

## Breathing

- SpO<sub>2</sub>
- EtCO<sub>2</sub>
- NICO monitoring
- Cyanokits
  - NICN monitoring
- Resq Pods
- BVM v Vents
- CPAP

Comparison article



**HAND-HELD**  
**QUANTITATIVE Capnometer**  
That Gives You More Than Just Color Changes...

**EASY CAP II**  
**PEDI-CAP**



**Rad57**



**toxCO**



**A Scene Like This Needs An Antidote Like CYANOKIT**

**CYANOKIT**



## Bag v Vent?



## Ventillators

Information icon

## CPAP/BiPAP



### How About BVM for the CHF Pt.?

- ✦ BVM by itself doesn't cut it, .... But....



✦ Add a PEEP valve with an effective seal and you have created CPAP!!

### Circulation

- ✦ Thumpers
- ✦ Geezer squeezers
- ✦ EtCO<sub>2</sub>
- ✦ Cyanokits
- ✦ NICN monitoring
- ✦ 12 Leads
- ✦ Intraosseous
- ✦ Resq Pods
- ✦ NIBP
- ✦ Tourniquets
- ✦ Hemostatics agents




**HAND-HELD**  
QUANTITATIVE  
Capnometer  
That Gives You More  
Than Just Color Changes...

**EASY CAP II**




**PEDI-CAP**








**ResQpod**

### CAT & MAT

### Hemostatic Agents

- Celox
- Hemacon
- Quik Clot
- ...

Seconds count.  
Stop the bleeding fast.






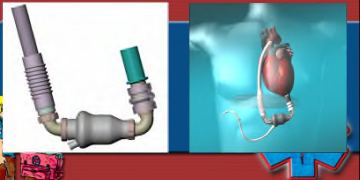
• IV or IO drug administration is preferred to ET administration

Health volun

### VADs




### LVADs



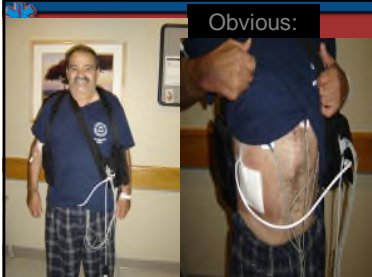
HeartMate II LVAD - simple

### Smaller, cleaner profile:




Simple Design:  
Valveless  
One moving part (rotor)

### Obvious:



### Defibrillator Vests?




### Disability

→ Post arrest cooling



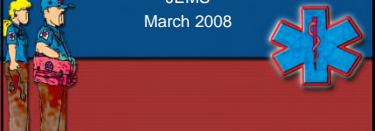
### Environmental


→ Temperatures



### Case Studies



JEMS  
March 2008







### Down at the State Capital

- 27 y/o male with a c/c of "generalized weakness."
- HPI: malaise, non-productive cough and myalgia increasing over the past 2 days
- He was at his office desk working when co-workers noticed he wasn't feeling well or looking well






- He has been healthy prior to the onset of these symptoms 2 days ago
- He denies significant PMH, takes no medications, and has no known drug allergies



### Vital Signs per Automated Devices

- HR 96/min
- B/P 104/48 mmHg
- RR 20/min
- Pulse oximetry 94% on RA






### Primary Examination

- Pt is in NAD, A, A & O x 4
- Afebrile
- Lungs are clear
- No JVD
- Regular rate and rhythm
- Abd is soft and non tender






- The Pt. states he probably has a virus "like everyone else in the office," and he just wants to go home and rest
- Colleagues and medical crew joke with pt. about "not running off to the sunny Bahamas and using up all of his sick days"
- Pt allows as how he won't, as he just returned from the balmy & sunny Florida yesterday, and "I just want to go home and rest – really"



### Any thoughts now?

- On secondary exam after this last comment by the patient reveals
  - The pt's left leg swollen and slightly erythematous from mid thigh distally
  - Pt unaware of this
- Distal pulses are symmetrical
- There is mild tenderness along the medial thigh in the distribution of the L saphenous vein, and the L calf is larger than the right and slightly tender



### Let's Review those Automated Vital Signs

➤ HR 96/min	Borderline tachycardic
➤ B/P 104/48 mmHg	Borderline hypotensive
➤ RR 20/min	Tachypneic
➤ Pulse oximetry 94% on RA	Borderline hypoxic

### What is your Assessment now?


- If you hadn't listened to your patient, would you have ended up here?
- If you hadn't touched your patient, would you have ended up here?


