

**Patient Safety in Interventional Radiological Procedures:
Safety Checklists and Protocols**

IRPaSS

(Interventional Radiology Patient Safety Screening)

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Introduction

The use of safety checklists in surgery is not novel. As with other invasive specialties, patient safety remains the first priority in any procedure. With the increasing complexity and scope of practice in Interventional Radiology, assuring patient safety remains paramount to the specialty. Checklists are an efficient means of reducing error in fast paced, complex environments. Despite the minimally invasive nature of interventional radiology (IR), the increasing complexity of IR cases, necessitates the use of a safety checklist in IR. Outlined is St. Joseph's Healthcare's experience in the implementation of a safety checklist routinely used for IR procedures, and has the potential to be modified to include hospital-wide interventional procedures.

Background

In 1999, the Institute of Medicine suggested that the majority of medical errors were the result of faulty systems processes, rather than individuals. The aviation industry is a case in point. With the complexity of operating an aircraft often cited as a hindrance to passenger safety, the use of a checklist to operate on the aircraft has dramatically reduced the incidence of adverse events.

In 2007, the World Health Organization (WHO) led an initiative to reinforce the importance of safety checklists in surgery. The organization defined a core set of safety standards that can be applied in all member states. This involved providing information on the role and patterns of surgical safety, defining minimum surgical 'vital statistics', and evaluating and disseminating the checklist at pilot sites and hospitals globally.

In 2008, the WHO published guidelines to identify parameters suggested to ensure patient safety. Hayes et al identified a statistically significant decrease of 36% (from 11.0% at baseline to 7.0%) in postoperative complications when the checklist was adopted and later studied in eight centers in eight countries, including two in North America. The total hospital rate of death dropped from 1.5% to 0.8% ($p=0.003$). This represented a drop from 10.3% to 7.1% in the high-income participating sites ($p<0.001$) and a decrease from 11.7% to 6.8% in

The low-income participating sites ($p < 0.001$). The authors attributed the reduction in adverse events to several factors, including behavioral changes within the team secondary to the adoption of the checklist. The checklist not only improved team cohesion, it also required changes to the previously existing systems.

Given the promise of improved patient outcomes, interventional radiology teams are increasingly adopting safety checklists in their practice. For example, the Cardiovascular and Interventional Society of Europe (CIRSE) recently published a checklist, for IR procedures in the European environment. In 2009, the UK National Patient Safety Agency and the Royal College of Radiologists collaborated to create a safety checklist for radiological procedures for implementation in England and Wales.

C J Koetser *et al* developed a specific Radiological Patient Safety System (RADPASS) checklist for interventional radiology. This was published in CVIR in April 2012. The implementation of checklist was assessed with its impact on healthcare aspect of radiological interventions.

Methods

The purpose of this document is to introduce the implementation of a safety checklist in IR. The protocol and concept could be adapted from the WHO Surgical Safety Checklist or from the available IR checklists. It is designed to be a collaborative process for use by the entire IR team: Interventional Radiologists, Nurses and Technologists involved in all image guided interventional procedures. The checklist involves a safety checklist, “pause” prior to commencing the procedure, and involves a number of components that must be met prior to and after the procedure. In addition to the checklist, there should be a team brief at the beginning of the list of cases, and a debriefing at the end, as is the case in most surgical procedures.

The checklist is divided into three main sections: patient information, pre-procedure information, and procedure related events. The patient information section includes initially identifying the “vitals” as per WHO recommendations – patient identification information. Other components of the pre-procedure section include: allergies/asthma, coagulation status, renal and liver function, cardiac history and in the case of radiological procedures, pregnancy. In addition, a procedure related section involves vital components of the procedure itself: consent, side marking, administration of procedural medications and vital parameters. The checklist is organized in such a way that the person completing it can tick one checkbox for “yes”, or “N/A”, initial, and include comments, if necessary. Initialing in each section of the checklist ensures accountability if different components of the checklist are performed by different members of the

team. The simplicity of the process ensures consistency throughout the checklist, as well as between one procedure and the next.

The procedure section includes the total fluoroscopy time and dose, as well as the total volume of contrast media administered. This allows for monitoring and future auditing to assure that patient safety is not compromised. This section also involves ensuring that the ward to which the patient is to be transferred has been informed and that aftercare instructions are communicated to the patient. The former represents a novel component to routine checklists, and is part of the attempt to ensure efficient and safe patient transfer, while reducing turnover time between one procedure and the next. After the procedure is completed, the checklist is scanned into the central Picture Archiving and Communication System (PACS).

