

Without a Transfusion – SANGUINATE and the Management of Acute Chest Syndrome

**Tinsley Harrison
Internal Medicine
Residency Program**

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Learning Objectives

- Describe the pathophysiology of acute chest syndrome
- Recognize the important role of blood transfusion in acute chest syndrome.
- Identify additional therapies for those not able to receive blood transfusion, specifically SANGUINATE.

Patient Presentation

29 year old African-American female with Sickle Cell Disease

- 1 day history of left sided chest pain, cough productive of yellow-green sputum, and a temperature of 38.3°C
- Jehovah's Witness – Refusing Blood Transfusions

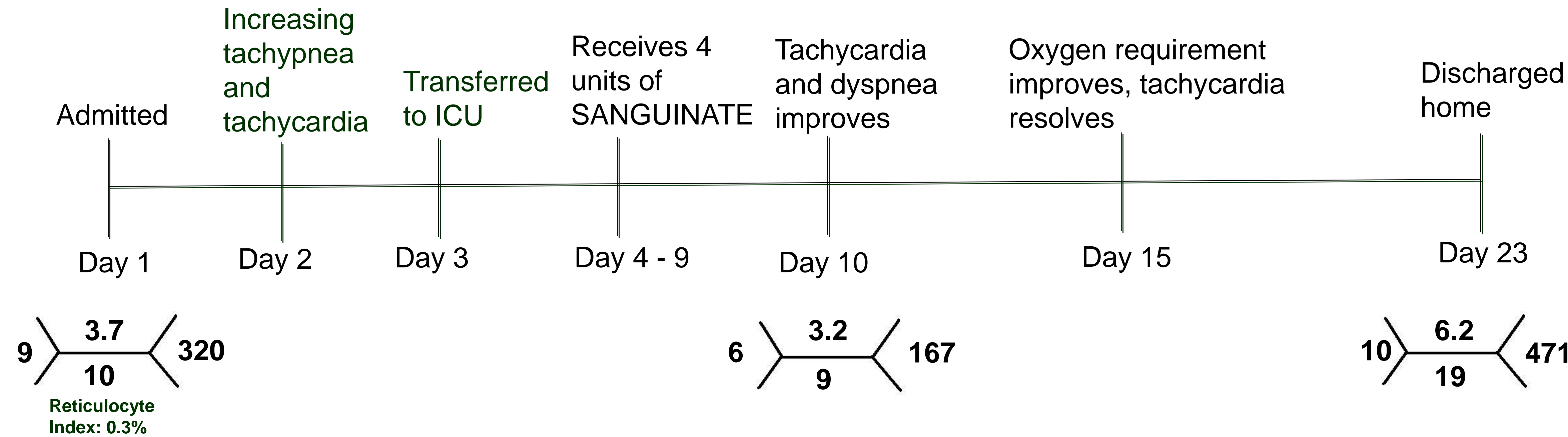
Physical Exam:

HR: 120 BP: 121/70 RR: 28 SpO2: 92% on 3L
Skin: Pale conjunctiva with dry mucous membranes
Respiratory: Left lower lobe crackles, no wheezes or rhonchi
Cardiac: Tachycardic, III/VI SEM in left upper sternal border

Laboratory Data:

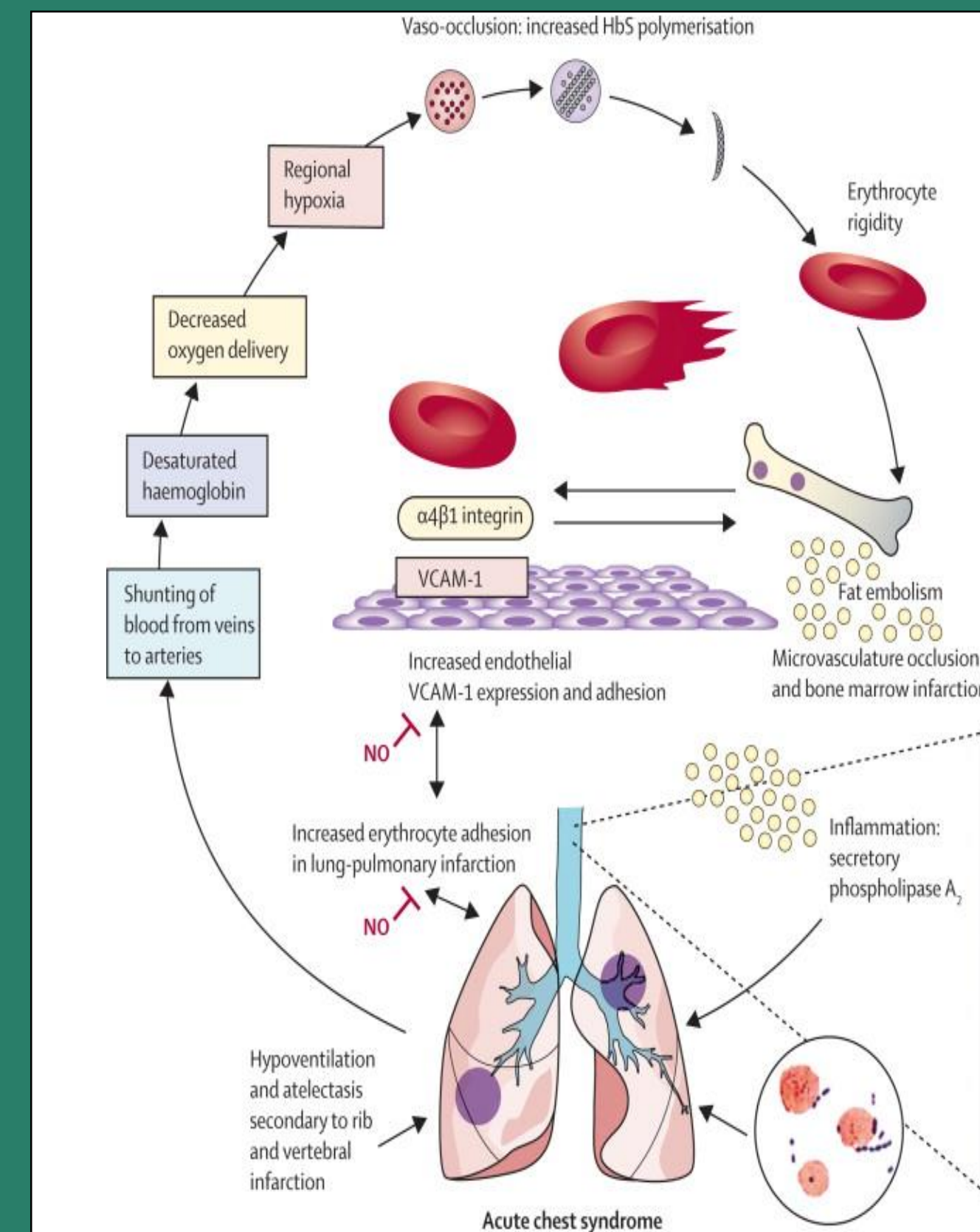
Chest X-ray showed left lower lobe infiltrate concerning for an infectious process
Sputum cultures and blood cultures showed no growth
Parvovirus B19 IgM Negative

Hospital Course



Diagnosis of Acute Chest Syndrome

- Diagnosis is made on average 2.5 days after initial presentation
- New segmental radiographic evidence of a pulmonary infiltrate at least one of the following:
 - Temperature $\geq 38.5^{\circ}\text{C}$
 - $>2\%$ decrease in O_2 saturation from a documented steady-state value on room air
 - $\text{PaO}_2 < 60$ mmHg
 - Tachypnea (per age-adjusted normal)
 - Intercostal retractions, nasal flaring, or use of accessory muscles of respiration
 - Chest pain
 - Cough
 - Wheezing or Rales



Treatment of Acute Chest Syndrome

- Exchange transfusion is the standard of care
 - Reduce inpatient mortality with odds ratio of 0.75 (95% CI, 0.57-0.99) and decreased rates of 30-day readmissions odds ratio of 0.78 (95% CI, 0.73-0.83)
- Empiric Antibiotic therapy, usually with Azithromycin
- Supplemental Oxygen
- Pain Control
- IV Fluid Hydration

SANGUINATE

Bovine carboxyhemoglobin in Phase II clinical trials

Only 29 patients have received the infusion

No effect on hemoglobin concentration

Believed to work by increasing oxygen delivery to tissues by actively transporting oxygen as well as by decreasing inflammatory cytokines

Take Home Points

- Acute Chest Syndrome is a life-threatening pulmonary condition in Sickle Cell patients
- The standard of care for treatment of Acute Chest Syndrome is exchange transfusion
- SANGUINATE is a promising alternative to blood transfusion in patients who are unable or unwilling to receive blood products

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