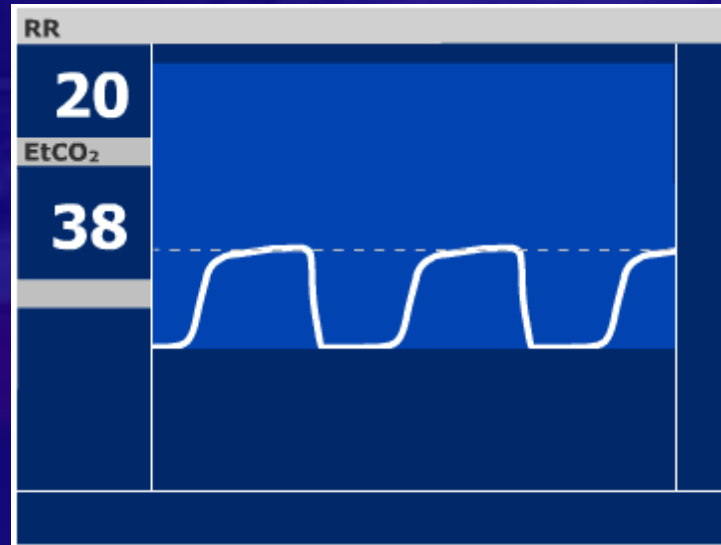


Challenging Capnography Cases



NTI class code:
EXED222

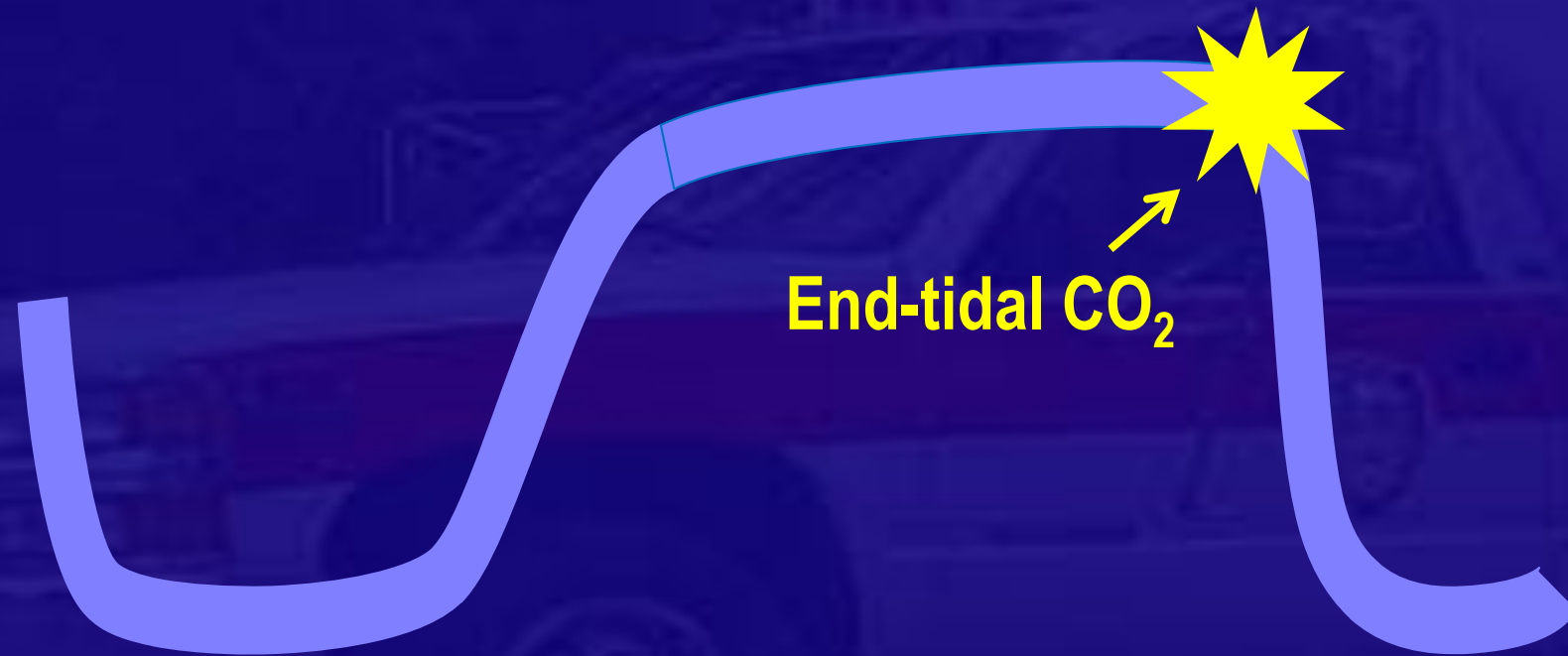
Mike McEvoy, PhD, NRP, RN, CCRN
Cardiac Surgical ICU RN & Chair Resuscitation
Committee – Albany Medical Center
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Review

