Les noves guies d‘ Insuficiència Cardíaca de la ESC-HFA 2016 a debat

Recomanacions a la insuficiència cardíaca aguda

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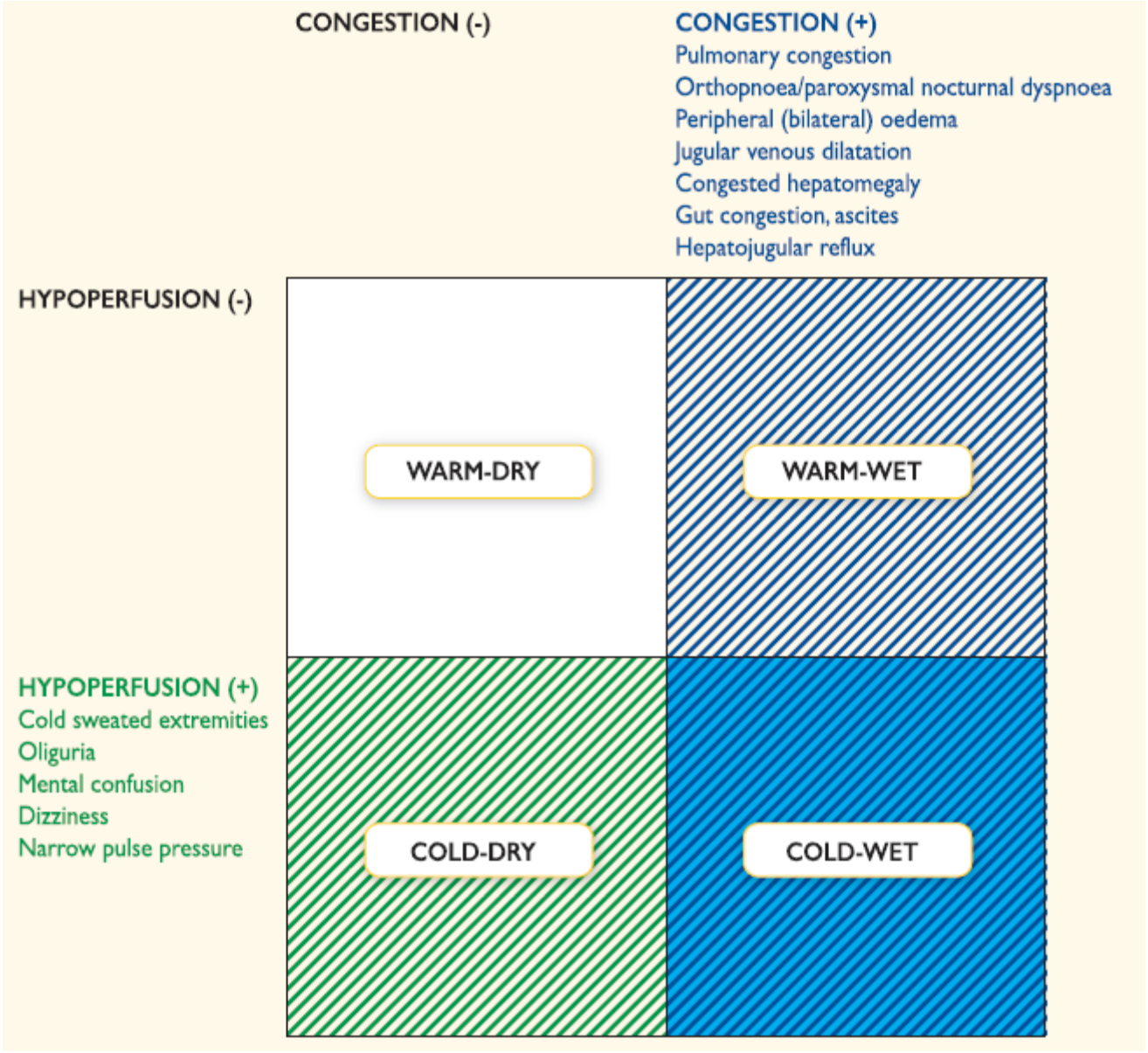
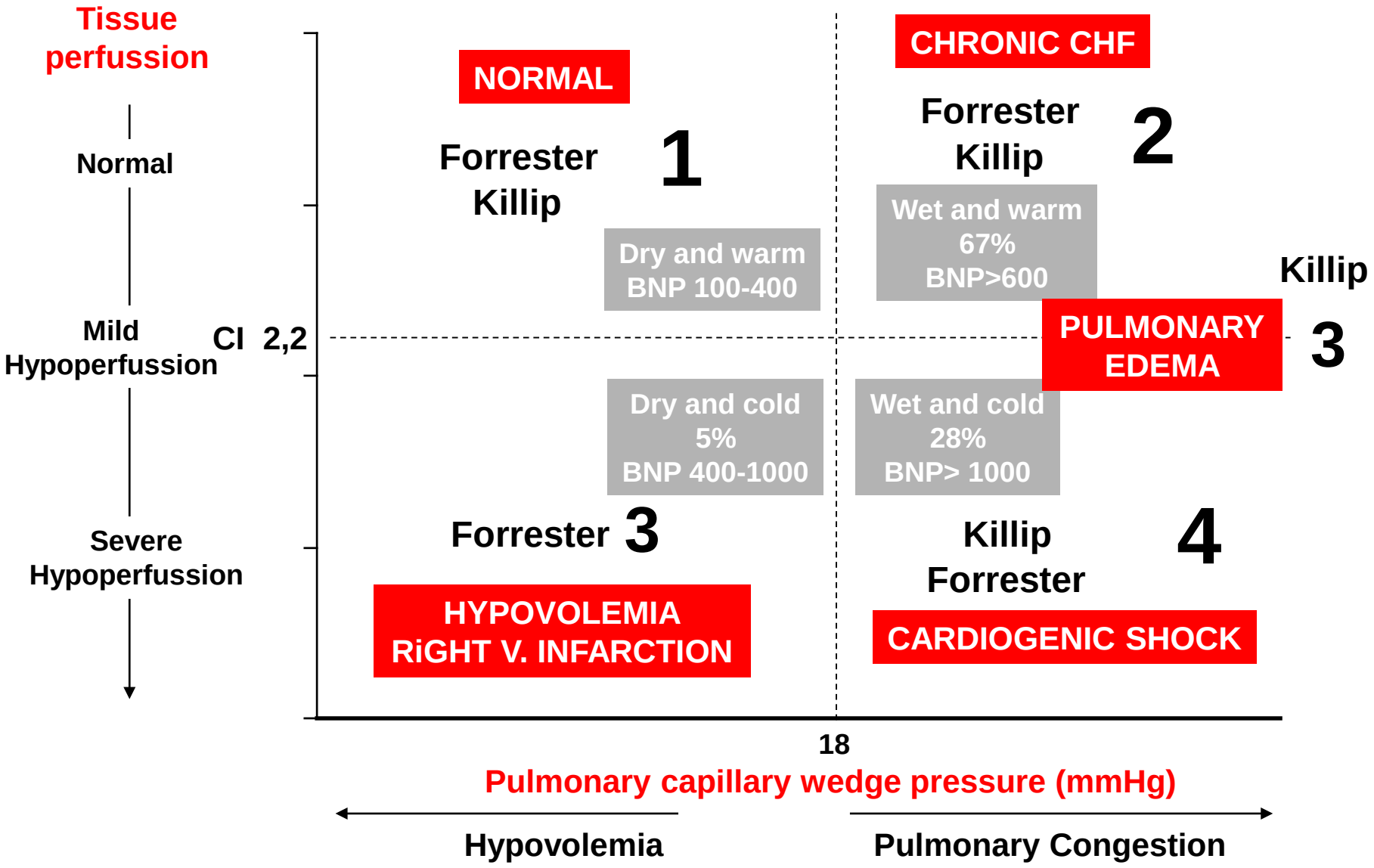
Consorci Sanitari Integral

Table 12.1 Factors triggering acute heart failure

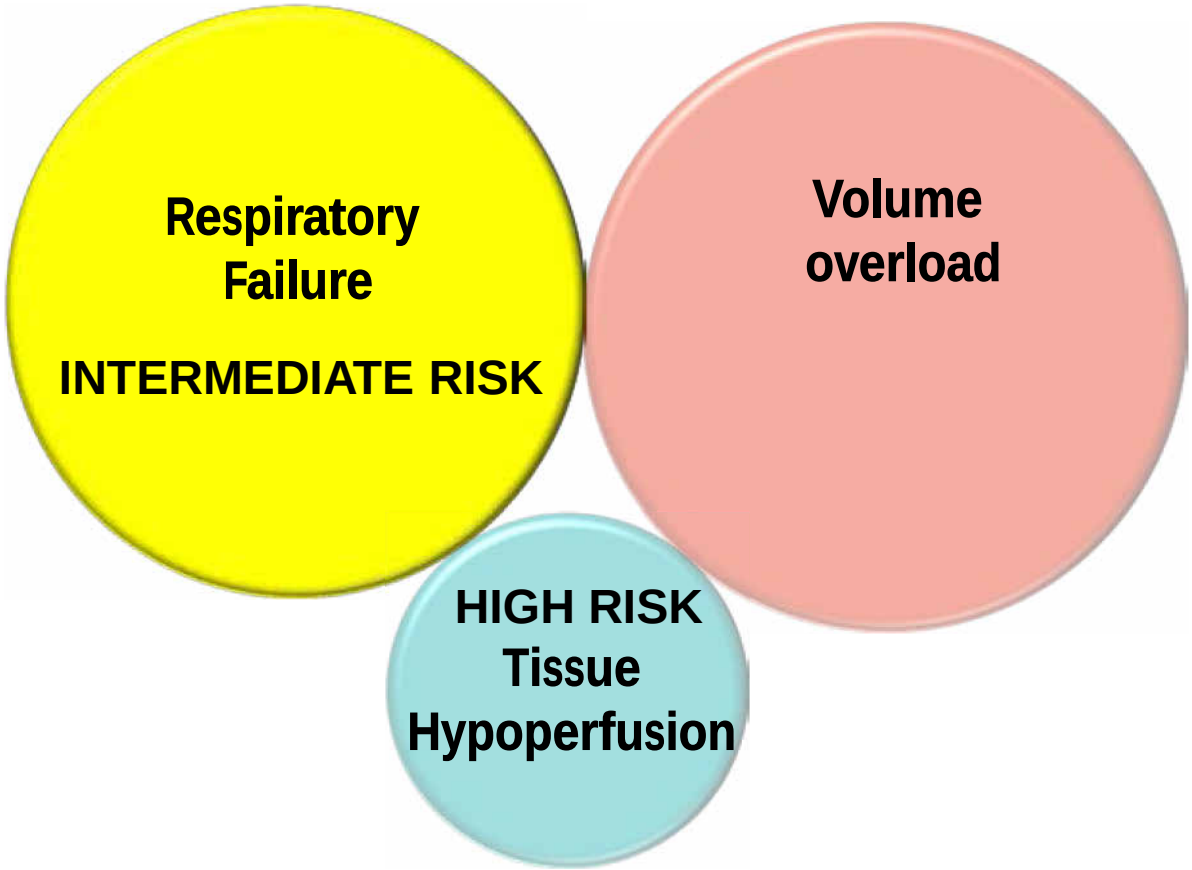
Acute coronary syndrome.
Tachyarrhythmia (e.g. atrial fibrillation, ventricular tachycardia).
Excessive rise in blood pressure.
Infection (e.g. pneumonia, infective endocarditis, sepsis).
Non-adherence with salt/fluid intake or medications.
Bradyarrhythmia.
Toxic substances (alcohol, recreational drugs).
Drugs (e.g. NSAIDs, corticosteroids, negative inotropic substances, cardiotoxic chemotherapeutics).
Exacerbation of chronic obstructive pulmonary disease.
Pulmonary embolism.
Surgery and perioperative complications.
Increased sympathetic drive, stress-related cardiomyopathy.
Metabolic/hormonal derangements (e.g. thyroid dysfunction, diabetic ketosis, adrenal dysfunction, pregnancy and peripartum related abnormalities).
Cerebrovascular insult.
Acute mechanical cause: myocardial rupture complicating ACS (free wall rupture, ventricular septal defect, acute mitral regurgitation), chest trauma or cardiac intervention, acute native or prosthetic valve incompetence secondary to endocarditis, aortic dissection or thrombosis.

