

CHF Exacerbation

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Keywords: CHF, congestive heart failure

Procedures: none

LEARNING OBJECTIVES

1. Recognize the symptoms that a patient with CHF exacerbation may display
2. Learn to employ a systematic approach to a dyspneic patient
3. Create a differential diagnosis for dyspnea
4. Understand the initial management of CHF exacerbation
5. Develop a basic understanding of the steps in oxygen escalation therapy

CRITICAL ACTIONS

- ✓ IV access x2
- ✓ Supplemental oxygen
- ✓ Non-rebreather
- ✓ Non-invasive positive pressure ventilation (CPAP or BiPAP)
- ✓ Telemetry monitoring
- ✓ Patient history
- ✓ Physical exam
- ✓ Ask for crash cart
- ✓ EKG
- ✓ CXR
- ✓ Labs: CBC, coagulation profile, BMP, cardiac biomarkers, BNP
- ✓ Furosemide IV
- ✓ Reassessment of vitals
- ✓ Consults called
- ✓ Closed-loop communication
- ✓ Summarize case to team and/or consultant

CASE ONE-LINER

55-year-old male presents with worsening dyspnea

PRESENTATION

| | |
|--------------------------|---|
| SETTING | Hospital ED |
| ADDITIONAL ROLES | Sim operator, sim RN, debrief manager CONSULTANTS: Cardiology, CCU, Radiology |
| PATIENT | 55yo male |
| CHIEF COMPLAINT | "I can't breathe." |
| Hx of PRESENTING ILLNESS | A 55-year-old man presents to ED with acute worsening of dyspnea in past 2 hours while walking the dog. For the past 2 weeks, the patient has experienced 3-pillow-orthopnea, PND, and cough productive of frothy sputum. He additionally notes his shoes have been tight and he has gained 20 lbs in 1 month unintentionally. Denies fevers, chills, chest pain. He has never experienced this before. |
| ROS | (+) DOE, orthopnea, PND, LE edema, productive cough, unintentional weight gain (-) Fever, chills, chest pain |
| PMH/PSH | PMH: HTN PSH: None |
| MEDICATIONS | Lisinopril |
| ALLERGIES | Codeine |
| SOCIAL Hx | Family Hx: mom = HTN Social Hx: (-) tobacco, (+) 2-8oz beers/wk |

INITIAL VITAL SIGNS

| HR | BP | RR | PULSE OXIMETRY | TEMP | WEIGHT |
|----|--------|----|-----------------|-------|--------|
| 73 | 172/95 | 30 | 80% on room air | 98.8F | 80 kg |

PHYSICAL EXAM

Items in red need to be verbalized

PRIMARY SURVEY

- None provided

GENERAL: AAOx3, in distress

HEENT: PERRL, TM physiologic, no signs of trauma, tongue midline

NECK: +JVD to angle of mandible

CV: S1/S2, RRR, (+) S3, (+) S4. No murmurs, rubs, or gallops. PMI displaced.

PULM: Rales diffusely in bilateral lower lung fields, tachypneic

ABD: Soft, non-tender, non-distended, +BS, no CVA tenderness

EXT: Warm with 2+ pitting edema to mid-thigh bilaterally

NEURO: Moving extremities freely

PHASE 1: INITIAL PRESENTATION

| TIME | CLINICAL PROMPT | EXPECTED MANAGEMENT | CONSEQUENCES | CRITICAL ACTIONS |
|-------------|---|---|--|--|
| 00:00-03:00 | <p>55yo male presents w/ dyspnea</p> <p>Repeat Vital Signs (after atropine) BP: 100/73 HR: 40 RR: 18 O2 sat: 99% on RA</p> | <ul style="list-style-type: none"> Order full set of vital signs, cardiac monitor, continuous oxygen saturation monitoring Order 2 large bore IVs Begin assessment of ABCs | <ul style="list-style-type: none"> RN prompts, “Do you want vitals/patient on the monitor/ IV access?” if not requested | <p>Obtained a complete set of vital signs? I P N</p> <p>Obtained a focused history? I P N</p> <p>Performed focused physical exam? I P N</p> <p>Ordered 2-large bore IVs? I P N</p> <p>Recognized abnormal VS? I P N</p> |

