

## **European Immuno-Oncology Clinic Companion**

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### **Abstract**

Siyemi Learning proposes the European Immuno-Oncology Clinic Companion (EIOCC), a needs-based, multicomponent initiative designed to support and facilitate increased knowledge, competence, confidence, and performance among the target population of European medical oncologists and other members of the cancer care team involved in the use of immuno-oncology therapies. The European IOCC initiative aligns with the mission of Siyemi Learning by focusing on three key components: needs-based design, collaboration, and interprofessional learning. First, the project begins with a learner self-assessment activity to refine and validate the educational goals and intended results of the overall initiative. In the development of individual activities, the EIOCC initiative leverages Siyemi Learning's relationships with ONCOassist, a technology partner, as well as the European Society of Medical Oncology (ESMO) and European Oncology Nursing Society (EONS) for broad learner recruitment. Together, the mix of activities selected for the EIOCC initiative will address the needs of the interprofessional cancer team, including medical oncologists, oncology nurses, and other healthcare professionals involved in the emerging field of immuno-oncology. Lastly, a comprehensive plan for outcomes assessment and dissemination, including publication in the continuing medical education (CME) literature, ensures that the lessons learned from this initiative can continue to propel the fields of CME and learning science forward.

**Keywords:** *Immuno-oncology, clinical pathways, case-based learning, immune-related adverse events, audit and feedback*

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## Overall Goal & Objectives

Siyemi Learning proposes the European Immuno-Oncology Clinic Companion (EIOCC), a needs-based, multicomponent initiative designed to support and facilitate increased knowledge, competence, confidence, and performance among medical oncologists and other members of the cancer care team involved in the use of immuno-oncology therapies. The European IOCC initiative aligns with the mission of Siyemi Learning by focusing on:

- **Needs-based design:** the project begins with a learner self-assessment activity to refine and validate the educational goals and intended results of the overall initiative
- **Collaboration:** the initiative leverages Siyemi Learning's relationships with ONCOassist, a technology partner, as well as the European Society of Medical Oncology (ESMO) and European Oncology Nursing Society (EONS) for broad learner recruitment
- **Interprofessional learning:** activities will address the needs of the interprofessional cancer team, including medical oncologists, oncology nurses, and other healthcare professionals involved in the emerging field of immuno-oncology

Based on our preliminary needs assessment, we have identified key learning objectives for the overall EIOCC initiative: assess the role of the immune system in regulating antitumor activity; evaluate the mechanisms of action (MOAs) of immuno-oncology agents and their role in cancer treatment; apply the latest clinical research to the selection and sequencing of immuno-oncology therapies in appropriate patients using case-based examples; and collaborate with team members to identify opportunities to manage immune-related adverse events (irAEs) and reduce symptom burden during treatment with immuno-oncology agents.

## Current Assessment of Need

Siyemi Learning will be employing a two-fold strategy for needs assessment to guide the European IOCC. First, we reviewed published oncologist survey data to identify needs in three areas: foundational knowledge of immuno-oncology, complexity of immunotherapy selection and sequencing, and management of irAEs. This broad analysis incorporates the full target audience of European oncologists to reflect all potential EIOCC learners. The Target Audience section summarizes additional needs and opportunities in the UK, Spain, and Italy. Second, the EIOCC initiative will begin with a learner self-assessment activity designed to validate knowledge, competence, and performance gaps related to immuno-oncology (see Project Design and Methods, Phase 0). Findings from the learner self-assessment will define the educational goals of additional EIOCC activities (Phases 1a and 1b).

