



Interruptions in Interventional Radiology: A Review of the Literature



Sindy Salmen, MSN, RN *

Clinical Quality Audit Analyst Sr., Amerigroup Kansas, Inc., Overland Park, KS

A B S T R A C T

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Interventional radiology (IR) nurses are responsible for providing conscious sedation and nursing care for patients undergoing invasive procedures. Nurses are expected to provide quality care in a fast-paced environment. Interruptions during the delivery of that care can lead to medical errors. In an attempt to learn more about the impact interruptions can have in IR, a literature search was conducted. Although several studies have examined the occurrence and reasons for interruptions during high-risk procedures such as medication administration, no articles were located that discussed the interruptions in a procedural unit like IR.

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Introduction

The Institute of Medicine (IOM) found that at least 44,000 people die each year from preventable medical errors resulting in a cost of up to \$29 billion dollars (IOM, 1999). Multiple studies have shown the relationship between interruptions and adverse outcomes. According to the Merriam Webster Dictionary (2016), to interrupt is to cause something to stop happening for a time. In one study conducted by Speroni, Fisher, Dennis, & Daniel (2013), 18% of the 123 hospital nurses they surveyed felt that interruptions and distractions were related to near misses. In another study by Gillespie, Chaboyer, and Fairweather (2012), 160 surgical procedures were observed in 10 different specialties; they found that 66.9% were characterized by interruptions, and their results showed a positive correlation between the number of intra-operative interruptions and the number of miscommunications. In fact, interruptions were identified as causing a 12.7% increase in clinical errors during medication administration according to a study by Westbrook, Woods, Rob, Dunsmuir, & Day (2010).

The effects of interruptions are not just limited to hospital units and the operating room, procedural areas like interventional radiology (IR) can also be affected. In fact, high error rates with serious consequences are most likely to occur in intensive care units (ICUs), operating rooms, and emergency departments (IOM, 1999, p. 1). Because IR is similar to an operating room, it would seem likely that they would also be at high risk for interruptions.

IR is a subspecialty of radiology that uses minimally invasive image-guided procedures to diagnose and treat diseases. Procedures that were once performed in the operating room are now done in an IR procedural room with specialty trained nurses providing the conscious sedation and all patient care. Nurses are challenged with delivering safe care to patients within a fast-paced environment. As a result, nurses may be interrupted while they are performing an assessment, monitoring their patient, or administering medications. The IR nurse is tasked with many duties such as preparing high-risk medication like heparin for intra-arterial injection, monitoring electrocardiogram status during central line placement, and administering conscious sedation. Interruptions in IR may include requests by technologists and physicians for assistance, answering phone calls about the next case, or requests for assistance from other IR nurses. Any interruption could place the patient at risk. Unlike a nursing unit where the nurse is with their patient for 8 to 12 hr, the procedural nurse may only provide care for 1 to 3 hr. Being able to fully review the record and perform an assessment without interruptions is critical. According to Westbrook et al. (2010), interruptions during the delivery of care have been associated with an increased risk and severity of medication errors. Clearly, there is a need to study this phenomenon in the context of a procedural environment to learn how to mitigate the potential adverse effects of interruptions.

In an attempt to learn more about interruptions that occur in IR, a literature search using the PubMed and CINAHL databases was performed using the search terms interruptions, operating room, procedural, and radiology. The search was limited to articles published from 2008 to 2013. Multiple articles were retrieved and reviewed if they met the search criteria. There were no articles published related to interruptions in an IR setting. However, there

* Corresponding author: Sindy Salmen, Amerigroup Kansas, Inc., Overland Park, KS 64089.

E-mail address: senglish@kc.rr.com.

were several articles pertaining to interruptions during medication administration and high-risk procedures such as the delivery of anesthesia in the operating room. After an extensive analysis of each article, four main themes were evident. Those themes are frequency of interruptions, causes of interruptions, safety, and solutions. Although some articles did have overlapping themes, they were grouped according to their dominant theme for inclusion on the literature map. The purpose of this literature review was to locate available evidence related to nursing interruptions in an IR department. The second goal was to review available research related to interruptions and identify and summarize the key themes and ultimately to discover any deficits in the literature that should be pursued by further research. Figure 1 illustrates the results of the literature review.

