

McLean ME, Cotarelo AA, Huls Ta, et al. UME-to-GME PandEMonium in COVID-19: large-scale implementation of a virtual ACGME Milestone-based curriculum for senior medical students matched into emergency medicine. *J Grad Med Educ.* 2021;13(6):848–857. doi:<http://dx.doi.org/10.4300/JGME-D-21-00620.1>

Supplementary Data

A.

List of participating EM residency programs, locations, intern class size, program length, and program type. All programs received Institutional Review Board exemption from their respective institutions. Information on class size, program length, and primary training site setting obtained from: FREIDA, the AMA Residency & Fellowship Database® Search for Residencies and Fellowships.²⁷

Program Name, Location	Intern Class Size	Program Length (Years)	Primary Training Site Setting
Albany Medical Center, Albany, NY	12	3	University
Florida Atlantic University, Boca Raton, FL	6	3	Community
George Washington University, Washington, DC	11	4	University
Henry Ford Hospital/Wayne State University, Detroit, MI	17	4	Community
Kaiser Permanente, San Diego, CA	6	3	Community
Maimonides Medical Center, Brooklyn, NY	18	3	Community
Mayo Clinic, Rochester, MN	9	3	University
Medical College of Wisconsin, Milwaukee, WI	12	3	University
Memorial Health System, Marietta, OH	6	3	Community
Mount Sinai Hospital, New York, NY	25	4	University
Mount Sinai Morningside-West, New York, NY	20	3	University
New York Medical College Metropolitan/Harlem, New York, NY	13	3	Community
Newark Beth Israel Medical Center, Newark, NJ	8	3	Community
NewYork-Presbyterian Brooklyn Methodist Hospital, Brooklyn, NY	13	3	Community
NewYork-Presbyterian Queens Hospital, Flushing, NY	9	3	Community
Norman Regional Health System, Norman, OK	6	4	Community
Northwestern University, Chicago, IL	15	4	University
Nuvance Health Program, Poughkeepsie, NY	10	3	Community
St. John's Riverside Hospital, Yonkers, NY	9	3	Community
Staten Island University Hospital-Northwell Health, Staten Island, NY	10	3	University
University of Arkansas for Medical Sciences, Little Rock, AR	10	3	University
University of Illinois, Peoria, IL	14	3	Community
University of Missouri, Columbia, MO	10	3	University
University of Missouri/Truman Medical Center, Kansas City, MO	11	3	University
University of Nevada Las Vegas, Las Vegas, NV	10	3	University
University of South Florida, Tampa, FL	10	3	Community
University of Washington, Seattle, WA	12	4	University
University of Wisconsin, Madison, WI	12	3	University

B.

Slack setup and curricular implementation instructions.

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Initial Setup of Slack Workspace

For programs without an existing Slack workspace

1. Access <http://www.slack.com>
2. Click on the “Create Team” tab
3. Enter your e-mail address
4. The website will email you a confirmation code. Type the confirmation code into the Slack website
5. Enter your full name and select a username
6. Type in a password
7. Fill out the information regarding your residency (i.e. What will your team use Slack for? Work. What kind of company is it? Healthcare/Pharmaceutical). Please select “Yes” to the question, “Are you a manager?”
8. Under the “Company name”, type in the residency name.
9. Create a team URL
10. Send out the invitations to the faculty and incoming interns. Completing this step starts the Slack Application.
11. On the left side of the Slack Application, under the “Channels” bar, click on the “+” button. Under the name, type in “cases.” Send the invitations to your interns and to any other instructors who will be involved in running the curriculum
12. It is also advised to install the applications on the desktop and mobile phone. To access the desktop application, select the “Download Slack” option on a link at the top right portion of the screen. To access the mobile phone application, go to the respective application store (i.e. Apple App Store, Google Play, etc.) and download the application. The application will prompt you for the username and password.
13. Slack is now successfully created and is ready for use.

Existing Workspace Set-Up for SIC 2020

For programs with an existing Slack workspace, or who have completed task A above

1. If you participated in SIC 2019, first archive your previous Cases channel. Go to the channel, click “Details” in the upper right corner, click “More” and “Additional Options” and “Archive this channel” then select “Yes archive the channel.”
2. Create a new “Cases” channel using the “+” button next to “Channels” on the left side of your workspace. We recommend making it a private channel so you can select which individuals to invite.
3. We also recommend you make an “Advice For Interns” channel, which not only helps them get to know the rest of the team and get important information, but also helps recruit participants to your Slack workspace.
4. Once you have your channels created, find your Slack Workspace Invitation link to send to your pre-interns. From your workspace, click the workspace name in the upper left corner, then click “Invite People to [insert workspace name].” Under “Default Channels” click “Edit/Add” and type in the “Cases” and “Advice for Interns” channels. Then click “Share Invite Link,” copy the link, and paste it into your intro email to your pre-interns.

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5. Check to make sure each of your pre-interns makes it onto the right channels, and feel free to invite a couple of extra people (St. John’s invites our program leadership including chiefs, but it can be anyone as long as they understand they’re there as a sounding board, not to give away the answers).