## I. Preliminary Needs Assessment Findings

### Gap Area #1: Foundational Knowledge of Immuno-Oncology

**What Should Be:** Oncologists make treatment decisions for patients with cancer based on a solid understanding, and confidence in knowledge, of the immune system, the MOAs of immuno-oncology therapies, and the evidence-based role of these agents in cancer care.<sup>1,2</sup>

**What Is:** European oncologists demonstrate substantial gaps in foundational knowledge necessary to support treatment decisions around immuno-oncology.<sup>3</sup> In a survey of 169 medical oncologists from six European countries, only 35% described themselves as “well-informed” on the topics of cancer immunotherapy and immuno-oncology.<sup>3</sup> Self-reported

knowledge gaps were consistent across regions and subtopics: basic pathophysiology of the immune system, use of biomarkers to guide the selection of immunotherapy; MOAs of immune checkpoint inhibitors; and the unique response kinetics and toxicities of immuno-oncology agents. Gaps in knowledge can impede the selection of evidence-based therapy. In another survey of medical oncologists, 57% reported that it was unlikely that they would use a new immunotherapeutic agent without understanding its MOA.<sup>4</sup> Oncologists' knowledge gaps also interfere with effective patient communication. In a global survey of 895 oncologists, only 23% felt that their patients were fully informed about their cancer and its treatment.<sup>5</sup> Oncologists who lack foundational knowledge in immuno-oncology are not able to provide the necessary education to patients and their families to support shared decision-making (SDM).

**Educational Need:** To deliver evidence-based care, oncologists require updates on new insights on immune system pathophysiology as it relates to cancer treatment, relevant tumor pathophysiology, expected antitumor response of new immuno-oncology agents, and other topics necessary to support clinical decision-making in routine oncology practice.<sup>6-9</sup>

### **Gap Area #2: Complexity of Immunotherapy Selection and Sequencing**

**What Should Be:** As ongoing clinical trials mature and knowledge about immuno-oncology agents advances, oncologists are able to absorb, process, and apply new evidence to decisions about biomarker testing, first-line therapy, and subsequent-line treatment selection.

**What Is:** Advances in immuno-oncology are developing at a rapid pace, leaving oncologists to decipher the best treatment approach for each individual patient. Clinical trials are incorporating new endpoints to reflect the unique response kinetics of immunotherapies relative to chemotherapeutic agents, making the practical interpretation of new research results especially challenging.<sup>10,11</sup> Further, as immunotherapy treatment decisions grow in complexity, SDM remains a central component of quality cancer care.<sup>12</sup> In a survey of 5,315 patients with colorectal or lung cancer, those who perceived their oncologists to be in control of treatment decisions (versus SDM) were significantly less likely to report excellent quality of care or excellent physician communication.<sup>12</sup> Models to support SDM in oncology practice are emerging, but challenges remain.<sup>13</sup> Communication between patients and oncologists can be hampered by patients' misconceptions regarding treatment expectations, with many patients believing immunotherapy offers a "cure" despite being treated in a non-curative setting.<sup>14</sup>

**Educational Need:** Oncologists need practical guidance on how to apply the latest clinical evidence regarding the optimal use of immuno-oncology agents across the spectrum of cancer therapy, given the real-world context of multidisciplinary care and SDM.

### **Gap Area #3: Management of Immune-Related Adverse Events**

**What Should Be:** Oncologists apply a clear understanding of the unique toxicity profiles of immuno-oncology agents to the management of patients receiving these therapies.

**What Is:** Inadequate management of immune-mediated toxicities can interfere with optimal dosing, adherence, and treatment effectiveness.<sup>15,16</sup> Until recently, oncologists have not had clear guidance on the management of irAEs. The availability of new guidelines, however, presents an opportunity to elevate the standards of care for patients undergoing treatment with immuno-oncology agents. The European Society of Medical Oncology (ESMO) published new guidelines on the management of immunotherapy toxicities in July 2017,<sup>17</sup> and joint

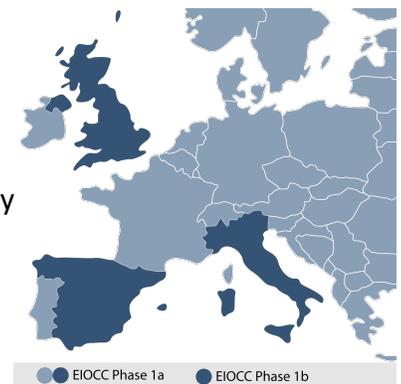
guidelines from the American Society of Clinical Oncology (ASCO) and the National Comprehensive Cancer Network (NCCN) are expected later this year.<sup>18</sup> Although new guidelines are welcome tools for facilitating evidence-based care, oncologists will be challenged to incorporate new and detailed algorithms on side effect monitoring and management.

