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Teaching Internal Medicine Residents to Perform Breast and Pelvic Exams: A Simulation Curriculum Module

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Abstract

Introduction: Internal medicine (IM) residents must be capable of performing ambulatory procedures required of a competent internist regardless of their career plans. Unfortunately, many IM residents may feel uncomfortable in the ambulatory setting and with ambulatory procedures as the bulk of residency training focuses on inpatient experiences. **Methods:** The session described here is a 1.5-hour case-based, interactive module for residents of all training levels centered on key ambulatory procedures, featuring experienced faculty demonstrating said procedures on a realistic, full-body manikin patient care simulator followed by direct observation of resident competence by that faculty member. Four students per group is optimal. As clinician educators serve as facilitators, faculty training is limited to a walk-through of each session. The materials associated with this publication include the session protocol, cases, direct observation procedure checklists, preparticipation surveys, and postparticipation surveys. **Results:** From July 2014 to June 2015, 66 residents of all training levels at Northwell Health-Lenox Hill Hospital in New York City, NY, completed this session. Upon completion, participant performance of breast and pelvic exams improved at every step of each procedure. Additionally, participant comfort, confidence, and intent to perform breast and pelvic exams increased. **Discussion:** Given the success of this session, this educational experience was expanded to include modules on other key ambulatory procedures to promote the development of independent, competent, proficient, and professional IM practitioners who provide high-quality, patient-centered care while fulfilling the program requirements set forth by the ACGME.

Keywords

Simulation, Internal Medicine, Breast Self-Examination, Case-Based, Gynecological Examination, Ambulatory Education

Educational Objectives

By the end of this module, internal medicine residents will be able to:

1. Correctly perform breast and pelvic exams.
2. Demonstrate how to interact with patients professionally, in a way that respects patient privacy and modesty while limiting medical jargon.
3. Become more comfortable performing breast and pelvic exams.
4. Become more confident in their ability to perform breast and pelvic exams.
5. Become more likely to perform breast and pelvic exams in their future practice in residency and, potentially, beyond.

Introduction

No matter if he or she chooses to pursue specialty training, each internal medicine (IM) resident must be capable of performing ambulatory procedures necessary of a competent internist.[1] One of the ACGME milestones that IM residents must achieve prior to graduation is to demonstrate skill in performing

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Appendices

A. Breast Exam Simulation Case.docx
B. Pelvic Exam Simulation Case.docx
C. Breast Exam Simulation DO .docx
D. Pelvic Exam Simulation DO .docx
E. PreSurvey.docx
F. PostSurvey.docx

All appendices are peer reviewed as integral parts of the Original Publication.

procedures.[1] Similarly, the American Board of Internal Medicine requires certified internists to know, to understand, and to be able to explain a similar list of procedures.[2] Unfortunately, several studies have demonstrated house staff deficiencies in performing breast and pelvic exams.[3-5] IM residents may feel uncomfortable in the ambulatory setting and with ambulatory procedures as the bulk of residency training focuses on inpatient experiences.[3-5] Because of this, it is imperative that residents be explicitly taught the skills they need to be competent physicians as it is not safe to assume that proficiency will be obtained in ambulatory procedures in the course of training.[6] It is also important to note that learners learn best by repeatedly and actively engaging in tasks while applying their knowledge and skills in a way that most mimics actual practice fostered by constructive feedback.[6] There is much literature demonstrating the powerful impact of simulation on inpatient and critical care procedures, such as central line placement[7-10]; however, the same cannot be said for ambulatory procedures. While there is support for using task trainers for certain ambulatory procedures, such as breast and pelvic exams,[11,12] no studies have been conducted using full-body simulators to teach IM residents how to perform ambulatory procedures.

Notably, the ACGME has mandated that IM residency programs provide ongoing direct observation of residents' skills.[13,14] Additionally, program directors and key faculty directly observing residents is the most accurate way to ensure competence and readiness for independent practice.[15] Unfortunately, many IM residency programs struggle to provide frequent direct observation of residents' skills with robust feedback due to inherent challenges such as time constraints for residents and faculty and lack of trained faculty.[16] Ambulatory procedure curricula that utilize simulation may supplement traditional clinical experience to provide more opportunities for direct observation of residents' skills in less time in a low-pressure environment with fewer faculty while limiting patient discomfort and the costs associated with standardized patients.

In order to promote the development of independent, competent, proficient, and professional IM practitioners who provide high-quality, patient-centered care while fulfilling the program requirements set forth by the ACGME,[1] this curriculum was developed and implemented as a series of case-based, interactive sessions each centered on a key ambulatory procedure, featuring experienced faculty demonstrating an ambulatory procedure on a realistic, full-body manikin patient care simulator followed by direct observation of resident competence by that ambulatory faculty member. The first session focused on breast and pelvic exams and is described here.

