Guidance for Fellows in implementing surgical safety checklists for radiological procedures

Board of the Faculty of Clinical Radiology
The Royal College of Radiologists
Introduction

In January 2009, the National Patient Safety Agency (NPSA) issued an alert supported by the Chief Medical Officer and the Health Minister requiring all healthcare organisations in England and Wales to implement the World Health Organization (WHO) Surgical Safety Checklist by February 2010. This alert followed directly from the publication of a paper in the New England Journal of Medicine which demonstrated a 50% reduction in patient morbidity and mortality after the introduction of a simple pre-procedural checklist — findings that were replicated in a similar study from Holland. These improvements were ascribed in part to improved compliance with perioperative protocols (for example, antibiotic prophylaxis and SpO2 monitoring), although the authors concluded that some of the benefits resulted from improvements in ‘soft skills’ such as team working and collaboration.

The Royal College of Radiologists (RCR) was represented on the NPSA panel issuing the alert, which specifically included all diagnostic and therapeutic image-guided interventions. The NPSA and the RCR subsequently issued an amended version of the WHO Surgical Safety Checklist for use with image-guided interventions (Appendix 1). The NPSA has clearly stated that the guidelines should apply to all patients undergoing procedures under general and local anaesthesia. The intention is to use the checklist when carrying out any diagnostic biopsy or therapeutic procedure within the radiology department. This was based heavily on the version of the checklist for use in operating theatre environments. Thereafter, Fellows expressed concerns about implementing this checklist within a radiology department. As clinical radiologists, we have a duty of care to do no harm to patients and the checklist should be seen as a tool to ensure patient safety and improve clinical practice. The checklist is not intended to replace current good practice, but should facilitate a pause for thought and discussion before carrying out any invasive procedure within the busy working environment of a radiology department. It is essential that staff using the checklist perceive it as part of a wider culture of safety within their department. It is a means to the end of greater patient safety, and not an end in itself. However, the NPSA and the RCR are clear that adaptation of the checklist to suit local needs is to be encouraged.

The purpose of this document is to provide Fellows with updated guidance to the implementation of a surgical safety checklist in their department.

I would like to thank Dr Raman Uberoi and Dr Chris Hammond for their help in producing this document.

Dr Pete Cavanagh
Vice-President, Clinical Radiology
Developing a checklist locally

The checklists used should be relevant and proportionate to the procedures being undertaken and sensitive to departmental geography. Departments should be encouraged to adapt the checklist for the requirements of different practice and different areas within the department. Completion of the checklist before each patient should not be over-burdensome or obstructive to the efficiency of the department, and on the whole should take three to four minutes to complete. For a checklist to be effective, all staff who will be using it need to have ‘bought into’ the concept and understand its effectiveness in improving safety. The secondary benefits of improved team working and communication cannot be overemphasised as drivers of improvements in patient care.

It is advisable, therefore, that radiology departments do the following:

- Educate staff as to the patient safety benefits of the implementation of a safety checklist
- Involve all staff working in the department in collaborative development of a checklist suitable for local deployment
- Have an open and frank discussion about the merits and obstacles of using the checklist
- Be prepared to implement different versions of the checklist in different areas of the department, dependent on the work undertaken there to complement local policies and good practice already in place
- Although patient safety is the responsibility of the whole team, departments should appoint a checklist ‘champion’ in each area of the department to co-ordinate checklist development, implementation and use
- Empower all staff to challenge areas of concern before, during and after procedures
- Audit the use of the checklist in all areas to ensure compliance and correct use of the checklist.

Using the checklist

All staff involved in a procedure must know their role during a particular patient episode. The checklist should be used as a catalyst for a meeting of all team members to discuss the case. Such a meeting is increasingly being demonstrated to add value to the patient episode and is strongly recommended.

It is essential that a member of the team is identified who takes responsibility for ensuring completion of the checklist and this is clearly identified in the local policies. This individual may be medical or non-medical.

Team members completing the checklist should be the same members starting the procedure.

Team members should not swap over during a procedure without a clear handover.

