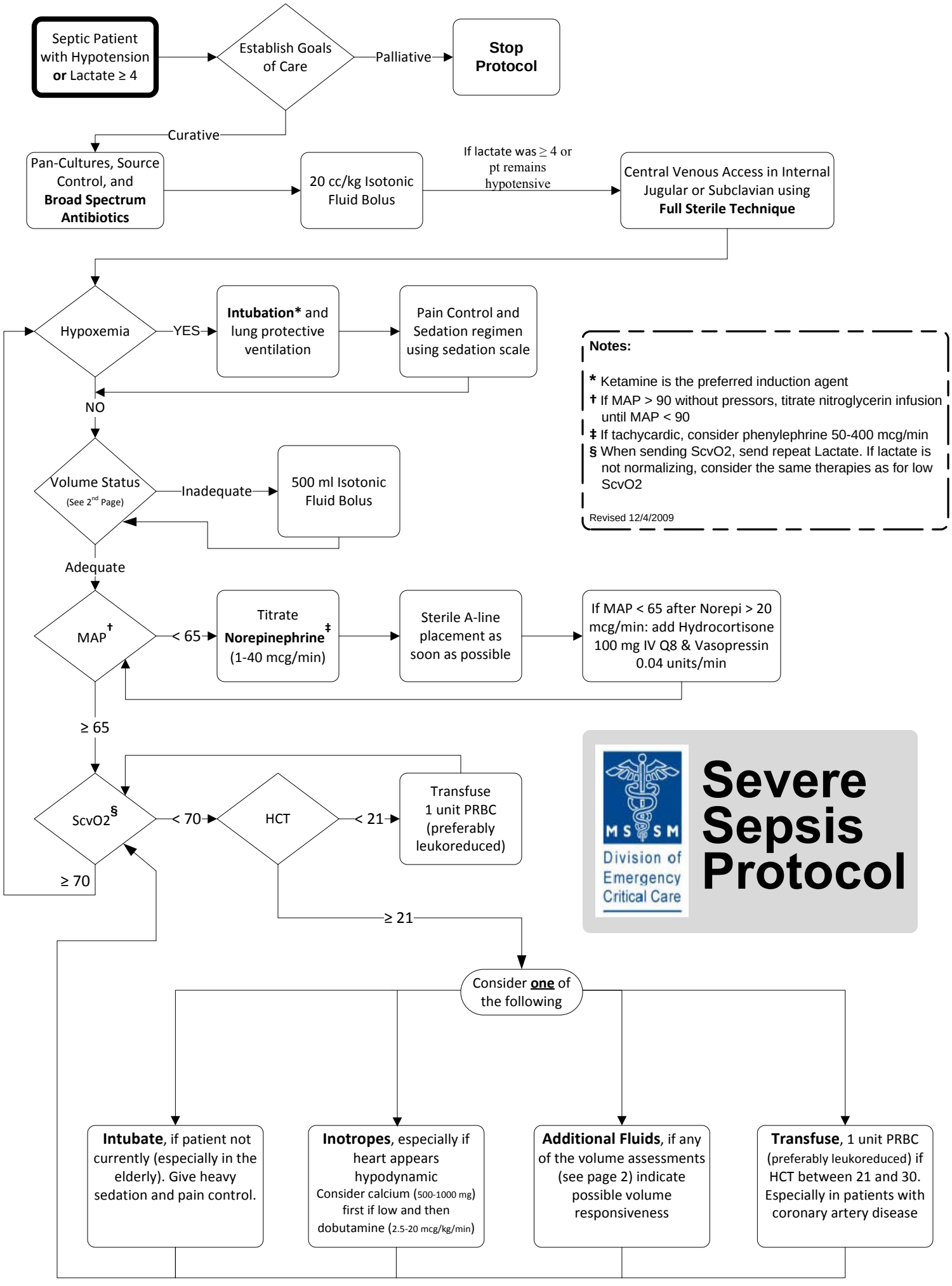

Septic Patient with Hypotension **or** Lactate ≥ 4
Establish Goals of Care
Palliative
Stop Protocol
Curative
Pan-Cultures, Source Control, and **Broad Spectrum Antibiotics**
20 cc/kg Isotonic Fluid Bolus
If lactate was ≥ 4 or pt remains hypotensive
Central Venous Access in Internal Jugular or Subclavian using **Full Sterile Technique**
Hypoxemia
YES
Intubation* and lung protective ventilation
Pain Control and Sedation regimen using sedation scale
NO
Volume Status (See 2nd Page)
Inadequate
500 ml Isotonic Fluid Bolus
Adequate
MAP†
< 65
Titrate **Norepinephrine**‡ (1-40 mcg/min)
Sterile A-line placement as soon as possible
If MAP < 65 after Norepi > 20 mcg/min: add Hydrocortisone 100 mg IV Q8 & Vasopressin 0.04 units/min
≥ 65
ScvO2§
< 70
HCT
< 21
Transfuse 1 unit PRBC (preferably leukoreduced)
≥ 70
≥ 21
Consider **one** of the following
Intubate, if patient not currently (especially in the elderly). Give heavy sedation and pain control.
Inotropes, especially if heart appears hypodynamic Consider calcium (500-1000 mg) first if low and then dobutamine (2.5-20 mcg/kg/min)
Additional Fluids, if any of the volume assessments (see page 2) indicate possible volume responsiveness
Transfuse, 1 unit PRBC (preferably leukoreduced) if HCT between 21 and 30. Especially in patients with coronary artery disease
Notes:
* Ketamine is the preferred induction agent
† If MAP > 90 without pressors, titrate nitroglycerin infusion until MAP < 90
‡ If tachycardic, consider phenylephrine 50-400 mcg/min
§ When sending ScvO2, send repeat Lactate. If lactate is not normalizing, consider the same therapies as for low ScvO2
Revised 12/4/2009
MSSM Division of Emergency Critical Care
Severe Sepsis Protocol

Assessing Fluid Responsiveness

STEP I-**CVP AS A BASELINE (IF CENTRAL LINE ALREADY IN PLACE)**

