KEEPING IT REAL: THE BENEFITS OF USING STANDARDIZED PATIENTS AND HIGH FIDELITY SIMULATIONS IN IN-SITU CONTRAST REACTION MANAGEMENT TRAINING

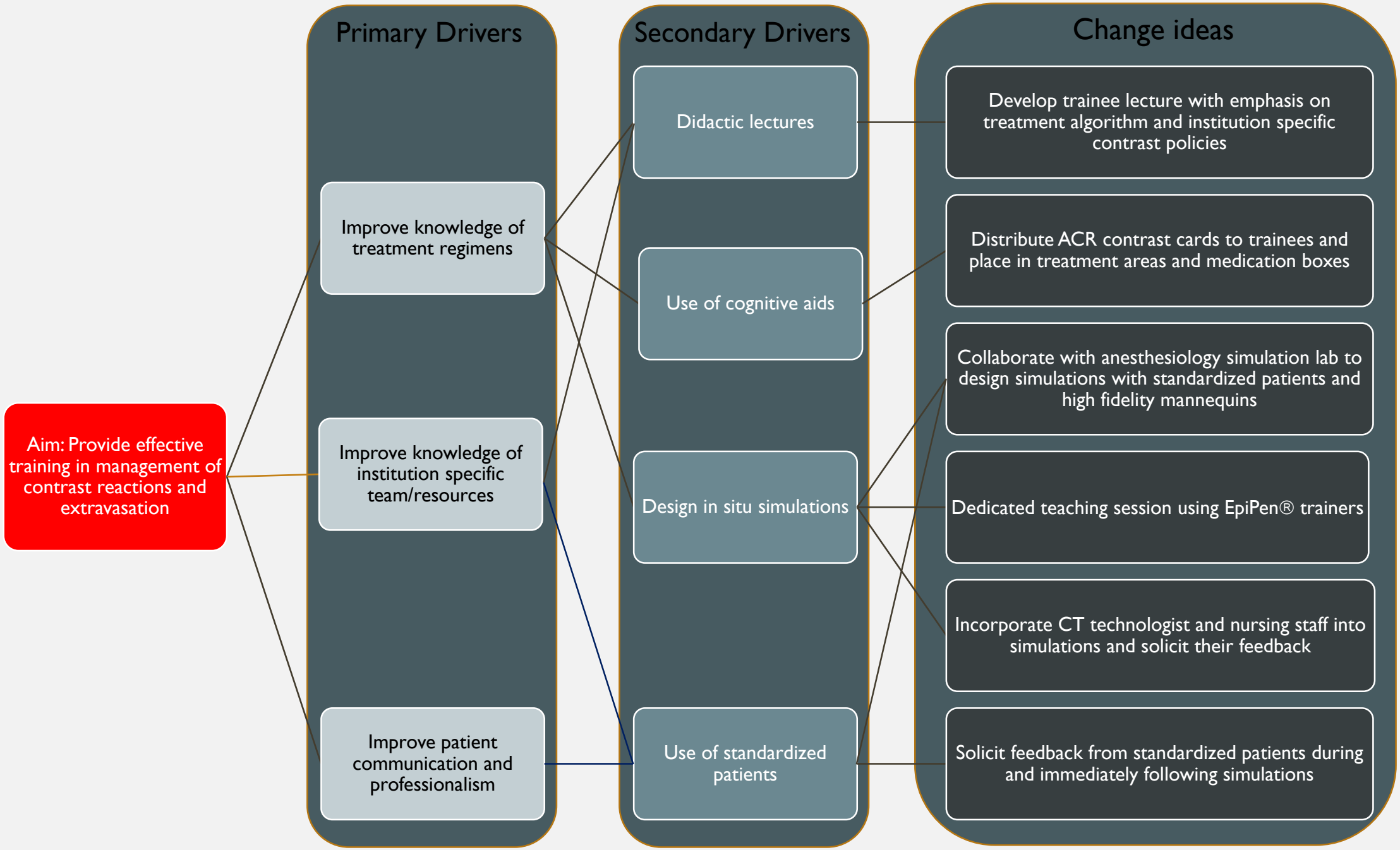
Wagner, S MD; Lee, E MD; Joyner, B MD; Jordan, S MD; McGinty, K MD