All members of the team should be involved in the discussions about the case at the time of checklist completion. There should be no absentees.

Checklist design

The RCR and NPSA have developed a suggested checklist template for image-guided interventions (Appendix 1). The checks described in this template can act as a guide to the final design of any locally adapted checklist. These checks should, in general, be considered as the minimum to be undertaken, and omissions should only be made after careful consideration.

During checklist design, it is essential that it is clear which checks are to be made, when during the process, where (geographically) within the department and by whom. A record of the completed checklist should be retained ideally either within the patient’s notes or scanned electronically onto the computerised radiology management system.

Examples of locally adapted checklists are given in Appendices 2 and 3.
Suggested specific checks

Before the procedure

- Have all team members introduced themselves by name and role?
  Comment
  This is for the patient to confirm they know what is happening and why. However, it is equally important that the team members confirm these details and an alternative form of words placing the emphasis on the team’s understanding of the proposed procedure may be preferred; for example, ‘Has the patient and all team members confirmed their identity and understand and confirm the procedure to be undertaken?’

- Has the patient confirmed their identity, the procedure, site and consent?

- Are all requirements of The Ionising Radiation (Medical Exposure) Regulations 2000 (IR(M)ER)\textsuperscript{5} met?
  Comment
  Clearly these checks need to be undertaken for any procedure using ionising radiation; that is, the possibility of pregnancy, current vetted request form and so on.

- Is the procedural site marked?
  Comment
  The fundamental principle is that the correct target lesion is treated. If site marking is not used, the target side and site and access point(s) should be explicitly discussed and agreed during the checklist completion so that all members of the team can confirm the details. For local adaptation, team members may wish to use ‘Has the team confirmed the procedure site?’

  If the target organ or access site is to be chosen intra-procedurally (for example, which kidney to drain in bilateral hydronephrosis), this fact should also be explicitly discussed and agreed during checklist completion.

  The sole reliance on intra-procedural imaging to guide intervention without prior discussion of target site (or of discussion that this site will be chosen intra-procedurally) represents poor practice and places patients at risk. There are many examples of wrong side intervention despite imaging findings, especially where the pathology is bilateral.

- Is the monitoring equipment check complete?
  Comment
  Monitoring equipment, especially pulse oximetry, should be regularly checked, known to be working and used on all patients, especially those who are sedated or elderly. All staff should understand the limitations of pulse oximetry.

- Is the anaesthetic machine/anaesthetic monitoring equipment and medication check complete?

- What is the patient’s American Society of Anesthesiologists (ASA) grade?

- Is there a difficult airway or aspiration risk?

- Are there any anaesthetic concerns?
  Comment
  Questions about anaesthesia or sedation could be split off into a separate section for use only if these are undertaken.
• Does the patient have a known allergy?
• Is there an anticipated risk of >500 ml blood loss?

Comment

The purpose of this question is to ensure that for high-risk procedures, intravascular (IV) access and fluid and/or blood resuscitative agents are available.

• Have risk factors for bleeding and renal failure been checked?

Comment

Take action where appropriate.

• Is the required equipment available?
• Has reusable equipment been adequately sterilised?
• Are there any equipment issues or concerns?

Comment

Imaging equipment function, calibration, dose and image quality issues could be discussed here. The availability of stock and specially ordered disposables should be checked pre-procedure to ensure the procedure can be completed.

• Are there any critical steps the team should be aware of?
• Has appropriate antibiotic prophylaxis been prescribed?

Comment

Where antibiotics are appropriate, it should be recorded whether they have been given within 60 minutes of the procedure starting. Other peri-procedural medication prescriptions could also be discussed here; for example, analgesics, antispasmodics, anticoagulants, patient-controlled analgesia prescriptions and so on.

• Is glycaemic control adequate?
• Does the patient need intra-procedural warming?
• Has venous thromboembolism (VTE) prophylaxis been undertaken?
• Has all essential imaging been reviewed?

Comment

Will it be available intra-procedurally if necessary?

After the procedure

A short team debrief at the end should be seen as an opportunity to carry out a discussion on the positives and negatives of the procedure to help improve future practice.

