

# University of Rochester Medical Center

## Emergency Medicine Residency

### Curriculum for Procedural Competency

---

#### Goals:

- Improve the quality of patient care through the development and mastery of clinical procedural skills that are essential to the practice of Emergency Medicine.
- Enhance resident education through hands-on training in monitored simulation, cadaver lab, skills lab, and patient care settings.
- Demonstrate proficiency in core procedures as required by the RRC.

#### Methods:

- Didactic instruction
  - Assigned book chapters in *Roberts and Hedges: Clinical Procedures in Emergency Medicine, 4<sup>th</sup> edition (2004) or 5<sup>th</sup> edition (2009), Elsevier Inc.*
  - Current published articles in Emergency Medicine journals
  - Instructional online videos/lectures (see Appendix A for detailed list by procedure/topic)
    - <http://www.nejm.org/multimedia/medical-videos> (readily viewable on URMC campus computers; need VPN or subscription to view off-site)
    - <http://www.emrap.tv>
    - <http://cmedownload.com/lectures/free>
    - <http://www.hqmeded.com>
    - <http://www.youtube.com>
- Practical curriculum
  - Cadaver labs
  - Simulator sessions
  - Advanced Life Support courses (ACLS, ATLS, PALS, NALS)
  - URMC Emergency Ultrasound Conference
  - URMC Central Line Training course
  - Skills lab sessions
  - Resident conference breakout sessions

## Resident Mandatory Requirements:

- Cadaver labs – each resident MUST attend at least 2 sessions per year, 3 hours per session, under direct faculty supervision
- Simulator sessions – each resident MUST attend all sessions (unless on away elective, vacation, or personal/family emergency) under direct faculty supervision
- Advanced Life Support courses – MUST have completed and passed ACLS, ATLS, PALS, and NALS
- URMIC Emergency Ultrasound Conference (held annually for incoming interns)
  - Ultrasound training and credentialing requirements are listed elsewhere
- URMIC Central Line Training course (held annually for incoming interns)

## Evaluation:

- Residents are responsible for maintaining an updated log of all procedures performed in training sessions and while providing patient care. This will be evaluated bi-annually and during promotion meetings.
  - It is each resident's responsibility to ensure he/she has attained the adequate number of procedures required for promotion during residency and for graduation.
- Procedural competency will be evaluated under faculty supervision during teaching/lab sessions, performance in direct patient care settings, and annual comprehensive assessment exams.
- Resident attendance in all mandatory hands-on teaching sessions listed above will be monitored. Exceptions will only be allowed for predetermined away electives, vacation days, or personal/family emergencies.
- Failure to comply will result in potential failure to be promoted to the next level of training.
- Remediation will be provided to residents through elective time if unable to perform to acceptable measures.

## Objectives:

All topics listed below are covered in *Roberts and Hedges: Clinical Procedures in Emergency Medicine, 4<sup>th</sup> edition (2004)* and *5<sup>th</sup> edition (2009)*, Elsevier Inc.

- Airway/Respiratory
  - Demonstrate knowledge of the anatomy of the upper airway and predictors for a difficult airway
  - Demonstrate correct maneuvers to open the airway, taking into consideration for cervical spine stabilization, and proper techniques for bag-mask ventilation

- Demonstrate correct use of airway adjuncts (for example, oropharyngeal airway, nasopharyngeal airway, laryngeal mask airway)
- Describe indications and potential complications for endotracheal intubation, and demonstrate proficiency with endotracheal intubation
  - Laryngoscope (Mac and Miller blades), Bougie, Glidescope/video-assisted, fiberoptic
- Describe the dosages, indications, and contraindications of commonly used pharmaceutical agents for rapid sequence induction (RSI)
- Demonstrate familiarity with cricothyrotomy and transtracheal jet ventilation
- Demonstrate ability to manage patient on ventilator
- Demonstrate ability to manage tracheostomy malfunction and tracheostomy tube change
- Demonstrate proficiency with chest tube thoracostomy
- Demonstrate ability to manage chest drainage system
- Demonstrate familiarity with thoracentesis
- Cardiac
  - Demonstrate ability to manage tachy- and brady- dysrhythmias
  - Describe indications and demonstrates proper technique for defibrillation and cardioversion
  - Demonstrate the proper operation of defibrillator device
  - Describe indications for emergency cardiac pacing
  - Demonstrate familiarity with both transcutaneous and transvenous cardiac pacing
  - Describe pathophysiology of pericardial effusion and tamponade
  - Describe indications for and demonstrate ability to perform bedside emergency pericardiocentesis
  - Describe indications for and demonstrate familiarity in performing ED thoracotomy
- Vascular
  - Demonstrate proficiency in obtaining peripheral IV access, including external jugular vein and ultrasound-guided cannulation of deep peripheral veins
  - Demonstrate proficiency in placement of central venous catheters in internal jugular, subclavian, and femoral veins
  - Demonstrate familiarity with umbilical vein catheterization
  - Demonstrate familiarity with saphenous vein cutdown
  - Demonstrate ability to perform arterial puncture and cannulation for blood gas analysis and arterial pressure monitoring
  - Demonstrate familiarity with use of Level 1 infuser
  - Describe indications and contraindications to intraosseous infusion, and demonstrate ability to establish IO access
- Analgesia / Regional anesthesia / Sedation
  - Demonstrate proficiency with providing local anesthesia

