
Supplemental Digital Appendix 1
Curriculum Goals, Domains, and Representative Objectives (Abbreviations: PDSA indicates Plan-Do-Study-Act)

<table>
<thead>
<tr>
<th>Curricular Goals</th>
<th>Domains &amp; Representative Objectives</th>
</tr>
</thead>
</table>
| GOAL 1 Value improvement science as an essential accompanying skillset to basic research and clinical science in caring for patients in the 21st century | • Health Systems Science  
Describe health system science and its relationship to clinical and basic research science  

• Fundamentals of Health System Improvement  
Identify the four core elements common to all major iterative improvement models (aims, measures, ideas for change, cumulative PDSA testing) |
| GOAL 2 Embody a sense of professionalism that includes system stewardship and a personal obligation to health and wellness as essential foundations for achieving the quadruple aim of healthcare | • Professionalism  
Value participation in departmental and system-wide improvement activities as a responsibility of all physicians  

• Quadruple Aim  
Apply the premise that personal well-being is a pre-requisite to provision of high-quality care to a hypothetical house officer case |
| GOAL 3 Routinely and effectively engage in inter-professional quality improvement and patient safety teams aligned with the priorities and improvement methodology of their respective clinical learning environments & eventual practice locations | • Quality Improvement & Patient Safety Methods  
Apply the concepts of standardized tasks, visual control, and continuous problem solving to a hypothetical healthcare scenario  
Recall the key steps involved in a healthcare root cause analysis  

• Teamwork & Teaming  
Describe a conceptual model for effective healthcare team dynamics |
Supplemental Digital Appendix 2
Overview of Simulation Sessions, Objectives, and Activities in the OHSU GME Integrated Improvement Science Curriculum (Abbreviations: AMA indicates American Medical Association; IOM Institute of Medicine; PDSA Plan Do Study Act; OHSU Oregon Health & Science University; GME Graduate Medical Education; VAPORHCS Veterans Affairs Portland Health Care System)

<table>
<thead>
<tr>
<th>Station</th>
<th>Learning Objectives</th>
<th>Simulation Activities</th>
</tr>
</thead>
</table>
| Pre-work, introduction, conclusion | - Identify the basic components of the AMA Health System Science Framework  
- Identify the four components of W. E. Deming's System of Profound Knowledge  
- Describe the growth mindset as it relates to health system improvement  
- Recognize participation in departmental and system-wide improvement activities as a responsibility of all house officers & physicians  
- Value effective participation in inter-professional and multi-disciplinary teams as an essential element of the daily work of all healthcare professionals  
- Recall the relative prevalence of communication errors as a root cause in many high-risk medical errors  
- Describe a shared conceptual model for best practice healthcare team dynamics  
- Describe each element of the quadruple aim  
- Identify the clinical syndrome of burnout and departmental/institutional sources of support for provider well-being  
- Define value in terms of healthcare quality, safety, service, and cost  
- Describe the current value gap in the 21st century US healthcare system  
- Interpret the six aims of the IOM Crossing the Quality Chasm framework as they relate to health system priorities | - Simulation day pre-brief |
| Error reporting and disclosure | - Define culture of safety, including Just, Reporting, Informed, and Learning Cultures  
- Demonstrate use of a standard approach to error report generation  
- Describe a basic taxonomy of adverse events and errors in medicine, including when each should be reported | - Simulated error report filing  
- Simulated error disclosure to a patient |

