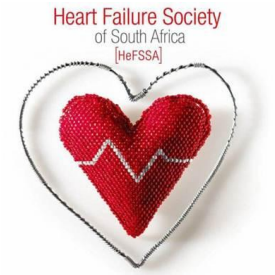
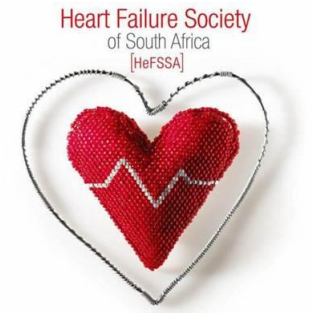


Program

- **Lecture 1:** Update on chronic heart failure –2012 ESC/HeFSSA guidelines
- **Lecture 2**: Update on acute heart failure –2012 ESC/HeFSSA guidelines
- **Lecture 3**: Update on the use of devices and end stage HF -2012 ESC/HeFSSA guidelines
- **Lecture 4**: Diagnosis and management of right heart failure



Program

Lecture 2 :

UPDATE ON ACUTE HEART FAILURE

- **Background Information**
- **ESC Guidelines on chronic heart failure 2012**
- **Adaptation to the ESC guidelines by South Africa Heart Association**

The 2012 ESC heart failure guidelines

European Heart Journal
doi:10.1093/eurheartj/ehs104

ESC GUIDELINES

ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure 2012

The Task Force for the Diagnosis and Treatment of Acute and Chronic Heart Failure 2012 of the European Society of Cardiology.

26 Task Force members!

Authors/Task Force Members: John J. V. McMurray (Chairperson) (UK)*, Stamatis Adamopoulos (Greece), Stefan D. Anker (Germany), Angelo Auricchio (Switzerland), Michael Böhm (Germany), Kenneth Dickstein (Norway), Volkmar Falk (Switzerland), Gerasimos Filippatos (Greece), Cândida Fonseca (Portugal), Miguel Angel Gomez Sanchez (Spain), Tiny Jaarsma (Sweden), Lars Køber (Denmark), Gregory Y. H. Lip (UK), Aldo Pietro Maggioni (Italy), Alexander Parkhomenko (Ukraine), Burkert M. Pieske (Austria), Bogdan A. Popescu (Romania), Per K. Rønnevik (Norway), Frans H. Rutten (The Netherlands), Juerg Schwitter (Switzerland), Petar Seferovic (Serbia), Janina Stepinska (Poland), Pedro T. Trindade (Switzerland), Adriaan A. Voors (The Netherlands), Faiez Zannad (France), Andreas Zeiher (Germany).

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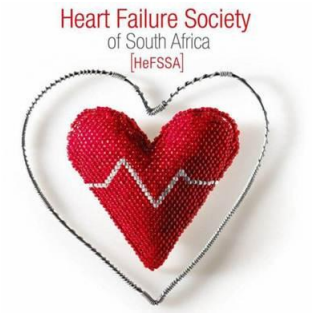
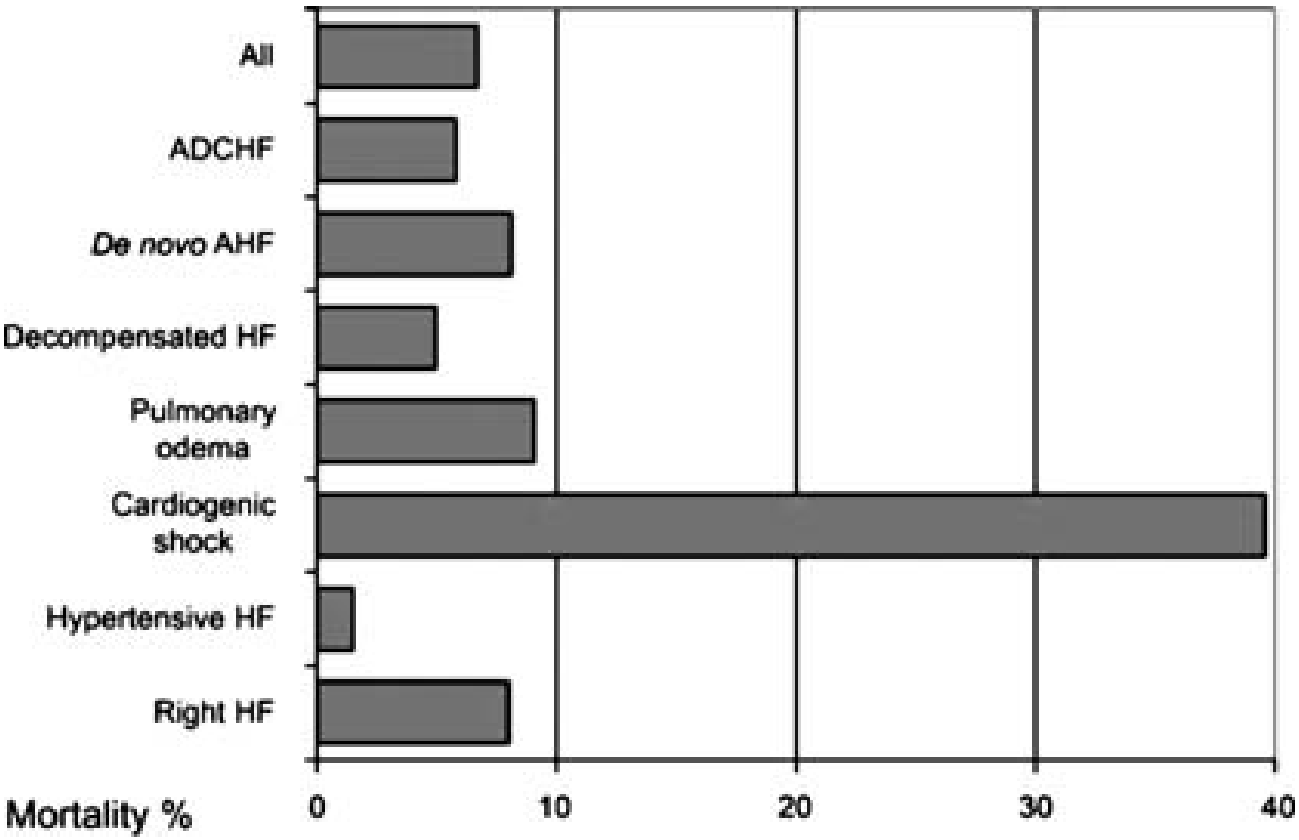