Creating your own checklist

- WHO *Surgical Safety Checklist* can be used as a template for IR checklist.
 - Requirement for Radiology: *Radiologists must assume the responsibility for marking the patient when undertaking invasive procedures that involve laterality.*
- Can be modeled to organization's rules & requirements.
- Must be suited to current environment's demands
- Can be tailored to address the needs of the team

- Ensure systematic, routine implementation**
- Be your own auditor**
 - Constantly reassess checklist
 - Encourage team to highlight deficiencies in checklist
 - Study work processes and identify areas for potential improvement.
- Listen to your team**
 - The utility of a safety checklist will only go as far as your team wants it to go*
- Consider EMR integration**

Where you already have an EMR, uploading your checklist allows for greater, easily accessible documentation

Metrics and Benchmarking

One of the most important aspects of checklist implementation is constant review. The initial checklist was subsequently revised to include a checkbox that would necessitate reviewing prior imaging. Review is not only necessary to ensure that the checklist is consistently updated to reflect changes in team practice, but to also ensure that all members of the team continue to subscribe to the checklist.

To measure success, metrics are essential. Adoption of the checklist could be determined by collecting the number of hospitals using the checklist (nominator) over the number of hospitals (denominator). A reasonable benchmark for adoption would be 80% on year one of the roll out.

Compliance could be measured two-fold. Firstly, collecting the number of patients that had the checklist performed (nominator) over the total number of patients meeting the criteria for the checklist (denominator). Again, a reasonable benchmark would be 80%. Secondly, collecting the number of checklists that are 90% complete (or higher) (nominator) over the total number of checklists started (denominator). The benchmark for this metric would also be 80%.

The metrics and benchmarks listed could also be incorporated into a tool-kit for other hospitals to aid in the roll out of the interventional procedures safety checklist.

Conclusion

Checklists standardize workflow, reducing the potential margin of error. Using safety protocols in procedures also allows the team to focus on more complex tasks intra-operatively. It also assures that patient-centered care is delivered. The complexity of patients necessitates that the system be standardized to ensure that health care practitioners only have to deal with the patient, rather than involve themselves in the complexities of an inadequately managed system¹. Using a checklist empowers the entire team, allowing them to actively participate in patient safety and management. It allows for shared responsibility, and emboldens staff to speak up when patient safety may be compromised. This creates a “culture” of vigilance and shared responsibility, enabling two-way communication between all members of the IR team.

There is widespread acceptance of the use of safety checklists across the globe. As part of the mandate to ensure patient safety, IR teams should consider adopting a similar checklist that reflects their own practices, as well as their organization's policies and procedures, modifying to suit their individual practice.

References:

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2. Lee MJ, Fanelli F, Haage P, Hausegger K, Van Llenden KP. Patient Safety in Interventional Radiology: A CIRSE IR Checklist; CVIR, 35:244-246.
3. Sidhu et al. Image Gently, Step Lightly: Promoting Radiation Safety in Pediatric Interventional Radiology. AJR 2010; 195:W299-W301
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IRPaSS
Interventional Radiology Patient Safety Screening

Radiologist / Fellow / Resident: _____
 Technologist: _____
 Nurse: _____
 PROCEDURE: _____
 Date: _____

PATIENT NAME or LABEL M F
 Last Name: _____
 First Name: _____
 Address: _____

 City / Prov Postal Code
 DOB: _____ Phone: _____
 yyyy/mm/dd

CHECKLIST	Yes	N/A	Nurse/Technologist	Notes / Comments
Patient information				
Name checked				
DOB / Hospital number matched				
Have you checked for				
Allergies/Asthma				
Diabetes				
Heart conditions (High BP, previous MI)				
Renal Failure (Creatinine)				
Liver Disorder				
Blood Thinners (ASA, Coumadin, Plavix)				
INR/Platelets/PTT/Hb				
Pregnancy/LMP				
<input type="checkbox"/> Proceed		<input type="checkbox"/> Postpone/Cancelled		
Procedure Related				
Patient Consent Obtained				
Side marked or checked with Radiologist				
Previous Imaging Reviewed				
Sedatives/Analgesic administered				
Antibiotics Administered				
Pulse, BP, O2 sats monitored				
Post Procedure				
Total Volume of Contrast				
Total Fluoro Time / Total Dose				
Receiving Ward / DSU Informed				
Patient has after-care Instructions				
Biopsy Specimen correctly Labeled and sent off				
Procedure/result explained to patient /MRP				

Adapted from the WHO Surgical Safety Checklist, © World Health Organization, 2008
 Version 01 Aug 2012

Time out for Safety Pause

- Confirm correct patient, name and date of birth
- Confirm procedure
- Correct side and consent
- Any discrepancies- **“STOP”**-Must be resolved before incision