CVP can serve as a starting point for adequate fluid loading. However, reaching these CVP thresholds does not guarantee adequate fluid loading. While a very low CVP usually indicates an under-resuscitated patient, the opposite is not true.

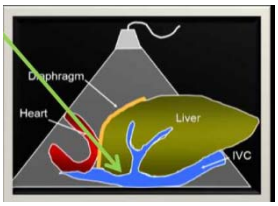
In non-intubated patients, fluid load until CVP > 10

In intubated patients, fluid load until CVP > 14

STEP II-**VERIFY (CHOOSE 1)**

IFNOT TUBED-USE **DYNAMIC IVC**

If IVC collapses with inspiration, give fluid bolus



IF NOT TUBED AND PATIENT HYPERPNEIC-CAN USE **DYNAMIC CVP**

If CVP decreases 2 mmHg with deep inspiration, administer fluid

IF TUBED, REGULAR HEART RHYTHM, ALINE, NOT SPONT BREATHING-USE **SYSTOLIC PRESSURE VARIATION**

Increase Vt to 10 ml/kg
If there is a visible decrease in systolic pressure with mechanical breaths, give fluid
After observation, change Vt back to lung protective settings

IF ALINE-USE **PASSIVE LEG RAISE**

Place patient in semi-fowlers (45)
Observe arterial MAP
Place patient in modified Trendelenberg
If arterial MAP rises during the next 60 seconds, patient will benefit from fluid
Return patient to original position

IF YOU ARE SKILLED AT ECHO-USE **LEFT VENTRICULAR ASSESSMENT** (LVEDD)

TTE M-mode PLAX
Hypovolemia < 2.3 cm
Measured at the tip of the mitral leaflets at the q-wave

IF TUBED, NOT SPONT BREATHING, REGULAR RHYTHM, SKILLED AT ULTRASOUND WITH DOPPLER-USE BRACHIAL ARTERY PRESSURE VARIATION

Increase Vt to 10 ml/kg
Find brachial artery at A/C level in transverse, switch to longitudinal
Switch to doppler mode
Record at mid-artery, < 60° angle (using beam steering/angle), sample center of vessel, adjust to avoid peak clipping
Δ Vpeak % = 100 x (Max – min) / ((Max + Min) / 2)
Δ Vpeak % > 10 or noticeable resp. variation of peaks: give fluid
Return Vt to previous settings