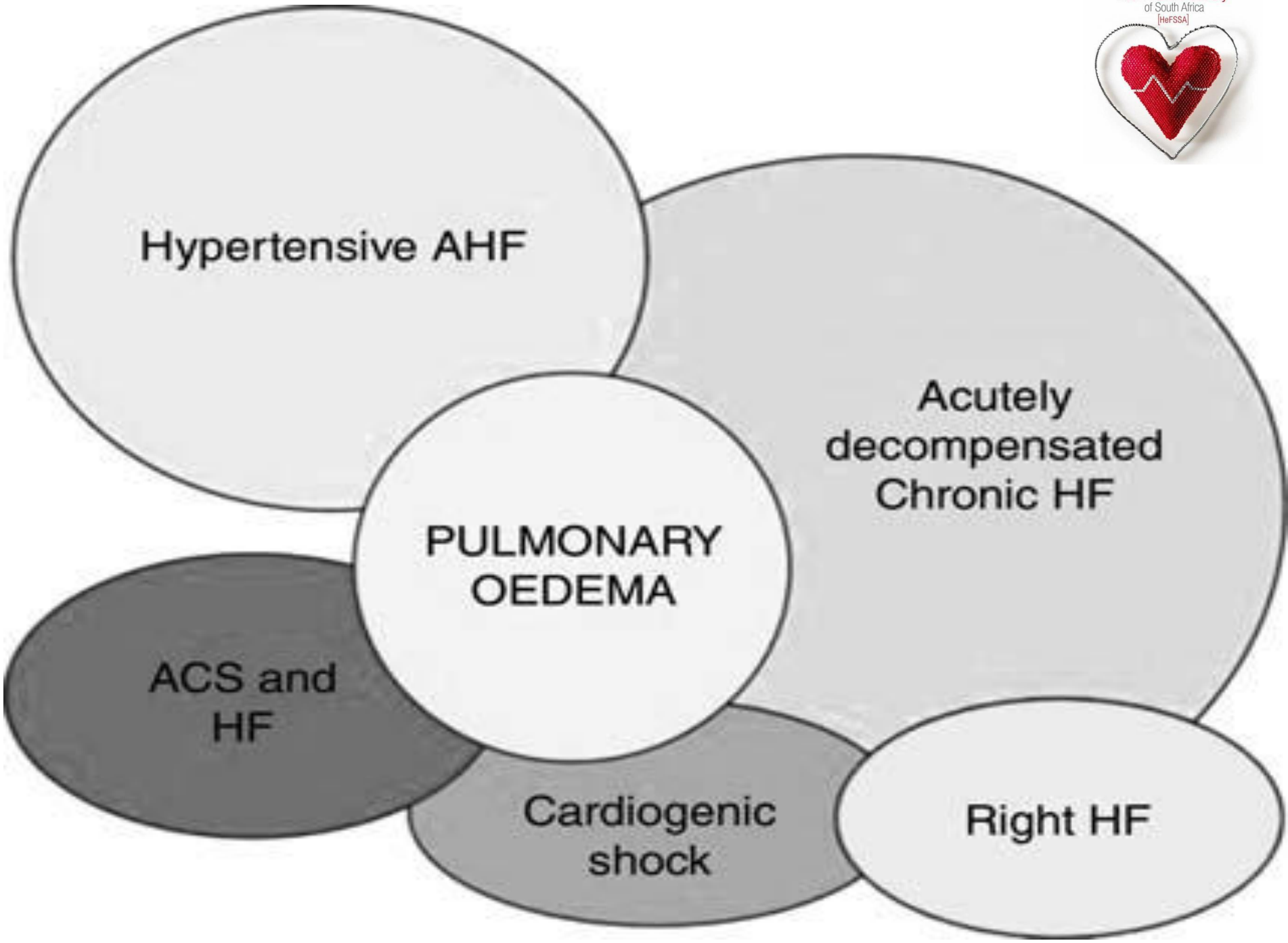
DEFINITION

Rapid onset of signs or symptoms of heart failure (de novo), or
Recurring signs and symptoms in a patient with known heart failure (acute decompensated chronic heart failure)

Serious public health problem in USA and Europe
In EU in 2010, 15 million patients with heart failure and 3.6 million emergency admissions for acute heart failure