Implementation Instructions for SIC Instructors

1. Save the SIC 2020 Cases file for easy access.
2. Post the brief instructions to pre-interns roughly 2 days before posting the first case.
3. Post the first case! To start a case, post the case history as indicated, and pin this post to the top of the channel. Then post each of the bolded questions one-by-one, allowing time for pre-interns to answer and discuss before posting the answer and the following question. (This can be anywhere between a few hours and ~12 hours.) You can actively encourage pre-intern collaboration/discussion, ask probing/supporting questions to encourage participation, and feel free to answer clarification questions from pre-interns.
4. The one-by-one question posts/answers is what we’re recommending this year based on prior feedback, but it’s flexible as long as all the material is covered. Feel free to personalize your posts and do what works best for you!
5. Also feel free to invite program leaders, faculty, and chief residents to your “Cases” channel to serve as a sounding board and add to the conversation. This tends to be very helpful! When you invite them, just make sure they know not to answer the actual case questions.
6. Wrap up each case with the respective wrap-up post and any additional relevant resources you like.
7. Move on to a new case every ~4 days until the full curriculum of 8 has been completed.
8. After the end of your curricular implementation, post the overall curriculum conclusion and resources provided.

C.

Sample introductory email to pre-interns.

Dear Intern Team,

Welcome again to Emergency Medicine! We know this has been a strange year so far, particularly since Match Day, and remote medical education has played an interesting role. Our program is enrolled in a project called the Slack Intern Curriculum. We will be starting an online, social media-based ED case curriculum for you next week. This is a set of 8 clinical cases to help you transition into EM residency and supplement your medical education before you arrive here in June. It’s a great way to meet your new co-residents and the rest of the team! What do you need to do? Just three things:

1. Complete the quick Pre-Curriculum Survey [[survey link](#)]
2. Join us on Slack by following this link: [[invitation link](#)]
3. Join in the discussion and collaboration on the Cases channel!

On our program’s Slack workspace, there is also a channel for Advice for Interns where your faculty and co-residents can help answer questions you have about moving, starting residency, COVID-19, life, and anything else. See you on Slack.com! Stay safe and healthy.

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D.

Kern’s 6-Step Framework applied for structured Slack Intern Curriculum construction.

Kern’s 6-Step Framework	Slack Intern Curriculum
1) Problem identification and general needs assessment	<ul style="list-style-type: none"> • The UME-to-GME transition is well known to be a challenge for newly-matched pre-interns. • The spring 2020 COVID-19 pandemic surge widened the historical educational gap for pre-interns as it displaced them from traditional in-person clinical experiences and didactics. • Though COVID-19 is a rare and unprecedented emergency, there have been and will be others affecting in-person medical education, and educators must be prepared. • The ACGME supports asynchronous learning in residency programs. Creating and evaluating new methods and innovative ways to support asynchronous learning is needed.
2) Targeted needs assessment	<ul style="list-style-type: none"> • Few virtual and collaborative educational options exist to bridge the UME-to-GME transition educational gap. Such collaborative virtual curricula have not previously been based on ACGME sub-competencies and milestones. • A virtual platform is needed to offer a private, invitation-only, collaborative learning environment. Slack.com can be used as one such virtual classroom with these features, also circumventing the issues of geographic and time zone differences between users. • This virtual classroom also must allow utilization of such conceptual frameworks as Knowles’ self-directed learning and Deci and Ryan’s self-determination theory to facilitate knowledge transition and acquisition for adult pre-intern learners. The Slack.com platform may also offer the opportunity for pre-interns who are normally shy with in-person groups to learn in a different setting. • A team of content experts (EM academic faculty, EM residents) was needed to move forward with curricular construction. • EM sub-competencies and milestones eligible for teaching and assessment in a virtual setting were thoroughly reviewed, resulting in selection of our curriculum’s ACGME domains (see Appendix E).
3) Goals and objectives	<ul style="list-style-type: none"> • Pre-interns will participate in clinical case discussions, either actively or passively (e.g., retroactively reviewing the case discussions if a discussion is missed). • Pre-interns will receive an introduction to commonly used EM educational resources (e.g., FOAMed, smartphone applications, and articles) in the context of virtual ED cases. • Pre-interns will report improvement in PPR both overall and regarding the 21 selected ACGME domains.
4) Educational strategies	<ul style="list-style-type: none"> • 8 Clinical case scenarios and supporting case materials developed by a team of content experts; careful attention given to ensure instructions and materials could be easily used across multiple participating institutions and used within the chosen virtual platform. • Program-level instructor(s) were responsible for implementing the case-based curriculum for their pre-interns via their program’s Slack workspace. • Length of time required to cover each case (one or multiple days), timing of the “play-of-the case”, and whether the education occurred synchronously or asynchronously was determined at the program level.