| Root cause analysis | • Demonstrate use of a standard approach to error disclosure  
• Outline the benefits of error disclosure from the perspective of patients, providers, and the healthcare system |
|---------------------|------------------------------------------------------------------------------------------------------------------|
|                     | • Recognize the value of frontline representative stakeholder input as an essential component of durable systems redesign  
• Use a team-based root cause analysis process that analyzes a simulated system error to create an action plan utilizing basic human factors engineering concepts  
• Recognize the relationship between effective safety event reporting and health system improvement  
• Use a ranking tool for anticipated strength of various hypothetical system changes to classify a set of hypothetical system changes |
|                     | • Simulated root cause analysis with creation of an action plan |
| Iterative improvement initiative | • Describe a process for identifying and utilizing health system priorities to guide integrated process improvement  
• Describe the four common elements of iterative improvement methods (aims, measures, ideas for change, cumulative PDSA testing)  
• Recognize at least 2 different iterative improvement models used in OHSU GME's participating sites (e.g., OHSU, VAPORHCS, Kaiser, etc.)  
• Appraise simulated improvement data and feedback in the context of simulated sequential PDSA cycles |
|                     | • Simulated improvement initiative with 3 PDSA cycles & A3 board |
| Sustaining improvement with Lean daily management | • Define 'Lean' as it applies to healthcare system improvement  
• Describe common Lean tools utilized in various GME clinical learning environments (e.g., A3 thinking, tiered huddles, 5S, improvement events, etc.)  
• Describe at least 3 elements of daily management systems found across OHSU GME participating sites (e.g., OHSU, VAPORHCS, etc.)  
• Demonstrate participation in a simulated team improvement huddle using a visual management board |
|                     | • Simulated team daily management & weekly improvement huddles |

**Supplemental Digital Appendix 3**

_Overview of the Four Simulation Sessions, Including the Subject Matter of Each Simulation Activity Contained Within Respective Sessions (Abbreviations: PDSA indicates Plan Do Study Act)_

<table>
<thead>
<tr>
<th>Error Reporting &amp; Disclosure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Error disclosed to patient</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Root Cause Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chart review</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Iterative Improvement Pilot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Literature review</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Daily Management Huddles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improvement rounds huddle</td>
</tr>
</tbody>
</table>
Supplemental Digital Appendix 4
Description of the Case Used for All Four Linked Simulation Sessions From the OHSU GME Multi-disciplinary QI/PS Simulation Curriculum in Portland, Oregon in 2018

<table>
<thead>
<tr>
<th>Case Element</th>
<th>Case Details/Artifacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting</td>
<td>The case occurs in the emergency department of an academic medical center.</td>
</tr>
<tr>
<td>Roles</td>
<td>The case centers on an emergency medicine intern who interacts briefly with a critical care fellow, their emergency medicine attending physician, the bedside emergency medicine nurse, and the patient. A clinical pharmacist reviews and approves the medication order.</td>
</tr>
<tr>
<td>Brief Narrative Setup</td>
<td>A young adult patient without any past medical history presents with rash and mild acute respiratory distress after eating shellfish. The intern in the emergency department assesses the patient briefly and correctly diagnoses early anaphylaxis. The intern recognizes the critical care fellow from a prior rotation, so asks for their advice in managing the patient, as this is their first experience treating anaphylaxis. The critical care fellow makes verbal recommendations and proceeds to attend to a separate deteriorating patient. The intern enters orders for epinephrine, steroids, and an antihistamine according to the verbal recommendations from the critical care fellow in the electronic medical record. They do not discuss the case with their attending before entering orders to begin treatment of anaphylaxis.</td>
</tr>
<tr>
<td>Clinical Event &amp; Error</td>
<td>The intern enters an order for intravenous epinephrine without realizing that the correct first step is intramuscular epinephrine. A pharmacist reviews the order and approves it, without noting the incorrect route of administration but correct dose for treating anaphylaxis. The nurse, who is new to the emergency department and who has not treated anaphylaxis before, obtains the epinephrine from the code cart and does not wait for it to come from central pharmacy. The nurse administers intravenous epinephrine as a bolus to the patient, who...</td>
</tr>
</tbody>
</table>
develops ventricular tachycardia and has a seizure.

### Clinical Resolution
The patient is stabilized in the emergency department, is transferred to the medical intensive care unit, recovers, and is discharged home without any known long-term complications. The error is reported by the emergency medicine intern and is analyzed as part of a root cause analysis.