Mortality of acute heart failure syndromes.
In-hospital mortality in Euro-Heart Failure Survey II by history of heart failure and clinical class.
EHFS II, Euro-Heart Failure Survey II.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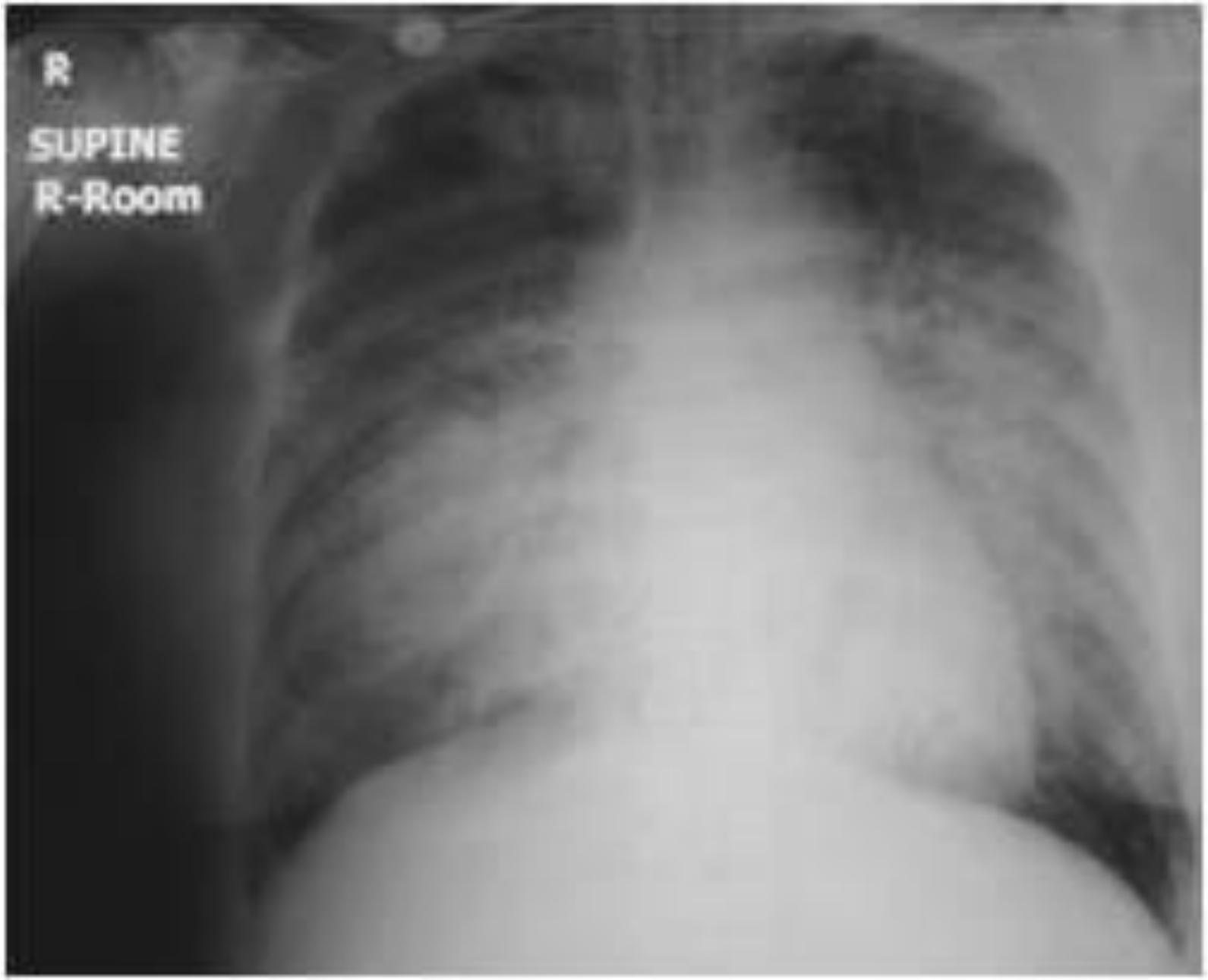
[HeFSSA]
Hypertensive AHF
Acutely
decompensated
Chronic HF
PULMONARY
OEDEMA
ACS and
HF
Cardiogenic
shock
Right HF



