I. **Title:** U/SS Case 5
Elderly Patient with Syncope / Leaking Abdominal Aortic Aneurysm

II. **Date Created:** February 8, 2006
Date Revised: December 8, 2006

III. **Category:** Ultrasound Simulation; Teamwork / Resident Core Curriculum; ACLS

IV. **Target Audience**: undergraduate and graduate medical trainees and staff, nurses, paramedics

V. **Learning Objectives or Assessment Objectives**

A. Primary -
- a.) recognition and management of semi-stable non-traumatic patient
- b.) recognition and management of hypotensive patient progressing into extremis
- c.) recognition and management of unstable patient with suspected leaking aortic aneurysm
- d.) integration of bedside ultrasonography into an organized medical resuscitation
- e.) deployment of teamwork behaviors

B. Secondary -
- a.) appropriate airway management
- b.) appropriate circulatory support
- c.) appropriate consultation and disposition

C. Critical actions checklist (see Appendix A)-

1. Simple checklist of critical actions
   - a.) call for help (Level I trauma- fall with hypotension)
   - b.) establishment of team structure with role assignment
   - c.) deployment of appropriate communications and teamwork behaviors
   - d.) primary trauma survey
   - e.) basic airway / breathing management (100% oxygen administration)
   - f.) recognition of circulatory dysfunction
   - g.) basic circulatory support (cardiac monitor, intravenous access, fluid administration)
   - h.) advanced circulatory support (blood product administration, Foley)
   - i.) secondary trauma survey
   - j.) evaluation and management of potential traumatic causes of hypotension (reviews injury mechanism and patterns, implementation of specific testing and treatment- CXR, pelvis XR, FAST [negative])
   - k.) exclusion of traumatic causes of hypotension

l.) evaluation and management of non-traumatic causes of hypotension (lab testing (hematocrit, electrolytes , toxicologic screens, ultrasonographic aortic evaluation, etc))
m.) recognition of abdominal aortic aneurysm with thrombus on abdominal ultrasonography
n.) emergent vascular surgery consultation

2. Optimal sequence of critical actions- expected sequence as above
3. Duration to critical actions- resuscitation to be completed within 20-25 minutes of starting scenario
4. Behavioral ratings- see Appendix A

VI. ACGME Competencies Assessed

1. Patient Care
2. Medical Knowledge
3. Interpersonal/Communication Skills

VII. Environment and Props

A. Lab Set Up – Emergency Department in simulation center / lab
B. Manikin Set Up –
   a.) advanced medical simulation manikin
   b.) male patient moulage with street clothing, c-collar / backboard, O2 mask
   c.) lines needed: right antecubital 18g IV
   d.) drugs needed: PRBC, fluid (NS)
C. Props – see "USS CASE 5 IMAGES" folder
   (basic airway and code blue cart is assumed)
   a.) ECGs: sinus tachycardia 150
   b.) bedside ultrasound: no fluid in Morrison's Pouch
   abd. aortic aneurysm with thrombus
D. Distractors – patient brought in as a questionable trauma secondary to syncopal episode; heart rate not elevated secondary to hypertension medications

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

A. Roles – paramedic x 1-2, nurse x 1, trauma surgeon
B. Who may play them – other residents, other students, actors
C. Action Role – supportive (see narrative)

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

A. Paragraph narrative overview of case and how case starts-

At 2pm, EMS brings in a 65 year old man who was found down at home. His wife states he walked over to the restroom after eating a meal. She then heard a loud noise in the bathroom and found the patient on the floor. She did not note any seizure activity and immediately called EMS. Found in a supine position on the floor as per EMS, he was awake, alert, responsive to verbal stimuli. VS in the field: HR 84, BP 90/50, SaO2 99% on 100% NRB. In the Emergency Department, the patient is arousable only with physical stimulation, holding his head and moaning. No obvious deformities are noted. The patient is collared and boarded, has an 18g IV in his right AC with 1liter NS running wide open.