### Case 2

- It's a hot summer morning and you are dispatched to a tennis court at a retirement village for a c/o "dizziness"
- Upon your arrival you find a 72 y/o female sitting against the fence, c/o
  - Fatigue
  - SOB
  - Chest tightness


For the past 20 minutes








- PMH
  - HTN treated with 25 mg of HCTZ qd
- Meds
  - ASA 81 mg qd
  - 25 mg of HCTZ qd
- Allergies
  - NKDA
- No other significant PMH




### Vital Signs per Automated Devices

- HR 40/min
- B/P 100/70 mmHg
- RR 18/min
- Pulse oximetry 98% on RA




### Initial Exam

- Pt is A, A & O x 4, with MOE x 4
- Lungs are clear and equal
- Regular rate and rhythm
- Abd is soft flat and non tender
- Pulses are equal and symmetrical x 4
- No JVD
- No edema




### Which Protocol do you Follow?

- This isn't a trick question!
  - Which protocol do you follow? Chest Pain? SOB?
  - IV, O<sub>2</sub>, monitor, ASA, NTG ? Morphine
  - Initial monitoring shows 1.5 mm elevation in L II
- Any thoughts or considerations at this point?
- OK, so you proceed with your CP protocol




- Pt is placed in a POC, (45 degrees) and you initiate your protocol
- You note while pt is in this position, that she has JVD not previously appreciated while she was sitting 90° against the fence
- Reassessment confirms the JVD, and lungs remain clear and equal
  - Of note though, is that as the pt takes a breath, then JVD rises to 2/3 the distance from clavicle to jaw




### Any thoughts now, or shall we continue with our protocol?

- The medics in this case opted to call in to medical control and share their findings
- The doc asked them to hold off on their planned treatment plan, and instead .....
- Fluid challenge pt with 250 cc of NS and then either
  - Start a NTG drip
  - Or if not available give a SL NTG and monitor closely for hypotension




### Vital Signs After Fluid Challenge

- HR 70/min
- B/P 115/75 mmHg
- RR 18/min
- Pulse oximetry 100% on RA
- The patient states the dizziness has resolved
- The NTG is administered




- Within 3 min the CP resolved
- The B/P dropped to 105/65
- Pt admitted to the CCU via the ER with a Dx of????
  - Acute inferior MI with right ventricular infarct




- What was the that JVD thing?


## Kussmaul's Sign



- Kussmaul's sign is the occurrence of increased jugular venous pressure and the appearance of JVD with inspiration. It can be indicative of R ventricular contractility deficiency.
- Other usual findings are arterial hypotension and clear lungs.




- Normal physiology would find the JVD falling with inspiration due to reduced intrathoracic pressure with inspiration.
- Kussmaul's sign can indicate venous return overload of the right ventricle due to failure of adequate systolic ejection.
- More likely causes of Kussmaul's sign include
  - Constrictive pericarditis
  - Pericardial effusion
  - Restrictive cardiomyopathy




### Case 3


- Dispatched to a 60 y/o male with a c/c of syncope
- Upon arrival, you find the pt sitting in a chair with his wife in attendance
- Wife reports that the couple was eating breakfast when the syncope occurred
- Pt has been feeling well up to the time that he awoke this am and c/o feeling dizzy and nauseated before breakfast



- The patient slumped in his chair mid sentence, unconscious
- 911 called
- The pt. spontaneously revived in < 1 min.
- Pt. was amnesic to the event
- No seizure activity noted




- No significant PMH
- NKDA
- Meds
  - Toprol for HTN x 2 years (pt compliant)
- Pt saw PCP last week and was given a clean bill of health




### Vital Signs per Automated Devices

- HR 68/min sinus rhythm – sinus arrhythmia
- B/P 112/75 mmHg
- RR 16/min
- Pulse oximetry 98% on RA




### Initial Exam

- Pt. A, A & O x 3 with MOE x 4 without motor-sensory deficits, DTRs are 2+, PERRL
- S<sub>1</sub>S<sub>2</sub>, with Regular rate and rhythm
- Lungs are clear to auscultation
- Abd is soft and non tender
- Pulses are 2+ x 4



### OK, Syncope protocol, Right?

- IV, O<sub>2</sub>, Monitor, and a glucose
- Glucose = 115 mg%
- 12 Lead EKG performed (part of protocol)
- The "reading" on the 12 L says "atrial fibrillation"




### What now?


- Change gears to "new onset A. fib with symptoms"?
- So what changes?
  - Cardiovert?
  - Antiarrhythmics?
  - Both?
- Base station contact?
  - If so, what do you want? Or what are you thinking?