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5) Implementation	<ul style="list-style-type: none"> • Pre-curriculum survey for pre-interns to assess PPR and reports of educational experiences so far in the pandemic surge. • Instructors and their respective pre-intern cohorts will have up to 3 months to complete the 8-case curriculum on their institution’s Slack.com workspace. • Post-curriculum survey for pre-interns to reassess PPR, as well as reports of educational experiences during the implementation timeframe.
6) Evaluating effectiveness of the curriculum	<ul style="list-style-type: none"> • Comparison of pre- and post-curriculum PPR both overall and for each of our 21 selected ACGME domains. • Solicitation of pre-intern and instructor feedback on the curriculum content, implementation procedures, chosen social media platform, and any real or perceived barriers to participation. • Solicitation of pre-intern report of overall effectiveness of the intervention and comparison with effectiveness of other commonly used virtual educational interventions.

Acronyms Defined: ACGME, Accreditation Council for Graduate Medical Education; COVID-19, 2019 Novel Coronavirus Disease; ED, Emergency Department; EM, Emergency Medicine; FOAMed, Free Open Access Medical Education; GME, Graduate Medical Education; PPR, Perceived Preparedness for Residency; UME, Undergraduate Medical Education.

E.

Virtually-teachable sub-competencies, level 1 and 2 Milestones, and topics selected from the Accreditation Council for Graduate Medical Education (ACGME) Emergency Medicine Milestones in Patient Care (PC) for incorporation into the Slack Intern Curriculum and assessment.

Sub-Competency	Milestone Levels and Topics Incorporated
Emergency Stabilization (PC1)	<ul style="list-style-type: none"> • Level 1: Recognizes abnormal vital signs • Level 2: Recognizes when a patient is unstable requiring immediate intervention; Performs a primary assessment on a critically ill or injured patient; Discerns relevant data to formulate a diagnostic impression and plan
Diagnostic Studies (PC3)	<ul style="list-style-type: none"> • Level 1: Determines the necessity of diagnostic studies • Level 2: Orders appropriate diagnostic studies; Performs appropriate bedside diagnostic studies and procedures
Diagnosis (PC4)	<ul style="list-style-type: none"> • Level 1: Constructs a list of potential diagnoses based on chief complaint an initial assessment • Level 2: Constructs a list of potential diagnoses, based on the greatest likelihood of occurrence; Constructs a list of potential diagnoses with the greatest potential for morbidity or mortality
Pharmacotherapy (PC5)	<ul style="list-style-type: none"> • Level 1: Knows the different classifications of pharmacologic agents and their mechanism of action; Consistently asks patients for drug allergies • Level 2: Applies medical knowledge for selection of appropriate agent for therapeutic intervention; Considers potential adverse effects of pharmacotherapy
Disposition (PC7)	<ul style="list-style-type: none"> • Level 1: Describes basic resources available for care of the emergency department patient

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	<ul style="list-style-type: none"> • Level 2: Formulates a specific follow-up plan for common ED complaints with appropriate resource utilization
General Approach to Procedures (PC9)	<ul style="list-style-type: none"> • Level 1: Identifies pertinent anatomy and physiology for a specific procedure; Uses appropriate universal precautions • Level 2: Performs patient assessment, obtains informed consent and ensures monitoring equipment is in place in accordance with patient safety standards; Knows indications, contraindications, anatomic landmarks, equipment, anesthetic and procedural technique, and potential complications for common ED procedures; Performs the indicated common procedure on a patient with moderate urgency who has identifiable landmarks and a low-moderate risk for complications; Performs post-procedural assessment and identifies any potential complications
Airway Management (PC10)	<ul style="list-style-type: none"> • Level 1: Describes upper airway anatomy; Performs basic airway maneuvers or adjuncts (jaw thrust/chin lift/oral airway/nasopharyngeal airway) and ventilates/oxygenates patient using bag valve mask (BVM) • Level 2: Describes elements of airway assessment and indications impacting the airway management; Describes the pharmacology of agents used for rapid sequence intubation including specific indications and contraindications; Performs rapid sequence intubation in patients without adjuncts; Confirms proper endotracheal tube placement using multiple modalities
Other Diagnostic and Therapeutic Procedures: Goal-directed Focused Ultrasound (Diagnostic/Procedural) (PC12)	<ul style="list-style-type: none"> • Level 1: Describes the indications for emergency ultrasound • Level 2: Explains how to optimize ultrasound images and identifies the proper probe for each of the focused ultrasound applications; Performs an extended focused assessment with sonography for trauma (eFAST)

Acronym Defined: PC, Patient Care

F.

Curriculum sample material including introduction post, sample case with associated de-identified message board dialogue (italic font below) and official answers, and overall curricular conclusion post.