### Disclosure & Reporting
Artifacts:
- Error report entered by the emergency medicine intern
- Screenshots of the error reporting system at the two major participating sites
- Disclosure role descriptions:
  - Emergency medicine intern
  - Emergency medicine attending
  - Patient

### Root Cause Analysis
Artifacts:
- Emergency medicine intern clinical evaluation note & addendum
- Critical care fellow emergency room code note
- Emergency medicine nurse clinical evaluation note & addenda
- Electronic medical record order entry system screenshot
- Interviewer & interviewee scripts for the following roles:
  - Emergency medicine intern
  - Intensive care fellow
  - Emergency medicine bedside nurse
  - Emergency Medicine Pharmacist
- Fishbone diagram & root cause statements

### Iterative Improvement
Artifacts:
- Background literature review:
  - Article on medication errors in emergency departments for high-risk medications

<table>
<thead>
<tr>
<th>Daily Management</th>
<th>Artifacts:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Clinical improvement huddle board with a run chart for the outcome &amp; process measure data, as well as an ‘abnormality tracker’ for keeping track of workflow problems as they arise for two rounds of ‘improvement rounds’ huddles</td>
</tr>
<tr>
<td></td>
<td>- Clinical daily management huddle board &amp; role scripts for huddle leader, team members, and members of the tiered-huddle structure (clinical huddle reports to inpatient unit huddle, which then reports to the executive huddle, with information and fixes cascading back to the other huddle stations) for 2 rounds of ‘daily readiness’ huddles</td>
</tr>
</tbody>
</table>

- Article on double verification of high-risk medications and their reduction of high-risk medication errors
- Institutional improvement priority overview document
- Baseline high-risk medication error rate for the emergency department for the last 12 months
- Team Lean improvement A3 board
- Current state process map
- Fishbone diagram & root cause statements from the root cause analysis
- Outcome, process, and balancing measure run charts & data with baseline and data from 3 plan-do-study-act cycles for implementation of a high-risk medication double-check & electronic medical record indication system
- Standard work document for high-risk medication verification process

**Supplemental Digital Appendix 5**

*Pre- and Post-curriculum Assessment Questions for the OHSU GME Multi-disciplinary QI/PS Simulation Curriculum in Portland, Oregon in 2018*

**Reaction:**
To what extent do you agree or disagree with the following statements?

The simulations in the bootcamp were high-quality.

<table>
<thead>
<tr>
<th>1 – Strongly Disagree</th>
<th>2 - Disagree</th>
<th>3 - Neutral</th>
<th>4 - Agree</th>
<th>5 – Strongly Agree</th>
</tr>
</thead>
</table>

The simulation format facilitated my understanding of the selected topics.

<table>
<thead>
<tr>
<th>1 – Strongly Disagree</th>
<th>2 - Disagree</th>
<th>3 - Neutral</th>
<th>4 - Agree</th>
<th>5 – Strongly Agree</th>
</tr>
</thead>
</table>

I would recommend this curricular program to my peers.

<table>
<thead>
<tr>
<th>1 – Strongly Disagree</th>
<th>2 - Disagree</th>
<th>3 - Neutral</th>
<th>4 - Agree</th>
<th>5 – Strongly Agree</th>
</tr>
</thead>
</table>

My department should continue to use this program to teach quality improvement and patient safety methods.

<table>
<thead>
<tr>
<th>1 – Strongly Disagree</th>
<th>2 - Disagree</th>
<th>3 - Neutral</th>
<th>4 - Agree</th>
<th>5 – Strongly Agree</th>
</tr>
</thead>
</table>

Plus – what worked well about this curriculum program?

Delta – what did not work as well/could be improved about this curricular program?

**Attitudes:**
Health system improvement is a necessary skillset for all physicians in the 21st century.

<table>
<thead>
<tr>
<th>1 – Strongly Disagree</th>
<th>2 - Disagree</th>
<th>3 - Neutral</th>
<th>4 - Agree</th>
<th>5 – Strongly Agree</th>
</tr>
</thead>
</table>

Health system improvement are relevant topics for my future area of practice.

<table>
<thead>
<tr>
<th>1 – Strongly Disagree</th>
<th>2 - Disagree</th>
<th>3 - Neutral</th>
<th>4 - Agree</th>
<th>5 – Strongly Agree</th>
</tr>
</thead>
</table>

**Confidence:**
How confident or unconfident would you feel about participating in the following activities?

Filing an error report

<table>
<thead>
<tr>
<th>1 – Not at all confident</th>
<th>2 – Minimally confident</th>
<th>3 – Moderately confident</th>
<th>4 – Very confident</th>
<th>5 – Extremely confident</th>
</tr>
</thead>
</table>

Disclosing an error to a patient
Knowledge:

