

HOW TO DESIGN A SIMULATION TEAM TRAINING PROGRAM

A HANDS-ON AND PERSONAL
EXPERIENCE GUIDE BY
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INTRODUCTION

EDUCATION AND TRAINING IS CRITICAL

INTERPROFESSIONAL EDUCATION AND training is critical to improving communication among members of the clinical care team that come from “silos” of clinical training and do not overlap. Lack of teamwork and communication among members of the care team are the leading contributors to adverse events, which can be reduced by improving the ways in which teams function.

Simulation of scenarios allows the members of the team to understand each other’s perspective and skills, improve communication and identify shared goals to ultimately improve quality and safety of medical care.

ALTHOUGH SIMULATION HAS been popular in surgical skills training, Radiologists and Interventional Radiologists are just now beginning to incorporate simulation into clinical education driven by recent technological advances that have allowed for more accurate simulation of endovascular procedures.

With the approval of the upcoming Interventional Radiology residency program in USA, simula-

tion-based training will be even more important for graduated responsibility and education of trainees in this field.

Since Interventional Radiology sections are frequently organized as self-contained procedural areas that include preprocedure intake, procedures and post procedure monitoring, education of multiple disciplines is important for patient care and safety in addition to technical procedural training for physicians.

“I am humbled by the positive reaction by members of our division following their participation in Sim Day and how it has positively impacted our communication and care goals on a daily basis.”

The Author

DR. WINOKUR is an Interventional Radiologist with a special interest in improving patient safety through interdisciplinary teamwork. The remainder of this white paper details his experience in creating an interdisciplinary simulation day involving their entire interventional radiology division resulting in an exceptional learning experience for all involved: physicians, nurses, and radiology technologists.



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KEY STEPS TO BUILDING
A SIMULATION PROGRAM

There are 4 critical steps to develop a successful simulation curriculum for multidisciplinary education.

STEP 1: DETERMINE THE KEY PLAYERS IN THE CLINICAL CARE TEAM

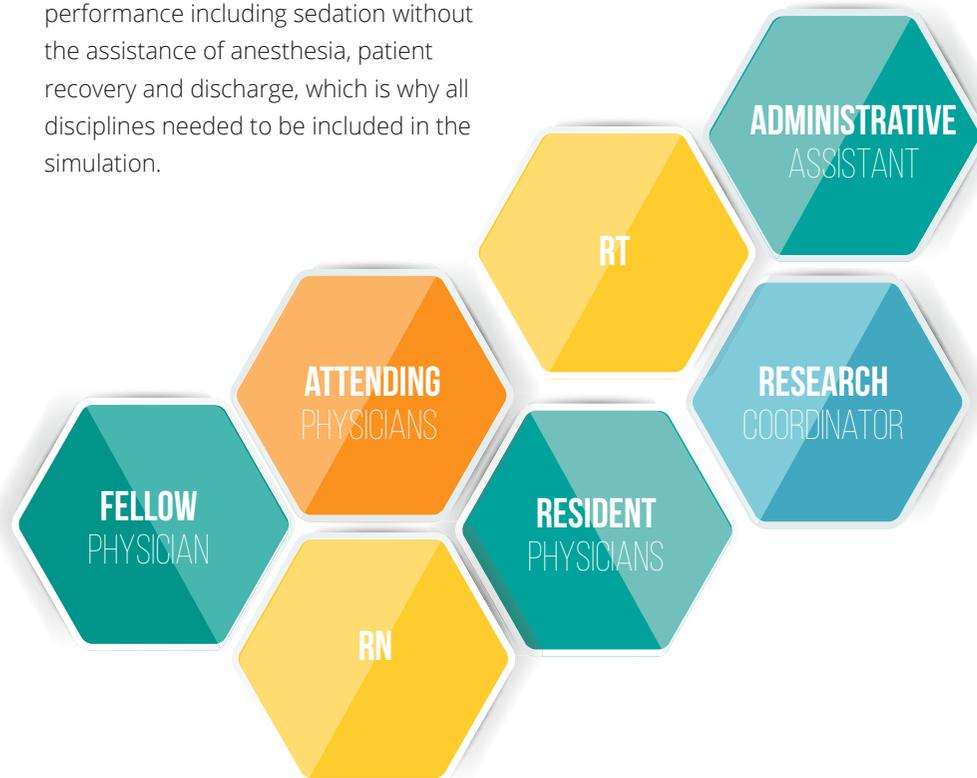
Involvement of each discipline

All members involved in the clinical care of patients in your normal routine workday should have representation in the planning phases of the simulation program and should be involved in the training event. Involvement of each discipline in the planning stage will allow the simulation event to have components targeted towards each participant. 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.

