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Practical multidisciplinary approaches to heart failure management for improved patient outcome

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Heart failure (HF) affects millions of people worldwide. Many patients experience repeated hospital admissions and a poor quality of life, and many die prematurely. The period following discharge from hospital is recognized as a particularly vulnerable time. Effective HF multidisciplinary teams are now recommended in HF guidelines and can improve outcomes, alleviate suffering, and make the overall experience of HF better for patients and their families. Yet audit of HF services reports inadequate levels of adherence with these recommendations and wide variation across countries and regions. This article aims to summarize the key elements necessary for high-quality multidisciplinary care to be provided for all patients, throughout the HF trajectory, from acute hospital admission to long-term follow-up. It also discusses practical approaches to improve communication between the acute hospital and community healthcare teams. These will need to be adapted depending on local needs and resources. These include HF management programmes, structured discharge planning, medicines reconciliation, nurse-led 'in-reach' and 'out-reach' approaches, and long-term follow-up and monitoring. The importance of involving patients and their families in discharge planning and empowering and educating them in self-care is also discussed. The overall goal is to develop strong multidisciplinary teams that improve patient outcomes, and ensure seamless care is offered to all patients.

Introduction

The transition between hospital and home following admission for an episode of acute heart failure (HF) is a vulnerable period,[1] often characterized by poor communication between healthcare professionals involved with inpatient and community care.[2] Patients and their caregivers often describe hospital discharge as sudden and unexpected and consequently feel ill-prepared. Not surprisingly, this period is marked by unplanned emergency room visits, hospital readmissions, and a high risk of death.[1–5] Following discharge from hospital, an estimated 20–25% of patients with HF globally are readmitted within 30 days, albeit with marked variation both within and across countries.[3] Furthermore, between 20% and 40% die within 1 year.[3] Healthcare policy makers have responded with guidance that focuses on improving the quality of care provided throughout the HF trajectory and in ensuring a smooth transition between care providers.[6–10]

Against this background, the European Society of Cardiology (ESC) guidelines on HF advocate seamless care between inpatient and community care settings and recommend multidisciplinary HF management programmes.[11] The HF team should represent the expertise of a range of professionals based in the hospital or in the community and include cardiologists, general practitioners, care of the elderly physicians, HF specialist nurses, pharmacists, and psychologists.[11] Yet an audit of HF services reports inadequate levels of adherence with these guidelines and therefore failure to adequately treat some patients.[12] Recognizing this, the latest ESC guidelines extend their recommendations to include advice for co-ordinated discharge

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planning and follow-up.[11] Furthermore, the HF Association of the ESC makes suggestions on the key roles and responsibilities of the professionals involved in the HF team at all stages of the acute HF pathway, including close collaboration between medical and nursing staff and experts from the allied health professions.[9,13] Here, we consider key aspects of the acute HF pathway and suggest models of good practice aimed at improving multidisciplinary care and thereby service delivery for patients with this devastating condition.

In-hospital care

Admission and length of stay

Patients admitted to hospital with acute HF (*de novo* or with acute decompensation of known chronic HF) are likely to be admitted to various inpatient ward settings where their care is delivered and managed by a variety of professionals. Good clinical practice recommendations suggest that high-risk patients and those with acute HF associated with an acute coronary syndrome will benefit from close monitoring in an acute cardiac unit or coronary care unit (CCU), whereas triage to intensive care should be reserved for patients with haemodynamic instability or poor respiratory status.[13] Following stabilization, these high-risk patients should ideally be transferred to a cardiology ward.[13] Cardiology wards generally have a higher ratio of cardiology-trained nurses and ready access to expert cardiologists, HF specialist nurses, and other members of the HF team. This enables close patient monitoring, the ability to rapidly respond to a deteriorating clinical status, clinical decision-making based on up-to-date guideline-derived standards, and ongoing HF-specific patient education. National outcome data from England and Wales report improved outcomes when patients are managed on cardiology vs. general medical or other wards, including lower in-hospital mortality (6.9% vs. 11.4% or 13.7%, respectively) and lower 30-day mortality (5.4% vs. 6.8% or 8.3%, respectively).[14] Furthermore, patients treated on cardiology wards were also more likely to be discharged on evidence-based therapies, be referred for HF monitoring and follow-up, and be referred to a cardiac rehabilitation programme; all key factors influencing longer-term outcome.[14] Therefore, the availability of specialist treatment on a cardiology ward can have a significant impact on a patient's quality of treatment and long-term outcomes.