Curriculum Introduction Post

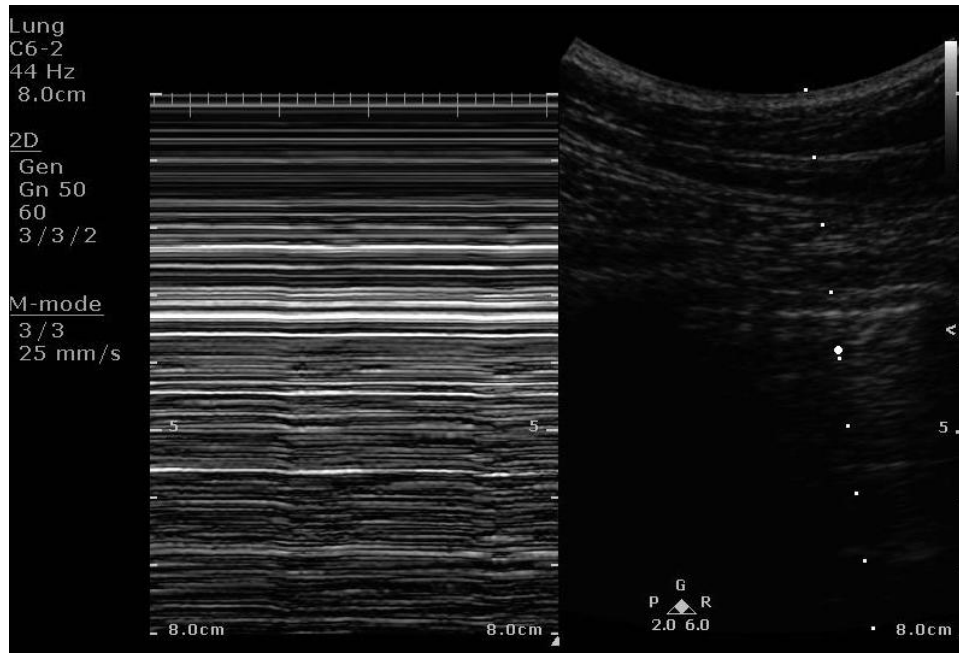
On Monday, we'll be starting the Slack ED Case Series! Please complete the quick Pre-Curriculum Survey [insert link]. For each of the 8 cases, we will post the initial case history and then give you some questions to discuss on this message board. When you've answered a question, we'll give you our thoughts and the official answer in the curriculum, and we'll reference some valuable resources to use in your training. There is no penalty for wrong answers!

Case 4 Presentation

A 39-year-old male with no known medical history was brought in by emergency medical services (BIBEMS) as a trauma activation after being stabbed in the chest. On arrival, you notice a bandaged wound on his left lateral chest, and multiple bruises to his head. The patient's eyes

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are closed, and they do not open to pain, he is moaning, and he withdraws his legs from pain but does not localize. Breath sounds are louder on the right than the left. Blood pressure (BP) is 122/80, heart rate (HR) is 90, and he has pulses in all extremities. Exam shows only a 2 cm laceration to the left lateral chest at the 6th intercostal space along with bruises to the face and head. The extended focused assessment with sonography for trauma (eFAST) exam shows no free fluid in the abdomen or pericardium, and the left lung ultrasound image is shown below.





Question 1: What is your evaluation of the patient's airway? Are any interventions required?
Question 2: What is your evaluation of the patient's breathing? Are any interventions required?
Question 3: What is your evaluation of the patient's circulation? Are any interventions required?

- *Intern A: It looks like the trachea is deviating away from the left side. The left side also has decreased breath sounds and a reduced lung markings, suggesting a collapsed lung. Looks like a tension pneumothorax that would need a needle decompression*
- *Intern B: "Barcode" sign on the u/s also suggests a pneumothorax.*
- *Intern C: In terms of airway, I believe the GCS is 7 so I'd be concerned they cannot protect the airway and thinking about intubating*
- *Ultrasound Faculty: What exactly is barcode sign?*
- *APD A: Great, great, great! You guys hit on everything! @Intern B, can you tell us more about the barcode sign while we move on?*
- *Intern B: Sure thing. In normal respiration, there is a back and forth movement between the pleural and visceral pleura. We can detect this difference in motion on U/s using the M mode. In normal lung sliding, M mode would show the "seashore" sign. In the absence of lung sliding (pneumothorax), M mode cannot detect a difference in motion, hence the "barcode" sign.*
- *APD B: I wanna go back to the ABCs for a second. I know we're all taught to follow that algorithm sequentially always but there are many situations where you should deal with the issues in a different order.*

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- *For example, it may be that the reason this man is obtunded is that he's extremely hypoxic (we didn't get an o2sat). It may be possible that when you fix the pneumothorax his GCS will improve and you can avoid intubation.*
- *I would argue that the first step in this case is immediate decompression. Then assess the A, etc.*
- *APD A: I agree @APD B, I think the ABC is a good way to remember what to do, talk about it and in general is a good order in which to go. But we can't always be sticklers to this right? For example, in any cardiac arrest, if we always did A and B before C, then no one would get a pulse check or compressions until after intubation. That would be bananas*

Question 4: Describe how you would put in the chest tube in this patient.