**Educational Need:** Oncologists will need practical case-based guidance on implementing new recommendations in the context of other clinical decision-making around immunotherapy. Managing patient expectations around immune-related events through education and counseling is essential for successful treatment.<sup>19</sup>

**II. Rationale for Learner Self-Assessment**—Although published survey data are critical for understanding clinical gaps related to immuno-oncology, surveys conducted even two to three years ago may no longer reflect current levels of knowledge. Given the rapid pace of advances in this field, as well as the accompanying flood of information after each major oncology congress, it is reasonable to expect some gains in basic immuno-oncology knowledge. Yet some oncologists who are challenged to stay up-to-date with the latest advances may show persistent gaps in knowledge and competence. The **EIOCC Learner Self-Assessment** (Phase 0) will validate and quantify current gaps.

### Target Audience

For the **EIOCC Learner Self-Assessment** (Phase 0) and **EIOCC Immuno-Oncology Clinic in a Box** (Phase 1a), the target audience includes European medical oncologists and other members of the multidisciplinary and interprofessional cancer care team. Learner recruitment plans are described at the end of this section. Oncologists in the UK, Italy, and Spain were selected as the target audience for the **EIOCC Clinic Mentor Pilot Program** (Phase 1b) based on: 1) the availability of robust baseline data documenting current needs in oncology care; and 2) the presence of national academic centers and/or medical societies focused on immuno-oncology, demonstrating the availability of nationally recognized faculty champions and an established framework for collaboration.



**Italy: Current Challenges**—In the European survey of immunotherapy knowledge and practice gaps, Italian oncologists (n = 30) demonstrated a need for education across a range of topics.<sup>3</sup> In particular, only a minority of Italian oncologists described themselves as well-informed on topics such as the immune system and carcinogenesis (40%), the role of biomarkers in predicting response to immunotherapy (43%), and the mechanisms of action of agents targeting the CTLA-4 and PD-1 signaling pathways (37% and 34%, respectively).<sup>3</sup> Barriers to effective communication appears to be a challenge in the Italian oncology setting. In a survey of 341 Italian patients with breast, lung, or colorectal cancer, patients rated their levels of satisfaction on 19 domains of cancer care.<sup>20</sup> Of these, “treatment information” and “information on symptoms and lifestyle” received the lowest ratings, suggesting persistent communication gaps with patients around treatment expectations.<sup>20</sup>

**Italy: Emerging Opportunities**—At the Veneto Institute Oncologico Veneto (IOV) in Padova, Italy, researchers launched a pilot program of innovative cost-containment strategies, including centralized drug-day compounding, to address barriers to ipilimumab treatment among patients with metastatic melanoma.<sup>21</sup> Findings from the IOV program highlight the importance of multidisciplinary collaboration among oncologists, pharmacists, nurses, and technicians, in improving access to new immuno-oncology therapies.<sup>21</sup> In another Northern Italian pilot program, researchers from cancer centers in Trento, Meldola, and Bergamo are assessing the feasibility of mobile platform (Onco-TreC) designed to support treatment adherence, symptom reporting, and toxicity management in patients receiving oral anticancer therapies such as sunitinib.<sup>22</sup> As a complement to these research projects, several Italian organizations are becoming prominent voices in immuno-oncology. In 2016, the Italian Association of Thoracic Oncology published general guidance on the use of immunotherapy in non-small cell lung cancer (NSCLC), as well as a specific update on the role of nivolumab in second-line NSCLC treatment.<sup>23,24</sup> The Italian Network for Tumor Biotherapy (Network Italiano per la Bioterapia dei Tumori; NIBIT) is a nonprofit consortium of more than 40 academic, regulatory, and industrial groups focused on advances in tumor immunology and immuno-oncology therapies.<sup>25,26</sup>

