

Pediatric Airway Management

Module 2

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The views, opinions and/or findings contained in this report are those of the author(s) and should not be construed as an official CMS position, policy or decision unless so designated by other documentation.

I. Title: 16 year old intoxication

II. Target Audience: Pediatric Residents, PEM fellows, EM Residents

III. Learning Objectives or Assessment Objectives

A. Primary - key learning objectives of the scenario

1. Assessing airway
2. Explore causes of intoxication
3. Recognize inability to protect airway
4. Manage airway of a 16 year old

B. Secondary - detailed technical goals, behavioral goals, didactic points

1. Team work and communication
2. Resource management

C. Critical actions checklist – a list to ensure the educational /assessment goals are met.
This *may* include: Simple checklist of critical actions, optimal sequence, time to critical action

1. A,B,C's
2. IV, oxygen, monitors
3. blood alcohol level. tox screen, glucometer
4. consider RSI
5. cricoid pressure
6. intubation
7. post intubation chest xray
8. nasogastric tube

IV. ACGME Competencies Assessed

A. Patient Care

1. Interviewing
2. Informed Decision Making
3. Performance of Routine Procedures

B. Systems-Based Practice

1. Patient advocate

C. Interpersonal / Communication Skills

1. Patient reassurance
2. Information transfer to supervisor / admitting MD

V. Environment and Props

See Appendix B Scenario Setup Checklist

VI. Simulation Personnel and Assigned Roles (Faculty, Actors, etc)

Parent: Your role is to be upset more than worried. You express that this is unusual for him. You can make a scene, start yelling at Joey, telling him he is going to be in so much trouble when he sobers up. You are going to sell his car and send him away to boarding school. Obviously he can not hear you but you continue to yell at him, you keep going up to the bedside to confront him. Your goal is to be somewhat obstructive to the scenario. You are allowed to offer history when asked.
Gets good grades, he is on the football team and was out with his football buddies tonight. If asked, he has never done this before. They denied drugs. His friends said he drank a lot of Captain Morgan's Rum. He has a history of mild asthma.

Meds: Albuterol for asthma
Allergies: NKDA
PMHx: asthma, hospitalized once as a toddler.
Social Hx: good grades, athletic
FHx: no history of drug use or alcoholism

Nurse: Your role is to be helpful when asked to do something, but not make suggestions as to what they should do. Please go through the motions of putting on the leads, pulse oximeter, BP cuff. Attempting an IV. You will help feed cues when instructed through the ear piece. Sometimes the hardest thing is to stand and wait and watch.

Respiratory therapist: when called, you come in and help with bagging the child if asked. Wait to have people ask you to do things, but once they ask, you can perform the appropriate tasks, such as handing things during intubation.

“Intern”: You are to help out, but not have any independent thought. If you are asked to intubate, you say that you are not comfortable and would rather watch the first one. You can be helpful with other tasks.

A. Who may play them – other residents, other students, actors

VII. Case Narrative (describes what the learner will experience)

Scenario will start with a rescue call and curtains closed.

Barrington Rescue #1 calling. “We have a 16 year old male who appears to have been drinking. His parents called us after he returned from a party. He has been vomiting and appears intoxicated. His HR is 110, RR 15, BP 110/70, and his Oxygen Sat is 99% on room air.” We will be there in 3 minutes.

Pull curtains to reveal patient and represent arrival of patient.

EMS brings patient into the room. He is slurring his speech. Not following commands.

Parent is present. S/he says that he is a good kid usually. Gets good grades, he is on the football team and was out with his football buddies tonight. If asked, he has never done this before. They denied drugs. His friends said he drank a lot of Captain Morgan's Rum. He has a history of mild asthma.