Decision-making around hospital admission often reflects the complex needs of HF patients and when these needs are complicated by multiple comorbidities and frailty then inpatient management may be better co-ordinated on a general medical or care of the elderly ward.[15] Strategies should be established that enable all patients to access the expertise of the specialist multidisciplinary HF team, regardless of where they are admitted. One approach is to develop an acute HF pathway: a systematic plan for patient management that crosses organizational boundaries.[13] The pathway can triage patients from the emergency room to CCU, cardiology ward, internal medicine, or care of the elderly ward.[15] It can also provide a management plan that ensures all patients with a diagnosis of HF, regardless of admission ward, are reviewed by a cardiologist and HF team, commenced on appropriate evidence-based treatment, and referred to an HF specialist nurse.[15] The HF specialist nurse can then co-ordinate ongoing review and follow-up by the HF team, provide the patient and family with HF patient education, and act as a central point of contact for advice and discharge planning (*Box 1*). Pathways are generic and disease focused and have the potential to limit individualized patient-centred care. Yet when implemented with the input of HF specialists (cardiologists and HF nurses) using a flexible approach, individualized to each patient's needs, they can reduce readmission, in-hospital death, and length of hospital stay.[16]

Optimal length of hospital stay following an episode of acute HF should be sufficiently long to ensure symptom control, to achieve euvolaemia, to treat exacerbating factors, to introduce appropriate evidence-based medication, and to co-ordinate a comprehensive discharge plan.[11,13] This will vary according to patient age, comorbidities, and social circumstances. The association between length of stay and improvement in outcome is clear and demonstrated in a sub-analysis of more than 6800 patients in the Acute Study of Clinical Effectiveness of Nesiritide in Decompensated Heart Failure (ASCEND-HF) trial, where longer length of hospital stay was associated with a reduced 30-day readmission rate ($r = -0.52$, $P < 0.01$).[17] Optimal length of hospital stay could therefore be viewed as a marker of quality care.

Medicines management

Medication prescribing errors can lead to adverse patient outcomes with between 5% and 8% of unplanned hospital admissions directly attributed to medication issues.[18] During care pathway transitions such as hospital admission or discharge, there is a risk of poor communication and unintended changes to medication. At these time points, up to 70% of patients experience an unintentional change in their medication, 30% of which may translate into an adverse patient outcome.[19] Therefore, quality improvement programmes have focused on improving the accuracy of medication prescribing for patients with HF.[20-22] Medicines reconciliation expands the traditional process of taking medical history to include documenting the rationale behind the discontinuation or commencement of medication.[23] Careful comparison of the medication prescription record with the list of medications provided by the patient will therefore uncover any inadequate medication prescription, poor adherence, and adverse drug interactions, should they exist. Medicines reconciliation can also clarify and communicate when and why decisions were made to stop or adjust medications, regardless of whether the medication is for HF or a co-existing condition. This will enable adjustments in response to altered renal function or blood pressure, or to permit optimal symptom control, or discontinuation of medication (such as non-steroidal anti-inflammatories or angiotensin converting enzyme inhibitors) ahead of introducing alternative therapies.

