



# Asthma exacerbation

## ● An accurate history reduces risk.

By Fidelindo Lim, DNP, CCRN, and Nick Deuz, BSN, RN

**YI RONG HUANG**, a 55-year-old man who speaks only Chinese, comes to the emergency department (ED) for nonradiating substernal chest pain. His electrocardiogram (ECG) shows a sinus rhythm with no ST changes; his vital signs are blood pressure (BP) 160/92 mm Hg, heart rate (HR) 95 to 100 beats/minute (bpm), respiratory rate (RR) 22 breaths/minute, oxygen saturation (O<sub>2</sub> sat) 94% on room air, and temperature 100.4° F (38° C). Bilateral rhonchi are noted on auscultation. His allergies and medications are unknown.

### History and assessment

Because of the language barrier, Mr. Huang's nurse, Peter, is unable to obtain an accurate medical history. Peter requests an interpreter and continues with his assessment. Mr. Huang's complete blood count, metabolic profile, and troponin I level are within normal ranges. After he's placed on 3 L of oxygen by nasal cannula, his O<sub>2</sub> sat increases to 98%. His BP is 160/92 mm Hg, and his HR is 94 bpm. His chest X-ray is consistent with lobar pneumonia, and the provider orders levofloxacin 500 mg I.V. daily. Before Mr. Huang is transferred to the telemetry unit, he's given 81 mg of aspirin and 6.25 mg carvedilol by mouth for hypertension.

### Call for help

The interpreter arrives in the telemetry unit, and Peter fills her in. Shortly after Mr. Huang is connected to the telemetry monitor, Peter hears him wheezing loudly. On auscultation, he notes diffuse wheezing in all lung fields. Mr. Huang is pale, diaphoretic, and lethargic. His vital signs are BP 168/90 mm Hg, HR 100 to 110 bpm with atrial fibrillation, RR 32 breaths/minute, and his O<sub>2</sub> sat is 90%. Concerned about these sudden clinical changes, Peter calls for the rapid response team (RRT).

### On the scene

After Peter updates the RRT leader, a 12-lead ECG, a portable chest X-ray, and an arterial blood gas (ABG) are performed. Mr. Huang is given albuterol nebulizer (5 mg/mL in 3 mL saline) and is placed on a 100% non-rebreather mask. His vital signs are monitored every 5 minutes. Mr. Huang's ABGs reveal compensated respira-

tory alkalosis, and his ECG shows a new onset of atrial fibrillation with a rate of 120 bpm.

Mr. Huang's English-speaking daughter arrives, and she explains that he has a history of asthma, GI reflux disease, and hypertension. Mr. Huang is given one dose of diltiazem 20 mg I.V. push. His atrial fibrillation soon converts to sinus rhythm between 80 to 85 bpm. A second dose of albuterol nebulizer is given, and aspirin and carvedilol are discontinued. Mr. Huang is given one dose of diphenhydramine 50 mg I.V. push. A repeat chest X-ray doesn't reveal any new changes.

### Outcome

Mr. Huang is placed on albuterol and ipratropium nebulizers every 6 hours. (His practitioner chose not to prescribe corticosteroids.) His wheezing improves and his O<sub>2</sub> sat is 97%. Mr. Huang's regular medications (lisinopril, fluticasone/salmeterol, and famotidine) are resumed, and a cardiologist is consulted. He is discharged home 2 days later on oral levofloxacin.

### Education and follow up

Current teaching focuses on preventing asthma attacks, which can be life-threatening. Asthma triggers include medications such as aspirin, nonsteroidal anti-inflammatory drugs (NSAIDs), and beta blockers. More than 25% of adults with asthma are hypersensitive to aspirin.

Mr. Huang was given aspirin and carvedilol (a non-cardioselective beta blocker) immediately before his asthma attack. Aspirin and other NSAIDs block cyclooxygenase 1, which is responsible for synthesizing prostaglandin E<sub>2</sub>, a potent bronchodilator, resulting in asthma exacerbation by constricting the airway and increasing oxygen resistance through the bronchioles. Combining the aspirin with carvedilol created a synergistic interaction that intensified Mr. Huang's bronchoconstriction. Normally, carvedilol would be avoided in a patient with asthma.

Before discharge, Mr. Huang is given an asthma action plan in Chinese. By acting quickly, Peter was able to mitigate the negative effects of Mr. Huang's condition. ★

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