A. Board format overview of patient:

Name/Age/Sex Joey Martin / 16 yo old / male
Mode of arrival EMS
Accompanied by parent
Triage Note see ER documentation in Appendix C

Chief Complaint appears intoxicated

Past Medical History Asthma
Medications and Allergies Albuterol & NKDA
Family and Social History Asthma

Patients Initial Exam

Temp 99.1
RR 6
HR 110
BP 110/70
Oxygen Sat 95% on RA

General appearance lethargic, not moving much

Primary Survey:

Airway: patent
Breathing: CTA B
CV: regular rhythm at 110, normal S1,S2 no murmurs, pulses are 1+ in all four ext, capillary refill is = 2-3 seconds
Disabilities: moves all extremities to painful stimuli
Exposure: no signs of trauma

Secondary Survey

HEENT slightly dry mucous, no signs of trauma
moist membranes, PERRL, TM's no hemotympanum
NECK, supple, no step off, non-tender
ABD soft, NT, ND
EXT no trauma
NEURO MAEW, slurred speech, localizes to painful stimuli, does not open eyes
Skin warm, well perfused, no bruising or petechia

Expected interventions I:

1. request vital signs and monitors
2. request IV access and oxygen
3. request glucometer
4. request fluid bolus
5. +/- naloxone

Progression:

Five minutes into case, Joey gradually becomes even less responsive. He starts to vomit repeatedly and a trend starts (16_yo_intox_worse) where his respiratory rate trends down, along with his oxygen saturation, his HR will gradually increase.

Nurses are able to get IV access. Glucometer is 120

Expected intervention II:

1. draw baseline labs, CBC, Lytes, tox screen, BAL, ABG
2. prepare for RSI and intubation

Progression:

If he does not get intubated, he will continue to vomit and drop his oxygen saturation. Once he is intubated, this will start a trend (16_yo_intox_recovery) he will stabilize and be ready to send to PICU.

Expected intervention III:

- 1) cricoid pressure and then RSI
- 2) intubation
- 3) nasogastric tube
- 4) chest xray
- 5) PICU

Labs: blood alcohol level 340, remainder labs WNL except for respiratory acidosis from hypoventilation.

Laboratory Exam see Appendix D

B. **Flow diagram** (see SimMan Programming Appendix E)

VIII. Instructors Notes (what the instructor must do to create the experience)

Explain roles to role players and have a facilitator available to assist with the flow of the Scenario. Computer operator will need to perform some manual adjustment of vital signs as the scenario is ongoing. Operator will also be required to either trigger vomiting noise or use microphone to create vomiting noise.

IX. Debriefing Plan

Method of debriefing – should follow learning objectives
conference room video playback

Debriefing Objectives:

1. Recognition of pending respiratory failure
2. Evaluation of an intoxicated teen
3. RSI in this case
4. Airway management



A. Actual debriefing materials (articles or learning materials)

Refer to Current PALS manual airway section

X. Authors and their affiliations. Frank L. Overly (PEM)

- A. RIHMSC CMS Transportable Simulation-Based Training Curriculum Project team
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Appendix A Global Competency Rating Scale

	Resident name _____ Examiner _____ Case Title <u>16 yo intoxication</u> Scenario Type Single Patient <input type="checkbox"/> Multiple Patient <input type="checkbox"/>	
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Critical Actions Checklist

	Critical Action	Yes	No	Time
1	Identify leader assign roles			
2	Assess A,B,C			
3	Oxygen			
4	Glucometer			
5	Monitors			
6	Assess Access			
7	Consider co-ingestion			
8	Recognize need to stabilize airway (airway adjunct NPA)			
9	Cricoid pressure			
10	RSI			
11	Intubation			
12	ETCO2 detector			
13	nasogastric tube			
14	chest xray			
15	PICU			

RIHMSC Global Competency Scale

Immediate critical EM actions	1 2 3 4 5 6 7
Appropriately targeted H&P	1 2 3 4 5 6 7
Recognizes & manages disease process	1 2 3 4 5 6 7
Considers differential diagnosis	1 2 3 4 5 6 7
Communication skills	1 2 3 4 5 6 7
Case synthesis (PICU)	1 2 3 4 5 6 7
Degree of expertise & leadership	1 2 3 4 5 6 7
BARS see attached	

Notes:

Rating Scale						
Very poor	Poor	Marginal	Acceptable	Good	Very good	Superior
1	2	3	4	5	6	7