PHASE 2: REASSESSMENT AND SECONDARY INTERVENTION

| TIME | CLINICAL PROMPT | EXPECTED MANAGEMENT | CONSEQUENCES | CRITICAL ACTIONS |
|-----------|---|--|--|--|
| 3:01-6:00 | <p>Patient still in respiratory distress, speaking in shorter sentences</p> <p>Repeat Vital Signs (after NRB) BP: 168/95 HR: 70 RR: 28 T: 98.8F O2 sat: 85% on RA</p> | <ul style="list-style-type: none"> Order STAT labs Order STAT EKG Order STAT CXR Start patient on non-rebreather (or place on O2 nasal cannula, then escalate to non-rebreather) | <ul style="list-style-type: none"> RN prompts, “Do you want any imaging/ labs?” if not requested RN prompts, “What do you want to do about his shortness of breath?” if no action RN prompts, “Do you want me to call anyone for help?” if no consults called | <p>Ordered STAT labs? I P N</p> <p>Ordered STAT CXR? I P N</p> <p>Ordered STAT EKG? I P N</p> <p>Placed on non-rebreather? I P N</p> |

PHASE 3: REASSESSMENT, TERTIARY INTERVENTION, RESULTS, RESOLUTION

| TIME | CLINICAL PROMPT | EXPECTED MANAGEMENT | CONSEQUENCES | CRITICAL ACTIONS |
|------------|--|--|---|---|
| 6:01-10:00 | <p>AFTER appropriate intervention (ie, furosemide IV, BiPAP/CPAP), pt becomes less tachypneic, O2 sat improves</p> <p>Repeat Vital Signs (after pacing)</p> <p>BP: 140/90</p> <p>HR: 75</p> <p>RR: 18</p> <p>T: 98.8F</p> <p>O2 sat: 95% on RA</p> | <ul style="list-style-type: none"> • Order furosemide IV • Start BiPAP/CPAP • Call consultant for definitive management and admission | <ul style="list-style-type: none"> • After furosemide and BiPAP, RN to prompt, "Who is admitting this patient?" if no service identified | <p>Interpreted lab and imaging results accurately?</p> <p>I P N</p> <p>Started furosemide?</p> <p>I P N</p> <p>Escalated to NIPPV?</p> <p>I P N</p> <p>Called consultant?</p> <p>I P N</p> <p>Succinct and direct handoff to specialist?</p> <p>I P N</p> <p>Updated patient at any point?</p> <p>I P N</p> |

PHASE 4: CONCLUSION & DEBRIEFING

| TIME | ACTIONS |
|-------------|---|
| 10:00-20:00 | <p>Debrief</p> <p>Q&A Session/Teaching</p> <p>Evaluations</p> |

