



# EMS System for Metropolitan Oklahoma City and Tulsa 2017 Medical Control Board Treatment Protocols



Approved 11/9/16, Effective 2/1/17, replaces all prior versions

## 12C – CARBON MONOXIDE ADULT & PEDIATRIC

### TREATMENT PRIORITIES

1. Personal safety
2. Patient safety
3. Vital signs (including CO & EtCO<sub>2</sub>, if equipped)
4. Oxygenation support
  - O<sub>2</sub> by NC, NRB
  - BVM, Bi/CPAP, ETT if indicated
5. Ventilation support
  - BVM, Bi/CPAP, ETT if indicated
6. OLMC consult for hyperbaric oxygen use direction in serious exposures

### EMD

DIRECT TO MOVE AWAY FROM SUSPECTED SOURCE  
IF SAFE TO DO SO  
OPEN AIRWAY IF NOT ALERT & INEFFECTIVE BREATHING  
IF AWAKE, AVOID PHYSICAL EXERTION  
OR ENVIRONMENTAL STRESS (TEMP EXTREMES).

### EMERGENCY MEDICAL DISPATCHER

### EMERGENCY MEDICAL RESPONDER

### EMT

### EMT-INTERMEDIATE 85

### ADVANCED EMT

### PARAMEDIC

### EMR

### EMT

MAINTAIN PERSONAL & PATIENT SAFETY  
GENERAL SUPPORTIVE CARE  
OBTAIN VITAL SIGNS  
O<sub>2</sub> HIGH LITER PER MINUTE FLOW (15 LPM +) VIA NRB, OR BVM AS APPROPRIATE  
APPLY CARDIAC MONITOR (if equipped)

MEASURE CARBON MONOXIDE LEVEL – %spCO (if equipped)  
IF spCO% NORMAL & NO SYMPTOMS, TREAT PER OTHER APPLICABLE PROTOCOL(S)  
IF spCO% ABNORMAL, EVALUATE IF SYMPTOMS INCLUDE ALTERED MENTAL STATUS? PT PREGNANT?  
OLMC CONSULT TO DISCUSS HYPERBARIC OXYGEN THERAPY FOR GCS ≤ 13 OR IF PREGNANT

**EMT OR HIGHER LICENSE:**  
MEASURE END-TIDAL CO<sub>2</sub> & MONITOR WAVEFORM CAPNOGRAPHY (if equipped)  
**ADULT:** APPLY Bi/CPAP IF INDICATED (if equipped)

PLACE SUPRAGLOTTIC AIRWAY IF INDICATED & ONLY IF BVM VENTILATIONS INEFFECTIVE

### EMT-I85

### AEMT

**ADULT:** INTUBATE IF INDICATED

IV ACCESS  
**ADULT:** IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS  
**ADULT:** IV NS 250 mL BOLUS IF SYS BP < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,  
**ADULT:** REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA  
**PEDIATRIC:** IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg  
**PEDIATRIC:** IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg IF NO SIGNS OF PULMONARY EDEMA

### PARAMEDIC

**ADULT:** MEDICATION ASSISTED INTUBATION IF INDICATED  
CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)



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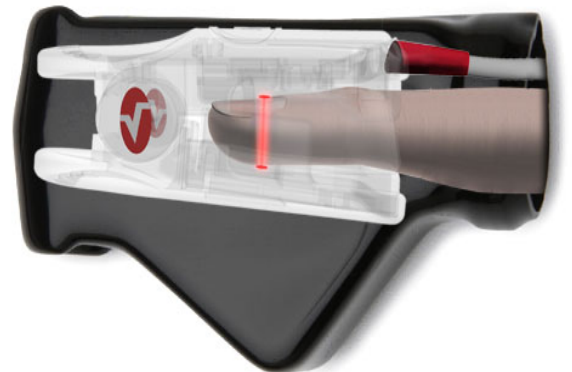
### PROTOCOL 12C: Carbon Monoxide, cont.