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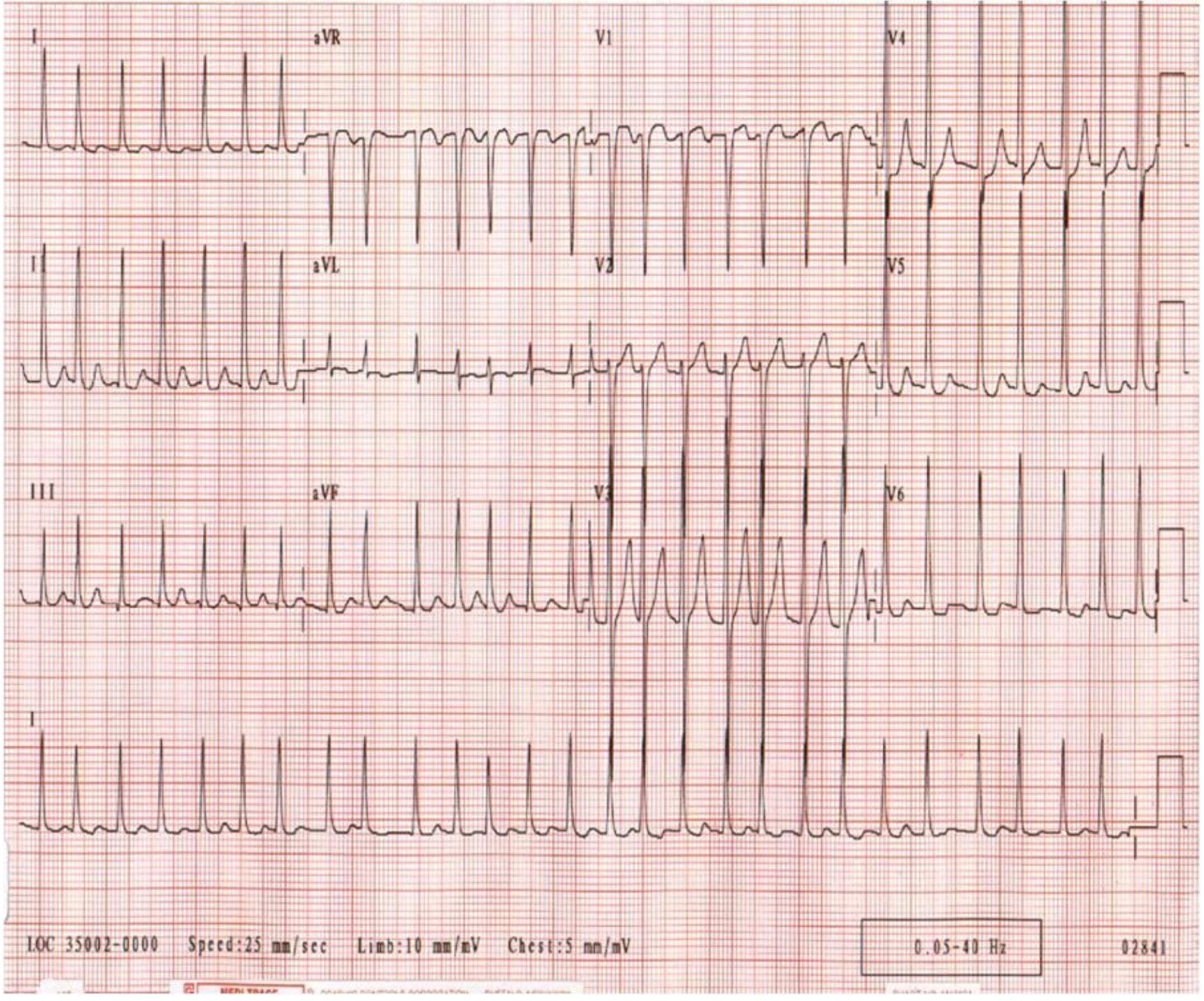
I
aVR
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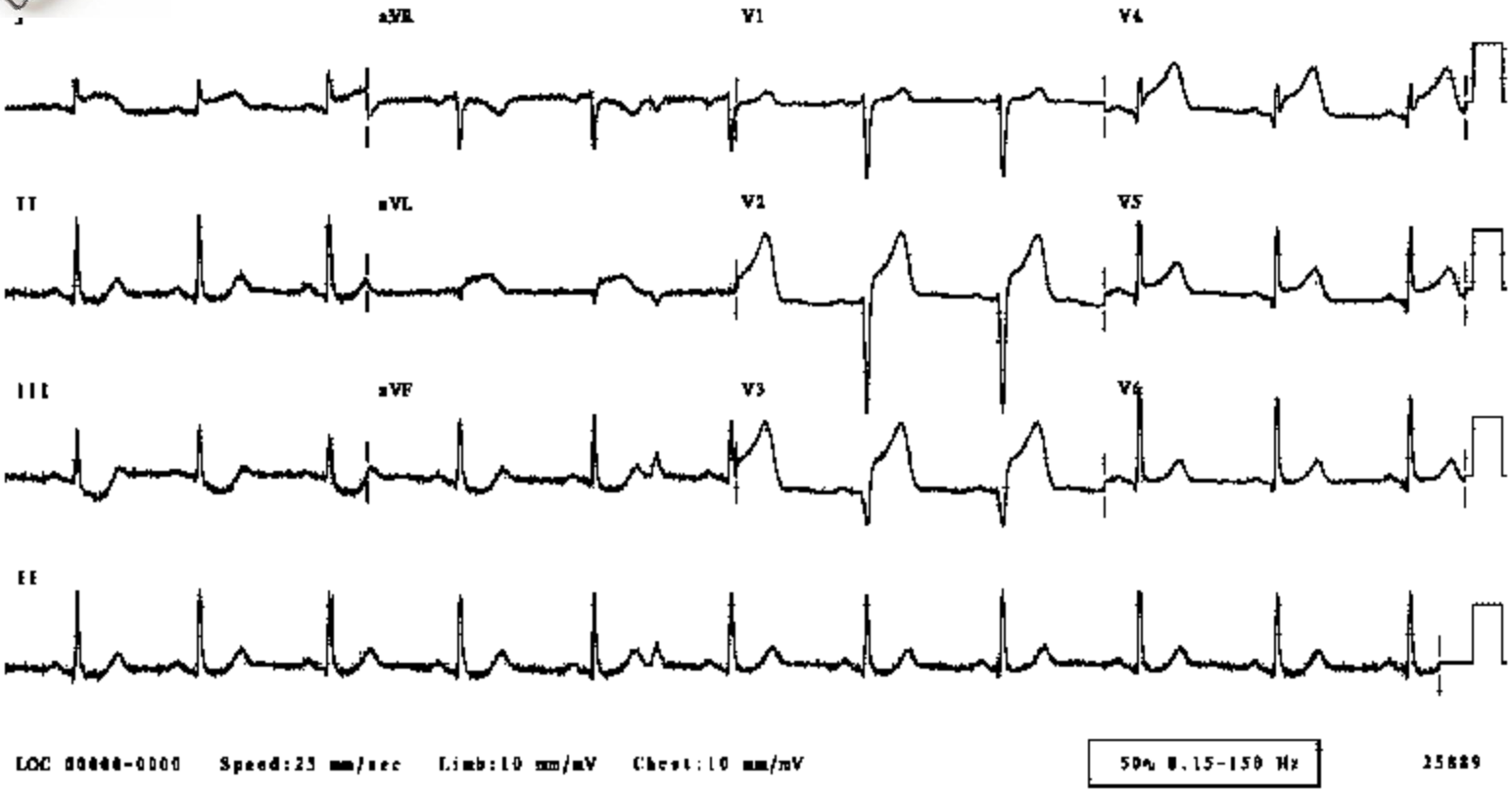

