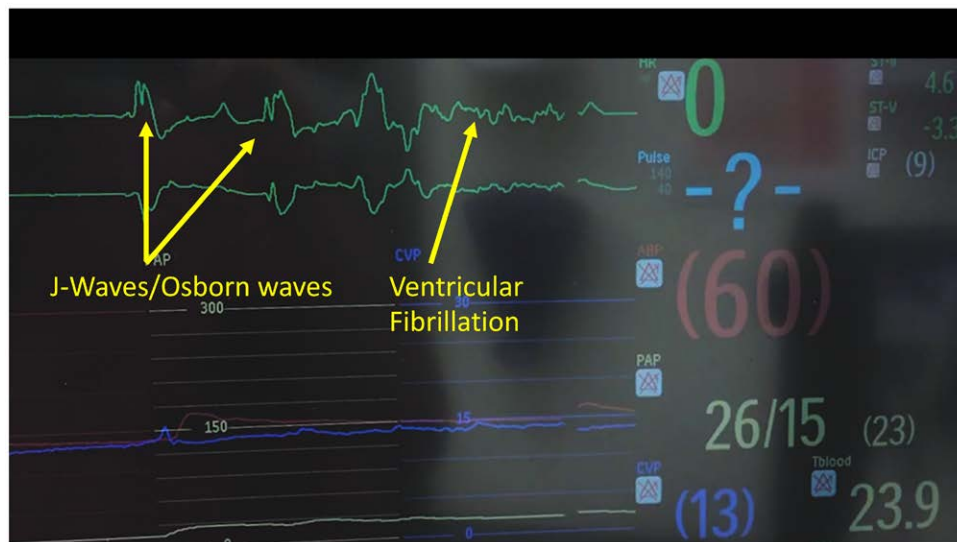
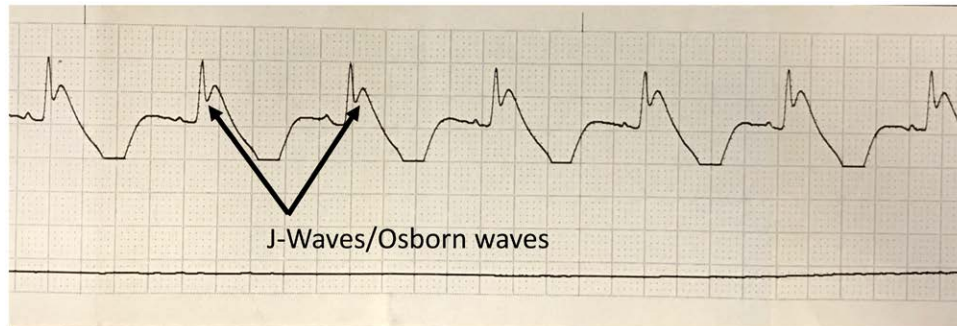


# Osborn Waves with Ventricular Fibrillation Caused by Hypothermia

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A 65-yr-old woman undergoing repair of an aortic dissection developed the above electrocardiogram at 24°C. J waves, or Osborn waves (electrocardiogram lead II, speed 25 mm/s), are abnormal positive deflections of the electrocardiogram that occur at the J point or the junction between the QRS complex and the ST segment. J-point elevations may be observed in patients with hypothermia (generally less than 32°C), subarachnoid hemorrhage, vasospastic angina, and Brugada Syndrome.<sup>1</sup> The wave amplitude correlates to the severity of the hypothermia, which prolongs repolarization leading to phase 2 reentry and the potential for ventricular fibrillation. Osborn waves represent the electrocardiographic

changes created by the differences between epicardial and endocardial potassium channel currents. Supplemental Digital Content (<http://links.lww.com/ALN/C540>; electrocardiogram lead II, speed 25 mm/s) demonstrates Osborn waves and development of ventricular fibrillation.

When caring for patients with hypothermia, whether used as a therapeutic adjunct such as for targeted temperature management after cardiac arrest, cardiac surgery, or owing to accidental environmental exposure, the electrocardiogram provides important information regarding the severity and effects of hypothermia. As was previously thought, Osborn waves may not portend the imminent development

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of malignant ventricular arrhythmias, and their presence may be associated with a more favorable outcome after cardiac arrest.<sup>2,3</sup> In the case of isolated Osborn waves, rewarming or avoidance of hypothermia is sufficient for the resolution of the electrocardiogram. Treatment of malignant ventricular arrhythmias requires prompt cardiac defibrillation. Rapid rewarming (to greater than 32°C and which may include the use of aggressive measures such as cardiopulmonary bypass) is most often required for defibrillation to be successful.

### Competing Interests

The author declares no competing interests.

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