**Spain: Current Challenges**—In the European survey of immunotherapy knowledge and practice patterns, Spanish oncologists (n = 30) demonstrated especially low rates of self-reported knowledge.<sup>3</sup> Only 20% felt well-informed on the topic of the immune system and carcinogenesis; 30% felt well-informed about anti-CTLA-4 therapies; and 0% described themselves as well-informed about agents targeting the PD-1 pathway.<sup>3</sup> These findings demonstrate a pronounced deficit in foundational knowledge necessary to incorporate immuno-oncology agents into routine clinical practice.

**Spain: Emerging Opportunities**—The Spanish Group for Cancer Immuno-Biotherapy (Grupo Español de Terapias Inmuno-Biologicas en Cancer; GÉTICA) is a nonprofit society focused on immunotherapy development and clinician education.<sup>27</sup> GÉTICA's growing contributions to the field of immuno-oncology include hosting annual scientific meetings and developing guidelines for endocrine-related AE management in patients receiving immune checkpoint inhibitors.<sup>28</sup> In 2017, the Spanish Society of Medical Oncology (Sociedad Española de Oncología Médica; SEOM) outlined the current and future needs of Spanish oncologists.<sup>29</sup> Based on a survey of 176 oncologists and findings from an expert advisory board, the SEOM identified 29 key priorities for the Spanish oncology community to meet the growing demand and complexity of oncology services.<sup>29</sup> Several SEOM recommendations align with the goals and methods of the proposed EIOCC initiative: advance the definition of agreed protocols/therapy guidelines and promote their implementation; define, establish and measure useful indicators for the assessment of care delivery quality and the impact of innovation incorporation; increase the use of information and communication technologies for promoting inter/multidisciplinary work; and promote research in biomarkers, immunotherapy and combined therapies.

**United Kingdom: Current Challenges**—Survival outcomes among patients diagnosed with cancer in the UK are falling behind those in the rest of Europe.<sup>30</sup> In a recent analysis of cancer mortality in 30 countries (28 member states of the EU plus Norway and Switzerland), the UK

had the worst survival rates for ovarian cancer and the second lowest survival rates for lung and pancreatic cancers.<sup>30</sup> Health-system barriers such as poor medication access contribute to these discrepancies in treatment outcomes. In the UK, the incorporation of newer cancer therapies into oncology practice is generally slower than in other G5 member countries (France, Germany, Italy, Spain). This is particularly true of newer targeted therapies and checkpoint inhibitors. To date, the UK has had the lowest usage rates of bevacizumab, imatinib, and erlotinib among G5 countries, and is in the middle of the group for ipilimumab usage.<sup>30</sup> Poor knowledge of immunotherapies may contribute to suboptimal cancer treatment outcomes. In the European immunotherapy survey, the subgroup of UK oncologists (n = 30) were unlikely to describe themselves as well-informed on the role of biomarkers as predictors of response to immunotherapy (33%), the mechanisms of action of agents targeting CTLA-4 (33%) or PD-1 (20%), or the management of immunotherapy-related AEs (37%).<sup>3</sup>

**United Kingdom: Emerging Opportunities**—The Cancer Immunology and Immunotherapy Centre (CIIC) ([www.qehb.org/ciic](http://www.qehb.org/ciic)) is a collaborative of approximately 30 academic and clinical research centers based at the University of Birmingham and the Queen Elizabeth Hospital Birmingham.<sup>31</sup> The CIIC member organizations are “focused on developing internationally outstanding basic tumor immunology research and translating key discoveries into improvements in cancer treatment.” A new Centre for Cancer Immunology at the University of Southampton will expand the immuno-oncology infrastructure within the UK.<sup>32</sup>

**Learner Recruitment**—Through our collaboration with ONCOassist, Siyemi Learning will engage with other ONCOassist partners for robust learner recruitment. Recruitment campaigns will target the ESMO member list of more than 13,000 European oncology professionals, as well as the EONS member list of 20,000 oncology nurses working in Europe.

