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Title: How to determine whether to perform chest compressions on an unconscious patient with an implanted left ventricular assist device

Author: Joseph P. Ornato

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Authors: Amir Louka, Samuel W. Grodman, Jeffrey D.

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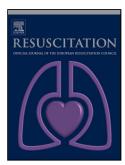
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## ACCEPTED MANUSCRIPT

How to determine whether to perform chest compressions on an unconscious patient with an implanted left ventricular assist device

#### **Authors**

Joseph P. Ornato, Virginia Commonwealth University Richmond, VA United StatesAmir Louka, MD, Virginia Commonwealth University Health System

Samuel W Grodman , MD, Virginia Commonwealth University Health System

Jeffrey D Ferguson , MD, Virginia Commonwealth University Health System

Patients with a functioning left ventricular assist device (LVAD) are typically fully conscious but pulseless because the devices provide continuous, non-pulsatile flow. Opinions differ as to whether rescuers should start chest compressions if the patient becomes unconscious (due to device malfunction or any other cause). Device manufacturers advise against doing so out of concern for device dislodgement, although a small case series¹ has not documented this complication. A new American Heart Association Scientific Statement² advises emergency rescuers to perform chest compressions if the end-tidal carbon dioxide (PetCO₂) level is <20mmHg after intubation based on the relationship between PetCO₂ and cardiac output. Resuscitation of this unconscious, pulseless 58M LVAD patient documents that the recommendation works. The patient had no detectable PetCO₂ (A) after paramedic endotracheal tube (ET) intubation despite direct observation of the tube traversing the vocal cords plus good rise and fall of the chest with ventilation and "frosting on the ET tube" (ECG shows asystole with LVAD noise). Chest compressions immediately resulted in a normal capnographic waveform with 23mmHg PetCO₂ (B) and, following epinephrine administration, the patient was resuscitated successfully. No device dislodgement occurred.

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