READINESS FOR RESIDENCY BOOTCAMP IMPLEMENTATION PLAYBOOK

A Framework for Colleges of Osteopathic Medicine
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Residency Readiness & COVID-19

The American Association of Colleges of Osteopathic Medicine (AACOM) Board of Deans established the UME-GME Task Force in 2022 to address critical issues affecting osteopathic medical education, including the transition to and readiness for residency. In 2021, AACOM began working with the nation’s colleges of osteopathic medicine (COMs) to explore ways to support residency preparation efforts for fourth-year medical students after the onset of the COVID-19 pandemic. There were increased concerns during this period about the preparedness of medical students who likely missed clinical experiences and patient encounters due to the pandemic. As such, COMs across the nation developed mechanisms to evaluate and provide additional refreshers to their medical students to better prepare them to start residency.

To follow on these efforts, the UME-GME Task Force’s Transition to Residency Working Group established an action group on residency-readiness bootcamps in 2022. The action group was tasked with developing a national framework for COMs to consider in their efforts to support students in their fourth year of medical school as they transition to residency. The framework is intended to serve as a guide that will be tailored to meet the specific needs and resource capacity of COMs. It is hoped that a national framework will facilitate increased collaboration and the sharing of tools and information across the nation and will demonstrate to residency program directors that all osteopathic medical students are fully prepared to enter and succeed in a residency position.

To that end, this playbook was developed for faculty and staff to serve as a guide to supplement existing efforts to prepare students for residency. It outlines specific skills that are transferable across specialties (such as responding to codes and performing physical exams) and should be assessed during a residency-readiness bootcamp to be held in the fourth year of medical school.

The model is similar to the Clinical Competency Committee (CCC) in the Accreditation Council for Graduate Medical Education (ACGME) whose role is to attest and sign off for learners.
Feedback on the specific skills was solicited and attained from program directors across specialties, clinical deans, deans and others, both MD and DO.

**Background**

Developing a national residency-readiness bootcamp framework will provide substantial benefit to osteopathic medical students and COMs. Such a bootcamp may increase the competitiveness of osteopathic medical students applying for residency.

In a survey of clinical deans conducted in 2021, the nation’s COMs reported that they desire national-level support for residency readiness. There was also interest in a national repository of resources for residency readiness that all COMs can use for their students as well as a desire to have standardized resources or programs that are available to all COMs. Finally, COMs reported a desire to have a standardized framework for the goals, objectives and assessment benchmarks of residency-readiness bootcamps. To date, several assessment metrics exist, including Entrustable Professional Activities (EPAs) and specialty milestones to assess readiness.

The challenges and limitations of establishing and maintaining residency-readiness bootcamps identified by clinical deans from the COMs in 2021 include:

- Financial cost limitations for implementing a program
- Time constraints for faculty and students
- Limited space and resources available for use by COMs

Several COMs have already implemented residency-readiness programming. These include:

- Structured Objective Structured Clinical Examination (OSCEs) and other clinical scenarios
- Simulations using standardized patients for those COMs that have an on-campus simulation center/facility
- Residency-readiness bootcamps (in-person and virtual bootcamps)
- Curriculum-based initiatives and didactics/coursework dedicated to residency readiness

**CHART I. SUMMARY OF ACTIVITIES ON RESIDENCY READINESS**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structured OSCEs</td>
<td></td>
</tr>
<tr>
<td>Simulations with standardized patients for COMs with and without a simulation facility</td>
<td></td>
</tr>
<tr>
<td>Curriculum-based initiatives and coursework</td>
<td></td>
</tr>
<tr>
<td>Weekly messages about how to handle scenarios</td>
<td></td>
</tr>
<tr>
<td>Sessions with residency program directors</td>
<td></td>
</tr>
<tr>
<td>Focus on 5 things residency program directors want: The ability to perform history, a physician exam, good oral summary, proper documentation and to recognize an emergency</td>
<td></td>
</tr>
<tr>
<td>Simulation program for OMS IVs</td>
<td></td>
</tr>
<tr>
<td>Three-day online/in-person events</td>
<td></td>
</tr>
<tr>
<td>Focus on EPAs as foundation or basis of competency/entrustability</td>
<td></td>
</tr>
<tr>
<td>AAMC pilot program: program directors are surveyed after students have been in GME for six months</td>
<td></td>
</tr>
<tr>
<td>In-person bootcamp catered to specialty that student matched into</td>
<td></td>
</tr>
</tbody>
</table>
Play-by-Play: Approach to COM-Specific Bootcamps
PLAY 1: Understand Your Capacity and What You Need at Your Institution

