



## Heart Failure Over the Holidays and During the Winter Months

- Studies have noted higher incidences of heart failure and emergency department visits and hospital admissions related to heart failure during the winter months.
- Possible reasons for the higher incidences of heart failure include increases in upper respiratory infections, especially in elderly patients, and catecholamine release in response to cold weather. These changes can lead to increases in heart rate and total peripheral resistance and decreases in cardiac output.
- The number of patients with heart failure is especially pronounced over the Christmas and New Year's holidays due to compounding factors such as overeating and lack of regular exercise.
- Imaging studies including X-ray and ultrasound can play an important role in diagnosing heart failure in the emergency department.

The holidays are a time for giving, revelry, celebration and reaffirming family bonds. They are also a time for unhealthy behaviors that can increase hospital admission rates and even increase mortality rates.

Among the negative behaviors are those grouped under the label 'dietary indiscretions' including eating too much, eating too often and eating too fast, and excessive alcohol consumption, which one study notably describes as 'holiday drinking.' Other factors contributing to increases in hospital admission rates include drop-offs in regular exercise and the greater likelihood of postponing a doctor's visit or forgetting to take medicine. In many cases, stress further compounds the negative health effects of these behaviors. Indeed, the holidays are rife with stress: stress over getting the right gift, meeting work deadlines before leaving the office for a week or more, or spending time with family.

The negative health effects associated with these behaviors arise not only during the holidays and in the immediate wake of the holidays but also during the winter months overall, making these months an especially vulnerable time for many in the U.S.

### Higher Rates of Heart Failure During the Winter Months

The winter months are associated with higher incidences of heart failure and emergency department visits related to heart failure. A 2001 study in the journal *Academic Emergency Medicine* found that 35.3% more such visits occur in December than in August, the month with the fewest visits. Other studies have found similar differences between the winter and summer months. Researchers have noted several possible reasons for the higher incidences of heart failure in the winter. During the winter months, providers see an increase in the number of people with upper respiratory infections, particularly in elderly patients. Such infections can be precipitating factors in patients already susceptible to heart failure. Catecholamine release in response to cold weather can also play a role since it leads to increases in heart rate and total peripheral resistance and decreases in cardiac output. The researchers have also pointed to overeating and other unhealthy behaviors as possible reasons for increases in the rates of heart failure during the winter months.

### Unhealthy Behaviors Over the Holidays Add to Increased Incidence of Heart Failure

More recently, researchers have examined rates of heart failure and emergency department visits and hospital admissions related to heart failure surrounding the holidays themselves. In 2004, a team of researchers looked at cardiac mortality in a two-week period surrounding the Christmas and New Year's holidays, reporting a 4.65% increase in mortality during this period, with the highest mortality rates on December 25 and 26 and January 1.



**Figure 1:** Computed tomography (CT) is used for cardiac imaging in both emergency and non-emergency settings. The image above is a coronal 3D volume rendered slab image of a cardiovascular protocol CT angiogram showing the heart and great vessels. The patient had undergone a prior heart valve replacement, and surgical clips can be identified within the upper mediastinum. Image courtesy of Brian B. Ghoshhajra, MD, MBA.

They attributed the increase in rates in part to the changes in the behaviors described above. Following this work, another group sought to determine whether the patterns of cardiac mortality carried over to emergency department (ED) visits for heart failure during the Christmas and New Year's holidays in 2008. The researchers found similar trends, with 30% and 35% increases in mortality during the four-day periods surrounding Christmas and New Year's Day, respectively. Notably, the highest rates of ED visits for heart failure, January 26 and 27 and December 2, were offset by a day with respect to the earlier study.

Other studies have shown similar trends, with higher heart failure admission rates in the days following the holidays than on the holidays themselves. A 2016 report looked at admissions surrounding holidays throughout the year – including Independence Day, Thanksgiving and Superbowl Sunday, as well as Christmas and New Year's Day – and observed, in all cases, higher admission rates during the four days after the holiday than on the actual day of celebration. The authors of the study attributed this finding to the fact that the ill effects of overindulgence can take time to manifest, particularly with respect to heart failure. Other factors may come into play though, such as the preponderance of people who decline to seek care on the holidays themselves. Indeed, the same study showed that, with the exception of Superbowl Sunday, heart failure admission rates on the holidays were lower than the average rates during the rest of the month.

The inclusion of Superbowl Sunday may seem incongruous at first since the other days are cultural holidays with rituals involving family and, in many cases, prolonged stress. The authors note that Superbowl Sunday shares risk factors with other holidays such as overeating and 'holiday drinking', compounded by the intensity of the game and the emotional stress associated with a loss. In fact, they observed a high rate of heart failure admissions in the wake of the Superbowl, though the difference between this rate and the average rate for the rest of the month was not statistically significant.

## Imaging Studies Aid in Management of Cardiac Patients in the Emergency Department

Radiology can play an important role in the diagnosis of heart failure in patients arriving to the emergency department. Chest X-rays can help identify pneumonia or other causes of dyspnea, the labored breathing often associated with heart failure but, like focused history and physical examination, can only be considered diagnostic when the findings are positive. A normal X-ray cannot rule out the condition.

Imaging can help in other ways as well. In a series of trials reported over the past decade, for example, researchers have explored the potential of coronary computed tomography angiography (CCTA) in [triaging patients presenting to the ED with chest pain symptoms](#). Researchers at Massachusetts General Hospital demonstrated the safety and efficacy of CCTA for such applications in a study reported in a 2017 issue of *European Radiology*. The following year, members of the team showed that the technique can also aid in diagnosing intermediate-to-high-risk ED patients with suspicion for acute coronary syndrome.

### Care for Acute Symptoms of Heart Failure

Patients should seek emergency care if they are experiencing new and severe chest pain accompanied by shortness of breath, sweating, nausea or weakness; a heart rate of more than 120-150 beats, especially if accompanied by shortness of breath; or continued shortness of breath after a period of rest. The Emergency Department at Massachusetts General Hospital in Boston is located at 55 Fruit Street.

### Acknowledgments

We would like to thank Brian B. Ghoshhajra, MD, MBA, Division of Cardiovascular Imaging, Department of Radiology, Massachusetts General Hospital, for his advice and assistance in preparing this article.

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