- Demonstrate ability to perform regional nerve anesthesia (for example, digital nerve block, supraorbital/infraorbital/mental nerve blocks, wrist and ankle blocks)
- Demonstrate proficiency with procedural sedation and describe dosages, indications, and contraindications of commonly used medications
- Soft tissue / Wound management
  - Demonstrate proficiency in wound closure and laceration repair
  - Demonstrate proficiency with abscess incision and drainage
  - Demonstrate familiarity with nailbed repair, tendon repair, and hemostasis of bleeding vessels
- Gastrointestinal
  - Demonstrate familiarity with orogastric and nasogastric tube placements, and describe the respective indications and contraindications
  - Demonstrate familiarity with gastric tube change
  - Demonstrate familiarity and ability to perform bedside paracentesis
- Musculoskeletal
  - Demonstrate proficiency with application and management of immobilization devices in setting of trauma (for example, cervical spine immobilization, backboard, TPOD, traction splint)
  - Demonstrate ability to manage and reduce common dislocations (shoulder, elbow, wrist, fingers, hip, knee, ankle)
  - Demonstrate proficiency with application of appropriate splints for management of extremity fractures and dislocations
  - Describe indications and contraindications for arthrocentesis, and ability to perform arthrocentesis of major joints
- Neurologic
  - Describe indications and contraindications for and demonstrate proficiency in performing bedside lumbar puncture
  - Develop familiarity with management of increased intracranial pressure and intracranial shunts
- Obstetrics/Gynecology
  - Demonstrate familiarity to perform vaginal delivery
  - Describe indications and steps needed to perform emergency Cesarean section in setting of maternal demise
- Genitourinary
  - Describe indications and contraindications to urethral catheterization, and demonstrate ability to place catheters
  - Develop familiarity with management of male GU emergencies (for example, phimosis, paraphimosis, priapism, testicular torsion)
- HEENT
  - Demonstrate familiarity with slit lamp exam
  - Demonstrate familiarity with equipment needed for irrigation of eye
  - Demonstrate familiarity with corneal foreign body removal
  - Describe indications and demonstrate familiarity with lateral canthotomy
  - Demonstrate familiarity and ability to perform needle aspiration / I&D of peritonsillar abscess

- Demonstrate familiarity of analgesia for the external ear, and proper management of external ear lacerations and auricular hematoma
- Demonstrate proficiency in management of epistaxis
- Demonstrate familiarity in management of dental emergencies, as well as reduction of mandible dislocation

## APPENDIX A – Online videos listed by procedure

\* Note: NEJM videos are readily viewable on URMC campus computers; need VPN or subscription to view off-site