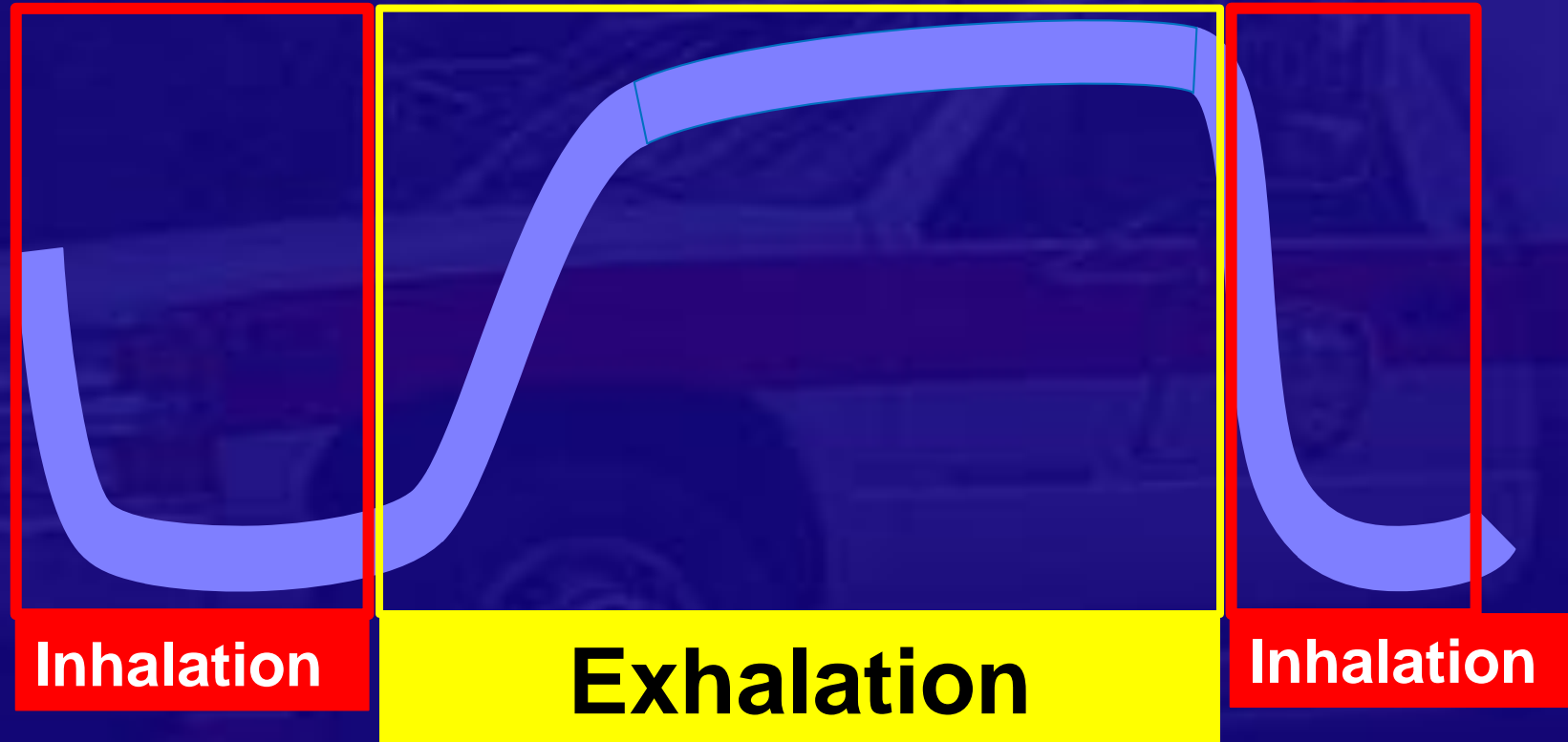


Where is EtCO₂ Measured?

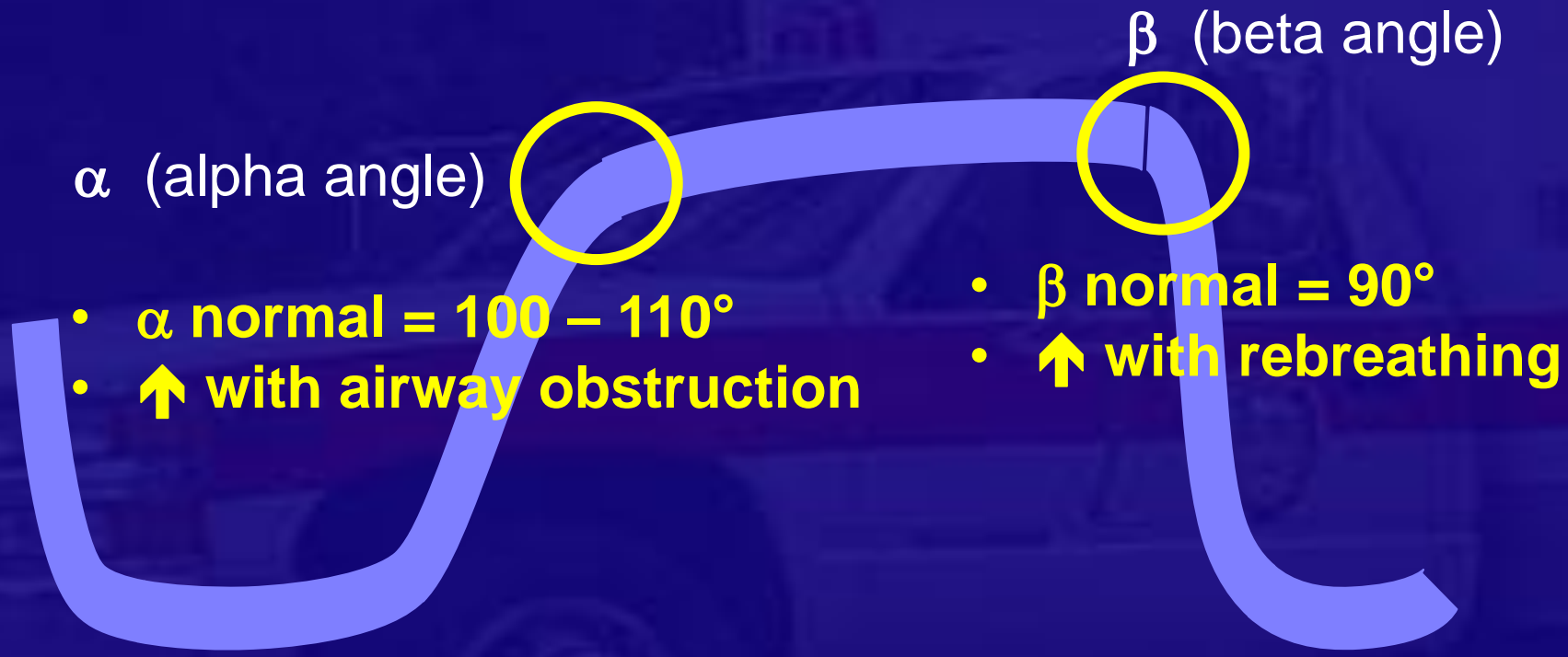


Normal EtCO₂ is 35 – 45 mmHg

Label Inhalation & Exhalation



Capnogram Angles



α (alpha angle)