IN OUR PLANNING TEAM, WE INCLUDED:

- 2 IR attending physicians
- 2 radiology resident physicians
- 1 IR fellow physicians
- 1 RN
- 1 RT
- 1 research coordinator
- 1 administrative assistant

IN INTERVENTIONAL RADIOLOGY, we are a stand-alone unit that performs patient registration, patient intake, procedural performance including sedation without the assistance of anesthesia, patient recovery and discharge, which is why all disciplines needed to be included in the simulation.



“ALL DISCIPLINES NEEDED TO BE INCLUDED IN THE SIMULATION.”

STEP 2: IDENTIFY AREAS OF WEAKNESS

ONCE THE PLANNING committee has been formed, it is important for each committee member to self-reflect on their individual and group performance caring for patients. This will allow each group member to identify areas of weakness within their discipline or during interactions with other disciplines. These areas of weakness will become the central component of planning the remainder of the event since it will dictate the ultimate goal.

This is the most important component of planning!

THE FOCUS OF the simulation event should be based on a local need.

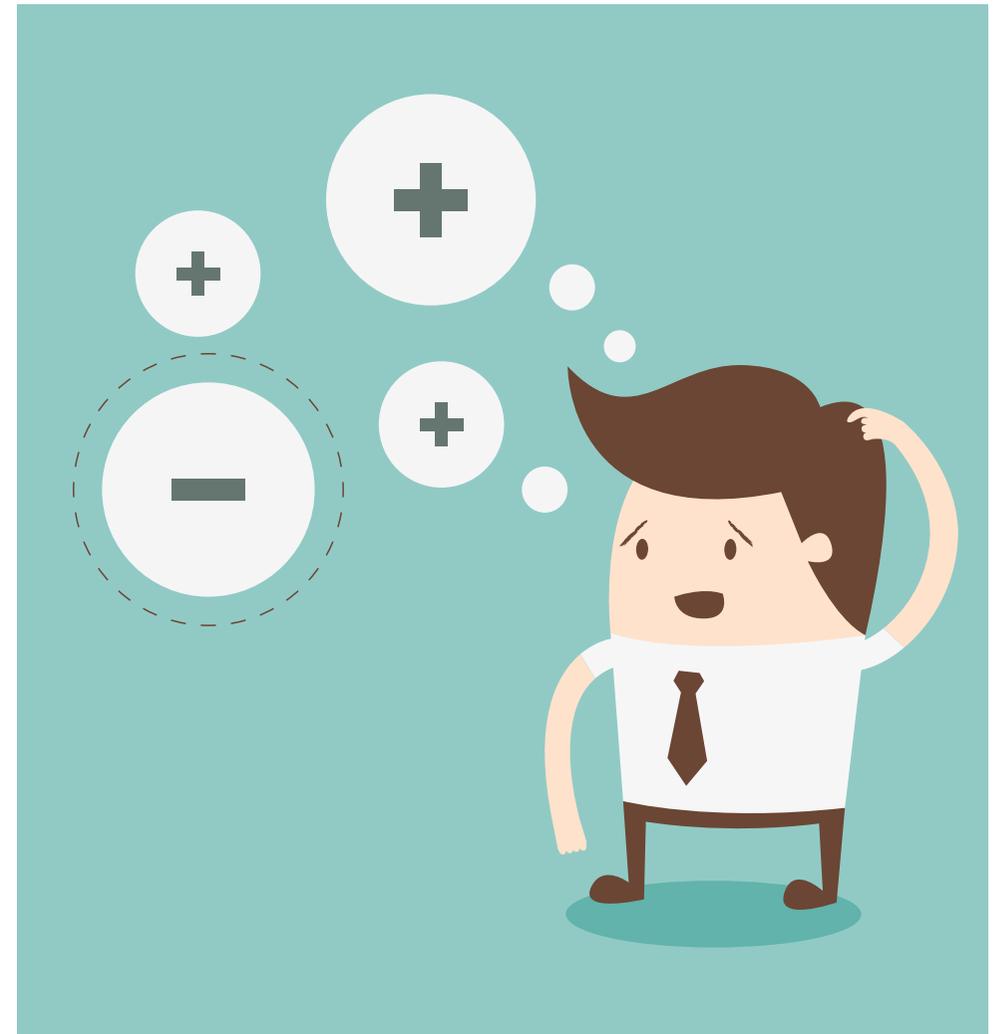
In order to identify areas of need, one should ask the following questions about one's section:

- 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?

