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### **Introduction**

Operating room fires occur approximately 550 - 650 times in the United States annually. The majority of OR personnel are familiar with the acronym RACE (Rescue, Alarm, Contain, Extinguish) in managing fires, but to obtain the best outcomes in the OR it is important for personnel to be familiar with role identification in a team for fire prevention and management. The American Society of Anesthesiologists (ASA) and the Association of periOperative Registered Nurses (AORN) have published guidelines and best practices, but despite their recommendations, the familiarity with team management in OR fires is suboptimal. Often such team training occurs in the main OR of hospitals and infrequently in other OR sites. Fire drills and fire simulations could lead to avoiding delays in prevention and management of intraoperative fires.

**Educational Rationale:** To teach team skills in managing an OR fire

**Target Audiences:** Nursing, OB, Anesthesiology, OR personnel

**Learning Objectives:** As per Accreditation Council for Graduate Medical Education (ACGME) Core Competencies

Upon completion of this simulation (including the debrief) learners will be able to:

- *Medical knowledge:* Describe causes of operating room fires
- *Patient care:* Describe events that led to operating room fire
- *Practice-based learning and improvement:* Describe components of “RACE” acronym, and describe order of application to an operating room fire, will be able identify turning off the medical gas shut-off valves as an action that should be taken
- *Interpersonal and communication skills:* Effectively communicate with others to integrate actions of OR personnel with the charge desk (nurse in charge) to keep patient and team members safe
- *Professionalism:* Demonstrate mutual respect for the expertise of other team members.
- *Systems-based practice:* Identify the location of the nearest fire alarm, nearest fire extinguishers, medical gas shut-off valves for the OR suite, and can demonstrate facility-specific procedure for turning them off  
Describe the facility’s plan for the evacuation of a patient from the surgical suite to a designated area  
Identify existing barriers within the system (such as shortages of equipment, personnel, knowledge gaps, institution specific protocols) that needs to be developed or modified to improve patient outcome

### **Questions to ask after the scenario:**

What will be the effect of a fire on surgeries in progress and scheduled cases later in the day?

### **Assessment Instruments:**

1. Learner Knowledge Assessment form (Appendix 1)
2. Simulation Activity Evaluation form (Appendix 2)

**Equipment needed and set up:****In-situ OR setup**

Mannequin set up in stirrups with blue drapes on legs

20 gauge IV in hand with N saline (that should contain an access port)

Epidural catheter in-situ

**Simulation Scenario set up:****The case**

Ms Fana Flamingo is a healthy 35-year-old G2P2, who just delivered a baby under epidural analgesia in the labor and delivery suite. There is a sulcus laceration and the patient is in the OR for repair under epidural anesthesia. She has oxygen via nasal cannula.

**Simulation pre-brief**

- Read the scenario and instruct team members on their role during the simulation
- The learners take their places in the OR
- One obstetrician is a confederate who alerts the learners that a fire has started

**Fire drill scenario**

| Trigger   | Patient Condition | Action  | Done | Time | Comments |
|---|-------------------|---|------|------|----------|
| In OR, repair is finished and there is a small area continuing to bleed   |                   | 1. Final count  |      |      |          |
|   |                   | 2. Cautery used to stop small bleed   |      |      |          |
| During use, there is a spark at the electrode tip which ignites the drape |                   | 1. Rescue or remove <ul style="list-style-type: none"> <li><input type="checkbox"/> Remove burning materials</li> <li><input type="checkbox"/> Disconnect electrical equipment</li> <li><input type="checkbox"/> Verify with anesthesia and turn off the oxygen shut off valve</li> </ul>                       |      |      |          |
|   |                   | 2. Alert or activate the alarm <ul style="list-style-type: none"> <li><input type="checkbox"/> Report the fire</li> <li><input type="checkbox"/> Pull the fire alarm</li> </ul>   |      |      |          |
|   |                   | 3. Confine or contain the fire <ul style="list-style-type: none"> <li><input type="checkbox"/> Close the doors</li> </ul>   |      |      |          |
|   |                   | 4. Extinguish or evacuate <ul style="list-style-type: none"> <li><input type="checkbox"/> Obtain fire extinguisher</li> <li><input type="checkbox"/> If small extinguish with saline or wet towels (get saline if needed)</li> <li><input type="checkbox"/> If fire is large, prepare for evacuation</li> </ul> |      |      |          |

**Appendix 1**

Obstetrics Interdisciplinary Team Simulation

Name of simulation: \_\_\_\_\_

Date: \_\_\_\_\_

OB Nursing Anes

Each item has two components. The “Before the simulation” column (left side) examines your perspective at the beginning of the simulation. The “End of Simulation” column (right side) is to evaluate your perspective at the completion of the simulation.

