Patient Safety Tip of the Week

November 14, 2017

Tracking C. diff to a CT Scanner

We've previously noted that your CT or MRI scanner could be a source of infection to patients (see our October 22, 2013 Patient Safety Tip of the Week "How Safe Is Your Radiology Suite?"). And a recent study showed a CT scanner was a potential source for nosocomial transmission of C. difficile infections in a large university hospital (Murray 2017). Those authors found that passing through the CT scanner in the ED within 24 hours after a patient with C. difficile had been there was associated with increased risk of developing C. diff infection (CDI).

But the real story in the Murray study is not that the CT scanner was a source of nosocomial transmission but rather they manner in which they identified it as a source. They used their EHR (electronic health record) as a tool to identify potential sources!

They first identified patients who had proven C. diff infections and then tracked all the places within the hospital that they had been. Places or spaces were considered potentially contaminated for 24 hours after a patient with CDI visited them. All hospitalized patients who had not yet tested positive for CDI and passed through a space while it was potentially contaminated were considered exposed to C. difficile, while patients who occupied the same space at any other time served as the unexposed control group.

CDI-positive patients moved through a mean of 4.2 hospital locations, potentially contaminating those spaces. Being exposed to CDI in the CT scanner in the emergency department was significantly associated with the development of CDI (OR 2.5). That remained significant even after adjustment for covariates and in sensitivity analyses that extended the incubation period to 72 hours. There were no trends in other areas of the hospital that reached statistical significance. Once they identified this increased risk of nosocomial transmission they found that the cleaning practices for the scanner table of the CT scanner in the ED had not yet been updated to match the standardized methods applied in other radiology suites.

The study shows the value of the EHR in tracking patients in time and space can be leveraged as a tool in infection control and hospital epidemiology. Many don't realize that the location and time stamps available in most EHR's can be used to track patient movements within the hospital.

The study also serves as a reminder that the standards which apply to one area of the hospital (such as the radiology suite) should also apply to any components that may be housed in separate areas of the hospital.

To our mind, it also highlights another possibility: compared to patients already hospitalized, patients in the ED are less likely to be diagnosed with CDI or considered at risk for CDI. Hence, some of the precautions taken with patients with known or suspected CDI may not be taken when the patient first arrives at the ED.

Previous studies have shown that patients in rooms occupied by other patients with CDI are at increased risk for CDI (Echaiz 2014). Also patients in rooms previously occupied by patients who had received antibiotics were also at risk for CDI (Freedberg 2016). All these studies emphasize the role environmental surfaces may play in transmission of CDI.

Some of our prior columns on patient safety issues in the radiology suite:

- October 16, 2007 "Radiology as a Site at High-Risk for Medication Errors"
- February 19, 2008 "MRI Safety"
- September 16, 2008 "More on Radiology as a High Risk Area"
- October 7, 2008 "Lessons from Falls....from Rehab Medicine"
- October 2008 "Preventing Infection in MRI"
- March 17, 2009 "More on MRI Safety"
- March 2009 "Risk of Burns during MRI Scans from Transdermal Drug Patches"
- August 11, 2009 "The Radiology Suite…Again!"
- January 2010 "Falls in the Radiology Suite"
- August 2010 "Sedation Costs for Pediatric MRI"
- January 25, 2011 "Procedural Sedation in Children"
- February 1, 2011 "MRI Safety Audit"
- October 25, 2011 "Renewed Focus on MRI Safety"
- March 13, 2012 "Medical Emergency Team Calls to Radiology"
- August 2012 "Newest MRI Hazard: Ingested Magnets"
- October 22, 2013 "How Safe Is Your Radiology Suite?"
- February 25, 2014 "Joint Commission Revised Diagnostic Imaging Requirements"
- July 2014 "New MRI Risks: for Staff!"
- July 1, 2014 "Interruptions and Radiologists"
- November 2014 "More Radiologist Interruptions"
- October 21, 2014 "The Fire Department and Your Hospital"
- June 23, 2015 "Again! Mistaking Antiseptic Solution for Radiographic Contrast"
- August 25, 2015 "Checklist for Intrahospital Transport"
- March 22, 2016 "Radiology Communication Errors May Surprise You"
- August 2016 "Guideline Update for Pediatric Sedation"
- October 2016 "MRI Safety: There's an App for That!"

- January 17, ,2017 "Pediatric MRI Safety"
- August 8, 2017 "Sedation for Pediatric MRI Rising"

References:

Murray SG, JWL, Croci R, et al. Using Spatial and Temporal Mapping to Identify Nosocomial Disease Transmission of Clostridium difficile. JAMA Intern Med 2017; Published online October 23, 2017
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Echaiz JF, Veras L, Zervos M, Dubberke E, Johnson L. Hospital roommates and development of health care-onset Clostridium difficile infection. Am J Infect Control 2014; 42(10): 1109-1111
http://www.ajicjournal.org/article/S0196-6553(14)00938-9/abstract

Freedberg DE, Salmasian H, Cohen B, et al. Receipt of Antibiotics in Hospitalized Patients and Risk for Clostridium difficile Infection in Subsequent Patients Who Occupy the Same Bed. JAMA Intern Med 2016; 176(12): 1801-1808
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