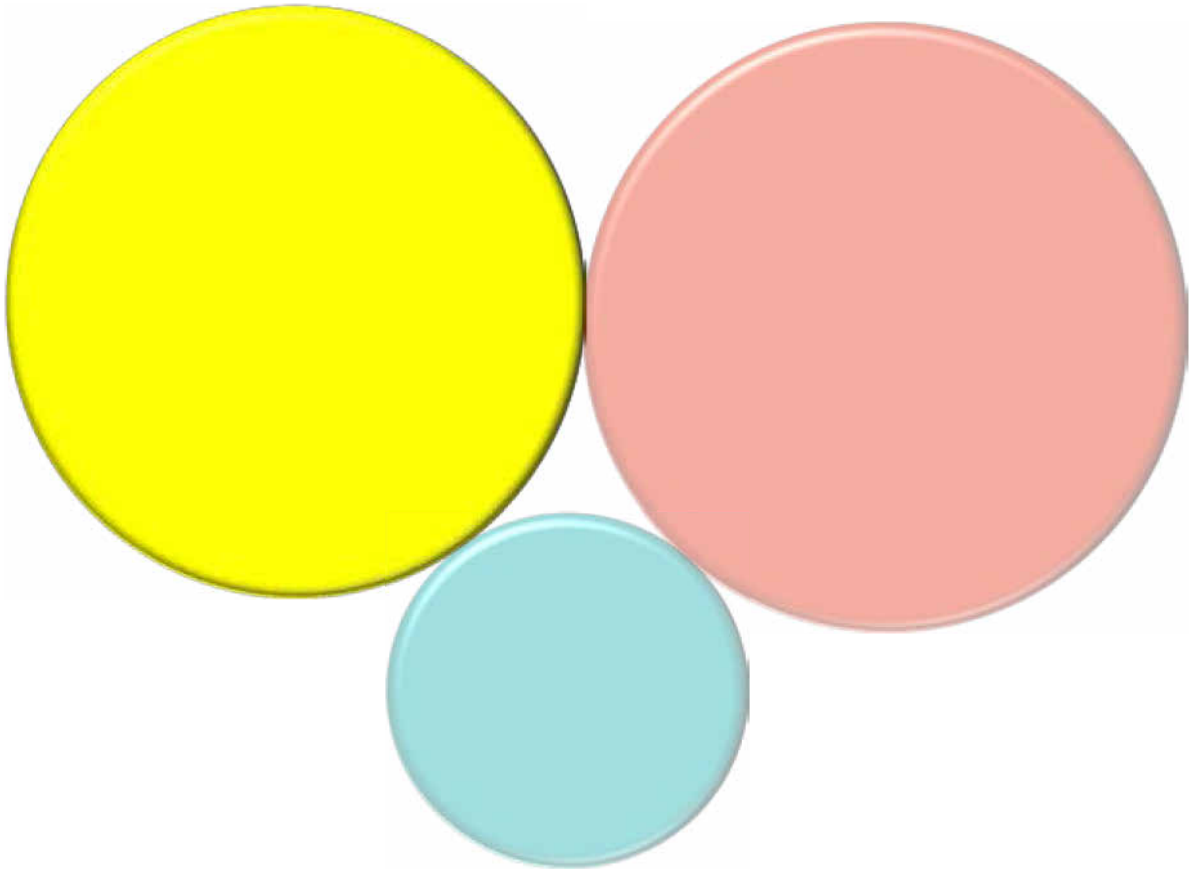

CONGESTION (-)
CONGESTION (+)
Pulmonary congestion
Orthopnoea/paroxysmal nocturnal dyspnoea
Peripheral (bilateral) oedema
Jugular venous dilatation
Congested hepatomegaly
Gut congestion, ascites
Hepatojugular reflux
HYPOPERFUSION (-)
WARM-DRY
WARM-WET
HYPOPERFUSION (+)
Cold sweated extremities
Oliguria
Mental confusion
Dizziness
Narrow pulse pressure
COLD-DRY
COLD-WET

