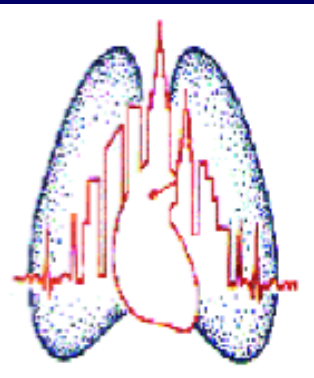
# Mount Sinai Surviving Severe Sepsis Campaign

Division of Pulmonary, Critical Care
and Sleep Medicine
Mount Sinai School of Medicine

MOUNT SINAI
SCHOOL OF
MEDICINE



# EDUCATION

# EARLY RECOGNITION

# GOLDEN 6 HOURS


QuickTime™ and a
decompressor
are needed to see this picture.

# Mount Sinai MICU Guidelines for the Management of Severe Sepsis:

# The "DREAM" Protocol

**Why**? The goal of this protocol is to provide house staff officers strategies on how to identify, evaluate, monitor and resuscitate high risk patients with SIRS (mortality ~10%), Severe Sepsis (mortality ~25%), and Septic Shock (mortality ~50%). We also offer guidance on when to call for a MICU evaluation.

**Please note**: These are just guidelines and do not substitute for the physician's bedside judgment and may not apply to all patient populations (ex. Cirrhosis, Severe CHF)

Lorin, Nierman, Greenspan 6/05

**STEP 1 =**
**Diagnose**

Identify the Patient who has: **Suspected Infection** and **SIRS**
Evaluate for **Severe Sepsis**: Is there Hypotension (SBP < 90)? Lactate > 4.0? Oliguria (UO < 30mL/hr)? Altered MS?

YES

**STEP 2 =**
**Resuscitate**

Evaluate need for **Intubation**

Place on **Cardiac Monitor** and Evaluate Hourly: HR, BP, RR, SaO2, I/Os with Foley

Obtain CBC/Platelets/diff, SMA-20, PT/PTT, Lactate, Bl Cx's * 2, CXR, ECG

Initiate **Antibiotics**

**Crystalloid Resuscitation: NS, PLA, or LR bolus of 1.0-3.0 liters over 1-2 hours**

Call for **MARS/MICU** evaluation

**DEFINITIONS**
**SIRS**: 2 out of 4
fever or T < 96.8
HR > 90
RR > 20 or pCO2 < 32
WBC > 12 or < 4 or > 10% bands
**Severe SIRS / Sepsis:**
SIRS and SBP < 90 or Lactate > 4.0 or oliguria or altered MS

**STEP 3 =**
**Evaluate Response**

**Evaluate whether the abnormalities in STEP 1 have responded to the resuscitation in STEP 2:**
Is the SBP > 90?
Is the UO > 30 mL/hr?
Is the Lactate Normalizing?
Is the Mental Status Improving?

**YES** → Maintenance IVF at 125-200 mL/hr

**NO**

**STEP 4 =**
**Aggressive Resuscitation**

**Place Central Venous Catheter**

**Bolus 500 mL crystalloid wide open:**
Evaluate after bolus if STEP 3 goals are met
If not met: may re-bolus 3 more times (for 2L total)

**SBP > 90** → Maintenance IVF at 125-200 mL/hr

**SBP remains < 90**

**Start and Titrate Vasopressor to MAP > 60:**
On Medical ward with peripheral IV: Dopamine at 5 mcg/kg/min
In Step-Down Unit with Central Line: Levophed at 5 mcg/min

**DEFINITIONS**
**Septic Shock:**
Sepsis induced hypotension despite adequate fluid resuscitation along with perfusion abnormalities.

**STEP 5 =**
**MICU Management**

**In MICU - Assess Candidacy for:** (1) Activated Protein C (Xigris), (2) Tight Glycemic Control, (3) Physiologic Steroid Replacement, (4) Low TV strategy for ARDS

# Mount Sinai MICU Guidelines for the Management of Acute Respiratory Failure –

# The "P"s

**Please note**: Due to the dynamic and unpredictable nature of airway management, these guidelines should be applied in a multi-disciplinary fashion with the assistance of an anesthesiologist, intensivist, respiratory tech and nurse. Choose a strategy that takes into account patient, co-morbidities, equipment, and physician skill level. Be Prepared!!!

