

## FROM THE SIMULATION LAB TO THE CT SUITE A Formative Assessment



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## BACKGROUND/PURPOSE

- ▶ Although rare and unpredictable, severe life threatening reactions to iodinated radiographic contrast material require prompt recognition and treatment
- ▶ Medical simulation training affords a safe environment in which to acquire, enhance and maintain skills but does not identify or address environmental issues at point of care and may not include all stakeholders
- ▶ For successive years 2009 through 2014, LSU Health Shreveport residents in Diagnostic Radiology training participated in annual ADE (adverse drug event) education that consisted of pre-test, didactic critical action response presentation and scenario testing of clinical and pharmacologic interventions required for successful resuscitation after contrast-induced anaphylaxis utilizing the medical simulation material (METI Stan wireless physiologic full body mannequin)
- ▶ Informal debrief was immediate and group debrief conducted in conference manner within the week.

## BACKGROUND/PURPOSE

- ▶ No adverse event or “mock code” training exists at University Health other than that conducted by and limited to Nursing services.
- ▶ After four years the LSU Health radiology resident ADE training program expanded to on-site CT suites in July 2013 with emergency response team activation in the outpatient and in hospital environments.
- ▶ We therefore sought to quantify the benefit of simulation components, assess technologist perceptions regarding “mock reactions” and report important lessons learned in the “real life” clinical environment.

## METHODS AND MATERIALS

- ▶ 5 question survey regarding the activity’s impact upon knowledge base confidence regarding ADE recognition and treatment in October 2013- *Analysis /Evaluation- formative and summative (residents and alumni surveyed)*
- ▶ Video review for determination of average time to vital sign assessment and oxygen application per year in simulation- *Analysis of Mastery prior to Completion of Training- Summative*
- ▶ 5 question CT technologist survey in December 2013-opinion

# RESIDENT ADE SIMULATION



## Simulation Lab Anaphylaxis Critical Actions Checklist

### Assess the patient:

- Speak to him/her (assess brief hx, symptoms and exclude laryngospasm)
- Obtain stethoscope and auscultate (bronchospasm)
- Obtain vital signs
- Take BP/place on monitor/pulse oximetry
- Observe skin/pallor/urticaria/flushing/diaphoresis

### Call for assistance:

- START team
- Code blue

### Treat:

- Administer oxygen
- Obtain IV access
- Administer IV fluids
- Administer antihistamines- correct dose and route
- Epinephrine- correct route and dose
- Administer bronchodilator- correct dose
- Bonus points

### Reassess, Transfer of Care and Patient Education:

- Obtain vital signs
- Provide clinical/pharmacologic event summary to accepting team
- Educate patient

### Outcome:

- Favorable                       Unfavorable

Date:  
 Physician learner:  
 Simulation lab administrators:  
 Standardized Patient:  
 Comments:

LSUHSC-S Diagnostic Radiology ADE (adverse drug event) training survey.

#1 **COMPLETE**  
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 Started: Tuesday, October 22, 2013 12:40:32 PM  
 Last Modified: Tuesday, October 22, 2013 12:49:50 PM  
 Time Spent: 00:09:17  
 IP Address: 206.176.175.200

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Q1: In what year did you complete or do you expect to complete your diagnostic radiology residency at LSUHSC-S? 2014

Q2: How many annual contrast reaction simulation activities have you participated? 3

Q3: Since undergoing ADE simulation training at LSUHSC have you provided care to a patient with an adverse contrast reaction? If "Yes," then please rank on a scale of 1-5 (with 1 being the least and 5 being the most helpful) as it pertains to the impact of the training on your perceived ability to manage the reaction. Yes, 5

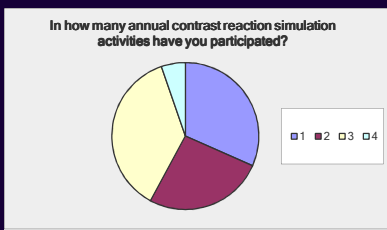
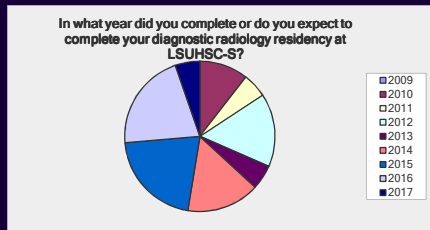
Q4: Please provide your overall opinion of the activity (scale of 1 -5 with 1 being the least and 5 being the most helpful) as it pertains to:

Your ability to recognize and appropriately treat an adverse contrast reaction	5
Your level of confidence	5
Pre test	4
Lecture	4
Debrief	4
Activity overall	5

Q5: Please provide comments and feedback. Are there any specific changes that you would suggest to improve the training that you received?  
 Give the resident more than just one training scenario or have one of any several ADE scenarios possible as oppose to just anaphylaxis.