DEBRIEFING POINTS

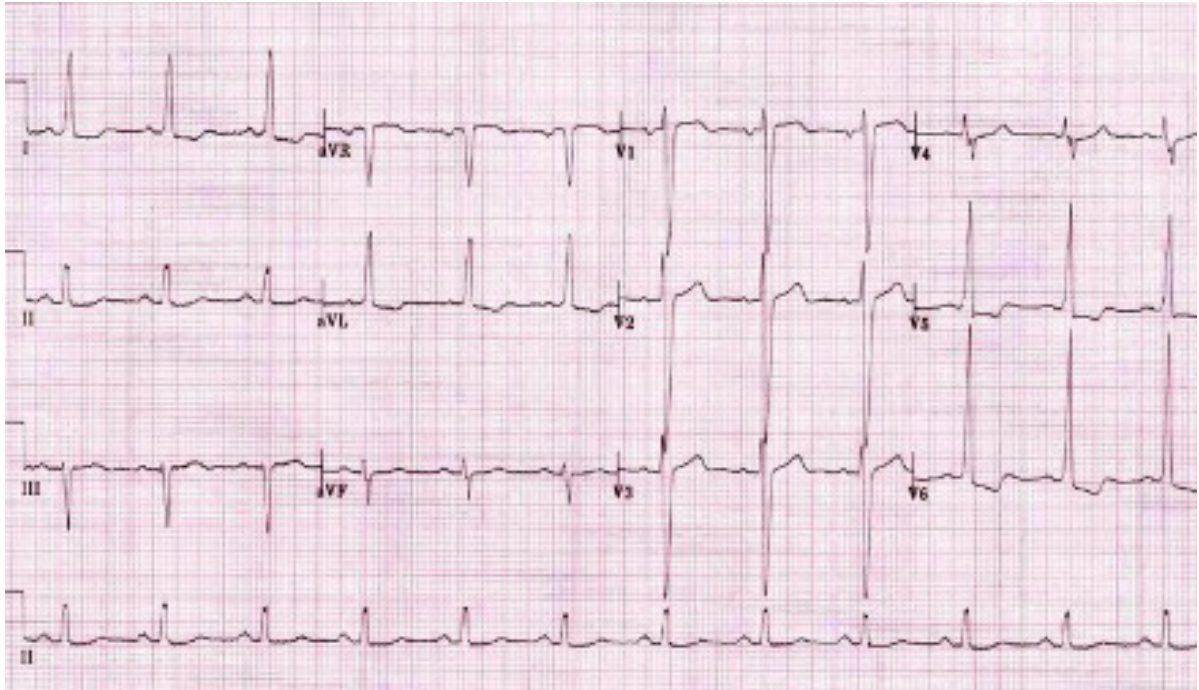
| GENERAL POINTS | SCENARIO-SPECIFIC POINTS |
|--|---|
| <ul style="list-style-type: none"> • What went well? • What are some opportunities for improvement? • Did you identify any gaps in knowledge? • Was there any delay in treatment? • How was communication between team members? | <ul style="list-style-type: none"> • Oxygen supply choices in the setting of worsening dyspnea • Differential diagnosis of dyspnea • Contraindications to BiPAP (general considerations) • Treatment options for CHF exacerbation (eg, diuretics, nitrates, oxygen supplementation - including non-invasive ventilation up to intubation) |

SCENARIO STIMULI

| Complete Blood Count | | Coagulation Profile | |
|-----------------------|--|---------------------|-----------------------------|
| WBC | 10.3 (Normal 5.0 - 14.5 x 10 ³ /mL) | PT | 12 (Normal 11-13.5 seconds) |
| Hemoglobin | 13.7 (Normal 11.5-15.5 gm/dL) | PTT | 25 (Normal 25-35 seconds) |
| HCT | 39.5 (Normal 35%-45%) | INR | 1.0 (Normal 0.8-1.1) |
| Platelets | 260 (Normal 150-450 x 10 ³ /mL) | | |
| MCV | 84 (Normal 76-90 fL/red) | | |
| Basic Metabolic Panel | | Additional Tests | |
| Sodium | 138 (Normal 136-145 mEQ/L) | Troponin I | 0.22 (Normal < 0.08 ng/mL) |
| Potassium | 4.5 (Normal 3.5-5.5 mEQ/L) | BNP | 2000 (Normal < 100 pg/mL) |
| Chloride | 103 (Normal 95-105 mEQ/L) | | |
| CO ₂ | 23 (Normal 17-29 mEQ/L) | | |
| BUN | 14 (Normal 5-20 mg/dL) | | |
| Creatinine | 0.9 (Normal 0.5-1.1 mg/dL) | | |
| Glucose | 99 (Normal 70-110 mg/dL) | | |

IMAGING

Representative EKG



Representative CXR



Representative POCUS

No ultrasound available