### Project Design and Methods

The overall strategy for the EIOCC initiative includes 4 phases: learner self-assessment (Phase 0), two rounds of educational interventions (Phase Ia and Ib), and outcomes evaluation and reporting (Phase 2). The educational activities were selected based on their combination of feasibility, proven effectiveness, and expected impact on clinical practice. The rationale for individual components is explored below. All activities and tools developed through the EIOCC will be made available publically at no cost.

Activity	Description
<b>Phase 0: EIOCC Learner Self-Assessment</b>	
One (1) case-based self-assessment 1.0 credit	The initiative will begin with a case-based self-assessment e-learning activity designed to: 1) assess alignment of current clinical practice with guidelines and evidence, 2) identify additional clinical gaps and educational needs, and 3) validate the educational goals, learning objectives, and desired results for the overall initiative. Learners will be recruited via ESMO/EONS mailing lists, The Christie, and other ESMO Designated Centres of Integrated Oncology and Palliative Care across Europe. Findings from a minimum of 100 learners will be used to shape Phase I/II content.

<b>Phase Ia: EIOCC Immuno-Oncology Clinic in a Box</b>	
Four (4) knowledge-building modules 0.25 credits each	Learners will be invited to an “Assess Your Knowledge” Quiz, and filtered to participate in up to 4 knowledge-building modules focused on: 1) a review of the immune system in cancer therapy; 2) MOAs of immuno-oncology agents; 3) immune-response kinetics; and 4) irAEs. Additional resources to include a forum for case discussion, clinical guidelines, sample institutional protocols/order sets, and patient education materials
Three (3) live webcasts 1.0 hours each	Webcasts will provide learners with practical strategies for implementing immuno-oncology clinics in their centres, with faculty Q&A.
Web-based clinical pathway (non-certified companion tool)	A new web-based tool powered by ONCOassist and designed to put the 2017 ESMO guidelines (and possibly the expected ASCO/NCCN joint guidelines) for irAE management and other relevant team-based algorithms.
Four (4) case-based activities 0.5 hours each	Each case will address a specific clinical challenge identified in the learner self-assessment activity and during webcast Q&As. Cases will demonstrate the point-of-care use of the ONCOassist app to support clinical decision-making and reflect latest clinical evidence, including updates presented at the 2018 ASCO, ESMO, and other annual meetings.
<b>Phase Ib: EIOCC Clinic Mentor Pilot Program</b>	
Three (3) A&F sessions at partner clinics in the UK, Spain, Italy 2.0 hours each	The EIOCC faculty mentors from the UK, Spain, and Italy will identify partner facilities to host on-site faculty visits that incorporate an electronic A&F intervention customized to the needs of each setting. Electronic data will be collected and evaluated prior to the visit (‘audit’), allowing time for ‘feedback’ during the clinic visit itself. Additional follow-up feedback will include emails from the faculty reinforcing the original feedback messages, and addressing new questions that arise during the onsite visit.
<b>Phase II: EIOCC Impact Assessment and Dissemination</b>	
Meeting abstracts and JECME manuscripts	Impact assessment and dissemination via meeting abstracts (e.g., ASCO/ESMO 2018 and 2019) and JECME manuscripts. Additional details in the Evaluation Design section.

A&F, audit and feedback; EIOCC, European Immuno-Oncology Clinic Companion; ESMO, European Society of Medical Oncology; irAE, immune-related adverse events; JECME, Journal of European CME; NCCN, National Comprehensive Cancer Network.

