APPENDIX

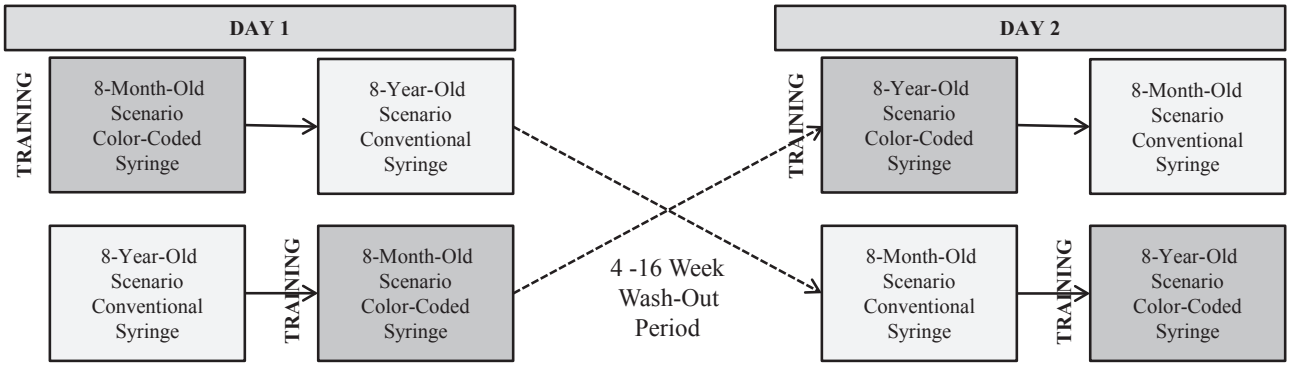

Figure E1. Study design schematic.

APPENDIX E1

ED Scenario A: Asystole Arrest in 8-Month-Old Boy (sudden infant death syndrome [SIDS])

An 8-month-old, previously healthy, term-infant boy was put down for a nap at 12:30 PM and found by parents to be unresponsive in his crib at 2 PM. Emergency medical services (EMS) found the patient in asystolic cardiac arrest. Bag-valve-mask resuscitation and chest compressions were initiated by EMS during transport, with a positive return of spontaneous circulation. An intravenous line was successfully placed by EMS personnel and naloxone was administered without a response, but no other medications were administered. The parents are on route but will not be available during the resuscitation. No other history is available. Blood glucose level in the field was 110 mg/dL.

Initial

Limp, unresponsive, well-nourished infant receiving assisted BVM ventilation

Respiratory rate (RR) 6 and agonal+gag reflex noted

Pulse oximetry 100% with BVM assistance

Brachial pulse present but weak, with manual blood pressure of 55/30 mm Hg in both arms

Rectal temperature 36.1°C (97°F)

Extremities are pale and are warm and dry to the touch

A functional intravenous line is in place

Patient receives a cardiac monitor, which reveals sinus rhythm at 110 beats/min

There is neither suspicion nor evidence of trauma.

Subjects were cued with an oxygen saturation that was decreasing to indicate need for intubation. If they asked follow-up about gag, no gag response.

Expected Interventions

Weight estimate, 8-month-old.

Broselow	Red (8–9 kg), kg
Estimate according to 1-10/5-20/10-30 rule	8
Age×2+8 (kg)	Too young

Preparation for intubation

Normal saline solution 20 mL/kg, ≈160 mL

AIRWAY (RAPID SEQUENCE INTUBATION)

Potential Medications

Atropine 0.02 mg/kg

Lidocaine 1–2 mg/kg

Succinylcholine 1–2 mg/kg

Rocuronium 0.6–1.2 mg/kg

Etomidate 0.2–0.6 mg/kg

Ketamine 1–2 mg/kg

Midazolam 0.1–0.2 mg/kg

Fentanyl 1–2 μg/kg

Case Progression

Shortly after successful first-attempt intubation, monitor shows asystole with no palpable pulses.

