

**Resident Improvement Science Curriculum**

**Logistical Information**

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|  | **PGY1** | **PGY2** | **PGY3** |
| **Theme** | **Quality Improvement** | **Patient Safety** | **High Value Care** |
| **Format** | Mentored, small group Quality Improvement cases | Mentored, small group Patient Safety case (Root Cause Analysis) and error disclosure | Mentored, small group High Value Care case |
| **Days and Times** | Tuesday afternoons  (6 sessions) | Wednesday afternoons  (6 sessions) | Wednesday afternoons  (6 sessions) |
| **Location** | Varies | | |
| **Quality Program Director** | Allen Repp, MD | | |
| **Quality Scholar** | Amanda G. Kennedy, PharmD, BCPS | | |
| **Office** | Given C344 | | |
| **E-mail** | [allen.repp@uvmhealth.org](mailto:allen.repp@uvmhealth.org) or [amanda.kennedy@uvmhealth.org](mailto:amanda.kennedy@uvmhealth.org) | | |
| **Disclosures** | None | | |

**Curriculum Overview**

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|  | **Resident Improvement Science Curriculum** |

**PGY1 Quality Improvement: Tuesdays from 1:30-2:30; Amanda Kennedy**

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| **Class** | **Theme** |
| 1 | Introduction to quality and the IHI Quadruple Aim  *What are we trying to accomplish?* Select a focus area (decision matrix) |
| 2 | *Why isn’t this working right?* (Cause and Effect diagram, “Five Whys” analysis) |
| 3 | *What are the steps in the process?* (process flow map) |
| 4 | *What do our customers want?* (stakeholder interview with patient advisor) |
| 5 | *How do we measure success?* (measures, SMART Goals, affinity diagram) |
| 6\* | Wrap-up discussion (including an overview of the IHI Model for Improvement and PDSA cycles); poster review for Quality Showcase, examples from previous years |

Faculty mentors include Preetika Muthuskrishnan, Maria Burnett, and Connie van Eeghen, under the direction of Amanda Kennedy.

\*We will offer residents the opportunity to design a QI project as their resident research project, with plans to implement the project on their own using successive Plan-Do-Study-Act (PDSA) cycles with the support of the Quality Program (optional for residents).

**PGY2 Patient Safety: Wednesdays from 1:30-2:30; Tim Pay and Meaghan Caravan**

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| **Class** | **Theme** |
| 1 | Introduction to patient safety principles |
| 2 | Common causes of error, performance and systems errors, and cognitive biases |
| 3 | Preparation for mock Root Cause Analysis (RCA) |
| 4 | Mock RCA |
| 5 | Debriefing session |
| 6 | Disclosure conversations (with Dr. Naomi Hodde) |

**PGY3 High Value Care: Wednesdays from 1:30-2:30; Allen Repp**

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| **Class** | **Theme** |
| 1 | Identify a case and an aim |
| 2 | Review and evaluate the clinical evidence |
| 3 | Introduction to healthcare charges, costs, and payments |
| 4 | Payment models and how they influence care delivery |
| 5 | Evaluate the actual financial data for the case and estimate impact of high value care |
| 6 | Finalize poster.  Did we provide High Value Care to this patient? |

**Description**

Quality Improvement (QI) is a clinical, academic and financial imperative for a safe and sustainable health care delivery system. The Department of Medicine Quality Program serves as a resource center and laboratory to support improvement in care delivery, education and training, and scholarship in quality, safety, and value in the Department of Medicine at the Robert Larner, MD College of Medicine at the University of Vermont. The program serves faculty, fellows, residents, and students through our mission to enhance care delivery, provide education and training, and promote scholarship in improvement science.

The Resident Improvement Science Curriculum is intended to prepare physicians to incorporate QI, patient safety, and high value care concepts into their current and future clinical care. The curriculum is divided across the three years of the residency program. The curriculum is taught as a small group seminar and as mentored, experiential learning. Residents work to learn fundamental concepts in QI, patient safety, and high value care, design and conduct projects that support these concepts, and present their work in local or regional venues.