- *Intern D: Chest tube site is usually fourth or fifth intercostal space along the mid to anterior axillary line, and I believe for pneumothorax you would want to aim the tube toward the apex*
- *APD A: @Intern D. Thanks for jumping in to the chest tube. You would be the resident with scalpel in hand, first to go in the resus room too right?*
- *APD B: I think sometimes the seashore and barcode signs are hard to tell because we're looking for perfect lines or perfect graininess. One way I've heard the signs for lung sliding differentiated is the following: If the lung and the subq look the same = pneumothorax. If they look different = normal lung*

Question 5: Describe how you would rapid-sequence intubation (RSI) this patient.

- *Intern E: If the patient's GCS score does not improve, and intubation is necessary to protect the airway, I would look at the patient's vitals to guide my choice of drugs. Since the patient's BP and Pulse appear to be within normal limits, I would re-cycle the BP prior to drawing up any meds. In this patient I think rocuronium and etomidate could be appropriate. (although I don't see a contraindication for ketamine if its preferred for its analgesia and amnesiac effect in this case).*
- *APD B: That sounds good! @Intern E intubated the patient. What's next @APD A?*

Question 6: What are the next steps for this patient?

- *Intern F: To complete RSI, we should auscultate the chest for lung sounds while bagging the patient, place an NG/OG tube, confirm placement of the ETT and NG/OG with a CXR and ETCO2, and provide proper post-intubation management by connecting the ETT to a ventilator and administering sedatives and/or analgesia. Lorazepam and morphine would be appropriate. Establish ventilator parameters by checking SpO2 and titrating FiO2 as needed with a RR and TV appropriate for the patient's weight. We can consult specialists like CT to establish this patient's disposition too.*

Official SIC Answers:

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1. Glasgow coma scale (GCS) is 7, the patient is not protecting his airway, and he requires intubation.
2. Decreased breath sounds on left, eFAST shows no lung sliding, and portable CXR shows large pneumothorax (PTX). Chest tube is required. Ideally, the chest tube should be placed before or concurrently with the endotracheal tube (ETT). Placing a patient on any positive pressure ventilation (PPV), includes both the ventilator and bilevel positive airway pressure (BiPAP) machine can worsen the existing PTX and cause a tension PTX where the mediastinum shifts to the contralateral side.
3. Circulation is stable at this time. No interventions are required.
4. We recommend the EM:RAP [Chest Tube Placement](#) video.
5. First of all, in an ideal situation, RSI would be done immediately after chest tube placement to avoid worsening of the PTX and development of tension PTX. We like the [NEJM - Orotracheal Intubation](#) video. Here are some common RSI medications you could choose - just always consider medication contraindications and allergies.

Medication	Class	Dosage
Etomidate	Sedative	0.3 mg/kg
Succinylcholine	Depolarizing paralytic	1.5 mg/kg
Rocuronium	Nondepolarizing paralytic	1 mg/kg

6. Next steps include confirmation of ETT and chest tube placement with portable CXR. You also need to complete and repeat the trauma “ABCDE” algorithm (see below) and do your secondary survey. Further imaging will be needed including head, cervical spine, chest and abdominal computed tomography (CT) scans. You may choose to scan the whole spine given the patient’s severity of injuries. The patient will require admission to the trauma service in intensive care unit (ICU) level of care.

ABCDE Algorithm for Trauma Patients		
A	Airway	"Tell me your name"
B	Breathing	Auscultate for equal bilateral breath sounds
C	Circulation	Control hemorrhage, check BP, 18g PIV x2
D	Disability	Check AVPU, GCS, consider FSBG
E	Exposure	Completely undress patient, do "log roll"

Case 4 Wrap-up

During actual trauma code, many of these things will be happening at the same time. The main point of this case is to identify the simultaneous airway and breathing issues and know that both need to be corrected with RSI and chest tube placement, respectively. Many of these trauma patients will come into your ED unstable for CT or “gold standard” diagnostics, and in that case, we first stick to the ABCDEs, perform initial critical stabilization actions, and rely as much as possible on bedside assessments like eFAST and portable CXR (pCXR) until they are stable.

Curriculum Conclusion

We hope you found the curriculum fun and valuable! There are tons of take-away lessons, but if you ever find yourself stuck, you can always go back to the ABCDEs of emergency medicine (airway, breathing, circulation, disability, exposure). Always get a full set of vital signs.

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Remember if a patient is unstable, ensure IV/O2/Monitor and fingerstick blood glucose (FSBG) are done, and prioritize the initial critical stabilization actions. We put together a list of common EM resources in case you'd like to review what we introduced in these cases (see below). Have a great intern year, doctors! And congratulations on matching into the best medical specialty - we are so glad to have you!

Resource	Price	Description	Link
Online			
ALiEM	Free	Online modules with quizzes	ALiEM Link
EM:RAP	\$	Podcasts/videos (some free)	EM:RAP Link
Epocrates Online	Free	Medication information	Epocrates Link
Foundations of EM	Free	EKG tutorials, chief complaints, differentials, and workups	Foundations of EM Link
LITFL	Free	EKG tutorials and examples	LITFL Link
MDCalc Online	Free	Medical calculator	MDCalc Link
NEJM Videos	Free	Procedure videos	NEJM Videos Link
Radiopaedia	Free	Imaging reviews and examples	Radiopaedia Link
StatPearls	Free	Concise articles about CC, DDX, and w/u	StatPearls Link
Smartphone Apps			
EMRA Antibiotic Guide	\$	Yearly subscription	EMRA Antibiotic Guide App Link
Epocrates	Free	Medication information	Epocrates App Link
GoodRx	Free	Medication pricing and discounts	GoodRx App Link
MDCalc	Free	Medical calculator	MDCalc App Link
PediSTAT	\$	App equivalent to Braslow tape	PediSTAT App Link
SonoSupport	\$	POCUS studies described	SonoSupport App Link

G.