THE FOCUS OF our simulation event was on barriers to effective communication among members of our division, which was highlighted by 2 different scenarios. In one scenario, there was an incorrect handoff of sidedness between trainees. The other scenario tested the communication of the team members in a high stress "code" situation resulting from a vessel rupture during a procedure.

"THE FOCUS SHOULD BE BASED ON A LOCAL NEED."



STEP 3: IDENTIFY THE OPTIMAL LOCATION FOR YOUR TEAM-BASED SIMULATION TRAINING

SIMULATIONS CAN BE performed in a multitude of settings, each with advantages and disadvantages. Many institutions have surgical simulation centers which allow for video recording from all angles, realistic operating suites and simulation mannequins to create a false reality. However, the simulated operating room does not mimic all “real world” work spaces or scenarios. Running a simulation event in a “work” area is extremely challenging logistically but allows the team to function in their usual surroundings. This will allow the participants to suspend reality more easily and potentially identify issues that can be fixed to improve patient safety and/or patient care.

SURGICAL SIMULATION CENTERS are typically under the administration of the surgery department. For proceduralists, who are not part of the surgery department, there can be scheduling and cost barriers to utilizing these centers.



ADVANTAGES

- Known environment
- Potentially identify system/infrastructure issues

DISADVANTAGES

- Lost cost of closing procedure rooms
- Lack of observation area
- Need to introduce video equipment



ADVANTAGES

- Prepared for simulation
- Observation areas and video ready

DISADVANTAGES

- Foreign environment
- Unrealistic
- High direct cost

“MANY MEMBERS OF THE TEAM WERE **UNAWARE** OF ITS EXISTENCE.”

By performing our simulation event in situ within the IR section, we identified that the emergency pull cord in the procedure room was not accessible (behind other equipment) and many members of the team were unaware of its existence. As a result of this experience, we have now created an interventional radiology-specific rapid response team (IR-RRT) to respond in cases of emergency when more staff is needed with a designated method of contact..

STEP 4: PROGRAM IMPLEMENTATION

ONE OF THE biggest barriers to a successful educational program is implementing a good idea. Following the first 3 steps will help gain momentum in achieving a successfully implemented program, although each member of the team will need to be a motivated participant. Regularly scheduled planning committee meetings, detailed design of the procedure day, detailed case design and debrief planning will help the day run smoothly and create an atmosphere of interest and education. Each member of the planning committee needs to be encouraged to be the “champion” for their discipline and voice of their group.

OUR PLANNING COMMITTEE met twice monthly for 4 months and weekly for 2 months to complete all components of the program, which included:

- Designing the structure of the day
- Assigning individuals rotations to participate in simulation, observe simulation or perform clinical duties
- Designing cases and creating all supporting documentation
- Testing the cases with a trial simulation

- A trial simulation event will allow the planning committee to identify gaps in the case design and make sure that the final event runs smoothly
- Determine debrief questions

Details of simulation day design

There are several key components to the design of a simulation event to achieve the goal of improving team member education and communication. In addition to preparing cases to simulate reality, assignments of each individual throughout the day and the post-simulation debrief must be planned.

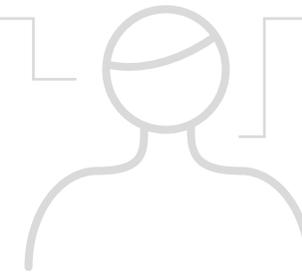
Case Development

Based on the previously identified areas of need or local weakness, the cases should be designed to highlight this learning goal. Case design requires all aspects of a “real” patient encounter to be recreated for the learner including chart notes, laboratory studies, and imaging studies. Each case should have a known goal and reproducible endpoint. The program planning committee will act as moderators for the simulation event and should be provided with a checklist of items that the team must perform adequately.

“EACH CASE SHOULD HAVE A KNOWN GOAL AND REPRODUCIBLE ENDPOINT.”

