The New ESC Guidelines
Focus on Acute Heart Failure

Pre-discharge management and criteria for discharge

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Wroclaw, Poland
Disclosure

Consultancy fees and speaker’s honoraria from: Amgen, Servier, Novartis, Johnson & Johnson, Merck, Berlin Chemie, Bayer, Cibiem, Vifor Pharma, Trevena, Abbott Vascular, Respicardia, and Cardiorentis

Research support: Servier, Vifor Pharma, Singulex
2016 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure

The Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC)

Developed with the special contribution of the Heart Failure Association (HFA) of the ESC

Authors/Task Force Members: Piotr Ponikowski* (Chairperson) (Poland), Adriaan A. Voors* (Co-Chairperson) (The Netherlands), Stefan D. Anker (Germany), Héctor Bueno (Spain), John G. F. Cleland (UK), Andrew J. S. Coats (UK), Volkmar Falk (Germany), José Ramón González-Juanatey (Spain), Yeli-Pekka Harjola (Finland), Ewa A. Jankowska (Poland), Mariell Jessup (USA), Cecilia Linde (Sweden), Petros Nihoyannopoulos (UK), John T. Parissis (Greece), Burkert Pieske (Germany), Jillian P. Riley (UK), Giuseppe M. C. Rosano (UK/Italy), Luis M. Ruilope (Spain), Frank Ruschitzka (Switzerland), Frans H. Rutten (The Netherlands), Peter van der Meer (The Netherlands)
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Recommendations on pre-hospital & 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


European Journal of Heart Failure (2015) 17, 544–558
The **optimal management and timing** in the management of acute heart failure

Appropriate „timing“ of each intervention

- Early intervention to improve long-term outcomes
- Early initiation of „peri-discharge phase“ management
- Early initiation of regular check-up

Clinical tasks:
- Defining goals of treatment
- Characterizing patient’ clinical profile
  - Strategizing care
- Monitoring effects of treatment
Goals of treatment in acute heart failure

**Immediate:**
- Improve organ perfusion & haemodynamics
- Restore oxygenation
- Alleviate symptoms
- Limit cardiac & renal damage
- Prevent thromboembolism
- Minimize ICU length of stay

**Intermediate:**
- 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 careful plan that provides:
  a. schedule for up-titrating and monitoring of pharmacological therapy
  b. need and timing for review for device therapy
  c. who will see the patient and when
- Enrol in disease management programme, educate, initiate lifestyle adjustments
- Prevent early readmission
- Improve symptoms, QoL and survival

Consecutive phases of AHF management

www.escardio.org/guidelines
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Consecutive phases of AHF management
Pre-discharge management and criteria for discharge

Identify aetiology and relevant co-morbidities
Pre-discharge management and criteria for discharge

Identify aetiology and relevant co-morbidities

Coexistence of two clinical conditions – ACS and AHF – always identifies a very-high-risk group where an immediate invasive strategy with intent to perform revascularization is recommended, irrespective of ECG or biomarker findings.

Recommendations for coronary angiography in chronic HF

Invasive coronary angiography is recommended in patients with HF and angina pectoris recalcitrant to pharmacological therapy or symptomatic ventricular arrhythmias or aborted cardiac arrest (who are considered suitable for potential coronary revascularization) in order to establish the diagnosis of CAD and its severity.

Invasive coronary angiography should be considered in patients with HF and intermediate to high pre-test probability of CAD and the presence of ischaemia in non-invasive stress tests (who are considered suitable for potential coronary revascularization) in order to establish the diagnosis of CAD and its severity.
Pre-discharge management and criteria for discharge

Identify aetiology and relevant co-morbidities

**Iron deficiency in acute HF (new definition):**
- depleted body iron stores (*low serum hepcidin*)
- insufficient iron amount in metabolizing cells (*high serum sTfR*)

75% of AHF - impaired iron status

- Preserved iron status
- Isolated high sTfR
- Isolated low hepcidin
- Iron deficiency (*↓hepcidin & ↑sTfR*)

Jankowska EA et al. Eur Heart J 2014;35:2468-76
Pre-discharge management and criteria for discharge

Titrate therapy to control symptoms and congestion and optimize blood pressure.
Titrate therapy to control symptoms and congestion and optimize blood pressure.

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Class</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard non-invasive monitoring of heart rate, rhythm, respiratory rate, oxygen saturation and blood pressure is recommended.</td>
<td>I</td>
<td>C</td>
</tr>
<tr>
<td>It is recommended that patients should be weighed daily and have an accurate fluid balance chart completed.</td>
<td>I</td>
<td>C</td>
</tr>
<tr>
<td>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.</td>
<td>I</td>
<td>C</td>
</tr>
<tr>
<td>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.</td>
<td>I</td>
<td>C</td>
</tr>
</tbody>
</table>
Pre-discharge management and criteria for discharge

Initiate and up-titrate disease-modifying pharmacological therapy
Initiate and up-titrate disease-modifying pharmacological therapy

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Class</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>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 contraindications.</td>
<td>I</td>
<td>C</td>
</tr>
<tr>
<td>In the case of <em>de novo</em> HFrEF, every attempt should be made to initiate these therapies after haemodynamic stabilization.</td>
<td>I</td>
<td>C</td>
</tr>
</tbody>
</table>

“in the case of haemodynamic instability/contraindications the daily dosage of oral therapy may be reduced or stopped temporarily until the patient is stabilized. In particular, β-blockers can be safely continued during AHF presentations except in cardiogenic shock.”
Therapeutic algorithm for a patient with symptomatic HFrEF

Patient with symptomatic\(^a\) HFrEF\(^b\)

