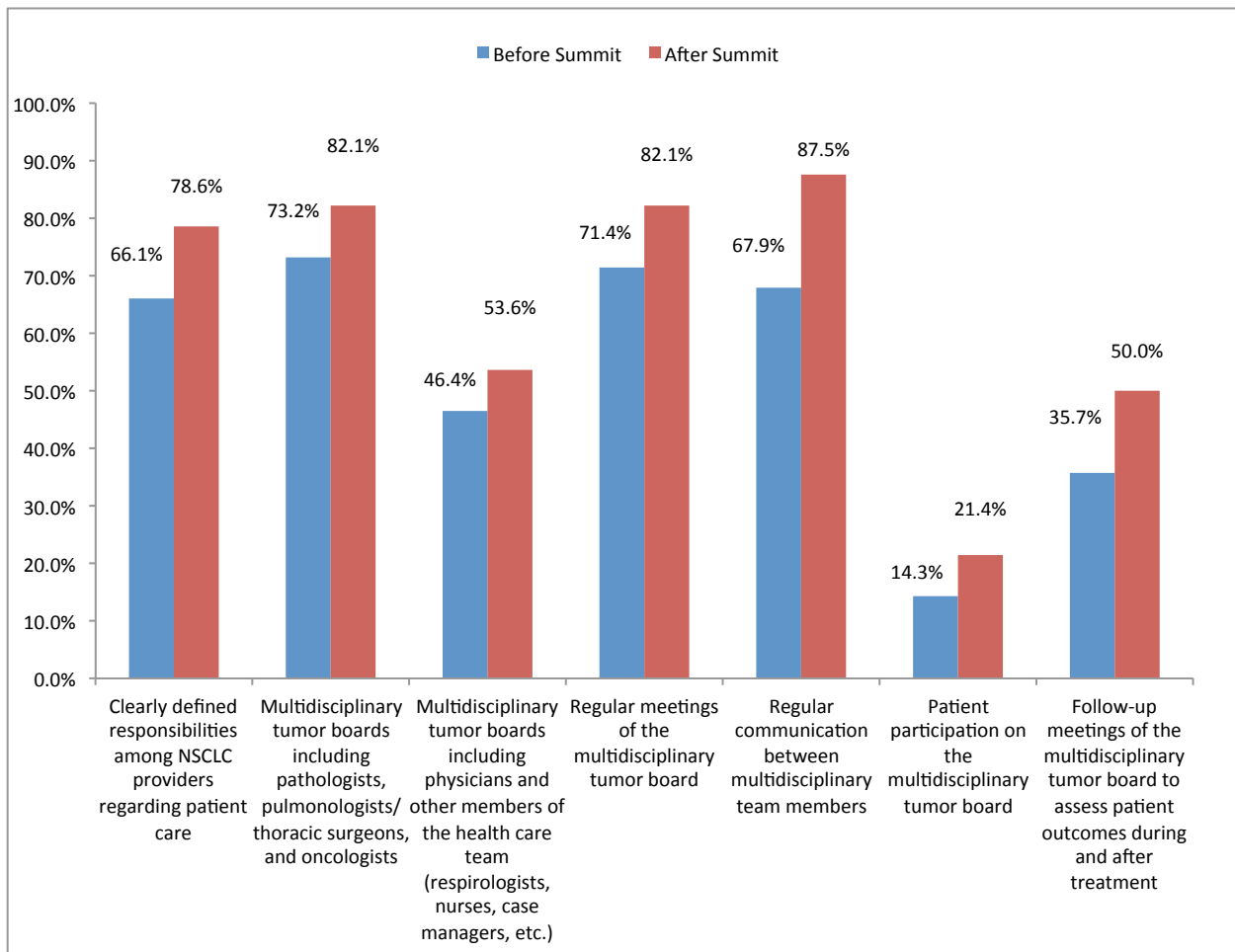
### **GAIN-EU Follow-Up Survey**

A Follow-Up Survey was administered to participants on completion of the program to assess changes in their practice based on their participation in the program. A total of 56 participants provided usable data from the Follow-Up Survey. More than half the participants (55.4%) specialized in pulmonology. Other specialties represented by the group included oncology (7.1%), pathology (7.1%), and thoracic surgery (12.5%).

### **Features of a Multidisciplinary Approach**

To gauge the previous implementation of multidisciplinary teams, the participants were asked to report whether they had, before participating in the GAIN-Europe program, used a multidisciplinary team to manage patients with suspected lung cancer. All but seven of the participants (12.5%) reported that they had used such an approach. Approximately 45% of the participants reported that the approach works well, and approximately 43% reported that they had used the approach but that it needs improvement.

When asked to report how often they used particular features of a multidisciplinary approach, the participants indicated an overall increase (**Figure 16**). For example, 78.6% of the respondents reported that, after the summits, responsibilities were often or always clearly defined among NSCLC specialists and other health care providers regarding patient care, compared with 66.1% before the summits. The percentage of participants who reported often or always using multidisciplinary tumor boards that include physicians and other members of the healthcare team (respirologists, nurses, case managers, etc.) increased from 46.4% to 53.6%. The percentage who reported often or always utilizing multidisciplinary tumor boards that include pathologists, pulmonologists/thoracic surgeons, and oncologists increased from 73.2% to 82.1%.



**Figure 16. Percentage of participants who reported that they used a particular feature of a multidisciplinary approach often or always.**

Mean frequencies, which are shown in **Figure 17**, were used to examine the increases in the utilization of the features for statistical significance. The results of a paired-sample *t*-test indicated that there was a significant increase in the utilization of all of the features (refer to **Table 9**.), reflecting a perceived increase in the utilization of each feature after the summits. The largest difference was reported for utilizing follow-up meetings of the multidisciplinary tumor board to assess patient outcomes during and after treatment, which increased by 0.46 units,  $t(55)=-5.06$ ,  $P < 0.01$ ,  $d=.68$ . The second largest difference was reported for utilizing multidisciplinary tumor boards that include pathologists, pulmonologists/thoracic surgeons, and oncologists, which increased by 0.43 units,  $t(55)=-3.77$ ,  $P < 0.01$ ,  $d=.50$ . Regular meetings of the multidisciplinary tumor board was also another feature that had a relatively moderate change,  $t(55)=-3.62$ ,  $P < .01$ ,  $d=.48$ .

Figure 17 and Table 9 show pre- and post-summit frequency of use of different features of multidisciplinary approaches in treating patients with lung cancer.

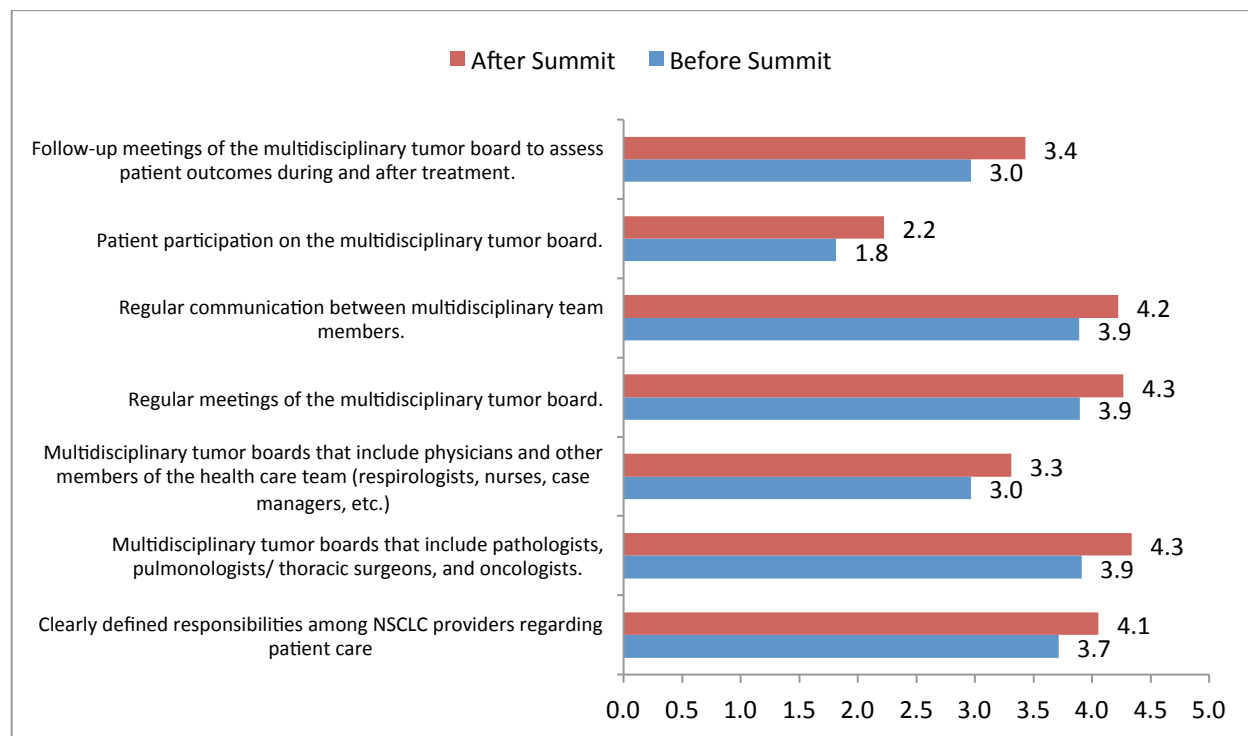


Figure 17. Change in the frequency of utilization of features of a multidisciplinary approach to the management of patients with lung cancer (on a scale from “never” [1] to “always” [5], and including the option “not applicable” [0]).