1. Which of the following correctly lists the three foundational pillars of clinical practice according to the Health Systems Science framework from the American Medical Association?
   a. Systems-based practice, practice-based learning & improvement, and interpersonal communication
   b. Clinical practice, health policy, and inter-professional collaboration
   c. Health system science, patient safety, team-based care
   d. Clinical science, basic science, health system science

2. Deming’s System of Profound Knowledge is a commonly used integrated framework for organizational improvement that includes which of the following aspects?
   a. Appreciation for a system, knowledge of variation, understanding of psychology, and theory of knowledge
   b. Understanding of psychology, appreciation for a system, concerted action, cyclical measurement
   c. Knowledge of variation, understanding of psychology, monitoring systems, prospective improvement
   d. Structure, process, and outcomes

3. The outlook that one’s abilities are dynamic, and challenges are embraced as opportunities for improvement, rather than the result of fixed attributes based on intrinsic talent, is known as:
   a. Performance improvement
   b. Intrinsic motivation
   c. Growth mindset
   d. Quality improvement

4. Which of the following best describes the ACGME requirements for all accredited residencies and fellowships as they relate to health system improvement?
   a. Education & engagement in health system improvement are encouraged, but not required
b. Education in health system improvement is required, though engagement is optional
c. **Education & engagement in health system improvement are both required**

5. Which of the following best represents the relationship between health system stewardship and the professional duty of all physicians?
   a. Many individual specialty professional societies include health system improvement in their codes of conduct
   b. **Stewardship of our own well-being & of the outcomes of our health systems is directly stated in the Oath of Geneva**
   c. Health system improvement is generally viewed by most professional societies as an adjunct to core physician duties
   d. Health system improvement is implied in the Hippocratic Oath through the phrase, “first, do no harm”

6. You are putting together a quality improvement team to help reduce the rate of catheter-associated urinary tract infections (CAUTIs) in the Trauma Intensive Care Unit. Your current team includes two physicians, a bedside nurse, and data analyst. Give what you know about characteristics of effective improvement teams, which of the following is the next most important role to include?
   a. Certified Nursing Assistant due to their role in catheter insertion/care process
   b. Catheter Supply Representative due to their knowledge of particular catheter kit being used
   c. Infectious Disease Specialist due to their knowledge of CAUTI risks/treatments
   d. Urologist due to their knowledge of urinary pathology

7. The most prevalent category of root causes found in the Joint Commission’s periodic reviews of sentinel events (errors that cause death or permanent harm) is:
   a. Diagnostic errors
   b. Medication dosing errors
   c. **Communication errors**
   d. Knowledge deficits

8. Which of the following is NOT a characteristic of an effective healthcare team according to the IOM core principles?
   a. Mutual trust/support
   b. Shared goal(s)
   c. **Minimizing conflict**
   d. Effective communication
   e. Reflection on key processes and outcomes

9. Which of the following is true regarding *teaming* in healthcare?
   a. Teaming is synonymous with teamwork, or the optimal behaviors of effective healthcare teams
   b. **Teaming is an active mindset for people who shift between many dynamic teams with little preemptive experience with a given set of members**
   c. Teaming describes establishment of stable team dynamics across recurring groups with a common purpose
   d. All of the above

10. Which of the following correctly describes the relationship between provider well-being and the triple aim:
a. Provider well-being is a pre-requisite to the triple aim of healthcare (better quality, lower cost, better patient satisfaction); together they represent the quadruple aim
b. Provider well-being is a pre-requisite to the triple aim of healthcare (better quality, increased access, and reduced waste); together they represent the quadruple aim
c. Provider well-being is secondary to the triple aim, as our first duty is to our patients
d. Provider well-being and the triple aim are unrelated

11. Which of the following correctly pairs the three elements of the syndrome of burnout to a resource for promotion of well-being at OHSU:
   a. Reduced mood, cynicism, inefficacy – colleagues and mentors
   b. Inefficacy, exhaustion, emotional outbursts – resiliency training
   c. Cynicism, depression, reduced work quality – fixing our work systems
   d. Exhaustion, cynicism, inefficacy - JBT Health & Wellness Center