Consider the following questions at the national and school level when determining how to support residency preparation for medical students:

- What are the benchmarks for residency preparation?
- Who should determine the benchmarks or when to assess them?
- When should COMs observe the benchmarks?
- What goals and objectives should be met in the residency-readiness efforts?
- What is the best time to assess benchmarks prior to graduation?
- Do you need simulation centers/training mediums?
- What partnerships should COMs be striving to obtain if they don’t already exist in a specific region (other schools or hospital partnership) and, if necessary, where would funding for partnerships be achieved?
- How could COMs cover some of the important residency skills that are not necessarily covered in milestones or EPAs—like difficult conversations with patients or family members?
- What established resources could be made available and who would oversee them?

CHECKLIST

☐ Complete resource evaluation at COM
☐ Determine number of faculty members who can commit to residency bootcamp
☐ Determine number of days required
☐ Evaluate the feasibility of bringing students to campus
☐ Assess ability to leverage clinical sites to host bootcamps
Consider the following recommended approaches to residency readiness:

- Longitudinal/continuity in residency readiness across the four years of medical school
- Establish a safe learning environment to identify gaps and resources
- Build flexibility into the attestation process: Consider intertwining mentorship opportunities with residents at clinical sites and having the “home base” at a COM as a resource
- Strive to test via practical demonstration rather than via paper to hone procedure-based interpersonal communication skills
- Do not make bootcamps high stakes or an impediment to graduation
- Use the bootcamps as an opportunity to validate skills rather than an opportunity to teach the skills. Resources to refresh the medical students’ knowledge on the skills and procedures should be readily available to students to access online asynchronously (see pages 14-15).

The structure of the bootcamps can vary, but COMs are encouraged to establish “skill stations” that assess a specific number of skills that can be marked complete once mastery is demonstrated by the student. Remediation should be offered to students until they have mastered these skills.

**CHECKLIST**

- Create communication plan to students on purpose and goals for the bootcamp
- Create communication plan for faculty and evaluators
- Ensure buy-in from leadership
- Organize resources for refreshers that can easily be accessed
- Offer library resources for procedural skills
PLAY 3: One Size Doesn’t Fit All: Bootcamp Setup

The setup of the residency-readiness bootcamp can vary based on the COM, its location and appropriate timing based on schedules and existing curriculum. There may be opportunities to assess skills in a virtual setting as well, as outlined in Chart II. As such, there is no standard recommendation on the number of faculty needed to execute an in-person bootcamp. The action group recommends a flipped classroom approach and arranging stations based on the skills that will be assessed. There can be one station per skill or skill set and students can rotate through each station to demonstrate proficiency. Each skill station should be approximately 15 minutes per skill. The instructor will start with a demonstration and then students will demonstrate their own competency. If a student fails to show competency, that skill will not be checked off and the student’s skills will be remediated at the completion of all the stations.

TIMELINE

The action group strongly recommends that the bootcamps are conducted during the spring of the fourth year of medical school, after students have matched and may have more flexibility to attend an in-person bootcamp.

FIGURE 1. RESIDENCY BOOT CAMP LOGISTICS

- Hold bootcamp in spring after Match, late March–April over one–two dates
- COMs provide list of procedures to review in advance of bootcamp
- Set up stations for each competency/skill and have groups of students rotate (speed-dating model)
- Each station will have a facilitator or can be organized in a way that fits the COM’s capacity
- Students are evaluated per skill, and skills are checked off once demonstrated
- Those who do not pass have a chance to come back to remediate after finishing all stations

CHECKLIST

- Determine location of residency bootcamp
- Set up tables/stations with a set number of skills to evaluate
- Ensure adequate staff support for bootcamp day(s)
- Consider ways to include the COM’s efforts to assess and validate skills prior to residency in the Medical Student Performance Evaluation
**PLAY 4:**

*Keep It Simple: Assess Few, but Critical, Knowledge and Skills*

There are key knowledge and skills needed before entry into residency that should be validated before starting residency, which should be checked off longitudinally during the four years of medical school (see Chart II). The list of skills and knowledge align with EPAs.

Some skills are critical, yet they fade with time and will need to be assessed longitudinally throughout the four years of medical school. Table 2 outlines both the skills that need to be checked off longitudinally and those that need to be validated through a residency-readiness bootcamp before entry into residency.