Table 9. Changes in the Frequency of Utilization of Features of a Multidisciplinary Approach to the Management of Patients with Lung Cancer

Feature	Mean (SD)		<i>t</i>	<i>P</i>	<i>d</i>
	Before Summit	After Summit			
Clearly defined responsibilities among NSCLC providers regarding patient care	3.71 (1.29)	4.05 (1.13)	-3.30	0.002	.44
Multidisciplinary tumor boards that include pathologists, pulmonologists/thoracic surgeons, and oncologists	3.91 (1.49)	4.34 (1.03)	-3.77	<0.001	.50
Multidisciplinary tumor boards that include physicians and other members of the healthcare team (respirologists, nurses, case managers, etc.)	2.96 (1.72)	3.31 (1.56)	-3.04	0.004	.41
Regular meetings of the multidisciplinary tumor board	3.89 (1.49)	4.27 (1.14)	-3.62	0.001	.48
Regular communication between multidisciplinary team members	3.89 (1.28)	4.22 (1.04)	-2.47	0.017	.34



Feature	Mean (SD)		<i>t</i>	<i>P</i>	<i>d</i>
	Before Summit	After Summit			
Patient participation on the multidisciplinary tumor board	1.81 (1.33)	2.22 (1.51)	-2.66	0.010	.36
Follow-up meetings of the multidisciplinary tumor board to assess patient outcomes during and after treatment	2.96 (1.39)	3.43 (1.33)	-5.06	<0.001	.68

### Changes Made to Practice

When asked whether they had made any changes to their practice as a result of participating in the GAIN-Europe program, most of the participants (83.9%) reported that they had. An additional 9 participants (16.1%) reported that they had not made changes in their practice but they had considering making changes.

The participants also reported whether they had made any changes to their practice as a result of participating in the GAIN-Europe program. Table 4 shows the changes reported by more than 10% of respondents:

**Table 4: Changes to Practice Reported by >10% of Respondents to Follow-up Survey**

Change Made to Practice	No. of Participants	% of Participants
Ensure that adequate biopsy specimen is obtained	42	75.0%
Evaluate new diagnostic strategies	31	55.4%
Use biomarkers to guide therapy	30	53.6%
Implement improved professional-judgment skills to the diagnosis and/or treatment of patients	30	53.6%
Apply recommendations from American College of Chest Physicians (ACCP) evidence-based guidelines to practice	28	50.0%
Utilize a multidisciplinary (tumor-board) approach to lung cancer	26	46.4%
Utilize a team-based approach (tumor-board) approach to lung cancer	24	42.9%
Improve patient education	21	37.5%
Consider quality of life in treatment decisions	19	33.9%
Incorporate new treatment strategies for lung cancer	17	30.4%
Use biomarkers to monitor disease progression	16	28.6%
Differentiate between various rare and common clinical or diagnosis problems	16	28.6%
Apply recommendations from College of American	14	25.0%

Change Made to Practice	No. of Participants	% of Participants
Physicians (CAP) evidence-based guidelines to practice		
Apply recommendations from American Society of Clinical Oncology (ASCO) evidence-based guidelines to practice	14	25.0%
Apply recommendations from National Comprehensive Cancer Network (NCCN) evidence-based guidelines to practice	14	25.0%
Apply recommendations from other evidence-based guidelines to practice	11	19.6%
Offer new therapies	10	17.9%

The change reported by the highest number of participants (75.0%) was ensuring that an adequate biopsy specimen was obtained. Evaluating new diagnostic strategies was the change reported by the second-highest number of participants (54.4%). The next most frequently reported changes were using biomarkers to guide therapy (53.6%) and implementing improved professional judgment skills to the diagnosis and/or treatment of patients (53.6%).

### **Goal 3: Ensure the long-term sustainability of the GAIN-Europe educational program**

Two program interventions are associated with the goal of ensuring the long-term sustainability of the GAIN-Europe program. The first intervention, the Lung Cancer Educator Program, was piloted at the SEPAR (Spanish Society for Pulmonology and Thoracic Surgery) Conference in Bilbao, Spain, on June 5, 2014. A second Lung Cancer Educator Program was held in Bucharest on November 22, 2014.

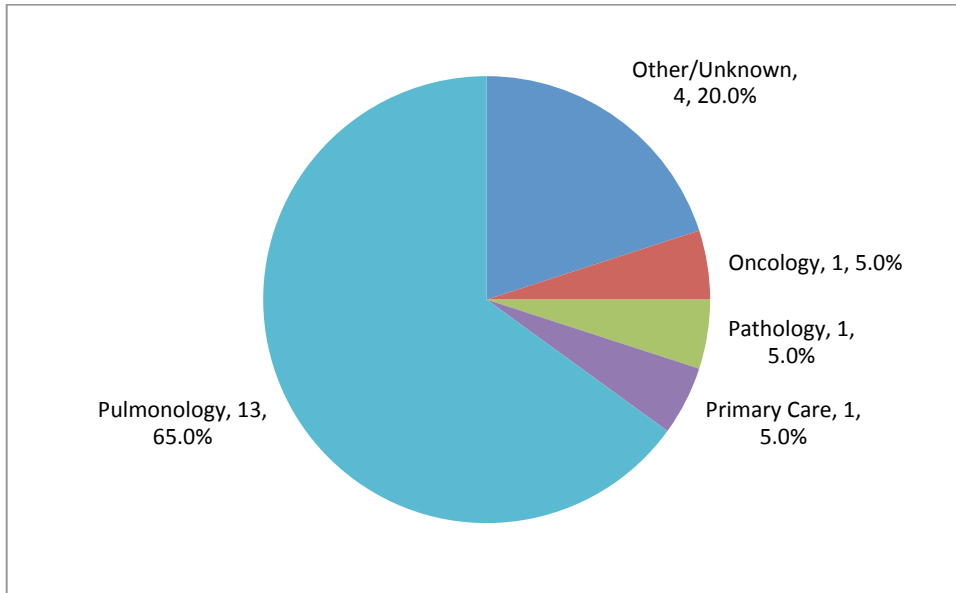
The second intervention associated with this goal is a GAIN-Europe community-education program, in which participants who obtain the Lung Cancer Educator designation are asked to implement at least one GAIN-Europe summit in their local community. The curriculum and parameters of the GAIN-Europe community program shared with all participants of the Train-the-Trainer program.

To be eligible for the GAIN-Europe community education program, the Train-the-Trainer participants were required to achieve a passing score on the Lung Cancer Educator Certification Examination, developed by AMP and administered by CHEST (A copy of this examination may be found in Appendix H.)

Evaluation data for this portion of the initiative were collected for two components of the Lung Cancer Educator Program, the Train the Trainer activity and the Lung Cancer Educator examination.

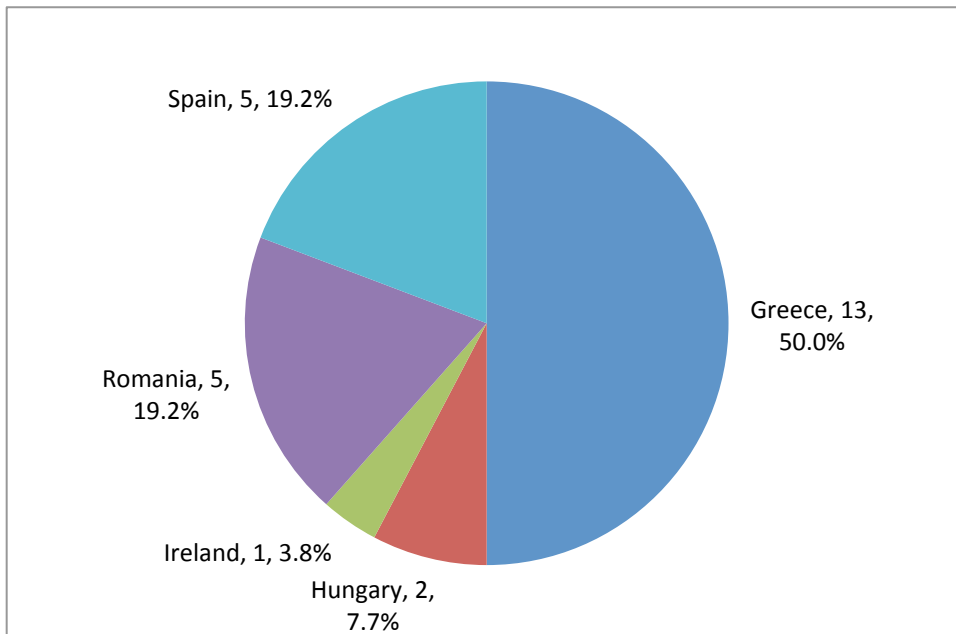
### Level 1: Participation

A total of 26 physicians took part in the Lung Cancer Educator Train-the-Trainer program. Figure 18 contains a breakdown of the Train-the-Trainer participants by specialty. More than half of those participants (65.0%) were pulmonologists. The other specialties included pathology, oncology, and primary care.



