Patterns of unplanned readmissions after heart failure hospitalization: novel longitudinal perspectives from Australia and New Zealand
Madelaire, Christian; Kristensen, Søren Lund

Published in: European Journal of Heart Failure

DOI: 10.1002/ejhf.2068

Publication date: 2021

Document version: Accepted manuscript

Citation for published version (APA):

Go to publication entry in University of Southern Denmark's Research Portal

Terms of use
This work is brought to you by the University of Southern Denmark.
Unless otherwise specified it has been shared according to the terms for self-archiving.
If no other license is stated, these terms apply:

- You may download this work for personal use only.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying this open access version

If you believe that this document breaches copyright please contact us providing details and we will investigate your claim.
Please direct all enquiries to puresupport@bib.sdu.dk

Download date: 31. Oct. 2023
Title: Patterns of unplanned readmissions after HF hospitalization: novel longitudinal perspectives from Australia and New Zealand

Authors: Christian Madelaire, MD PhD\textsuperscript{1,2}  
Søren Lund Kristensen, MD PhD\textsuperscript{2}

Affiliations: \textsuperscript{1}Department of Cardiology, Odense University Hospital, Odense, Denmark. \textsuperscript{2}Department of Cardiology, Herlev Gentofte Hospital, Gentofte, Denmark. \textsuperscript{3}Department of Cardiology, Rigshospitalet University Hospital, Copenhagen, Denmark.

Word count: 1385 including title page, abstract, text, references, tables, and figure legends

Correspondence: Søren Lund Kristensen,  
Department of Cardiology, Rigshospitalet  
Blegdamsvej 9, 2100, Copenhagen  
Denmark  
Tel: +45 28694385  
Email: slk@heart.dk

This article has been accepted for publication and undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process which may lead to differences between this version and the Version of Record. Please cite this article as doi: 10.1002/ejhf.2068

This article is protected by copyright. All rights reserved.
Heart failure (HF) is a condition associated with frequent hospitalizations needed to decongest patients with intravenous diuretics, whilst closely monitoring biochemistry and thoroughly evaluating the patients cardiac and wider health status. However, such admissions should be balanced against the inherent costs, not just for health care systems but also for the individual patient; Immobilization, associated muscle loss, infection risk and loss of self-empowerment are all reasons why length and number of hospitalizations should be kept to a minimum.

It is of great interest therefore to study and monitor changes in rates of HF hospitalization, and unplanned readmissions over time. It is well known that an unplanned (re)admission to hospital is associated with an increased mortality risk, impaired functional status, and quality of life and consequently it has been introduced as measure for monitoring treatment quality across health care institutions together with mortality (1) (Figure).

In the United States (US), the Hospital Readmission Reduction Program (HRRP) that was established in 2012 - as a part of the Affordable Care Acts – has taken this a step further by applying financial penalties to hospitals with 30-day readmission rates higher than expected (2). The intent was to reduce health care cost by penalizing early readmissions after hospitalization due to acute myocardial infarction, HF, pneumonia, (and since 2015, COPD, and elective knee and hip arthroplasty). While reduction of hospitalizations by drug or device therapy in a clinical randomized trial are likely to represent important steps forward in the treatment of patients, a deliberate reduction in number of readmissions due to financial disincentives may not.

The decision of whether or not to hospitalize a patient with is complex, and often depends on many factors beyond clinical assessment of HF status, including comorbidity, patient and physician preferences, logistic and other practical issues. This decision should not be influenced by financial
and structural incentives, which could lead to abstaining from hospitalization with consequent further deterioration of the patient’s condition.

Several US studies have shown that 30-day hospital readmission rates have declined since the implementation of HRRP (3–5), while the derived effect on 30-day mortality remains debated (4,6,7). However, data regarding trends in 30-day mortality and unplanned readmission rates following HF hospitalization during this period outside of the US are sparse, but needed to get a better barometer of secular trends in countries where health systems are not penalized by higher readmissions rates. In this issue of the journal, Labrosciano et al. provide new findings that enrich our understanding of this area. The authors present data from 2010 through 2015 for Australia, and New Zealand, two countries with highly developed healthcare systems that have not undergone a broad political intervention to bring down short-term readmission rates.

Notably, Labrosciano et al. also report a substantial decline in unadjusted 30-day mortality risk (12.5% to 8.1%) but lesser declines in 30-day unplanned readmission rate (23.2% to 21.9%) for HF patients. Both trends remained significant after adjusting for temporal differences in patient characteristics. Further, when the authors examined the institutional risk-standardized mortality rate (RSMR) and readmission rate (RSRR), the former ranged from 6.1% to 17.3% across institutions, and the latter from 17.7% to 27.1%. Importantly, only around one third of the unplanned readmissions were due to HF, while more than half were due to non-cardiovascular conditions. These hospitalization patterns has been described previously (8,9), but the fact that non-cardiovascular admissions dominate the early phase after a HF hospitalization emphasizes the multimorbid characteristics of patients with HF who are at greatest risk of death and readmissions. This is further illustrated by the higher prevalence of renal disease, chronic lung disease and diabetes along with more prior cancers, among those readmitted.
Comparing the trends seen in the present article with those reported from the US, what stands out is the substantial decline in mortality seen in Australia/NZ which is not mirrored in the US. This decline in mortality is observed despite very modest reductions in unplanned readmissions, such as readmission changes in the US cannot guarantee reductions in mortality.

The decline in mortality post HF admission over time is likely explained by factors such as implementation of novel therapies, earlier diagnosis and intervention, and better treatment of comorbid conditions as well as increased focus on patient education. Improving survival may likely results in a more fragile population thus more susceptible to readmission, which is underscored by Labrosciano and colleagues, reporting that less than half of the early readmissions were due to cardiovascular conditions. The hospitalizations may be a marker of deterioration but can also be an opportunity to evaluate and optimize therapy and eventually acknowledge terminal disease and initiate palliative actions. Therefore, hospitalization rates are multifaceted, and their interpretation is complex.

Although the present study is impressively large, some limitations have to be acknowledged. The study lacked information on left ventricular ejection fraction, BNP, renal function etc., limiting its value in comparing outcomes across institutions. The almost three-fold difference in 30-day mortality between the institutions with the lowest and highest RSMR may, as the authors suggest, reflect differences in clinical processes and transitional care practices and patient demographics.

With more than a fourth of the population living in rural or remote areas, it is also possible that variations in access to healthcare and threshold for seeking medical help are relevant to RSMR variations (10).

In conclusion, this important work by Labrosciano and colleagues adds a more global perspective on early outcomes after a hospitalization with HF. It shows early post-hospital mortality rates have
declined substantially between 2010 and 2015, seemingly independent of readmission rates. This finding, in turn, underscores that the road to improved survival in HF is not necessarily paved with avoidance of hospitalizations.

Conflicts of interest: None declared

REFERENCES


Figure: The vulnerable post-hospitalization period, and potential focus points for evaluating health quality metrics and/or applying financial incentives to improve outcomes, including hospital discharge planning (1), 30-day unplanned readmission (Target of the US Hospital Readmissions Reduction Program (HRRP) (2)), and 30-day mortality (3). Australia and New Zealand do not have national coordinated initiatives to improve HF outcomes.