In a meta-analysis of 14 studies evaluating the effect of pharmacist-led medication reconciliation programmes on

Box 1 An integrated multidisciplinary heart failure model of care from Southampton General Hospital, UK

A specialist integrated multidisciplinary HF team serving a large geographical area of 2242 km^2 (urban and rural) and a population of 600 000

Structure:

- The entire HF team are based in a large urban teaching hospital in South East England
  - Two cardiologists with specialist training in HF provide clinical leadership
  - Trainee doctor with a special interest in HF
  - Nine specialist HF nurses who rotate between in-hospital and community care
  - Senior specialist HF nurse who provides leadership to the HF nursing team
  - Pharmacist (part-time)
  - Healthcare assistant (part-time)
  - Administrator
  - Data clerk

Processes:

- All in-patients admitted with a primary diagnosis of HF are seen within 48 hours
- Outreach is provided by the HF team to all patients admitted to the hospital (cardiology wards, general medicine, elderly care or elsewhere) with a primary diagnosis of HF
- Referral of any patient with decompenesated HF that is secondary to treating other conditions (such as fracture neck of femur or cancer)
- All patients are seen by the HF team at least twice during in-hospital admission (within 48 hours of admission and around time of discharge)
- The pharmacist provides medicines management and advises the HF team on complex medication issues
- All patients are seen within 10 days of discharge, with the timing of the appointment based on clinical need. Appointments are held at the hospital nurse-led assessment clinic, a community clinic or in the home, depending on patent preference and need. Patients see a cardiologist if necessary
- A telephone advice line provides immediate advice and support
- Consultant-led clinic provides management decisions for patients with complex needs
- A discharge summary is emailed to the patient's GP (via secure email) within 24 hours of discharge
- Laboratory and other test results are emailed to the GP as soon as received
- Team administrator checks receipt of all email communication
- Multidisciplinary team meetings take place weekly and include HF nurses working within the hospital and community
- Longer term follow-up by community HF nurses is provided for 3–6 months or until medication and self-care knowledge is considered optimal
- Annual review by cardiologist with HF specialist training
- Patients with a high symptom burden, advancing symptoms and additional need for self-management support are recommended to attend a 12-week 'Well-Being and Conditioning Programme"

Outcome measures:

- Readmissions, mortality and quality of life audited annually
- Adherence with evidence based recommendations audited annually
- Patient feedback sought bi-annually by postal survey

HF, heart failure.

clinical outcomes across multiple diseases during hospital transitions, use of medicines reconciliation vs. standard care was associated with a reduction in the risk of emergency department visits [relative risk (RR) 0.72; 95% confidence interval (CI): 0.57–0.92] and hospital readmissions (RR 0.81; 95% CI: 0.70–0.95).[24] However, despite this benefit and the introduction of medicines reconciliation more than a decade ago,[22,23] many organizations are still determining how best to implement such a service. Ideally medicines reconciliation should be the responsibility of a named healthcare professional, usually an HF specialist nurse or pharmacist.[24,25] However, local systems of care should clearly define roles and assign responsibilities as appropriate to their teams and resources. Guidelines in England and Wales recommend that medicines reconciliation take place at every transition in the HF care continuum, and within 24 h of hospital admission.[23] Achievement of this target is considered a marker of quality for patients and commissioners.[23] Medicines reconciliation strategies can include electronic communication tools and standardized forms and checklists; however, there is no evidence for the benefit of one approach over another.[26] Particular support and attention should be given to patients with cognitive impairment and multiple comorbidities for whom it may be challenging to obtain accurate medication history on admission, or convey necessary information to, on discharge.

Discharge planning and improving communication

In-hospital and community healthcare services often work independently of each other, resulting in limited communication and the potential for fragmentation of care when patients' transition between sectors.[27] This is particularly important in the high-risk period immediately following discharge. Barriers to effective communication between professionals include time and resource pressures, lack of clarity over roles, and inadequate team-work.[28] Not surprisingly, poor communication can contribute to the risk of early readmission, mortality, and a reduced quality of life.[29] Patients and their families are also often confused and anxious over whom to contact, and when, following hospital discharge.[30,31] Improvements in quality of care and outcomes can be achieved through structured discharge planning, and through the involvement of patients and, if they wish, their families in the process.[11]

Discharge planning should commence as soon as the patient is stabilized.[11] It requires physiological assessment of haemodynamic stability and symptoms alongside an assessment of the social environment into which the patient will be discharged and their capability and capacity to self-care (*Table 1*).[11,13] Assessment of care may also require the objective assessment of frailty or cognitive functioning, both advocated in the latest ESC guidelines for assessment of an older adult.[11] An individualized multidisciplinary management plan can then be developed, including information on any further investigations that may be required, when to initiate oral HF medication, patient education, and any plans for involvement of other health or social care services.[11] A predicted date for hospital discharge can then be communicated to patients, their families, and any community service providers.