Expected Interventions

Cardiopulmonary resuscitation (CPR) initiated with bagging off ventilator and chest compressions

Epinephrine 1:10,000, 0.01 mg/kg (0.1 mL/kg) administered through the intravenous line/IO, 0.08 to 0.09 mg (0.8 to 0.9 mL)

ED Scenario B: Asystole Arrest in 8-Year-Old Girl (Sepsis)

An 8-year-old previously healthy girl with 2 days of high fever and cough received a diagnosis yesterday of viral infection by the primary care physician. After she suddenly collapsed at home, her parents called 911. The patient was minimally responsive on EMS arrival and received a nonrebreather face mask and 18-gauge intravenous catheter placed in right antecubital fossa. Blood glucose level in the field was 110 mg/dL.

Initial

Well-nourished girl responsive only to painful stimuli; no signs of trauma

RR 30 with coarse breath sounds and severe retractions

Pulse oximetry 100% with BVM assistance

Weak radial pulse, with manual blood pressure of 60/30 mm Hg

Rectal temperature 38.9°C (102°F)

Extremities very warm and diaphoretic to the touch

There is a functioning 18-gauge intravenous line in the right antecubital fossa, but no medications or fluids have been administered by EMS.

Patient receives a cardiac monitor, which reveals sinus tachycardia at 140 beats/min

Subjects were cued with an oxygen saturation that was decreasing to indicate need for intubation.

Expected Interventions

Weight estimate, 9-year-old.

Broselow	Orange (24–29 kg), kg
Estimate based on 1-10/5-20 rule/10-30	28
Age×2+8 (kg)	26

Preparation for intubation
Normal saline solution 20 mL/kg, ≈160 mL

AIRWAY (RAPID SEQUENCE INTUBATION)

Potential Medications

Atropine 0.02 mg/kg
Lidocaine 1–2 mg/kg
Succinylcholine 1–2 mg/kg
Rocuronium 0.6–1.2 mg/kg
Etomidate 0.2–0.6 mg/kg
Ketamine 1–2 mg/kg
Midazolam 0.1–0.2 mg/kg
Fentanyl 1–2 μg/kg

CASE PROGRESSION

Shortly after successful first-attempt intubation, monitor shows asystole with no palpable pulses.

Expected Interventions

CPR initiated with bagging off ventilator and chest compressions
Normal saline solution 20 mL/kg
Epinephrine 1:10,000, 0.01 mg/kg (0.1 mL/kg) administered through the intravenous line/IO, 0.24 to 0.30 mg (2.4 to 3.0 mL)

APPENDIX E2

Poststudy survey

APPENDIX E3

Technical definitions and criteria

Resuscitation medications included in analysis:
Epinephrine 1:10,000 (0.1 mg/mL)
Atropine (0.1 mg/mL)
Midazolam (1 mg/mL)
Fentanyl (50 μg/mL)
Succinylcholine (20 mg/mL)
Ketamine (10 mg/mL)
Lidocaine (20 mg/mL)
Rocuronium (10 mg/mL)
Etomidate (2 mg/mL)

Inclusive weights for defining Broselow (2007B edition) dosing ranges:
Pink: 5.51–7.49 kg
Red: 7.51–9.49 kg
Blue: 18.51–22.99 kg
Orange: 23.01–28.99 kg

Quality control criteria triggering investigator third review of a data point:

1) Dosing outcomes—control method
   a. One of the 2 independent reviewers did not report a dose.
   b. One of the 2 independent reviewers reported dose but commented that it was difficult to view.
   c. The 2 independent reviewers reported doses that differed by >0.2 mL.
   d. All independent review data reported a dose outside the Broselow range.
2) Dosing outcomes—experimental method
   a. One of the 2 independent reviewers did not report a dose color.
   b. One of the 2 independent reviewers reported a partial dose color (ie "$^1/_2$ of blue").
   c. The 2 independent reviewers reported that a different dose color was given.
3) Elapsed time outcomes—control and experimental methods
   a. One of the 2 independent reviewers did not report a start or stop time.
   b. The 2 independent reviewers reported elapsed times that differed by >5 seconds.