BUILDING PARTNER RADIOLOGY

BY KELLY D'ARIES AND CHRISTINE YOUNG-RUCKRIEGEL

Introduction

Advances in medical imaging have led to a rise in radiology centers both within and outside of acute care settings. *Forbes* reports that the medical imaging market is expanding at a compound annual growth rate of 5.4 percent.[1] Infection prevention is frequently requested to evaluate free-standing radiology sites and ambulatory radiology sectors. Infection prevention departments must increase their understanding of radiology services to ensure patient safety in this rapidly expanding field.

In the past, radiology services were primarily for imaging. Today radiology services include diagnostic imaging along with interventional radiology where patients have basic to complex invasive procedures performed. Insertion of G-tubes to placement of drains to remove an abscess, along with central line insertions, are just a few examples. These new services require practices which address a wider range of medical equipment and more varied environments than ever before.

Risk Assessment

Classifying risk begins with a thorough risk assessment. A risk assessment is a tool that names types of hazards impacting an organization, department, or a process. The risk could be current or future state. The risk assessment shows where vulnerability exists and potentially contributes to infections or harm. No two organizations will produce the same risk assessment. This is because there are multiple factors to consider when developing an assessment. A numerical grid will identify sound methods to prevent harm to those areas which require enhanced policies, procedures, or actions.

A risk assessment is an industry standard for all infection prevention programs. There are abundant templates available to assist in the development of a risk assessment. In our experience, the simpler the better. Following are three elements to set up risk:

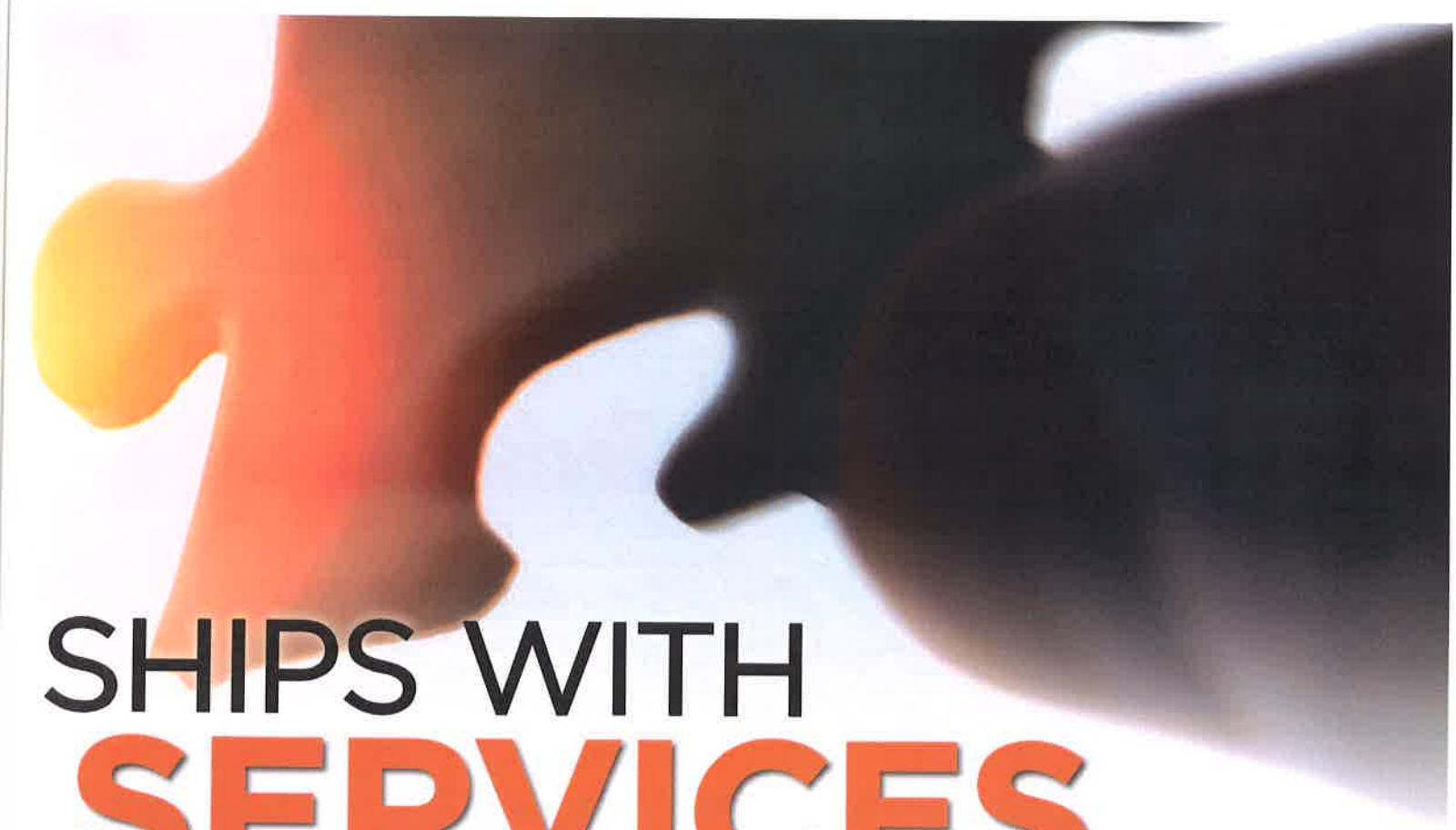
1. Probability of occurrence
2. The degree of harm/risk should the event occur
3. Current practices in place to mitigate the risk.

Building your Risk Assessment

Inquiry is your best friend. One metric to consider while developing your risk assessment tool might be a review of incident reports. A review of events may determine frequency of occurrence and if these issues are ongoing.

