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
  - 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](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://www.emrap.tv)
    - [http://cmedownload.com/lectures/free](http://cmedownload.com/lectures/free)
    - [http://www.hqmeded.com](http://www.hqmeded.com)
    - [http://www.youtube.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
- URMC Emergency Ultrasound Conference (held annually for incoming interns)
  - Ultrasound training and credentialing requirements are listed elsewhere
- URMC 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, 4th edition (2004) and 5th 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](http://uems.buffalo.edu/emergmedvideos/airway/index.html)

- **Bag-valve-mask ventilation**
  - [http://www.hqmeded.com/node/70](http://www.hqmeded.com/node/70)

- **Bougie** - [http://www.hqmeded.com/node/17](http://www.hqmeded.com/node/17)

- **Glidescope**
  - [www.emrap.tv](http://www.emrap.tv) Episode 31


- **Cricothyrotomy**
  - [http://www.youtube.com/watch?v=dvWy9NXiZZI](http://www.youtube.com/watch?v=dvWy9NXiZZI)
  - [http://www.youtube.com/watch?v=p-Yl2_epWO0](http://www.youtube.com/watch?v=p-Yl2_epWO0)

- **Chest tube**
  - [http://www.youtube.com/watch?v=tSXQ7GR35E4](http://www.youtube.com/watch?v=tSXQ7GR35E4)

- **Cardiac pacing** – [www.emrap.tv](http://www.emrap.tv) Episode 73


- **Central venous catheter**
University of Southern California, grand rounds – 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=IUX-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  Episode 22

- Ultrasound guided peripheral IV insertion
  - http://www.hqmeded.com/node/25

- Umbilical vein catheterization
  - www.emrap.tv  Episode 97

- Intraosseous lines
  - www.emrap.tv  Episode 30

- Arterial puncture and catheterization
  - http://www.nejm.org/doi/full/10.1056/NEJMvcm0803851#figure=vcm080 3851_thumb111x111.jpg *

- Thoracentesis
  - http://www.youtube.com/watch?v=6-9W-Y2dbpc (NEJM video)

- Paracentesis

- Lumbar puncture
  - http://www.youtube.com/watch?v=Nz10vv9wFXo (NEJM video)

Shoulder dislocation – www.emrap.tv  Episode 21
Elbow dislocation – www.emrap.tv  Episode 11
Knee arthrocentesis – 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 Episode 77
• Extensor tendon laceration repair – www.emrap.tv Episode 18
• Abscess incision and drainage
  o http://www.nejm.org/doi/full/10.1056/NEJMvcm071319#figure=preview.gif*
  o www.emrap.tv Episode 101
• Peritonsillar abscess - http://cmedownload.com/lecture/ultrasound-evaluation-
  peritonsillar-abscess
• Ear laceration – www.emrap.tv Episode 87
• Conscious sedation –
  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

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

### Week 2

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Chapter(s)</th>
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</thead>
<tbody>
<tr>
<td>Arthrocentesis and joint injection – shoulder, elbow, wrist, knee ankle, great toe MTP</td>
<td>Ch. 54 (4th edition)</td>
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<td></td>
<td>Ch. 53 (5th edition)</td>
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<tr>
<td>Thoracentesis</td>
<td>Ch. 9</td>
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<tr>
<td>Paracentesis</td>
<td>Ch. 44 (4th edition)</td>
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<td>Ch. 43 (5th edition)</td>
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<tr>
<td>ED thoracotomy – including pericardotomy, open cardiac massage, and cross-clamp aorta</td>
<td>Ch. 18</td>
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<tr>
<td>Venous cutdown</td>
<td>Ch. 23</td>
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<tr>
<td>Nerve blocks</td>
<td></td>
</tr>
<tr>
<td>• HENT – supraorbital, infraorbital, mental</td>
<td></td>
</tr>
<tr>
<td>• Extremities – digital, wrist (median, ulnar, radial), and ankle (saphenous, deep peroneal, superficial peroneal, sural, posterior tibial)</td>
<td>Ch. 31 (4th edition)</td>
</tr>
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<td>Ch. 30 (5th edition)</td>
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<tr>
<td></td>
<td>Ch. 32 (4th edition)</td>
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<td>Ch. 31 (5th edition)</td>
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<tr>
<td>ENT and ophthalmologic procedures – such as lateral canthotomy, technique for drainage of peritonsillar abscess, technique for nasal packing</td>
<td>Ch. 64-65 (4th edition)</td>
</tr>
<tr>
<td></td>
<td>Ch. 63-64 (5th edition)</td>
</tr>
<tr>
<td>Laceration exploration and closure, including tendons and nailbed</td>
<td>Ch. 36 &amp; 49 (4th ed)</td>
</tr>
<tr>
<td></td>
<td>Ch. 35 &amp; 48 (5th ed)</td>
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