- Airway
  - Airway Management Series, University at Buffalo, SUNY
    - <http://uems.buffalo.edu/emergmedvideos/airway/index.html>
  - Difficult airway - <http://cmedownload.com/lecture/emlive-lemon-law>
  - NEJM video - <http://www.nejm.org/doi/full/10.1056/NEJMvcm063574#figure=preview.gif> \*
- Bag-valve-mask ventilation
  - <http://www.hqmeded.com/node/70>
  - <http://www.nejm.org/doi/full/10.1056/NEJMvcm071298#figure=preview.gif> \*
- Bougie - <http://www.hqmeded.com/node/17>
- Glidescope
  - [www.emrap.tv](http://www.emrap.tv) Episode 31
  - <http://cmedownload.com/lecture/emlive-glide-scope>
- Fiberoptic intubation - [http://www.nejm.org/doi/full/10.1056/NEJMvcm0906443#figure=attach\\_1\\_heid\\_vcm0906443\\_thumb111x111.jpg](http://www.nejm.org/doi/full/10.1056/NEJMvcm0906443#figure=attach_1_heid_vcm0906443_thumb111x111.jpg) \*
- Cricothyrotomy
  - <http://www.nejm.org/doi/full/10.1056/NEJMvcm0706755#figure=preview.gif> \*
  - <http://www.youtube.com/watch?v=dvWy9NXiZZI>
  - [http://www.youtube.com/watch?v=p-YI2\\_epW00](http://www.youtube.com/watch?v=p-YI2_epW00)
- Chest tube
  - <http://www.nejm.org/doi/full/10.1056/NEJMvcm071974#figure=preview.gif> \*
  - <http://www.youtube.com/watch?v=tSXQ7GR35E4>
- Cardiac pacing – [www.emrap.tv](http://www.emrap.tv) Episode 73
- Pericardiocentesis - <http://www.medicalvideos.us/videos/274/>
- Central venous catheter
  - NEJM Femoral - <http://www.nejm.org/doi/full/10.1056/NEJMvcm0801006#figure=preview.gif> \*
  - NEJM Subclavian - <http://www.nejm.org/doi/full/10.1056/NEJMvcm074357#figure=preview.gif> \*
  - NEJM Internal jugular - <http://www.nejm.org/doi/full/10.1056/NEJMvcm055053#figure=preview.gif> \*  
<http://www.nejm.org/doi/full/10.1056/NEJMvcm0810156#figure=preview.jpg> \*

- University of Southern California, grand rounds – [www.emrap.tv](http://www.emrap.tv) Episode 56
- University of Chicago Hospitals
  - Part 1 - <http://www.youtube.com/watch?v=6KHM-IVF5Ek>
  - Part 2 - <http://www.youtube.com/watch?v=sUzMvLYyERI>
  - Part 3 - <http://www.youtube.com/watch?v=lUx-jLjGTl0>
  - Part 4 - <http://www.youtube.com/watch?v=Ge2iQxWjH4w>
  - Part 5 - <http://www.youtube.com/watch?v=nPnyXlhMpvA>
- Ultrasound guidance
  - <http://www.hqmeded.com/node/14>
  - <http://cmedownload.com/lecture/central-venous-access>
  - <http://www.youtube.com/watch?v=mrbmQxDalis> – great video of following the needle shadow and identifying the tip
- Supraclavicular approach to CVC insertion – [www.emrap.tv](http://www.emrap.tv) Episode 22
- Ultrasound guided peripheral IV insertion
  - <http://www.nejm.org/doi/full/10.1056/NEJMvcm0706789#figure=preview.gif> \*
  - <http://www.hqmeded.com/node/25>
  - <http://cmedownload.com/lecture/ultrasound-guidance-peripheral-iv-insertion>
- Umbilical vein catheterization
  - <http://www.nejm.org/doi/full/10.1056/NEJMvcm0800666#figure=preview.gif> \*
  - [www.emrap.tv](http://www.emrap.tv) Episode 97
- Intraosseous lines
  - [www.emrap.tv](http://www.emrap.tv) Episode 30
  - <http://www.nejm.org/doi/full/10.1056/NEJMvcm0900916#figure=preview.jpg> \*
- Arterial puncture and catheterization
  - [http://www.nejm.org/doi/full/10.1056/NEJMvcm0803851#figure=vcm0803851\\_thumb111x111.jpg](http://www.nejm.org/doi/full/10.1056/NEJMvcm0803851#figure=vcm0803851_thumb111x111.jpg) \*
  - <http://www.nejm.org/doi/full/10.1056/NEJMvcm044149#figure=preview.gif> \*
- Thoracentesis
  - <http://cmedownload.com/lecture/ultrasound-guidance-thoracentesis>
  - <http://www.nejm.org/doi/full/10.1056/NEJMvcm053812#figure=preview.gif> \*
  - <http://www.youtube.com/watch?v=6-9W-Y2dbpc> (NEJM video)
- Paracentesis
  - <http://cmedownload.com/lecture/ultrasound-guidance-paracentesis>
  - <http://www.nejm.org/doi/full/10.1056/NEJMvcm062234#figure=preview.gif> \*
- Lumbar puncture
  - <http://www.nejm.org/doi/full/10.1056/NEJMvcm054952#figure=preview.gif> \*
  - <http://www.youtube.com/watch?v=Nz10vv9aFXo> (NEJM video)
- Shoulder dislocation – [www.emrap.tv](http://www.emrap.tv) Episode 21
- Elbow dislocation – [www.emrap.tv](http://www.emrap.tv) Episode 11
- Knee arthrocentesis – [www.emrap.tv](http://www.emrap.tv) Episode 5