12. The key variables contributing to value in healthcare are best described by which of the following equations:
   a. Quality + Safety / effort
   b. (Quality + Safety + Service) / cost
   c. Quality adjusted life years gained / (cost + effort)
   d. (Quality x access) / cost

13. Which of the following most correctly summarizes the current value of healthcare in the United States relative to other countries?
   a. The US achieves outcomes comparable to other developed nations, though does so at a much greater cost
   b. The US spends a similar percentage of its Gross Domestic Product (GDP) on healthcare as other well-developed nations, though has poorer comparable health outcomes
   c. The US healthcare system achieves better health outcomes with lower per-capita cost than many comparable developed nations
   d. The US healthcare system achieves poorer health outcomes with higher per-capita cost than many comparable developed nations

14. Which of the following correctly pairs one of the six Institute of Medicine’s aims for the US healthcare system with an OHSU/VA Portland Healthcare System quality priority?
   a. Patient-centered – reducing administrative costs
   b. Timely – reducing the observed/expected mortality ratio
   c. Safe - reducing healthcare-associated infections (e.g., Clostridium difficile)
   d. Effective – increased patient satisfaction
   e. Equitable – reducing length of stay

15. Which of the following is one of OHSU quality management’s tier-1 quality improvement priorities?
   a. Reducing operative procedure delays
   b. Reducing the observed/expected mortality ratio
   c. Increasing telehealth use
   d. Increasing net revenue
16. Which of the following most accurately describes OHSU’s recommendation regarding alignment of quality work across the health system with the tier-1 quality improvement priorities:
   a. Complete alignment, where 100% of the improvement work maps to 1 or more top tier priorities, which preferentially receives institutional improvement resources
   b. Tight alignment, where the vast majority (95% or more) of the improvement work maps to 1 or more top tier priority, which preferentially receives institutional improvement resources
   c. Loose alignment, where resources are provided to clinics, departments, and divisions, who choose all of their locally relevant priorities independent from organizational priorities

17. The OHSU (OPEx) and VA Lean-based improvement models and the IHI Model for Improvement have all of the following elements in common, EXCEPT:
   a. Well-defined improvement aims
   b. Measures
   c. Use of A3 reports to organize projects
   d. Ideas of change
   e. Cumulative testing (PDSA) cycles

18. Which of the following correctly matches the primary improvement method used by OHSU/Portland VA with the correct underlying themes?
   a. IHI’s model for improvement - deciding what to improve, setting aims, and selecting changes for iterative improvement
   b. Lean process improvement - deciding what to improve, setting aims, and selecting changes for iterative improvement
   c. IHI’s model for improvement - maximizing value from the customer’s perspective and reducing waste in systems
   d. Lean process improvement - maximizing value from the customer’s perspective and reducing waste in systems

19. Which of the following is NOT a component of the PDSA cycle?
   a. Plan – selecting a goal, a change, and a measurement system before implementing a system change
   b. Do – implementing a system change
   c. Spread – adapting a successful system change to other care contexts
   d. Act – analyze results of your experiment & decide whether to adapt, adopt, or abandon the system change

20. In Lean health system improvement, the term A3 refers to which of the following?
   a. The decision at the end of a PDSA cycle to either Adapt, Adopt, or Abandon a system change
   b. A process for organizing & presenting your improvement team’s problem-solving process
   c. A process for building an effective improvement team: Articulate a vision, Align priorities, Ask for resources
   d. An 11 x 17-inch piece of paper

21. All of the following are Lean performance improvement principles, EXCEPT:
a. Performance improvement should be managed centrally by experts with stakeholder input
b. Value is defined by the customer/patient – is what they are seeking/would pay money for
c. Waste is anything which consumes resources but provides no value
d. Standardization is the foundation of sustainable improvement
e. Continuous improvement requires routine problem recognition and management

22. Which of the following correctly pairs the management system term with its definition?
   a. Standard work - simple written description of the safest, highest quality, and most efficient way known to perform a particular task (i.e., the way work should be done)
   b. Tiered-huddle – weekly meeting to discuss improvement work on a single unit, comparing it to the tiered institutional priorities
   c. Improvement rounds – unit meeting wherein problems are surfaced and escalated to higher levels of the organization to ask for resources to efficiently improve work
   d. Visual display board – tool used by units to show the patients on the unit, which team is following which patients, and contact numbers for key team members