%SpCO	Expected Signs & Symptoms – * may not correlate w/ individual pt symptoms
0-3%	None - Normal
4-9%	Minor Headache (**Normal for Smokers)
10-19%	Headache, Shortness of Breath
20-29%	Headache, Nausea, Dizziness, Fatigue
30-39%	Severe Headache, Vomiting, Vertigo, AMS
40-49%	AMS, Syncope, Tachycardia
50-59%	Seizures, Shock, Apnea, Coma
60% +	Coma, Death

Technique (Masimo RAD-57™ - see protocol Special Note):

Fingertip Sensor Placement Using Light Shield:

- Using the light shield with correct placement of finger is **VERY IMPORTANT** for accuracy of reading
- Clean and dry finger
- Orient equipment and finger to replicate diagram
- When possible, use ring finger, non-dominant hand (using the dominant hand of smokers has been shown to result in higher level readings that do not correlate with body-wide levels of CO)
- Insert finger until the tip of finger hits the stop block
- Sensor should NOT rotate or move freely on finger
- LED's (red light) should pass through mid-nail, not cuticle
- Connecting cable should be on top (nail side)





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#### Startup Sequence:

- Place sensor on finger (clean/dry skin)
- Press "POWER" button
- Verify all LED's light up and a 1 second tone is heard
- Startup mode begins
- All preset configurations are displayed
- Scrolling zeroes 0 – 0 – 0 and flashes dashed lines
- May take up to 25 seconds
- Do not move sensor during startup
- When complete, reading is displayed
- Begin patient monitoring
- Defaults to pulse rate and oxygen saturation reading
- "PI" bar graph displays strength of arterial perfusion

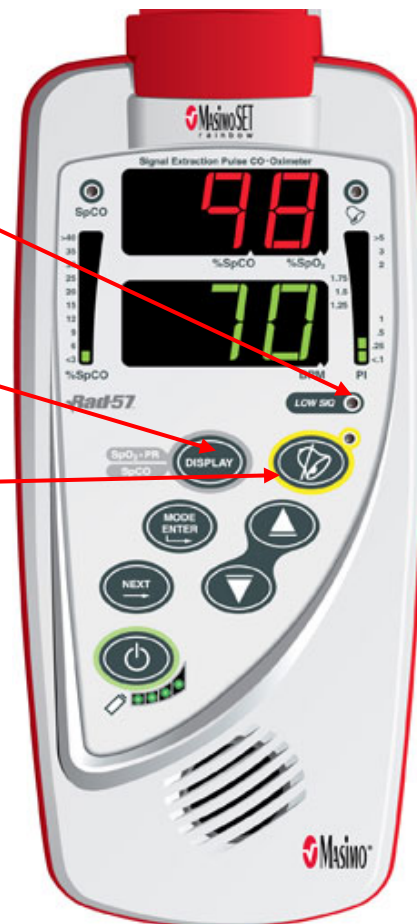
Power Button. Press "ON", Hold for "OFF"

Each green LED window below Power Button that illuminates indicates 25% battery power



#### Operation / Pulse Oximetry & Pulse Rate:

- Displays after startup sequence described above
- Oxygen Saturation on top in red numbers
- Pulse Rate on bottom in green numbers
- Low Signal I.Q.<sup>®</sup> (SIQ) LED lit indicates poor pulse ox signal quality - evaluate finger/sensor, use alternate finger
- Press "DISPLAY" to display %spCO
- Press "Bell" to silence alarms (if needed)





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### PROTOCOL 12C: Carbon Monoxide, cont.

#### Operation / Carbon Monoxide (Carboxyhemoglobin) Measurement:

- Press “DISPLAY” button as described above to toggle display to show %SpCO reading (to toggle back to pulse oximetry and pulse rate mode, press “DISPLAY” again)
- Carboxyhemoglobin displayed in % on top in numbers
- “CO” displayed on bottom confirming mode
- Real-time SpCO indicator continuously reads SpCO
- Confirm abnormal readings by taking several measurements on different fingers and average the readings



#### Operation / Troubleshooting:

##### Error Messages:

- “NO Cbl” = cable not seated properly into device or defective cable
- “SEN OFF” = sensor off finger or misaligned
- “bAd CbL” = defective cable (cable most likely needs replaced)
- “CbL” = incompatible cable (change to appropriate cable)
- “bAd SEN” = defective sensor (sensor most likely needs replaced)
- “SEN” = unrecognized sensor (change to appropriate sensor)
- “Err” = return for service

Will not power on = check battery compartment and replace batteries

Continuously in startup mode (Scrolling zeroes 0 – 0 – 0 and flashes dashed lines) = shield sensor from flashing lights, strobes or high ambient light with Light Shield (best accurate practice is to always use the Light Shield); try another finger

#### Using Physio-Control LifePak® 15 with Masimo sensing to measure %SpCO:

- Power on, connect pulse oximetry cable to monitor/defibrillator and sensor, place sensor on patient
- To display %SpCO, use the SPEED DIAL to select the pulse oximetry display area
- Select PARAMETER from menu
- Select SpCO. Selected value displays for 10 seconds. If %SpCO is elevated, an advisory event occurs and elevated value flashes and alarm tone sounds