CLINICAL AND FUNCTIONAL CLASSIFICATION

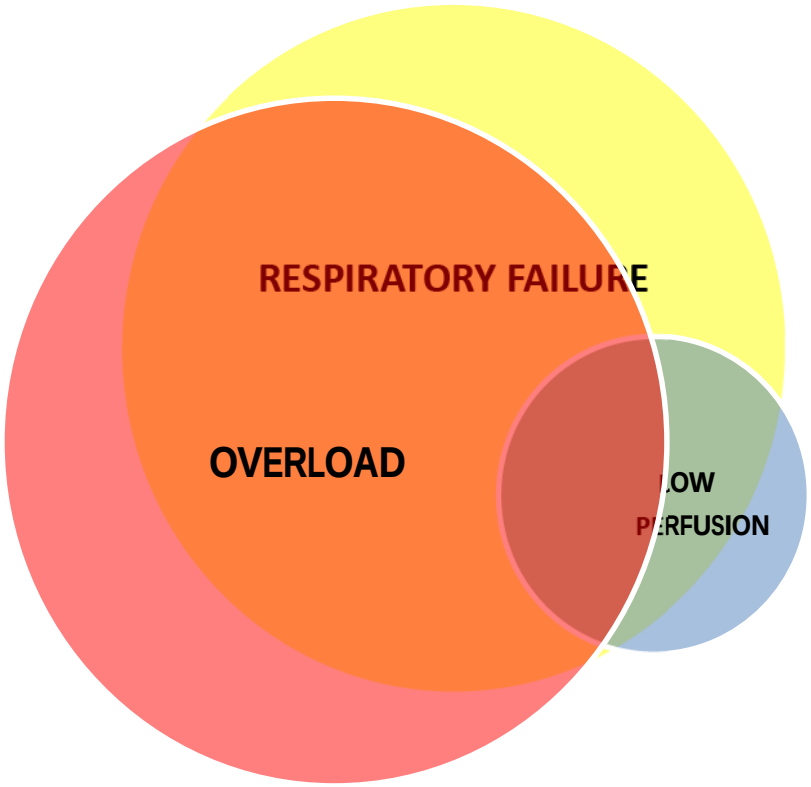


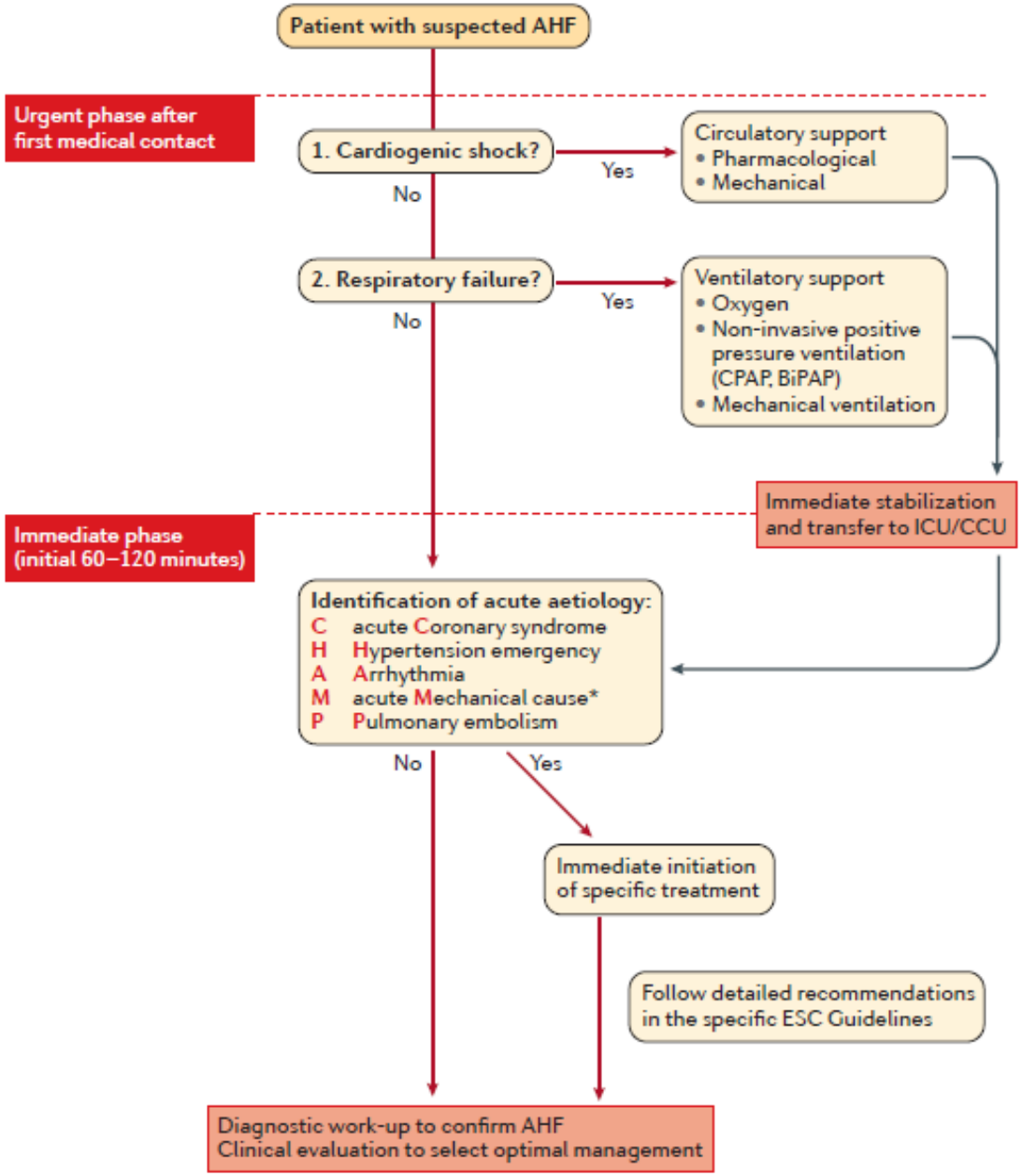
Main alterations in AHF





Main alterations in AHF



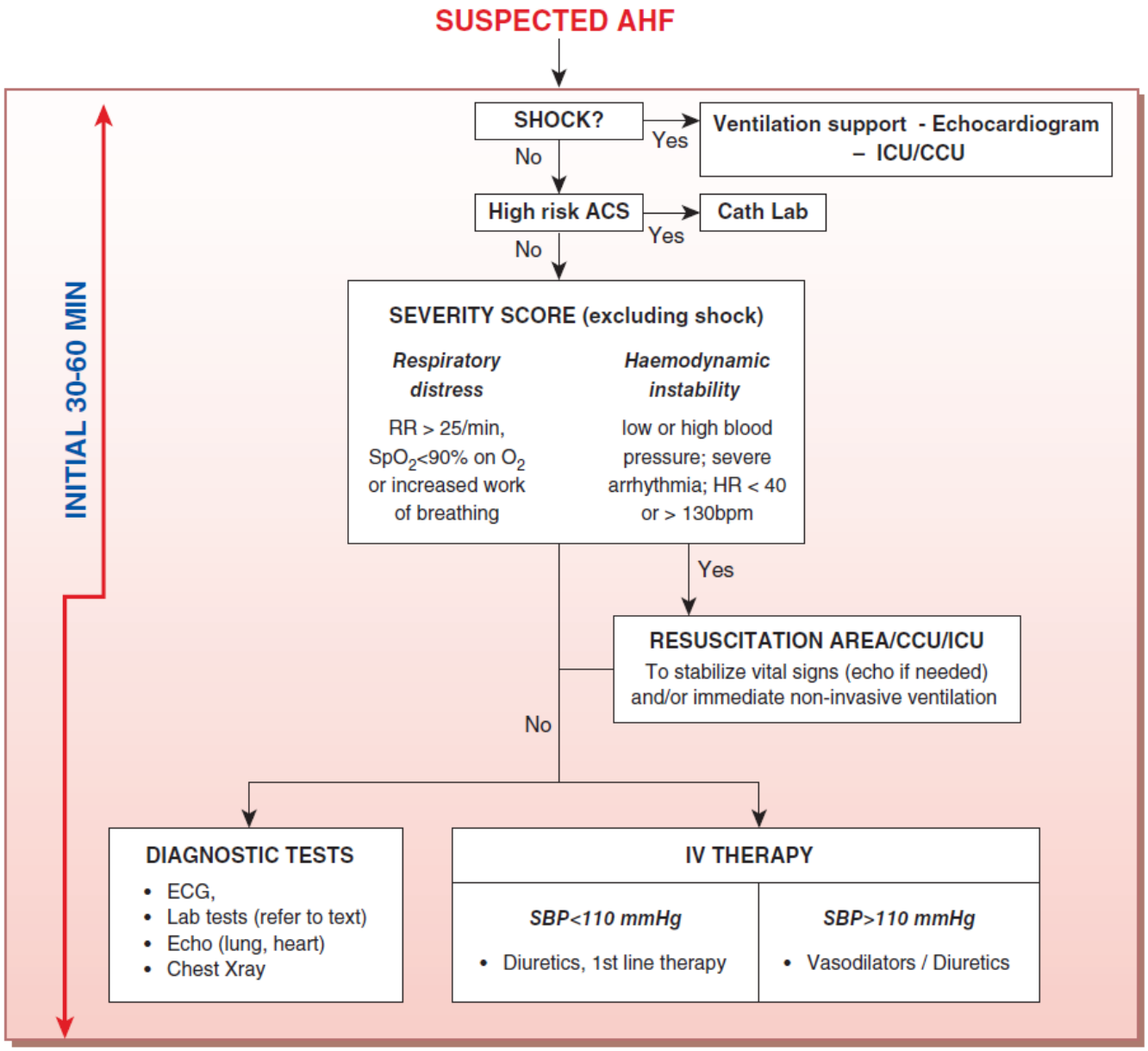

Patient with suspected AHF
Urgent phase after first medical contact
1. Cardiogenic shock?
Yes
Circulatory support
• Pharmacological
• Mechanical
No
2. Respiratory failure?
Yes
Ventilatory support
• Oxygen
• Non-invasive positive pressure ventilation (CPAP, BiPAP)
• Mechanical ventilation
No
Immediate stabilization and transfer to ICU/CCU
Immediate phase (initial 60–120 minutes)
Identification of acute aetiology:
C acute Coronary syndrome
H Hypertension emergency
A Arrhythmia
M acute Mechanical cause*
P Pulmonary embolism
No
Yes
Immediate initiation of specific treatment
Follow detailed recommendations in the specific ESC Guidelines
Diagnostic work-up to confirm AHF
Clinical evaluation to select optimal management

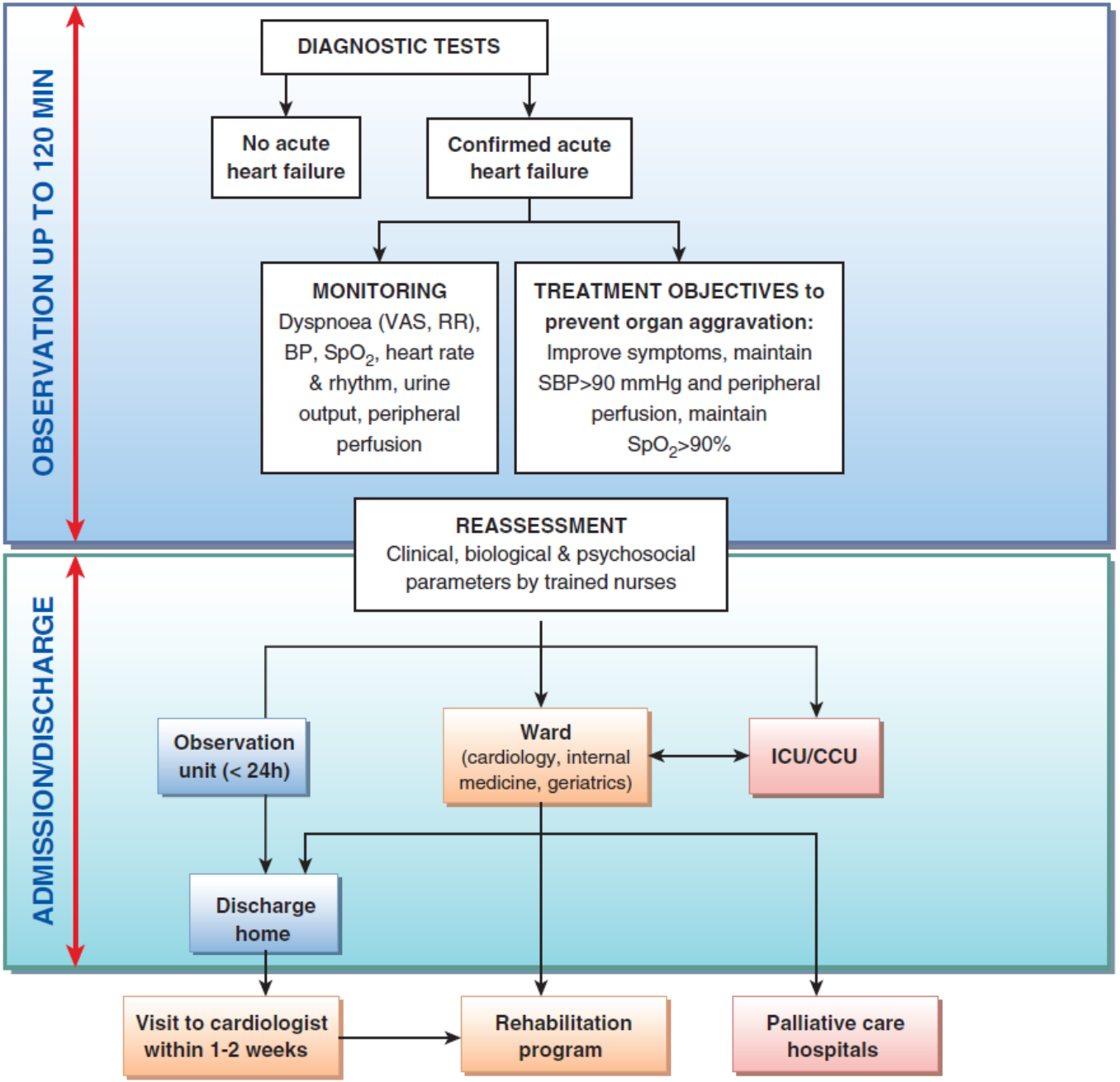
European Heart Journal (2015) **36**, 1958–1966
doi:10.1093/eurheartj/ehv066