**1. How would you rate your knowledge of the acronym RACE as it applies to an OR fire?**

| BEFORE THE SIMULATION |   |   |   |   |               |   | END OF SIMULATION |   |   |   |   |               |   |
|-----------------------|---|---|---|---|---------------|---|-------------------|---|---|---|---|---------------|---|
| 1                     | 2 | 3 | 4 | 5 | 6             | 7 | 1                 | 2 | 3 | 4 | 5 | 6             | 7 |
| Little/none           |   |   |   |   | Knowledgeable |   | Little/none       |   |   |   |   | Knowledgeable |   |

**2. How would you rate your knowledge of the location of the medical gas shutoff valve?**

| BEFORE THE SIMULATION |   |   |   |   |               |   | END OF SIMULATION |   |   |   |   |               |   |
|-----------------------|---|---|---|---|---------------|---|-------------------|---|---|---|---|---------------|---|
| 1                     | 2 | 3 | 4 | 5 | 6             | 7 | 1                 | 2 | 3 | 4 | 5 | 6             | 7 |
| Little/none           |   |   |   |   | Knowledgeable |   | Little/none       |   |   |   |   | Knowledgeable |   |

**3. How would you rate your knowledge of the location of the nearest fire extinguisher?**

| BEFORE THE SIMULATION |   |   |   |   |               |   | END OF SIMULATION |   |   |   |   |               |   |
|-----------------------|---|---|---|---|---------------|---|-------------------|---|---|---|---|---------------|---|
| 1                     | 2 | 3 | 4 | 5 | 6             | 7 | 1                 | 2 | 3 | 4 | 5 | 6             | 7 |
| Little/none           |   |   |   |   | Knowledgeable |   | Little/none       |   |   |   |   | Knowledgeable |   |

**4. How would you rate your knowledge of the location of the nearest fire alarm?**

| BEFORE THE SIMULATION |   |   |   |   |               |   | END OF SIMULATION |   |   |   |   |               |   |
|-----------------------|---|---|---|---|---------------|---|-------------------|---|---|---|---|---------------|---|
| 1                     | 2 | 3 | 4 | 5 | 6             | 7 | 1                 | 2 | 3 | 4 | 5 | 6             | 7 |
| Little/none           |   |   |   |   | Knowledgeable |   | Little/none       |   |   |   |   | Knowledgeable |   |

**5. How would you rate your knowledge of facility patient evacuation plan during an OR fire?**

| BEFORE THE SIMULATION |   |   |   |               |   | END OF SIMULATION |   |   |   |   |               |   |
|-----------------------|---|---|---|---------------|---|-------------------|---|---|---|---|---------------|---|
| 1                     | 2 | 3 | 4 | 5             | 6 | 1                 | 2 | 3 | 4 | 5 | 6             | 7 |
| Little/none           |   |   |   | Knowledgeable |   | Little/none       |   |   |   |   | Knowledgeable |   |

**Appendix 2**

## SIMULATION ACTIVITY EVALUATION FORM

DATE OF SIMULATION: \_\_\_\_\_

OCCUPATION: Consultant PG Yr 1 2 3 4    STUDENT    NURSE    MIDWIFE    OTHER

SPECIALTY: \_\_\_\_\_ YEARS IN PRACTICE: \_\_\_\_\_

Please rate the following aspects of this training program using the scale listed below:

1 = poor    2 = suboptimal    3 = adequate    4 = good    5 = excellent

Use "N/A" if you did not experience or otherwise cannot rate an item

**INTRODUCTORY MATERIALS**

|                              |   |   |   |   |   |     |
|------------------------------|---|---|---|---|---|-----|
| Orientation to the simulator | 1 | 2 | 3 | 4 | 5 | N/A |
|------------------------------|---|---|---|---|---|-----|

**PHYSICAL SPACE**

|                                |   |   |   |   |   |     |
|--------------------------------|---|---|---|---|---|-----|
| Realism of the simulator space | 1 | 2 | 3 | 4 | 5 | N/A |
|--------------------------------|---|---|---|---|---|-----|

**EQUIPMENT**

|                                 |   |   |   |   |   |     |
|---------------------------------|---|---|---|---|---|-----|
| Satisfaction with the mannequin | 1 | 2 | 3 | 4 | 5 | N/A |
|---------------------------------|---|---|---|---|---|-----|

**SCENARIOS**

|                          |   |   |   |   |   |     |
|--------------------------|---|---|---|---|---|-----|
| Realism of the scenarios | 1 | 2 | 3 | 4 | 5 | N/A |
|--------------------------|---|---|---|---|---|-----|

|   |   |   |   |   |   |     |
|---|---|---|---|---|---|-----|
| Ability of the scenarios to test technical skills | 1 | 2 | 3 | 4 | 5 | N/A |
|---|---|---|---|---|---|-----|

|  |   |   |   |   |   |     |
|--|---|---|---|---|---|-----|
| Ability of the scenarios to test behavioral skills | 1 | 2 | 3 | 4 | 5 | N/A |
|--|---|---|---|---|---|-----|

|                                    |   |   |   |   |   |     |
|------------------------------------|---|---|---|---|---|-----|
| Overall quality of the debriefings | 1 | 2 | 3 | 4 | 5 | N/A |
|------------------------------------|---|---|---|---|---|-----|

**FACULTY**

|                        |   |   |   |   |   |     |
|------------------------|---|---|---|---|---|-----|
| Quality of instructors | 1 | 2 | 3 | 4 | 5 | N/A |
|------------------------|---|---|---|---|---|-----|

|                                 |   |   |   |   |   |     |
|---------------------------------|---|---|---|---|---|-----|
| Simulation as a teaching method | 1 | 2 | 3 | 4 | 5 | N/A |
|---------------------------------|---|---|---|---|---|-----|

**COMMENTS**