Interventions targeted at improving healthcare provider communication during the transition period tend to focus on improving the quality of information shared between the hospital and community setting, improving coordination and continuity of care, and reducing healthcare utilization.[32,33] Such interventions can have a major impact on patient outcomes following discharge and may include medicines reconciliation, electronic tools to generate a structured discharge summary, shared involvement in follow-up between hospital and community, web-based access to discharge information for general practitioners, early follow-up, and the communication of follow-up appointments ahead of hospital discharge.[29] Furthermore, the key areas of competence for cardiologists and nurses to underpin expertise in HF have been identified,[34,35] and these individuals, along with all members of the multidisciplinary team, should ensure they maintain ongoing education and training to support delivery of high-quality care. In a US study of 599 hospitals participating in quality improvement projects to reduce HF readmission, lower-risk-standardized 30-day readmission rates (RSRRs) were associated with the following strategies: partnering with primary care to reduce readmission ($P = 0.017$), partnering with local hospitals to reduce readmission ($P = 0.02$), nurses leading medication reconciliation ($P = 0.002$), arranging follow-up appointments prior to discharge ($P = 0.037$), having a process in place to send discharge summaries directly to primary care ($P = 0.004$), and assigning staff to follow-up on test results post-discharge ($P = 0.049$).[25] Although the magnitude of effect for each individual component was quite modest, hospitals that implemented multiple strategies had significantly lower RSRRs ($P < 0.001$) suggesting there is benefit in using several interventions together in parallel.[25] These findings suggest that transitional care can be improved when there is an increased focus on the integration of in-hospital and primary care and on improving communication.

Other interventions used to improve communication in transitional care include shared databases, standardized electronic patient records, alert cards, and patient-held records.[36,37] Where secure electronic systems exist then letters, queries, and laboratory and other test results can be emailed from the HF secondary care team to the general practitioner or community HF team for action. This ensures that information is passed on in a timely manner. Systems will need to be in place to ensure receipt of the email and this can be provided by the team administrator (*Box 1*). More recently, models where community HF nurses undertake 'in-reach' work with hospitals have been reported, with feedback supporting these models for their acceptability, feasibility, and potential for benefit.[38] One such model involves rotational posts between community and hospital care to enable the HF specialist nurse to gain clinical expertise in both settings (*Box 1*). This increases the nurses' understanding of the complex nature of the HF pathway and the disease itself, as the patient transitions between hospital and home, and so aims to improve communication, timely patient discharge, and appropriate readmission.[38] Another 'in-reach' approach is for the

Table 1 Discharge planning

Patients admitted with acute HF are medically fit for discharge:
• when haemodynamically stable, euvolaemic, 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
• once home–social environment and capability to self-care have been assessed
Patients should be:
• enrolled in a disease management programmes
• seen by their general practitioner within 1 week of discharge
• seen by the hospital cardiology team within 2 weeks of discharge if feasible
Patients with chronic HF should be followed up within a multidisciplinary HF service

HF, heart failure.

community HF nurses to undertake weekly visits to inpatients and attend weekly multidisciplinary team meetings in the acute hospital.[39] This aims to improve the continuity of care to the inpatient as well as improving co-ordination of care on discharge. There is currently no clear evidence of the benefit of these approaches; however, any intervention that focuses on improving the information communicated between professionals, and between professionals and patients, is likely to improve both the quality of care and patient outcome.