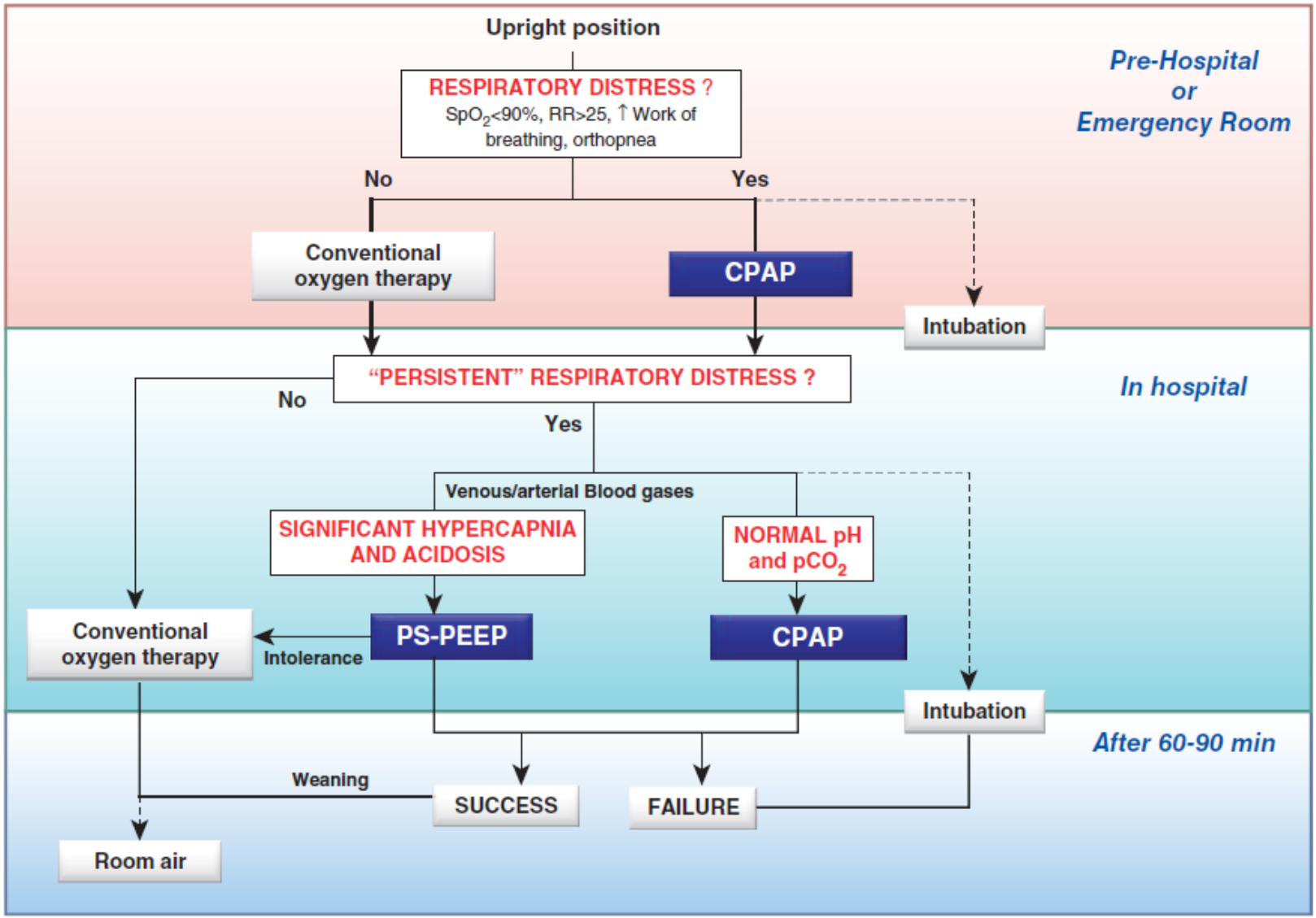
CURRENT OPINION

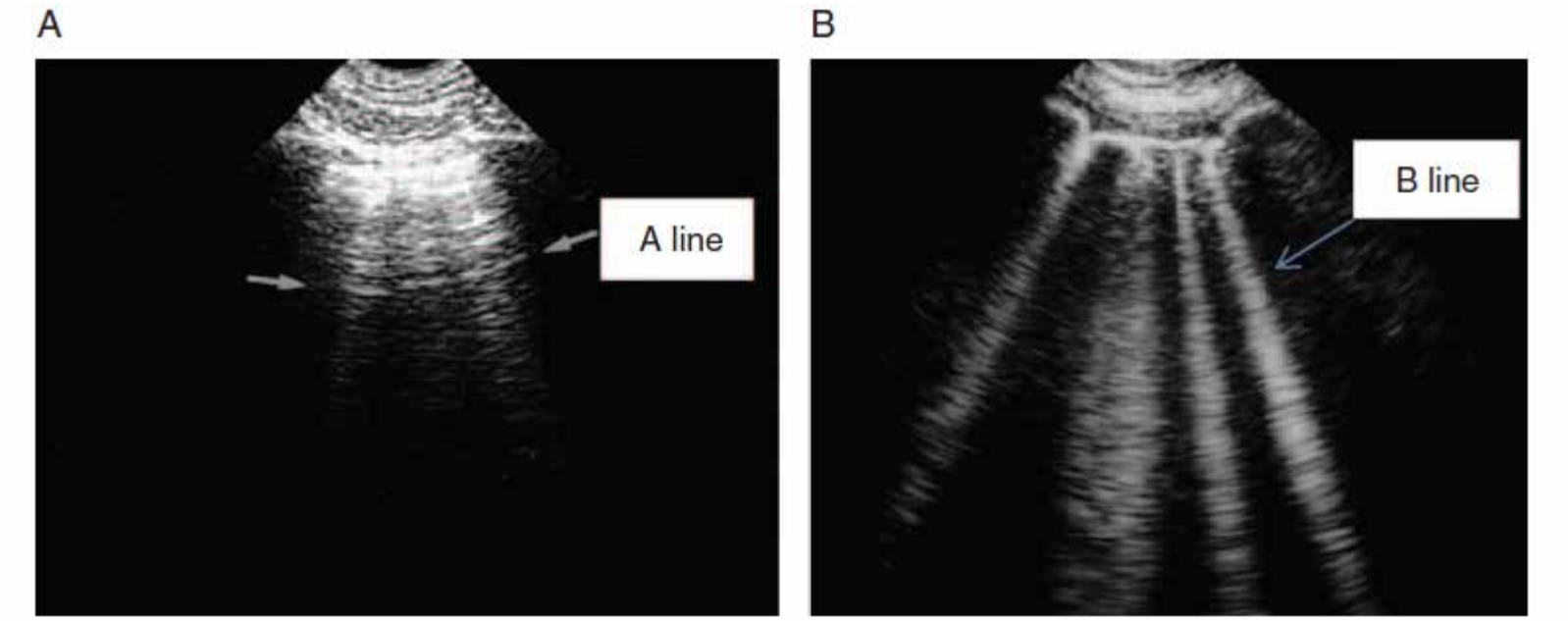
Recommendations on pre-hospital and early hospital management of acute heart failure: a consensus paper from the Heart Failure Association of the European Society of Cardiology, the European Society of Emergency Medicine and the Society of Academic Emergency Medicine – short version

Alexandre Mebazaa[1]*, M. Birhan Yilmaz[2], Phillip Levy[3], Piotr Ponikowski[4], W. Frank Peacock[5], Said Laribi[6], Arsen D. Ristic[7], Ekaterini Lambrinou[8], Josep Masip[9], Jillian P. Riley[10], Theresa McDonagh[11], Christian Mueller[12], Christopher deFilippi[13], Veli-Pekka Harjola[14], Holger Thiele[15], Massimo F. Piepoli[16], Marco Metra[17], Aldo Maggioni[18], John J.V. McMurray[19], Kenneth Dickstein[20], Kevin Damman[21], Petar M. Seferovic[22,23], Frank Ruschitzka[24], Adelino F. Leite-Moreira[25,26], Abdelouahab Bellou[27,28], Stefan D. Anker[29,30], and Gerasimos Filippatos[31]


SUSPECTED AHF
INITIAL 30-60 MIN
SHOCK?
Yes
Ventilation support - Echocardiogram – ICU/CCU
No
High risk ACS
Yes
Cath Lab
No
SEVERITY SCORE (excluding shock)
Respiratory distress
RR > 25/min, SpO2<90% on O2 or increased work of breathing
Haemodynamic instability
low or high blood pressure; severe arrhythmia; HR < 40 or > 130bpm
Yes
RESUSCITATION AREA/CCU/ICU
To stabilize vital signs (echo if needed) and/or immediate non-invasive ventilation
No
DIAGNOSTIC TESTS
ECG,
Lab tests (refer to text)
Echo (lung, heart)
Chest Xray
IV THERAPY
SBP<110 mmHg
Diuretics, 1st line therapy
SBP>110 mmHg
Vasodilators / Diuretics


OBSERVATION UP TO 120 MIN
DIAGNOSTIC TESTS
No acute heart failure
Confirmed acute heart failure
MONITORING
Dyspnoea (VAS, RR), BP, SpO2, heart rate & rhythm, urine output, peripheral perfusion
TREATMENT OBJECTIVES to prevent organ aggravation:
Improve symptoms, maintain SBP>90 mmHg and peripheral perfusion, maintain SpO2>90%
REASSESSMENT
Clinical, biological & psychosocial parameters by trained nurses
ADMISSION/DISCHARGE
Observation unit (< 24h)
Ward
(cardiology, internal medicine, geriatrics)
ICU/CCU
Discharge home
Visit to cardiologist within 1-2 weeks
Rehabilitation program
Palliative care hospitals


Upright position
RESPIRATORY DISTRESS ?
SpO2<90%, RR>25, ↑ Work of breathing, orthopnea
Pre-Hospital or Emergency Room
No
Yes
Conventional oxygen therapy
CPAP
Intubation
"PERSISTENT" RESPIRATORY DISTRESS ?
In hospital
No
Yes
Venous/arterial Blood gases
SIGNIFICANT HYPERCAPNIA AND ACIDOSIS
NORMAL pH and pCO2
Conventional oxygen therapy
Intolerance
PS-PEEP
CPAP
Intubation
After 60-90 min
Weaning
SUCCESS
FAILURE
Room air


A
A line
B
B line

Chest X-ray

- **Up to 20% of patients with AHF is nearly normal**
- **Supine chest radiographs are of limited value in AHF**
- **To identify alternative non-cardiac diseases**

ECG

- **Is rarely normal in AHF (high negative predictive value)**
- **Helpful in identifying underlying cardiac disease and potential precipitants (rapid AF, ACS)**

Echocardiography

- **<u>Immediate</u> is mandatory only in patients with hemodynamic instability (particularly in CS) and in patients suspected of acute life-threatening structural or functional cardiac abnormalities (mechanical, valvular, aortic dissection).**
- **<u>Early</u> in *de novo AHF or unknown cardiac function* (≤ 48 h)**
- **<u>Pocket-size</u> may be used as an extension of the clinical examination <u>Repeated echocardiography</u> not needed unless relevant deterioration in clinical status**

Bedside thoracic ultrasound

- **For signs of interstitial edema and pleural effusion if the expertise is available**

Pulmonary artery catheter, arterial or central venous line and urinary catheter

- **Are not routinely indicated**

Plasma natriuretic peptide level (BNP, NT-proBNP or MR-proANP)