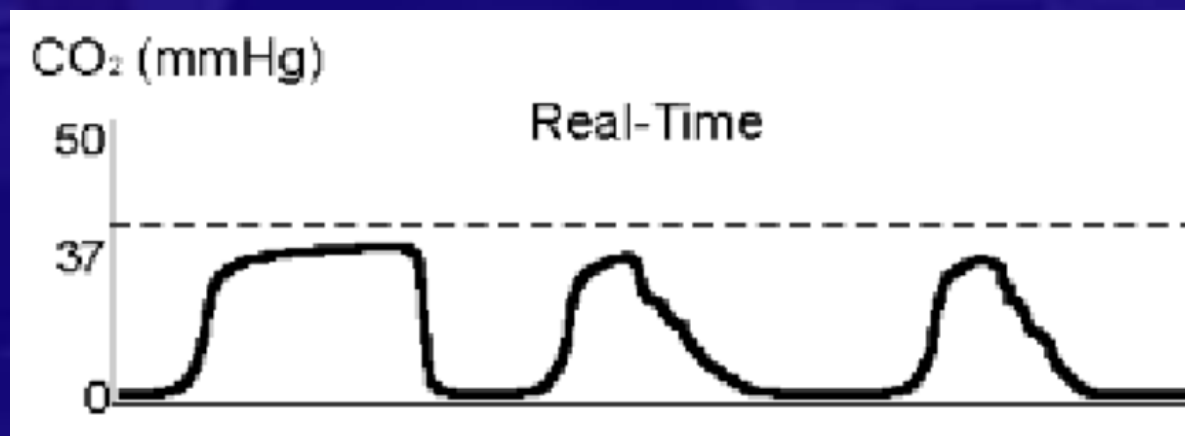
β (beta angle)

- α normal = 100 – 110°
- ↑ with airway obstruction

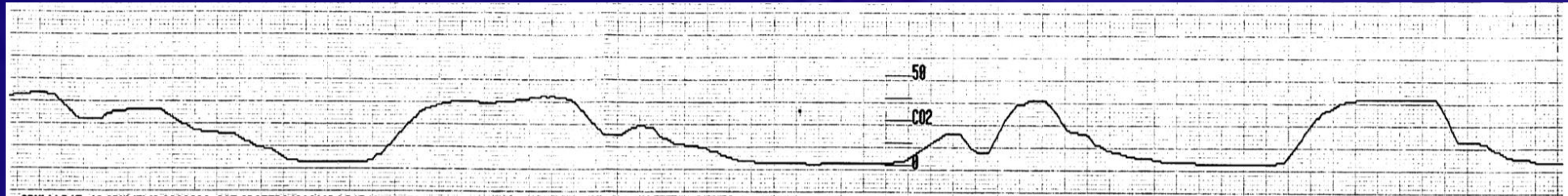
- β normal = 90°
- ↑ with rebreathing

Conscious Sedation

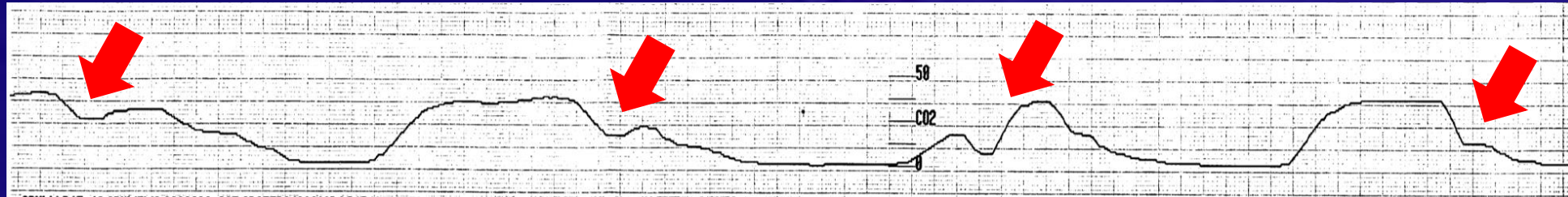
- CO₂ monitoring required in medical settings
- Despite this, arrests continue to occur