Involving patients in transitional care

Patients can play a significant role in the continuity and management of their HF during transitions in care. This requires the necessary knowledge, skills and confidence to manage their post-discharge care, be involved in shared decision-making, and navigate the healthcare system, knowing when and how to seek help.[40] Heart failure education should commence during the in-hospital phase and extend throughout the entire HF trajectory. Whilst the entire multidisciplinary team should be involved in delivering appropriate and relevant HF education to patients (*Table 2*), the HF nurse frequently takes responsibility for overall delivery.[9] Information should be individualized to each patient, take into account their health literacy and readiness to learn, and include resources beyond oral and written information. Patient-focused websites may be a useful resource for some patients and their families.[11] Patient-held records or 'alert cards', although primarily designed to facilitate communication between the HF specialist and other healthcare providers, can empower patients, enabling them to understand and be actively involved in managing their HF.[36]

Post-discharge follow-up and long-term monitoring

Heart failure management programmes

The importance of seamless transition from the hospital to community for long-term follow-up is well recognized.[11,27] Early studies of structured outpatient monitoring report a reduction in the risk of re-hospitalization when patient follow-up is managed within an HF management programme.[41] Key aspects of HF management programmes include multidisciplinary involvement with an HF nurse as key co-ordinator,[41] and this level of monitoring is given the highest level of recommendation (Class 1A) by the European guidelines.[11] A recent European survey (33 countries) reported that although HF clinics are present in the majority of countries (75%), more than 25% of these clinics did not utilize an HF specialist nurse, highlighting the diversity in service structure.[42] Although these data show improvements in the availability of HF specialist in recent years, they also highlight the many patients unable to access high-quality multidisciplinary care who may not benefit from prevention or early detection of an acute decompensation. These patients may also miss out on the benefit of a tailored HF management programme. Components of HF management programmes recommended by European guidelines include intense follow-up, particularly during the transition from hospital to home, close monitoring, the optimization of HF therapies, and the provision of support and additional education to patients and their families (*Table 3*).[11]

Approaches to follow-up and monitoring

Follow-up and monitoring may take place in the clinic, home or remotely,[11] and in contemporary practice, programmes typically incorporate several different approaches to enable them to be tailored to individual need and severity of HF. Analysis of data from the Efficacy of Vasopressin Antagonism in Heart Failure Outcome Study with Tolvaptan (EVEREST) trial suggests that early follow-up should occur within 1 week of hospital discharge so that data from clinical examination, laboratory tests, and assessment of physical and mental functioning can be analysed to identify and manage high-risk patients.[43] European guidelines recommend review by a general practitioner within 1 week of discharge and follow-up by a specialist HF physician within 2 weeks.[11,13] Regardless of when and how monitoring is performed, the patient plays a central role through objective self-monitoring and reporting of any change in symptoms. Local HF services should be easily accessible to patients and any family caregivers, and where possible, appointments should be made for patients to attend community clinics closer to home, or in their own home, if unable to travel (*Box 1*). Remote follow-up may involve structured telephone calls where the patient answers a series of focused questions about their symptoms and HF signs, external

Table 2 Multidisciplinary team delivery of patient education in HF: key principles, key players and key topics

Key principles	1. Information should be individualized to each patient to take into account their health literacy and readiness to learn 2. Information should be provided in small amounts, at regular intervals, to improve uptake and retention 3. Information should be provided in oral and written formats, and other formats (e.g. web-based, videos) where available 4. Education should involve family and carers to ensure support is available to patients at home 5. Multidisciplinary team members should regularly follow-up with patients and carers to confirm understanding
Key players	Cardiologist Specialist HF nurse General practitioner Pharmacist Dietician Physiotherapist Psychologist
Key topics for education	HF causes Prognosis Understanding symptoms, including self-monitoring and self-management Medication management (dosing, effects, side effects) Self-care and self-care support aids Lifestyle management (including exercise, diet, weight, alcohol and smoking) Psychological management

HF, heart failure.