Upon presentation is recommended in all patients with acute dyspnea and suspected AHF to help in the differentiation of AHF from non-cardiac causes of acute dyspnea

AHF may be disclosed:
BNP <100 pg/mL
NT-proBNP <300 pg/mL
MR-proANP <120 pg/mL

<u>Predischarge</u> may be considered for prognostic evaluation

Table 12.3 Causes of elevated concentrations of natriuretic peptides[522–524]

Cardiac	Heart failure Acute coronary syndromes Pulmonary embolism Myocarditis Left ventricular hypertrophy Hypertrophic or restrictive cardiomyopathy Valvular heart disease Congenital heart disease Atrial and ventricular tachyarrhythmias Heart contusion Cardioversion, ICD shock Surgical procedures involving the heart Pulmonary hypertension
Non-cardiac	Advanced age Ischaemic stroke Subarachnoid haemorrhage Renal dysfunction Liver dysfunction (mainly liver cirrhosis with ascites) Paraneoplastic syndrome Chronic obstructive pulmonary disease Severe infections (including pneumonia and sepsis) Severe burns Anaemia Severe metabolic and hormone abnormalities (e.g. thyrotoxicosis, diabetic ketosis)

Other laboratory tests at presentation

Cardiac troponins, BUN (or urea), creatinine, electrolytes (sodium, potassium), glucose, complete blood count, liver function tests and TSH

D-dimer in suspicion of acute pulmonary embolism

Cardiac troponins are elevated in the vast majority of patients with AHF, often without obvious myocardial ischaemia or an acute coronary event, suggesting ongoing myocyte injury or necrosis. Also in acute pulmonary embolism is useful for risk stratification and decision-making

Routine **arterial blood gas** is not needed. Restricted when SpO_2 is not reliable
Venous blood gases might acceptably indicate pH and CO_2

Renal function and electrolytes every 1–2 days or even more frequently

Procalcitonin levels may be considered in patients with AHF with suspected coexisting infection, particularly for the differential diagnosis of pneumonia and to guide antibiotic therapy.

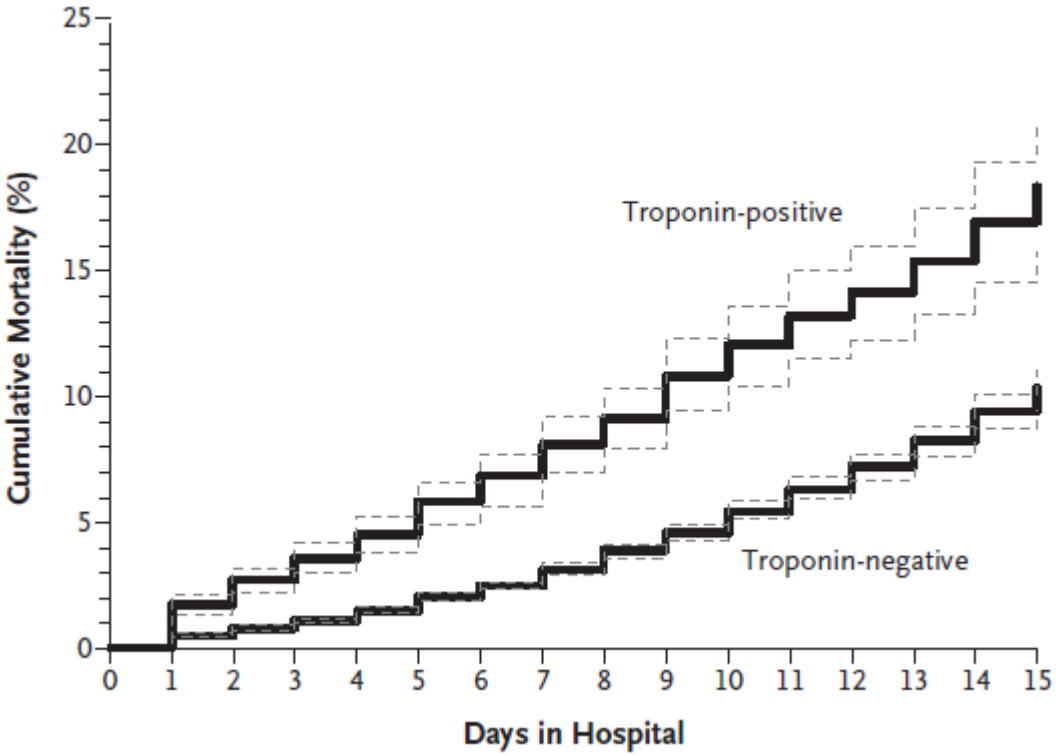
Liver function tests (reduced CO and/or increased CVP). Identify patients of poor prognosis

TSH should be assessed in newly diagnosed (hypothyroidism and hyperthyroidism may precipitate AHF)

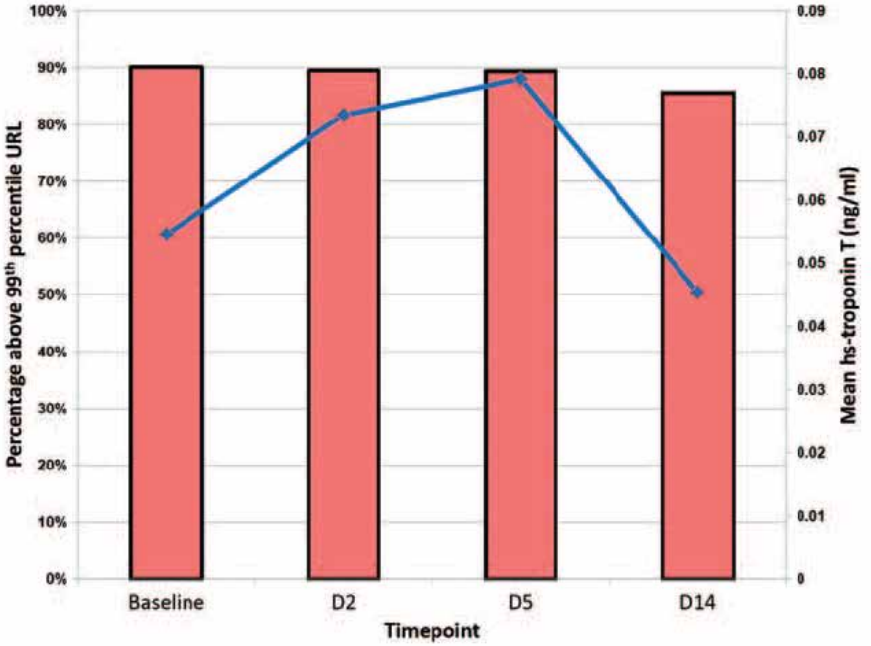
Other **biomarkers** have been investigated for their diagnostic and prognostic value in AHF, but none has reached the stage of being recommended for routine clinical use

ADHERE Registry :
4240 out of 67920 patients (6.2%) were Troponin+

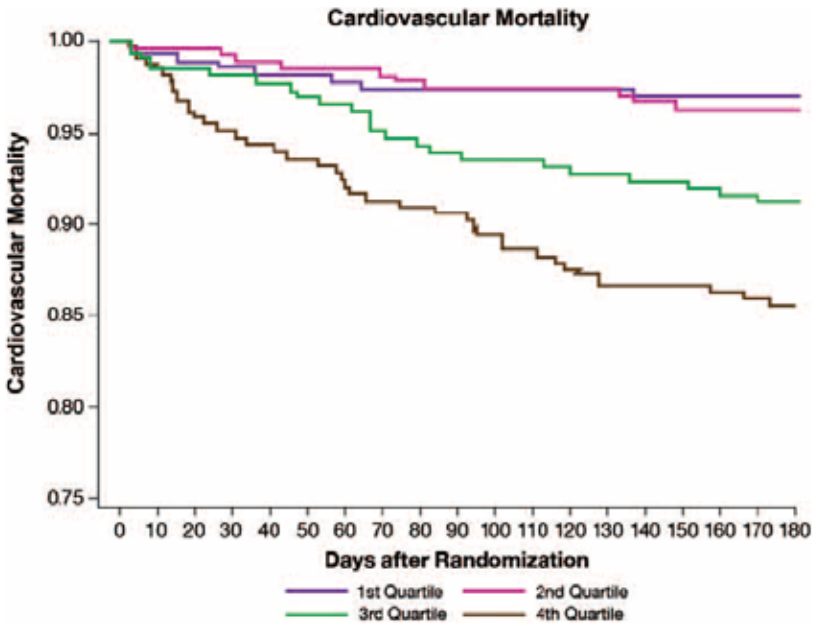
Patients Troponin +: lower SBP on admission,
lower LVEF
Higher in-hospital mortality (8.0% vs. 2.7%, P<0.001)