University of North Carolina Hospitals Chapel Hill, NC

THE UNIVERSITY *of* NORTH CAROLINA *at* CHAPEL HILL

BACKGROUND

- Although contrast reactions and contrast extravasations have been shown to be uncommon events, they have the potential for life threatening implications.
- Effective simulation training in these scenarios is vital to the optimal development of a fully competent radiologist and to overall patient safety.
- This study aimed to assess the feasibility and effectiveness of using standardized patients and high fidelity simulations in in-situ simulations to train radiology residents and fellows in contrast reactions and extravasations management.


Aim: Provide effective training in management of contrast reactions and extravasation
Primary Drivers
Improve knowledge of treatment regimens
Improve knowledge of institution specific team/resources
Improve patient communication and professionalism
Secondary Drivers
Didactic lectures
Use of cognitive aids
Design in situ simulations
Use of standardized patients
Change ideas
Develop trainee lecture with emphasis on treatment algorithm and institution specific contrast policies
Distribute ACR contrast cards to trainees and place in treatment areas and medication boxes
Collaborate with anesthesiology simulation lab to design simulations with standardized patients and high fidelity mannequins
Dedicated teaching session using EpiPen® trainers
Incorporate CT technologist and nursing staff into simulations and solicit their feedback
Solicit feedback from standardized patients during and immediately following simulations

STUDY DESIGN

- 23 radiology residents and 6 fellows
- Participated in 4 treatment scenarios:
  - Mild, moderate, and severe contrast reactions
  - Contrast extravasation
- Proctored by an attending radiologist, an attending anesthesiologist, and a CT technologist
- In situ within the treatment and CT scanner areas and utilized standardized patients
- Simulation topics:
  - Appropriate patient communication
  - Medication dosages
  - Proper EpiPen® administration
  - Institutional/ACR management guidelines
- Individual and group debriefs occurred
- Survey sent to all participants to gauge perceived effectiveness of the training

RESULTS

- 27 survey responses
- **97% of residents agreed or strongly agreed** that in-situ training is an effective way to learn contrast reactions and extravasations
- **93% agreed or strongly agreed** that standardized patients are an effective way to learn these scenarios
- Only 11% of respondents strongly agreed or agreed that didactic lectures are effective for the same training
- **68% and 75%** of respondents had **participated in the treatment of an actual contrast reaction and contrast extravasation**, respectively
- Majority of residents selected an appropriate treatment regimen in the clinical scenarios
- However, the standardized patients commented that in **more than half of the simulations**, the resident did not communicate effectively with them

TEACHING POINTS

- Regular training in management of contrast reactions and extravasations is essential to radiology education and training
- Use of standardized patients in simulations helps address issues of communication and professionalism that may be overlooked with high fidelity mannequins
- In situ simulations are an accessible and affordable means of performing simulations and help remedy institution specific knowledge deficits

CONCLUSIONS

- In-situ training and use of standardized patients is a feasible strategy for training in contrast reaction events
- This type of training was considered more effective training tool when compared to other potential educational modalities
- Benefits of this type of training include:
  - Development of effective patient communication
  - Gaining familiarity with staff and environment
  - Discovery of general and institutional-specific knowledge gaps

REFERENCES

- Ali S, Alexander A, Lambrix M, Ramakrishna R, Yang CW. High-Fidelity Simulation Training for the Diagnosis and Management of Adverse Contrast Media Reactions. AJR Am J Roentgenol. 2019;212(1):2-8.
- Pfeifer K, Staib L, Arango J, et al. High-Fidelity Contrast Reaction Simulation Training: Performance Comparison of Faculty, Fellows, and Residents. J Am Coll Radiol. 2016;13(1):81-7.
- Tubbs RJ, Murphy B, Mainiero MB, et al. High-fidelity medical simulation as an assessment tool for radiology residents' acute contrast reaction management skills. J Am Coll Radiol. 2009;6(8):582-7.