Unrecognized AO

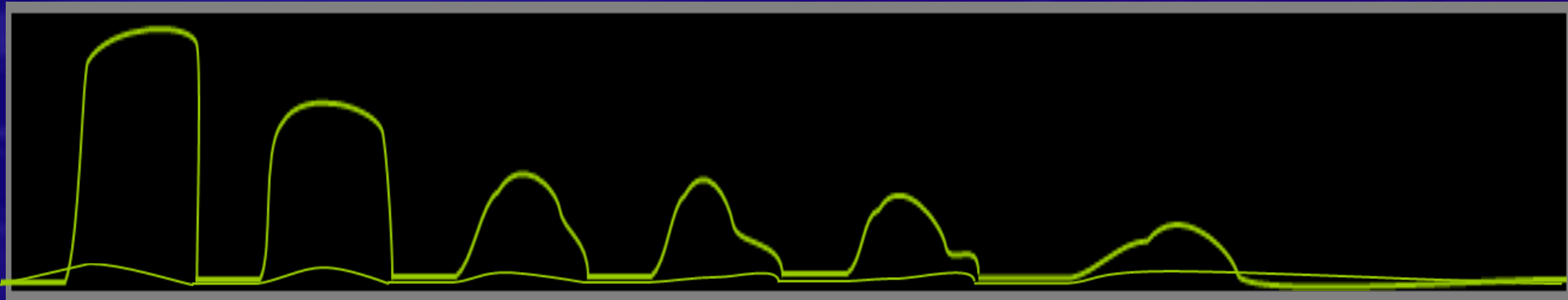


Unrecognized AO



Road Trip to CT Scanner

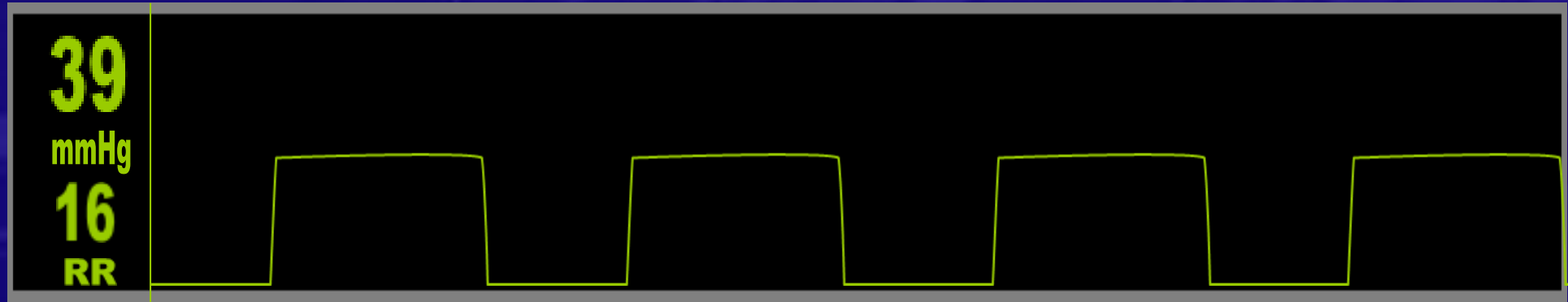
- 86 yo COPDer severe respiratory distress; intubated
- HR 128, RR 14 by BVM, SpO₂ 99%



- The tube came out
- When is this most likely to occur?

Reintubated

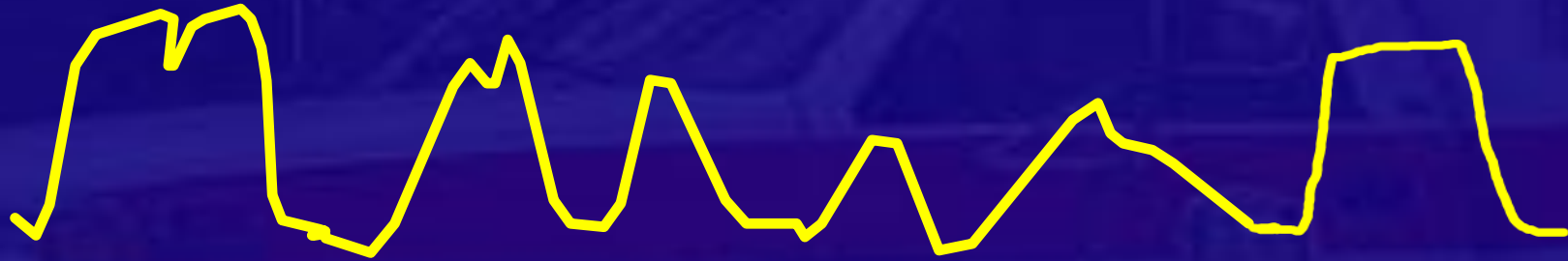
- The patient is reintubated
- This is the capnography waveform:



- Is the tube in?
- Is the ventilation rate and depth appropriate?

GSW – intubated by EMS

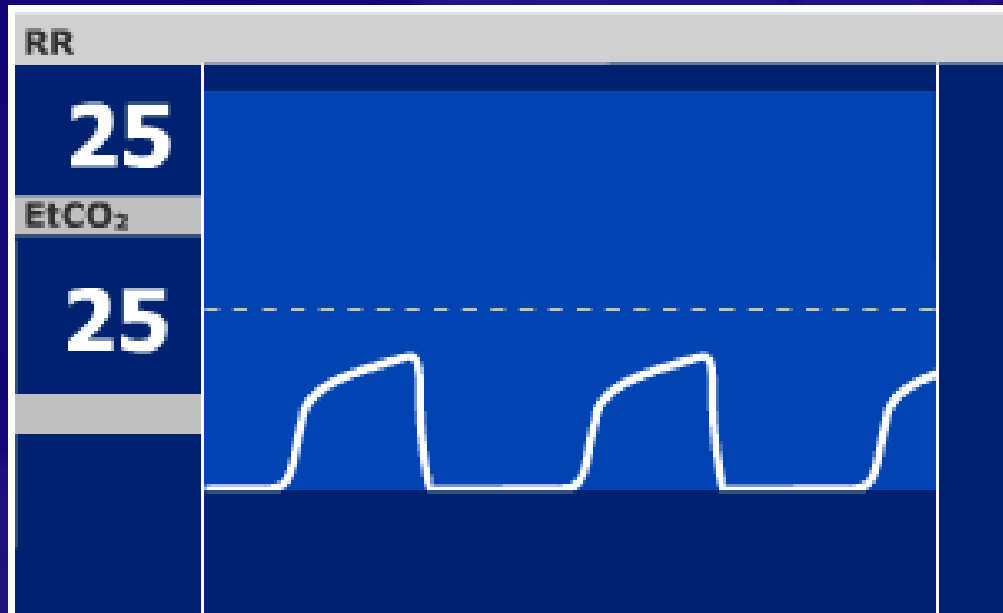
- Paramedics left 15” ago
- The patient begins to awaken:



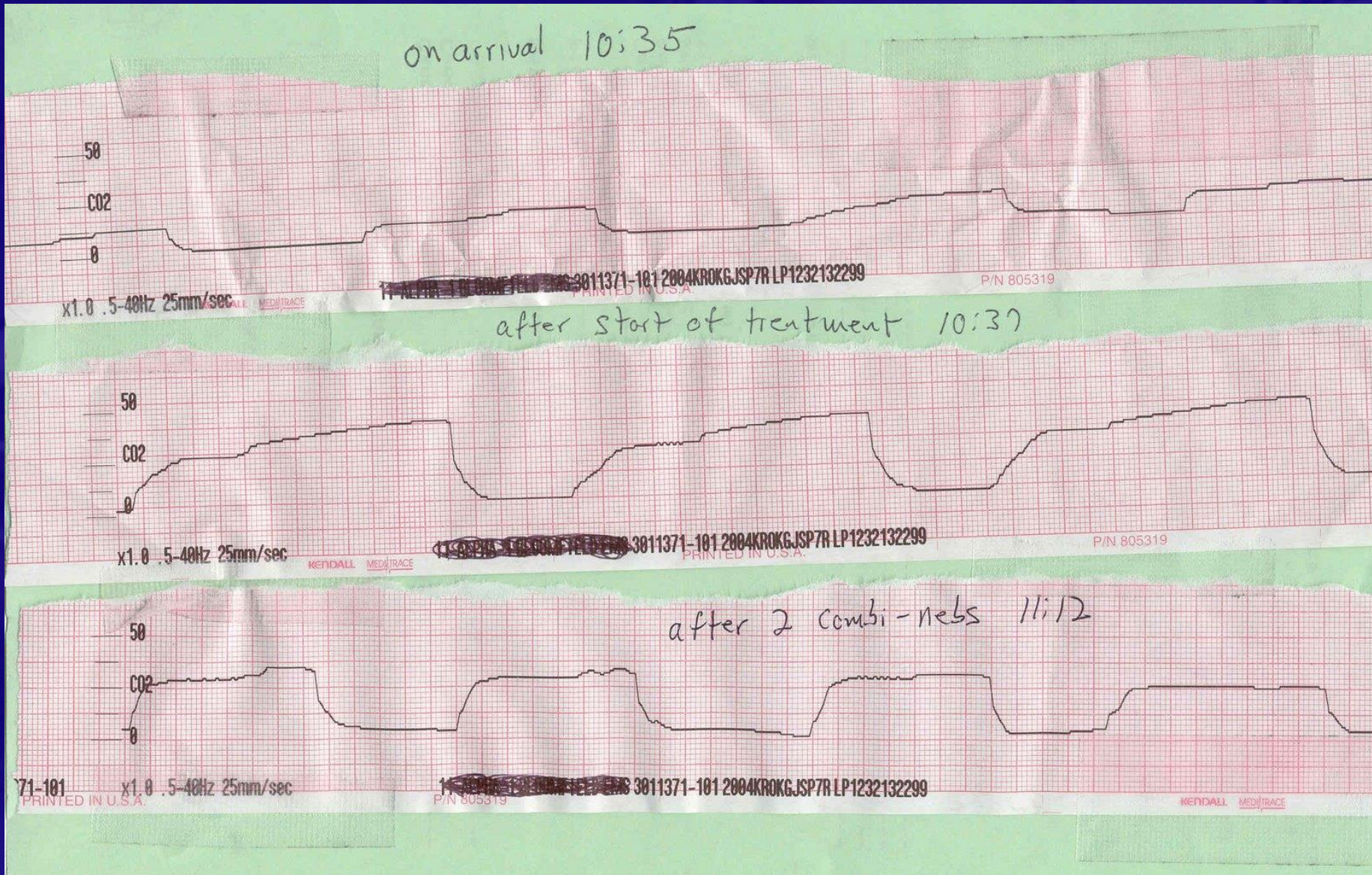
- $\text{EtCO}_2 = 30$, RR = 38
- “Curare Cleft” = diaphragmatic movement (breathing over drugs)
- “Bucking” ventilation needs drug tx

