"All That Wheezes… is Respiratory Distress"
Tricks and Tips for Identifying Patients with COPD and CHF

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I. INTRODUCTION/OBJECTIVES

-Identify signs and symptoms consistent with COPD
-Recognize patients in acute pulmonary edema
-Immediately recognize respiratory failure
-Use history and physical examination to inform EMS treatment decisions

II. GENERAL PATIENT ASSESSMENT

-Gauge level of distress and work of breathing
-Work of breathing is an important indicator of severity
-Work of breathing is assessed by a variety of signs including: oximetry, rate and depth of respirations
-The brain is an "end organ." Altered mental status indicates hypoxia or hypercarbia. Altered mental status due to respiratory failure is a poor prognostic indicator

III. CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) HISTORY

-Patients report a productive cough
-History of multi-year symptoms, breathlessness
-Dyspnea on exertion common to several disease processes
-History of cigarette smoking
-Self reported wheezing and fatigue

IV. COPD ASSESSMENT

-Poor sensitivity for diagnosis of COPD
-Hyperinflation of lungs (on assessment, on x-ray)
-Wheezing
-Diminished lung sounds
-Hyper-resonance of lung sounds
-Prolonged expiratory phase
-Patients may have a "barrel" chest from continued overexpansion
-Cachexia/wasting
-Heart sounds may be distant
-Accessory muscle use common; supraclavicular retractions regularly observed
-Crackles may also be present on the lung examination (inflammation in the airways and mucous plugging may cause rales, rhonchi, and wheezing)

V. **ECG CHANGES IN COPD PATIENTS**

-Cor pulmonale is also evident on ECG. Right atrial and ventricular enlargement causes a pattern of right heart strain to appear. Large p waves, rightward axis suggests cor pulmonale

-Multifocal atrial tachycardia is diagnosed in the presence of three different p wave morphologies and tachycardia

-MAT is almost always uniformly treated by correcting or addressing the underlying cause

-MAT is one of several irregularly irregular supraventricular tachycardias

VI. **CONGESTIVE HEART FAILURE (CHF) HISTORY**

-A useful tool is provider suspicion of the disease

-Exertional dyspnea

-Dyspnea at rest

-Orthopnea and paroxysmal nocturnal dyspnea

-Orthopnea usually occurs rapidly and within 1-2 minutes of lying down

-Complicated by a low vital capacity

-Ascites can worsen orthopnea; the presence of cough may be an "orthopnea equivalent"

-Fatigue, weakness, and oliguria also occur. Renal injury/failure occurs due to persistently decreased renal perfusion or uncontrolled hypertension

-Cerebral symptoms (forgetfulness, confusion) occur due to decreased circulation. Patients may have co-existing vascular disease which may further impair cerebral circulation

VII. **CHF ASSESSMENT**

-Gallops and irregular heart sounds are associated with CHF exacerbations

-Tachycardia, bibasilar rales, and ascites present

-Ascites may be misleading in that it is not a required component for the diagnosis of CHF. Some patients in acute pulmonary edema may actually be volume DEPLETED!

-Jugular venous distention is another sign this is unreliable and difficult to measure. JVD may be caused by other illnesses like pulmonary fibrosis and hypertension. In addition, the patient must be correctly positioned.

VIII. **CHF EKG FINDINGS**

-Ischemia is a common component of CHF exacerbations. Therefore, associated EKG findings include bundle branch blocks, ST segment elevation

-Poor R wave progression across the precordial leads reveals the presence of prior myocardial infarctions

-Tachycardia is common in CHF exacerbations

-PVCs and other ectopy can indicate a less than well perfused myocardium

-Anterior wall STEMI (large volume of infracted muscle) is associated with the development of cardiogenic shock

IX. **CHF INTERVENTIONS**

-Continuous Positive Airway Pressure (CPAP) is an intervention associated with decreased cost, decreased ICU length of stay, and improved mortality

-Early and aggressive use of CPAP key to survival

-CPAP like any other EMS treatment intervention must be carefully assessed and monitored

-Altered mental status and hypotension represent contraindications to the application of CPAP

-CPAP increased intrathoracic pressure, decreases preload, and decreases work of breathing

-Early and aggressive use of nitroglycerin also key to survival

X. SUMMARY AND CASE STUDIES