Supplemental Digital Table 1

**University of Pennsylvania Health System (UPHS) Healthcare Leadership in Quality Residency Track: Core Curriculum**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Learning objectives</th>
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| Health Care Quality                        | • Review the historical perspective and magnitude of the quality problem in health care  
                                            | • Recognize the six aims for quality defined by the Institute of Medicine\(^a\)  
                                            | • Analyze landmark studies of U.S. health care quality  
                                            | • Recognize variations in health care quality performance and utilization                                                                     |
| Quality Measurement                        | • Describe Donabedian’s model for quality measurements\(^b\)  
                                            | • Critique select measures  
                                            | • Recognize the link between measurement and improvement  
                                            | • Review select national organizations involved in quality and safety measurement                                                               |
| Blueprint for Quality and Safety           | • Recognize yearly quality and safety goals for the UPHS  
                                            | • Describe the historical perspective and evolution of the UPHS Blueprint for Quality and Safety                                                   |
| Unit-Based Clinical Leadership (UBCL) teams | • Recognize the historical evolution of UBCL teams  
                                            | • Understand the role and expectations of physicians in UBCL teams  
                                            | • Review specific key quality and patient safety work responsibilities of UBCL teams                                                           |
| UPHS DataMart                              | • Review the external and internal quality reporting systems and metrics of interest, such as hospital mortality, for the UPHS  
                                            | • Understand and be able to use the UPHS DataMart  
                                            | • Describe sources of data for quality measurement  
                                            | • Define and recognize implications of the CMS value-based purchasing program                                                                    |
| Quality Improvement                        | • Review the historical perspective of quality improvement in industry and health care  
                                            | • Describe various quality improvement methodologies  
                                            | • Review common pitfalls in quality improvement  
                                            | • Recognize effective strategies for changing systems                                                                                         |
| High-Value Care                            | • Understand the difference between cost-conscious and cost-effective care  
                                            | • Review strategies to assess and deliver high-value, cost-conscious care                                                                        |

\(^a\) Institute of Medicine  
\(^b\) Donabedian’s model for quality measurements
| Ambulatory Quality                                                                 | • Describe the rationale and history of the patient-centered medical home movement  
|                                                                                   | • Illustrate the conceptual model linking patient-centered medical homes and accountable care organizations  
|                                                                                   | • Recognize basic concepts of population health management  
|                                                                                   | • Review current UPHS ambulatory quality and safety activities  
| Organizations and Leadership                                                     | • Recognize change management and the role of physician leaders  
|                                                                                   | • Understand high reliability organizational principles and their application to medicine  
|                                                                                   | • Recognize the role of leadership in quality improvement  
| Evidence-Based Medicine                                                          | • Describe the necessary steps required to ask and answer clinical questions effectively  
|                                                                                   | • Review approaches to efficiently search and appraise the clinical literature  
|                                                                                   | • Understand the pros and cons of various information resources  
| Patient-Centered Care                                                            | • Define patient-centered care  
|                                                                                   | • Identify patient-centered care approaches in the hospital  
|                                                                                   | • Discuss the properties, advantages, and disadvantages of patient experience survey tools in  
| Quality Improvement Research                                                      | • Review basic principles of QI research and design  
|                                                                                   | • Understand challenges and approaches to study design (observation and quasi-experimental studies) and controlled prospective studies  
|                                                                                   | • Recognize the continuum of QI research and QI  
| Innovation                                                                      | • Understand how to define problems in a manner that enables innovative solutions  
|                                                                                   | • Learn how to test new ideas, using prototypes, quickly at low cost  
|                                                                                   | • Recognize the importance of clear, narrowly defined hypotheses to drive rapid experiments  
| Patient Safety                                                                   | • Describe the epidemiology of preventable medical error and how the patient safety movement has evolved.  
|                                                                                   | • Define and give examples of patient safety vocabulary: preventable adverse event/medical error, non-preventable adverse event, near miss, and sentinel events.  
|                                                                                   | • Explain the Model for Human Error (also known as James Reasons’ Swiss Cheese Model of Error)\(^c\)  
|                                                                                   | • Define the word “culture” as it applies to a health care setting and how it impacts patient safety  
|                                                                                   | • Use root cause analysis skills to identify and categorize systems factors that contribute to a medical error and propose risk-reduction strategies  

\(^c\) Model for Human Error: James Reason’s Swiss Cheese Model of Error.
Health Care Informatics
- Describe the role of the electronic health record (EHR) in the field of quality and safety
- Illustrate how attention to the principles of human factors engineering can influence the effectiveness and safety of informatics tools
- Describe the significance of EHR Meaningful Use (MU) criteria in clinical practice
- Review the UPHS informatics infrastructure

Teamwork
- Describe principles of effective teamwork
- Illustrate characteristics of high-functioning teams for systems improvement

Process Improvement Curriculum
- Understand and apply project planning tools: Project Charter, stakeholder analysis, voice of the customer
- Define the Current Condition Tools: process mapping (including Value Stream Mapping and waste identification)
- Understand and apply contributing factors tools: root cause analysis, 5 whys, Pareto chart
- Link quality measures to specific aim statements
- Understand countermeasure development