Bronchospasm

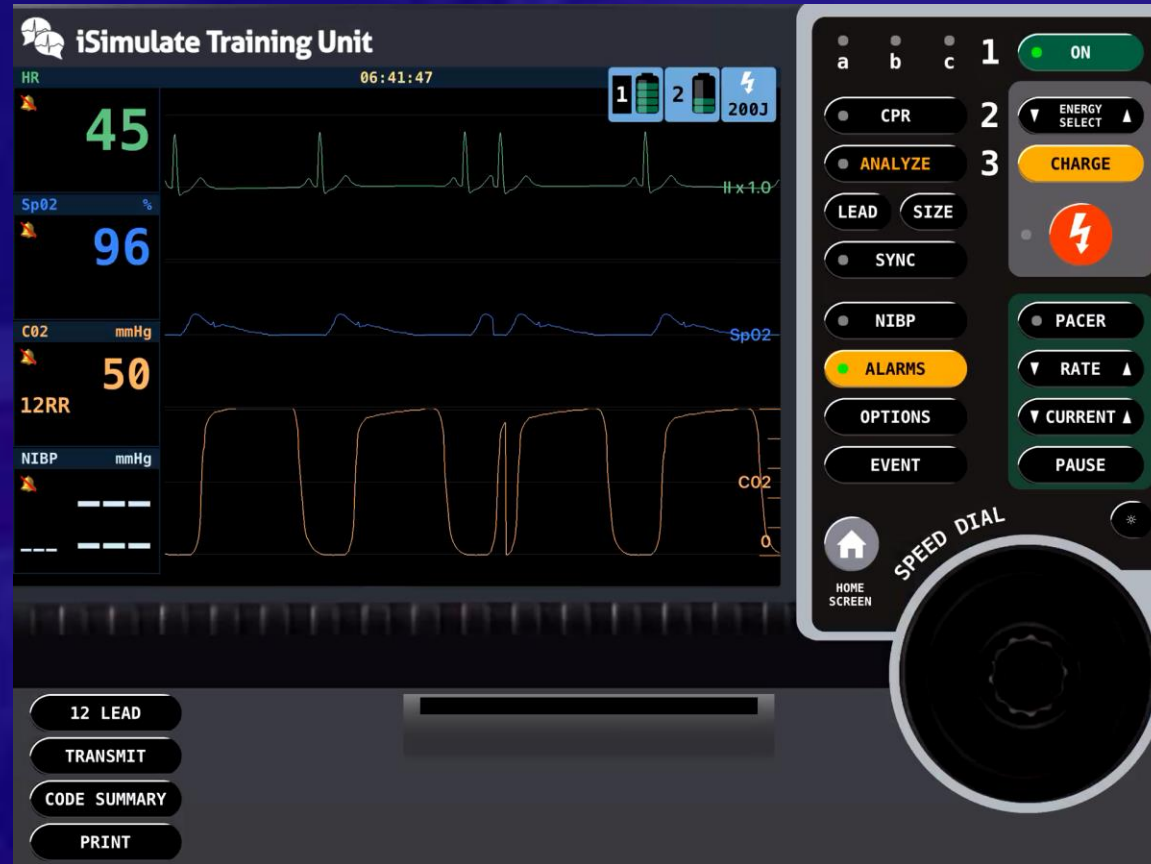
- Asthma, COPD...
- Elevation of α angle, loss of alveolar plateau (“shark-fin” appearance)
- Degree of angle = severity



Effects of Treatments



Case #1: Bradycardia



Case #1: Bradycardia

The screenshot displays the iSimulate Training Unit interface. On the left, vital signs are shown: HR (Heart Rate) at 45 bpm (circled in yellow), SpO2 at 96% (with a yellow arrow pointing to it), C02 at 50 mmHg (circled in yellow), and 12RR at 12RR. The right side features a control panel with buttons for CPR, ANALYZE, LEAD, SIZE, SYNC, NIBP, ALARMS, OPTIONS, and EVENT. A SPEED DIAL is also present, with settings for PACER, RATE, CURRENT, and PAUSE. The bottom of the screen includes a 12 LEAD button, TRANSMIT, CODE SUMMARY, and PRINT buttons, along with a timer and navigation icons.

iSimulate Training Unit
06:41:56

HR 45
SpO2 96
C02 50 mmHg
12RR 12RR

ALARMS | **PACER** | **RATE** | **CURRENT** | **PAUSE**

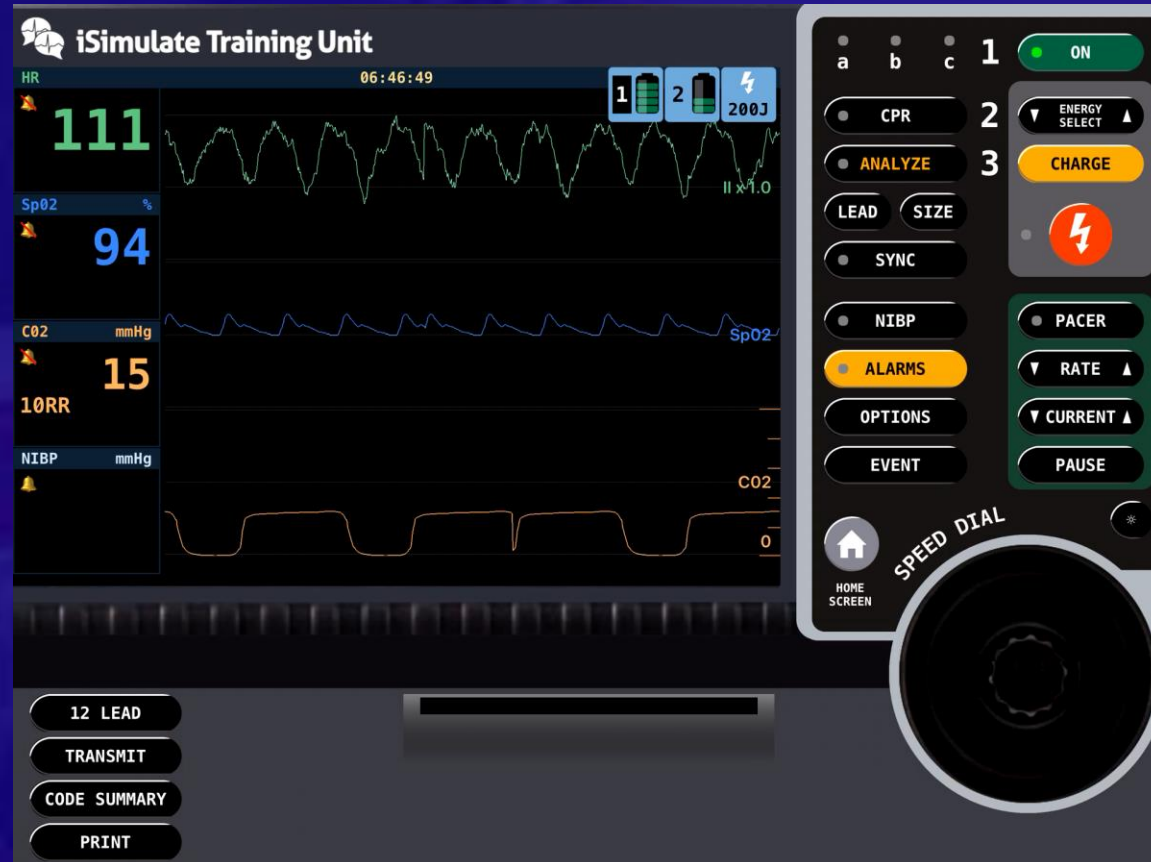
12 LEAD | **TRANSMIT** | **CODE SUMMARY** | **PRINT**