23. All of the following are true regarding daily huddles in healthcare EXCEPT:
   a. They engage the team in thinking and talking about standard work
   b. They update the team regarding specific quality and safety initiatives affecting their daily work
   c. They identify issues that require escalation to higher-level management for resolution
   d. They are informal, unstructured meetings that occur at regular intervals
   e. They are a key element in both Lean models (like those used at OHSU and the VA) and the model for improvement from the IHI

24. Just Culture, a critical foundation of a culture of safety, is best defined as:
   a. An atmosphere of trust that encourages open reporting of medical errors/unsafe conditions balanced with personal accountability for reckless behavior
   b. A “blame-free” approach to medical errors
   c. An atmosphere of professionalism that promotes ethical treatment of those involved in medical errors
   d. An equitable and fair balance between administrative reprimands and support for employees that make mistakes at work

25. Which of the following is a helpful framework for writing an error report (aka PSI)?
   a. WWW – what happened, who is responsible, what should be fixed
   b. SOS – system involved, overview, suggestion for improvement
   c. ESP – error, system involved, person responsible
   d. BLAME – brief overview, list of events, action items, monitoring plan, everyone involved

26. Which of the following should be reported using the Patient Safety Intelligence system (PSI; or equivalent reporting system at your clinical site):
   a. A near miss (error caught before it reaches the patient)
   b. An unsafe condition (a situation that could be harmful but has not yet harmed a patient)
   c. A complaint about another employee’s professional behavior
27. Which of the following is true regarding event disclosure to patients?
   a. Disclosure of errors to patients reduces the likelihood that they will file a lawsuit
   b. Patients want to know that an error occurred, that it was the result of an error, and what will be done to prevent recurrences
   c. There is broad agreement that harmful errors should be disclosed to patients, however, disclosure of near misses & non-harmful errors should be approached on a case-by-case basis
   d. Disclosing errors in a standard way that includes an apology decreases the rate and cost of malpractice litigation
   e. All of the above are true

28. Which of the following best describes the process of root cause analysis (RCA) in healthcare?
   a. RCA is a prospective systems analysis tool that identifies theoretical risks and looks for the systems factors that predispose to medical errors
   b. RCA is a retrospective systems analysis tool that seeks to find the single system weakness that caused the event
   c. **RCA is a systematic characterization of the unsafe conditions that predispose to an error that culminates in an action plan to improve the system**
   d. RCA is a systems analysis tool that investigates contributors to a medical error and culminates in a report explaining possible contributors

29. Which of the following best describes the Swiss Cheese model as it relates to health system improvement?
   a. Errors are usually the result of negligence or malicious intent on the part of people in the healthcare system – making systems safer relies mostly on removing troublesome personnel
   b. Errors occur at the intersection of latent system failures and active failures at the point of care by front-line personnel – making systems safer relies mostly on removing troublesome personnel
   c. **Errors are usually the result of multiple small system flaws that overlap & allow mistakes to reach patients – making systems safer relies mostly on application of multiple defenses/safeguards**
   d. Errors are usually the result of a single, large root cause, with smaller contributing factors – making systems safer relies mostly on correction of the single root cause

30. You are on an improvement team working to decrease dosing errors in the emergency department for high-risk medications. Which of the following recommendations could you make to the team that best incorporates what is known about strength of system changes from human factors engineering literature?
   a. We should focus on staff training, as education is the most reliable system change
   b. Pharmacy should standardize their workflow with a checklist, as checklists are the most reliable system change
   c. We should change policy to prohibit the administration of high-risk medications without consulting with pharmacy on the unit

d. We should pilot an automatic stop alert in the electronic medical record that stops providers before signing any medication orders to ensure that the dosing is correct, as forcing functions are strong system changes

e. We should pilot indication-based dosing in the electronic medical record, requiring override to enter non-standard dosing, as forcing functions are strong system changes

**Self-Rated Skills:**
How able or unable to perform the following tasks do you currently feel?

<table>
<thead>
<tr>
<th>Task Description</th>
<th>1 - Unable, even with assistance</th>
<th>2 - Able to do so with constant assistance</th>
<th>3 - Able to do so with significant assistance</th>
<th>4 - Able to do so with minimal assistance</th>
<th>5 - Able to do so independently</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name at least 2 of OHSU's clinical quality priorities.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Find information detailing OHSU's clinical quality priorities.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Describe the main performance improvement methodology used by OHSU's department of quality</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Find information about OHSU's performance improvement tools and trainings.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

How proficient or not proficient at completing the following tasks do you currently feel?