Harmful action **Yes** **No** **Comment:**

Description of Elements in RIH MSC Global Rating Scale

No	Competency	Descriptor
1	Immediate emergency medicine actions	<ul style="list-style-type: none"> ● IV, O2, Monitor ● Immediate stabilization dependent on case
2	Appropriately targeted history/physical exam	<ul style="list-style-type: none"> ● History and physical based on case
2	Recognizes & manages disease process	<ul style="list-style-type: none"> ● Completes all critical actions based on checklist in appropriate sequence and timeframe
3	Considers differential dx	<ul style="list-style-type: none"> ● Avoids premature diagnostic closure
4	Presentation skills/interpersonal relations	<ul style="list-style-type: none"> ● Quality of verbal presentation (assessment-oriented)¹ = data content, expression, organization of medical decision making, overall presentation – (AO format = patient ID, assessment & mgmt/therapeutic plan, limited justification based on H&P) ● Respectful interaction with patient ● Works effectively with ED staff
5	Case synthesis/Cognition	<ul style="list-style-type: none"> ● Recognizes diagnosis ● Appropriately dispositions patient ● Obtains all appropriate consults/follow-ups ● Recognizes unresolved issues ● Avoids common cognitive errors²
6	Degree of Expertise/Leadership ³	<ul style="list-style-type: none"> ● fluency: does the activity run together in an integrated and uninterrupted sequence with a minimum of pauses/hesitations. ● automaticity: can practitioner deal appropriately with a situation even when not concentrating on it or expecting it ● simultaneity: ability to complete several tasks at one time ● rapidity: the ability to make an appropriate response quickly ● knowledge base
7	Crisis Management Behaviors/Teamwork ⁴	<ul style="list-style-type: none"> ● Anticipation and planning ● Awareness and utilization of all available resources ● Distribution of workload and mobilization of help ● Routine reevaluation of the situation ● Awareness and utilization of all available information ● Triage and prioritization ● Efficient management of multiple patients ● Effective coping with disruptions/distractions ● Can add BARS assessment/Medteams⁵
8	Safety Behaviors	<ul style="list-style-type: none"> ● Safe medication ordering (asks about allergies, Knows indications/contraindications for therapy, communicates dose, route and timing, knows pt weight) ● Any potentially harmful behaviors should be noted

¹ Maddow CL, et. al. Efficient Communication: Assessment-Oriented Oral Case Presentation. Academic Emergency Medicine 2003; 10: 842-847.

² Pat **Croskerry** Achieving Quality in Clinical Decision Making: Cognitive Strategies and Detection of Bias Acad Emerg Med 2002 9: 1184-1204.

³ Gellatly Angus, editor. The Skillful Mind: An Introduction to Cognitive Psychology. Open University Press, Milton Keynes England. 1986

⁴ Martin Reznick, Rebecca Smith-Coggins, Steven Howard, Kanthi Kiran, Phillip Harter, Yasser Sowb, David Gaba, and Thomas Krummel
Emergency Medicine Crisis Resource Management (EMCRM): Pilot Study of a Simulation-based Crisis Management Course for Emergency Medicine Acad Emerg Med 2003 10: 386-389.

⁵ Gregory D. Jay, Scott D. Berns, John C. Morey, Dan T. Risser, Shawna J. Perry, and Robert Simon Formal Teamwork Training Improves Teamwork and Reduces Emergency Department Errors: Results from the MedTeams Project Acad Emerg Med 1999 6: 408-a

Appendix B Scenario Setup Checklist

key: solid text - minimum requirements

light text - optional

- A. Environment** Children's Hospital Inpatient Ward
- bed: ED trauma bay
 - actor roles: Pediatric ED nurse
Parent
Respiratory technician
Radiology technician
Senior physician (expert)
 - personnel: Manikin operator / Audiovisual technician
Facilitator x 1-2
Actor x 1-2
 - patient medical forms (included in package)
-

B. Advanced medical simulation manikin

- gender: male
 - clothing: street clothes
 - moulage / props: smell of alcohol

 - programming: Laerdal SimMan scenario (included in package)
-

C. Medical equipment

-patient assessment equipment

- blood pressure cuff
- cardiac monitor / defibrillator
- EKG machine
- pulse oximeter
- stethoscope
- ventilator

-standard resuscitation equipment (“pediatric code cart” / “crash cart”)

- protective equipment (gloves, goggles, gowns)
- basic airway management devices
 - oropharyngeal airway (OPA; assorted)
 - nasopharyngeal airway (NPA; assorted)
 - bag-valve mask (pediatric and adult)
- intubation equipment
 - laryngoscope handles / blades / batteries (assorted)

