

Standardizing Resident Procedure Training Through Deliberate Practice

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BACKGROUND

- “See one, do one, teach one” began as the one of the first formal medical training systems under the direction of Dr. William Halsted⁵.
- In the case of invasive procedures, this method has begun to fall out of favor due to risk posed to patients and limited resident comfort with procedural skills after minimal practice^{2,5}.
- By and large, this method has been replaced by deliberate practice, which includes:
 - Preparation prior to practice
 - Self reflection
 - Continuous feedback
 - Repeated practice³.
- Recent literature has demonstrated that deliberate practice increases the proficiency and confidence of residents performing procedures^{1,3}.
- In addition, adult learners have been found to have improved outcomes when actively participating, as well as when utilizing multiple learning modalities⁵.
- Described in the literature is a new framework of “learn, see, practice, do²”.
- We describe the implementation of a new curriculum within OhioHealth Graduate Medical Education for teaching invasive procedures.

OBJECTIVE

- To create a standardized curriculum for teaching invasive procedures

PROGRAM INNOVATION

- Within the OhioHealth system, this curriculum is used for all incoming residents who will be performing procedures (emergency medicine, internal medicine, and surgery).
- Focused on five high risk, high frequency procedures:
 - Endotracheal Intubation
 - Internal jugular central line
 - Subclavian central line
 - Arterial line
 - Moderate sedation
- A multidisciplinary task force of attending physicians and residents collaborated to determine the educational content.
- The primary focus of the curriculum is graduated responsibility: beginning with knowledge acquisition, advancing to skill performance via simulation, then direct observation, and ultimately indirect observation.
- Procedural course occurs during orientation week, consisting of multiple learning modules, simulation practice sessions, and includes assessments throughout to demonstrate proficiency.
- Successful completion of orientation week course grants the resident the ability to perform the procedure with direct, proactive supervision, including a supervisor physically present in the room⁶.



Figure 1. Deliberate Practice design of Resident Procedure Entrustment Curriculum

PROCEDURE ENTRUSTMENT CURRICULUM

Didactic Material

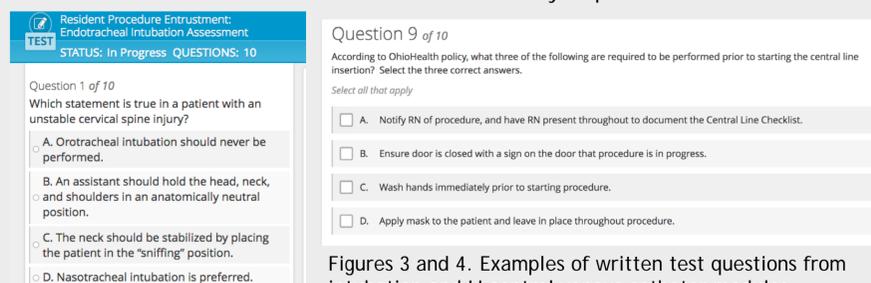
- Read an article outlining the major indications, contraindications, risks and benefits of each procedure
- Novel videos were created that are unique to OhioHealth that allow learners to understand best practices while becoming familiarized with equipment and processes specific to OhioHealth.
 - Reviews indications, contraindications, as well as possible complications
 - Brief discussion of how to assess patient prior to procedure (e.g. Mallampati Score, IJ ultrasound technique)
 - Required equipment and medications
 - Video of procedure from set up to completion on simulated patient/mannequin



Figure 2. Screenshot from OhioHealth Procedure Entrustment Curriculum video

Written Test

- Ten questions based on information from above didactics.
- The task force determined 80% correct is necessary to pass.



Figures 3 and 4. Examples of written test questions from intubation and IJ central venous catheter modules

Practice Simulation

- Resident practices the procedure at least once on a simulation mannequin with an attending physician supervising with individualized feedback provided.

Evaluated Simulation

- Resident performs the procedure on a simulation mannequin while being observed by an attending physician
- A checklist of up to 20 items, including “critical actions” is used for evaluation.
- A critical action is defined as any step in the process that if omitted results in automatic failure and need to remediate
- If 80% of steps and all critical steps are met, the resident is approved for direct supervision.

Bedside Training

- Residents must log each procedure and have them signed by supervising physician
- Supervisor indicates whether continued direct supervision is needed or if resident is ready for indirect supervision
- Minimum numbers necessary for indirect supervision were defined by the task force, but can be set higher by individual programs

RELEVANCE

- Didactics provided online as well as the checklists used for evaluation have been standardized across the three OhioHealth hospitals with residency programs.
- Online content decreases faculty needs as learners can obtain education in an asynchronous fashion.
- The curriculum focus is a patient-centered model of procedure training. Deliberate practice allows for mastery skill development with graduated responsibility.
- Future evaluation of procedure complications and impact on patient care are necessary. Additionally, evaluation of the cost implications of the curriculum would be beneficial.
- After completing the curriculum successfully, each resident is provided with a badge backer which denotes the level of supervision needed when performing procedures.
- During a recent Clinical Learning Environment Review (CLER) visit to Ohio Health, a focus was placed on ancillary staffs’ role regarding resident supervision.
- The badge backer has also provided the nidus for a culture change in which the residents have their level of supervision at their fingertips and nursing staff can quickly verify.

RESIDENT BADGE BACKER

OhioHealth		Dr. PGY-GME	
Direct Supervision	Procedure	Indirect Supervision	
	Endotracheal Intubation		
	IJ Central Line		
	Subclavian Central Line		
	Arterial Line		
	Moderate Sedation		

CONCLUSION

- The use of deliberate practice allows residents to work toward skill mastery with pre-practice information gathering, personalized feedback and ample practice opportunities.
- While this has only been implemented for five procedures to date, currently there is work underway to expand the process and include specialty-specific procedures

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