**Figure 18. Train the Trainer Participation by Specialty (n=20 who provided data)**

Train-the-Trainer survey respondents hailed from Hungary, Ireland, Spain, Romania, and Greece. Figure 19 shows the distribution of respondents based on their location.



### Figure 19. Country of Residency of the Train the Trainer Participants (n=26)

Half of the Train the Trainer participants hailed from Greece (50.0%). The countries with the second-highest participation level were Romania and Spain, with five participants each (19.2%).

#### Level 2: Satisfaction

At the conclusion of the Train the Trainer program, participants and faculty members engaged in a round-table discussion about their experience. Participants focused their comments in three areas. A selection of participants' comments about the program is provided below.

#### Bringing Knowledge to Their Local Community

- "I want to be able to take this information and format back to my country and educate my colleagues."
- "I want to implement this course in my home county."
- "This educational method is the most successful program I have attended. I want to bring this training back to my university."
- "I want to incorporate this knowledge in my local training program for physicians."

#### Multidisciplinary Teamwork

- "This program allows us to understand each of our roles to improve the care of our patients. We can use this important type of educational program to teach [us] to do things better."
- "I want to be able to understand each other's [my colleagues'] jobs to be able to work with each other."

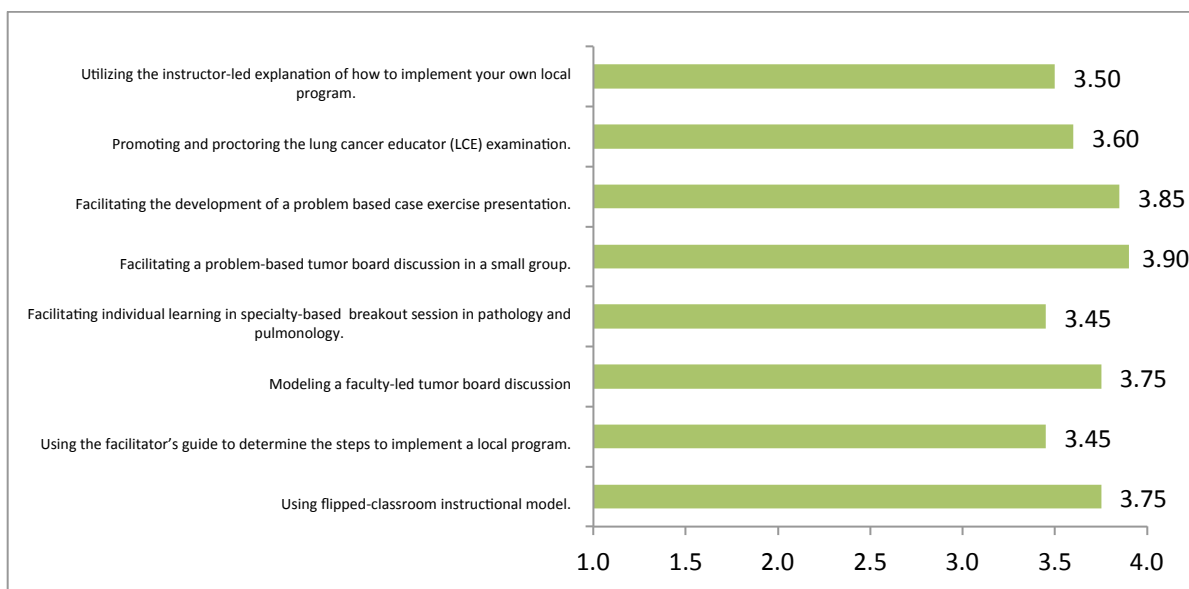
#### Patient Care

- "I think the standardization of this course will be helpful for [our] knowledge and the way we treat our patients with lung cancer."
- "Multidisciplinary meetings like this allow us to learn about this disease [NSCLC] that causes trouble with many persons. [It allows physicians to] ... be able to treat [their patients] better."

Participant feedback for improving the Train-the-Trainer Program included multiple requests for additional support for program facilitation in their local community and training resources. These requests were incorporated in the instructional design for the GAIN-Europe Community Program, a sustainability initiative to support certified Lung Cancer Educators' implementation of the GAIN-Europe curriculum in their local community. The materials for these community programs will be supplemented with simulation equipment and logistical support from CHEST and program collaborators. The first community program will take place in Athens, Greece on March 28, 2015.

## Program Perceptions

After the program, 20 participants (76.9%) also expressed their perceptions of the program via the GAIN-Europe Train-the-Trainer survey. The participants' overall satisfaction with the program was high. On a scale of 1.00 to 4.00 (not at all satisfied to very satisfied), the mean rating was 3.40. No participants rated the program at the two lowest levels. The participants' satisfaction with the components of the program was also high (Figure 20). The component with the highest mean rating (3.9) was facilitating a problem-based tumor board discussion in a small group. The other highest-rated components were facilitating the development of a problem-based case-exercise presentation (with a mean rating of 3.9) and modeling a faculty-led tumor board discussion using a flipped-classroom instructional model (for both, the mean rating was 3.8).



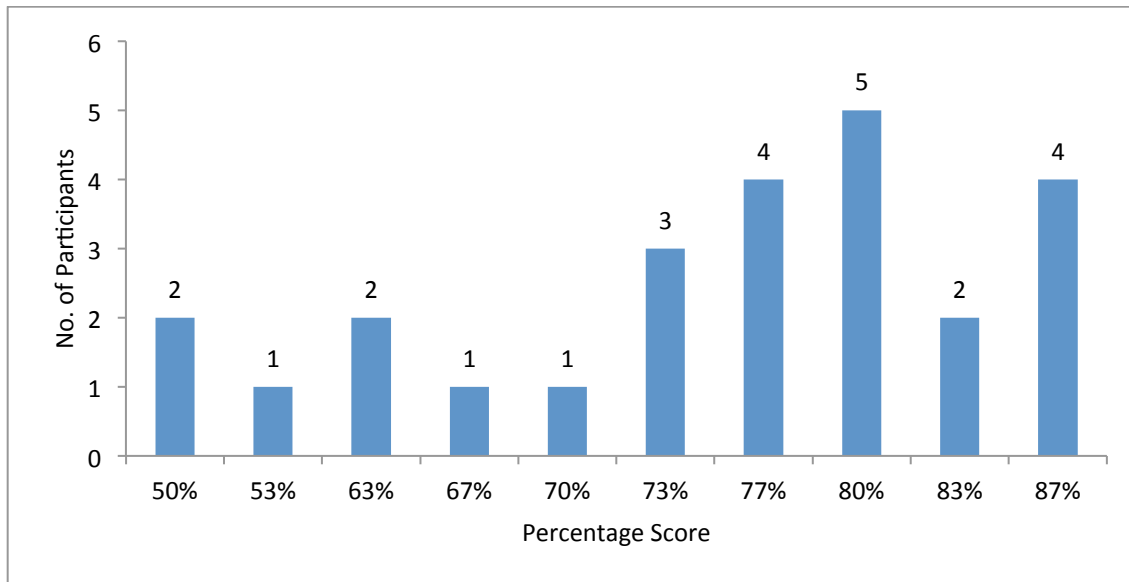
**Figure 20. Mean ratings of satisfaction with components of the Train the Trainer program**

### Level 3: Knowledge—the Lung Cancer Educator Examination

At the conclusion of the 5.5-hour Train-the-Trainer event, 25 participants in the Lung Cancer Educator program completed a proctored exam to demonstrate their knowledge and skills related to GAIN-Europe summit education and the Train-the-Trainer program. The Lung Cancer Educator exam consisted of 30 questions in several substantive areas related to the exam (an outline of exam content is provided in Appendix H). The proctored exam was administered via the online CHEST learning-management system. Examinees took between 26 and 46 minutes to complete the exam. On average, respondents answered 22.3 of 30 questions correctly. The

individual respondents' raw scores were converted into percentages of correct answers for the remaining analysis.

The distribution of the test scores, based on percentage of questions answered correctly, is provided in Figure 22.

