



Scenario Development Form

Scenario name: Heart Failure

Scenario File Name in HPS6 Software: Heart Failure.hs6

Overlay on which preconfigured patient? Standard Man

Synopsis of Scenario:

A 63-year-old man with a history of chronic heart failure presents to the Emergency Department in moderate respiratory distress. The patient is anxious, tachycardic, dyspneic and has difficulty talking because of his extreme shortness of breath. Shortly after the initial assessment of the patient, his condition rapidly deteriorates before therapy can be initiated. There are five states which transition both automatically and manually. Routine monitors (ECG, NIBP and SpO₂) are connected to the patient. He is continually assessed, treated with diuretics and, after a second dose of diuretics, he improves. On initial examination the vital signs are:

Heart Rate: 118 Blood Pressure: 160/100 Respiratory Rate: 32Pulse
Oximetry: 84%

Heart: Tachycardic rate and regular rhythm

Lungs: Diffuse rales bilaterally

Other: Pitting edema, absence of pedal pulses

Learning objectives:

Recognize the signs and symptoms of heart failure (HF)

Understand the treatment for HF

Recognize the need for preload reduction (diuretics)

Background information and history:

Hypertension, Prior MI

Drug allergies: No known allergies

Medications: "Water" pill

Monitors Required:

5-lead ECG, Non-invasive blood pressure monitoring (NIBP), Pulse oximeter (SpO₂)

Specific equipment and supplies required:

O₂ tank/mask/line, Ambu-bag, Simulated medications (e.g. Furosemide)

Notes:

The scenario is run with Standard Man as the starting point. In the 'Baseline/Setup' state selected respiratory and cardiovascular parameters are adjusted to generate a patient in Heart Failure. The scenario automatically transitions to the 'Initial Assessment' state after



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30 seconds. Before definitive treatment is initiated, the instructor manually transitions to '*Condition Worsens Before Treatment*' and the patient subsequently shows rapid deterioration. With the administration of Furosemide and an increase in oxygen flow rate, the patient shows slight improvement. After these interventions the instructor manually transitions to '*Slight Improvement After Furosemide.*' When additional Furosemide is administered, the instructor manually transitions to '*Continued Improvement*' and the patient shows further improvement.

For ECS Users: In the states '*Condition Worsens Before Treatment*', '*Slight Improvement After Furosemide*' and '*Continued Improvement*' (States 3, 4 and 5, respectively) use the "*Fraction of Inspired Oxygen Override*" (Tabs/Respiratory/Lung) to simulate the application of supplemental oxygen via nasal cannula. Use a setting of 30% for 2LPM and 42% for 4LPM.

References:

Boron WF, Boulpaep EL. Medical Physiology. Saunders, 2003



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Clinical Course for Scenario

State Name	Patient Status (Include VS, ABG, etc.)	Learning Outcomes or Actions Desired
#1: Baseline/ Setup	Standard Man initially; then HR: 118, BP: 160/100, RR: 32, labored SpO ₂ : 84%, BS: Rales Pedal pulses absent	In this state the baseline physiology of Standard Man is adjusted to yield a patient in Heart Failure who presents to the Emergency Department Transition: Automatic transition to 'Initial assessment' after 30 seconds
#2: Initial Assessment	HR: 100, BP: 160/100, RR: 26, labored SpO ₂ : 84%, BS: Rales Pedal pulses absent	Performs an initial assessment, interpret findings and documents Initiates ECG and SpO ₂ monitoring Initiates oxygen Transition: Manual transition to 'Condition Worsens Before Treatment' at the discretion of the Instructor
#3: Condition Worsens Before Treatment	HR: 136, BP: 162/118, RR: 32, labored SpO ₂ : 91% on 2LPM nasal cannula, BS: Rales	Reassess the patient, interpret findings and document Notes change in condition Recognizes the need for immediate therapy Recommends a dose of furosemide IVP Increases oxygen flow rate Transition: Manual transition to 'Slight Improvement After Lasix' upon the administration of furosemide
#4: Slight Improvement After Lasix	HR: 130, BP: 150/102, RR: 24, labored SpO ₂ : 96% on 4LPM nasal cannula BS: Rales Urine output: Scant, yellow	Reassess the patient, interpret findings and document Notes slight improvement following repeat dose of furosemide Assesses urinary output Recommends second dose of furosemide



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		IVP Transition: Automatic transition to 'Continued Improvement' after five minutes
5. Patient stabilized	HR: 110, BP: 140/85, RR: 18, non-labored SpO2: 97% on 4LPM nasal cannula	Reassess the patient, interpret findings and document Transfers care to a higher level Calls report to ED/Admitting Unit