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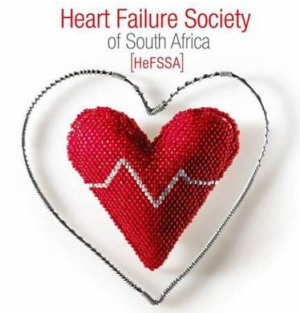
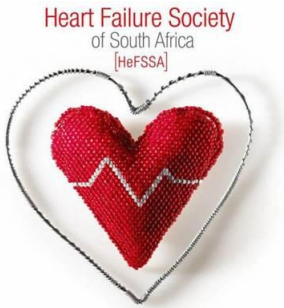


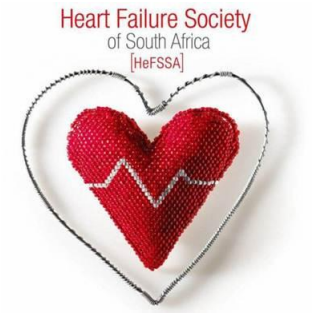
AHF is not a distinct diagnosis but rather a collection of syndromes with different causes and varying clinical features which fall under the heart failure umbrella and require urgent medical intervention.

Treating these AHF syndromes as a single entity and attempting to evaluate the benefits of a single new agent would appear to be futile!



Patients with certain clinical presentations, especially those with ‘de novo’ heart failure, are more difficult to study in clinical trials

- First, a diagnosis of the underlying cause of the clinical presentation is required.
- Second, due to the potential instability of the underlying disease processes involved such as acute valve malfunction or acute myocardial diseases such as myocarditis, baseline stability of clinical or haemodynamic status cannot be assumed or even expected.



Program

Lecture 2 :

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Precipitants And Causes Of Acute Heart Failure

(ESC Guidelines 2012)

Events usually leading to rapid deterioration
• Rapid arrhythmia or severe bradycardia/conduction disturbance
• Acute coronary syndrome
• Mechanical complication of acute coronary syndrome (e.g. rupture of interventricular septum, mitral valve chordal rupture, right ventricular infarction)
• Acute pulmonary embolism
• Hypertensive crisis
• Cardiac tamponade
• Aortic dissection
• Surgery and perioperative problems
• Peripartum cardiomyopathy
Events usually leading to less rapid deterioration
• Infection (including infective endocarditis)
• Exacerbation of COPD/asthma
• Anaemia
• Kidney dysfunction
• Non-adherence to diet/drug therapy
• Iatrogenic causes (e.g. prescription of an NSAID or corticosteroid; drug interactions)
• Arrhythmias, bradycardia, and conduction disturbances not leading to sudden, severe change in heart rate
• Uncontrolled hypertension
• Hypothyroidism or hyperthyroidism
• Alcohol and drug abuse

AHF = acute heart failure; COPD = chronic obstructive pulmonary disease; NSAID = non-steroidal anti-inflammatory drug.

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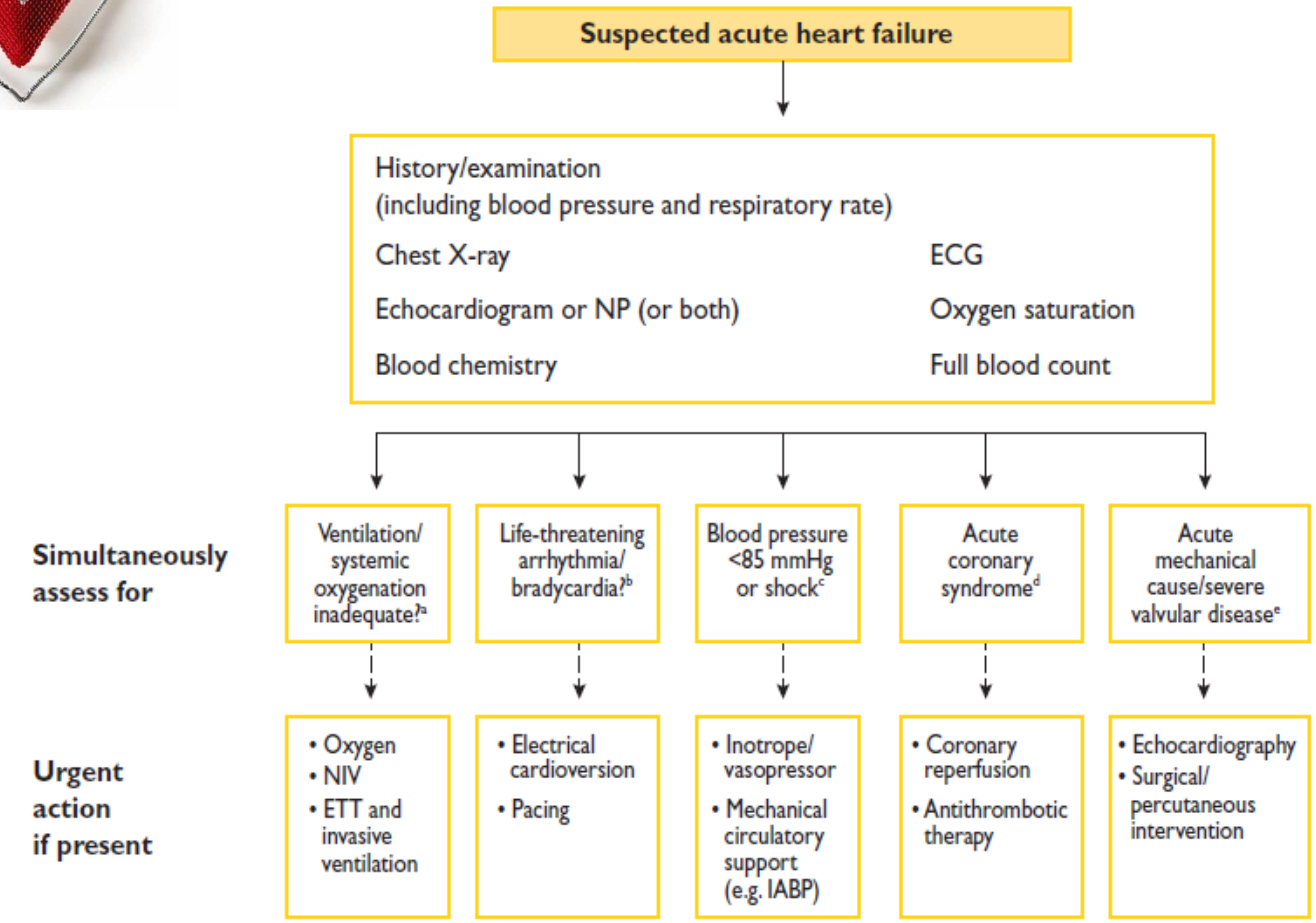
Initial Assessment Of Patient With Suspected Acute Heart Failure