• Has the procedure note been completed?

Comment

This should include the name and side of the procedure.

• Have all guide wires and catheters been accounted for?

Comment

Fellows may feel this question superfluous for percutaneous procedures where there is no wound for devices to be misplaced into. However, for joint procedures with surgical colleagues, it is vital that a device and swab count is made and is correct.

• Have any implanted devices been recorded?

Comment

For complex devices, this should be recorded in the patient’s notes as well as within the department. Part and lot numbers should be recorded in a manner that can easily be retrieved. A computerised system is preferable to paper ledger.
• Have any equipment problems been identified that need to be addressed?

Comment

Will this affect the next patient on the list? Any serious incidents or device failure should be communicated to the trust governance teams and Medicines and Healthcare products Regulatory Agency (MHRA).

• Have instructions for post-procedural care been clearly documented?

Comment

If post-procedural care instructions are detailed on a protocol document, this must be clearly stated and the protocol attached to the procedure note. The instructions in the protocol document must be clear and precise.

Further comments

Records of checklist completion and audit (the audit standard and an audit template are available on the RCR website; www.rcr.ac.uk/CRauditlive).

In theory, the checklist should act as a catalyst to improved communication, teamwork and patient safety. The presence of a completed checklist in the patient’s record (or on an electronic radiology database), does not of itself guarantee safety if the culture of the department does not embrace the ethos of teamwork, collaboration and safety that the checklist is designed to foster.

In practice, the recording of checklist completion aids in audit and helps in the assessment of safety culture at a departmental (rather than patient-by-patient) level. Moreover, hospital trust insurance schemes and remuneration may be partially reliant on evidence of checklist completion for a given percentage of invasive procedures.

It is, therefore, recommended that arrangements are made for completed checklists to be scanned onto the radiology results server where possible. If this is not possible, a specific note should be made in the procedure report commenting on checklist completion.

Audits of compliance with checklist completion should occur annually. An administrative staff member can be assigned to data collection for these audits.

Audits of outcomes and complications, attended by all members of the team, are also an essential element of any patient safety system: please refer to the relevant RCR audit guideline (www.rcr.ac.uk/CRauditlive).

Sole practitioners

Where a Fellow is undertaking procedures alone (usually relatively minor image-guided interventions such as fine-needle aspiration [FNA]), the formal completion and scanning of a checklist for each patient might appear over-burdensome and perverse. However, the RCR recommends that sole practitioners run through the checklist (ideally locally adapted) before each intervention and record that they have done so in the procedure report. A suggested form of words is ‘pre-procedural checks completed in line with RCR/NPSA recommendations’.

Workload

It is important to acknowledge that the introduction of the safe surgery checklist will require additional consultant, nurse and radiographer time and this must be recognised in job plans.

Approved by the Board of the Faculty of Clinical Radiology: 1 November 2012
References


Appendix 1. The RCR/NPSA checklist
Appendix 2. Example of a locally adapted checklist

### Checklist 1
In procedure room prior to patient being brought in

<table>
<thead>
<tr>
<th>Item</th>
<th>Yes</th>
<th>No/No A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have all team members introduced themselves by name and role</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All team members to confirm:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What is the patient's name</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What procedure is planned</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What equipment and devices are required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What patient and room positioning is needed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procedure site clearly identified</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consent documentation complete</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aware of patient's allergies</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All team members to check:
- Has imaging been reviewed
- Are IRMER requirements met
- Is there appropriate IV access
- Is glycemic control adequate
- Is patient warming adequate
- Have all necessary drugs been prescribed and given (eg antibiotics, analgesia, PCA)

Have steps to preserve renal function been initiated (preparation, CO2 angiography, hydration changes etc)

Have steps to prevent excessive blood loss been initiated (HF & peds check, PFP, anticoagulants etc)