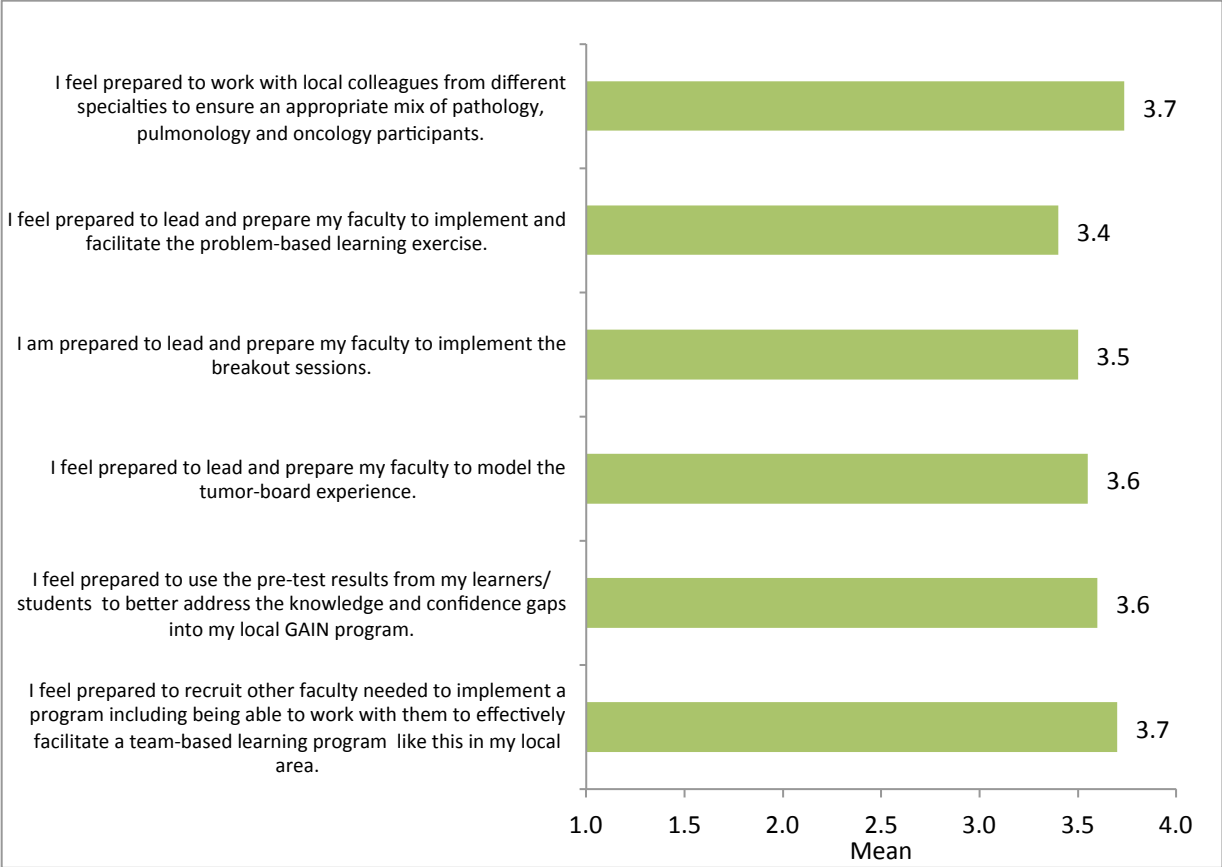


**Figure 22. Lung Cancer Educator Examination Scores, by Number of Examinees Achieving Each Score (n=25)**

A passing score was 70.0%; the average percentage score on the examination was 74.3%. Nineteen of the 25 examinees passed the exam. Approximately 11 examinees achieved scores above 80.0%. The 6 candidates with a failing score on the exam will be permitted to re-take the Lung Cancer Educator Examination at a future date.

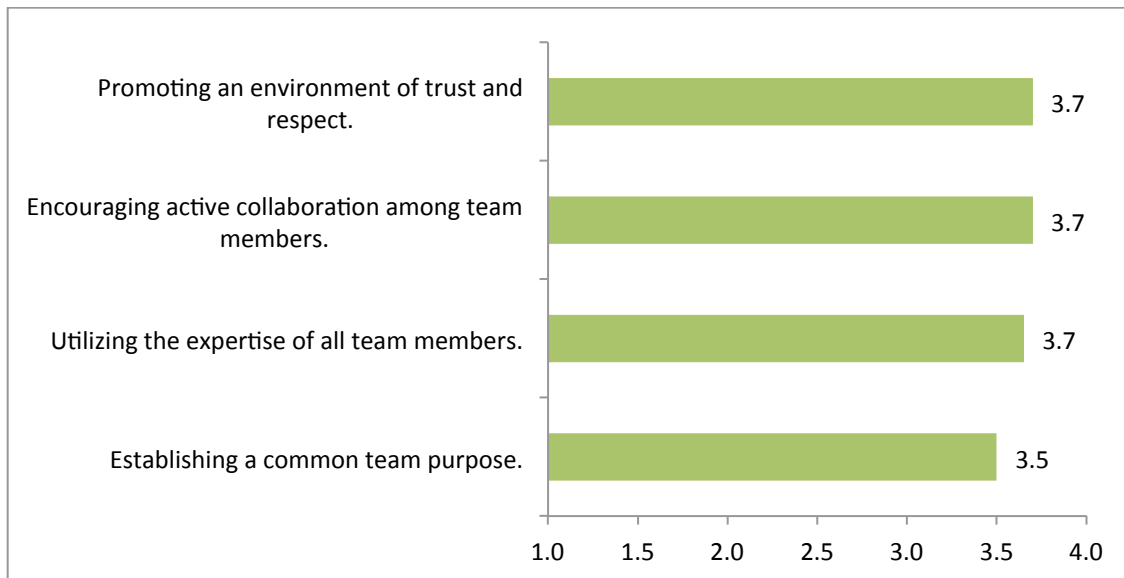
#### **Level 4: Competence**

Responses from the GAIN-Europe Train-the-Trainer Survey indicated that the participants' perceptions of their preparedness to implement a local GAIN-Europe program in their community were also high (**Figure 23**). Nineteen of the participants (95.0%) reported that they were reasonably or well prepared. The participants felt most prepared to work with local colleagues from different specialties to ensure an appropriate mix of pathology, pulmonology, and oncology participants and to recruit and work with other faculty members as needed to implement a similar program (M = 3.7). Readiness to prepare faculty for modeling the tumor-board experience and using their pre-test results to better address gaps in knowledge and confidence gaps were also highly rated (M = 3.6).



**Figure 23. Mean level of preparedness for implementing aspects of a local GAIN-Europe program in the participant’s community**

As shown in **Figure 24**, GAIN-Europe Train the Trainer participants reported high confidence in their ability to utilize the expertise of all team members, to encourage active collaboration among them, and to promote an environment of trust and respect. These two areas had the highest mean rating (3.7) for the participants’ level of confidence. Establishing a common purpose for the team also had a relatively high mean rating; however, this rating was slightly lower than the mean rating for the other areas or perceived preparation.



**Figure 24. Mean level of confidence for working with local faculty members to promote various aspects of team-based learning**

## Conclusion

Section III provided assessment results for the three primary goals of the GAIN-Europe project and their specific interventions. Those goals are as follows:

- To increase the knowledge, competence, and performance of European clinicians who manage and treat NSCLC
- To increase the impact of the GAIN-Europe education program on physician practice and patient care
- To ensure the long-term sustainability of the GAIN-Europe educational program

Overall, both the GAIN-Europe Summit and Train-the-Trainer participants expressed satisfaction with the program. In addition, the Summit participants demonstrated increased knowledge and reported changes in practice indicators. The next section of the report presents and discusses key findings for each of the GAIN-Europe program goals, based on data provided in Section III of the report.



## IV. Findings and Lessons Learned

This section presents findings for the GAIN-Europe program based on the outcomes results presented in the previous section of this report. Findings are organized and presented according to the GAIN-Europe evaluation goals.

### **Goal 1: Increase physician knowledge, skills, and competence in NSCLC management and assessment.**

The GAIN-Europe Summit intervention was designed to achieve the goal of improving physician knowledge, skills, and competence for NSCLC management and assessment. Hands-on education to increase medical knowledge and skills for physicians and to address the importance of a multidisciplinary approach (pathology, pulmonology and oncology) was presented during the breakout sessions. Findings for the GAIN-Europe Summits, organized according to the Moore levels of CME Outcomes, are as follows:

#### **Level 1: Participation**

**Program attendees:** The overwhelming majority of program attendees were pulmonologists and thoracic surgeons; there was much lower representation from pathologists and oncologists. This difference was greater at the Madrid and Bilbao summits, which took place during pulmonology-physician conferences. The program collaborators emphasized the importance asking the local faculty to reach out to multidisciplinary colleagues in their home community to encourage multidisciplinary participation that includes pathologists and oncologists.

**Summit attendance by location:** Participant registration and attendance varied considerably by summit location. The highest participation rates were seen in Athens (n = 30), Cluj-Napoca (n = 29), Thessaloniki (n = 31), and Bucharest (n = 34). Local faculty and learners commented that they were influenced by the reputation of the collaborating United States (US) associations and the reputation of the US faculty in making decisions to attend the Summit.

**Program participants and survey completion:** GAIN-Europe participants completed pre-summit and post-summit coursework and assessments.

**GAIN-EU participant demographics:** The typical GAIN-Europe participant was a pulmonologist, had more than 20 years of experience, and was responsible for managing the treatment of 6 to 15 patients with lung cancer per month. Pathologists and oncologists were also prevalent among the participants, as well as participants who managed 16 to 20 patients with lung cancer per month.

#### **Level 2: Satisfaction**

**GAIN-Europe Summits instructional format:** Over half (56.0%) of GAIN-Europe attendees believed that the instructional format was appropriate. The most frequently suggested improvements were to include more case-based presentations (48.9%) and additional hands-on

instructional components (24.1%), such as more TBUS-EBNA simulation exercises and more problem-based learning cases.

**GAIN-Europe Summits instructional components:** The tumor board communication exercises were the best-addressed component of the summit, according to 44.0% of the respondents to the Satisfaction/Confidence Survey. The Pathology Analysis breakout session and Slide Preparation breakout session received the lowest ratings in this area, with the fewest respondents reporting that the components were adequately or well addressed (89.4% and 87.2%, respectively). A suspected reason is the low representation of pathologists and oncologists among the respondents to the survey (16.4% and 13.7%, respectively).

**Program Satisfaction:** Overall, GAIN-Europe attendees expressed satisfaction with the Summit, with 97.9% agreeing or strongly agreeing that they would recommend the workshop to others in their specialty and 97.2% agreeing or strongly agreeing that the workshop would help them as a practicing member of an NSCLC multidisciplinary team.