Case #1: Bradycardia

The screenshot displays the iSimulate Training Unit interface. The top left shows the title "iSimulate Training Unit" and a timer at 06:43:28. The main display area shows vital signs and ECG waveforms. The HR (Heart Rate) is 30, SpO2 (Oxygen Saturation) is 94, C02 (Carbon Dioxide) is 80, and NIBP (Non-Invasive Blood Pressure) is 148/90. The ECG shows a regular rhythm with a rate of 30. A yellow circle highlights the HR value, and a yellow arrow points to the SpO2 value. The right side of the interface features a control panel with buttons for CPR, ANALYZE, LEAD, SIZE, SYNC, NIBP, ALARMS, OPTIONS, and EVENT. A "SPEED DIAL" control is also visible, with a "HOME SCREEN" button. The bottom of the interface shows a Windows taskbar with the search bar and various application icons.

Vital Sign	Value
HR	30
SpO2	94
C02	80
NIBP	148/90

Case # 2: Post ROSC



Case # 2: Post ROSC

The screenshot displays the iSimulate Training Unit interface. On the left, a vertical panel shows vital signs: HR 111, SpO2 94, C02 59, 10RR, and NIBP 0/0. The top right shows a time of 06:47:20 and battery status for three devices (1, 2, and 200J). A yellow box highlights a waveform, likely SpO2, which shows a regular, oscillating pattern. Below this, another waveform for C02 is visible, with a yellow arrow pointing to its rising phase. On the right, a control panel includes buttons for CPR, ANALYZE, LEAD, SIZE, SYNC, NIBP, ALARMS, OPTIONS, and EVENT. A 'SPEED DIAL' is also present. At the bottom, there are buttons for 12 LEAD, TRANSMIT, CODE SUMMARY, and PRINT, along with a progress bar and playback controls.

