

# Taking EMS Into Tomorrow: Part 4

**Living with congestive heart failure (CHF) is not easy, but there are steps EMS providers can take to improve the lives of CHF patients**

**T**he heart is an amazing 10-ounce pump. Each heartbeat squeezes about 2.4 ounces of blood into the circulatory system. At an average rate of 72 beats per minute, 1.3 gallons of blood are pumped every 60 seconds. In a day, that's 1,900 gallons, almost 700,000 gallons each year. The average 70-year-old heart has pumped over 48 million gallons during its lifetime—enough to fill 68 Olympic-sized swimming pools.

When the heart fails to pump as well as it should, fluid backs up and causes congestive heart failure (CHF), which is often the end stage of cardiac disease. Almost five million Americans have CHF and over 400,000 new cases are diagnosed each year. If you're over 40, there's a one in five chance that you'll develop CHF before you die. If you've got high blood pressure, your risk will double. If you've had a myocardial infarction, your risk for CHF goes up 500%.

CHF is the most common primary or secondary diagnosis for all people over 65 who are admitted to the hospital. A third of people discharged from the hospital with CHF are dead within the year and less than 25% are still alive six years after their diagnosis. Over \$23 billion is spent each year on the diagnosis and treatment of CHF in America.

Data show that 30%–40% of people who are discharged from the hospital with CHF will be readmitted within the next six months. However, research indicates that over 40% of these readmissions could have been prevented. In 9 out of 10 cases of relapse, the precipitating factors can be identified. The main factors include lack of adherence to physicians' recommenda-

tions, including medication use, uncontrolled hypertension, cardiac arrhythmias, iatrogenic (healthcare-provider caused) and pulmonary infections. Emotional factors such as high stress precede the hospitalization of 49% of people with CHF.

## CAUSES OF HEART FAILURE

The most common causes of CHF are ischemic heart disease, myocardial infarction, hypertension and diabetes mellitus. Less common causes include non-ischemic dilated cardiomyopathy, alcoholic cardiomyopathy, HIV-related cardiomyopathy, myocarditis associated with infection, valvular heart disease and chronic arrhythmias.

There are many ways to classify CHF, including systolic (that which is caused by the inability of the ventricle to contract fully) and diastolic (the impairment of ventricular relaxation and filling). CHF can also be classified as left or right heart failure. Left heart failure causes congestion in the lungs with pulmonary symptoms including shortness of breath, orthopnea (shortness of breath when lying down) and nocturnal coughing. Left heart failure also causes fatigue, confusion, memory problems and diaphoretic, cool extremities. Right heart failure causes a backup of fluid in the rest of the body, which results in peripheral edema, ascites (fluid in the abdominal cavity) and a swollen liver.

## FUNCTIONAL CLASSIFICATION OF CHF

Many cardiologists use the New York Heart Association's functional classification of CHF to describe the severity of the disease in a particular patient.

## Simulating Congestive Heart Failure

Have you ever tried a virtual-reality ride at an amusement park? You climb into a little pod, hang on to the seat in front of you and participate in a variety of thrilling situations. These rides use a combination of video, sound and motion to create what feels like a real experience. Well, there's a new virtual-reality experience that's making its way around the country, but you're not likely to find it at the local amusement park—instead, you'll find the Heart FXPOD at medical schools and hospitals.

The Heart FXPOD is a 5½-minute multisensory simulation that gives you “virtual” congestive heart failure (CHF). As you experience tachycardia, fatigue and shortness of breath, you hear the voices of real patients and their family members describe what it's like to live when your heart can't do what it used to be able to do. This simulator is designed to help healthcare professionals better empathize with and care for people whose hearts are deteriorating.

The Heart FXPOD is currently in the middle of a 63-city tour of the nation's leading centers for cardiovascular care. For more information, visit [www.heartfxpod.com](http://www.heartfxpod.com).

Studies show that 50% of CHF patients do not follow the discharge instructions they receive when they leave the hospital. It's common for people to run out of their medications, forget to fill their prescriptions or not have enough money to buy their medications.

### Class I

Patients with cardiac disease who have no limitations to their physical activity. Physical activity does not cause undue fatigue, palpitations, shortness of breath or chest pain.

### Class II

These patients with cardiac disease have slight limitation of their physical activity. There are no symptoms at rest. Ordinary physical activity results in fatigue, palpitations, shortness of breath or chest pain.

### Class III

Patients with cardiac disease resulting in marked limitation of physical activity. These patients are usually asymptomatic at rest. Less than ordinary physical activity causes fatigue, palpitation, dyspnea or chest pain.

### Class IV

Patients with cardiac disease who have lost their ability to engage in any physical activity without discomfort. Symptoms may be present while at rest. Any physical activity increases discomfort.