<table>
<thead>
<tr>
<th>Task Description</th>
<th>1 - Not at all proficient</th>
<th>2 - Minimally proficient</th>
<th>3 - Moderately proficient</th>
<th>4 - Very proficient</th>
<th>5 - Extremely proficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify a quality problem related to patient care</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Develop and focus on an aim related to a quality problem</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Identify outcome and process measures appropriate for a clinical problem</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Identify changes in practice to improve processes and outcomes of care</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Demonstrate how to use several cycles of change to improve care delivery</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Formulate a data plan related to demonstrating a change results in improvement</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Use run control charts in interpreting results of change in an effective manner</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Create an inter-professional improvement team and assign roles necessary for improvement success</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Ensure change tested is implemented into practice and sustained</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

*aSelf-rated QI/PS skill across several domains was assessed using a questionnaire adapted with permission from Glissmeyer EW, Ziniel SI, Moses J. Use of the Quality Improvement (QI) Knowledge Application Tool in assessing pediatric resident QI education. J Grad Med Educ. 2014;6(2):284-291.*
**Supplemental Digital Appendix 6**

Characteristics of All Participants in the OHSU GME Multi-disciplinary QI/PS Simulation Curriculum in Portland, Oregon in 2018 (Abbreviations: GME is graduate medical education, no. is number, OHSU is Oregon Health & Science University, PGY is post-graduate year, and QI/PS is quality improvement and patient safety)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Participants no. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>44 (62)</td>
</tr>
<tr>
<td>Female</td>
<td>27 (38)</td>
</tr>
<tr>
<td>Non-Binary/prefer not to answer</td>
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</tr>
<tr>
<td>PGY</td>
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</tr>
<tr>
<td>1</td>
<td>20 (28)</td>
</tr>
<tr>
<td>2</td>
<td>10 (14)</td>
</tr>
<tr>
<td>3</td>
<td>0 (0)</td>
</tr>
<tr>
<td>4</td>
<td>12 (18)</td>
</tr>
<tr>
<td>5</td>
<td>19 (27)</td>
</tr>
<tr>
<td>6</td>
<td>6 (8)</td>
</tr>
<tr>
<td>7</td>
<td>3 (4)</td>
</tr>
<tr>
<td>Program</td>
<td></td>
</tr>
<tr>
<td>Anesthesiology</td>
<td>2 (3)</td>
</tr>
<tr>
<td>Cardiovascular Disease</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Child &amp; Adolescent Psychiatry</td>
<td>6 (8)</td>
</tr>
<tr>
<td>Clinical Informatics</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Diagnostic Radiology</td>
<td>3 (4)</td>
</tr>
<tr>
<td>Female Pelvic Medicine &amp; Reconstructive Surgery</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Gastroenterology</td>
<td>5 (7)</td>
</tr>
<tr>
<td>Hematology &amp; Oncology</td>
<td>4 (6)</td>
</tr>
<tr>
<td>Hospice &amp; Palliative Medicine</td>
<td>2 (3)</td>
</tr>
<tr>
<td>Neurology</td>
<td>1 (1)</td>
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<tr>
<td>Obstetrics &amp; Gynecology</td>
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<tr>
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<tr>
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<tr>
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<td>8 (11)</td>
</tr>
<tr>
<td>Pediatric Anesthesiology</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Psychiatry</td>
<td>3 (4)</td>
</tr>
<tr>
<td>Pulmonary &amp; Critical Care Medicine</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Radiation Medicine</td>
<td>2 (3)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional &amp; Acute Pain</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Rheumatology</td>
<td>4 (6)</td>
</tr>
<tr>
<td>Sports Medicine</td>
<td>2 (3)</td>
</tr>
<tr>
<td>Surgery</td>
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<tr>
<td>Surgical Critical Care</td>
<td>4 (6)</td>
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