**Attendees' perceptions of GAIN-Europe skill enhancement:** An overwhelming majority (97.3%) agreed or strongly agreed that the workshop enhanced their critical-thinking skills. Also, 98.6% agreed or strongly agreed that the workshop helped them understand the clinical relevance of the multidisciplinary approach to NSCLC.

### **Level 3: Declarative and Procedural Knowledge**

**Pre-test and post-test completions:** More than half (60.1%) of GAIN-Europe respondents completed the pre-test and post-test. For US physicians, the primary incentive to complete these tests is to obtain credits toward maintenance of their licensure or certification. GAIN-Europe offered participants the opportunity to earn as many as 5.75 AMA PRA Category 1 credits. However, many European countries do not acknowledge US CME credits; in these countries, this incentive is not applicable, and completion rates for post-course work were lower.

**Pre-test and post-test results:** The overall mean score for the matched GAIN-Europe pre-tests was 5.95 of 10.00. The overall mean score for the paired GAIN-Europe post-test was 7.14 of 10.0. There was a statistically significant increase in mean scores from the pre-test to the post-test, based on the results of a paired samples *t*-test.

**Test results by location:** A preliminary grouping of test results by location shows an increase in knowledge across all sites, based on mean scores. However, the low number of test completions at some sites limits the ability to make comparisons across the sites for knowledge and skill acquisition.

### **Level 4: Competence PBL Assessments**

**Assessment Completion:** The PBL 5-Point Checklist showed an overall completion rate of 81.2% data cells. By contrast, the PBL Team Assessment Tool showed a higher overall completion rate of 88.9% of data cells.

**PBL 5-Point Checklist Findings (PBL Team Discussion):** Overall, the teams adequately met more than 67.5% of the assessment criteria. The competency areas with the highest percentage of objectives that were adequately met (or higher) were diagnosis strategy and staging strategy (95.2%), followed by specimen handling and team dynamics (92.9% each).

**PBL Team Assessment Tools Findings (PBL Case Presentation):** Using a 5-part approach, faculty-member raters provided scores from 0 to 5 to indicate their assessment of the components of this model. The highest scores were seen in Team Communication (mean = 3.9), and the lowest scores were seen in the area of Procedural Strategies and Procedural Techniques and Results (mean= 3.5). Overall, faculty assigned an average score of 65.5 of 100.0 points for all GAIN-Europe teams.

**Goal 2: To increase the impact of the GAIN-Europe program on physician practice and patient care.**

The goal of increasing the impact of the GAIN-Europe program on physician practice and patient care was assessed by the Systems Survey and the Tumor Board–PBL interventions in the GAIN-Europe curriculum. The curriculum developed for Tumor Board–PBL was presented during the small group sessions of the GAIN-Europe Summits. The Systems Survey describes the local contexts in which European providers operate, whereas the PBL provides Level 4 assessments of the Live-Summit activities. Findings from the Systems Survey are noted as follows; the PBL findings have been described earlier herein.

#### **GAIN-Europe Systems Survey**

**Survey Completions:** The GAIN-Europe Systems Survey was completed by 60.1% of GAIN-Europe Summit participants.

**Typical Systems-Survey Respondent:** The most frequent specialty of respondent who completed the GAIN-Europe Systems Survey was a pulmonologist/respirologist. Survey respondents, on average, worked with 23.1 patients with lung cancer and 22.2 patients with NSCLC per month.

**Multidisciplinary Teams:** Multidisciplinary teams of physicians that include pathologists, pulmonologists, and oncologists were common among System-Survey respondents; 50.7% of the respondents reported that they always use this approach. Utilizing multidisciplinary teams that include physicians and other healthcare professionals was reported by 31.6% of the respondents. Working with teams that include patients was less common: only 5.3% of the respondents reported that they always employ such an approach.

**Technology Availability:** The availability of technology was a concern for GAIN-Europe respondents. More than half of System Survey respondents (58.6%) reported that they did not perform reflex testing at their site, and more than half (55.3%) reported that rapid on-site

cytological examination (ROSE) or other similar techniques were not available. Approximately 10% of respondents indicated that molecular testing was not available in their location.

**Communication with Specialists:** Availability of specialists was a frequent or very frequent concern for 32.2% of respondents for the optimal evaluation of patients for suspected lung cancer; and the expertise of specialists was a frequent or very frequent concern for 42.1% of respondents. Furthermore, 33.6% of the respondents noted that communication among patients and other members of the patient-care team was a frequent barrier to the optimal evaluation of patients for suspected lung cancer. In addition, 31.6% of the respondents believed that their medical-records systems were a frequent barrier to their ability to optimally evaluate patients for suspected NSCLC.

### ***GAIN-EU Follow-up Survey***

Participants were asked to complete a follow-up survey to indicate changes in practice and their success with implementation of the tumor board. A total of 56 participants provided usable data for the Follow-up Survey. More than half of these respondents (55.4%) had a specialty in pulmonology. Other specialties included oncology (7.1%), pathology (7.1%), and thoracic surgery (12.5%).

**Multidisciplinary Approach:** Forty-nine (87.5%) participants had utilized a multidisciplinary approach before the summit. However, approximately 43% of these respondents reported that the approach needed improvement. After participation in the GAIN-Europe program, respondents reported an increase in their use of the multidisciplinary team features advanced by the GAIN-Europe program (See Table 9.)

**Tumor-Board Utilization:** The percentage of participants who reported using a tumor board that included pathologists, pulmonologists, and oncologists rose from 73.2% to 82.1%. The percentage of participants who utilized tumor boards with physicians and other healthcare team members rose from 46.4% before the summit to 53.6% afterward. The percentage of respondents who indicated that there were often or always clearly defined responsibilities among NSCLC specialists rose from 66.1% to 78.6%.

**Changes Made to Practice:** Most of the participants (83.9%) reported making changes to their practice after having attended the Summit. An additional 16.1% reported that they had not made changes afterward but had considered making changes. The change reported by the highest number of participants (75.0%) was ensuring that an adequate biopsy specimen was obtained. Evaluating new diagnostic strategies was reported by the second-highest number of participants (54.4%). Other changes frequently reported by participants were using biomarkers to guide therapy (53.6%) and implementing improved professional judgment to the diagnosis/treatment of patients (53.6%).

### **Goal 3: To ensure long-term sustainability of the GAIN-Europe educational program**

To ensure long-term stability of the GAIN-Europe educational program, the Lung Cancer Educator Train-the-Trainer program intervention was designed to provide participants with the

knowledge and skills to implement the GAIN-Europe Summit in their own communities. The pilot program had 11 participants and was conducted at the Sociedad Espanola de Neumologia y Cirugia Toracica (SEPAR) conference. A subsequent Train-the-Trainer program was conducted in Thessaloniki, Greece on November 22, 2014 with 15 participants.

The evaluation provides demographic and program satisfaction information from participants. An analysis of the Lung Cancer Educator examination demonstrates Moore Level 3: Knowledge and Level 4: Competence outcomes for physicians who completed this activity. The preliminary evaluation findings from this activity include the following:

### **Level 1: Participation**

**Attendance:** Of the 20 respondents to the Train-the-Trainer survey, 65.0% were pulmonologists or thoracic surgeons. Among the other respondents were pathologists, oncologists, and radiation oncologists.

### **Level 2: Satisfaction**

**Satisfaction comments:** Overall, respondents indicated satisfaction with the program. Specifically, they mentioned their desire to bring the course to their local community, opportunities to affect patient care via the multidisciplinary approach, and multidisciplinary teamwork on the NSCLC team as important outcomes and components of the program.

**Suggested improvements:** When asked about potential improvements to the Train-the-Trainer program, the participants suggested providing additional support for facilitating programs in their local communities and providing more reading materials and other resources for training participants in their future roles as program facilitators.

### **Level 3/Level 4: Knowledge and Competence**

**Lung Cancer Educator Examination:** A proctored online exam was administered to 25 GAIN-Europe Train-the-Trainer program participants. The exam contained 25 questions on topics covered in the online materials, tumor board lecture and breakout sessions, as well as 5 questions related to team dynamics and communication. On average, respondents answered 22.3 of 30 questions correctly.

**Examination Scores:** The exam pass rate was set at 70.0%; 19 examinees achieved a score above this pass rate.

**Lung Cancer Educator Program Implementation:** To complete their certification requirements, LCEs will be required to implement a daylong summit in their local communities. Guidelines and parameters for implementing this program have been made available to trainees. The first of the Lung Cancer Educator led GAIN-Europe Community Program Summits will be implemented in Athens, Greece on March 28, 2015. The GAIN Collaborators are working to secure additional dates for the Train-the-Trainer program.

## **V. Conclusion**

The GAIN-Europe Education Program provided an opportunity for a multidisciplinary group of European physicians to gain knowledge and skills in the management of NSCLC. The intended program impact of GAIN-Europe was to “support the improvement of NSCLC diagnosis and treatment as it is contextually relevant in European countries and healthcare systems.” This impact was connected with the following main program goals:

- 1) Improving knowledge/skills, competence, and performance of physicians involved in the assessment and management of NSCLC
- 2) Increasing the impact of the GAIN-Europe program on physician practice and patient care
- 3) Ensuring the long-term sustainability of the GAIN-Europe educational program

Each GAIN-Europe intervention and the program-assessment tools was connected with one of the above-mentioned program goals, as described in GAIN-Europe Logic Model and the GAIN-Europe Outcomes Chart. This report provided a complete description of the GAIN-Europe program and its interventions, a review of data collected, and a summary of key findings determined from the data. In addition, this section of the report provides a summary of the key strengths and challenges of the program.