- Therapy with ACE-I\(^c\) and beta-blocker (Up-titrate to maximum tolerated evidence-based doses)

  - Still symptomatic and LVEF ≤35%
    - No
    - Yes

  - Add MR antagonist\(^d,e\) (up-titrate to maximum tolerated evidence-based dose)

    - Yes
    - No

Still symptomatic and LVEF ≤35%

- Able to tolerate ACEI (or ARB)\(^f,g\)
- Sinus rhythm, QRS duration ≥130 msec
- Sinus rhythm,\(^h\) HR ≥70 bpm

- ARNI to replace ACE-I
- Evaluate need for CRT\(^i,j\)
- Ivabradine

These above treatments may be combined if indicated
Therapeutic algorithm for a patient with symptomatic HFrEF

Urgent need for discharge protocols in order to initiate disease-modifying therapies before hospital discharge

Patient with symptomatic HFrEF

Therapy with ACE-I and beta-blocker
(Up-titrate to maximum tolerated evidence-based doses)

Still symptomatic and LVEF ≤35%

Yes

Add MR antagonist
(up-titrate to maximum tolerated evidence-based dose)

Still symptomatic and LVEF ≤35%

Yes

Able to tolerate ACEI (or ARB)

Sinus rhythm, QRS duration ≥130 msec

Sinus rhythm, HR ≥70 bpm

ARNI to replace ACE-I

Evaluate need for CRT

Ivabradine

These above treatments may be combined if indicated
Criteria for discharge from the hospital and follow-up in high-risk period

Patients admitted with AHF are medically fit for discharge:

- when **haemodynamically stable, euvolemic**, established on **evidence-based oral medication** and with **stable renal function** for at least 24 h before discharge
- once provided with **tailored education** and advice about self-care
Assessment of prognostic variables during discharge and early post-discharge period

<table>
<thead>
<tr>
<th>EXPECTED OUTCOMES</th>
<th>Prevention of fluid overload</th>
<th>Symptomatic improvement</th>
<th>Prognostic improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>signs of congestion</td>
<td>+++</td>
<td>+</td>
<td>++</td>
</tr>
<tr>
<td>blood pressure</td>
<td>+</td>
<td>?</td>
<td>+</td>
</tr>
<tr>
<td>heart rate</td>
<td>?</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>orthostatic test</td>
<td>+</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>ECG</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QRS duration (for CRT)</td>
<td>+</td>
<td>++</td>
<td>+++</td>
</tr>
<tr>
<td>AF / tachyarrhythmias</td>
<td>+ ?</td>
<td>+</td>
<td>++</td>
</tr>
<tr>
<td>Laboratory examinations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>myocardial viability</td>
<td>+</td>
<td>+</td>
<td>++ (?)</td>
</tr>
<tr>
<td>natriuretic peptides</td>
<td>++</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>renal function / electrolytes</td>
<td>+</td>
<td>+ / 0</td>
<td>+ / ++ (?)</td>
</tr>
<tr>
<td>anaemia / iron deficiency</td>
<td>?</td>
<td>++</td>
<td>+</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Variable</th>
<th>Score</th>
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<tbody>
<tr>
<td></td>
<td>-1</td>
</tr>
<tr>
<td></td>
<td>None</td>
</tr>
<tr>
<td><strong>Bedside assessment</strong></td>
<td></td>
</tr>
<tr>
<td>Orthopnoea^a</td>
<td>None</td>
</tr>
<tr>
<td>JVP (cm) &lt;8 and no hepatojugular reflux</td>
<td></td>
</tr>
<tr>
<td>Hepatomegaly Absent in the setting of normal JVP</td>
<td>Absent</td>
</tr>
<tr>
<td>Oedema</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Laboratory</strong></td>
<td></td>
</tr>
<tr>
<td>Natriuretic peptides (one)</td>
<td></td>
</tr>
<tr>
<td>BNP</td>
<td>&lt;100</td>
</tr>
<tr>
<td>NT pro-BNP</td>
<td>&lt;400</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dynamic manoeuvres</strong></td>
<td></td>
</tr>
<tr>
<td>Orthostatic testing</td>
<td></td>
</tr>
<tr>
<td>Significant decrease in SBP or increase in HR</td>
<td></td>
</tr>
<tr>
<td>No change in SBP or HR</td>
<td></td>
</tr>
<tr>
<td>6 min walk test</td>
<td></td>
</tr>
<tr>
<td>&gt;400 m</td>
<td></td>
</tr>
<tr>
<td>Valsalva manoeuvre</td>
<td></td>
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<tr>
<td>Normal response</td>
<td></td>
</tr>
<tr>
<td>Absent overshoot pattern</td>
<td></td>
</tr>
<tr>
<td>Square wave pattern</td>
<td></td>
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Gheorghiade M et al. Eur J Hear Fail 2010, 12, 423-33
Pre-discharge management and criteria for discharge

Develop a careful plan that provides:

a. schedule for up-titrating and monitoring of pharmacological therapy
b. need and timing for review for device therapy
c. who will see the patient and when

Patients should be:

• enrolled in a disease management program
• seen by their general practitioner within 1 week of discharge
• seen by the hospital cardiology team within 2 weeks of discharge (if feasible)
Three-phase terrain of lifetime readmission risk after Heart Failure Hospitalization

- **Initial discharge**
  - **Red** periods of highest risk for readmission
  - **Green** unavoidable readmissions

**“Transition Phase”**

**“Plateau Phase”**

**“Palliation and Priorities”**

Desai AS and Stevenson LW. Circulation. 2012;126:501-506