Peacock WF. NEJM 2008



Mean hs-cTnT values



Baseline high-sensitivity cardiac troponin T

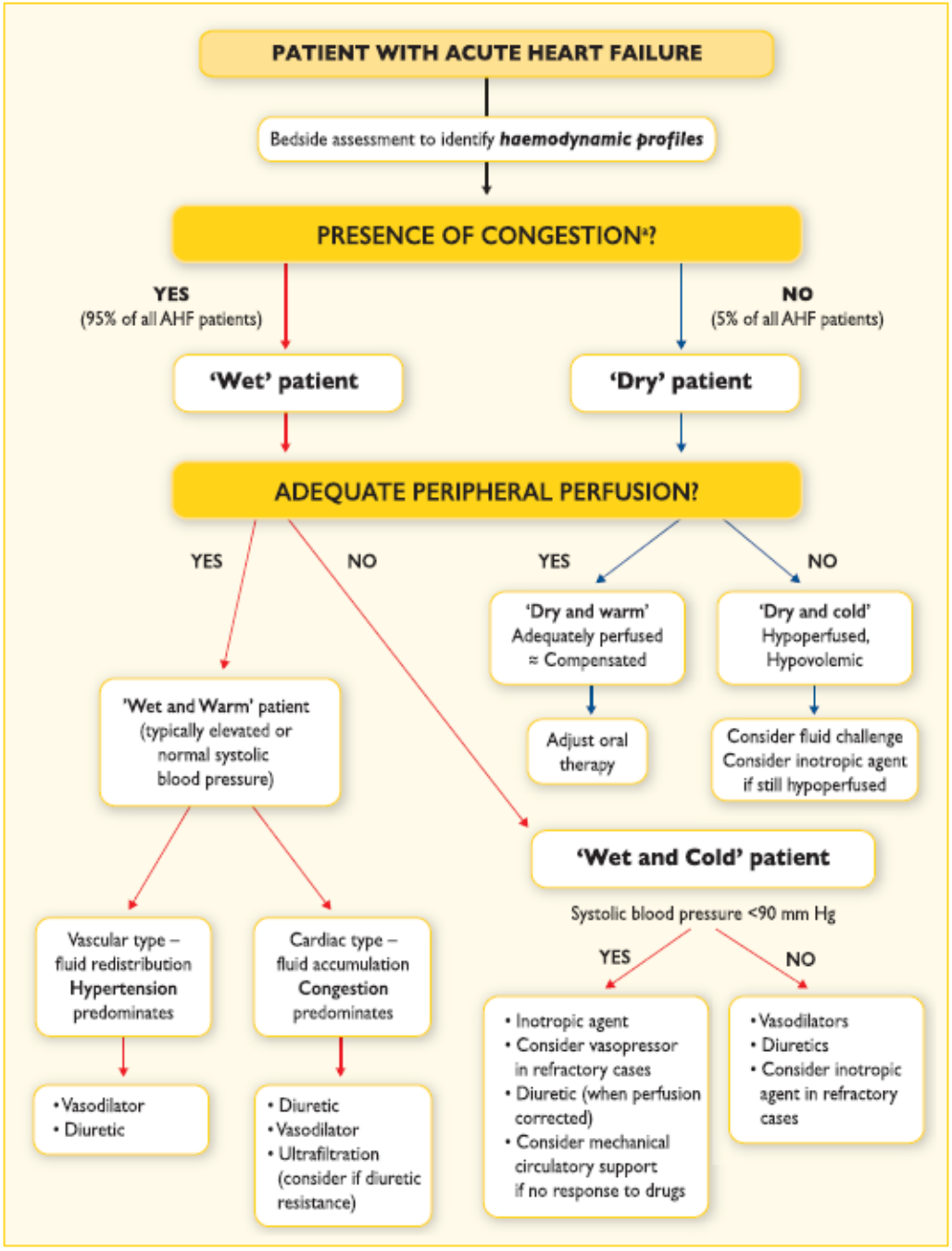
Felker M. Eur J Heart Fail 2015

Recommendations regarding monitoring of clinical status of patients hospitalized due to acute heart failure

Recommendations	Class [a]	Level [b]
Standard non-invasive monitoring of heart rate, rhythm, respiratory rate, oxygen saturation and blood pressure is recommended.	I	C
It is recommended that patients should be weighed daily and have an accurate fluid balance chart completed.	I	C
It is recommended to evaluate signs and symptoms relevant to HF (e.g. dyspnoea, pulmonary rales, peripheral oedema, weight) daily to assess correction of fluid overload.	I	C
Frequent, often daily,measurement of renal function (blood urea, creatinine) and electrolytes (potassium, sodium) during i.v. therapy and when renin-angiotensin-aldosterone system antagonists are initiated is recommended.	I	C
Intra-arterial line should be considered in patients with hypotension and persistent symptoms despite treatment.	IIa	C
Pulmonary artery catheter may be considered in patients who, despite pharmacological treatment present refractory symptoms (particularly with hypotension and hypoperfusion).	IIb	C

Recommendations for the management of patients with acute heart failure: oxygen therapy and ventilatory support

Recommendations	Class [a]	Level [b]	Ref [c]
Monitoring of transcutaneous arterial oxygen saturation (SpO_2) is recommended.	I	C	
Measurement of blood pH and carbon dioxide tension (possibly including lactate) should be considered, especially in patients with acute pulmonary oedema or previous history of COPD using venous blood. In patients with cardiogenic shock arterial blood is preferable.	IIa	C	
Oxygen therapy is recommended in patients with AHF and SpO_2 <90% or PaO_2 <60 mmHg (8.0 kPa) to correct hypoxaemia.	I	C	
Non-invasive positive pressure ventilation (CPAP, BiPAP) should be considered in patients with respiratory distress (respiratory rate >25 breaths/min, SpO_2 <90%) and started as soon as possible in order to decrease respiratory distress and reduce the rate of mechanical endotracheal intubation. Non-invasive positive pressure ventilation can reduce blood pressure and should be used with caution in hypotensive patients. Blood pressure should be monitored regularly when this treatment is used.	IIa	B	541–545
Intubation is recommended, if respiratory failure, leading to hypoxaemia (PaO_2 <60 mmHg (8.0 kPa)), hypercapnia ($PaCO_2$ >50 mmHg (6.65 kPa)) and acidosis (pH <7.35), cannot be managed non-invasively.	I	C	


PATIENT WITH ACUTE HEART FAILURE
Bedside assessment to identify haemodynamic profiles
PRESENCE OF CONGESTION*?
YES
(95% of all AHF patients)
NO
(5% of all AHF patients)
'Wet' patient
'Dry' patient
ADEQUATE PERIPHERAL PERFUSION?
YES
NO
YES
NO
'Dry and warm'
Adequately perfused
≈ Compensated
'Dry and cold'
Hypoperfused,
Hypovolemic
Adjust oral therapy
Consider fluid challenge
Consider inotropic agent if still hypoperfused
'Wet and Warm' patient
(typically elevated or normal systolic blood pressure)
'Wet and Cold' patient
Systolic blood pressure <90 mm Hg
YES
NO
Vascular type – fluid redistribution
Hypertension predominates
Cardiac type – fluid accumulation
Congestion predominates
• Vasodilator
• Diuretic
• Diuretic
• Vasodilator
• Ultrafiltration (consider if diuretic resistance)
• Inotropic agent
• Consider vasopressor in refractory cases
• Diuretic (when perfusion corrected)
• Consider mechanical circulatory support if no response to drugs
• Vasodilators
• Diuretics
• Consider inotropic agent in refractory cases

Diuretics		
Intravenous loop diuretics are recommended for all patients with AHF admitted with signs/symptoms of fluid overload to improve symptoms. It is recommended to regularly monitor symptoms, urine output, renal function and electrolytes during use of i.v. diuretics.	I	C
In patients with new-onset AHF or those with chronic, decompensated HF not receiving oral diuretics the initial recommended dose should be 20–40 mg i.v. furosemide (or equivalent); for those on chronic diuretic therapy, initial i.v. dose should be at least equivalent to oral dose.	I	B
It is recommended to give diuretics either as intermittent boluses or as a continuous infusion, and the dose and duration should be adjusted according to patients' symptoms and clinical status.	I	B
Combination of loop diuretic with either thiazide-type diuretic or spironolactone may be considered in patients with resistant oedema or insufficient symptomatic response.	IIb	C

AHF with hypoperfusion, diuretics should be avoided before adequate perfusion is attained

Combination requires careful monitoring to avoid hypokalaemia, renal dysfunction and hypovolemia.

Optimal dosing, timing and method of delivery is unclear. In the 'high-dose' arm of the DOSE study, administration of furosemide at 2.5 times the previous oral dose resulted in greater improvement in dyspnea, larger weight change and fluid loss at the cost of transient worsening in renal function. The dose should be the smallest to provide adequate clinical effect.

A bolus of 10–20 mg i.v. torasemide may be considered as an alternative.

Vasodilators		
i.v. vasodilators should be considered for symptomatic relief in AHF with SBP >90 mmHg (and without symptomatic hypotension). Symptoms and blood pressure should be monitored frequently during administration of i.v. vasodilators.	IIa	B
In patients with hypertensive AHF, i.v. vasodilators should be considered as initial therapy to improve symptoms and reduce congestion.	IIa	B

Intravenous vasodilators are the second most often used agents in AHF for symptomatic relief; however, there is no robust evidence confirming their beneficial effects

Are especially useful in patients with hypertensive AHF, whereas in those with SBP<90 mmHg (or with symptomatic hypotension) should be avoided

Dosing should be carefully controlled to avoid excessive decreases in BP, which is related to poor outcome

Vasodilators should be used with caution in patients with significant mitral or aortic stenosis

Inotropic agents – dobutamine, dopamine, levosimendan, phosphodiesterase III (PDE III) inhibitors		
Short-term, i.v. infusion of inotropic agents may be considered in patients with hypotension (SBP <90 mmHg) and/or signs/symptoms of hypoperfusion despite adequate filling status, to increase cardiac output, increase blood pressure, improve peripheral perfusion and maintain end-organ function.	IIb	C
An intravenous infusion of levosimendan or a PDE III inhibitor may be considered to reverse the effect of beta-blockade if beta-blockade is thought to be contributing to hypotension with subsequent hypoperfusion.	IIb	C
Inotropic agents are not recommended unless the patient is symptomatically hypotensive or hypoperfused because of safety concern.	III	A

Inotropes should be reserved for cases with severe CO reduction, compromising vital organs, mainly in hypotensive-AHF (excluding hypovolemia or other reversible causes)

Levosimendan is preferable over dobutamine to reverse the effect of betablockade if beta-blockade is thought to be contributing to hypoperfusion. In patients with hypotension (SBP <85 mmHg) or cardiogenic shock, in combination with other inotropes or vasopressors

ECG monitoring is required for administering inotropes, because they can cause tachycardia, ischemia and arrhythmias, and may increase mortality. In any case, inotropes have to be used with caution starting from rather low doses and up-titrating with close monitoring