While the onset of CHF can be acute, more often than not exacerbations of CHF are preceded by more subtle clues such as worsening shortness of breath with activity; increasing weakness or tiredness; increased swelling in the ankles or lower back; orthopnea, where more pillows are needed to prop a sufferer up to sleep at night; paroxysmal nocturnal dyspnea (PND), where the patient wakes up in the middle of the night gasping for breath; increased need to urinate at night; and fainting or dizzy spells.

Usually when folks with CHF call EMS it's because they can't breathe, have chest pain, and/or they are exhibiting the confusion or nervousness with diaphoresis associated with cardiogenic shock. Our treatments, which are geared to clearing fluid from patients' lungs, decreasing their pain and increasing overall perfusion, can have a profound and immediate impact on how they feel.

Most EMS systems use a series

of treatments and medications to decrease the load on the heart. Some systems use continuous positive airway pressure (CPAP) to help push fluids out of the lungs. These interventions are good and in many cases lifesaving, but much more can be done. EMS systems have the poten-

tial to provide support and monitoring to patients with CHF, which could decrease episodes of exacerbation. Research shows it is possible to reduce hospitalizations from CHF by 50% and the length of stay for those who are hospitalized by 90% with support and facilitated self-monitoring.

## How You Can Educate CHF Patients

EMS providers are in an ideal position to educate patients about ways in which they can improve their health.

- **Exacerbations of CHF are usually preceded by weight gain.** Patients with CHF should climb on a scale every day at the same time and then record their weight. An increase of 3–5 pounds in a week is a signal that the patient may be heading for trouble.
- **Uncontrolled hypertension, defined as a diastolic blood pressure of 105 mm Hg or more, has been identified in more than 40% of CHF patients who were readmitted to the hospital.** Patients need to regularly monitor their blood pressure and see their physicians if it's too high.
- **It's important for patients with CHF to eat a low-sodium diet, which equates to less than 2–3 grams a day.** There's a gram of sodium in one slice of pepperoni pizza. Other high-salt foods that should be avoided include lunch meats, cheese, canned soups, bacon, salted nuts, potato chips, sauerkraut, pickles, olives, smoked meats and fish, diet soda, soy sauce, prepackaged dinners, dried soup mixes and salad dressings.
- **Patients with CHF should avoid taking non-steroidal anti-inflammatory drugs (NSAIDs) like aspirin, Motrin, Advil, naproxen, Naprosyn, Aleve and ibuprofen.** These medications block the effects of diuretics and ACE inhibitors, which are used to treat CHF. In one study, there was a 200% increase in hospitalizations for CHF patients taking NSAIDs and diuretics.
- **Patients with CHF need to be careful when using herbs, vitamins and alternative supplements, as many of these can interfere with or potentiate the medications used to treat CHF.** Hawthorn berries, which people take for cardiovascular disease, high blood pressure, high cholesterol and insomnia, can be dangerous to patients taking prescription medications. Licorice and licorice extracts, which people take to improve digestive health, can increase high blood pressure. St. John's Wort, which people take as an antidepressant, interferes with levels of Digoxin and warfarin in the blood. One study showed that 45% of patients with CHF were taking some kind of herb or alternative supplement.
- **Psychological stress has been reported by 49% of CHF patients who are readmitted to the hospital.** Yes, when your grandmother says, "Don't do that, you'll put me in the hospital," she may have been right.
- **Patients need to comply with the discharge instructions they receive from their physicians when they leave the hospital.** Studies show that 50% of CHF patients do not follow these instructions. It's common for people to run out of their medications, forget to fill their prescriptions or not have enough money to buy their medications. Research also shows that older patients, smokers and those with diabetes are least compliant with their discharge instructions.

## WHAT CAN EMS SYSTEMS DO?

Patients with CHF who have called 9-1-1 should be treated according to local protocols. Some patients will be too ill to provide you with a good history, but for those who can communicate, a thorough, detailed history should be gathered. Ask about the things that could have caused the exacerbation, including taking NSAIDs or alternative supplements, emotional stress, excess salt in their diet and failure to properly take their medications.

EMS systems might consider "adopting" some of their patients with CHF. Calling patients on the phone each day, asking them how they feel, their weight, if they have taken their medications and if they have enough of their medications could provide them with the support necessary to comply with their treatment plan. If the patient has a blood

pressure device, we could also record their blood pressure over the phone. Alternatively, some systems could encourage patients to drop by the station to have their blood pressure and weight checked. A few EMS systems may even want to provide home visits where they check medication supply, weight and blood pressure. Recording patients' daily weight and blood pressure allows us to track the progress of their disease and intervene before their lungs fill with fluid.

If a patient is gaining weight, their blood pressure is increasing, or they are running out of their medications, EMS folks monitoring them have several options. They can tell the patient to contact their physician. They can, with the patient's permission, contact the patient's physician on their behalf to report their findings and discuss what needs to be done. They can transport the patient to the physician's office or hospital for further evalua-

tion. Their physician should determine the weight and blood pressure alarm points that would cause action.

With the proper support, it is possible that people with this diagnosis will stay out of the hospital, live longer and feel better. Isn't that why we got into this business in the first place? ■

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