Familiarize yourself with literature related to infection-related outbreaks within radiology centers. Our literature search indicated past outbreaks with gel in warmers and injection safety.[2,3] Build your knowledge base for rounding by including previous outbreak information and include the elements of standard precautions as a framework in the risk assessment. We based our risk assessment on the CDC core elements:

- Hand hygiene
- Environmental cleaning and disinfection
- Injection and medication safety
- Appropriate use of personal protective equipment based on activities being performed
- Minimizing potential exposures (e.g., respiratory hygiene and cough etiquette)
- Reprocessing of reusable medical equipment between each patient or when soiled.[4]



SHIPS WITH SERVICES

Injection Safety

Our discussion along with observations of the radiology department demonstrated frequent use of injectables. This observation led to further exploration of all practices related to injection safety. Injections are high volume and high risk for many procedures in the interventional and diagnostic areas. Injections are administered by staff for myriad reasons, from numbing of the site for line insertions, to administration of contrast material through intravenous fluid, to setting up multi-injector equipment. The risk assessment ranked injection safety as a focus priority for action.

Our action plan began with auditing teams within the area with the CDC Injection Safety audit tool.[5] The next key step included a department review of the current injection safety education available. We directed our assessment by asking basic questions.

1. When onboarding new team members, what initial and ongoing education is provided to team members on injection safety?
2. What is the content of the education?
3. Is the leadership team participating in any injection audits?
4. Who provides injection safety education, and are department competencies available?

This inquiry guided our action plan as gaps existed. The consensus was injection practices required further emphasis based on the volume of the injections. Additionally, injection safety education was not standardized to the department. The radiology team leads took part in the injection audits as well. Having the leaders involved in collecting injection audits solidified making this topic a focused priority and gained their support on our next set of recommendations.

Collaboration between infection preventionists (IPs) and radiology leadership resulted in the development of an educational session on a computer-based system, followed by a pre- and post-test. The leadership team agreed to incorporate standardized education on safe injection practices during orientation and repeat it annually via a hospital learning management system with a post-test.

Multi-Dose Infuser Technology

The partnership between the IP and the radiology leadership was so successful we were asked to consult on multi-dose infuser technology. The radiology team was approached by a vendor, who suggested the radiology department purchase a multi-dose CT motion injector. This machine offered to reduce the cost of consumables, reduce the volume of contrasted waste, and save time. All these factors appealed to the radiology department.

Current practice for the delivery of contrast medium is to use a single-dose contrast injector. Single-use contrast vials are for one patient each time and extra contrast is discarded. The unusable contrast media amounts can be more than 300 mL per patient. Storage of large volumes of contrast take up space and may require temperature control. All these parameters made it attractive to consider the purchase of the multiple contrast media injectors. The proposed benefit of multi-dose infusers is their ability to deliver contrast to multiple patients, resulting in cost savings by reducing waste from unused contrast and potentially freeing up storage space.

It is important to inquire in the evaluation of multi-dose infusers if the tubing and/or the I.V. bags require changing between patients. Exploring the manufacturers instructions for

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Figure. Radiology Risk Assessment.

LOCATION: Radiology

Event: Environmental Care Rounds in the Radiology Department

Potential Risks/Problems	Probability of Occurence			Harm Risk			Current Practice				Score
	High	Med	Low	Life Threatening	Permanent Harm	Temporary Harm	Poor	Fair	Good	Solid	
	3	2	1	3	2	1	4	3	2	1	
Risks Identified in Department											
Injection Safety	3				2			3			18
Hand Hygiene		2				1			2		4
Environmental Cleaning		2				1		3			6
Appropraite Use of PPE		2				1			2		4
Exposure Transmission		2			2				2		8
Reprocessing of Reuseable Medical Equipment			1			1			1		1
*The Risk assessment grid is Multiplied in each category											

Risk Level Score	
High	26-36
Medium	13-25
Low	0-12

FIGURE: KELLY D'ARIES AND CHRISTINE YOUNG-RUCKRIEGEL

use (MIFU) on this detail is imperative. The IP review of the system indicated there was still a requirement for changing the tubing and the saline which delivers contrast medium between patients. The reason for this is the tubing and the saline are considered single use. The review of the company literature indicated signage would have to include visible hang time allowance for saline. There were other components of the machine which only allowed a hang for eight hours.

The product advertised itself as being able to hang a single-dose I.V. bag for multiple patients if red tag signage is posted on the saline bag noting the time the bag is hung. The tag supplied by the company would allow single-dose I.V. bags to become multi-dose I.V. bags for use on multiple patients. The agency using the contrast is the one who must obtain approval from the company who manufactures the intravenous solution.

Through research of this multi-use infuser technology, we did locate some infusers for which the saline and the tubing were provided from the same company, potentially eliminating some equipment changes. The IP should request material on multi-dose contrast infusers to ensure MIFU are being adhered to and inquire if they are in use when rounding in the departments.

We are grateful the department reached out to us for our perspective. We shared a presentation with them on potential risks to keep in mind if they purchase this machine. The department faces administrative challenges in managing supplies, but our shared priority remains ensuring patient safety when introducing new technology.

When evaluating multi-dose infusers, it is crucial to assess the components which are extraneous to the infuser which do not come directly from the company but require use. In this case the I.V. solution bags were extraneous to the purchase of the product but remain identified as single patient use and require changing between patients.

Conclusion

Our rounding in the radiology department enabled a clear pathway to risk assess the area and prioritize action plans where gaps existed. The overall outcome of interfacing with the department resulted in a mandatory systemwide computerized learning module on injection safety for all radiology team members. Our successful partnership shows the strength of building partnerships to enhance patient safety and prevent the transmission of infection. P

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