- Laceration repair basics -  
<http://www.nejm.org/doi/full/10.1056/NEJMvcm064238#figure=preview.gif> \*
- Corner stitch (flap laceration) – [www.emrap.tv](http://www.emrap.tv) Episode 77
- Extensor tendon laceration repair – [www.emrap.tv](http://www.emrap.tv) Episode 18
- Abscess incision and drainage
  - <http://www.nejm.org/doi/full/10.1056/NEJMvcm071319#figure=preview.gif> \*
  - [www.emrap.tv](http://www.emrap.tv) Episode 101
- Peritonsillar abscess - <http://cmedownload.com/lecture/ultrasound-evaluation-peritonsillar-abscess>
- Ear laceration – [www.emrap.tv](http://www.emrap.tv) Episode 87
- Conscious sedation –  
[http://www.nejm.org/doi/full/10.1056/NEJMvcm0800732#figure=attach\\_1\\_NEJMvcm0800732\\_thumb111x111.jpg](http://www.nejm.org/doi/full/10.1056/NEJMvcm0800732#figure=attach_1_NEJMvcm0800732_thumb111x111.jpg) \*



## APPENDIX B – Cadaver lab procedures

Bold text indicates procedures that **MUST** be completed.

Chapters from *Roberts and Hedges: Clinical Procedures in Emergency Medicine* are listed. Residents should review these readings **PRIOR** to attending lab sessions.

Instructional videos for select procedures are listed in Appendix A. Residents should review these videos **PRIOR** to attending lab sessions.

### Week 1

<b>Intubation</b> – including airway positioning and Bougie	Ch. 3 and 4
<b>Cricothyrotomy</b> – all residents must participate	Ch. 6
<b>Chest tube thoracostomy</b> – including securing tube in place	Ch. 10
<b>Pericardiocentesis</b> – attempt US guidance	Ch. 16
<b>Central venous catheter placement</b> – include IJ, subclavian, and femoral sites; attempt US guidance	Ch. 22
Arterial puncture and catheter placement	Ch. 20
Lumbar puncture	Ch. 62 (4 <sup>th</sup> edition) Ch. 61 (5 <sup>th</sup> edition)

### Week 2

<b>Arthrocentesis and joint injection</b> – shoulder, elbow, wrist, knee ankle, great toe MTP	Ch. 54 (4 <sup>th</sup> edition) Ch. 53 (5 <sup>th</sup> edition)
<b>Thoracentesis</b>	Ch. 9
<b>Paracentesis</b>	Ch. 44 (4 <sup>th</sup> edition) Ch. 43 (5 <sup>th</sup> edition)
<b>ED thoracotomy</b> – including pericardotomy, open cardiac massage, and cross-clamp aorta	Ch. 18
Venous cutdown	Ch. 23
Nerve blocks <ul style="list-style-type: none"><li>• HENT – supraorbital, infraorbital, mental</li><li>• Extremities – digital, wrist (median, ulnar, radial), and ankle (saphenous, deep peroneal, superficial peroneal, sural, posterior tibial)</li></ul>	Ch. 31 (4 <sup>th</sup> edition) Ch. 30 (5 <sup>th</sup> edition)  Ch. 32 (4 <sup>th</sup> edition) Ch. 31 (5 <sup>th</sup> edition)
ENT and ophthalmologic procedures – such as lateral canthotomy, technique for drainage of peritonsillar abscess, technique for nasal packing	Ch. 64-65 (4 <sup>th</sup> edition) Ch. 63-64 (5 <sup>th</sup> edition)
Laceration exploration and closure, including tendons and nailbed	Ch. 36 & 49 (4 <sup>th</sup> ed) Ch. 35 & 48 (5 <sup>th</sup> ed)