**Cross-Walk of Core Skills with ACGME Core Competencies**

*Internal Medicine Transition to Residency Individualized Learner Plan (ILP) Templates by Alliance of Academic Internal Medicine*

**PRE-AND-POST RESIDENCY BOOTCAMP SURVEY TEMPLATES:**

- Pre-bootcamp survey template
- Post-bootcamp survey template
### Chart II. What Core Knowledge/Skills Do Students Need Before Entering Residency?

<table>
<thead>
<tr>
<th>Knowledge/Skills Needed</th>
<th>Longitudinal Check Offs During Medical School</th>
<th>Validated Items Before Starting Residency</th>
<th>Can Be Validated Online</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACLS/PALS: Intubation, running a code</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Acid/Base balance</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Consenting for procedures</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>DNR</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>How to hand off a patient</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Inserting peripheral IV</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Triage patients when on call</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>History taking</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Physical exam</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral presentation</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>OPP/OSCE</td>
<td>X</td>
<td>X*</td>
<td></td>
</tr>
<tr>
<td>Ultrasound skills (POCUS)</td>
<td>X*</td>
<td>X*</td>
<td></td>
</tr>
<tr>
<td>Reading and presenting a chest X-ray</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Admissions, transfer and discharge documentation</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Fluid resuscitation</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assessing suicide risk</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>EKG interpretation</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Sutures</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access evidence-based resources at point of care</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comfort care transition or goals of care discussion</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Knowledge/Skills Needed | Longitudinal Check Offs During Medical School | Validated Items Before Starting Residency | Can Be Validated Online
--- | --- | --- | ---
Communicating with consultants (formal, verbal or written consult request) | X | | 
How to advocate for patients and health equity as a resident | X | | 
Communicating with non-physician colleagues (what are appropriate requests) | X | | 
How to efficiently review the EMR (key tabs and in what order) | X | | 
Time management, prioritizing tasks (e.g., consults then orders, then family updates, then notes, etc.) | X | | 
Delivering bad news | X | | 
Assessing patient’s decision-making capacity | X | | 
DPOA vs. medical decision-maker, POLST vs. advanced health directive | X | | 
Basics of health insurance | X | | 
Basics of quality improvement projects | X | | 
Receiving and providing feedback | X | | 
Hospice vs. LTAC vs. SNF -> transferring care decisions | X | | 
Fundamentals of antibiotics | X | | 
Fundamentals of sedation/analgesia medications | X | | 
Guides on other procedures like thoracentesis, paracentesis, arthrocentesis, chest tube placement, etc. | X | | 
Growth mindset | X | | 
Self-care/wellness | X | | 

*Based on curriculum at COMs*
PLAY 5: Refresh Before and After the Bootcamps

It’s ideal to offer an online resource that students can log onto with virtual resources (documents, videos, simulations, etc.) to review skills that they have run into and identify as an individual problem. An online resource would be accessible when needed, and not mandatory or punitive. However, this must be balanced by the program director’s need for an attestation of proficiency.

CHECKLIST

☐ Determine which procedures may apply to specific specialities if wanting to provide more specialty-specific refreshers

☐ Provide resources at institution that may require a fee to access, e.g., through library

☐ Share reference lists in advance of any residency bootcamp activity

LIST OF PROCEDURES (GENERAL/SPECIALTY SPECIFIC)
Subscription to New England Journal of Medicine required to access videos