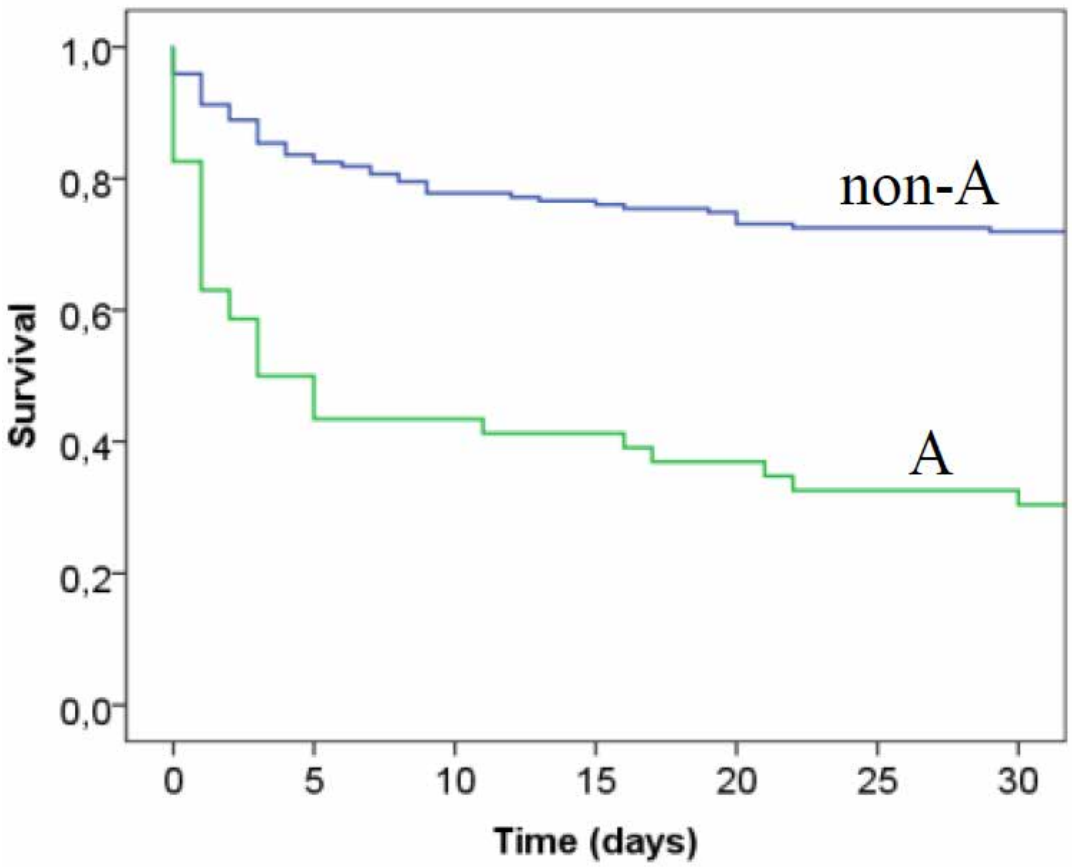
Vasopressors		
A vasopressor (norepinephrine preferably) may be considered in patients who have cardiogenic shock, despite treatment with another inotrope, to increase blood pressure and vital organ perfusion.	IIb	B
It is recommended to monitor ECG and blood pressure when using inotropic agents and vasopressors, as they can cause arrhythmia, myocardial ischaemia, and in the case of levosimendan and PDE III inhibitors also hypotension.	I	C
In such cases intra-arterial blood pressure measurement may be considered.	IIb	C

These agents are given to raise BP and redistribute blood to the vital organs. However, this is at the expense of an increase in LV afterload.

Dopamine was compared with norepinephrine in the treatment of various shock patients. A subgroup analysis suggested that norepinephrine would have fewer side effects and lower mortality.

Epinephrine (adrenaline) should be restricted to patients with persistent hypotension despite adequate cardiac filling pressures and the use of other vasoactive agents, as well as for resuscitation protocols.

ADRENALINE
was independently associated with mortality



Adjusted for center and gender

The association remained after Propensity score analysis

OR 4.3 (1.5-12.6) p<0.0507

Harjola VP. Eur Heart J 2015

Thrombo-embolism prophylaxis		
Thrombo-embolism prophylaxis (e.g. with LMWH) is recommended in patients not already anticoagulated and with no contra-indication to anticoagulation, to reduce the risk of deep venous thrombosis and pulmonary embolism.	I	B
Other drugs		
For acute control of the ventricular rate In patients with atrial fibrillation:		
a. digoxin and/or beta-blockers should be considered as the first-line therapy.[d]	IIa	C
b. amiodarone may be considered.	IIb	B
Opiates may be considered for cautious use to relieve dyspnoea and anxiety in patients with severe dyspnoea but nausea and hypopnea may occur.	IIb	B

Digoxin is mostly indicated in AF and FC>110 bpm. However, in patients with co-morbidities or other drugs affecting digoxin metabolism and/or the elderly, the maintenance dose may be based on the measurements of digoxin concentration in peripheral blood

Tolvaptan may be used to treat patients with volume overload and resistant hyponatremia (thirst and dehydration are recognized adverse effects).

Routine use of opiates is not recommended and they may only be cautiously considered in patients with severe dyspnea, mostly with pulmonary edema. Dose-dependent side effects include nausea, hypotension, bradycardia and respiratory depression.
There are controversies regarding the potentially elevated mortality risk in patients receiving morphine.

Anxiolytics or sedatives may be needed in a patient with agitation or delirium. Cautious use of benzodiazepines (diazepam or lorazepam) may be the safest approach.

Recommendations regarding oral evidence-based disease-modifying therapies in patients with acute heart failure

Recommendations	Class [a]	Level [b]
In case of worsening of chronic HFrEF, every attempt should be made to continue evidence-based, disease-modifying therapies, in the absence of haemodynamic instability or contra-indications.	I	C
In the case of de *novo* HFrEF, every attempt should be made to initiate these therapies after haemodynamic stabilization.	I	C

Recommendations	Class [a]	Level [b]
Ultrafiltration may be considered for patients with refractory congestion, who failed to respond to diuretic-based strategies.	IIb	B
Renal replacement therapy should be considered in patients with refractory volume overload and acute kidney injury.	IIa	C

Routine use of ultrafiltration is not recommended and should be confined to patients who fail to respond to diuretic based strategies.

The following criteria may indicate the need for initiation of renal replacement therapy in patients with refractory volume overload:

- **oliguria unresponsive to fluid resuscitation measures**
- **severe hyperkalaemia (K>6.5 mmol/L)**
- **severe acidaemia (pH <7.2)**
- **serum urea level >25 mmol/L (150 mg/dL)**
- **serum creatinine >300 mmol/L (>3.4 mg/dL)**

Recommendations regarding management of patients with cardiogenic shock

Recommendations	Class [a]	Level [b]
In all patients with suspected cardiogenic shock, immediate ECG and echocardiography are recommended.	I	C
All patients with cardiogenic shock should be rapidly transferred to a tertiary care center which has a 24/7 service of cardiac catheterization, and a dedicated ICU/CCU with availability of short-term mechanical circulatory support.	I	C
In patients with cardiogenic shock complicating ACS an immediate coronary angiography is recommended (within 2 hours from hospital admission) with an intent to perform coronary revascularization.	I	C
Continous ECG and blood pressure monitoring are recommended.	I	C
Invasive monitoring with an arterial line is recommended.	I	C
Fluid challenge (saline or Ringer's lactate, >200 ml/15–30 min) is recommended as the first-line treatment if there is no sign of overt fluid overload.	I	C
Intravenous inotropic agents (dobutamine) may be considered to increase cardiac output.	IIb	C
Vasopressors (norepinephrine preferable over dopamine) may be considered if there is a need to maintain SBP in the presence of persistent hypoperfusion.	IIb	B
IABP is not routinely recommended in cardiogenic shock.	III	B
Short-term mechanical circulatory support may be considered in refractory cardiogenic shock depending on patient age, comorbidities and neurological function.	IIb	C

Intensive Care Med (2016) 42:147–163
DOI 10.1007/s00134-015-4041-5

REVIEW

A. Mebazaa
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C. Mueller
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M. Richards
N. Sato
K. Sliwa
J. Spinar
H. Thiele
M. B. Yilmaz
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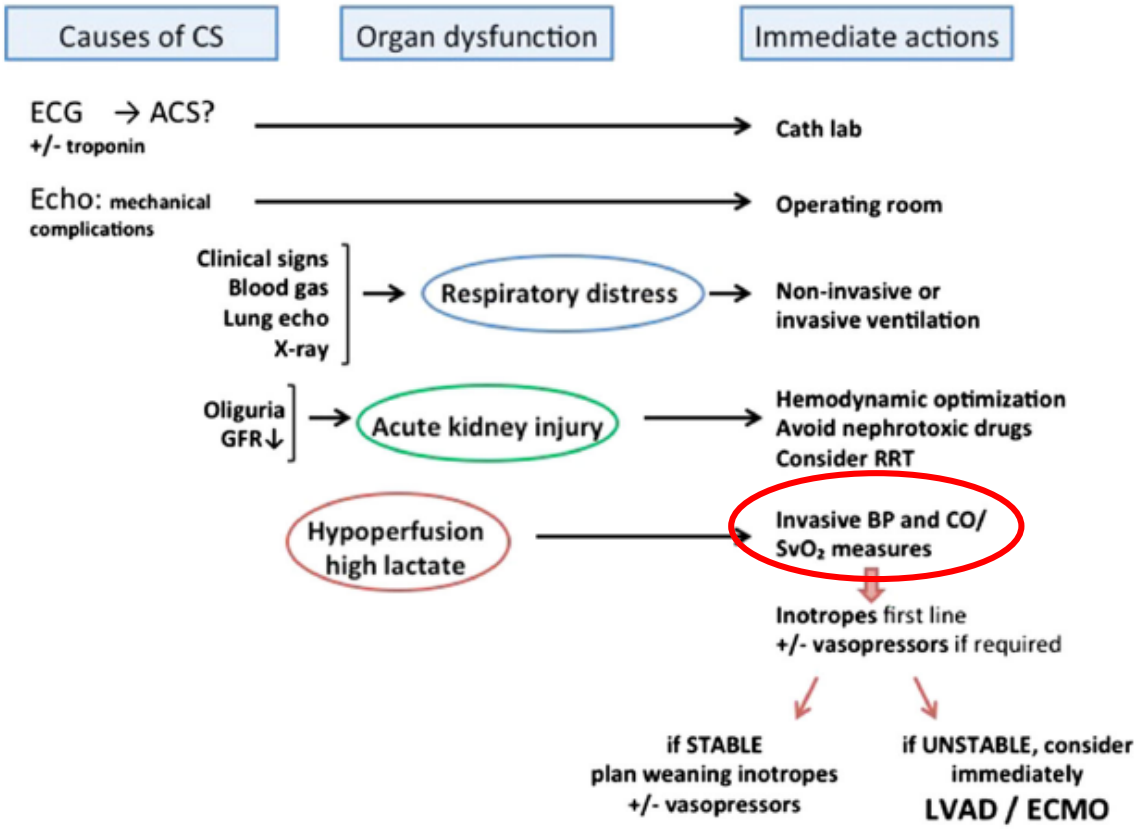
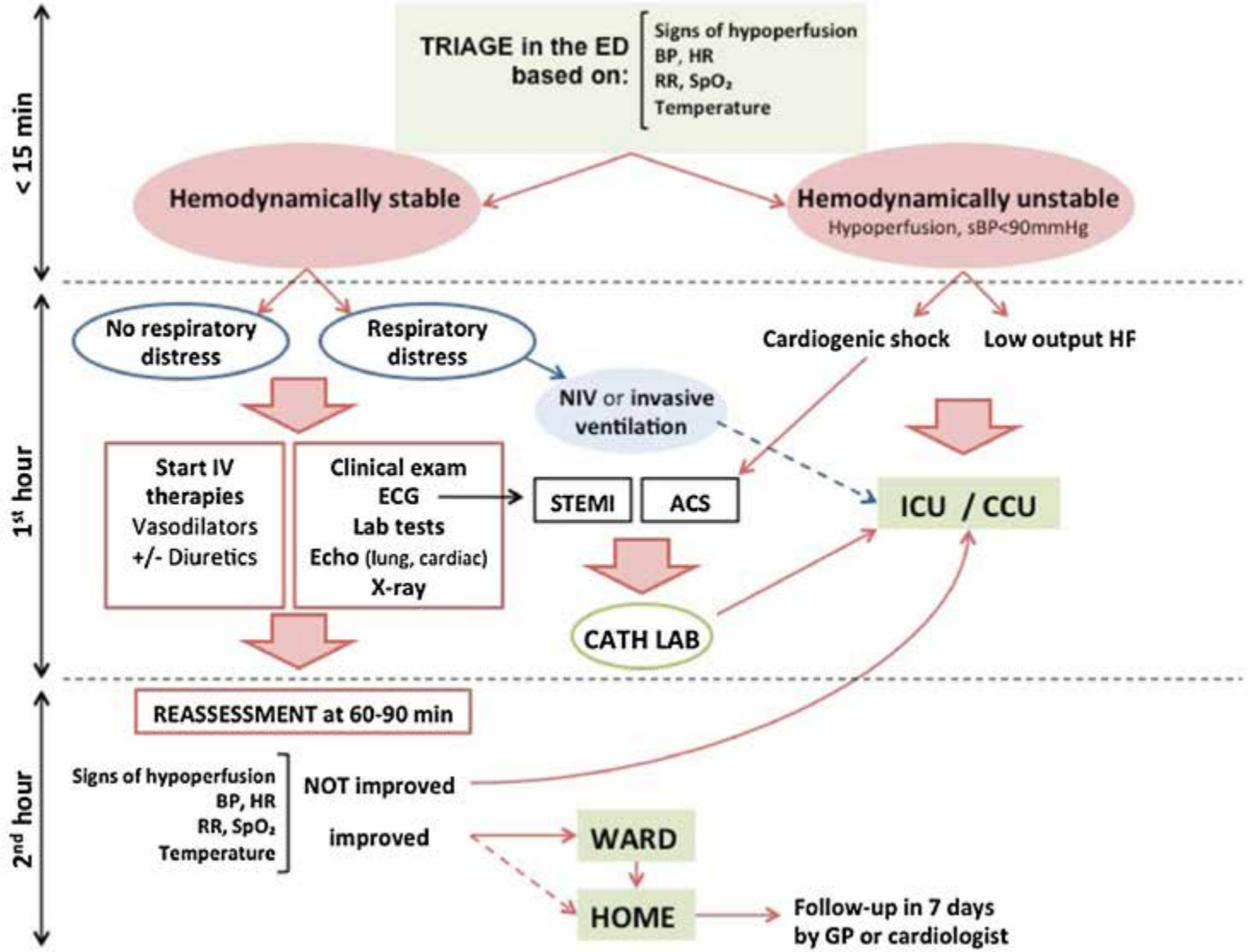
Acute heart failure and cardiogenic shock: a multidisciplinary practical guidance