**ACGME Common Program Requirements and Internal Medicine Milestones**

The Resident Improvement Science Curriculum seeks to promote progression towards level 4 and level 5 performance in ACGME milestones (See Appendix). Our curriculum is specifically focused on milestones for systems-based practice.

**Expectations**

Residents are expected to attend educational sessions, prepare their projects, and participate in quality improvement, patient safety, and high-value care experiences. Residents are expected to actively participate in all discussions, projects, and experiences.

**Learning Objectives**

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| **PGY1 Quality Improvement** |

Residents will learn about quality improvement by applying systems thinking and various quality improvement tools to real-world case examples over the course of six sessions during the PGY1 year. The topics of the case examples will be selected by the residents and Faculty Mentors. A final summary of learning will be suitable as a poster to the Department of Medicine Quality Showcase, or similar venue.

Upon completion of the curriculum, the resident will be able to:

* Describe the definition of quality in healthcare and discuss how it relates to the IHI Quadruple Aim
* Identify opportunities to improve the quality of care in our medical center
* Apply systems based thinking and a standard process (IHI Model for Improvement) to an improvement opportunity in their practice environment
* Develop a scholarly poster to summarize and present the approach to an improvement initiative

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| **PGY2 Patient Safety** |

Residents will complete a Root Cause Analysis (RCA) of a near-miss patient safety event over the course of five sessions during the PGY2 year. The topic of the patient safety case will be selected by the residents and Faculty Mentors. Approaches to disclosing adverse events are incorporated into this curriculum.

Upon completion of the curriculum, the resident will be able to:

* Recognize core patient safety principles and common causes of errors, including systems errors and cognitive biases
* Demonstrate proficiency with near-miss identification by using the hospital system for reporting near misses and errors in their practice environment
* Examine a near miss report using a process of error evaluation (RCA)
* Integrate RCA findings and formulate recommendations for system changes
* Appraise communication approaches to disclosing adverse events to a patient (in simulated case)

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| **PGY3 High Value Care** |

Residents will evaluate a High Value Care (HVC) case over the course of six sessions during the PGY3 year. The topic of the case will be selected by the residents and Faculty Mentors. The final project will be suitable as a poster to the Department of Medicine Quality Showcase, or similar venue.

Upon completion of the curriculum, the resident will be able to:

* Identify opportunities to improve the value of care in our medical center
* Appraise evidence around care practices
* Explain healthcare costs and payments
* Evaluate the financial impact of HVC on individual patients and health care systems
* Develop a scholarly poster to summarize and present the results of a HVC analysis

**Curriculum Evaluation**

Residents are expected to complete an evaluation of each year of the curriculum at its conclusion. The information gained, including constructive criticisms, will be used to improve the curriculum. De-identified results may be published in an effort to share best practices and lessons learned beyond our organization.

**Institutional Review Board (IRB)**

Some projects in the PGY2 and/or PGY3 year may require approval by the UVM IRB and/or Data Management Office. Residents may be required by the IRB to complete the Human Subjects training described on the IRB website: https://www.uvm.edu/rpo/institutional-review-board-human-subjects-research. Residents are encouraged to complete this training during their PGY1 year to avoid delays in the PGY2 and/or PGY3 years.

**Scholarship**

It is expected that residents in their PGY2 and PGY3 years demonstrate evidence of scholarship as part of their quality improvement and high value care curriculum. Scholarship includes documentation of productivity, such as through poster and oral presentations. There is no expectation that residents submit peer-reviewed publications or grants related to this curriculum. Faculty Mentors who wish to pursue peer-reviewed publications based on the residents’ projects are expected to follow established criteria for authorship (http://www.icmje.org).