- Abscess Incision and Drainage
- Ankle-Brachial Index for Assessment of Peripheral Arterial Disease
- Arterial Puncture for Blood Gas Analysis
- Arthrocentesis
- Basic Laceration Repair
- Basic Splinting Techniques
- Blood-Pressure Measurement
- Bone Marrow Aspiration and Biopsy
- Central Venous Catheterization
  - Internal Jugular Vein
  - Subclavian Vein
  - Femoral Vein
- Chest-Tube Insertion
- Clinical Evaluation of the Knee
- Conscious Sedation for Minor Procedures in Adults
- Cricothyroidectomy
- Diagnosing Otitis Media - Otoscopy and Cerumen Removal
- EKG Interpretation
- Emergency Pericardiocentesis
- Endometrial Biopsy
- Endotracheal Extubation
- Examination of the Larynx and Pharynx
- Fiberoptic Intubation
- Gastrostomy-Tube Exchange
- Genitourinary Exam
  - Male
  - Female
- Hand Hygiene
- How to Perform a Punch Biopsy of the Skin
- Intraosseous Catheter Placement in Children
- Laryngeal Mask Airway in Medical Emergencies
- Lumbar Puncture
- Nasogastric Intubation
- Orotracheal Intubation
- Paracentesis
- Pelvic Exam
- Peripheral IV Insertion: Peripheral Intravenous Cannulation
- Placement of an Arterial Line
- Positive-Pressure Ventilation with a Face Mask and a Bag-Valve Device
- Procedural Sedation and Analgesia in Children
- Pulmonary-Artery Catheterization
- Pulse Oximetry
- Reduction of a Pulled Elbow
- Repositioning Dislocated Temporomandibular Joints
- Thoracentesis
- Ultrasound-Guided Insertion of a Radial Arterial Catheter
- Ultrasound-Guided Internal Jugular Vein Cannulation
- Ultrasound-Guided Peripheral IV Placement
- Umbilical Vascular Catheterization
- Urethral Catheterization
- Interpretation of the Adult Chest X-Ray
- How to Read an Abdominal X-Ray
- Approach to Abdominal X-Ray Interpretation
- MSK X-ray (Use Musculoskeletal)
- Mental Status Exam
  - Hand Hygiene
  - Skin Prep, Draping—proper technique
  - Suture (simple, running, subcutaneous, mattress)/laceration repair, staples
  - Incision and Drainage Procedure
  - Digital Block (administer a local anesthetic)
  - NG Tube Placement (describe maintenance and proper removal)
  - Foley Catheter Placement (describe maintenance and proper removal)
  - IV Access
  - PAP/Bi-Manual Exam
  - Male Genital Exam
  - Rectal Exam
  - Breast Exam
  - Wet Mount
  - Basic MSK Splinting
  - Wound Dressing
  - OMT Hospital vs. Outpatient
- Vaginal Delivery (FM, OB, EM)
- C-Section (appropriately assist with)
- Cord Blood Collection
- STI Collection
- Read Head CT, r/o acute intracranial bleed
- IV Fluid Use (pediatric versus adult bolus versus maintenance)
- Blood Product Use
- Management of DKA
- Admission Orders
- Discharge Orders and Note
- Procedure Note
- Post Delivery Note
- Outpatient SOAP note
- Fetal Heart Tracing
- APGAR
- Pre-Op Evaluation
- Aseptic Protocols
- Calculate Creatinine Clearance
- Basic Lab Interpretation—CBC, chem panel, UA

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Acknowledgments

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APPENDIX

Entrustable Professional Activities as Part of a Residency Readiness Bootcamp

Most educators have likely heard of entrustable professional activities (EPAs) as an approach to assessing medical students and residents; yet research indicates that use of the terminology has become confusing because there are at least four or more descriptions evident in the extant literature following its original use. Ten Cate originally coined the term to describe the units of professional practice that clinicians engage with in their daily work. Use of the term was subsequently expanded to include EPA assessments, EPA advancement decisions and EPAs as curricular frameworks. In the context of residency preparation, it is important to revisit the meaning of EPAs as professional units of practice before deciding how to apply EPAs as measurements of residency readiness.

Ten Cate provides a primer on EPAs useful to those considering incorporation of EPA assessments in determining residency readiness. Of particular note, he describes the difference between EPAs and the competencies that underpin the EPAs, with EPAs functioning as operational definitions of the tasks that each clinical department, clinical ward or healthcare worker may have for the day, for the week or for any period of time. As such, these are the tasks that operationally define the profession. In contrast, competencies describe the multiple knowledge, skills and attitudes/behaviors that individuals must learn in order to perform professional work tasks (i.e., EPAs). A basic task such as taking a patient's history, for example, requires the application of several competency domains (including professionalism). Learners can become competent professionals when they acquire requisite knowledge, skills, and attitudes within a competency domain. Professionals possess competency in definable areas. However, it is never said that professionals “possess” or “achieve” EPAs.

While a learner might seem competent, the delegation of a task or the decision to transfer responsibility to a learner is complicated and requires that supervisors make grounded entrustment decisions. Decisions like this, which happen often frequently, are sometimes called ad hoc entrustment decisions. An entrustment decision occurs when a supervising physician feels the learner’s skills match the complexity of the patient and the risks in doing the task are acceptable. There are many covariants to the entrustment decision-making process, including (a) the perceived learner features, (b) a supervisor’s propensity to delegate responsibility, (c) the complexity of the EPA, (d) the clinical context and (e) the nature of the relationship of the clinician and the learner.

Entrustment decisions should always be based upon sufficiently grounded trust, with multiple observers in agreement that the entrustment is justified to reduce subjective bias and to incorporate a series of observations into the decision-making process. Typically, an EPA entrustment decision requires multiple direct observations, longitudinal observations, case-based discussions and product evaluations. Case-based discussions and entrustment-based discussions can serve as short, focused conversations after an EPA has taken place to ensure that the learner has a deep understanding of what was done. These conversations are best when “what-if” questions are included to explore whether the learner will know what to do in the future if similar situations arise in unexpected or unfamiliar ways.

