

How Effective are New Milestones Assessments at Demonstrating Resident Growth? 1 Year of Data [☆]

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OBJECTIVE: Assessment tools that accrue data for the Accreditation Council for Graduate Medical Education Milestones must evaluate residents across multiple dimensions, including medical knowledge, procedural skills, teaching, and professionalism. Our objectives were to: (1) develop an assessment tool to evaluate resident performance in accordance with the Milestones and (2) review trends in resident achievements during the inaugural year of Milestone implementation.

DESIGN: A novel venue and postgraduate year (PGY) specific assessment tool was built, tested, and implemented for both operating room and labor and delivery “venues.” Resident development of competence and independence was captured over time. To account for variable rotation schedules, the year was divided into thirds and compared using two-tailed Fisher's exact test.

SETTING: Brigham and Women's and Massachusetts General Hospitals, Boston MA.

PARTICIPANTS: Faculty evaluators and obstetrics and gynecology residents.

RESULTS: A total of 822 assessments of 44 residents were completed between 9/2014 and 6/2015. The percentage of labor and delivery tasks completed “independently” increased monotonically across the start of all years: 8.4% for PGY-1, 60.3% for PGY-2, 73.7% for PGY-3, and 87.5% for PGY-4. Assessments of PGY-1 residents demonstrated a significant shift toward “with minimal

supervision” and “independent” for the management of normal labor ($p = 0.03$). PGY-3 residents demonstrated an increase in “able to be primary surgeon” in the operating room, from 36% of the time in the first 2/3 of the year, to 62.3% in the last 1/3 ($p < 0.01$).

CONCLUSION: Assessment tools developed to assist with Milestone assignments capture the growth of residents over time and demonstrate quantifiable differences in achievements between PGY classes. These tools will allow for targeted teaching opportunities for both individual residents and residency programs. (J Surg Ed ■■■■-■■■. © 2016 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: ACGME milestones, obstetrics and gynecology, evaluation tool, resident assessment, competency

COMPETENCIES: Patient Care, Medical Knowledge, Interpersonal and Communication Skills, Professionalism, Practice-Based Learning and Improvement

INTRODUCTION

In July 2014, the second wave of U.S. Residency Programs including Obstetrics and Gynecology (Ob-Gyn) implemented the Next Accreditation System (NAS), including assessment and reporting of discrete Milestones.^{1,2} Per the Accreditation Council for Graduate Medical Education (ACGME), one goal of the NAS is to use outcomes-based educational Milestones to assess and track resident performance. Milestones are descriptors of and targets for resident proficiency, signified by medical knowledge, technical skills, attitudes, and performance that correspond to subcompetencies of the 6 ACGME core competencies. Each specific Milestone is organized according to a developmental framework from less to more advanced, and residents are expected

[☆]Our assessment tool was included in a round-table discussion at the 2015 Council on Resident Education in Obstetrics and Gynecology & Association of Professors of Gynecology and Obstetrics (CREOG & APGO) Annual Meeting in San Antonio, TX, and the tool design was displayed as a poster. The results of the present analysis were presented as a poster at the 2016 CREOG & APGO Annual Meeting in New Orleans, LA.

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to demonstrate increased proficiency and advancement to independence as they progress in their training.

With implementation of Milestone reporting, the need for development of appropriate assessment tools has become paramount to residency programs in all specialties.³⁻⁷ Many previously used assessments lacked the granularity of data necessary to map residents to their Milestone levels.⁸⁻¹⁰ Widely used electronic evaluation systems such as New Innovations and MedHub were not primarily developed to accrue and analyze data for Milestone mapping of residents. Residency Program Directors and coordinators were tasked with the immense project of providing information to their Clinical Competency Committees to allow for accurate and objective assessments appropriate to this new system. The introduction of ACGME Milestones provided an ideal opportunity to update the tools previously used to evaluate residents. Using the Milestones as a guide, our goal was to develop an online evaluation system incorporating features that allowed for tracking trainee growth over time.