### **Strengths of the GAIN-Europe Education Program**

- The GAIN-Europe program incorporates a multidisciplinary approach to NSCLC management in which participants engage in activities and learning across the entire treatment cycle. Many participants directly commented that this approach helped them to “understand” the constraints and concerns of NSCLC team members in different specialties.
- GAIN-Europe Summits incorporate a variety of instructional strategies to address differences in learning styles and educational content. These strategies include didactic presentations, tumor board behavioral modeling, hands-on biopsy and slide preparation simulation exercises, team-based case discussions, and case presentations.
- The GAIN-Europe Summits also incorporate innovative instructional design techniques, such as the flipped-classroom model, team-based learning experiences, and PBL. These content-delivery strategies enhanced learner experiences at the Summits.

- The GAIN-Europe Summits were well received by the participants.
  - Attendees expressed high satisfaction with program components.
  - Attendees stated that the program enhanced their critical-thinking skills.
  - Attendees stated that the program enhanced their ability to function on a multidisciplinary NSCLC team.
- Pre-test and post-test results indicate that attendees significantly increased their knowledge and performance related to NSCLC topics because of their participation in the Summits.
- Results of the PBL Team Assessments indicate that participants scored the highest on components related to pulmonology and team-based learning. This finding reflects the high percentage of GAIN-Europe participants who identified as pulmonologists/ respirologists.
- The Lung Cancer Educator Train-the-Trainer Program was well received by participants. Participant comments indicated that the best aspects of the program were the opportunity to conduct a GAIN-Europe training session in their home location, opportunities to affect patient care, and better understanding of multidisciplinary teamwork. The first of the GAIN-Europe Community Program Summits is scheduled to take place in Athens, Greece on March 28, 2015. Additional programs are anticipated to take place in 2015 as well.
- The Lung Cancer Educator examination pass rate was set at 70%. Ultimately, 19 of the 25 participants passed the Lung Cancer Educator examination and are eligible to implement the program in their local communities as Gain-Europe Community program.

### **GAIN-Europe Challenges**

- GAIN-Europe Summits were attended mostly by pulmonologists and thoracic surgeons. Attendance rates were lower among pathologists and oncologists. As a result, more pulmonologists than physicians from other specialties ultimately participated in the Train- the- Trainer program and completed the Lung Cancer Educator program.
- Assessment tools and models may not be as familiar to European learners and faculty members, including assessing team-based learning and communication efforts. There were improvements in faculty understanding of the tools over the course of the summits; job aids were added for the faculty-orientation sessions at the fall summits to address these issues.
- Performance Improvement Modules (PIMS) and resources were accessed infrequently by European physicians. Only 12 pathologists accessed CheckPath and 3

pulmonologists accessed ACQUIRE PIMS, resulting in too little data to meaningfully measure performance or competence.

- GAIN-Europe participants greatly benefitted from the program as individual clinical caregivers. However, during the course of the program, it became apparent that NSCLC teams of pathologists, pulmonologists, and oncologists who already worked together would be more likely to implement changes to their NSCLC practice or adopt the modeled tumor-board multidisciplinary approach to lung cancer management.
- Participants often commented that they wished other team members could have participated in the Summit program with them. Because GAIN-Europe education targets multidisciplinary education goals, the collaborators should consider marketing the GAIN- Europe summits and education resources to entire NSCLC healthcare teams that regularly work together.

### **GAIN-Europe Summary**

The GAIN-EU program provided an expert-supported, multidisciplinary approach to improving knowledge/skills and competence of physicians involved in the assessment and management of NSCLC. Using a tumor board model, the program directly engaged physicians in multidisciplinary teamwork and problem-based learning using unique educational formats that improved physician knowledge and confidence. Furthermore, it encouraged sustainability beyond program completion through the Lung Cancer Educator Certification. Most notably, the statistically significant intermediate-term outcomes indicate that the program contributed to increased utilization of several features of a multidisciplinary team (tumor boards). These results imply potential future positive impact on physician practice and patient care.



## Appendices

Appendix A	Executive Committee
Appendix B	Additional Case Scenarios
Appendix C	GAIN-Europe Summit Host Sites
Appendix D	Evaluation Plan
Appendix E	GAIN-Europe Logic Model
Appendix F	GAIN-Europe Logic Model Outcomes Chart
Appendix G	Data Collection Tools and Interventions
Appendix H	Examination to Assess Lung Cancer Educators'
Appendix I	Pre/Post-test question descriptions (pg. 34)
Appendix J	Breakout Session Handouts
Appendix K	Clinical Summary Guidelines

## Appendix A. Executive Committee and Collaborators

### **Executive Committee**

#### **Eric S. Edell, MD, FCCP (Chair)**

Mayo Clinic, Rochester, MN

#### **Septimiu Murgu, MD, FCCP (Co-Chair)**

The University of Chicago Medicine, Chicago, IL

#### **Loren Harris, MD**

Maimonides Medical Center, New York, NY

#### **Mari Mino-Knudson, MD**

Harvard Medical School, Boston, MA

#### **Helmuth Popper, MD**

Medical University of Graz, Graz, Austria

#### **Antoni Rosell, MD**

Bellvitge University Hospital, Barcelona, Spain

#### **Ravi Salgia, MD, PhD**

The University of Chicago Medicine, Chicago, Illinois

#### **Giorgio V. Scagliotti, MD, PhD**

University of Turin, Turin, Italy

## **Collaborators**

### **American College of Chest Physicians (CHEST)**

#### **Nicki Augustyn**

Senior Vice President, Education

#### **Chad Jackson, MS, RRT, CHT, CCMEP**

Senior Director, Clinical Simulation, Live Learning and Innovation

#### **Greg Lasko, MA**

Manager, Educational Design

#### **Danielle Jungst**

E-Learning and Product Development Coordinator

#### **Josh Vognsen**

Learning Management System and Simulation Specialist

### **American Society for Clinical Pathology (ASCP)**

#### **Suzanne Ziemnik, MEd**

Vice President, Continuing Professional Development

#### **Eric R. Parks, PhD**

Director, Educational Design and Technology

#### **Asma M. Ali, PhD(c), ERM**

Director, Evaluation, Measurement, and Assessment

### **The France Foundation**

#### **Stacy Miller, BA**

President

#### **Theodore Bruno, MD**

Chief Medical Officer

#### **Daniel Rabin, PhD**

Medical Director

#### **Heather Tarbox, MPH**

Director of Education

#### **Amanda Noe**

Senior Project Manager

### **Applied Measurement Professionals (Consultants)**

#### **Rob Shaw, PhD**

Applied Measurement Professionals

### **Alliance for Continuing Education in the Health Professions Foundation (Consultants)**

#### **Don Moore, PhD**

Vanderbilt University

#### **Christine Amorosi, RN, MHSA**

The Alliance for Continuing Education in the Health Professions

#### **Anne Marie Smith, MBA, PMP**

Lifelong Learning Services

#### **Jack R. Kues, PhD, FACEHP, CCMEP**

University of Cincinnati Academic Health Center

#### **Marcia Jackson, PhD**

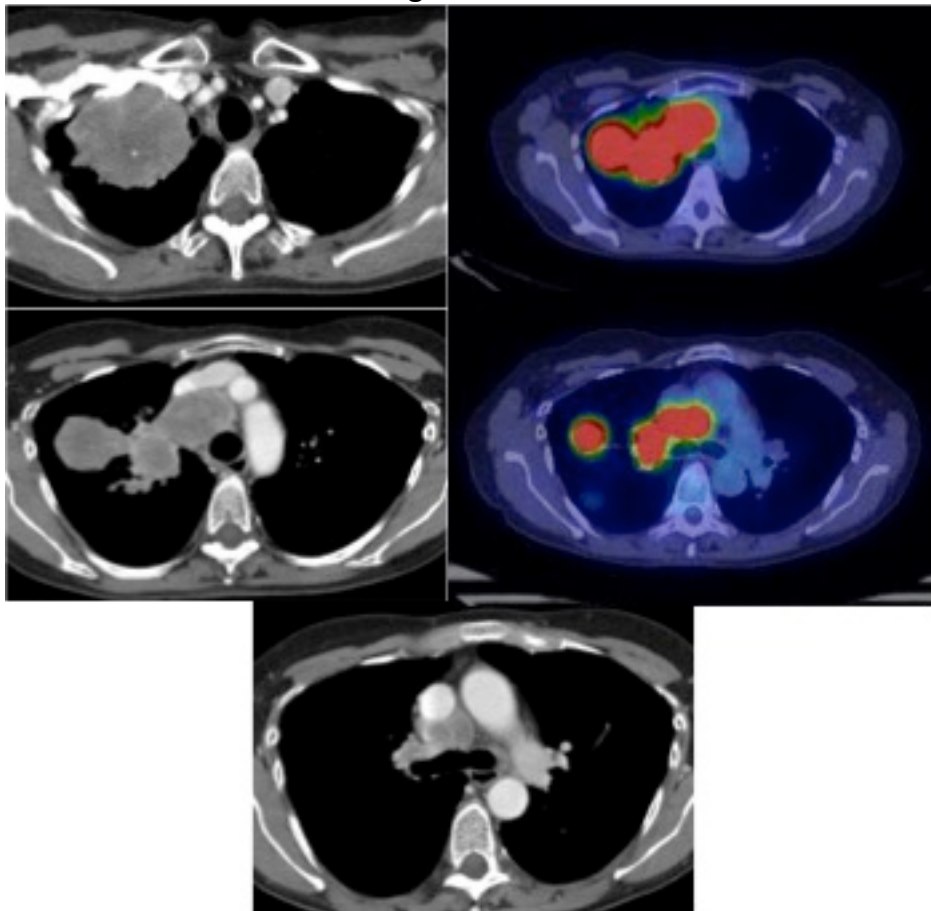
CME by Design

## Appendix B. Problem-Based Learning Case Scenarios

### Scenario 2

Based on the information presented below, please describe your procedural decision-making using *The Practical Approach* format. Do your best to complete each item of the Four Boxes. You may choose to address one or more issues in greater depth, and should attempt to justify your opinions using peer reviewed literature and selected references.