From July 2014 to June 2015, 66 residents of all training levels at Northwell Health-Lenox Hill Hospital in New York City, NY, completed a 1.5-hour educational session in groups of four led by one of three key ambulatory faculty members proficient in breast and pelvic exams using a full-manikin simulator. At the beginning of each session, participants individually performed a breast exam on the simulator while being observed by the facilitator, who was using a breast exam procedure checklist to evaluate the resident's performance but did not provide feedback as a baseline skills assessment. The facilitator then led the group in the discussion of a case of a patient with a breast lump and demonstrated the correct performance of a breast exam. Following this, resident participants individually performed a second breast exam on the simulator under direct observation by the facilitator followed by feedback. This procedure was repeated for the pelvic exam with Pap smear utilizing a case of a patient with vaginal discharge. At the session's conclusion, participants completed an anonymous electronic survey to elicit their comfort with performing breast and pelvic exams and their intent to perform the procedures in the future after the session.

This session and the experiences therein were viewed extremely positively by participants. Subjectively, these sessions increased participants' comfort with breast and pelvic exams as well as their likelihood to perform them in the future. Objectively, these sessions augmented the procedural skills of participants pertaining to breast and pelvic exams, including respect for patient privacy, modesty, and autonomy. Academically, this curriculum provided resident physicians with experience in performing physically and emotionally challenging tasks and ample opportunity for direct observation of the procedural skills and bedside manner of trainees in an environment that is educational but safe and respectful of patients.

Methods

Several educational approaches are incorporated into this curriculum in order to reach as many learners as possible and reinforce the lessons therein. Before they begin, participants individually attempt a breast and pelvic exam under direct observation by experienced ambulatory faculty without feedback. The faculty leader then leads the residents as a group through a case that necessitates the performance of a breast and pelvic exam for appropriate patient care. This includes the faculty facilitator demonstrating the procedures on the patient simulator. Finally, participants individually perform breast and pelvic exams on the manikin under direct observation and are provided with feedback. The inclusion of the full-manikin patient simulator allows for the performance of breast and pelvic exams while providing ample opportunity for experienced faculty to directly observe and provide feedback on resident procedural skills as well as bedside manner without causing discomfort to a patient or an awkward participant-patient interaction.

This module is designed for IM residents of all levels of training. No prerequisite knowledge, skills, or experiences are required of the learners prior to engaging in a curricular session. The most important requirements for effectively implementing this curriculum are a faculty member to lead the sessions and a residency coordinator, faculty member, or chief resident to assign residents to the sessions. The faculty facilitators must be well versed in the curriculum and its cases, comfortable with performing and teaching these procedures, and familiar with the patient simulator. Though only one facilitator is required per session, the same facilitator does not have to lead every session. The total number of facilitators to be utilized is up to the discretion of the administrator of the curriculum as long as all facilitators lead the case discussions, demonstrate the procedures, and evaluate resident performance in the same manner. The number of sessions per week and the timing of those sessions are also up to the discretion of the administrator of the curriculum. The number of resident participants can vary as well; however, the administrator should attempt to keep the number to four or less to keep all participants engaged in the session.

This curriculum utilizes the Clinical Chloe patient care simulator (available at www.gaumard.com), which costs roughly $1,000 depending on the vendor. Clinical Chloe is a full-body manikin with interchangeable genitalia equipped for oral hygiene, ophthalmic drops, ear irrigation and drops, nasal and oral tube placement and suction, tracheostomy care, ostomy care, intramuscular injections, straight catheterization and indwelling urinary catheter placement, breast exams, external genital exams, pelvic exams with Pap smears, and musculoskeletal splinting and bracing. As this simulator is not electronic and does not include voice transmission, the facilitator responds to questions posed to it by participants and moves the limbs of the simulator when participants ask the simulator to assume a given position. In addition to the simulator, all sessions require a private, designated space (such as a patient room or a quiet corner behind a privacy curtain), an exam table with stirrups and paper covering, patient gowns, paper drapes, gloves of various sizes, paper towels, and hand sanitizer and/or a sink. For the breast and pelvic exams, lubricant, speculums, cervical brushes and spatulas, Thinprep, a light source, and a procedure table are needed. Optionally, one could include cervicitis and vaginitis probes.