Unrevealed history:

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



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.

CASE

1. IVF RESUSCITATION
2. CRASH CART ACCESSIBILITY
3. AIRWAY PROTECTION
4. CLEAR OBSTACLES FOR RESUSCITATION

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

CODE

In order to evaluate and improve hand-off between team members as the focus of our simulation event, we created a scenario that included an inappropriate handoff of a wrong-sided procedure.

In our other case scenario that included a code situation, the case ultimately ended in a code regardless of team performance.

Program Planning and Implementation

When planning the logistics of the simulation day event, every member of the department who you would like to be involved in the simulation day event must be accounted for at all times. If the event is to be performed during regular business hours, in situ or at a simulation center, the staff must be assigned to clinical work as well as simulation. Since simulation is not natural for most participants, an orientation to case simulation should be included at the start of the event to teach individuals about appropriate behavior for simulation and methods to improve group learning.

On the right is a sample chart of rotating groups for simulation and continued

departmental operations during our simulation day event.

Debrief Design

Debrief, which consists of a time for the participants to discuss their performance on the simulated case, needs to be included in the time allocated for each case. People learn from reflecting on their experience and identifying what each individual learned about themselves and others more than the experience itself. During orientation, it is important to inform the participants of the ground rules of debrief to allow for maximum learning, which include:

- 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.
- Immediate debrief should be structured with preplanned questions to probe the team and question their abilities to communicate effectively.



TIME	SIMULATION ROOM 1	SIMULATION ROOM 2	WORK
9:00-10:10	Group Aa – Scenario Group Ab – Observation	Group Ba – Scenario Group Bb – Observation	Group Ca – Angio 1 Group Cb – CT
10:20-11:30	Group Ca – Scenario Group Cb – Observation	Group Aa – Scenario Group Ab – Observation	Group Ba – Angio 1 Group Bb – CT
11:40-12:50	Group Ba – Scenario Group Bb – Observation	Group Ca – Scenario Group Cb – Observation	Group Aa – Angio 1 Group Ab – CT

Sample chart of rotating groups for simulation

Debrief Questions

1. How do you feel the scenario went?
2. Are there areas which could be improved?
3. Did you feel your prior experience adequately prepared you for this?
4. Can you identify specific weaknesses?
5. Did this experience increase awareness of gaps in your own knowledge?
6. What changes would you make based on this experience?
7. Did you feel that the perceived organizational hierarchy prevented you from voicing your concerns?
8. Did each team member treat one another with respect?
9. 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?

What we learned and mistakes to avoid

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.

TAKE HOME POINTS

1. The focus of the simulation event should be based on a local need
2. Interdisciplinary simulation event planning requires input from all members of the clinical care team
3. An appropriate amount of time should be set aside for planning the event
4. A simulated reality can be achieved

in multiple settings and it is key to assess the best site to achieve the desired goal

5. The simulation event will not be successful without administration buy-in for financial and time support
6. The gains in team communication are well worth the lost revenue
7. The most meaningful part of running simulation is the debrief
8. Do not be dissuaded from pursuing the event by negative perceptions about simulation
9. Envision planning this event as a challenge to improve departmental communication and, ultimately, the quality and safety of patient care!

“PLANNING A SIMULATION EVENT FOR MULTIPLE DISCIPLINES REQUIRES DEDICATED TIME.”

WHAT DID THE PARTICIPANTS THINK ABOUT THE TEAM TRAINING EVENT?

Quotes from participants of our event.

"Simulation was a great tool for all members of the healthcare team. It allowed us to learn from one another and talk about ways to provide better quality and compassionate care for our patients."

Bradley Pua, M.D.

"Simulation day showed me that technologists, nurses and physicians have similar goals. Together, we can optimize the safety of our patients."

Ellen Bridges, RN

"Was very cynical pre; I am now a believer in the simulation of situations."

Thomas Sos, M.D.

"Before the simulation training, as a technologist, it was easy for me to think that if anything goes wrong during a procedure, the attending physician would automatically assume the leadership role and dispense the orders that are to be carried out. However, because of the simulation training, I realized that each person must assume a position of leadership and take ownership of their role and function. The importance of simulation-based teamwork training is incontestable."