- water-based lubricant
- endotracheal tubes (assorted)
- intravenous access equipment
 - tourniquets
 - gauze pads
 - intravenous catheters (assorted)
 - intravenous fluid tubing drip sets (micro + macro)
 - intravenous fluid bags (normal saline)
 - phlebotomy supplies
 - sterile saline for flushes
 - stopcocks and connectors
- dressings (assorted)
- naso-/oro-gastric tubes (assorted)
- nebulizer
- oxygen source
- oxygen delivery devices (face masks, nasal cannulas)
- syringes (catheter tip; assorted)
- syringes (lavage tip)
- tape
- urinary catheters (assorted)
- wall suction and suction tubing (Yankower and tracheal suction)

-difficult airway management equipment

- endotracheal tubes (assorted, including size 7.0, 7.5, 8.0)
- surgical tracheostomy kit

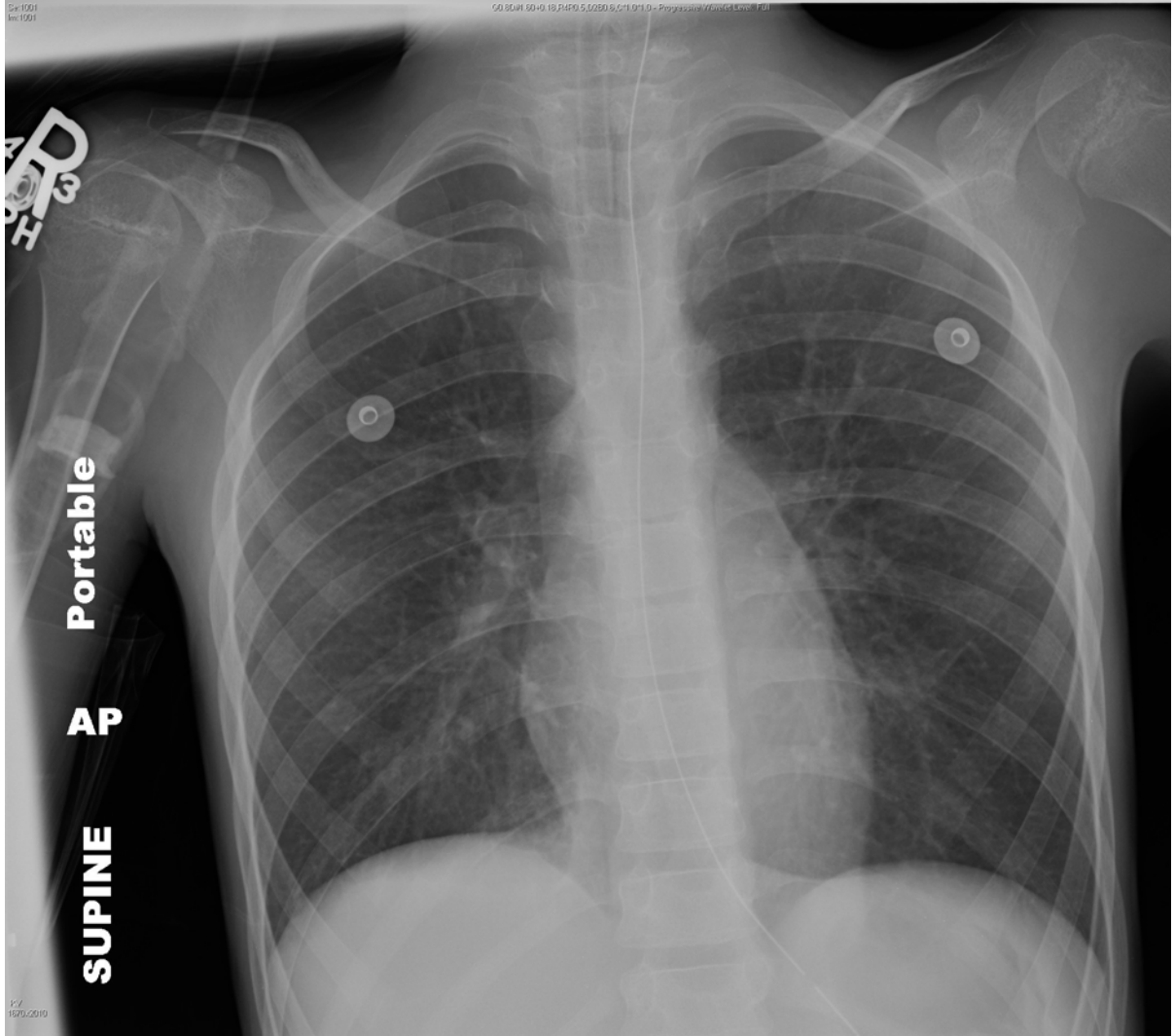
-medications

- general medications
 - adenosine
 - amiodarone
 - atropine
 - dextrose (D50)
 - dopamine infusion
 - epinephrine
 - vasopressin
- asthma medications
 - anti-cholinergic (inhalational + nebulization; e.g. ipratropium)
 - beta-agonist (inhalational + nebulization; e.g. albuterol)
 - Racemic Epinephrine
 - magnesium (parenteral)
 - methylxanthine (parenteral; e.g. aminophylline)
 - steroid (parenteral; e.g. prednisolone)
- rapid sequence induction / intubation medications (institution-specific)
 - e.g. etomidate / midazolam / ketamine
 - e.g. succinylcholine / vecuronium/ rocuronium

**DE-IDENTIFY IMAGES AND PROPS TO
COMPLY WITH HIPAA REGULATIONS!!!**

D. Radiographs, electrocardiograms, and other patient data
(included in package)

chest radiograph (intubated 16 year old)



Appendix C Patient Triage note



EMERGENCY DEPARTMENT RECORD CENSUS NO.