Additional materials include the clinical cases (Appendices A & B), procedural direct observation checklists (Appendices C & D), and pre- and postsurveys (Appendices E & F), which are included in the appendices. We wrote the clinical cases to include scenarios for which a breast or pelvic exam would be necessary. The procedure direct observation checklists used by facilitators to evaluate resident performance before and after the session were developed using the American College of Physicians[17] recommendations for adequate performance of breast and pelvic exams and were reviewed for completeness by experienced ambulatory faculty members. The pre- and postsurveys were designed to elicit participants' perceptions of the quality of their ambulatory procedure training prior to the session and the impact of session on their comfort, confidence, and intent to perform breast and pelvic exams. If paper materials are to be used, one copy of the protocol and clinical cases, two copies of the direct observation checklist (one for the pretest and one for the posttest) for each procedure, and one copy each of the pre- and postsurveys for each participant would be needed. Printing the pretest checklist on one side of a piece of paper and the posttest checklist on the other would assist the facilitator in providing feedback to participants. If electronic

materials are to be used, the facilitator would need access to an electronic device to complete the checklists, and each participant would need access to an electronic device to complete the pre- and postsurvey.

Each session lasts approximately 1.5 hours with four participants. If additional procedures are covered or more participants are included, the length would need to be longer. In general, facilitators should arrive approximately 10-15 minutes prior to their session in order to ensure that all materials are present, all supplies are close at hand, and the simulator is assembled, if necessary. Time can be saved by having participants complete the presurvey at some point prior to the session and the postsurvey at some point after the session.

Prior to beginning this session, it is important for all faculty facilitators to meet to review the curriculum and to discuss and agree upon the collection and storage of supplies, the flow of the session, the manner in which the cases will be approached and facilitated, how the breast and pelvic exams will be demonstrated (especially with regard to the use of the simulator), and how and when data will be collected. Schedules for facilitators and participants as described above would need to be made prior by a curriculum administrator. The designated space should be stocked with the supplies for each session. Also, paper copies of session materials or electronic devices with session materials saved on file should be available and ready for use.

When participants arrive or prior to the session, they should complete the anonymous presurvey on paper or electronically. Next, it should be emphasized that the simulator should be treated as a live patient from that point forward and that the facilitator will respond verbally and manipulate the simulator physically in response to participants' requests of the simulator. One at a time and removed from other participants, each resident should perform a breast exam on the simulator during which time the facilitator will speak for and manipulate the simulator while evaluating the resident's performance using the pretest checklist. No feedback should be given to participants at this time. The facilitator should then lead the group through the breast mass case by having participants elicit a history from the facilitator who is acting as the patient using the scripted answers of the case. When it comes time for the physical exam of the case, the facilitator should demonstrate the correct performance of a breast exam on the simulator, including modeling an appropriate physician-patient interaction. Afterwards, one at a time, participants should individually perform a breast exam on the simulator in a patient room or behind the privacy curtain as the facilitator speaks for and manipulates the simulator while evaluating the performance using the posttest checklist. Feedback should be given to each participant at the conclusion posttest. This feedback should center on the participant's performance as well as any notable positive or negative features of the patient-physician interaction. The preceptor should then lead a discussion of the plan of the case. This protocol should be repeated for the pelvic exam using the vaginal discharge case. Used materials should be discarded and the simulator wiped clean before stowing. If data are to be collected on paper, direct observation sheets (pretest on one side and posttest on the other) should be put in a designated collection bin, and the anonymous participant postsurvey should be distributed to participants for completion and placed in another collection bin. If data are to be collected electronically, completed checklists can be saved to a designated folder by the facilitator, and the participants can be e-mailed a link with which to complete the postsurveys.

Participants are evaluated objectively by the facilitator using the pretest and posttest checklists for each procedure as described above. The facilitator also provides feedback to participants on their interactions with the simulator. Participants evaluate the curriculum using postsurveys. Direct observations and facilitator feedback as well as the participant pre- and postsurveys provide debriefing for participants and facilitators.

Results

From July 2014 to June 2015, 66 residents of all levels of training completed the breast and pelvic exam sessions under the tutelage of two rotating facilitators (the director of the Lenox Hill Hospital Internal Medicine Residency Primary Care Track and the chief resident for ambulatory care). No prerequisite

training or knowledge was required of participants, and the facilitators met as a group to discuss the flow of the teaching and ensure uniformity prior to the first scheduled session.

The participants' performance of breast and pelvic exams before and after the education session improved for every step of each exam as demonstrated by improvement in the number of procedure steps successfully completed before and after the session. On a scale of 1 to 5 (from very uncomfortable to very comfortable), participant comfort with performing breast exams went from an average rating of 3.38 before the session to 4.42 afterwards. The rating increased from 2.74 to 4.08 for comfort with performing pelvic exams. On a scale of 1 to 5 (from very unlikely to very likely), participant likelihood to perform breast exams in the future increased from 2.33 before the session to 3.51 afterwards. The rating increased from 2.35 to 3.42 for likelihood to perform pelvic exams. On a scale of 1 to 5, the average rating of the educational session by participants was 4.73.

Written and oral feedback for the curriculum by residents was overwhelmingly positive. One participant wrote, "Excellent educational experience! Despite feeling very comfortable prior to my Clinical Chloe session, I now feel both comfortable and confident with both pelvic and breast exams." Another wrote, "Excellent teaching session, my comfort level with breast and pelvic exams has increased significantly."

