The Problem
Procedure kits stocked in Ultrasound included some products which were identified as suboptimal for needle safety

- Since lidocaine is no longer provided as a sterile vial within the kit, the person performing the procedure must withdraw lidocaine from a vial held by a sonographer
  - Sharp-bevel needles were provided in kits as stocked before the intervention. Staff noticed that this potentially put sonographers at risk of needlesticks.
- Needle/sharp receptacles available in kits were cumbersome to use due to manufacturing details
  - High density closed cell foam meant that some needles could not easily be slid into the needle receptacle
  - Removal of needles required two hands, placing the second hand at risk of a rebound needle stick
  - Because of these difficulties, sharps were being left on the field and safety equipment not used
- Needle receptacles were not available for some procedures not utilizing sterile kits
- Suboptimal needle safety has a potentially large impact in the busy US procedure area, averaging 10-12 procedures per day.
- These issues link directly to the IOM Dimension of Quality Care: Safety

Aim/Goal
Improve needle safety procedures in Ultrasound by replacing supplies with more effective options, and providing additional safety supplies where needed.

The Team
Maryellen R. M. Sun, MD, Director of Ultrasound Services
Bernadette Kennedy, RDMS, Ultrasound Director
Juanita Cook, RDMS, Ultrasound Manager
Bridget O’Bryan, RN, Nurse Director, Radiology
Suzanne Swedeen, RN, Quality Assurance Nurse, Radiology
Sarah Ghanem, NP, Clinical NP for Ultrasound
Kate Schmid, NP, Clinical NP for Ultrasound
Laurie Sammons, RDMS, Advanced Practice Sonographer
Kelsey Worcester, RDMS, Advanced Practice Sonographer

The Interventions

- Needle safety issues were discussed in Ultrasound Operations meetings and Interventional Radiology Operations meetings
- Input was solicited from colleagues through use of an Ultrasound Idea Board and departmental surveys
- Ultrasound Managers contacted suppliers for demonstrations of additional products
- Open cell foam needle cups were selected and added to US procedure kits
- These cups were made routine for use in procedures without prepackaged kits as well
- Additional kits for FNA procedures were designed and ordered from supplier
- Blunt-tip filling needles were selected to replace sharp bevel filling needles for two-person lidocaine syringe filling
- Use of new products was demonstrated to trainees and staff

The Results -

Above: Two-operator lidocaine withdrawal procedure using blunt filling needle (A); close up view of old (gray hub) and new (red hub) needles for lidocaine withdrawal (B). Difficulty placing sharp into old needle collection cup (C) resulted in this item being deposited on the sterile field (F). Difficulty withdrawing sharps from old collection cup (D) required use of two handed technique; low profile of cups meant stabilizing hand was close to needle tips. Improved release of needles from new cup often permits one handed removal(e); if stabilization is required, higher profile of cups means hand can be further from needle tip.

Lessons Learned
Unexpected challenges have included long response times from vendors to actualize change. Complacency with existing equipment resulted in development of habits of less-safe use of needles for some individuals during this time (e.g. internal trocar of 22G spinal needle is dropped onto field rather than deposited in needle cup, as the needle was difficult to insert into existing cups). Additional training will be required to remind practitioners of safe use of new equipment.

Next Steps
- The team will continue to ensure that the planned changes are brought to completion in all areas by working with manufacturers and suppliers.
- Feedback from other stakeholders (trainees, sonographers, radiologists, nurses) will be sought
- Frequency of needlestick injuries will be monitored

For More Information Contact
Maryellen Sun, MD msun@bidmc.harvard.edu
Dept of Radiology, Director of Ultrasound Services & Genitourinary Imaging