# RESIDENT ADE RESULTS

n = 19



# RESULTS

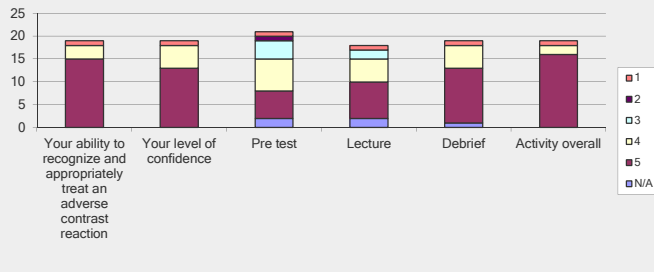
## LSUHSC-S Diagnostic Radiology ADE (adverse drug event) training survey.

Since undergoing ADE simulation training at LSUHSC have you provided care to a patient with an adverse contrast reaction? If "Yes", then please rank on a scale of 1-5 (with 1 being the least and 5 being the most helpful) as it pertains to the impact of the training on your perceived ability to manage the reaction.

Answer Options	Response Percent	Response Count
Yes	57.9%	11
No	31.6%	6
1	0.0%	0
2	0.0%	0
3	0.0%	0
4	15.8%	3
5	52.6%	10
Please provide details or comments:		0
<i>answered question</i>		<b>19</b>
<i>skipped question</i>		<b>0</b>

# RESULTS

Please provide your overall opinion of the activity (scale of 1-5 with 1 being the least and 5 being the most helpful) as it pertains to:



## RESULTS- RESIDENT COMMENTS

- More frequent. More situations.
- Improved "de-simulation" (i.e. - get out of the sim lab)
- Give the resident more than just one training scenario or have one of any several ADE scenarios possible as opposed to just anaphylaxis.
- More frequent mock codes - a couple times per year at least - to make residents more familiar with treating various types of reactions

## TAKING IT TO THE NEXT LEVEL OF FIDELITY

- ▶ Stan has come on-site to CT suites and simulated vasovagal reaction through full arrest
- ▶ Learning objectives are still valid BUT
  - ▶ Local equipment is tested
  - ▶ Emergency response teams have been activated in the outpatient and hospital environs and CPR initiated
- ▶ American Heart Association BLS skills sheet adapted and incorporated as measurement tool

# CT SCANNER ADE SIMULATION



Good afternoon CT technologists!

In a continuing effort for quality improvement, I am interested in your opinions regarding preparedness for adverse contrast reaction and code blue in the CT areas. The CT suite is your environment, no one else knows it the way you do, and your feedback is invaluable. This is in no way intended to find fault, rather an opportunity to express thoughts you may have on the topics of safety, basic life support/CPR expectations, equipment function or emergency response teams, and welcome your ideas and comments.

Please take a moment to answer the few questions below, and return to me. I will keep all responses and comments anonymous, and report only the overall survey result numbers to your managers and administrative leadership.

On a scale of 1-5 (where 1 is not at all and 5 is extremely confident) please rate your comfort level regarding your ability to:

**DETERMINE THE SEVERITY of patient condition deterioration and activate the CORRECT response team**

1            2            3            4            5

Establish pulselessness and promptly initiate effective CPR

1            2            3            4            5

Assist the responding team by identifying and obtaining medications, including those in the crash cart

1            2            3            4            5

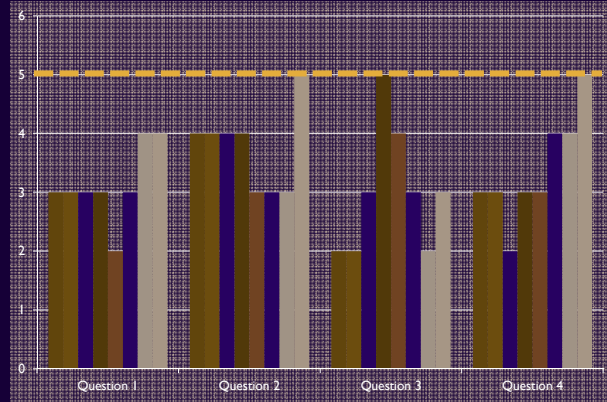
Utilize all equipment in your CT suite including Life Pac 20 QUICKLY and correctly