Copies of of pre-intern pre-curriculum survey; pre-intern post-curriculum survey; and instructor survey.

Pre-intern pre-curriculum survey

Welcome to Emergency Medicine! Your residency has enrolled in the Slack Intern Curriculum project. Before we start, there are a few questions about your previous medical education experiences and preparedness for residency in Emergency Medicine. This < 5 minute survey is anonymous and voluntary. Your answers will be used only if you consent. We will use the answers to assess, develop, and improve the curriculum.

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1. Do you consent to having your answers used in the Slack Intern Curriculum research project? (Yes/No single choice, required)
2. What Emergency Medicine residency program did you match to in March 2020? (Single textbox)
3. During the 2019-2020 academic year, what was your primary role for the majority of the year? (Select one)
 - a. Senior medical student
 - b. Preliminary year
 - c. Transitional year
 - d. Research
 - e. Work or volunteering (clinical)
 - f. Work or volunteering (non-clinical)
 - g. Other (specify)
4. Did you graduate medical school early as a result of the COVID-19 pandemic?
 - a. No
 - b. Yes - now I am working clinically in a resident role, on the COVID-19 front lines.
 - c. Yes - now I am working clinically in a resident role, but not on the COVID-19 front lines.
 - d. Yes - now I am working as a resident, but not clinically.
 - e. Other (specify)
5. Roughly, when was the last time you had each of the following experiences? (Answers in whole numbers of weeks ago; single textbox per question)
 - a. Physically examined a patient in the Emergency Department (# weeks ago)
 - b. Physically examined a patient in *any* in-person setting (# weeks ago)
 - c. Had an in-person medical educational conference/didactic (# weeks ago)
 - d. Had a virtual live medical educational conference/didactic (# weeks ago)
6. What types of educational and clinical modalities have you used since Match Day 2020? (Check all that apply)
 - a. In-person lectures
 - b. Live virtual lectures (e.g., Zoom conference)
 - c. Recorded lectures
 - d. Online modules
 - e. Telemedicine clinical patient care
 - f. In-person clinical patient care
 - g. Textbook reading
 - h. Journal article reading
 - i. Problem-based learning (PBL)
 - j. Team-based learning (TBL)
 - k. Podcasts
 - l. YouTube or other online videos
 - m. Social Media Medical Education (e.g., Slack.com, Facebook, Twitter, Instagram, Figure 1, etc.)
 - n. FOAMed (Free Open Access Medical education)
 - o. Other (specify)

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7. How would you rate the effectiveness of mandatory learning activities at your current program after Match Day 2020? Scale of 1 (“Very ineffective”) to 5 (“Very effective”)
8. How concerned are you that the COVID-19 pandemic has negatively affected your medical education *since the 2020 Match*? Scale of 1 (“Very unconcerned”) to 5 (“Very concerned”)
9. How prepared do you feel for residency in Emergency Medicine, particularly on each of the following topics? Scale of 1 (“Very unprepared”) to 5 (“Very prepared”)
 - a. Recognizing abnormal vital signs
 - b. Recognizing unstable patients requiring immediate intervention
 - c. Discerning relevant data to formulate a diagnostic impression and plan
 - d. Determining the necessity of diagnostic studies
 - e. Ordering appropriate diagnostic studies
 - f. Interpreting results of diagnostic studies
 - g. Constructing a differential diagnosis
 - h. Understanding classes of medications and mechanisms of action
 - i. Selecting appropriate medications
 - j. Recruiting appropriate resources (e.g., consultants, primary care, social work)
 - k. Making decisions regarding admission or discharge
 - l. Assigning admitted patients to an appropriate level of care (ICU/Telemetry/Floor/Observation Unit)
 - m. Describing pertinent anatomy and physiology for specific procedures
 - n. Describing indications, contraindications, and complications of ED procedures
 - o. Describing upper airway anatomy
 - p. Describing procedure equipment, anesthetic, and technique
 - q. Describing the pharmacology of medications used for rapid sequence intubation, including indications and contraindications
 - r. Confirming endotracheal tube placement using multiple modalities
 - s. Describing indications for emergency ultrasound
 - t. Explaining how to optimize ultrasound images
 - u. Interpreting emergency ultrasound images
 - v. OVERALL self-perceived preparedness for EM residency
10. Please use the following to create your unique identifier code for this survey:
 - a. First 2 letters of your mother’s maiden name
 - b. First 2 letters of your birth city
 - c. First 1 letter of your birth state
 - d. First 1 letter of your birth month
 - e. Number of siblings you have

Pre-intern post-curriculum survey

Thank you for participating in the Slack Intern Curriculum! We previously asked about your medical education experiences and preparedness for EM residency. We have a quick re-assessment and some follow-up questions which would be very helpful. This 7 minute survey is anonymous and voluntary. Your answers will be used only if you consent. We will use the answers to assess, develop, and improve the curriculum. We appreciate your time!