AHF



Mebazaa A. Int Care Med 2016

Table 12.6 Goals of treatment in acute heart failure

Immediate (ED/ICU/CCU)
Improve haemodynamics and organ perfusion.
Restore oxygenation.
Alleviate symptoms.
Limit cardiac and renal damage.
Prevent thrombo-embolism.
Minimize ICU length of stay.
Intermediate (in hospital)
Identify aetiology and relevant co-morbidities.
Titrate therapy to control symptoms and congestion and optimize blood pressure.
Initiate and up-titrate disease-modifying pharmacological therapy.
Consider device therapy in appropriate patients.
Pre-discharge and long-term management
Develop a careplan that provides: o A schedule for up-titration and monitoring of pharmacological therapy. o Need and timing for review for device therapy. o Who will see the patient for follow-up and when.
Enrol in disease management programme, educate, and initiate appropriate lifestyle adjustments.
Prevent early readmission.
Improve symptoms, quality of life, and survival.

Multidisciplinary team management

- **Organization of care: Community - Hospital services**
  Rehabilitation - Palliative care
- **Discharge planning**
- **Lifestyle advice**
- **Exercise training**

<u>Structured follow-up</u>:

- **Patient education**
- **Optimization of medical treatment**
- **Psychosocial support**
- **Improved access to care**
- **Older, frailty, cognitive impairment**
- **Palliative and end-of-life care**

International Journal of Cardiology

Volume 222, 1 November 2016, Pages 62–71

Review

Practical approach on frail older patients attended for acute heart failure

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European Heart Journal Acute Cardiovascular Care

Clinical Practice/Education

European Society of Cardiology – Acute Cardiovascular Care Association position paper on safe discharge of acute heart failure patients from the emergency department

European Heart Journal: Acute Cardiovascular Care 1–10

DOI: 10.1177/2048872616633853
acc.sagepub.com
SAGE

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Gaps in knowledge

6. Acute heart failure

- Prospective evaluation of the 'time-to-treatment' concept in AHF
- Evaluation of whether inadequate phenotyping is responsible for the failure of treatments to improve outcome in AHF
- Better definition and treatment of diuretic resistance
- Role of nitrates in the management of AHF
- Treatments improving mortality and morbidity
- Strategies and therapies to prevent early rehospitalization after discharge for a hospital admission for AHF.

Punts forts de les guies de ICA

- **Pèptids natriurètics i troponina**
- **CHAMP approach**
- **Timing i indicació de l'ecocardiograma**
- **Estratègies per iniciar ràpidament el tractament**
- **Criteris d'ubicació de pacients (UCI, sala, Urgències)**
- **Trasllat de pacients en shock**
- **Valoració de l'assistència ventricular**
- **Enfoc multidisciplinar del maneig i implicació de diferents àmbits a l'alta**

Punts dèbils de les guies de ICA

- **Classificació basada en IC crònica avançada (Nohria) que no cobreix tots els supòsits (insuficiència respiratòria)**
- **Desaparició dels fenotips de prèvies guies (EAP, IVD, ICCD entre altres)**
- **No aborda la IC dreta**
- **Enfoc marcadament esbiaixat sota el prisma del cardiòleg (No d'Urgències)**
- **Recomana TSH a urgències**
- **No presenta punts de tall diagnòstics de ICA de BNP o NT-ProBNP**
- **No aborda la monitorització hemodinàmica per ECO**
- **No recomana la monitorització del CO / SvO2, lactat, catèter venós central i sonda urinària en el shock cardiogènic**
- **Poc èmfasi en l'ús de l'eco pulmonar**
- **Poc èmfasi en el possible efecte deleteri de l'adrenalina**

Table 12.2 Definitions of the terms used in Section 12 on acute heart failure

Term	Definition
Symptoms/signs of congestion (left-sided)	Orthopnoea, paroxysmal nocturnal dyspnoea, pulmonary rales (bilateral), peripheral oedema (bilateral).
Symptoms/signs of congestion (right-sided)	Jugular venous dilatation, peripheral oedema (bilateral), congested hepatomegaly, hepatojugular reflux, ascites, symptoms of gut congestion.
Symptoms/signs of hypoperfusion	Clinical: cold sweated extremities, oliguria, mental confusion, dizziness, narrow pulse pressure. Laboratory measures: metabolic acidosis, elevated serum lactate, elevated serum creatinine. Hypoperfusion is not synonymous with hypotension, but often hypoperfusion is accompanied by hypotension.
Hypotension	Systolic BP <90 mmHg
Bradycardia	Heart rate <40 bpm
Tachycardia	Heart rate >120 bpm
Abnormal respiratory effort	Respiratory rate >25 breaths/min with use of accessory muscles for breathing, or respiratory rate <8 breaths/min despite dyspnoea.
Low O_2 saturation	O_2 saturation (SaO_2) <90% in pulse oximetry Normal SaO_2 neither excludes hypoxaemia (low PaO_2) nor tissue hypoxia.
Hypoxaemia	O_2 partial pressure (PaO_2) in arterial blood <80 mmHg (<10,67 kPa) (blood gas analysis).
Hypoxaemic respiratory failure (type I)	PaO_2 <60 mmHg (<8 kPa)
Hypercapnia	CO_2 partial pressure ($PaCO_2$) in arterial blood >45 mmHg (>6 kPa) (blood gas analysis).
Hypercapnic respiratory failure (type II)	$PaCO_2$ >50 mmHg (>6,65 kPa).
Acidosis	pH <7.35
Elevated blood lactate	>2 mmol/L
Oliguria	Urine output <0.5 mL/kg/h

BP = blood pressure; bpm = beats per minute; $PaCO_2$ = partial pressure of carbon dioxide in arterial blood; PaO_2 = partial pressure of oxygen in arterial blood; SaO_2 = oxygen saturation.

Recommendations regarding diagnostic measurements in patients with suspected acute heart failure	Class [a]	Level [b]
Upon presentation a measurement of plasma natriuretic peptide level (BNP, NT-proBNP or MR-proANP) is recommended in all patients with acute dyspnoea and suspected AHF to help in the differentiation of AHF from non-cardiac causes of acute dyspnoea.	I	A
Recommendations for the management of patients with acute heart failure – pharmacotherapy	**Class [a]**	**Level [b]**
Intravenous loop diuretics are recommended for all patients with AHF admitted with signs/symptoms of fluid overload to improve symptoms. It is recommended to regularly monitor symptoms, urine output, renal function and electrolytes during use of i.v. diuretics.	I	C
In patients with new-onset AHF or those with chronic, decompensated HF not receiving oral diuretics the initial recommended dose should be 20–40 mg i.v. furosemide (or equivalent); for those on chronic diuretic therapy, initial i.v. dose should be at least equivalent to oral dose.	I	B
It is recommended to give diuretics either as intermittent boluses or a continuous infusion, and the dose and duration should be adjusted according to the patients' symptoms and clinical status.	I	B
Inotropic agents are not recommended unless the patient is symptomatically hypotensive or hypoperfused because of safety concern.	III	A
Recommendations regarding management of patients with cardiogenic shock	**Class [a]**	**Level [b]**
In all patients with suspected cardiogenic shock, immediate ECG and echocardiography are recommended.	I	C
All patients with cardiogenic shock should be rapidly transferred to a tertiary care centre which has a 24/7 service of cardiac catheterization, and a dedicated ICU/CCU with availability of short-term mechanical circulatory support.	I	C
Recommendations regarding oral evidence-based disease-modifying therapies in patients with acute heart failure	**Class [a]**	**Level [b]**
In case of worsening of chronic HFrEF, every attempt should be made to continue evidence-based, disease-modifying therapies, in the absence of haemodynamic instability or contra-indications.	I	C