Table 3 Characteristics and components of management programmes for patients with heart failure (from the European Society of Cardiology heart failure guidelines)[11]

Characteristics	• Should employ a multidisciplinary approach (cardiologists, primary care physicians*, nurses, pharmacists, physiotherapists, dieticians, social workers, surgeons, psychologists, etc.) • Should target high-risk symptomatic patients • Should include competent and professionally educated staff
Components	• Optimized medical and device management • Adequate patient education with special emphasis on adherence and self-care • Patient involvement in symptom monitoring and flexible diuretic use • Follow-up after discharge (regular clinic and/or home-based visits; possibly telephone support or remote monitoring) • Increased access to healthcare (through in-person follow-up and by telephone contact; possibly through remote monitoring) • Facilitated access to care during episodes of decompensation • Assessment of (and appropriate intervention in response to) an unexplained change in weight, nutritional status, functional status, quality of life or laboratory findings • Access to advanced treatment options • Provision of psychological support to patient and family and/or caregivers

*General practitioners.

monitoring systems that electronically relay physiological data to a professional for review and response, or implantable haemodynamic devices or defibrillators that can transmit data back to the members of the multidisciplinary team.[44] Although these remote approaches may be useful, evidence for their benefit is not yet well established.[11] In remote approaches the HF nurse is frequently central to the review, triage and initial response to the remote monitoring data, liaising with the cardiologist and HF team, as appropriate, and supporting the patient in developing their self-care skills.[44] Challenges to the use of remote monitoring in clinical practice relate to how best to integrate these approaches into routine follow-up.

There is little available evidence to guide recommendations on the frequency of monitoring or of the most useful variables to monitor. Good clinical practice recommends that patients are seen frequently while medical therapy is optimized, following a recent hospital admission, during periods

of increasing symptoms, or during assessment for device therapy.[9] The interval between monitoring should be short during periods of up-titration of medication (every fortnight) and include clinical assessment, serum urea, electrolytes and creatinine and adherence with medication.[45] Older adults or patients with multiple comorbidities will benefit from more frequent monitoring.[11] Where available, an HF assessment unit or nurse-led clinic can provide routine monitoring and assessment of the stable patient, whereas a cardiologist-led clinic manages patients with complex needs (*Box 1*).

Medication optimization

The post-discharge period is also a time to optimize medication. For many years nurses have worked within clinical protocols that provide guidance on when to measure blood chemistry, what changes in blood chemistry and/or vital signs should trigger referral to a general practitioner, and which parameters are considered safe for up-titration.[11] Within the UK, nurses' contribution to medication optimization has been extended further, and following a period of additional education and mentoring, nurses can independently prescribe medication.[46] This process has gained acceptance amongst professionals and patients and evaluation reports it as enabling safe and timely care.[47]

Education and support for patients

During the post-discharge period, nurses and other members of the multidisciplinary team should continue to provide educational materials to patients, as and when necessary. This is to ensure patients are informed regarding their condition and the importance of self-monitoring, and fully able to contribute to decision-making about future treatment options. Heart failure specialist nurses can support patients through the provision of a telephone help-line to promptly address any questions and concerns.[11] For those patients who may be reluctant to utilize such a service for fear of interrupting the HF specialist nurse, systems that enable a voice message to be left may be useful, although this does consume more of the nurses' time. Local organizations will need to determine how best to provide outpatient support depending on the resources they have available. In addition, many patients with HF, and their family caregivers, find it useful to meet other patients to share similar experiences and discuss problem-solving strategies. Local HF patient support groups can provide a convenient forum and these groups are often facilitated by an HF specialist nurse who arranges the venue, helps identify topics and speakers, and offers professional advice and support to patients.[48] Such groups can also provide a forum for patients to hear the outcomes of relevant research and new therapeutic treatments. Evaluation of community-based support groups indicates that they offer a number of benefits; however their major impact appears to be related to improvements in health-related quality of life and well-being, rather than survival.[49]

