Improving donation after circulatory death (DCD): educational design for a high-fidelity simulation lab

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Title

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Introduction & Aims

Donation after circulatory death (DCD) is an established strategy to expand donor pool. Understanding the complex management of DCD implies the development of innovative strategies for an active learning experience, through interactive simulations and use of breakthrough technologies.
The aims of a DCD learning station are to:
•Understand the clinical process and each step of both Controlled and Uncontrolled DCD (modified Maastricht classification) through simulation scenarios
•Learn about the basic principles of the Normothermic Regional Perfusion (NRP) technique, through the use of an interactive extra-corporeal life support (ECLS) simulator

Learning objectives

•Diagnose cardio circulatory death
•Understand the clinical process and each step of both Controlled and Uncontrolled DCD (modified Maastricht classification)
•Develop the ICU process from decision of Withdrawal of Life-Sustaining Treatments (WLST) till organ retrieval
•Understand the criteria identify a potential DCD
•Learn family approach technique for organ donation
•Evaluate and assess the organ viability obtained from DCD
•Apply the organ preservation techniques
•Understand and deepen NRP

Session description (planned activities)

Learning station 1: Uncontrolled DCD (uDCD)
Setting: emergency department (ED)
General description: From EMT arrival until statement of death in ED: cardiac arrest (advanced RCP with mechanical compression device), patient transfer to reference hospital ED and evaluation, circulatory death declaration, cannulation for organ preservation and organ suitability.
Rationale: Process from Out-hospital cardiac arrest to hospital alerts for possible uDCD
Objectives and skills:
•Medical evaluation and decisions to stop or not
•Diagnose cardio circulatory death
•Understand the criteria identify a potential uDCD

•Learn family approach technique for organ donation
•Evaluate and assess the organ viability obtained from uDCD
•Apply the organ preservation techniques
•Understand and deepen NRP

Learning station 2: Controlled DCD (cDCD)
Setting: intensive care unit (ICU)
General description: from the Withdrawal of Life-Sustaining Treatments (WLST) to the operative room (OR): cardiac arrest (advanced RCP with mechanical compression device), post-ROSC coma with temperature target management (TTM), neurological compromise without therapeutic options, WLST decision, family approach, preservation techniques, retrieval procedures.
Rationale: Process from post-ROSC coma through WLST to alerts for cDCD
Objectives and skills:
•Develop the ICU process from decision of WLST till organ retrieval
•Learn family approach technique for WLST and organ donation
•Prediction of asystole and diagnose of cardio circulatory death
•Control and limit the ischaemic injury
•Pre and Post mortem interventions. Ethical aspects
•Evaluate and assess the organ viability obtained from cDCD
•Apply the organ preservation techniques of cDCD

Learning station 3: DCD lung
Setting: ED
General description: From EMT arrival until statement of death in ED: cardiac arrest, patient transfer to reference hospital ED and evaluation, circulatory death declaration, lung retrieval procedure
Rationale: Process from cardiac arrest to alerts for DCD lung
Objectives and skills:
•ED patient admission, medical evaluation
•Diagnose cardio circulatory death
•Apply the criteria to identify a potential DCD lung
•Learn family approach technique for organ donation
•Evaluate and assess the organ viability obtained from DCD lung

Educational methods (e.g. group dynamics, interactive methods)

42 participants divided in 3 groups (14 participants each): A, B, C

Expected impact

DCD identification and management will contribute to expand donor pool for the treatment end-stage lung, liver and kidney disease

Target audience

Emergency and ICU physician and nurses

Level (introductory/ intermediate/ advanced)

advanced

Maximum number of participants

42

Clinical speciality keyword

critical care, emergency department, transplantation medicine, ECLS

Equipment requests

•Adult total-body ALS simulator with extra-corporeal life support (ECLS) features and set-up
•Working station and control room
•ECLS equipment for NRP technique
•Mechanical compression devices for advanced RCP
•Airway management and monitoring devices