Frequency of interruptions

In this literature review, the frequency of interruptions has been studied in a variety of clinical settings and during various aspects of care. Most articles focused on learning how to prevent errors and ensure patient safety. There were several articles that focused primarily on quantifying the number of interruptions that occurred during patient care. Although most studies measured the number of interruptions by observational methods, there was variation on the location and the episode of care that was observed. For example, Kreckler, Catchpole, Bottomley, Handa, & McCulloch (2008) observed 38 drug rounds on a surgical ward and discovered that on average, 11% of the time was spent managing interruptions. In fact, half of the sample encountered two or more interruptions, and the mean duration was 1 min per interruption (Kreckler et al., 2008). Their conclusion was that interruptions occur often during drug administration and that they can lead to patient harm (Kreckler et al., 2008).

Biron, Lavoie-Tremblay, & Loiselle (2009) observed work interruptions during medication administration on a medical unit and found that interruptions occurred at a rate of 6.3 per hr. They also concluded that medication administration is not protected against work interruptions that pose significant risks (Biron et al., 2009). Anthony, Wienczek, Bauer, Daly, & Anthony (2010) confirmed that interruptions do occur during medication

administration in both medical and surgical ICUs. Their study revealed 76 interruptions during the time 218 medications were administered or one in every four medications given.

The operating room is considered at high risk for interruptions and potential medical errors such as miscommunication. Gillespie et al. (2012) observed 160 surgical procedures in 10 specialties and discovered that more than 100 cases experienced interruptions and one case had as high as nine interruptions. Their results showed a direct relationship between the number of intraoperative interruptions and the number of miscommunications, which was noted in 56.9% of the observed procedures. Campbell, Arfanis, & Smith (2012) chose to observe the entire anesthesia process from induction to recovery in 30 different surgical operations. They concluded that distractions of which interruptions was considered a component were common in anesthetic practice.

Hall et al. (2010a) chose to study nursing interruptions in a medical surgical unit from a systems perspective using mixed methods and discovered that in 2,880 hr of observation 13,025 interruptions occurred.

Causes of interruptions

There were five articles that focused primarily on the causes of interruptions. Three of the five articles used observational methodology, and two articles used a descriptive study design. All studies grouped interruptions into categories for reporting purposes. Four studies were focused on interruptions during the administration of medications, which is expected considering the increased concern related to patient safety.

Buchini & Quattrin (2012) discovered 14 causes of interruptions in an ICU during medication administration, of which nine were classified as avoidable. Their results showed that management of physician requests accounted for 55.04% of those interruptions followed by management of call lights at 53.16% and illegible prescriptions at 52.74%.

Tomietto, Sartor, Mazzocoli, & Palese (2012) observed 56 medication rounds on seven surgical units in a teaching hospital and discovered that the leading causes for interruptions were medication or materials being unavailable 31.3% of the time with patient requests being the second cause at 26.5%. Another study by

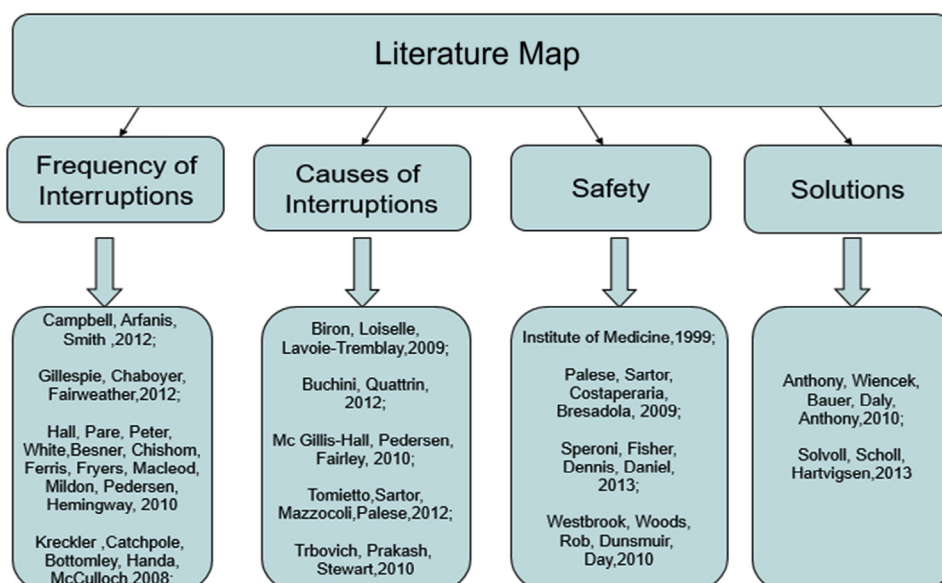


Figure 1. Literature map.

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