

## **Abstract**

**Background:** Acute heart failure is classically defined by symptoms and signs related to elevated ventricular filling pressures. Regardless of precipitant, underlying etiology or ejection fraction, the vast majority of hospital admissions are the result of worsening chronic heart failure. For the acutely decompensated patient, 4 hemodynamic profiles ; stratified by degree of decongestion ("dry" or "wet") and adequacy of perfusion ("warm" or "cold") predict prognosis and guide therapy.

**Aims:** The aim of this essay is to discuss the new modalities in diagnosis and management of acute heart failure.

**Methodology:** The ability to accurately measure cardiac output remains an integral part of diagnosing and managing critically ill patients. There are many minimally invasive devices currently available on the market designed to reduce the risks associated with the use of PAC. These devices have variable degrees of 'invasiveness' with some being only marginally less invasive than PACs.

**Conclusion:** VA ECMO is a potential therapy for patients with refractory cardiogenic shock, particularly in those with severe cardiogenic shock and combined respiratory failure. VA ECMO for cardiogenic shock is a bridge to recovery, durable VAD implantation, or transplantation, and clinical trajectory and prognosis must enter centrally into the judgment of a patient's candidacy for ECMO. The use of VA ECMO in critically ill patients requires a multi- specialty team of practitioners.

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**Keywords:** Modalities, Diagnosis and Management, Acute Heart Failure

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## **List of Abbreviations**

ACE	: Angiotensin converting enzyme
ADM	: Adrenomedullin
ANP	: Atrial natriuretic peptide
ARB	: Angiotensin-receptorblocker
ARNi	: Angiotensin receptor–neprilysin inhibitor
AT1	: Angiotensin type 1
AV	: Atrioventricular
AVP	: Action of arginine vasopressin
BNP	: B-type natriuretic peptide
BUN	: Blood urea nitrogen
cAMP	: Cyclic adenosine monophosphate
CCO	: Continuous Cardiac Output
CCU/ICU	: Coronary cardiac unit/ intensive care unit
CHF	: Congestive heart failure
COPD	: Chronic obstructive pulmonary disease
CRP	: C-reactive protein
DBP	: Diastolic blood pressure
DRIs	: Direct renin inhibitors

## *List of Abbreviations*

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ECG	: Electrocardiogram
ECLS	: European Extracorporeal Life Support
ECOM	: Endotracheal cardiac output monitor
ED	: Esophageal Doppler
ELSO	: Extracorporeal Life Support Organization
ESC	: European Society of Cardiology
ETA	: Endothelin-A
ETB	: Endothelin- B
ETT	: Endotracheal tube
FiO <sub>2</sub>	: Fraction of inspired oxygen
GDF	: Growth differentiation factor
GFR	: Glomerular filtration rate
HF	: Heart failure
HFSA	: Heart Failure Society of America
IABP	: Intra-aortic balloon pump
JVP	: Jugular venous pressure
LAD	: Left anterior descending artery
LiDCO	: Lithium dilution Cardiac Output
LV	: Left ventricular

## *List of Abbreviations*

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MCS	: Mechanical circulatory support
MIBG	: Metaiodobenzyleguanidine
MR-proADM	: Mid-regional pro adrenomedullin
MR-proANP	: Mid-regional pro atrial natriuretic peptide
NE	: Norepinephrine
NO	: Nitric oxide
NOS	: Nitric oxide synthase
NPR-A	: Natriuretic peptide receptor A
NPR-C	: Natriuretic peptide receptor C
NRG-1	: Neuregulin-1
NT-proBNP	: N-terminal proBNP
PAC	: Pulmonary artery catheter
PiCCO	: Pulse Index Continuous Cardiac Output
PPV	: Positive pressure ventilation
RAAS	: Renin–angiotensin–aldosterone system
RAS	: Renin-Angiotensin system
rhNRG-1	: Recombinant human neuregulin-1
RXFP	: Relaxin family peptide
SBP	: Systolic blood pressure

## *List of Abbreviations*

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sGC	: Soluble guanylate cyclase
SV	: Stroke volume
SVR	: Systemic vascular resistance
TEE	: Transesophageal echocardiography
VA	: Veno-arterial
ECMO	: Extra Corporeal Membrane Oxygenation

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# Introduction

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# **Aim of Essay**

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*Chapter (1)*

**Anatomy and  
Physiology of the  
Heart**

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## *Chapter (2)*

# **Pathophysiology of Acute Heart Failure**

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## *Chapter (3)*

# **Diagnosis and Management of Acute Heart Failure**

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## *Chapter (4)*

# **New Modalities of Diagnosis and Management**

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# Summary

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