Can these EPA parameters become fully realized in a residency readiness bootcamp? EPAs were designed for workplace-based assessment, so their application during a residency readiness bootcamp would be somewhat unique, although not impossible if done correctly.
Identified in the extant literature are six EPAs that show promise for launching a coordinated UME-GME effort to prepare medical students for residency:11

<table>
<thead>
<tr>
<th>EPA</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPA4</td>
<td>Enter and discuss orders/prescriptions</td>
</tr>
<tr>
<td>EPA8</td>
<td>Patient handover</td>
</tr>
<tr>
<td>EPA10</td>
<td>Urgent/emergent care</td>
</tr>
<tr>
<td>EPA11</td>
<td>Informed consent</td>
</tr>
<tr>
<td>EPA12</td>
<td>Procedures</td>
</tr>
<tr>
<td>EPA13</td>
<td>Patient safety</td>
</tr>
</tbody>
</table>

Although EPAs can be somewhat specialty-specific, many feature generalized tasks applicable across specialties.11 Therefore, opportunities to perform core EPAs and be assessed or receive feedback in the fourth year might be particularly useful for preparing medical students for their PGY-1 year in specialty areas such as surgery where use in resident selection has already been noted.12-14 In two recent surveys conducted by national residency program organizations, program directors from general surgery and internal medicine have shared expectations for incoming residents regarding the core EPAs. General surgery program directors reported that they felt all 13 EPAs were relevant for general surgery12-13 and internal medicine leaders noted that all but EPA 12 were relevant to their specialty area.14 UME programs should consider the potential impact of EPA use given that these two specialty programs filled 42 percent (13,506 of 32,194) of all PGY-1 positions offered in the National Resident Matching Program during 2019.15

While useful, prescribing a specific experience to foster and determine readiness to perform core tasks/EPAs is difficult due to the variations in curricula and experiences at each school. The extent to which the core EPAs can be integrated into activities, experiences, required and elective curricula and residency-readiness activities will likely vary across medical schools. However, it is worth recognizing that the clinical skills required to begin a residency program extend well beyond those described as the core EPAs, which is why this guide in its entirety is important.

The first method would be to simply note elements of EPAs that might be assessed in previously defined checklists for various activities. While this is not a true assessment of the tasks or expectations of practice, it is a conscious note of where weaknesses might lie in the competencies that feed into EPAs. This process could elevate attention to the EPAs that warrant additional attention or where the curriculum might need to change to ensure better preparation for particular tasks. The writing group noted EPAs in the checklists provided in this document. This method can also be further seen in the work of Eliasz et al.6 in which they describe the mapping process that they took in developing their checklist to incorporate EPAs as well as the Night-onCall (NOC) activities that they used to address readiness for residency, framed around the tasks suggested by the AAMC core EPAs,17 which are similar to AACOM’s core EPAs for entering residency.18

The second method would be to incorporate some objective structured clinical exercises into your residency bootcamp experience (or other specific curricular experiences in the fourth year, such as readiness courses, internships/subinternships, residency preparation curriculum, etc.) where learners would receive feedback through simulated scenarios on tasks and readiness in a simulated environment. Although not containing the required elements for full EPA assessment (e.g., in context, actual patient encounter, multiple direct observations, longitudinal observations, case-based discussions and product evaluations), this method could provide valuable feedback, especially to those who have not received formal feedback on the tasks as a whole up to that point.

The final, and best, method would be to collect EPA assessments across time in actual clinical settings (through year three and four rotations) and review supporting evidence/data from the accumulation of these assessments to target specific areas of concern (and specialty-specific concerns, if possible) longitudinally but especially focused during a bootcamp or clerkship curricular experience. Examples of this type of method can be seen through the Education in Pediatrics Across the Continuum program specifically
designed for students entering pediatric residencies.\textsuperscript{19} The interdepartmental acting internship experience at Virginia Commonwealth University School of Medicine can also provide some insights into a more longitudinal experience using EPAs in an actual clinical setting to provide feedback on tasks in preparation for residency.\textsuperscript{20-21}

No matter which method is most appropriate for your institution, resources, experiences, curriculum and goals, the preparation of learners surrounding tasks outlined in the EPAs is important and will serve to set the learner up for success in residency, as noted by surgery and internal medicine program directors.

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