Just-in-Time Training Summary Sheet
Patient Care Priorities for the
First 24 hours in Burn Mass Casualty for Non-Burn Physicians
(Based upon “Guidelines for Burn Care Under Austere Conditions”)

TRIAGE
1. If facility resources are overwhelmed, triage according to the “Resource Triage Diagram for Burn Injury in a Disaster” (see Appendix). To estimate Total Body Surface Area (TBSA) burn use the “Rule of Nines” or Palmar Method (See Appendix). Note: Only 2nd and 3rd degree burns are tallied.
2. Direct exposure to ionizing radiation (even as low as 2-6 Gy) may change the above triage categories (worsened outcomes).
3. Consider concomitant injuries from the effect of the blast. Follow Advanced Trauma Life Support (ATLS) guidelines.

DECONTAMINATION FOR RADIATION EXPOSURE
1. Determined by a radiation meter such as a Geiger-Mueller meter with a pancake probe. Readings of greater than two times background in counts per minute (cpm) are considered positive for contamination. If not available, all patients should be considered contaminated.
2. There can also be internal contamination (e.g., pulmonary secretions).
3. Irrigate with water or saline. Contain runoff. Follow proper disposal of contaminated clothing/supplies.

AIRWAY/BREATHING

Considerations:
- If there is a lack of ventilators, separate the need for airway protection from the need of mechanical ventilation.
- Utilize airway adjuncts where necessary.
- May need to ration oxygen.
- Conduct periodic airway/ventilator needs assessment rounds.
- C-spine precautions as needed.

[Diagram] Figure 2. Proposed decision matrix for airway management during burn disasters.
CIRCULATION (RESUSCITATION)
1. Patients with burns less than 20% BSA can be effectively resuscitated from burn shock using oral solutions; many patients with burns up to 40% TBSA can also be safely resuscitated in this manner.
   a. There are many formulas for oral rehydration solutions, but all include clean water, glucose, and electrolytes (see Appendix).
   b. Adults and children > 2 years should be allowed to take sips from a cup frequently, with the goal of consuming approximately 8 to 10 ounces every 10 to 15 minutes.
   c. Very young children < 2 years should be given a teaspoon of fluid every 1 to 2 minutes.
   d. Oral fluids should be given in amounts tolerated by the patient, accepting the occasional episode of nausea and vomiting as inevitable but not a reason to discontinue oral therapy.
2. For patients with burns >20%, IV resuscitation, if supplies permit, should be utilized using the Parkland formula. In resource-constrained environments, IV resuscitation may need to be restricted to survivable burns >40%.
   a. Total mL 24 hour fluid requirement = 4mL LR x Kg body weight x %TBSA
   b. Give ½ during the first 8 hours post injury and ½ during the following 16 hours
   c. Example: 4mL x 70 Kg patient x 50% TBSA = 14,000mL
   d. Give 7000mL during first 8 hours (875mL/hour) and 7000mL during following 16 hours (437.5mL/hour)
   e. Monitor hourly urine output: 30-50mL/hour for adults, 1m/Kg/hour for children
   f. Other endpoints of resuscitation as able: Vital signs, Hct, Lactate, Base Deficit
   g. Increase/decrease fluids by 10-20% each hour according to urine output. Beware of abdominal compartment syndrome if fluid rate gets to 6mL/Kg/hour.

If the patient is not responding to increases crystalloid volume consider 5% Albumin or FFP. If means of communication available, contact a burn surgeon for assistance or consider re-triage of resources.

WOUNDS
Recommendations adapted from “Guidelines for Burn Care Under Austere Conditions: Surgical and Nonsurgical Wound Management”
1. If the burn injury has just occurred, remove smoldering clothing and flush for a few minutes with any readily available water source (cool to lukewarm temperature). This will stop the burning process and provide some pain relief.
   Caution: Avoid hypothermia, especially in patients with larger TBSA burns.
2. Identify and train a wound-care team.
3. Prepare a venue for wound care.
4. Determine availability of topical antimicrobials and plan their rational use.
5. Provide adequate analgesia and anxiolysis.
   a. Benzodiazepines
   b. Opioids, Ketamine
6. Mafenide acetate (Sulfamylon) and silver sulfadiazine (Silvadene) creams should be used when available (especially contaminated and/or deeper wounds). Twice daily ideal, once daily acceptable.
   a. Alternatives are Bacitracin, Polysporin with Vaseline or Xeroform gauze interface.
7. Alternatives to creams/ointments
   a. Silver-based dressings: e.g., Acticoat™, Kerra Contact® Ag, Silverlon®
   b. Aqueous solutions: e.g., Mafenide acetate solution, Dakin’s
8. For patients with minor burns (<10% TBSA), consider having them do their own wound care or help each other if resources are limited.
Figure 1. Depiction of the Rule of Nine's and Palmar Method of burn size estimation. For the Rule of Nines, each body region has a surface area in a multiple of nine. In the Palmar Method, the patient’s palm represents approximately 1% of that patient’s BSA. Reprinted with courtesy from The Burn Center at Saint Barnabas Medical Center, Livingston, New Jersey.
APPENDIX (Continued)

Table 2. Composition of oral glucose-electrolyte solutions and clear liquids (based on 62–64, 66–68)

<table>
<thead>
<tr>
<th>Solution</th>
<th>Na⁺</th>
<th>K⁺</th>
<th>Cl⁻</th>
<th>Base</th>
<th>Glucose</th>
<th>Osmolality</th>
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<tbody>
<tr>
<td>Rehydration</td>
<td></td>
<td></td>
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<tr>
<td>WHO-UNICEF ORS salts</td>
<td>90</td>
<td>20</td>
<td>80</td>
<td>10 (citrate)</td>
<td>111 (20 g/L)</td>
<td>310</td>
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<tr>
<td>WHO-UNICEF reduced osmolarity ORS salts</td>
<td>75</td>
<td>20</td>
<td>65</td>
<td>10 (citrate)</td>
<td>75 mmol/L</td>
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<tr>
<td>Meyer's solution</td>
<td>85</td>
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<td>63</td>
<td>29 (citrate)</td>
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<tr>
<td>Rehydralyte®</td>
<td>75</td>
<td>20</td>
<td>65</td>
<td>30</td>
<td>139 (25 g/L)</td>
<td>325</td>
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<tr>
<td>Infalyte® or Ricelyte® liquid, oral</td>
<td>50</td>
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<td>45</td>
<td>36 (citrate)</td>
<td>30 g/L as rice syrup solids</td>
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<td>Lytren®</td>
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<td>10 (citrate)</td>
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<td>Pedialyte®</td>
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<td>35</td>
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<td>Gatorade®</td>
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<td>Cola</td>
<td>2</td>
<td>0.1</td>
<td>2</td>
<td>13 (HCO₃⁻)</td>
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<td>750</td>
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<tr>
<td>Ginger ale</td>
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<td>2</td>
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<td>Apple juice</td>
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Images from J Burn Care Res 2016; 37:e427–39

REFERENCES