### **Web-Based Toolkits: Rationale for the Immuno-Oncology Clinic in a Box**

Clinicians worldwide increasingly rely on web-based learning for continuing professional development.<sup>33</sup> According to the 2016 ACCME Data Report, online enduring activities now account for more than 50% of all learner interactions with ACCME-accredited providers.<sup>33</sup> In a study of 383 physicians in Scotland, 94.3% reported using internet resources on three or more working days per week, and 87.4% rated ‘completing online learning modules’ among the most valued online activities.<sup>34</sup> In a 2017, the European Cancer Patient Coalition endorsed the wider

use of information communication technologies, including mobile health (mHealth) tools, to deliver more personalized cancer care.<sup>35</sup> Siyemi Learning has applied the latest evidence in adult learning science to shape the web-based phase of this multi-modal, multi-exposure initiative.<sup>36-38</sup> Compared with single interventions, multifaceted educational programs are more likely to achieve significant improvements in knowledge and self-reported intention to change practice behavior.<sup>39-41</sup> Siyemi Learning will develop a dedicated EIOCC portal to host all components of the Immuno-Oncology Clinic in Box, a multicomponent framework designed for medical oncologists across Europe to adopt, customize, and implement to address their unique institutional needs.

### **Clinical Pathways: Rationale for the EIOCC Pathway for irAE Management**

Clinical pathways are detailed protocols that translate complex guidelines into clear algorithms for patients undergoing specific types of treatment.<sup>42</sup> When used at the point of care, clinical oncology pathways are effective tools for improving patient-provider communication about complex treatment options.<sup>43</sup> Oncology pathways are increasingly being incorporated into routine practice, with individual cancer centers, hospital networks, payors, and other stakeholders developing pathways.<sup>43</sup> Many success stories are also emerging. At the Dana-Farber Cancer Institute (DFCI) in Boston, MA, the implementation of the DFCI Pathway for stage IV NSCLC significantly reduced the cost of NSCLC care while preserving clinical outcomes, including overall survival.<sup>44</sup> In the United States, an estimated 25% of cancer patients are now treated under clinical oncology pathways, up from 15% in 2010.<sup>43</sup>

In 2017, ASCO published criteria for developing high-quality oncology pathway programs, with an emphasis on programs that are expert-driven, transparent, patient-focused, up-to-date, and evidence-based.<sup>43</sup> ASCO also recommends cost-effective technology, integrated decision-support tools (e.g., links to order sets), and achievable outcomes (e.g., expectations regarding pathway adherence).<sup>43</sup> Siyemi Learning will integrate these criteria into the development of a web-based EIOCC pathway for irAE management in collaboration with ONCOassist, a point-of-care mobile app designed by oncology professionals to facilitate evidence-based clinical decision-making.<sup>45</sup> Unlike other point-of-care apps, ONCOassist is the only app that is classified as a medical device and CE-approved for use in European Economic Area countries to aid in clinical decisions. Siyemi Learning has obtained guidance from the ACCME to ensure that the EIOCC web-based tool will be developed in compliance with all ACCME standards.

### **Case-Based Learning: Rationale for the EIOCC Case Series**

Case-based activities and simulations of clinical decision making also enhanced educational effectiveness.<sup>46</sup> Point-of-care feedback, which involves prompting learners with relevant guideline recommendations at the time of clinical decision-making, improves knowledge transfer and facilitates the adoption of clinical practice guidelines.<sup>47</sup> Each case in the EIOCC series will feature at least one clinical decision point designed to instruct learners on the appropriate use of the web-based EIOCC irAE Management Pathway. The cases will also model SDM techniques that support the discussion of immuno-oncology treatment decisions.