- ✦ In this case, the medics contacted medical control, and reiterated the situation with new VSs which are essentially unchanged from the initial ones
- ✦ The medics ask for orders for diltiazem
- ✦ The astute physician inquires as to the dose of the patient's Toprol XL




- ✦ Further questioning of the pt. reveals that during his visit to the doctors office last week, he had his prescription refilled
- ✦ ..... "yes, but when I see her again, I'm going to tell her that I was doing fine with the 50 mg pills...."
- ✦ .... "she told me that I'd feel even better with the big boys (100 mg pills)"




### So, what are you thinking now?

- ✦ Beta blockade toxicity
- ✦ A couple of interesting things;
  - ✦ The initial 12 L "read A fib at a rate of 69"
  - ✦ But was actually a sinus arrhythmia at a rate of 69  
Hmmmm
  - ✦ These guys were going to treat a beta blocker toxicity with a calcium channel blocker  
Hmmmm
  - ✦ The beta blockade is why the HR couldn't compensate for the relative hypotension





## Case 4


# A Breather



### .... Respond to a 64 y/o Male with difficulty Breathing






- ✦ On arrival you find a classic COPDer, a 64 y/o M, who is c/o SOB and just wishes a "treatment" "like you guys always do"
- ✦ RR 36-40, with diminished BSs bilat with scattered wheezing, speaking in 3-5 word sentences, 2+ palpable radial pulses at 150ish, color is a ruddy cyanosis with a SpO2 = 90%

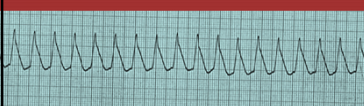





### How do you Treat this Patient?

- ✦ NPPB of ?
- ✦ Oxygen?
- ✦ IV?
- ✦ Monitor?


### Again, your intern is looking for something to do, so.....

**Ventricular Tachycardia**  
If criteria is met, make the call  
If not, continue down to the next.

1. ERAD + positive MCL-1  
or
2. QRS morphology in V1 or V6  
or
3. RAD + negative MCL-1  
or
4. Concordance (Up or Down)  
or
5. RS interval (V lead) is >100ms  
or
6. QRS is > .14 seconds

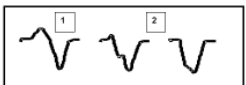
**2** Lead MCL-1 (V1) Morphology Criteria  
If MCL-1 (V1) is an upright complex....



1. Taller left peak than right, "BIG mountain little mountain"
2. Single upright peak, "steeple sign"
3. Single peak with a slur, "fireman's hat"

Lead MCL-1 (V1) Morphology has a 94% accuracy if it looks like one of these examples


If MCL-1 (V1) is a negative deflection...



1. Fat "R" wave – the r wave is more than 40ms (one little square) wide.
2. Slurring or notching to the initial downstroke (q or s wave)

**3** Lead MCL-6 (V6) Criteria

1. Any negative deflection (when you get to this point) is VT
2. Rare cases show a tall q wave in a biphasic complex



Now how do you want to proceed?

Does this change anything?

**Case 5**

→ Another call to the .....\*?!\*?!\*xo?\*

→ This is your Station's 3<sup>rd</sup> call to this joint this morning

→ Now, responding to a 23 y/o male feeling ill

→ You arrive on scene to find a 23 y/o male, known alcoholic who states he was drinking last night but not yet today and he just feels lousy, c/o H/A, slight nausea, no vomiting and "no energy"

**So what do you think?**

→ How do you wish to proceed?

→ Vital Signs from NIV monitors:

- RR 16
- HR (monitor) 104
  - Pulse rate correlates
- SpO2 = 100%
- B/P 118/82


**Anything else you wish to do?**



CO = 16

**Any last thoughts?**

- How about those other two calls of a similar nature you responded to?



**ANY QUESTIONS?**