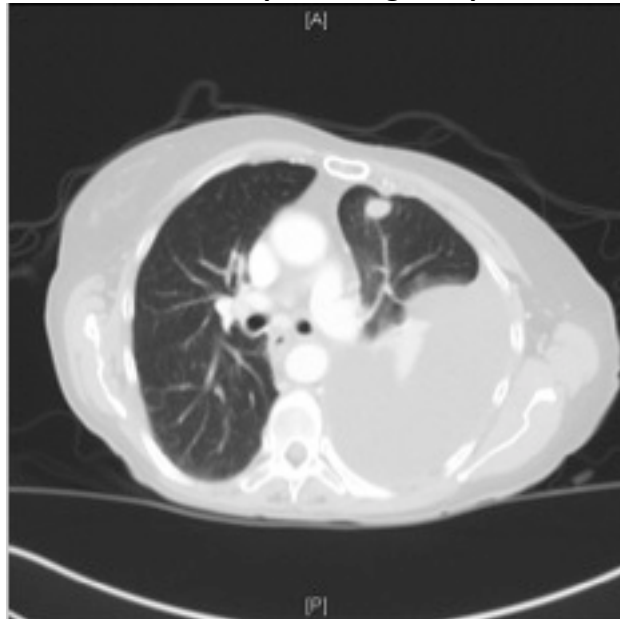
**Ms. BB is a 58-year-old female with 20 pack-years history of smoking referred from an outside facility for tissue diagnosis and further management of her lung mass. Her performance status is 3. Chest CT and integrated PET-CT are shown below.**



### Scenario 3

Based on the information presented below, please describe your procedural decision-making using *The Practical Approach* format. Do your best to complete each item of the Four Boxes. You may choose to address one or more issues in greater depth, and should attempt to justify your opinions using peer reviewed literature and selected references.

**Ms. CC is a 78-year-old female, non-smoker, with second hand exposure who presents with dyspnea. Her father died from lung cancer and mother from colon cancer. Her PS is 2. Her relevant CT image is shown below. You suspect malignant pleural effusion.**



## Appendix C. Summit Sites

**February 24, 2014**

**Athens, Greece**

**Vlasis Polychronopoulos, MD, FCCP (Chair)**  
Hygeia Hospital, Athens

**Ioannis Gkiozos, MD, FCCP**  
Medical School of Athens  
Sotiria Regional General Hospital for  
Pulmonary and Heart Diseases, Athens

**Konstantinos Syrigos, MD**  
Sotiria Regional General Hospital for  
Pulmonary and Heart Diseases, Athens  
School of Medicine, University of Athens  
Yale School of Medicine, New Haven, CT

**Grigorios Stratakos, MD**  
Medical School of the National and  
Kapodistrian University of Athens  
Evangelismos General Hospital, Athens

**Vasileios Skouras, MD**  
401 General Army Hospital, Athens

**Eric S. Edell, MD, FCCP**  
Mayo Clinic, Rochester, MN

**Septimiu Murgu, MD, FCCP**  
The University of Chicago Medicine,  
Chicago, IL

**Helmuth Popper, MD**  
Medical University of Graz, Graz, Austria

**February 26, 2014**  
**Turin, Italy**

**Giorgio V. Scagliotti, MD, PhD (Chair)**  
University of Turin

**Stefano Gasparini, MD, FCCP**

Azienda University Hospital–Riuniti Hospital

**Silvia Novello, MD, PhD**  
University of Turin

**Mauro Papotti, MD**  
University of Turin

**Eric S. Edell, MD, FCCP**  
Mayo Clinic, Rochester, MN

**Septimiu Murgu, MD, FCCP**  
The University of Chicago Medicine,  
Chicago, IL

**Helmuth Popper, MD**  
Medical University of Graz, Graz, Austria

**February 28, 2014**  
**Barcelona, Spain**

**Antoni Rosell, MD (Chair)**  
Bellvitge University Hospital, Barcelona

**Teresa Moran, MD**  
Catalan Institute of Oncology, Barcelona  
Hospital University Germans Trias and Pujol,  
Barcelona

**José Ramirez, MD, PhD**  
University of Barcelona

**Ramon Rami-Porta, MD**  
MútuaTerrassa University Hospital, Terrassa

**Eric S. Edell, MD, FCCP**  
Mayo Clinic, Rochester, MN

**Septimiu Murgu, MD, FCCP**  
The University of Chicago Medicine,  
Chicago, IL

**Helmuth Popper, MD**

Medical University of Graz, Graz, Austria

**March 21, 2014**

**Madrid, Spain**

**CHEST World Congress**

**Eric S. Edell, MD, FCCP**

Mayo Clinic, Rochester, MN

**Luis Angel, MD**

UT School of Medicine San Antonio, San Antonio, TX

**Ioannis Gkiozos, MD, FCCP**

Medical School of Athens, Athens, Greece  
Sotiria Regional General Hospital for  
Pulmonary and Heart Diseases, Athens,  
Greece

**Septimiu Murgu, MD, FCCP**

The University of Chicago Medicine,  
Chicago, IL

**Mauro Papotti, MD**

University of Turin, Turin, Italy

**José Ramirez, MD, PhD**

University of Barcelona, Barcelona

**May 3, 2014**

**Vienna, Austria**

**Helmuth Popper, MD (Chair)**

Medical University of Graz, Graz

**Wolfgang Hilbe, MD**

Medical University Innsbruck, Innsbruck

**Peter Errhalt, MD**

Krems Provincial Hospital, Krems

**Eric S. Edell, MD, FCCP**

Mayo Clinic, Rochester, MN

**Antoni Rosell, MD**

Bellvitge University Hospital, Barcelona,  
Spain

**May 5, 2014**

**Paris, France**

**Emmanuel Martinod, MD (Chair)**

Avicenne Hospital, Bobigny

**Virginie Westeel, MD**

Besançon University Hospital, Besançon  
University of Franche-Comté, Besançon

**Pierre Saintigny, MD**

Centre de Recherche en Cancérologie de  
Lyon, Lyon

**Eric S. Edell, MD, FCCP**

Mayo Clinic, Rochester, MN

**Mari Mino-Knudson, MD**

Harvard Medical School, Boston, MA

**Antoni Rosell, MD**

Bellvitge University Hospital, Barcelona,  
Spain

**May 7, 2014**

**Budapest, Hungary**

**Zsolt Pápai-Székely, MD (Chair)**

St. George Hospital, Szekesfehervar

**József Furák, MD**

University of Szeged, Szeged

**Barna Szima, MD**

Markusovszky Hospital, Szombathely

**Eric S. Edell, MD, FCCP**

Mayo Clinic, Rochester, MN

**Mari Mino-Knudson, MD**

Harvard Medical School, Boston, MA

**Antoni Rosell, MD**

Bellvitge University Hospital, Barcelona, Spain

**May 9, 2014**

**Cluj-Napoca, Romania**

**Marioara Simon, MD, PhD**

Pneumology Hospital, Cluj-Napoca

**Dorin Vancea, MD, PhD**

**Doinita Crisan, MD, PhD**

Luliu Hatieganu University of Medicine and Pharmacy, Cluj-Napoca

**Petronela Rusu, MD, PhD**

**Cristian Paleru, MD, PhD**

Marius Nasta National Institute of Pneumology, Bucharest, Romania

**Eric S. Edell, MD, FCCP**

Mayo Clinic, Rochester, MN

**Mari Mino-Knudson, MD**

Harvard Medical School, Boston, MA

**May 30, 2014**

**Dublin, Ireland**

**David Breen, MD (Chair)**

Galway University Hospital, Galway

**Frans Colesky, MD**

National University of Ireland, Galway

**Cormac Small, MD**

Galway University Hospital, Galway

**Karen C. Redmond, MD, FRCS(CTh)**

Mater Misericordiae University Hospital, Dublin

**Ioannis Gkiozos, MD, FCCP**

Medical School of Athens, Greece

Sotiria Regional General Hospital for Pulmonary and Heart Diseases, Athens, Greece