**Academic Integrity**

Plagiarism, fabrication, collusion, or cheating of any kind will not be tolerated. Any suspected violations will be reported as appropriate. For a review and definitions associated with Academic Integrity, please see the University of Vermont’s Code of Academic Integrity policy: https://www.uvm.edu/sites/default/files/UVM-Policies/policies/acadintegrity.pdf

**Appendix**

**ACGME Common Program Requirements**

<https://www.acgme.org/globalassets/pfassets/programrequirements/cprresidency_2023v3.pdf>

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| IV.B. | **ACGME Competencies** |
| IV.B.1.f | **Systems-based Practice** |
|  | Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care, including the structural and social determinants of health, as well as the ability to call effectively on other resources to provide optimal health care. |
| IV.B.1.f).(1) | **Residents must demonstrate competence in:** |
| IV.B.1.f).(1).(b) | advocating for quality patient care and optimal patient care systems; (Core) |
| IV.B.1.f).(1).(c) | participating in identifying system errors and implementing potential systems solutions; (Core) |
| IV.B.1.f).(1).(d) | incorporating considerations of value, equity, cost awareness, delivery and payment, and risk-benefit analysis in patient and/or population-based care as appropriate; (Core) |
| IV.B.1.f).(1).(e) | understanding health care finances and its impact on individual patients’ health decisions; and, (Core) |
| IV.B.1.f).(1).(f) | using tools and techniques that promote patient safety and disclosure of patient safety events (real or simulated). (Detail) |

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| VI.A.1. | **Patient Safety and Quality Improvement** |
| VI.A.1.a).(1).(a) | The program, its faculty, residents, and fellows must actively participate in patient safety  systems and contribute to a culture of safety. (Core) |
| VI.A.1.a).(2).(a) | Residents, fellows, faculty members, and other clinical staff members must: |
| VI.A.1.a).(2).(a).(i) | know their responsibilities in reporting patient safety events and unsafe conditions at the clinical site, including how to report such events; and, (Core) |
| VI.A.1.a).(2).(a).(ii) | be provided with summary information of their institution’s patient safety reports. (Core) |
| VI.A.1.a).(2).(b) | Residents must participate as team members in real and/or simulated interprofessional clinical patient safety and quality improvement activities, such as root cause analyses or other activities that include analysis, as well as formulation and implementation of actions. (Core) |
| VI.A.1.a).(3).(a) | Residents and faculty members must receive data on quality metrics and benchmarks related to their patient populations. (Core) |

**ACGME Internal Medicine Milestones for Systems-Based Practice**

**Milestone:** **Systems-Based Practice 1: Patient Safety and Quality Improvement**

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| **Level 3** | **Level 4** | **Level 5** |
| * Contributes to the analysis of patient safety events (simulated or actual) * Participates in disclosure of patient safety events to patients and families (simulated or actual) * Contributes to local quality improvement initiatives | * Conducts analysis of patient safety events and offers error prevention strategies (simulated or actual) * Discloses patient safety events to patients and families (simulated or actual) * Demonstrates the skills required to identify, develop, implement, and analyze a quality improvement project | * Leads teams and processes to modify systems to prevent patient safety events * Models the disclosure of patient safety events * Creates, implements, and assesses sustainable quality improvement initiatives at the institutional or community level |

<https://www.acgme.org/globalassets/PDFs/Milestones/InternalMedicineMilestones.pdf>