### **Audit & Feedback: Rationale for the EIOCC Clinic Mentor Pilot Program**

Healthcare professionals can overestimate their compliance with performance standards by 20% to 30%.<sup>39</sup> Audit and feedback (A&F) is the practice of providing objective clinical performance summaries to healthcare professionals with the goal of supporting an evidence-based change in practice behavior.<sup>48</sup> In traditional A&F programs, the 'audit' portion involves the direct observation of a physician's clinical performance, followed by face-to-face 'feedback' regarding any aspects of his or her practice that is inconsistent with the desired standards of care.<sup>48</sup> A recent meta-analysis of 140 A&F studies identified several features that increase the likelihood of achieving a significant effect on professional clinical behavior: the person conducting the audit is a supervisor or colleague; feedback is given both verbally and in writing, is provided more than once, and includes clear targets and an action plan; and the A&F focuses on aspects of clinical behavior with low baseline performance<sup>48</sup>

With the increasing availability of health data in electronic format, electronic A&F is emerging as another option for supporting behavior change.<sup>49</sup> Compared with standard individual-based A&F, electronic A&F facilitates feedback to entire care teams, departments, and facilities. This approach may have more relevance for team-based care, where multiple healthcare professionals (oncologists, oncology nurses, technicians) are responsible for patient outcomes, and care is highly coordinated.<sup>49</sup> Two recent randomized trials of A&F interventions in the UK demonstrated the feasibility of improving safe prescribing behaviors among healthcare professionals using electronic prescribing data compared with national safety benchmarks as the focus of the A&F.<sup>50,51</sup>

As part of the **EIOCC Clinic Mentor Pilot Program**, Siyemi Learning and the EIOCC faculty mentors will collaborate with each partner facility in the UK, Spain, and Italy to develop an approach to A&F that is most suitable to each setting. The A&F will include elements that increase the likelihood of improving professional practice: a focus on practices with low baseline performance levels; use of verbal and written feedback; multiple occurrences of feedback; and feedback that includes clear targets and an action plan.<sup>48</sup>

### **Evaluation Design**

Siyemi Learning looked beyond the CME/CPD literature to examine current best practices in evaluating both the implementation and impact of health programs.<sup>53</sup> Educational interventions that are not implemented appropriately will not have the desired educational impact.<sup>53</sup> Therefore, at each initiative phase, we will collect data to assess implementation (process measures) and measure the educational impact (outcomes measures).

The outcomes assessment plan will: 1) determine whether learning goals have been met; and 2) quantify the magnitude of educational effect. Effect sizes for each activity will be reported within the context of Moore's expanded outcomes framework, up to knowledge, competence, and performance, where applicable.<sup>54</sup> Further, the impact analysis will consider threats to internal validity of the pretest/posttest design, including history and maturation.<sup>53</sup> Finally, we will measure the clinical impact of these initiatives by calculating the number of cancer lives

reached (i.e., number of patients treated by each participant) relative to the magnitude of increase in treatment decisions that align with the standards of care.

Intervention	Process Measures	Assessment and Reporting of Educational Impact		
		Outcomes Measures	Effect Size	Use & Dissemination
<b>Phase 0: EIOCC Learner Self-Assessment</b>				
Learner self-assessment activity	<i>Target audience reach:</i> learner participation  <i>Evaluation feedback:</i> content appropriate to practice	<i>Knowledge:</i> Recognition of key signaling pathways (e.g., checkpoint inhibition); MOAs of immuno-oncology agents; immunotherapy response kinetics; prevalence and pathophysiology of irAEs.	None; goal is to validate presumed gaps and identify additional gaps	Outcomes to validate gaps and guide the development of EIOCC Phase Ia & Ib content
<b>Phase Ia: EIOCC Immuno-Oncology Clinic in a Box</b>				
<b>Knowledge-building modules</b>	<i>Target audience reach:</i> learner participation  <i>Evaluation feedback:</i> content appropriate to practice	<i>Knowledge:</i> Recognition of key signaling pathways (e.g., checkpoint inhibition); MOAs of immuno-oncology agents; immunotherapy response kinetics; prevalence and pathophysiology of irAEs.	40-60% increase in knowledge	Individual activity outcomes to be reported as meeting abstracts (e.g., ESMO 2018 and 2019);
<b>Live webcasts</b>	content appropriate to practice	<i>Knowledge:</i> Recognition of the place of immuno-oncology agents in current clinical pathways; recognition of opportunities for team-based care.  <i>Confidence:</i> self-reported confidence in immuno-oncology treatment selection and irAE management	20-40% increase in knowledge  20-40% increase in confidence	outcomes from the full Immuno-Oncology Clinic in a Box portion of the EIOCC initiative to be submitted to <i>JECME</i>
<b>Case-based activities</b>		<i>Competence:</i> Selection of evidence-based treatment	20-40% increase in competence	Additional findings will inform focus of 2018 EIOCC interventions

