Interventional Radiology ‘Simulation Day’

Outline of this quality storyboard:

**Why** did we conduct a simulation day?
**Why** should your department?
**How** did we conduct a simulation day?
**How** can you?
Introduction

• Team training for individuals of differing backgrounds is key to improving communication and patient safety.

• Simulation of scenarios allows each group to understand the skills and perspectives of each group.

• Our division wanted to improve team communication and the ability to manage rare life threatening scenarios.

Team Based Training is Paramount

Must avoid the ‘silo’ mentality of physicians, nurses, technologists only performing their perceived role.

Safety is more than identifying the correct patient, procedure, equipment and operator.
IR is different than Surgery

- Interventional radiology functions as a standalone short procedure unit with its own intake, procedure rooms staffed by radiologic technologists and ICU trained nurses, and a recovery room.
- Most procedures are performed in IR without the presence of an anesthesiologist.
- There is approximately a 50/50 mix of inpatient and outpatient procedures.
- Our staff consists of 12 IR attendings, 5 IR fellows, 2 rotating radiology residents, 2 nurse practitioners, 3 physicians assistants, nurses, radiologic technologists, and registrars. Our nurses rotate to cover procedure rooms and the recovery room where both intake and recovery are performed.

Key Steps to Planning

1. Determine the key players in your department.
2. Identify areas of weakness.
3. Identify the optimal location for the event.
4. Implement the program.
Step 1: Key Players

- All disciplines involved in patient care should be included in planning.
  - This allows each group to be represented in the event.
- By keeping each care group engaged in the event they will learn from their experience and improve the way they deliver clinical care to patients.
Step 2: Identify Weakness

THIS IS THE MOST IMPORTANT COMPONENT!

- Have you observed communication breakdown among team members that has affected patient care?
- Are there gaps in the knowledge of your team to optimally manage your patients?
- Are there identifiable infrastructure barriers?
- Do you have optimal personnel?
- Are there physical barriers to implementation of optimal patient care?
- Do you have enough space or appropriate allocation of materials throughout the space?

Goals of Interventional Radiology Simulation

Knowledge
Clinical Management

Technical performance
Skills

Workflow improvement
Communication

Team communication
Silo Mentality
The Cornell Experience

The focus of our simulation was based on failures of communication.

- Sidedness
- Interdisciplinary communication/awareness
- High stress situations (i.e. Code)

Step 3: Location

**IN SITU**
- ADVANTAGES
  - Known environment
  - Potentially identify system/infrastructure issues
- DISADVANTAGES
  - Lost cost of closing procedure rooms
  - Lack of observation area
  - Need to introduce video equipment

**SIM CENTER**
- ADVANTAGES
  - Prepared for simulation
  - Observation areas and video ready
- DISADVANTAGES
  - Foreign environment
  - Unrealistic
  - High direct cost
IR has Unique Needs, Situations and Equipment

- Angiography systems and additional in room equipment have a large physical presence in the procedure room.
- Radiation safety during emergencies can frequently be forgotten.

Unique NYC issues

- Adapt the simulation to your department and goals and weaknesses.
- We have a long hallway making communication from one procedure room to the recovery room challenging.
- This is an issue in day to day work, so we used it in simulation.
- Urban Real Estate Realities: Smaller rooms Suboptimal layout
Step 4: Program Implementation

- Regularly scheduled Simulation Day Committee planning meetings.
- Each representative must be engaged in planning to make sure their group is engaged in the event.
- Components to plan and coordinate:
  - Structure of the day
  - Assign individuals to simulation or “work”
  - Design cases and create supporting documentation
  - Trial simulation
  - Determine debrief questions

Simulation Day Workflow

- Educate the participants with an introductory lecture.
- Educate participants on limitations of simulation and equipment.
- Divide into groups for simulation or clinical work.

Planning Team Members:
- Moderate or observe
- Record Data
- Lead Debrief Sessions
Assign all participants their roles

<table>
<thead>
<tr>
<th>TIME</th>
<th>SIMULATION ROOM 1</th>
<th>SIMULATION ROOM 2</th>
<th>WORK</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00-10:10</td>
<td>Group Aa – Scenario</td>
<td>Group Ba – Scenario</td>
<td>Group Ca – Angio 1</td>
</tr>
<tr>
<td></td>
<td>Group Ab – Observation</td>
<td>Group Bb – Observation</td>
<td>Group Cb – CT</td>
</tr>
<tr>
<td>10:20-11:30</td>
<td>Group Ca – Scenario</td>
<td>Group Aa – Scenario</td>
<td>Group Ba – Angio 1</td>
</tr>
<tr>
<td></td>
<td>Group Cb – Observation</td>
<td>Group Ab – Observation</td>
<td>Group Bb – CT</td>
</tr>
<tr>
<td>11:40-12:50</td>
<td>Group Ba – Scenario</td>
<td>Group Ca – Scenario</td>
<td>Group Aa – Angio 1</td>
</tr>
<tr>
<td></td>
<td>Group Bb – Observation</td>
<td>Group Cb – Observation</td>
<td>Group Ab – CT</td>
</tr>
</tbody>
</table>

How to design cases?

