2) Background
3) Methods
4) Outcomes
5) Your qualifications

-You have 5 minutes maximum to present your idea. You will be timed, and cut off, if necessary.
-You will have 5 minutes of commentary and questions from the panelists and the audience, with the goal of finding mentorship in this process itself. What you do with the offer is up to you! You can commit to your idea, find someone else whose project you like better to work with, opt in with someone who is looking for help on a pre-existing project, or scrap your idea in favor of a new one.

37 Sim/QI: A Novel Simulation Based Curriculum for Meaningful Achievement of Resident Patient Safety Milestones

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Introduction/Background: There is a gap between the idea of "work as imagined" and the reality of "work as done" that hinders QI work's impact. Resident physicians are often experts in "work as done." The ACGME requires that residents learn patient safety competencies. Sim-QI is a resident elective that shows a novel way to both teach high yield patient safety skills and to improve local clinical processes.

Learning Objective: The learner will:

1) Use the IHI Quality Improvement (QI) Essentials Toolkit to assess local procedural practice.
2) Incorporate simulation (sim) into the QI process.
3) Identify opportunities for QI and share with leadership.
4) Achieve a high level of expertise on ACGME Milestone 16.

Curricular Design: This two week Sim-QI elective curriculum used the Institute for Healthcare Improvement (IHI) QI Essentials Toolkit in conjunction with in situ sim to improve a local process. Learning activities included: attending hospital safety meetings, participating in a team in-situ sim scenario, and guided asynchronous digital learning. Together, sim faculty and the learner designed a local QI needs assessment process focused on the central venous line (CVL) procedure. The learner implemented a QI needs assessment through an observational, cross-sectional, case series study with mixed methods at one ED. Methods included video-recorded in situ sim procedures, direct observation of clinical procedures, standardized interviews with interprofessional staff directly involved in vascular access. Data were used to create a Failure Modes Effect Analysis (FMEA) and process map. These were shared with clinical leadership. The resident assessed the elective experience using a standardized program assessment, and their work was reviewed for achievement of the Patient Safety milestone.

Impact/Effectiveness: The learner created a CVL process map (Fig.1) and an FMEA table (Fig. 2). The main opportunity identified was the need for a central line cart. This data will also inform curricular development for an upcoming health system wide CVL training initiative. We envision that this novel Sim-QI curricula can be applied broadly to other procedures and practices, and could be used in other EM programs to both improve workflows and build QI competencies.

Figure 1. Process Map

Steps in Process	Failure Mode	Failure Causes	Failure Effect	Likelihood of Occurrence (1-10)	Likelihood of Detection (1-10)	Severity (1-10)	Risk Profile Number (RPN)	Actions to Reduce Occurrence of Failure
Alert nursing staff about procedure	-Nurse unavailable -New nurse unfamiliar with procedure and responsibilities	-Staff shortage -High number of new staff	-Missing materials - inefficient time spent -Missed steps due to lack third party observer	6	8	2	96	-Train new nurses on CVL procedure -Make policy that nursing needs to be present for specific times of procedure (ex. Time out, set-up) - Address low RN staffing
Gather Materials: kit, bundle, ultrasound, sterile probe cover, chloraprep, sterile caps, mayo stand	-Delay in finding materials especially sterile probe covers, caps, kits -Materials not in ED	-ED not well stocked with sterile central line materials -Multiple locations where materials could be found -High staff turnover (residents and nursing)	-Delay in central line placement -Removing materials from trauma slot and emergency ward (unavailable for critical case)	10	5	6	300	-Create bundle/kit combo that has all necessary components other than US and mayo stand and have it readily available in same place in ED -Create central line cart
Wipe down US probe and use US to find target vessel and ID carotid/lung prior to sterile procedure	Not wiping down probe Not tracing vein Not ID proper landmarks	-Forgetting to wipe down or lack or knowledge -Lack of experience or training finding target vessel and ID carotid/lung - Wipes not available	-Risk of infection, (CLABSI) -Carotid cannulation -Pneumothorax (PTX)	7	8	5	280	-Have probe wipes with each US machine -Include in checklist
Prep kit for use: -Draw up lidocaine - Flush all ports and cap - Remove needle and wire caps	-Missing any steps listed -Missing materials -Faulty materials	-Multiple steps to remember -Possibly multiple operators -Lack of experience/training	-Air embolism -Kinked wire during procedure -Need for new kit mid-procedure, possibly introducing higher risk infection	3	5	8	120	-Checklist procedure - study line failures ona systemic level to identify common themes in cases where complication occurs - SIM CVL placement -Supervision by senior resident, attending
Attending in room for needle in to wire out	-Resident not getting attending -Attending unavailable	-Busy ED -Multiple sick patients -Unaware of policy	- improper placement - PTX - CLABSI	5	4	5	100	-Make all staffs aware of policy (email, central policy platforms) -Checklist in time out

Figure 2. Excerpt from Failure Modes Effects Analysis - note multiple steps in process not displayed in this excerpt