Lorin, Nierman, Greenspan, Leibowitz 6/05

# PATIENT REQUIRES INTUBATION

- Is there a rapidly reversible etiology – Narcan (narcotic OD)? Lasix (CHF)? Nebs (bronchospasm)?
- Call Anesthesia (anesthesia desk x47475)
- Obtain pertinent info for the anesthesiologist - anticipate the difficult airway →

**Predict Difficult Airway**

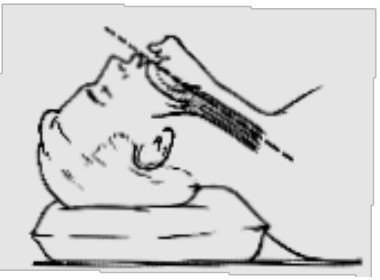
**Anatomy**

Limited mouth opening
Limited neck extension
Short thyromental dist.
Stocky short neck
Receding mandible

**Clinical**

Prior difficult intubation, Obesity, Unstable neck – spine (trauma, RA), Angioedema, Bleeding

**POSITION** = "Sniff"
Neck flexed, Head extended



## PREPARATION - EQUIPMENT SETUP

Secure **IV** access
Place on **Cardiac Monitor** and **Pulse Oximeter**
Obtain Bag valve device (**Ambu-bag**)
Obtain **Yankauer** suction
Obtain **Oral** +/- Nasal airway – remove dentures
Obtain **Laryngoscope** with Mac #3 blade and intact light
Obtain **ETT** – size 7.0-8.0 – with stylet and intact cuff

**Why Pre-oxygenate?**
Replaces N2 in FRC with O2 which provides ~3-5 minute window of appropriate oxygenation during apnea.

## PRE-OXYGENATE

Ambu-bag ~3-5 min. and Attempt to obtain highest level of oxygen. – preferably >95% SaO2

## PRE-MEDICATE

**Fentanyl** bolus 50-200 mcg IV – onset 1-2 minutes, lasts ~ 1 hr **OR**
**Versed** bolus 1-4 mg IV - onset 3-5 minutes, lasts ~ 30-60 min **OR**
Consider **Etomidate**: 0.3 mg/kg (usual dose ~20 mg IV) - onset ~20 sec, lasts 5-10 min **OR**
Consider **Propofol**: 0.5- 2.0 mg/kg IV - onset ~20 sec, lasts 8 min – monitor for hypotension
No Paralysis – unless supervised by a senior anesthesiologist or intensivist

## INTUBATE – with the aid of an anesthesiologist

## POST-INTUBATION MANAGEMENT

Check End Tidal CO2 by **CO2 detector** – changes from purple to yellow color
Auscultate for Bilateral Breath Sounds – ETT length should be ~ 20-22cm (tip to lip)
Monitor SaO2 and check ABG
Order CXR
Sedative drip: Fentanyl (~100 mcg/hr) or MSO4 (~2-5 mg/hr) or Propofol (~5 mcg/kg/hr) +/- Ativan 1-2 mg Q6 hrs

## PROVIDE INITIAL MECHANICAL VENTILATOR SETTINGS

**ARDS DEFINITION:**
1. B/L Infiltrate
2. PO2/FiO2 ratio < 200
3. PCWP < 18 or no evidence of left atrial hypertension by clinical or echo

### ARDS
Refer to MICU
ARDSnet Protocol.
TV = ~6cc/kg IBW
Ex. A/C 20/420/100/5

### CONVENTIONAL STRATEGY
Mode = A/C Rate = 12
TV = 10 cc/kg IBW
FiO2 = 100%
PEEP = 5
Ex. A/C 12/700/100/5 (70kg pt)

### STATUS ASTHMATICUS
Mode = A/C
Rate = 6-10
TV = 6-8 cc/kg IBW
FiO2 = 100%
PEEP = 0
Ex. A/C 8/400/100/0 (for 70kg pt)

## PROBLEM GUIDE

**High Peak Airway and High Plateau Pressure**: PTX, Pulm Edema, ARDS, worsening PNA, Atelectasis (lobar or whole lung), Mainstem Intubation, Obesity, Massive Ascites
**High Peak Airway and Low Plateau Pressure**: Bronchospasm, Biting ETT, Secretions, Mucous plugging
**Low Peak Airway**: ETT disconnected from ventilator
**Low Exhaled TV**: Lost airway, Cuff deflation

# Criteria for Initiating the Medical Acute Response Service (MARS)

**Beeper # 917-616-1010 (or in-house ×7955)**

**7:30 AM - 6:00 PM**

**(all calls regarding critical care after 6:00 PM should be directed to the MICU fellow)**

1. **Cardiovascular**:
   a. **Hypotension**: Acute change in systolic blood pressure to less than 90 mm Hg or a change in 40 mm Hg from baseline
   b. **Arrhythmia**: Acute change in heart rate < 40 or > 120 (in a patient not on telemetry and not followed by cardiology service)