Exercise training

There is increasing evidence for the benefit of structured exercise training on improvement in post-discharge outcomes for patients with HF, and regular aerobic exercise is now recommended.[11] A recent meta-analysis reported that aerobic exercise-based interventions in HF were associated with a statistically significant reduction in hospitalization (RR 0.75, 95% CI: 0.62–0.91; $P = 0.005$) and HF hospitalization (RR 0.61, 95% CI: 0.46–0.8; $P = 0.0004$), and conferred clinically meaningful improvement in health-related quality of life [mean difference 5.8 units, as measured by the Minnesota Living with HF tool (MLwHF)].[50] The value of exercise has long been included as a key topic for patient education, where a lifestyle approach to promote physical activity is advocated (*Table 2*).[11] However, structured exercise programmes are often poorly integrated into ongoing management of HF patients.[51] To optimize uptake of exercise training, local organizations require resources that enable exercise programmes to be individualized to each patient, taking into account the severity of their HF, comorbidities, age, and cultural attitudes to exercise. Effective programmes require multidisciplinary involvement, including input from a cardiologist, HF specialist nurse and physiotherapist/exercise physiologist, as well as facilities for supervised exercise.

Long-term follow-up

The optimal time period for long-term intensive monitoring is uncertain and will be highly variable between patients. Studies of HF management programmes point to an optimal time period for intensive follow-up post-discharge of 3–6 months;[41] in practice the majority of programmes do not provide such levels of follow-up beyond 6 months. Thereafter, patients will benefit from ongoing monitoring to ensure they remain on optimal therapy. There is currently no evidence for the superiority of a specialist HF clinic, compared with a general practitioner in the ongoing monitoring of the stable patient who is optimized on HF therapy. For example, in a Dutch study of patients assigned for follow-up in primary care ($n = 97$) or in an HF clinic ($n = 92$), there was no difference between groups at 12-month follow-up in terms of guideline adherence, medication adherence, number of deaths, or hospital admissions for cardiovascular (CV) reasons.[52] Similarly, in the European NorthStar study of patients assigned for follow-up in primary care ($n = 460$) or in an HF clinic ($n = 461$), there was no difference between groups at median follow-up of 2.5 years for the primary endpoint of time to death or CV readmission ($P = 0.149$), or any of the secondary endpoints (mortality, HF admission, quality of life, number of days admitted, and number of admissions; all $P > 0.05$).[53] Stable patients on optimal medication should therefore be considered for referral to primary care for long-term follow-up,[11] although consideration should be given to the availability and organization of local resources and patient preference.

Conclusion

Treatment of HF is challenging as different treatment needs exist for acute HF and chronic HF. Although there is a strong evidence base to support interventions that improve

survival and quality of life, provision of care and healthcare resources vary across countries and regions meaning not all patients receive comprehensive specialist care. This is particularly important in the vulnerable period immediately prior to, and following discharge from hospital when patient care is transitioning to the community. In order to provide seamless transition during this vulnerable time various strategies can be employed, including medicines reconciliation, structured discharge planning, empowering patients and their families in self-care through provision of educational materials, and interventions to improve communication between different healthcare sectors. Following discharge, enrolment of patients in HF management programmes, encompassing aspects of follow-up and monitoring, medication optimization, education and support, and exercise training are important for improved outcomes.

The organized delivery of high-quality acute HF management both in-hospital and in the community also requires a strong HF multidisciplinary team, embracing both hospital and community healthcare professionals and working closely together to provide an integrated service. During hospitalization, a multidisciplinary HF team may be able to provide an 'outreach' service to ensure that all patients admitted with HF, regardless of whether on a general or specialist ward, are reviewed by an HF specialist and all hospitals should have an acute HF pathway that identifies the plan of care for patients admitted with HF. Likewise, in the period just prior to discharge, strategies that involve the community team extending their reach into the hospital environment and contributing to discharge planning may also assist in the seamless transition of care once the patient has been discharged to the community. Although many of these multidisciplinary strategies have been evaluated within local quality improvement programmes, further research is required to identify the key components and processes involved, and to extend their uptake on a national and international level.

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