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1. Do you consent to having your answers used in the Slack Intern Curriculum research project? (Yes/No single choice, required)
2. What Emergency Medicine residency program did you match to in March 2020? (Select single choice)
3. Did you graduate medical school early as a result of the COVID-19 pandemic?
 - a. No - I either graduated on time or am still in medical school
 - b. No - I graduated on time in a prior academic year
 - c. Yes - now I am working clinically in a resident role, on the COVID-19 front lines.
 - d. Yes - now I am working clinically in a resident role, but not on the COVID-19 front lines.
 - e. Yes - now I am working as a resident, but not clinically.
 - f. Yes - but I am not yet working as a resident
 - g. Other (specify)
4. Roughly, how many weeks worth of your clinical rotations were canceled as a result of the COVID-19 pandemic? Enter a whole number from 0-30. (Single textbox)
5. Which of your spring rotations were canceled or otherwise limited by the COVID-19 pandemic? (Check all that apply)
 - a. Anesthesia
 - b. Cardiology
 - c. Dermatology
 - d. Emergency Medicine
 - e. Family Medicine
 - f. Gastroenterology
 - g. Hematology/Oncology
 - h. ICU
 - i. Internal Medicine
 - j. Nephrology
 - k. Neurology
 - l. Obstetrics and Gynecology
 - m. Orthopedics
 - n. Pathology
 - o. Pediatrics
 - p. Psychiatry
 - q. Radiology
 - r. Surgery
 - s. Urology
 - t. N/A
 - u. Other (specify)
6. How concerned are you that the COVID-19 pandemic has negatively affected your medical education *since the 2020 Match*? Scale of 1 (“Very unconcerned”) to 5 (“Very concerned”)

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7. During the COVID-19 pandemic, how effective have each of the following modalities been to your medical education/training? (Scale of 1-5; if you did not use a particular modality, please select "N/A")
 - a. In-person lectures
 - b. Live virtual lectures (e.g., Zoom conference)
 - c. Recorded lectures
 - d. Online modules
 - e. Telemedicine clinical patient care
 - f. In-person clinical patient care
 - g. Textbook reading
 - h. Journal article reading
 - i. Problem-based learning (PBL)
 - j. Team-based learning (TBL)
 - k. Podcasts
 - l. YouTube or other online videos
 - m. Social Media Medical Education (e.g., Slack.com, Facebook, Twitter, Instagram, Figure 1, etc.)
 - n. FOAMed (Free Open Access Medical education)
 - o. Question bank (e.g., Rosh Review, UWorld, etc)
 - p. Other study online package (e.g., HippoEM, etc)
 - q. Other (specify)
8. How would you rate the effectiveness of the Slack Intern Curriculum of ED cases? Scale of 1 (“Very ineffective”) to 5 (“Very effective”)
9. How much did you participate in the Slack Intern Curriculum? Scale of 1 (“Not at all”) to 5 (“Maximum”)
10. For you yourself, which of the following were barriers to participating in the Slack Intern Curriculum?
 - a. Vacation time
 - b. Family commitments
 - c. Clinical rotations
 - d. Non-clinical required educational assignments
 - e. Work
 - f. Volunteering
 - g. Research
 - h. Technical issues with Slack
 - i. Internet access issues
 - j. There were no barriers to participation for me
 - k. Other (specify)
11. How prepared do you feel for residency in Emergency Medicine, particularly on each of the following topics? Scale of 1 (“Very unprepared”) to 5 (“Very prepared”)
 - a. Recognizing abnormal vital signs
 - b. Recognizing unstable patients requiring immediate intervention
 - c. Discerning relevant data to formulate a diagnostic impression and plan
 - d. Determining the necessity of diagnostic studies

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- e. Ordering appropriate diagnostic studies
 - f. Interpreting results of diagnostic studies
 - g. Constructing a differential diagnosis
 - h. Understanding classes of medications and mechanisms of action
 - i. Selecting appropriate medications
 - j. Recruiting appropriate resources (e.g., consultants, primary care, social work)
 - k. Making decisions regarding admission or discharge
 - l. Assigning admitted patients to an appropriate level of care (ICU/Telemetry/Floor/Observation Unit)
 - m. Describing pertinent anatomy and physiology for specific procedures
 - n. Describing indications, contraindications, and complications of ED procedures
 - o. Describing upper airway anatomy
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 - q. Describing the pharmacology of medications used for rapid sequence intubation, including indications and contraindications
 - r. Confirming endotracheal tube placement using multiple modalities
 - s. Describing indications for emergency ultrasound
 - t. Explaining how to optimize ultrasound images
 - u. Interpreting emergency ultrasound images
 - v. OVERALL self-perceived preparedness for EM residency
12. Please use the following to create your unique identifier code for this survey:
- a. First 2 letters of your mother's maiden name
 - b. First 2 letters of your birth city
 - c. First 1 letter of your birth state
 - d. First 1 letter of your birth month
 - e. Number of siblings you have

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Instructor survey

Thank you for collaborating with us on the Slack Intern Curriculum! We hope you and your pre-interns found the cases valuable and interesting. Please help us by taking this ~5 minute survey which elicits your feedback and your own thoughts on medical education in the COVID-19 pandemic. We will use the answers to assess, develop, and improve the curriculum. We appreciate your time!

