



Case Study

Continuous ScvO₂ monitoring, an integral part of Early Goal-Directed Therapy in the treatment of sepsis.

Sepsis patients may be at high risk of irreversible organ failure, even in the presence of normal vital signs. In this case, continuous ScvO₂ monitoring with the PreSep oximetry catheter detected occult tissue hypoxia in an 85-year-old male patient – enabling early action and his successful treatment.

History of Present Illness

85-year-old male with a history of hypertension, atherosclerotic heart disease, and congestive heart failure. He presents with cough and shortness of breath that started while making breakfast. He became ill while visiting his wife in the hospital and decided to come to the Emergency Department from the hospital floors.

Up to 50% of patients resuscitated from shock may have continued global tissue hypoxia (i.e. increased lactate and decreased ScvO₂) even with the normalization of vital signs and central venous pressure.¹

Physical Examination

Temperature: 34.5° C

Pulse: 84

Blood Pressure: 150 / 98

Respiratory Rate: 28

Elderly male who was awake, talkative, alert and in no acute distress.

HEENT: Mild jugular venous distention at 30°; dry mucous membranes.

Lungs: Crackles in the left lung base.

Cardiovascular: Regular rate and rhythm. No auscultatory murmur.

Abdomen: Mildly distended and tympanitic below the umbilicus.

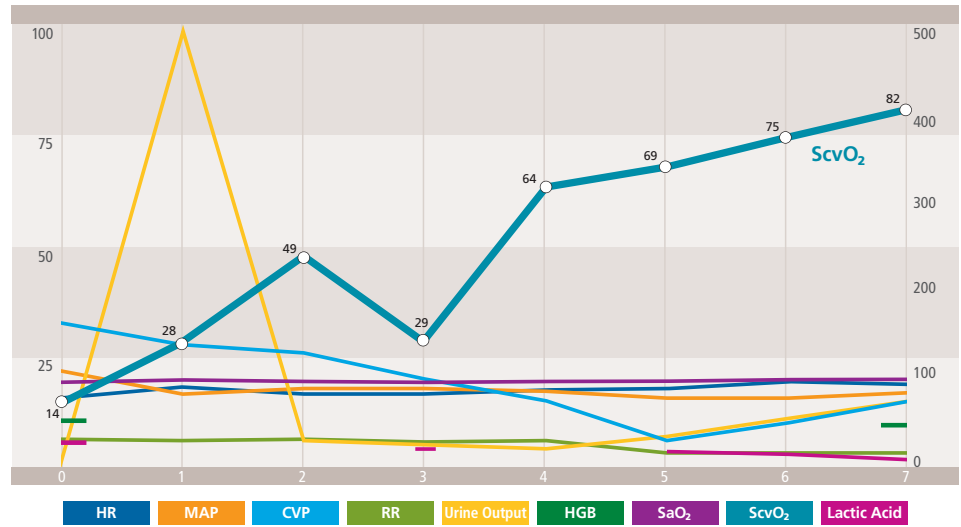
Rectal: Heme-negative, brown stool with very enlarged prostate.



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Diagnosis

1. Urosepsis secondary *Proteus mirabilis* and obstructive uropathy.
2. Pneumonia – *Pseudomonas aeruginosa*.
3. Mild consumptive coagulopathy.
4. Decompensated heart failure – exacerbated by sepsis.
5. Acute renal insufficiency secondary to obstructive uropathy and acute tubular necrosis.



Hour	HR	MAP	CVP	RR	Urine Output	HGB	SaO ₂	ScvO ₂	Lactic Acid	Diagnostics and Medical Intervention
0	79	110	33	32	0	11.5	98.7	14	5.3	Chest x-ray positive for left lower lobe pneumonia. Foley catheter attempted but unsuccessful, urology consultation, increased CVP and pre-renal azotemia indicates myocardial insufficiency.
1	88	83	28	30	500		99	28		Suprapubic catheterization performed, large amount of cloudy urine is present (post-obstructive diuresis), urinalysis positive for urinary tract infection. Antibiotics started for pneumonia and urinary tract infection. Dobutamine started at 2.5 mcg/kg/min.
2	84	90	26	32	30		97	49		Dobutamine increased to 5 mcg/kg/min.
3	83	89	20	28	25		98	29	4.1	Dobutamine increased to 7.5 mcg/kg/min. Sudden drop in ScvO ₂ , patient became agitated, tachypneic which necessitated intubation and mechanical ventilation.
4	88	87	15	30	20		98	64		Patient sedated and dobutamine increased to 10 mcg/kg/min.
5	90	79	6	16	35		97	69	3.6	Fluid challenge given and dobutamine increased to 12.5 ug/kg/min.
6	97	79	10	16	55		99	75	2.9	Repeat fluid challenge and additional sedation provided.
7	95	85	15	16	75	10	99	82	1.5	Patient transported to the intensive care unit, extubated 3 days later and discharged 7 days later to home.

Conclusion

The use of continuous ScvO₂ monitoring is an integral part of Early Goal-Directed Therapy (EGDT) protocol for the treatment of sepsis. ScvO₂ identified the severity of imbalance between oxygen delivery and consumption, which enabled early, aggressive resuscitation, resulting in a successful treatment and subsequent discharge of the patient.

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References:

1. Rivers EP, et al. Central venous oxygen saturation monitoring in the critically ill patient. *Curr Opin Crit Care* 2001; 7(3): 204-11.

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