Esc guidelines 2012



ECG (Electrocardiogram); ETT ¼(Endotracheal Tube); IABP (Intra-aortic Balloon Pump): NIV (Non-invasive Ventilation); NP(Natriuretic Peptide)

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Drugs Used To Treat Acute Heart Failure That Are Positive Inotropes Or Vasopressors Or Both (ESC Guidelines 2012)

	Bolus	Infusion rate
Dobutamine	No	2–20 µg/kg/min (β+)
Dopamine	No	<3 µg/kg/min: renal effect (δ+)
		3–5 µg/kg/min; inotropic (β+)
		>5 µg/kg/min: (β+), vasopressor (α+)
Milrinone	25–75 µg/kg over 10–20 min	0.375–0.75 µg/kg/min
Enoximone	0.5–1.0 mg/kg over 5–10 min	5–20 µg/kg/min
Levosimedan[a]	12 µg/kg over 10 min (optional)[b]	0.1 µg/kg/min, which can be decreased to 0.05 or increased to 0.2 µg/kg/min
Norepinephrine	No	0.2–1.0 µg/kg/min
Epinephrine	Bolus: 1 mg can be given i.v. during resuscitation, repeated every 3–5 min	0.05–0.5 µg/kg/min

[a]Also a vasodilator.
[b]Bolus not recommended in hypotensive patients (systolic blood pressure <90 mmHg).
α = alpha adrenoceptor; β = beta adrenoceptor; δ = dopamine receptor.

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SIZE OF TREATMENT EFFECT →

ESTIMATE OF CERTAINTY (PRECISION) OF TREATMENT EFFECT

	CLASS I *Benefit >>> Risk* Procedure/Treatment **SHOULD** be performed/ administered	CLASS IIa *Benefit >> Risk* *Additional studies with focused objectives needed* **IT IS REASONABLE** to perform procedure/administer treatment	CLASS IIb *Benefit ≥ Risk* *Additional studies with broad objectives needed; additional registry data would be helpful* Procedure/Treatment **MAY BE CONSIDERED**	CLASS III *Risk ≥ Benefit* Procedure/Treatment should **NOT** be performed/administered **SINCE IT IS NOT HELPFUL AND MAY BE HARMFUL**
LEVEL A Multiple populations evaluated* Data derived from multiple randomized clinical trials or meta-analyses	■ Recommendation that procedure or treatment is useful/effective ■ Sufficient evidence from multiple randomized trials or meta-analyses	■ Recommendation in favor of treatment or procedure being useful/effective ■ Some conflicting evidence from multiple randomized trials or meta-analyses	■ Recommendation's usefulness/efficacy less well established ■ Greater conflicting evidence from multiple randomized trials or meta-analyses	■ Recommendation that procedure or treatment is not useful/effective and may be harmful ■ Sufficient evidence from multiple randomized trials or meta-analyses
LEVEL B Limited populations evaluated* Data derived from a single randomized trial or nonrandomized studies	■ Recommendation that procedure or treatment is useful/effective ■ Evidence from single randomized trial or nonrandomized studies	■ Recommendation in favor of treatment or procedure being useful/effective ■ Some conflicting evidence from single randomized trial or nonrandomized studies	■ Recommendation's usefulness/efficacy less well established ■ Greater conflicting evidence from single randomized trial or nonrandomized studies	■ Recommendation that procedure or treatment is not useful/effective and may be harmful ■ Evidence from single randomized trial or nonrandomized studies
LEVEL C Very limited populations evaluated* Only consensus opinion of experts, case studies, or standard of care	■ Recommendation that procedure or treatment is useful/effective ■ Only expert opinion, case studies, or standard of care	■ Recommendation in favor of treatment or procedure being useful/effective ■ Only diverging expert opinion, case studies, or standard of care	■ Recommendation's usefulness/efficacy less well established ■ Only diverging expert opinion, case studies, or standard of care	■ Recommendation that procedure or treatment is not useful/effective and may be harmful ■ Only expert opinion, case studies, or standard of care

Recommendations	Class[a]	Level[b]	Ref[c]
Patients with an ACS			
Immediate primary PCI (or CABG in selected cases) is recommended if there is an ST elevation or a new LBBB ACS in order to reduce the extent of myocyte necrosis and reduce the risk of premature death.	I	A	221
Alternative to PCI or CABG: *Intravenous thrombolytic therapy is recommended, if PCI/CABG cannot be performed, if there is ST-segment elevation or new LBBB, to reduce the extent of myocyte necrosis and reduce the risk of premature death.*	I	A	222
Early PCI (or CABG in selected patients) is recommended if there is non-ST elevation ACS in order to reduce the risk of recurrent ACS. Urgent revascularization is recommended if the patient is haemodynamically unstable.	I	A	221
Eplerenone is recommended to reduce the risk of death and subsequent cardiovascular hospitalization in patients with an EF ≤40%.	I	B	107