**Definitions**

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| **Choosing Wisely** | An initiative to promote conversations between clinicians and patients by helping patients choose care that is supported by evidence, not duplicative of other tests or procedures already received, free from harm, and truly necessary.[[1]](#footnote-1) |
| **High-Value Care** | Improves health, avoids harms, and eliminates wasteful practices.[[2]](#footnote-2) High-value care includes cost-conscious care and stewardship of resources, including avoiding the overuse and misuse of diagnostic tests and therapies that do not benefit patient care but add to healthcare costs.[[3]](#footnote-3) |
| **Improvement Science** | A framework for research focused on healthcare improvement with the goal of ensuring that quality improvement efforts are based as much on evidence as the best practices they seek to implement[[4]](#footnote-4),[[5]](#footnote-5) Healthcare improvement science is the generation of knowledge to cultivate change and deliver person-centered care that is safe, effective, efficient, equitable and timely. It improves patient outcomes, health system performance and population health.[[6]](#footnote-6) |
| **Medical Error** | The failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim.[[7]](#footnote-7) |
| **Patient Safety** | Freedom from accidental injury7 |
| **Quadruple Aim** | Includes the Triple Aim of improving the patient experience of care (including quality and satisfaction), improving the health of populations, and reducing the per capita cost of health care plus the addition of the fourth aim of improving the work life of health care providers, including clinicians and staff.[[8]](#footnote-8) |
| **Quality** | The degree to which health care services for individuals and populations increase the likelihood of desired outcomes and are consistent with current professional knowledge.[[9]](#footnote-9) |
| **Quality Improvement** | The framework used to systematically improve care. Quality improvement seeks to standardize processes and structure to reduce variation, achieve predictable results, and improve outcomes for patients, healthcare systems, and organizations.[[10]](#footnote-10) |

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| **Root Cause Analysis** | A structured method used to analyze serious adverse events. A central tenet of RCA is to identify underlying problems that increase the likelihood of errors while avoiding the trap of focusing on mistakes by individuals.[[11]](#footnote-11) |
| **Safety Culture** | Maintaining a commitment to safety at all levels, from frontline providers to managers and executives.11 |
| **Systems Approach** | Takes the view that most errors reflect predictable human failings in the context of poorly designed systems.11 |
| **Triple Aim** | A framework developed by the Institute for Healthcare Improvement (IHI) that describes an approach to optimizing health system performance, including improving the patient experience of care (including quality and satisfaction), improving the health of populations, and reducing the per capita cost of health care.[[12]](#footnote-12) |

**Helpful Resources**

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| Agency for Healthcare Research and Quality (AHRQ) Patient Safety Network (PSNet) | psnet.ahrq.gov |
| American College of Physicians (ACP)  High-Value Care | www.acponline.org/clinical-information/high-value-care |
| Choosing Wisely | www.choosingwisely.org |
| Institute for Healthcare Improvement (IHI) | www.ihi.org |
| Revised Standards for Quality Improvement Reporting Excellence: SQUIRE 2.0 | www.squire-statement.org |

1. www.choosingwisely.org [↑](#footnote-ref-1)
2. www.acponline.org/clinical-information/high-value-care [↑](#footnote-ref-2)
3. Weinberger SE. Providing high-value, cost-conscious care: a critical seventh general competency for physicians. Ann Intern Med. 2011 Sep 20;155(6):386-8. PMID: 21930856 [↑](#footnote-ref-3)
4. https://isrn.net/about/improvement\_science.asp [↑](#footnote-ref-4)
5. Shojania KG, et al. Evidence-based quality improvement: the state of the science. Health Aff. 2005;24(1):138-50. PMID: 15647225 [↑](#footnote-ref-5)
6. Skela-Savič B, et al. The development of a consensus definition for healthcare improvement science (HIS) in seven European countries: A consensus methods approach. Zdr Varst. 2017 Feb 26;56(2):82-90. PMID: 28289467 [↑](#footnote-ref-6)
7. Kohn L.T, et al. (2000). To err is human: building a safer health system. Washington, D.C., National Academy Press. [↑](#footnote-ref-7)
8. Bodenheimer T, et al. From triple to quadruple aim: care of the patient requires care of the provider. Ann Fam Med. 2014;12(6):573-6. PMID: 25384822 [↑](#footnote-ref-8)
9. Institute of Medicine (U.S.). Committee on Quality of Health Care in America. (2001). Crossing the quality chasm: a new health system for the 21st century. Washington, D.C., National Academy Press. [↑](#footnote-ref-9)
10. https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/MMS/Quality-Measure-and-Quality-Improvement- [↑](#footnote-ref-10)
11. https://psnet.ahrq.gov/primers [↑](#footnote-ref-11)
12. http://www.ihi.org [↑](#footnote-ref-12)