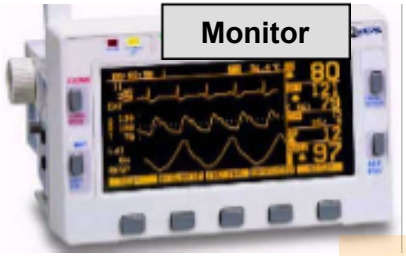
| Quick Reference |
|---|
| New SBP < 90 |
| New HR < 40 |
| New HR > 120 |

2. **Pulmonary**:
   a. **Emergent Intubation Care** – Initiating MSH MICU "***Acute Respiratory Failure***" Protocol
   b. **Pre-Intubation Care**:
      i. SaO2 < 90% despite inhaled $O_2$ by face mask ≥ 50%.
      ii. Acute sustained change in respiratory rate to less than 8 or greater than 30 breaths per minute
      iii. Acute pCO2 elevation above 45
      iv. Any acute condition resulting in the inability to protect airway

| Quick Reference |
|---|
| New Intubation |
| New SaO2 < 90% |
| New RR < 8 |
| New RR > 30 |
| New pCO2 > 45 |

3. **Severe Sepsis:** Initiating MSH MICU "***DREAM***" Protocol
4. **Urgent Central Venous Catheter Placement**

# Crisis Management – Personnel and Responsibilities



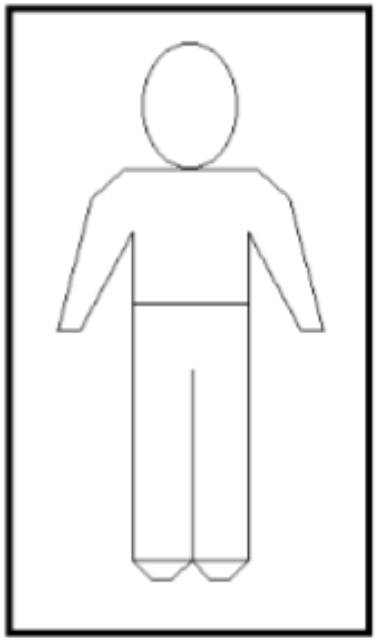

## Airway Crew Member #1

## Airway Crew Member #2 (optional)

1. Oxygen set up
2. Ambu-bag
3. Suction

## Pump Crew

1. Pulse
2. Blood Pressure
3. Chest Compressions



## Therapy Crew

1. Push Meds
2. Fluids
3. Defibrillate


## Procedure Crew

1. Central Line Access
2. Bloodwork/ABGs
3. Alternate with Pump Crew

## Team Leader = PGY 3

## Senior RN

1. Intubation Tray
2. Prepare Meds
3. Record Events

## RN Support Staff Right Side Team

1. Monitor set up
2. Suction set up
3. Medications/Drips/Saline bags

## RN Support Staff Left Side Team

1. Intubation Tray – help set up
2. Defibrillator set up
3. Medications/Drips/Saline bags

# Crisis Management and Leadership Skill Training
# 10 Step Process

1. **Identify yourself** – exercise immediate leadership (Team Leader)
2. **Position** yourself and patient – clear sides, backboard, TL at foot of bed
3. **Assign teams** – distribute workload, mobilize resources, communicate effectively, use teamwork
    1. **Airway Crew** – 2 people
    2. **Circulation/Pump Crew** – 1 person
    3. **Therapy Crew** – 1-2 people
    4. **Procedure (line) Crew** – 1 person
4. **Assign tasks** - set priorities and allocate attention
5. **Repeat speak back**
6. **Crowd control**
7. **Monitor crew** – double check, reorganization, identify mistakes, evaluate new info
8. **Summaries** – evaluating overall progress or lack of progress
9. **Complete task** – goals met or not met
10. **Debriefing session**

# "Shockable or Non-Shockable"

"**Shockable = VF/VT**"

↓

**One Shock**:
Monophasic: 360J
Biphasic: 120-200J

↓

**Resume CPR/Give Meds**:
1st round: Epi +/- VP
2nd round: Epi +/- Amio +/- Lido

"**Non-Shockable = Asystole/PEA**"

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**CPR**

↓

**Give Meds**:
**Epi +/- VP +/- Atropine**

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"**Shockable or Non-Shockable**"

# Expectations

- Recognize sepsis early- overcalling is better than undercalling a situation.
- Once you have recognized a problem, you act upon it- initiate the protocol and then call for help.
- That you work with us until the patient has been stabilized and triaged to the appropriate place.