Discussion

The session described here is part of a larger curriculum designed to increase the frequency and accuracy with which IM residents perform ambulatory procedures. The overarching purpose of this curriculum is to prepare residents for independent practice. We hypothesized that direct observation of residents' performance of ambulatory procedures on a simulator with constructive feedback by key faculty during a case-based tutorial session would increase residents' comfort with and intention to perform ambulatory procedures as well as their technical skills. Upon completion of the session focusing on breast and pelvic exams, participants improved at every aspect of these procedures as evidenced by comparison of the pre- and postsession direct observations. Additionally, participants reported increased comfort, confidence, and likelihood to perform the featured ambulatory procedure.

This curriculum has many strengths. It is low in cost, and full-size manikin patient simulators can be purchased for as little as $1,000 as no special features, such as voice transmission, heart or breath sounds for auscultation, and so on, are required for this curriculum. Fewer faculty would be needed than with traditional clinical experiences as multiple residents can be included in a session. Furthermore, simulation allows for the creation of clinical scenarios specific to the needs of learners and abilities of faculty. Other educational approaches incorporated into this curriculum include cased-based learning, expert demonstration, and direct observation with feedback to reach different types of learners and reinforce the curricular objectives. Lastly, this curriculum provides opportunities for IM residency programs to fulfill key ACGME mandates, such as continual direct observation of resident performance.

This curriculum has weaknesses as well. Simulation can never completely mimic life. Clinical practice is unpredictable. One is often pulled in multiple directions. Time is short. Patients are complex. We believe, though, that our curriculum creates a foundation of skills, a framework of knowledge, so that residents are prepared for future clinical practice and continued learning. Additionally, though fewer faculty are necessary, this curriculum can be quite time intensive for facilitators. This can be eased by spreading out sessions, engaging more faculty, and obtaining more protected teaching time for facilitators, if possible. It should be noted, however, that as more faculty become involved, session uniformity and evaluation interrater reliability may decline, making faculty development all the more crucial. Lastly, scheduling will always be a challenge to any residency curriculum for residents and faculty alike. Communication amongst all parties is key.

There are several variations and extensions to this curriculum that could be pursued if desired. The cases may be altered, and different procedures could be substituted. As stated previously, the session described

here is part of a larger curriculum, which includes multiple sessions each of which focuses on different ambulatory procedures such as external male genital exams, prostate exams, and subcutaneous injections. This session also could be conducted with standardized patients; however, our institution does not grant us the financial resources to use standardized patients. We would argue that one of the strengths of this session is that it can easily be done with minimal resources at any institution. Several senior residents who enjoy teaching and completed the female and male exams sessions as trainees have expressed interest in facilitating sessions for younger trainees. While this would be quite valuable in terms of expanding facilitator capabilities, inexperienced and undertrained residents should not be enlisted as facilitators of this curriculum in order to maintain uniformity and quality. However, residents with experience, faculty mentorship and supervision, and rigorous training may be acceptable facilitators on a case-by-case basis. For example, the chief resident who acted as one of the facilitators participated in a session during residency, graduated at the top of her class as a member of the primary care track, became the chief resident for ambulatory care, and has become a successful primary care physician. She also underwent specific training by us for facilitating these sessions and was periodically observed in action to guarantee quality teaching. Additionally, as mastery of a skill can only be obtained by repetition, procedure logs could be actively monitored for the number of breast and pelvic exams performed by each resident to ensure continued practice and skill retention. Lastly, we plan to include a procedures-only recap session to evaluate the long-term effectiveness of this curriculum by asking participants to demonstrate the breast and pelvic exam on the simulator towards the end of residency.

We are nearing the end of the second anniversary of this curriculum's implementation. Several unexpected challenges have presented themselves along the way. Several meetings were needed before we obtained administrative support to purchase the simulator. Furthermore, residents were originally skeptical of the utility of this curriculum, concerned it was just another mandatory activity. To obtain buy-in, we demonstrated the value of this curriculum in terms of meeting ACGME requirements to residency administration. We also were able to convince residency administration to allow residents to use these sessions to count towards required their procedure quotas. Additionally, to generate excitement before sessions began, we sent the residents e-mail announcements, one of which featured a picture of the simulator. Despite early roadblocks, seeing the fruits of this curriculum and the impact it has on the residents who complete it has been incredibly rewarding as we are witnessing the beginnings of a cultural change. In our ambulatory practice, residents are beginning to take the initiative when performing these procedures (or at least not shying away from them). Their presentations are not only more accurate but also more professional (no longer is precious precepting time wasted in discussion of how awkward it was to do a genital exam). Most impressively, some residents even appear more confident in patient interactions.

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