1            2            3            4            5

Comments \_\_\_\_\_

\_\_\_\_\_

n = 8



Average response      3.1      3.75      3.14      3.3

## CT TECHNOLOGIST SURVEY COMMENTS

- ▶ Codes make me extremely nervous and I feel like any response I have is too slow because I feel like there is someone's life at stake. I am sure that sounds absurd because I am in the medical field but I don't want anyone to die and especially because of something I did or didn't do.
- ▶ Honestly, I rate myself a [3] because I'm probably average in knowing what SPECIFICALLY & CORRECTLY should be done. I'm NOT incompetent, or unqualified, but because the afore mentioned events that may be encountered as a technologist are FEW & FAR BETWEEN. EX. If I am watching a patient in front of me having a severe anaphylactic reaction to IV contrast. In that moment, I wouldn't think waiting 20 minutes on the START team is NOT the best choice. (I could be totally wrong!!) but, I have called a code blue. (This may be incorrect procedure) I think if we as technologists are gonna be proficient at a level [5] then maybe we should be refreshed quarterly, so that we can be familiar; and pay more than the USUAL attention and grasp to what is correct procedure.



## CT TECHNOLOGIST SURVEY COMMENTS

- ▶ I would feel more comfortable using the Life Pac if I had more training on it. At this point I'm afraid I would struggle if I had to use it in an emergency situation.
- ▶ I feel that practice makes perfect. We don't have situations like that all the time, so when one arises we have to put our thinking caps on. I can always have room for improvement. I think it would be great to have a guide printed to go by for basic code issues.

## LESSONS LEARNED

- ▶ **July 2013**
  - ▶ ERT activation number incorrect
  - ▶ No pulse oximeter in FWCC
  - ▶ No albuterol (ACR guideline) and ERT does not include respiratory therapy
- ▶ **November 2013**
  - ▶ VCT code button inoperable
  - ▶ LightSpeed 16 Suction cannister on floor/ unsecured
  - ▶ Technologist calls reading rooms to find an MD
- ▶ **December 2013**
  - ▶ All equipment present and functional
  - ▶ Single CT technologist need to answer switchboard "call back" raised- discussed with switchboard and administration by Don Johnston and revised to no answer code team immediately dispatched
- ▶ **February 2014**
  - ▶ FWCC ERT pagers non functional- new paging system purchased
  - ▶ Tested 1931 911 page
  - ▶ Equipment and medications reviewed with nursing
- ▶ **LSU Health Radiology residents voluntarily enrolled in ACLS**
- ▶ **CT technologists average survey responses reflect a need for further training**
- ▶ **CT technologist comments request or state mock codes would be beneficial**

## ACTIONS

- ▶ All environmental deficiencies identified have been corrected
- ▶ CT manager asked to instruct her technologists to page 1931 and enter extension followed by 911 prior to calling reading rooms
- ▶ LSU Health Radiology residents voluntarily enrolled in ACLS
- ▶ New pager system instituted at FWCC
- ▶ Nursing administration partnership

## CONCLUSIONS

- ▶ Medical simulation training affords a safe environment in which to acquire, enhance and maintain skills but cannot identify or address environmental issues at point of care
- ▶ CT technologist readiness for ADE may be overestimated by their superiors
- ▶ Mock codes are viewed positively by CT technologists
- ▶ Time and resources should be devoted to program development

## SPECIAL THANKS TO:

AMY ROWELL, DANIEL DO, JILL DIXON, DON  
JOHNSTON, STACEY LEE, CHAVONNE WILLIAMS

ALL SURVEY RESPONDENTS AND THE CURRENT  
RADIOLOGY RESIDENTS PARTICIPATING IN AND  
CHAMPIONING THIS IMPORTANT TOPIC

LASHAN MAHONEY, CONNIE BLIGEN AND  
SPENCER BALL FOR THEIR INITIATIVE AND  
PARTICIPATION