Patient with altered mental status

CLINICAL INTRODUCTION
A woman in her 60s with history of diabetes mellitus, hypertension and hypothyroidism presented to the emergency department after being found confused, non-verbal and with low urine output in a nursing home. Her last known well was around 6 o’clock in the morning before presentation. Her temperature was 94.5°F, blood pressure (BP) was 179/80 mm Hg, heart rate (HR) was 50/min, and saturation was 97% on room air. She was cold to touch. The lungs were clear to auscultation bilaterally. She was noted to have gaze preference initially to the right, then to the left, right-sided weakness and left facial droop. A code stroke was activated; however, the CT head showed no acute pathology. Laboratory results were significant for white cell count of 12,500 cells/mm³, and PH of 7.35. An hour later, her BP dropped to 88/50 mm Hg and HR was 42/min with no rectal temperature measurement detected despite multiple attempts. The patient was started on intravenous fluids (IVF). Her ECG on presentation and an hour later are shown in figure 1A,B.

QUESTION
What action would you advise next?
A. Urgent transcutaneous pacemaker placement
B. Emergent percutaneous coronary intervention (PCI)
C. Active rapid rewarming
D. Active slow rewarming
E. Urgent haemodialysis

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Figure 1 ECG on admission (A) and repeat ECG an hour later (B).
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ANSWER: D
Diagnosis
Moderate hypothermia.

WHAT ACTION WOULD YOU ADVISE NEXT?

D) Active slow rewarming

Key ECG features that assist in correct diagnosis are sinus bradycardia, attenuated P wave and classic J (Osborn) wave. Our image shows bradycardia with diffuse classic J (Osborn) waves prominent in leads II and V4–V6 (more prominent in panel B). It was proposed to be due to hypothermia-induced prolongation of action potential and abnormal repolarisation creating a transmural voltage gradient between the ventricular epicardium and endocardium resulting in J point elevation. Hypothermia has variable ECG manifestations that range from bradycardia, decreased P wave amplitude, wide QRS complex, Osborn waves, prolonged PR interval, and atrial and ventricular arrhythmias.1 2 Early identification is important in the context of the clinical setting to avoid unnecessary interventions before appropriately rewarming the patient. Cardiac pacemaker is also ineffective in treating bradycardia (choice A) until fully rewarming the patient. There is no indication for PCI (choice B) and haemodialysis (choice E) at this point. Rapid rewarming (choice C) triggers a cascade of destructive inflammatory processes.3

Patient outcome
Temperature obtained via bladder probe was 87.4°F. The patient was rewarmed slowly with warming blankets, a Bair Hugger and warm IVF. The patient’s BP and mental status improved. Her bradycardia and Osborne waves resolved, except for a prolonged QT interval.

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References