1. Do you consent to having your answers used in the Slack Intern Curriculum research project? (Yes/No single choice, required)
2. With which Emergency Medicine program are you affiliated? (Select single choice)
3. What is your role within your residency program? (Select the one that best represents your role)
 - a. Junior resident
 - b. Senior resident
 - c. Chief resident
 - d. Fellow
 - e. Clerkship director
 - f. Assistant/associate program director
 - g. Program director
 - h. Faculty member (*not* including CD/APD/PD)
 - i. Other (specify)
4. Other than your pre-interns, what were the roles of your Slack *Cases* channel members? (Include yourself; select all roles represented on your *Cases* channel)
 - a. Junior resident
 - b. Senior resident
 - c. Chief resident
 - d. Fellow
 - e. Clerkship director
 - f. Assistant/associate program director
 - g. Program director
 - h. Faculty member (*not* including CD/APD/PD)
 - i. Other (specify)
4. What were your curriculum start/end dates?
 - a. Start (first post of Case 1)
 - b. End (curriculum conclusion post after Case 8 completed)
5. How connected do you feel with your pre-interns at this moment, compared with prior years when you *did not* use the Slack Intern Curriculum? Scale of 1 (“Less connected than prior years”) to 5 (“More connected than prior years”)
6. What were the best features of the Slack Intern Curriculum? (Check all that apply)
 - a. Case graphics/images (e.g., x-rays, EKGs)
 - b. Flexible start and end dates for implementation
 - c. Resource links (e.g., MDCalc, StatPearls, texts, peer-reviewed articles, NEJM videos, etc.)
 - d. Ease of posting (copy/paste function for text and embedded images)

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- e. Team building
 - f. Ability to reach pre-interns living all across the country
 - g. Ability to post at any time of day and/or night
 - h. Other (specify)
7. What improvements could be made to the Slack Intern Curriculum and the implementation protocol? (Check all that apply)
- a. More still graphics (e.g., x-rays, EKGs)
 - b. Video clips (e.g., ultrasound, CT imaging, physical exam findings)
 - c. Deeper dive into higher-level clinical concepts
 - d. More cases
 - e. Fewer cases
 - f. More questions per case
 - g. Fewer questions per case
 - h. More resource links (e.g., MDCalc, StatPearls, texts, peer-reviewed articles, NEJM videos, etc.)
 - i. Prizes for best participation
 - j. Implement sooner after Match Day
 - k. Implement later after Match Day
 - l. Longer duration of curriculum (e.g., post one case a week for 8 weeks)
 - m. Shorter duration of curriculum (e.g., post 2-3 cases a week for 3 weeks)
 - n. Other (specify)
8. How concerned are you that the COVID-19 pandemic has negatively affected medical education and training for **medical students**? Scale of 1 (“Very unconcerned”) to 5 (“Very concerned”)
9. How concerned are you that the COVID-19 pandemic has negatively affected medical education and training for **residents**? Scale of 1 (“Very unconcerned”) to 5 (“Very concerned”)
10. During the COVID-19 pandemic, how effective do you believe each of the following modalities have been for your program's medical education/training? Scale of 1 (“Very ineffective”) to 5 (“Very effective”); if you did not use a particular modality, please select "N/A")
- a. In-person lectures
 - b. Live virtual lectures (e.g., Zoom conference)
 - c. Recorded lectures
 - d. Online modules
 - e. Telemedicine clinical patient care
 - f. In-person clinical patient care
 - g. Textbook reading
 - h. Journal article reading
 - i. Problem-based learning (PBL)
 - j. Team-based learning (TBL)
 - k. Podcasts
 - l. YouTube or other online videos

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- m. Social Media Medical Education (e.g., Slack.com, Facebook, Twitter, Instagram, Figure 1, etc.)
 - n. FOAMed (Free Open Access Medical education)
 - o. Question bank (e.g., Rosh Review, UWorld, etc)
 - p. Other study online package (e.g., HippoEM, etc)
 - q. Other (specify)
11. Based on your perceptions, how would you rate the effectiveness of the Slack Intern Curriculum of ED cases? Scale of 1 (“Very ineffective”) to 5 (“Very effective”)
12. Overall, how much did your pre-interns participate in the Slack Intern Curriculum? Scale of 1 (“Not at all”) to 5 (“Maximum”)

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