In addition to developing new assessment tools, many residency programs are still grappling with how to use the information from the new assessments to assign Milestone levels on a semiannual basis as required by ACGME.¹¹⁻¹⁵ Additionally, there has been very little interrogation of the validity of data being used by Clinical Competency Committees to assign Milestone levels.^{16,17} In this study, we describe a novel assessment tool that aligns with ACGME Ob-Gyn Milestones and review the data obtained in the first year of utilization of this tool.

MATERIAL AND METHODS

This cross-sectional cohort study was reviewed and approved for exemption by the Partners HealthCare Institutional Review Board. The assessment tool was developed and implemented within the Brigham & Women's Hospital/Massachusetts General Hospital Integrated Residency Program in Ob-Gyn, a program with 11 residents in each of 4 postgraduate years (PGY). Residents in this program are always on an Obstetrics or Gynecology service, with the exception of one 4-5 week block during their intern year on an Internal Medicine service, and a second 4-5 week block during their second year on a Surgical Intensive Care Unit service. Residents throughout all 4 years have in-house weekend call duty on either an Obstetric or Gynecologic service.

Over the course of several months, an assessment tool was built using the ACGME Milestones as a guide. The assessment questions and answer choices were created and reviewed by faculty members from multiple Ob-Gyn disciplines, including General Ob-Gyn, Gyn Oncology, High-Risk Obstetrics, and Urogynecology. Before implementation, the tool was introduced to the remainder of the faculty during 2 formal required Grand Rounds lectures, and the final tool was modified to incorporate suggestions from those lectures.

The evaluation tool was designed using the REDCap system. REDCap software allows for the creation of branching logic, so that assessments can be targeted to a specific "venue" (e.g., operating room [OR] or labor and delivery [L&D]), surgical procedure, and PG year. The software is accessible via multiple outlets, and assessors access the evaluations by: (1) typing in a URL, (2) clicking a direct evaluation link sent by email, or (3) using smartphone technology with a unique QR code. Assessments could therefore be completed using computers, tablets, and smartphones. Multiple faculty members completed "practice" evaluations on their computers and smartphones before the tool's formal implementation to provide feedback on ease of use and help ensure a smooth program-wide launch.

Once the tool was developed, a pilot study tested the feasibility of the REDCap system in evaluating residents, including the use of branching logic technology. The pilot study was undertaken during "intern boot-camp," an established orientation day during which incoming first-year residents learn basic surgical and delivery skills. The intern boot-camp evaluation was designed in accordance with "level 1" Milestone development, and positive choices selected by assessors during the orientation equated to the achievement of at least a "level 1" score, the expected level for incoming residents. The REDCap assessment tool was felt to adequately evaluate the targeted Milestones, according to resident and faculty input.

Following the pilot study, the formal assessment tool was further developed using branching logic, so that 1 evaluation tool incorporated all possible assessments for all level residents for both the OR and L&D venues. We chose to target these 2 venues initially because residents rotate in the OR and on L&D for all 4 years and spend a substantial amount of time on these rotations as compared to outpatient clinical areas. The tool was used to evaluate residents according to multiple dimensions, including medical knowledge, procedural technique, teaching skill, and professionalism. Assessments were PG year-, procedure- and venue-specific.

Resident assessments were captured over time and stored within the REDCap system. To account for different resident rotation schedules, the year was divided into thirds for analysis. Resident development was compared both across years and within the same year using two-tailed Fisher's exact test, where $p < 0.05$ defined significance.

RESULTS

Screenshots of the OR assessment tool can be found in [Figure 1A](#) and [B](#), demonstrating the different questions asked of evaluators based on PGY and surgery type. The evaluation questions are auto-populated based on the evaluator's selection of a resident's name (noted as 'PGY1' in the figure later) and choosing type of surgery, either laparotomy, laparoscopy, hysteroscopy, or vaginal.

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