iSimulate Training Unit
06:47:20

HR
111

SpO2
94

C02
59

10RR

NIBP
0/0

1 **2** **200J**

1 **2** **3**

ON

ENERGY SELECT

CHARGE

PACER

RATE

CURRENT

PAUSE

HOME SCREEN

SPEED DIAL

2

12 LEAD

TRANSMIT

CODE SUMMARY

PRINT

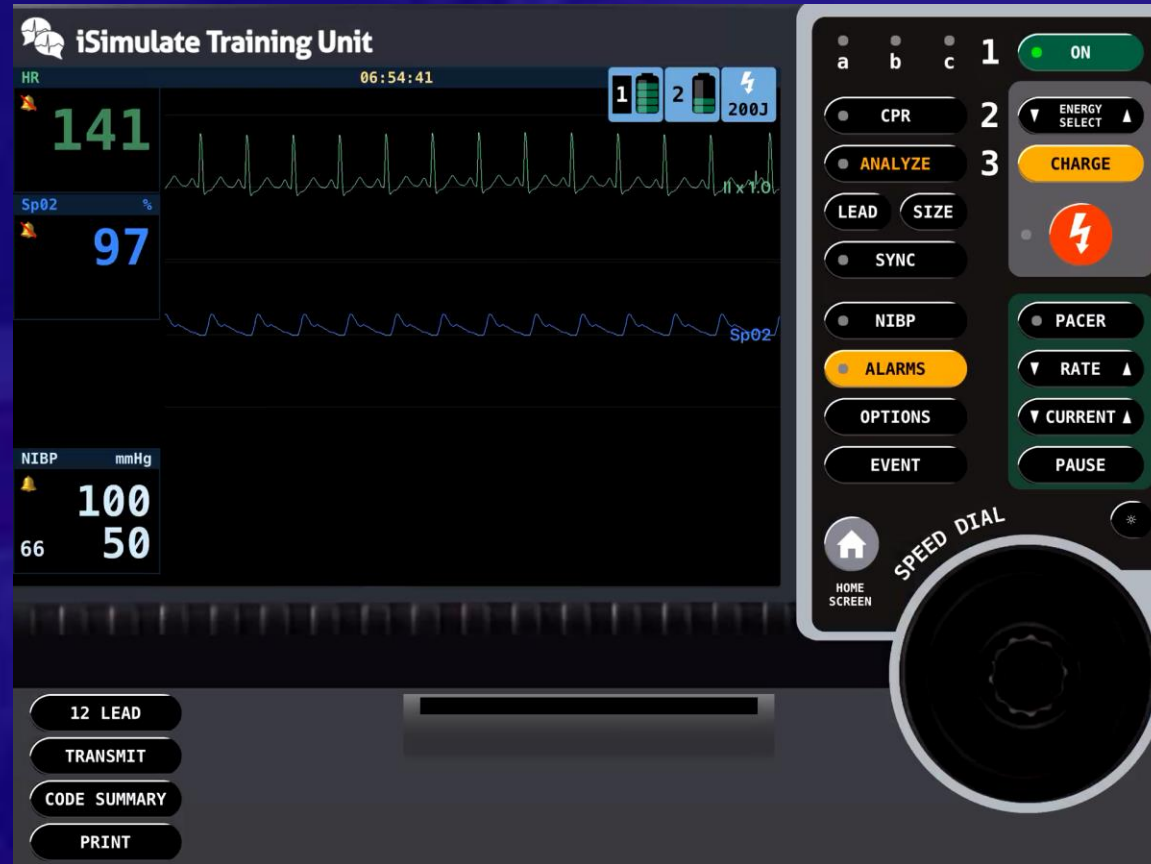
0:00:30 0:01:02

Case # 2: Post ROSC

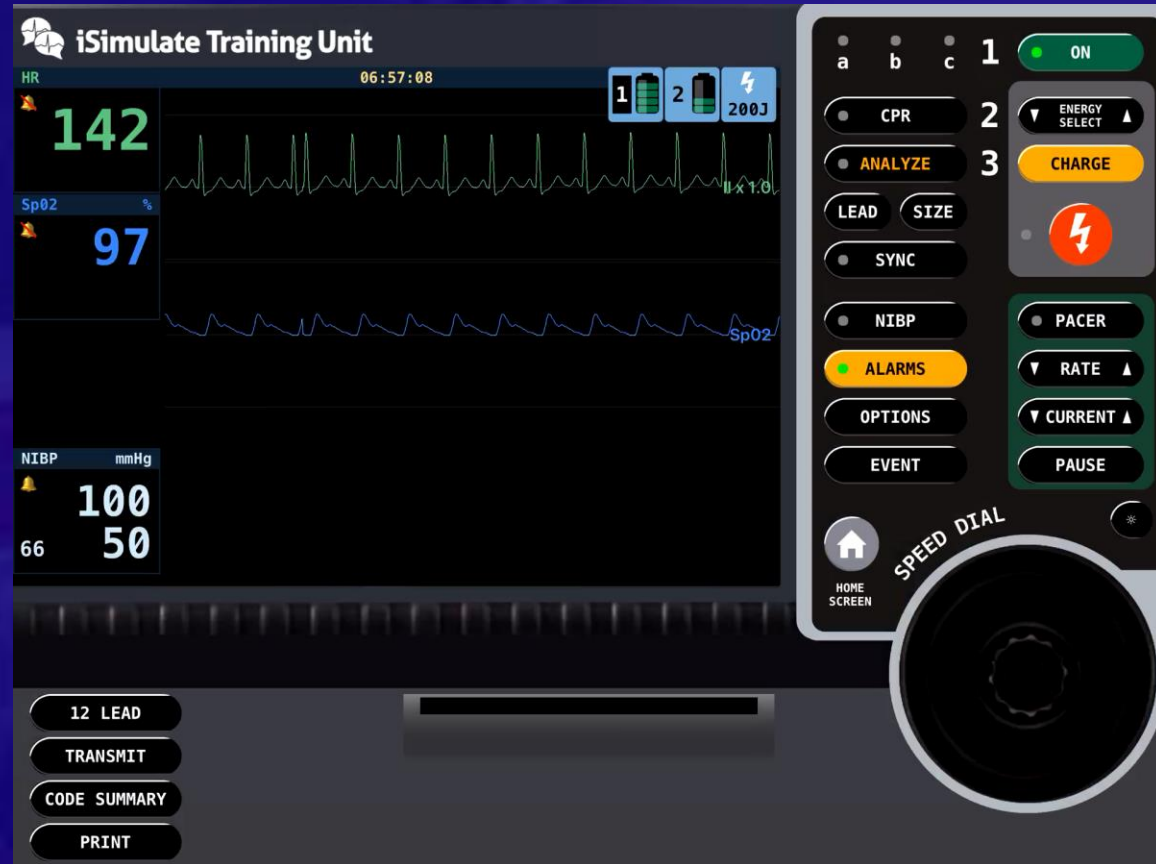
The screenshot displays the iSimulate Training Unit interface. The top left shows the title "iSimulate Training Unit" and a timer at 06:48:03. The main display area shows vital signs: HR 103, SpO2 94, CO2 10 (circled in yellow), and 10RR. Below these, NIBP is shown as 100/50 (boxed in yellow). The CO2 waveform is highlighted with a yellow arrow pointing to the 10 value. The right side features a control panel with buttons for CPR, ANALYZE, LEAD, SIZE, SYNC, NIBP, ALARMS, OPTIONS, and EVENT. A "SPEED DIAL" is also visible. The bottom of the screen shows a Windows taskbar with the search bar and various application icons.

Parameter	Value
HR	103
SpO2	94
CO2	10
10RR	10
NIBP	100 / 50

Case # 3: 15 yo asthmatic



Case # 4: 15 yo asthmatic (again)



Case # 4: 15 yo asthmatic

The screenshot displays the iSimulate Training Unit interface. The top left shows the title "iSimulate Training Unit" and a time of 06:58:09. The main display area is divided into several sections:

- Vital Signs Panel (Left):**
 - HR: 141 (Heart Rate)
 - SpO2: 97% (Oxygen Saturation)
 - C02: 47 mmHg (End-tidal CO2)
 - NIBP: 100/50 mmHg (Non-Invasive Blood Pressure)
- Waveform Panel (Center):** Displays three waveforms: HR (green), SpO2 (blue), and C02 (orange).
- Control Panel (Right):** Features a "SPEED DIAL" knob and several buttons:
 - Buttons: CPR, ANALYZE, LEAD, SIZE, SYNC, NIBP, ALARMS, OPTIONS, EVENT.
 - Energy Select: ON, ENERGY SELECT, CHARGE.
 - Pacer: PACER, RATE, CURRENT, PAUSE.
 - Home Screen: HOME SCREEN.
- Bottom Panel:** Includes buttons for 12 LEAD, TRANSMIT, CODE SUMMARY, and PRINT. A progress bar at the bottom shows 0:01:01 elapsed time and 0:00:00 remaining time.

Ventilator Patient

- 45 yo auto-pedestrian, open tib-fib, BP 120/60 (80), HR 90, SpO₂ 97%, EtCO₂ 45



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- Normal waveform

Questions?

Thanks for your attention!



NTI class code:
EXED222

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