

# The Mystery Diagnosis

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**Case Presentation:** The following scenario is an actual case that, initially, was a mystery to the staff, nurse practitioner, and oncologist. Mrs. Smith, a 72-year-old woman, was finishing her first treatment of cyclophosphamide, doxorubicin, vincristine, and prednisolone plus rituximab for non-Hodgkin lymphoma. She had been dozing during the four hours required for the infusion. Toward the end of the last bag of fluid, her daughter noticed that Mrs. Smith was breathing more slowly than normal. The chemotherapy nurse assessed Mrs. Smith. Her respirations were 10 breaths per minute and a little deeper than usual. Mrs. Smith was awakened, and her respirations increased to 16 breaths per minute. Her oxygen saturation was 88%. Although the saturation was not evaluated immediately prior to treatment, the level was previously documented at 94%. Mrs. Smith denied dyspnea or any other symptoms. Her other vital signs were a blood pressure of 110/70 mmHg and a pulse of 72. The nurse practitioner was summoned to evaluate the patient.

The nurse practitioner ordered oxygen at 2 liters per minute. The oxygen saturation increased to 92%. A review of Mrs. Smith's history revealed porcine aortic valve replacement at age 55 with moderate restenosis and corresponding aortic valve murmur. As a result, the only medication she was on was warfarin for lifelong anticoagulation. The review of systems and complete physical examination were unchanged. The only positive finding on physical examination was the aortic valve murmur.

## The Suspects

Although the primary diagnosis was hypoxia, the practitioner had to identify the cause and proceed with determining the underlying problem. The differential diagnoses included pulmonary embolus (PE), congestive heart failure (CHF), silent myocardial infarction (MI), anemia, sedation- or hypopnea-induced hypoxia, and cardiac arrhythmia.

The following section will examine each of the diagnostic suspects along with the associated symptoms (alibis).

A PE may present with a sudden onset of pain, with or without dyspnea, that may result in hypoxia if a large portion of the alveolar surface is affected. It may be accompanied by dullness on percussion. A PE is associated with deep vein thrombosis (DVT). Electrocardiogram (EKG) changes also may be present (Henke, 2000). In this case, the suspect had an alibi: Mrs. Smith did not have pain or a sudden onset of dyspnea. The physical examination was negative for dullness to percussion over the lung fields. She had no calf tenderness, erythema, or edema to suggest DVT, and the use of warfarin for anticoagulation made it unlikely. An EKG would assist in the differentiation process. However, one was not done at the initial symptom presentation.

The second differential diagnosis and primary suspect, CHF, is characterized by dyspnea with fine rales on auscultation of lungs. CHF also may be accompanied by tachycardia and hypotension, although generally, these are later signs. EKG changes may be seen, but usually after CHF is well established. Clues that suggest reduced cardiac output include narrow pulse pressure, Cheyne-Stokes respirations, resting tachycardia, and/or cool extremities (Hunt et al., 2004; Winkour, 2000). Although Mrs. Smith did not exhibit any of these symptoms, CHF remained the primary suspect.

Hypoxia may be an expression of circulatory compromise caused by a silent MI. Generally, a silent MI may reveal itself with changes in blood pressure, heart rate, and EKG, in addition to symptoms of dyspnea and fatigue (Shelton, 2000). Mrs. Smith experienced none of these changes.

Anemia often presents with diminished oxygen-carrying capacity and may

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