ACE = angiotensin-converting enzyme; ACS = acute coronary syndrome; AF = atrial fibrillation; ARB = angiotensin receptor blocker; CABG = coronary artery bypass graft; CPAP = continuous positive airway pressure; ECG = electrocardiogram; EF = ejection fraction; HF = heart failure; i.v. = intravenous; LBBB = left bundle branch block; LMWH = low molecular weight heparin; LV = left ventricular; PaO_2 = partial pressure of oxygen; PCI = percutaneous coronary intervention; TOE = transoesophageal echocardiography.

[a]Class of recommendation.

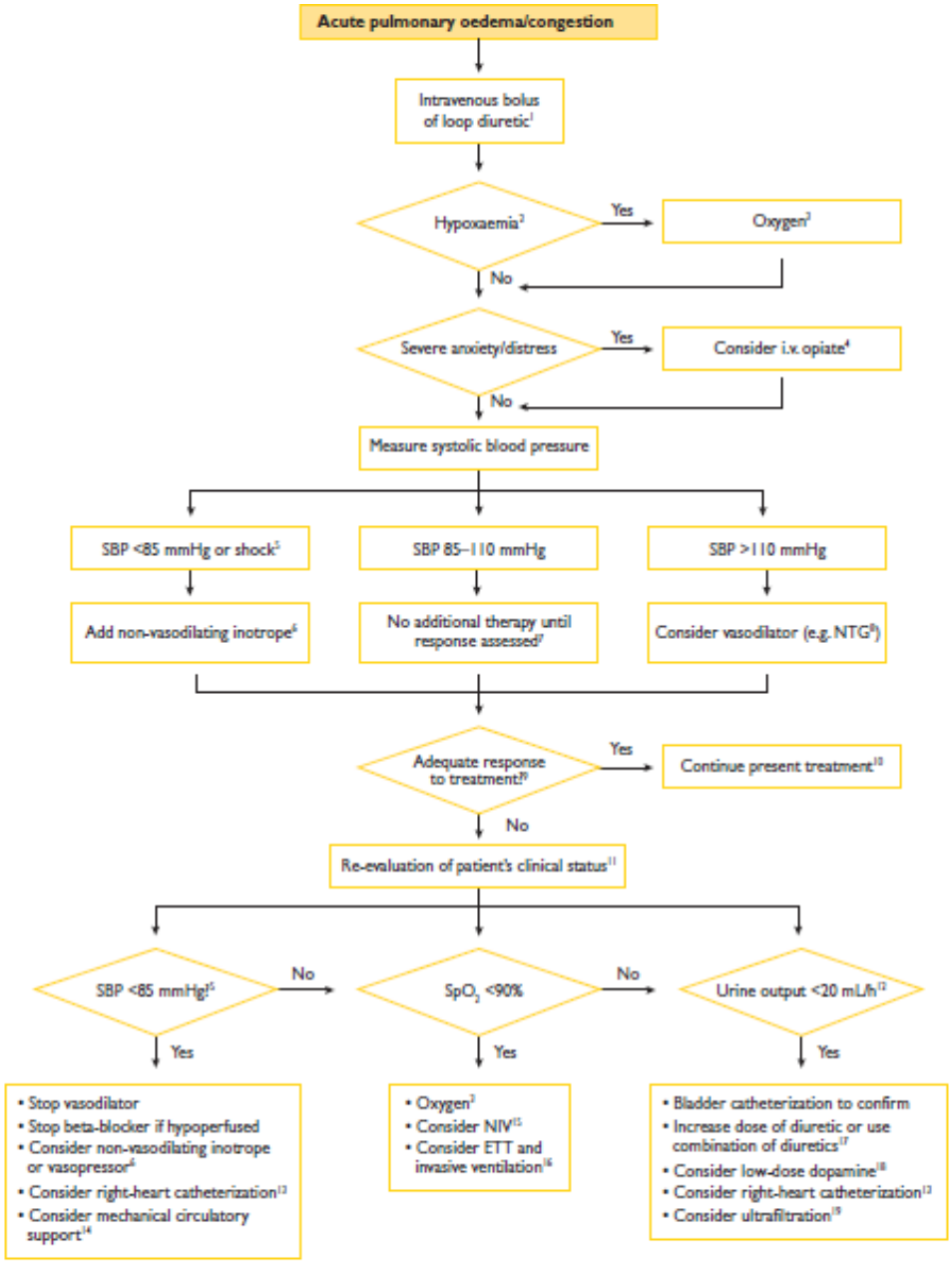
[b]Level of evidence.

[c]References.

Heart Failure Society of South Africa (HeFSSA)

Algorithm For Management Of Acute Pulmonary Oedema/Congestion.

