American Society of Neuroradiology
Practice Audit Survey Discussion Points – Module C

1. Did you address the patient, identify yourself, and wear a badge upon entering the fluoroscopic suite?

   Professionalism and compassion are essential for successful patient-physician relationships. Many institutions have policies regarding identification and patient interactions. Kahn et al. developed a checklist of physician etiquette when encountering patients in the hospital setting [1]. This checklist includes:
   - Asking permission to enter the room and wait for an answer
   - Introduce yourself, showing ID badge
   - Shake hands (wear glove if needed)
   - Sit down. Smile if appropriate
   - Briefly explain your role
   - Ask the patient how they are feeling about being in the hospital

   In a study related to the physical appearance of doctors, the use of white coats was the preferred patient choice followed by "professional informal" clothing without a white coat [2]. Scrubs were much less appealing to the older population compared to the younger generation, however both age groups preferred the use of a white coat to identify a physician.

   Most patients preferred doctors to address the patient by their first name. Most preferred doctor to introduce themselves using title, first and last names and to be wearing a name badge in their breast pocket [3].

2. Did you obtain written informed consent?

   Informed consent should always include the discussion of potential short and long-term complication from the procedure. Written informed consent is the standard of practice including discussion of the potential risks and benefits [4]. Complications from LP include but are not limited to:
   - Local discomfort
   - Radicular pain
   - Hemorrhage/Hematoma
   - Infection
   - Post LP headache requiring intervention (blood patch) [5]
   - Radiation exposure
   - Brain herniation/death [6]

3. Did you follow The Joint Commission’s (TJC) universal protocol for patient and procedure site identification?
Conducting pre-procedural patient identification is mandatory and is outlined by TJC universal protocol. You must verify the correct procedure, for the correct patient, at the correct site. For spinal procedures, like lumbar punctures, mark the general spinal region on the skin [7, 8]. Marking should be done prior to moving the patient into the fluoroscopy suite and before using sedation. Although altered mental status or sedation itself does not prevent the site marking process, participation from the patient, a family member or health care proxy should be encouraged.

Conduct a time-out immediately before starting the invasive procedure in the location where the procedure is to be done [7, 8]. The time-out involves all the immediate members of the procedure team including the individuals performing the lumbar puncture, the nurse and/or radiology technologist [7]. All members must agree on patient identity, site and procedure before continuing. Document the completion of the time-out.

4. How did you wash your hands?

Hand hygiene is the single most important practice to reduce the transmission of infectious agents in the healthcare setting. “Hand Hygiene” includes both hand washing using soap and water or alcohol-based products that do not require water. When hands are visibly dirty, wash with soap and water (Category 1A). If hands are not visibly soiled, hand decontamination with alcohol-based hand rub is the preferred method [9].

Artificial or long fingernails can reduce the effectiveness of hand hygiene. The CDC/HICPAC recommends (Category IA): “that artificial fingernails and/or extenders not be worn by healthcare personnel who have contact with high-risk patients” [10]. There is less evidence that jewelry affects the quality of hand hygiene.

The use of sterile gloves does not replace the need for appropriate hand hygiene [11].

5. What type of universal precautions did you use?

The CDC found that there is sufficient evidence to warrant the additional protection of a face mask when injecting material into the spinal or epidural space (Category IB) [10, 12, 13].

The use of eye protection chosen is determined by the specific work situations and personal vision needs. Personal eyeglasses and contact lenses are NOT considered adequate eye protection [10]. The use of disposable face shield may provide greater protection than eye goggles.
No conclusive studies have demonstrated that the use of maximal precautions (i.e., full body drapes, caps/bonnets, eye shield, gloves, and full sterile gowns) versus standard precautions (i.e., sterile gloves and small drape) result in improved infection control during lumbar punctures [14, 15]. Some institutions advocate the use of maximal precautions for LP based on well-established guidelines for prevention of intravascular central venous catheter placement. Recommendations for the prevention of central line infection cannot automatically be applied for LP [14]. Use of such protective equipment is at the discretion of the physician and institution at which they practice.

6. **What type of antiseptic sterilization solution did you use of the procedure/skin access site?**

Controversy persists regarding the most appropriate antiseptic solution to use during lumbar puncture. Varying concentrations of providone-iodine are routinely used for aseptic sterilization despite “suggestions” of inadequate skin preparation with this method [16]. Neurosurgical literature demonstrated a reduction of spinal catheter related infections after changing to chlorhexidine containing skin preparation solutions [17].

Recently the American Society of Regional Anesthesia Practice Advisory on Infectious Complications Associated With Regional Anesthesia and Pain Medicine recommended that 0.5% chlorhexidine gluconate with alcohol be considered the antiseptic of choice before all percutaneous spinal interventions including lumbar punctures. Despite this recommendation, products with chlorhexidine contain US Food and Drug Administration (FDA) warnings to “not use for lumbar punctures” and “avoid contact with meninges”. The overall incidence of neuroaxis/peripheral nerve injury of 12,000+ spinal interventions was 0.46% [18].

7. **What type of sharps safety did you use during the procedure?**

The prevention of sharps injuries has always been an essential element of Universal and now Standard Precautions [10]. Do not recap, bend, break or hand-manipulate used needles. If recapping is required, the CDC recommends use of the one-handed scoop technique only. Use the safety feature when available.

8. **What type of anesthetic medication container did you use during your procedure?**

The Healthcare Infection Control Practices Advisory Committee investigated large outbreaks of iatrogenic hepatitis infections. They concluded that primary breaches in infection were the result 1) reinserion of used needles into a multiple-dose vial or solution container and 2) use of a single needle/syringe to administer
intravenous medication to multiple patients [10]. Use single-dose vials for parenteral medication whenever possible (Category IA).

9. **What techniques did you use to prevent post-lumbar puncture headache?**

Post-lumbar puncture headaches (PLPH) are the most common complication of lumbar puncture. The headache is characterized as a dull or throbbing headache in the frontal or occipital region that begins 24-72 hours after the procedure and may be exacerbated by standing, coughing, sneezing or straining [5]. Typical symptoms are diagnostic, usually without need for additional imaging.

In both the Neurology and Anesthesia literature, there is evidence that PLPH are reduced using 22-gauge noncutting (atraumatic) needles [19, 20]. The overwhelming majority of FGLPs are performed using 22g or 20g needle [21]. Incidence of headache with varying needle sizes is further discussed by Ahmed et al [5] and there is convincing evidence that the smaller needle size is associated with a lesser risk of headache [19]. Inserting a cutting needle with bevel oriented in a parallel/longitudinal orientation reduces PSPH by approximately 50% (Class I recommendation)[19]. Replacing the stylet prior to removal of the needle reduced the incidence of PLPH [5, 12, 19].
REFERENCES

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