PATIENT NAME: <u>Martin, Joey</u> DATE OF BIRTH: <u>16 year old</u> MEDICAL RECORD NO.: <u>000-00-0000</u>	TIME IN: <u>02:00</u> TIME OUT: ADMIT: <u>ICU</u>
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Triage Assessment: <u>Intoxicated</u>		SENT IN BY PVT/MD? <u>Y</u> / N	
TIME, PLACE OF ACCIDENT OR ILLNESS		MODE OF ARRIVAL <u>ambulance</u> BROUGHT BY <u>county EMS</u>	
PULSE OX <u>95% (RA)</u>	TEMP <u>99 F</u>	PULSE <u>110</u>	RESP <u>110</u>
BP / <u>6</u>		INITIAL	TIME <u>110</u>
LAST DT DATE <u>/ 70</u>		ALLERGIES: <u>OF</u>	
PAIN SCORE <u>none</u>			
<u>16 y/o brought in by rescue. Parent reports he was out at a party and came home, vomited and became very lethargic</u>			
<u>albuterol PRN</u>			

LMP <u>ASTHMA</u>		GERD / ULCER		PSYCH OTHER _____	
CAD		COPD		MIGRAINE	
HTN		SEIZURES		SMOKER	
MI		CANCER		PPD: _____	
CABG _____		STENT _____		EKG AT _____	
FSBS _____ AT _____		BREATHALYZE _____ AT _____			
REGISTRATION CLERK NAME:			TRIAGE RN SIGNATURE: <u>OF</u>		

TIME 02:05	Slurring speech, moving all extremities. Smells like alcohol. No sign of trauma.
patient does localize to pain	
AGs	

<p style="text-align: right;">CRITICAL CARE TIME: _____</p> <p style="font-size: 1.2em; transform: rotate(-15deg); opacity: 0.7;">Patient seen and examined by me. Resident - documented history and physical reviewed and discussed. Resident agrees with my assessment and plan. RP</p>

Diagnosis: <u>ETOH intoxication</u>	ADMIT TO: <u>C. Jones-Bence, PGY-2</u> PHYSICIAN 1	R. Pender
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Appendix D Patient Laboratory Values

Pediatric Module 2 Complete Blood Count

White Blood Cell (3.5-11.0) K/uL:	8.5
Hemoglobin (11.0-15.0) G/DL:	13.1
Hematocrit (32.0-45.0) %:	40.7
Platelet (150-400) K/uL:	345
Differential:	
Neutrophils:	45%
Lymphocytes:	50%
Monocytes:	5%