(ESC Guidelines 201)



Recommendations For The Treatment Of Patients With Acute Heart Failure (Cont.) (ESC Guidelines 201)

Recommendations	Class[a]	Level[b]	Ref[c]
Patients with hypotension, hypoperfusion or shock			
Electrical cardioversion is recommended if an atrial or ventricular arrhythmia is thought to be contributing to the patient's haemodynamic compromise in order to restore sinus rhythm and improve the patient's clinical condition.	I	C	–
An i.v. infusion of an inotrope (e.g. dobutamine) should be considered in patients with hypotension (systolic blood pressure <85 mmHg) and/or hypoperfusion to increase cardiac output, increase blood pressure, and improve peripheral perfusion. The ECG should be monitored continuously because inotropic agents can cause arrhythmias and myocardial ischaemia.	IIa	C	–
Short-term mechanical circulatory support should be considered (as a 'bridge to recovery') in patients remaining severely hypoperfused despite inotropic therapy and with a potentially reversible cause (e.g. viral myocarditis) or a potentially surgically correctable cause (e.g. acute interventricular septal rupture).	IIa	C	–
An i.v. infusion of levosimendan (or a phosphodiesterase inhibitor) may be considered to reverse the effect of beta-blockade if beta-blockade is thought to be contributing to hypoperfusion. The ECG should be monitored continuously because inotropic agents can cause arrhythmias and myocardial ischaemia, and, as these agents are also vasodilators, blood pressure should be monitored carefully.	IIb	C	–
A vasopressor (e.g. dopamine or norepinephrine) may be considered in patients who have cardiogenic shock, despite treatment with an inotrope, to increase blood pressure and vital organ perfusion. The ECG should be monitored as these agents can cause arrhythmias and/or myocardial ischaemia. Intra-arterial blood pressure measurement should be considered.	IIb	C	–
Short-term mechanical circulatory support may be considered (as a 'bridge to decision') in patients deteriorating rapidly before a full diagnostic and clinical evaluation can be made.	IIb	C	–

ACE = angiotensin-converting enzyme; ACS = acute coronary syndrome; AF = atrial fibrillation; ARB = angiotensin receptor blocker; CABG = coronary artery bypass graft; CPAP = continuous positive airway pressure; ECG = electrocardiogram; EF = ejection fraction; HF = heart failure; i.v. = intravenous; LBBB = left bundle branch block; LMWH = low molecular weight heparin; LV = left ventricular; PaO_2 = partial pressure of oxygen; PCI = percutaneous coronary intervention; TOE = transoesophageal echocardiography.

[a]Class of recommendation.

[b]Level of evidence.

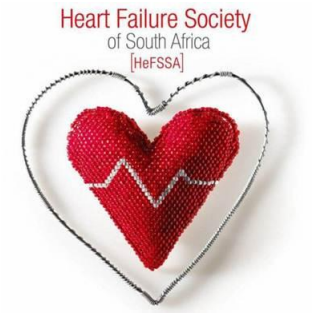
[c]References.

Intravenous Vasodilators Used To Treat Acute Heart Failure

(ESC Guidelines 2012)

Vasodilator	Dosing	Main side effects	Other
Nitroglycerine	Start with 10–20 µg/min, increase up to 200 µg/min	Hypotension, headache	Tolerance on continuous use
Isosorbide dinitrate	Start with 1 mg/h, increase up to 10 mg/h	Hypotension, headache	Tolerance on continuous use
Nitroprusside	Start with 0.3 µg/kg/min and increase up to 5 µg/kg/min	Hypotension, isocyanate toxicity	Light sensitive
Nesiritide[a]	Bolus 2 µg/kg + infusion 0.01 µg/kg/min	Hypotension	

[a]Not available in many European Society of Cardiology countries.



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Chronic Heart Failure: Diagnosis and Treatment Algorithm

adopted from ESC HF guideline 2012

Algorithm for the diagnosis of Heart Failure with Reduced Ejection Fraction (HF-REF) or left ventricular systolic dysfunction (LVEF<50%)

General Assessment

- Risk factor profile (hypertension etc.)
- Family History
- Recent pregnancy < 1 year

Symptoms

- Shortness of breath - on effort
  - lying flat
  - during the night
- New cough
- Ankle swelling
- Irregular or fast heart beat
- Effort fatigue
- More frequent nocturia

Signs

Signs of congestion:
- raised JVP
- tender hepatomegaly
- peripheral oedema
- ascites

Chest signs:
- inspiratory crackles
- pleural effusion

Signs of heart disease:
- tachycardia
- displaced apex beat
- presence of cardiac murmur
- presence of S3
- cool peripheries

Suspected **Heart Failure / LV Dysfunction** because of signs and symptoms

↓

Assess presence of cardiac disease by ECG, CXR and/or NTproBNP / BNP

→ Normal → HF-REF unlikely

↓ Any abnormalities

Imaging by Echocardiography

→ Normal → HF-REF unlikely

↓ Any abnormalities

Assess aetiology, precipitating factor/s and NYHA functional class

→ Additional diagnostic tests in selected cases → Referral to specialist for e.g. cardiac catheterisation, MRI, endomyocardial biopsy

↓

*Choose **THERAPY***

Holistic Care

- Salt restriction (in hypertensives only)
- Exercise (once stabilised)
- Heart failure management programme
- Avoid : NSAID, glitazones, CCB (except amlodipine, felodipine)
- Palliative care

Pharmacological Management in patients with HF / Reduced ejection fraction

Therapy that reduces:

Mortality	Hospitalisation	Symptoms	Surgical
ACE-I	ARB	Diuretic	Heart transplant
B Blocker	Ivabradine		Valvular intervention
Aldosterone antagonist	Digoxin		LV assist device
Hydralazine + Nitrate			
Biventricular pacing + ICD (CRT-P / CRT-D)			

Precipitating Factors

Mandatory: U & E, Glucose, TSH

Possible: LFT, Ferritin, Calcium, hsTroponin T (Table 6 ESC guidelines)

Special consideration

Hydralazine + Nitrates (Black African patients)

Digoxin (AF, resistant symptomatic heart failure)

Warfarin (AF, LV clot)

Amiodarone (to sustain Sinus Rhythm)

Aldosterone antagonist (Early post-MI heart failure)

ACE-I + ARB if Aldosterone antagonist cannot be used

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www.hefssa.org