		choices in case-based clinical vignettes. <i>Confidence:</i> self-reported confidence in immuno-oncology treatment selection and irAE management	20-40% increase in confidence	
<b>Phase Ib: EIOCC Clinic Mentor Pilot Program</b>				
<b>Faculty expert visit with electronic A&amp;F</b>	<i>Target audience reach:</i> facility and individual learner participation  <i>Evaluation feedback:</i> content appropriate to practice	<i>Performance:</i> compliance with defined standards of care (referral for PD-L1 testing; treatment selection consistent with guidelines; documentation of irAE severity; irAE monitoring and management consistent with ESMO guidelines.	10-15% in rates of compliance to outcomes measures	Outcomes from the full EIOCC Clinic Mentor Pilot Program to be submitted to <i>JECME</i>

**Phase Ia: EIOCC Immuno-Oncology Clinic in a Box**—Estimates of effect sizes for internet-based CME activities vary considerably, although effect sizes of 0.2, 0.5, and 0.8 are recognized thresholds for small, medium, and large effects, respectively.<sup>41,46</sup> In one meta-analysis of 48 internet-based CME activities, the mean effect size was 0.75, with an increase of 45% in evidence-based decision-making in response to clinical case vignettes.<sup>55</sup> **Phase Ib: EIOCC Clinic Mentor Pilot Program**—Traditional and electronic A&F can result in modest but clinically meaningful changes in practice behavior.<sup>48,49</sup> In the meta-analysis of traditional A&F studies, the median change was a 4.3% absolute increase in compliance with desired practice (interquartile range, 0.5% to 16%).<sup>48</sup> In another meta-analysis of electronic A&F, the weighted odds ratio of compliance with desired practice was 1.93 (95% CI, 1.36-2.73) when comparing electronic A&F versus no intervention.<sup>49</sup> Absolute differences in the rates of compliance ranged from 9.4% to 14.9% between the electronic A&F intervention and control groups.<sup>49</sup> Based on these findings, Siyemi Learning will identify appropriate dichotomous process measures to assess whether the care provided is in compliance with specific standards (outcomes: yes/no). The expected effect size is an increase of 10% to 15% in the observed rate of compliance with specific standards related to immuno-oncology treatment following the A&F intervention.

**Detailed Workplan**

Siyemi Learning will commence work starting October 2017 with completion in December 2018. The milestones for each phase are described in the Deliverables schedule. Based on the success of the 2018 activities, the EIOCC project may expand to include a growing library of additional resources, and extended into other regions in 2019 and beyond.

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## Appendix: Deliverables Schedule

Deliverable	Planning	Launch	Completion
<b>Phase 0: EIOCC Learner Self-Assessment</b>			
Case-based self-assessment	October 2017	December 2017	February 2018
<b>Phase Ia: EIOCC Immuno-Oncology Clinic in a Box</b>			
Knowledge-building modules	January 2018	April 2018	June 2018
Live webcasts	February 2018	May 2018	July 2018
Web-based irAE tool	November 2018	March 2018	NA
Case-based activities	January 2018	April 2018	July 2018
<b>Phase Ib: EIOCC Clinic Mentor Pilot Program</b>			
Clinic visits with A&F	May 2018	June 2018	August 2018
<b>Phase II: EIOCC Impact Assessment and Dissemination</b>			
Meeting abstracts and JECME manuscripts	April 2018	July 2018	December 2018