Jimmy Ng, RT

ABOUT MENTICE

WE BELIEVE IN CHANGING THE PARADIGM FOR IMPROVEMENT IN HEALTHCARE

FOUNDED IN 1999, Mentice is the world leader in endovascular medical simulation, providing qualified solutions for training and assessment of medical professionals. With a focus on minimally invasive techniques and procedures, Mentice enables training in a realistic, risk-free environment.

MENTICE INTRODUCED THE world's first endovascular simulator in 2001 – the VIST® – and has since been the market leader with the world's largest install base of simulators for endovascular intervention.

MENTICE SIMULATORS ARE the most validated endovascular training systems. The advantages are well documented and include, enhancing clinical performance, reducing cost, and, ultimately, Improving Patient Safety.



Medical Simulation Versatility

Mentice VIST® simulators provide, due to their flexibility, an ideal simulation solution, which covers mobile and stationary setups, individual and team training, from learning to assessment, from basic motor skills to procedural competence – all in an individually customizable set of procedural modules.

VIST® Simulation Systems

The VIST®-Lab and the VIST® G5 systems share unique advantages in terms of the highest fidelity, clinical realism and use of actual clinical devices.



Full body mannequin, with (removable) 2 Virtual Reality simulators, adjustable table, four screens (one touch screen) — **VIST® LAB.**

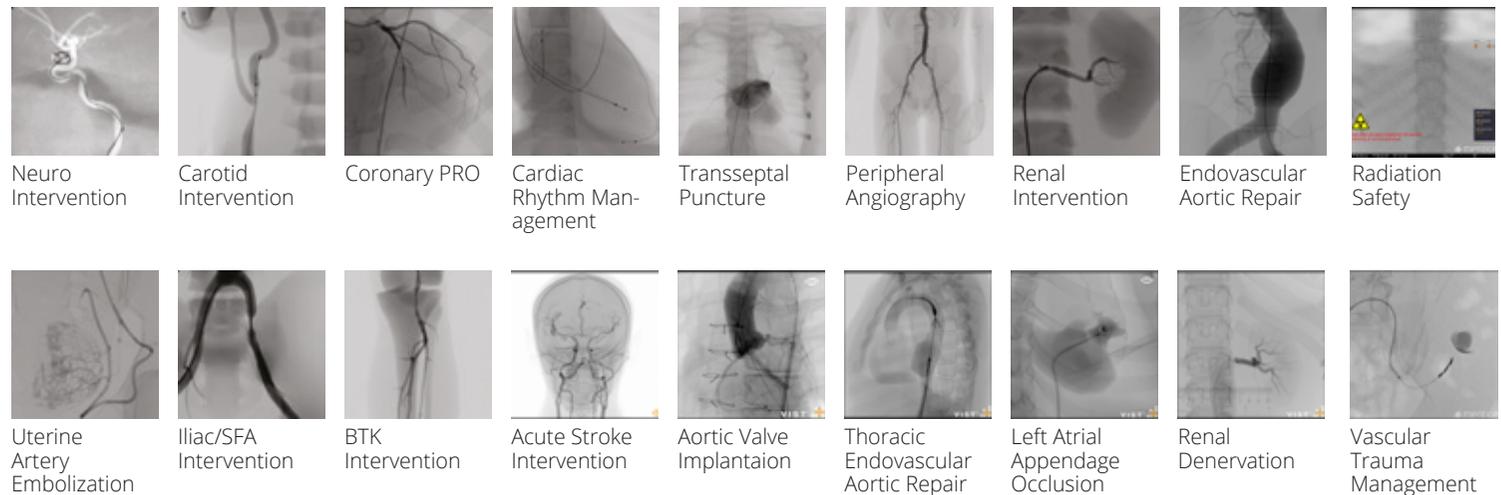
Virtual Reality simulator with laptop and extra screen — **VIST® G5.**

MOBILITY: Mentice simulators are available in a stationary (VIST®-Lab) and a portable (VIST® G5) setup. This provides an unmatched versatility covering any kind of training setup (see next page).

MODULE CHOICES: Customers can choose from a large number of endovascular modules covering all endovascular specialties: radiology, cardiology, vascular surgery, cardiovascular surgery, neuroradiology, electrophysiology, oncology - with new modules being added all the time.

VIST® Training Modules

A structured and comprehensive suite of modules with clearly defined learning objectives, giving trainees exposure to a wide range of patient scenarios and anatomical variations.



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