**Mauro Papotti, MD**

University of Turin, Turin, Italy

**June 5, 2014**

**Bilbao, Spain**

**Train the Trainer Course**

**Eric S. Edell, MD, FCCP**

Mayo Clinic, Rochester, MN

**Mari Mino-Knudson, MD**

Harvard Medical School, Boston, MA

**June 6, 2014**

**Bilbao, Spain**

**SEPAR Meeting**

**Mari Mino-Knudson, MD**

Harvard Medical School, Boston, MA

**Rosa Cordovilla, MD, FCCP**

Salamanca University Hospital, Salamanca

**Roger Llatjos-Sanuy, MD**

Bellvitge University Hospital, Barcelona

**Eric S. Edell, MD, FCCP**

Mayo Clinic, Rochester, MN

**November 20, 2014**

**Thessaloniki, Greece**

Eric Edell, MD

Mayo Clinic, Rochester, MN



Septimiu Murgu, MD  
The University of Chicago Medicine,  
Chicago, IL

**Ioannis Gkiozos, MD**  
Sotiria General Hospital  
Athens Medical School, Greece

**Andriani Charpidou, PhD**  
University of Athens, Athens, Greece

**Georgios Kontopyrgias, MD**  
Metropolitan General Hospital

**Ioannis Vamvakaris, MD**  
Metropolitan General Hospital

**Dimitrios Vassos, MD**  
University of Athens, Athens, Greece

**Zoi Kalaitzi, MD**  
Metropolitan General Hospital

**November 22, 2014**  
**Bucharest, Romania**

**Helmut Popper, MD**  
Medical University of Graz, Graz, Austria

**Eric Edell, MD**  
Mayo Clinic, Rochester, MN

**Septimiu Murgu, MD**  
The University of Chicago Medicine,  
Chicago, IL

**Marioara Simon, MD**  
Pneumology Hospital  
Cluj-Napoca, Romania

**Elena Magheran, MD**  
"Marius Nasta" Pneumoftziology Institute  
Bucharest, Romania

**Cristian Paleru, MD**  
National Institute of Pneumology  
Bucharest, Romania

**Cornelia Nitipir, MD**  
Dr. Victor Babes Foundation

## Appendix D. Evaluation Plan

### A. PURPOSE

The GAIN-GLOBAL Extension Project will expand curriculum into Europe through close partnerships with European organizations and clinical leaders and champions. Specifically, the GAIN Global Initiative will support the improvement of NSCLC diagnosis and treatment as it is contextually relevant in European countries and healthcare systems. To this end, the overall project goals are:

- To improve the knowledge, performance, and competence of European physicians involved in the assessment and management of NSCLC
  - To implement key elements of the GAIN curriculum that address clinical gaps and transfer learning to improve clinical knowledge, use of appropriate medical technology, and performance in practice that optimize patient assessment and diagnosis, as well as subsequent care delivery
  - To implement a certified ACCP/ASCP Lung Cancer Educator program using standardized materials, teaching instruments, and assessment tools from GAIN

GAIN-Europe proposes to fulfill these program goals through the implementation of 10 country-specific summits and related educational programs. The learning objectives are aimed at increasing understanding of NSCLC among the multidisciplinary healthcare team (pulmonologists/respirologists, pathologists, thoracic surgeons, oncologist, and others), with primary emphasis on pulmonology/respirology and pathology. On completion of the program, the participant will be able to:

- Describe the increasing use of tumor biomarkers and targeted therapies in the personalized area of patients with NSCLC
- Demonstrate the knowledge and skills required to obtain an adequate tissue specimen for NSCLC diagnosis and treatment
- Demonstrate acquisition of specific skills in medicinal staging, TBNA-EBUS, slide preparation, and diagnosis/ pathology analysis of lung cancer
- Identify biomarker testing and targeted therapy options for personalized care for patients with NSCLC
- Develop and implement an interdisciplinary coordinated-care plan for patients with NSCLC using a tumor-board model.

The assessment and evaluation tools for Phase 1 (preparation for the GAIN-Europe beta test) aim to:

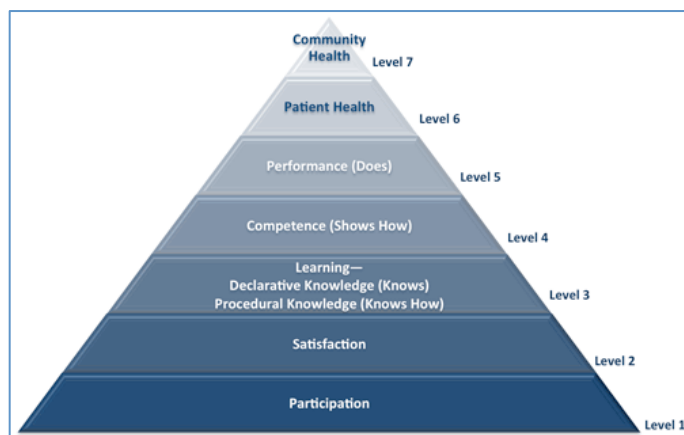
- 1) Pilot-test the assessments for knowledge, skill, and competence that will be used as part of GAIN-Europe beta test

- 2) Provide baseline information about the country-specific context in which NSCLC practitioners operate. (i.e., GAIN-Europe Systems Survey)
- 3) Provide baseline demographic, satisfaction, and competence information about GAIN-Europe participants
- 4) Provide formative feedback on instructional design and delivery (i.e., provide formative feedback on instructional design and delivery of the tumor-board concept.)

A variety of tools, described in Section B, will be developed to meet these evaluation objectives according to the Moore Levels of Evaluation for Health Professionals (2012).

## B. ASSESSMENT AND EVALUATION MODEL AND METHODS

Several evaluation activities have been identified for GAIN-Europe. Each activity corresponds to a distinct level of the Moore evaluation model and provides unique outcomes information for the activity. The evaluation plans for GAIN-Europe will follow a complex systems design. The GAIN-Europe evaluation teams have discussed the assessment of Moore Levels 1 through 7. **Figure 21** depicts the Moore Evaluation Model.



**Figure 21.** The Moore Levels of Evaluation for Continuing Medical Education

Further, **Table 10** lists evaluation activities and the primary protocols to be used to gather information for the GAIN-Europe grant. The last column of the table indicates whether the tool and/or assessment purpose was specifically discussed in the grant.

**Table 10.** Evaluation Activities and Purposes

<b>Evaluation Activity</b>	<b>Moore Level</b>	<b>Purpose</b>	<b>Additional Considerations</b>
<b>GAIN-Europe Systems Survey</b>	6	To provide baseline information about the NSCLC treatment cycle for the given countries  Used to develop/customize instructional plan  To provide baseline for outcomes measurement	Customization of survey for local audiences
<b>Knowledge</b>	4	Formative feedback for design and delivery of materials	Fielded with Knowledge Survey  Pre-/post-test
<b>Demographic Survey/Satisfaction Survey</b>	1	Number of participants  Satisfaction with summits/breakout sessions	Demographic Survey from previous program of GAIN 1.0 used as baseline  Pathology/pulmonology breakout session from GAIN  Field demographic survey immediately after beta testing
<b>Knowledge Before and After Assessment</b>	3, 4	Modified version of GAIN-Europe Pre-/Post-Summit Assessment	Knowledge assessment at beta stage
<b>PBL-Assessment Checklists</b>	4, 5	Rubric for PBL Assessment	Based on checklists from Dr. Murgu

**C. DATA COLLECTION AND ANALYSIS PLAN**

All assessment tools will be distributed and analyzed according to methods indicated in the GAIN-Europe Grant and/or common classical test theory statistical methods. Data collection and analysis will follow the timetables indicated in **Table 11**.

**Table 11.** Data Collection and Analysis Plans

<b>Data-Collection Tool</b>	<b>Evaluation/Research Questions</b>	<b>Deployment</b>	<b>Analysis Methods</b>
<b>GAIN-Europe System Survey</b>	<p>What are the baseline treatment-cycle indicators for NSCLC within participating European locations?</p> <p>What are the baseline systems indicators within the GAIN-Europe location?</p> <p>What are the reliability and validity of our survey?</p>	Before Summit	Classical test theory—reliability and validity
<b>Confidence/Skills</b>	<p>Was the training design effective?</p> <p>Did the training meet your needs/expectations?</p> <p>What is the your comfort [level] with the GAIN-Europe materials and resources?</p>	<p>After Summit</p> <p>Fielded with learning objective</p>	<p>Formative design notes</p> <p>Frequency and cross-tab analysis</p>
<b>Satisfaction/Demographic Survey</b>	<p>What is the background of respondents?</p>	Before Summit	<p>Counts of participants by location change</p> <p>Geographic information system (GIS) mapping of project coverage</p>
<b>Knowledge and Skills Assessment</b>	<p>Knowledge and skills change with identifying patients, collecting and analyzing lung-tissue specimens, performing biomarker assays for patients with selected types of lung cancer, and treating patients with NSCLC</p>	<p>Modify from previous lung-cancer post-test</p> <p>Send to steering committee for approval</p>	<p>Pre-/post-Summit change</p> <p>Validation and reliability using classical test theory (CTT) and Rash</p>

Data-Collection Tool	Evaluation/Research Questions	Deployment	Analysis Methods
			analysis

<b>Rubric</b>	What are the unique issues at each site for the plan?	Developed by Drs. Morgue and Dell	Qualitative analysis of PBL Cases and Participant Tumor Boards
	What are the unique issues at each site for coordination?	Implemented by GAIN faculty	
	What are the most unique implementation strategies?		