Is there an infection risk

Are there any anticipated difficulties

Are there any questions

### Checklist 2
For GA, sedation or regional anaesthesia cases

<table>
<thead>
<tr>
<th>Item</th>
<th>Yes</th>
<th>No/No A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaesthetist / sedationist to check</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is all necessary anaesthetic equipment available and checked</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is all required monitoring in place</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are appropriate drugs available</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are blood and other resuscitative agents available if needed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has an appropriate discharge destination been confirmed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there any anaesthetic issues</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Checklist 3
Before patient leaves the angiography suite

<table>
<thead>
<tr>
<th>Item</th>
<th>Yes</th>
<th>No/No A</th>
</tr>
</thead>
<tbody>
<tr>
<td>All team members to check:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implanted devices recorded</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specimens correctly labelled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post procedural care clearly understood</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have items of stock running low (&lt;2 remaining)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>been reordered urgently</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there equipment or procedural problems that need follow-up</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does this procedure require a team debrief</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To address procedural or staffing issues that have gone particularly well or poorly

Now scan this form onto CRIS

### Patient details (or CRIS sticker)

<table>
<thead>
<tr>
<th>Field</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td></td>
</tr>
<tr>
<td>DoB</td>
<td></td>
</tr>
<tr>
<td>ID number</td>
<td></td>
</tr>
<tr>
<td>Procedure date</td>
<td></td>
</tr>
</tbody>
</table>

Checklist for complex interventions - version 3. Amended September 2011
Appendix 3. Example of a locally adapted checklist

**SIGN IN radiologist/operator**
- Team members introduce themselves by name and role
- Patient identification
- Check not on anticoagulants, no clotting disorder.
- Essential imaging available and reviewed
- Team briefing including procedure, specific concerns, critical and unexpected events
- Equipment available & in date
- Symptomatic site & procedure site confirmed

**SIGN IN radiographer/RA**
- Patient identification
- Procedure checked with radiologist
- Procedure entered onto CRIS
- Consent form read understood and signed

**PROCEDURE**

**SIGN OUT radiologist/operator**
- Procedure name & side recorded on JCIS/CRIS
- Specimen properly labelled. Check side labelling
- Implanted devices recorded on JCIS and CRIS eg coils, clips
- Tissue bank consent stamped on path form where appropriate
- Correct clinical codes entered on white sheet

**SIGN OUT radiographer/RA**
- XR/US equipment problems identified & addressed
- Correct codes entered on CRIS
- Patient has received after care advice and instructions

**Note:** This checklist contains the core content for England & Wales. **USE IT FOR EVERY PATIENT WHERE CONSENT IS OBTAINED**

The operating radiologist must stamp the patient's consent form with the **RED STAMP**. The radiologist, radiographer and nurse must then sign it for each case, to show this checklist has been completed.

For guidance please see overleaf.
Checklist explanatory notes:

The main radiologist/operator is responsible for confirming that the process has been undertaken satisfactorily followed by stamping and signing the consent form.

TEAM BRIEF before the procedure, led by the main radiologists in Assessment or 1 stop clinic
The team brief should be carried out with all team members present (radiologist, radiographer and nurse). It can be done wherever is appropriate to the interventional setting. However, it is not intended to be conducted over the patient. Introductions need only be carried out once at the beginning of a list. However at times of list, room or personnel changes introductions must be carried out each time a change happens.

• SIGN IN PATIENT before the procedure, led by the main radiologist
The radiologist, radiographer and/or radiographic assistant are responsible for the respective sign in checks. Ultimate responsibility for this checking process remains with the main radiologist. They may delegate this and the extended briefing to an appropriate member of the team but they must be familiar with the patient and the procedure plan.

• SIGN OUT before patient leaving the room, led by the main radiologist
When the radiologist completes the procedure he or she will also run through the checklist to ensure that specimens are properly labelled, any equipment problems are recorded, the correct clinical code(s) are applied to the case and whether there are any specific after care instructions. The radiographer will identify and address any X-ray equipment problems. They will also ensure that the patient has received after care advice, for inpatients this must be documented in the patients’ case notes.

Then having done this, the radiologist uses the red stamp on the consent form and the radiologist, radiographer/radiographic assistant must then sign it to confirm completion of the safety checklist.