B. Board format overview of patient:

1. Name/Age/Sex: Jim Canter 65 year old male
2. Mode of arrival: EMS
3. Accompanied by: wife
4. Triage Note: n/a
5. Chief Complaint: none
6. Past Medical History: **HTN, diabetes, hypercholesterolemia**
7. Medications and Allergies: **atenolol, captopril, hctz, glucophage, lipitor, aspirin; NKDA**
8. Family and Social History: occasional smoker; retired dentist
9. Patient's Initial Exam:

Vital signs:	heart rate:	88 bpm
	blood pressure:	**92/54**
	respiratory rate:	18
	oxygen saturation:	99% (100% NRB); 98% RA
	temperature:	98.4F
Airway:	intact	
Breathing:	clear bilaterally	
Circulation:	**weak pulses,** warm extremities	

Secondary Exam:	elderly male, well-developed; on backboard
HEENT:	s**mall contusion right frontal region**
Neck:	no JVP noted; no midline tenderness; c-collar
Lungs:	clear bilateral with full inspiration
Cardiac:	normal
Abdomen:	**diffuse tenderness**
Extremities:	warm, no signs of trauma
Neurologic:	**GCS 12 (E4/V4/M5)**. pupils 4mm

Additional information:

Fingerstick blood sugar: 135

EKG: normal sinus rhythm 88

C-spine XR: normal CXR: no PTX or HTX pelvis XR: normal

FAST: negative

Aortic Ultrasound : 5x4 cm abd. aortic aneurysm + thrombus

C. Flow diagram with branch points, times of expected interventions and reactions from Sim Man with notes (see Appendix A + B)

Case progression:

1. Initial presentation of syncopal elderly patient with unknown etiology. Trauma evaluation started secondary to assumed fall (patient is brought in full immobilization).
   Vital signs: heart rate: 84 / minute
   blood pressure: 80 / 40 mmHg
   respirations: 16 / minute

2. Patient may be initially treated as an unstable trauma patient with appropriate evaluation and imaging (c-spine, chest and pelvis radiographs). FAST can be performed to detect intra-abdominal bleeding (negative). With an initial negative trauma evaluation and continued hypotension after 2 liters of saline infusion, other etiologies are proposed (autonomic / adrenal insufficiency, cardiac contusion, septic shock). The patient remains unstable and cannot go to computed tomography.

3. A bedside abdominal / aortic ultrasound reveals an infrarenal abdominal aortic aneurysm with thrombus. The resident will need to emergently consult vascular surgery to arrange disposition. The patient will not improve with colloid infusion.

D. Distracters in case: suspected traumatic etiology of hypotension; blunted tachycardia secondary to HTN medication

E. Trends needed: (see Appendix B)

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

A. Tips to keep scenario flowing in lab and via computer
   - presentation of patient with persistent hypotension
   - lulls in activity may be broken with entry of wife

B. Tips to direct actors- as above

C. Scenario programming- see Appendix B
   1. Optimal management path
   2. Potential complications path(s)
   3. Potential errors path(s)
   4. Program debugging

XI. Debriefing Plan

A. Method of debriefing

1. This is a case of a syncope patient with persistent hemodynamic instability and unknown etiology. Initial evaluation must include a rapid trauma evaluation for potential sources of hypotension. After determining the absence of thoracic, abdominal, pelvic, long bone or external blood loss, other etiologies must be suspected. As a leaking AAA can bleed into the retroperitoneal space in an occult manner, evaluation of the aorta to determine the presence / absence of an abdominal aortic aneurysm can aid in timely and appropriate management / disposition. Early colloid administration can be also beneficial.

2. Debriefing Topics

a.) didactic content

- emergency ultrasound in trauma patients (FAST)
    - 4+ views
    - limits of detection (retroperitoneal space)

- abdominal aortic aneurysm with retroperitoneal bleeding
    - presentation
        -hypotension of unknown etiology (patients commonly unaware of pathology)
        -hemodynamic instability (may be absent or profound)
    - evaluation
        -labs (serial bloods, lactate)
        -role of bedside FAST to assess presence of intra-abdominal bleeding
        -role of bedside ultrasound for aortic aneurysm
        -CT scan / angiography if patient is stable
    - treatment
        -aggressive hemodynamic resuscitation
        -vascular surgery consultation
    -disposition
        -VIR (stenting) or OR

b.) teamwork behaviors

-leadership
    -resuscitation leadership establishment
    -role and responsibility assignment
-collaboration
    -recognition and integration of team input
    -error recognition and correction
-communication
    -callouts of critical information
    -callbacks for confirmation of information
-situational awareness
    -continued patient reassessment

-plan development and execution
-task prioritization
-workload assessment
-team member cross-monitoring
-requests for assistance
-professionalism

XII. Pilot Testing and Revisions

A. Numbers of participants- 3-5 learners (1-2 leaders)
B. Performance expectations, anticipated management mistakes
-not getting FAST
-not getting ultrasound of aorta

XIII. Authors and their affiliations

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Additional authors: Leo Kobayashi, MD; RIHMSC, Rhode Island Hospital
Frantz Gibbs, MD; RIHMSC, Rhode Island Hospital

XIV. Additional Debriefing Materials:

Barkin A., Rosen C. Ultrasound detection of abdominal aortic aneurysm. *Emerg Med Clin North Am* 2004; 22(4): 675-682.