Pediatric Module 2 Toxicologic Assays

Aspirin	non detectable	
Acetaminophen	non detectable	
Blood Alcohol Level	.340	
Drugs of abuse	THC	ND
	Barbiturates	ND
	Amphetamines	ND
	Opiates	ND
	Phencyclidine	ND
	Cocaine	ND

Pediatric Module 2 Arterial blood gas (iStat)

pH (7.35-7.45): 7.28 L

PCO₂ (35-45) MMHG: 70 H

PO₂ (78-82) MMHG: 80

O₂ Sat (93-98) %: 99

Na⁺ (135-145) MEQ/L: 140

K⁺ (3.6-5.1) MEQ/L: 4.0

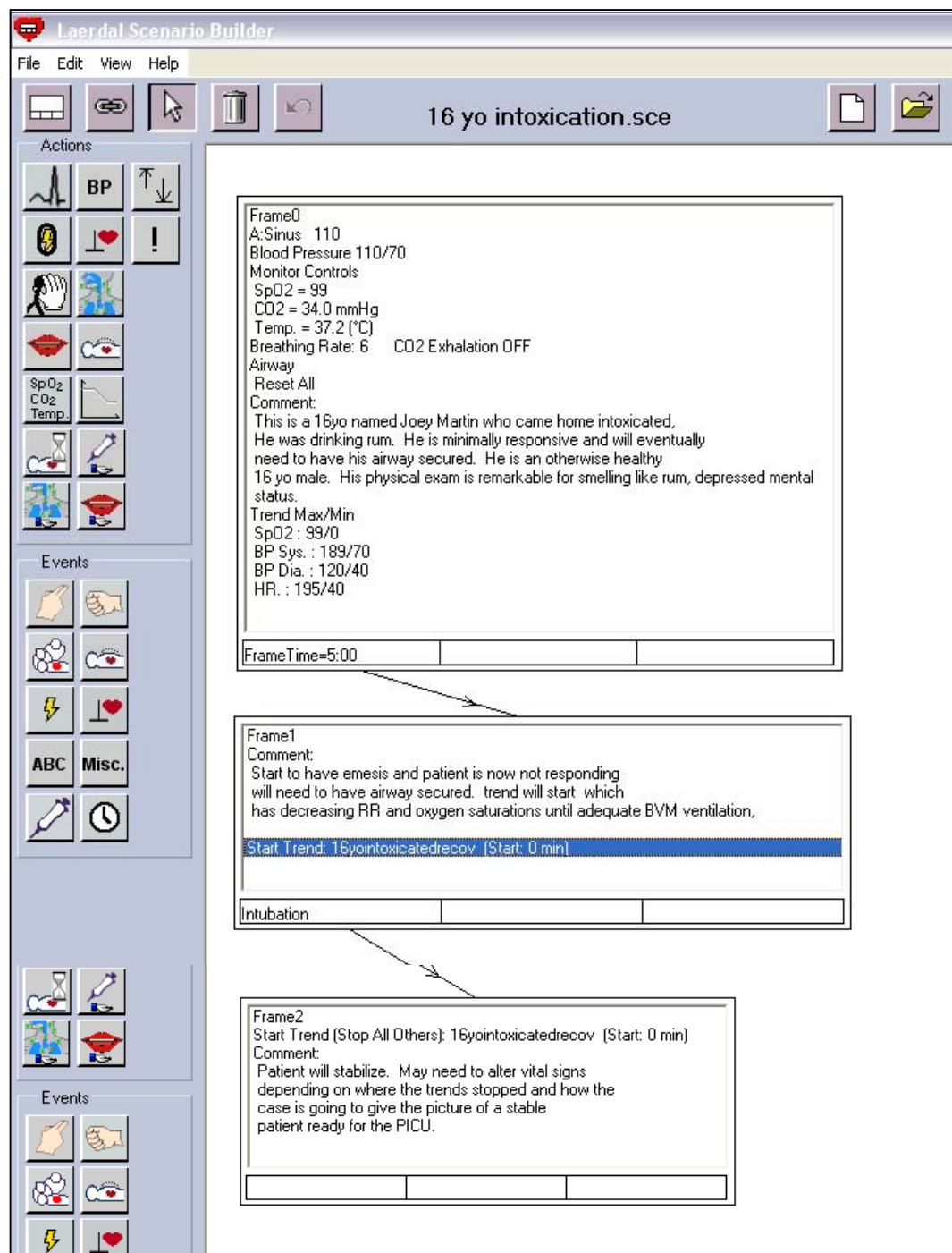
Cl⁻ (98-110) MEQ/L: 98

CO₂ (20-30) MEQ/L: 23

Glu (67-109) MG/DL: 88