Choose realistic representations of your cases, workload and experiences based on local need:
- Involve all team members
- Unplanned excursions that mimic real life events
- Poor handoffs
- Unexpected patient reactions
- Changes in medical status

Script as much as possible:
- Extensive attention to realism and detail
- Including necessary equipment and imaging
A realistic simulation in progress

Well-developed cases: Case #1
Percutaneous nephrostomy (ED patient)

Designed with:
- Poor handoff from the ED
- Wrong side on handoff, where/how would this be caught?
- Abrupt change in clinical status, open ended
  Evaluate the team’s differential diagnosis and response
Well-developed cases: Case #2
Iliac stenting for peripheral vascular disease (outpatient)

KSIC, 2012

Designed with:
- Inadequate catheters/equipment unless requested
- Abrupt change in clinical status, resulting in a code
- Evaluate the team’s differential diagnosis and response

What do you need to develop for each case?

Patient Data:
- History
- Labs / Vitals / Allergies
- Pre-procedure Imaging
- Equipment List
- Requisitions/Consent Forms/H&P
- Intra-procedure imaging

Make a flowchart for each case based on team decisions.
Interventional Radiology Simulation Day: A Quality Storyboard

60 year old male with history of HTN/DM/ESRD with RLE claudication and high grade stenosis on MRA. Plan for RLE angiogram, possible angioplasty and possible stenting.

Unrevealed history:
- Right iliac stenosis
- Vitals: Temp 97.6°F, BP 148/88 HR 87 bpm, RR 20 Pulse Ox 99% RA
- Labs: WBC 9.3, Hgb 13.6, Hct 40.8, Pt 250 Na 145 K 5.8, Cl 105, CO2 22, BUN 6, Cr 1.0 Glucose 69, PT 12.5, INR 1.1, oPTT 34.4
- Allergies – NKDA
- ABI Right 0.6, ABI Left 0.9

Following iliac artery angioplasty, the iliac artery ruptures resulting in the patient becoming hypotensive and tachycardic.

1. IVF resuscitation
2. Crash cart accessibility
3. Airway protection
4. Clear obstacles for resuscitation
Debrief is where the learning occurs

This should be lead by moderators. This is as or more important than the cases themselves.

**Ground rules for a debriefing:**
- A supportive environment where each individual can feel valued, respected and free to learn without fear of judgment.
- Each participant should share experiences in a frank, open and honest manner.
- Respect the vulnerability of others when making comments.
- Honor confidentiality.
- Speak for oneself and not for others.

Sample debriefing questions

- How do you feel the scenario went?
- Are there areas which could be improved?
- Did you feel your prior experience adequately prepared you for this?
- Can you identify specific weaknesses?
- Did this experience increase awareness of gaps in your own knowledge?
- What changes would you make based on this experience?
- Did you feel that the perceived organizational hierarchy prevented you from voicing your concerns?
- Did each team member treat one another with respect?
- Is there anything we can do as a division with regard to updating/creating protocols, improvements to our work environment that could help avoid this situation in the future?
Barriers to Implementation

TIME
Planning a simulation event for multiple disciplines requires dedicated time from all parties to participate in planning meetings.

DEPARTMENTAL BUY-IN
Administrative approval is necessary to close a department or reduce clinical volume.

PARTICIPANT BUY-IN
The participants need to believe that this is simulated reality in order for the event to be successful.

Observe Case performance - metrics

Nephrostomy:
- Wrong side Identification
- Hypotension differential
- Antibiotic Choices

Iliac stent:
- Equipment Selected
- Code procedure
- Radiation Safety
Evaluation Methods and Results

Likert Scale pre/post survey:  
42 participants  
11 questions  
Well Received

Debriefing sessions:  
VERY well received  
Mapped to the ACGME Six Core Competencies

How comfortable are you in voicing your concerns within the healthcare team?

Average comfort level pre 3.7  
Average comfort level post 4.3

Adding ancillary activities

Once the day is set aside for a division wide activity, additional activities can be included:  
Vendor demonstrations  
New product in-service  
Medical student / Resident training

In our simulation day, time for nurses and technologists to practice with items such as filters and balloons was particularly well received.
Simulation Day Improvements

Learn from each iteration, Improve your department.

We identified issues with emergency situations.

*Improved team support during ‘all hands on deck’ situations creating a local RRT system.*