Constantino TG, Bruno EC, Handly N et al. Accuracy of emergency medicine ultrasound in the evaluation of abdominal aortic aneurysm. *J Emerg Med* 2006: 29(4): 455-60.

Knaut AL, Kendall JL, Patten R et al. Ultrasonographic measurement of aortic diameter by emergency physicians approximates results obtained by computed tomography. *J Emerg Med* 2005; 28(2): 119-26.

O'Connor R. Aneurysm, abdominal. In eMedicine Specialties > Emergency Medicine > Cardiovascular. Bessman E, Talavera F, Setnik G et al. (eds), eMedicine Web site. Updated October 26, 2005. Available at: http://www.emedicine.com/emerg/topic27.htm Accessed December 11, 2006.

Tang A, Euerle B. Emergency department ultrasound and echocardiography. *Emerg Med Clin North Am* 2005; 23(4): 1179-94.

Appendix A

Scenario Evaluation Form

BrownMed
BROWN MEDICAL SCHOOL

Resident Name _____

Examiner _____

Case Title _____

RIH MSC
RHODE ISLAND HOSPITAL
MEDICAL SIMULATION CENTER

Scenario Type Single Patient ☒ Multiple Patient ☐

Critical Actions Checklist

	Critical Action	Yes	No	Time
1	call for help (Level I trauma- fall with hypotension)			
2	establishment of team structure with role assignment			
3	deployment of appropriate communications and teamwork behaviors			
4	primary trauma survey			
5	basic airway / breathing management (100% oxygen administration)			
6	recognition of circulatory dysfunction			
7	basic circulatory support (cardiac monitor, intravenous access, fluid administration)			
8	advanced circulatory support (blood product administration, Foley)			
9	secondary trauma survey			
10	evaluation and management of potential traumatic causes of hypotension (reviews injury mechanism and patterns, implementation of specific testing and treatment- CXR, pelvis XR, FAST [negative])			
11	exclusion of traumatic causes of hypotension			
	continued			

	Critical Action	Yes	No	Time
12	evaluation and management of non-traumatic causes of hypotension (lab testing (hematocrit, electrolytes , toxicologic screens, ultrasonographic aortic evaluation, etc))			
13	recognition of abdominal aortic aneurysm with thrombus on abdominal ultrasonography			
14	emergent vascular surgery consultation			

ACGME Competencies		
Competency	**Required Skill**	**Check**
Patient Care		
	Caring and respectful behaviors	
	Interviewing	
	Informed decision-making	
	Develop & carry out patient management plans	
	Performance of procedures	
	a) Routine physical exam	
	b) Medical Procedures	
	Work within a team	
Medical Knowledge		
	Investigatory and analytic thinking	
Practice-Based Learning and Improvement		
	Analyze own practice for needed improvements	
	Use of information technology	
	Facilitate learning of others	
Interpersonal & Communication Skills		
	Creation of therapeutic relationship with patients	
	Listening skills	
Professionalism		
	Respectful, altruistic	
	Ethically sound practice	
System-Based Practice		
	Understand interaction of their practices with the larger system	
	Knowledge of practice and delivery systems	
	Practice cost-effective care	

MedTeams

Teamwork Assessment Form

Date_____ Unit_____ Team_____ Shift_____

1. Maintain Team Structure & Climate	
a. Establish the leader	
b. Designate roles and responsibilities	
c. Communicate essential team information	
d. Resolve conflicts constructively	
	Overall rating:
2. Plan & Problem Solve	
a. Engage team members in the decision making process	
b. Identify established protocol to be used or develop a plan	
c. Communicate the plan to teammates	
d. Cross monitor actions of team members	
	Overall rating:
3. Communicate with the Team	
a. Effective use situational awareness updates	
b. Call out critical information during emergent events	
c. Use check-backs to verify information transfer	
d. Systematically hand off responsibilities during team transitions	
	Overall rating:
4. Manage Workload	
a. Re-prioritize patients care in response to overall caseload of team	
b. Execute team established plan	
c. Balance workload within the team	
d. Request assistance for task overload	
	Overall rating:
5. Improve Team Skills	
a. Conduct event reviews	
b. Conduct shift reviews	
	Overall rating:

Very Poor	Poor	Marginal	Acceptable	Good	Very Good	Superior
1	2	3	4	5	6	7

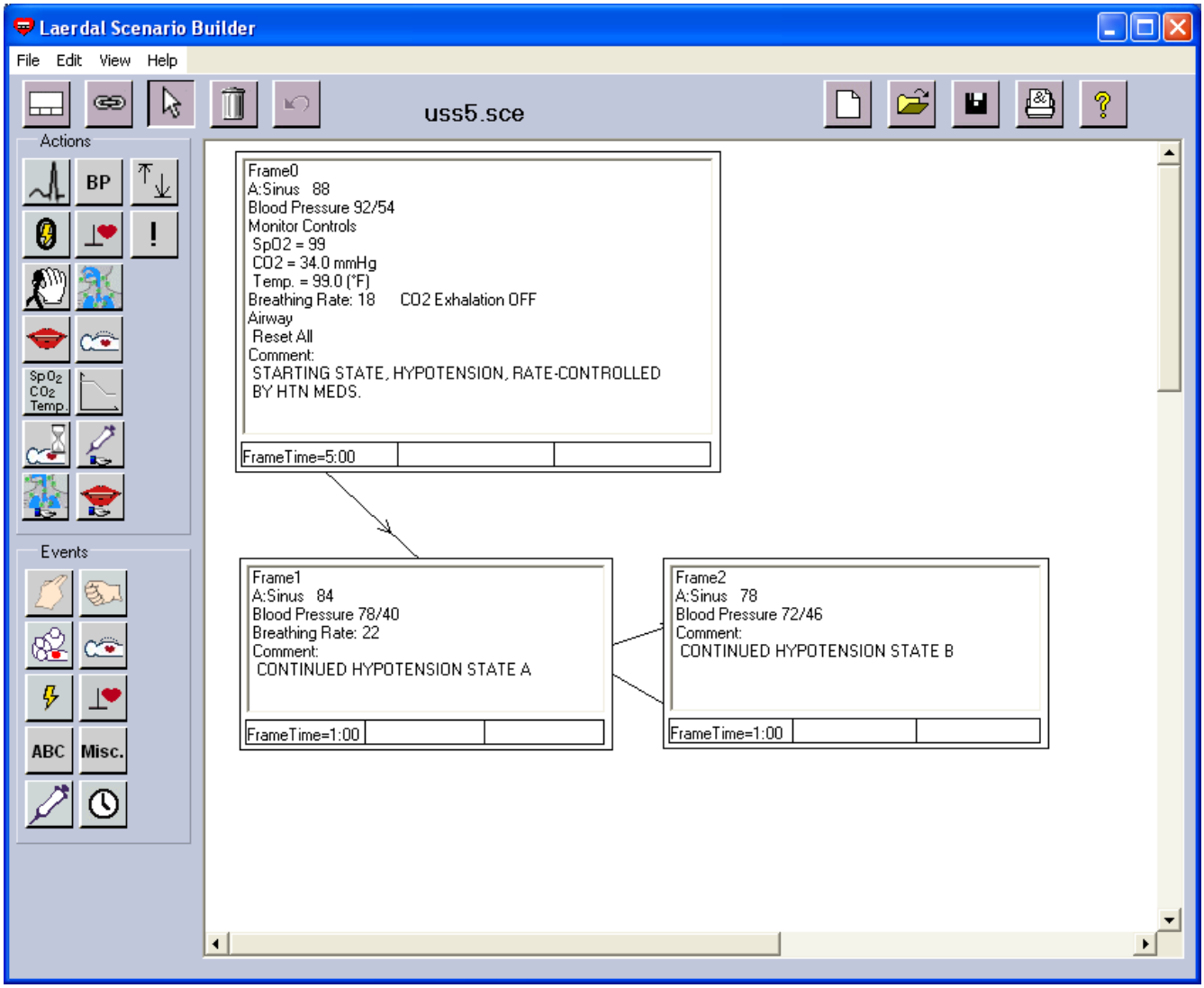
Teamwork Assessment Form

Likert Scale Descriptors

1. Very Poor
   - ❖ Teamwork principles operating minimally
   - ❖ Evidence of a hostile negative environment
2. Poor
   - ❖ Elements of teamwork observed about ten percent of the time
3. Marginal
   - ❖ Elements of teamwork observed about twenty-five percent of the time
4. Acceptable
   - ❖ Elements of teamwork observed about fifty percent of the time
5. Good
   - ❖ Elements of teamwork observed about seventy-five percent of the time
6. Very Good
   - ❖ Elements of teamwork observed about ninety percent of the time
7. Superior
   - ❖ Elements of teamwork observed ninety-eight percent of the time

Appendix B

Laerdal SimMan v2.2 scenario content



Note: The events to force transitions to a new frame will need to be edited via the “Edit Event Menus” feature within Scenario Builder