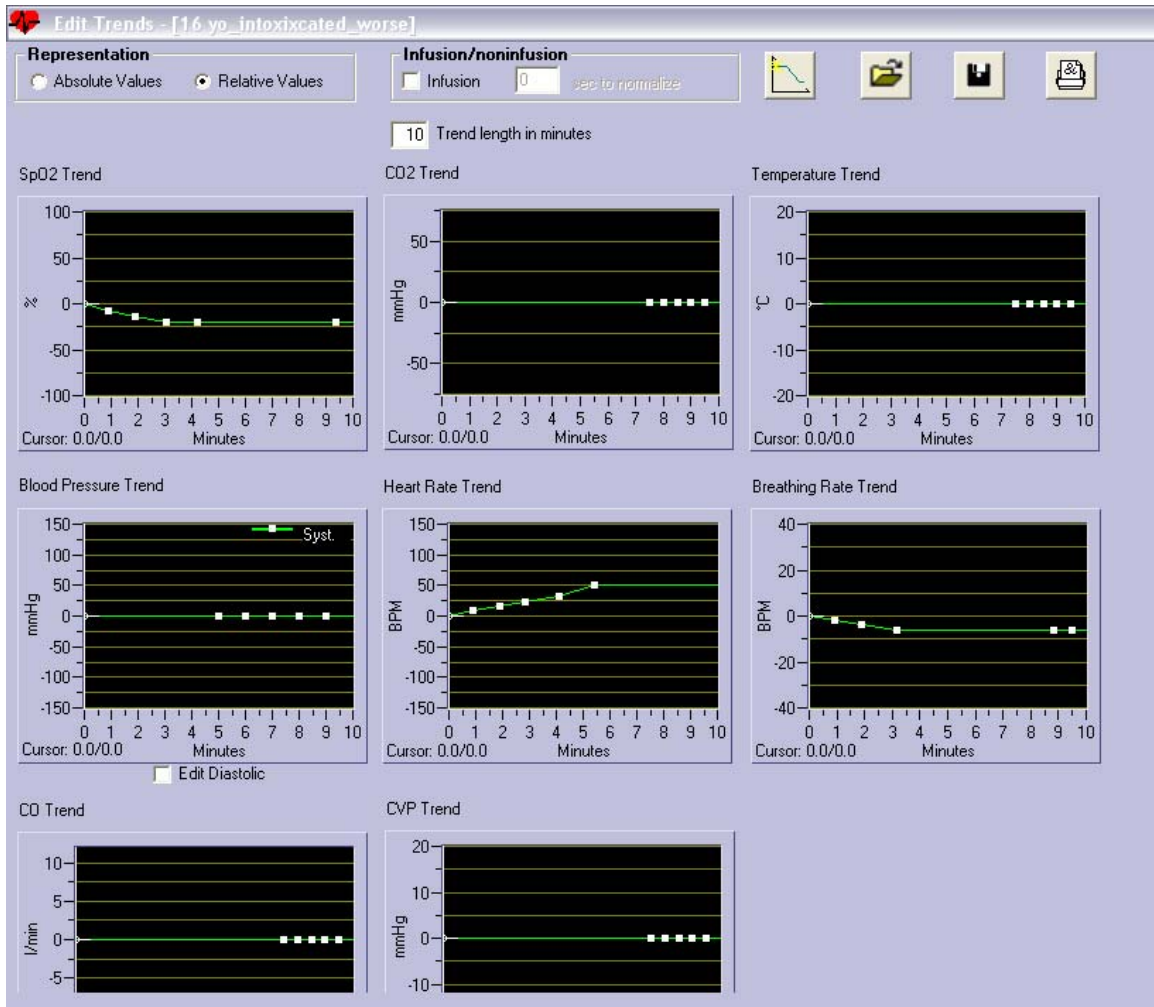
Hematocrit (32-45)%: 39

Appendix E SimMan Scenario Programming

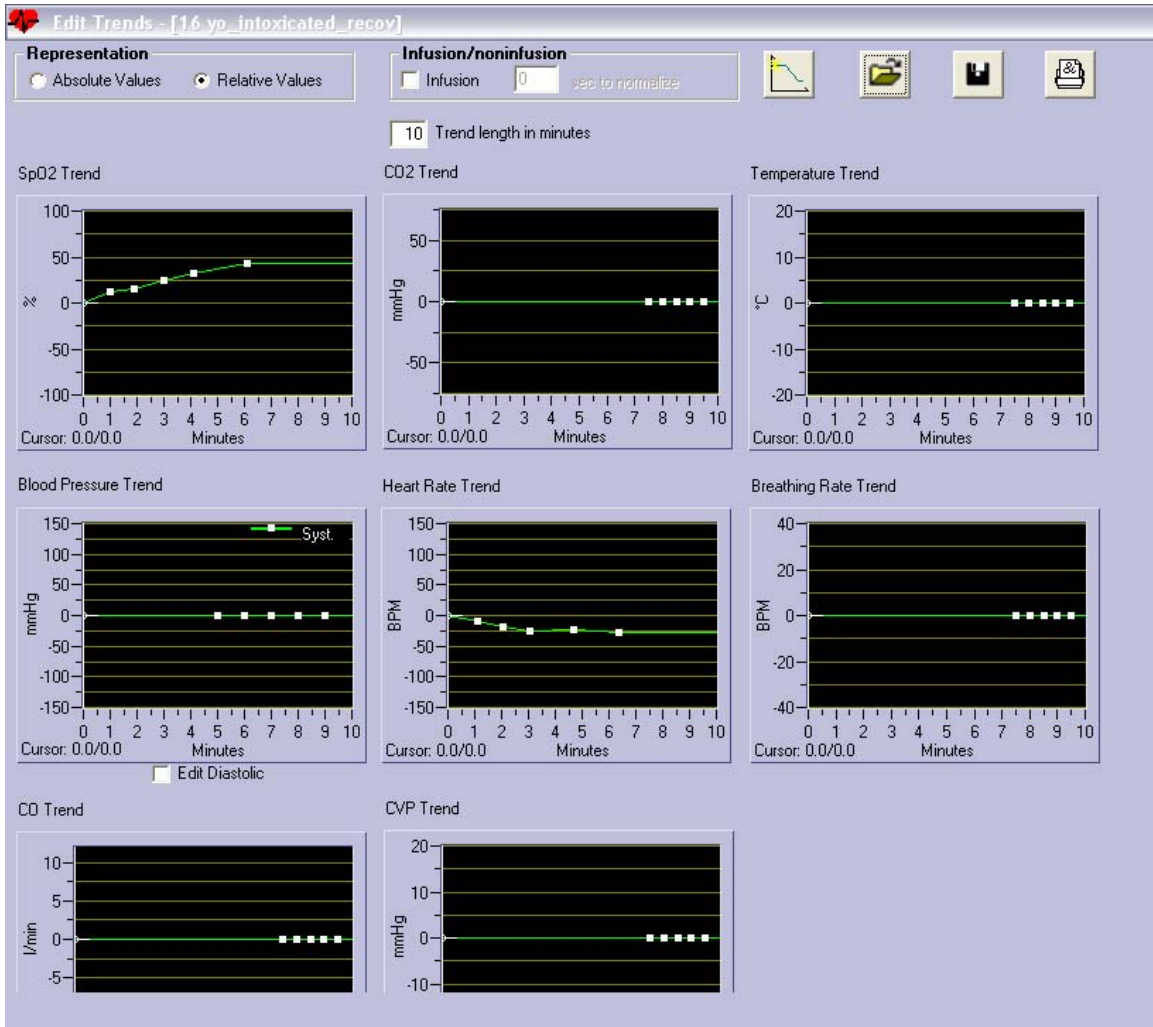


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SimMan Scenario Trends



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