Improving Care for Patients with Heart Failure: What Can Taiwan Accomplish?

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Heart failure is a growing public health issue worldwide, due to the improved survival of patients with heart diseases and the increased complexity of treatment options. If unrecognized and inadequately treated, the disease burden of heart failure can be devastating and costly. This review will compare the similarities and differences in different aspects of contemporary care of the patient with heart failure between Taiwan and many Western societies. In addition, this review will also examine potential treatment modalities and approaches that can be adopted in Taiwan’s health care system, with the goal of bettering care for patients with heart failure in Taiwan.

Key Words: Heart failure • Taiwan • Disease management program

INTRODUCTION

Heart failure is a growing epidemic worldwide, owing to the aging population and the increasing survival of patients presenting with acute myocardial infarction and various other heart diseases. In the USA, heart failure has become one of the most common hospital discharge diagnoses in the elderly population, and has consumed a large proportion of total health care expenditure.1 Patients with heart failure may take on average 5-7 different medications. In many cases, patients with heart failure have to undergo expensive and risky diagnostic and therapeutic procedures. They are often restricted to living their lives in disability, with recurrent hospitalizations for decompensation that are costly to the society.

Despite decades of therapeutic advances, the diagnosis of heart failure still carries an abysmal prognosis.2 In a study of over 30,000 patients admitted with new-onset heart failure, the 30-day and one-year mortality rates were an 12% and 30%, respectively.3 Several new approaches, including drugs, devices, and surgical approaches, have been explored to combat heart failure. These treatment approaches have followed the evolution of the conceptual models created to understand the pathophysiology of heart failure.

The increasing prevalence of heart failure in Taiwan may parallel with that seen in many Western countries. The expanding patient population, coupled with rapid growth in treatment options, demands the recognition of heart failure as an important subspecialty of cardiology, and an important target for quality improvement. The purpose of this paper is to critically evaluate the current status of heart failure epidemiology and care in Taiwan, and examine aspects of heart failure care in Western societies that can be applicable to Taiwan.

Differences between Taiwan and western countries in heart failure care

Differences in heart failure epidemiology

Although there have been limited data regarding the epidemiology of heart failure in Taiwan, previous reports have suggested that the annual mortality rate of pa-
tients with heart failure could be as high as 40-50% for New York Heart Association (NYHA) functional class III to IV patients who are waiting for cardiac transplantation.\(^4,5\) Additionally, the in-hospital mortality rate may be as high as 23.5\%.\(^4\) These figures appear to be inferior when directly compared with those in Western societies, although no direct comparison has been made. Nevertheless, with an aging society and a medical system primarily geared towards reactive salvage as opposed to proactive prevention, the disease burden of heart failure in Taiwan is only going to increase. More recent data reported a prevalence of heart failure in a community-based cohort of approximately 5.5\%, with the majority being hypertension as etiology. The 5- and 10-year mortality ranged from 14\% and 48.2\% in those with impaired LVEF versus 14.1\% and 24.4\% in those with preserved LVEF, respectively.\(^6\)

Overall, patients with heart failure in Taiwan have high prevalences of hypertension and diabetes mellitus as their comorbid conditions. With the growing influence of the Western diet and the high prevalence of cigarette smoking in Taiwan, myocardial infarction as the cause of heart failure is becoming increasingly common. We can witness how the epidemiological trends will go with a glimpse of heart failure epidemiology in many Western societies. Even with a strong emphasis in the interdisciplinary management of heart failure in the United States of America, there are still an estimated 5 million Americans suffering from heart failure and over 500,000 new cases diagnosed annually.\(^7,8\) A larger burden comes with the costly hospitalizations associated with heart failure exacerbations: approximately 1 million hospital admissions per year (a 174\% increase from 1979 to 2003),\(^7\) and readmission rates as high as 30\% at 3 months and 60\% at 6 months following discharge.\(^5\) In particular, both concomitant atrial fibrillation and diabetes mellitus commonly occur in the heart failure population, and both are increasing in prevalence in the Taiwan population as well. This all translates into significant disease burden, large expenditures for heart failure diagnostic testing and treatments, and the desperate need to improve on existing diagnosis and management strategies.

Health care system differences

Compared to the OECD (Organisation for Economic Co-operation and Development) countries, Taiwan’s health care system is relatively efficient. Although there are fewer physicians and acute care beds, Taiwan’s existing infrastructure has provided a large volume of ambulatory care services and significant amount inpatient care\(^10\) (Figure 1). Taiwan’s health care system is recognized for its accessibility, low cost, and high degree of public satisfaction. However, there are several important challenges with respect to the emerging burden of heart failure. In particular, the amount of time and attention spent on each individual heart failure patient with respect to disease management is limited. Most doctors in Taiwan frequently neglect patients’ understanding of their disease and adherence to their prescribed medications. Interventions for dietary and lifestyle modification are not readily available. Since the health literacy and knowledge of self-care for patients with heart failure in Taiwan is relatively low, the lack of adequate patient-oriented approaches may directly impact the effectiveness of treatment regimens.

Genotype and racial difference

Genetic determinants of the pathophysiology of heart failure are likely polygenic, and hence the relative contributions to environmental influences are complex. Though heart failure genomic information has not been widely utilized in clinical practice, there are many examples of how this information can potentially transform the way we look at the heart failure phenotype.\(^11\) Advances in “pharmacogenetics” rely on observations that involved specific patient populations, with particular genotypes responding differently to the same drug treat-
ment. In some cases, the genetic heterogeneity may affect drug metabolism or clearance. For examples, the angiotensinogen gene haplotypes were associated with hypertension in Taiwanese patient, which may interfere with the treatment in heart failure patient.\textsuperscript{12,13} In other cases, the responses to therapy may differ, due to physiologic differences between polymorphisms of enzymes and metabolic pathways affected. Previous studies also reported interethnic differences in the frequencies of genotype polymorphisms of the renin-angiotensin system in Chinese heart failure patients.\textsuperscript{14-16} How such information in the future can influence our treatment decisions remains to be investigated.

Racial differences have recently emerged as a “surrogate maker” for underlying genetic heterogeneity. Although clinical evidence has often been extrapolated from one race to another, clinical presentations and physiologic differences can be observed in different racial cohorts. For example, in a cohort study of patients admitted with a diagnosis of heart failure, South Asian patients were found to be younger and more often had concomitant diabetes mellitus and acute ischemic heart disease than Caucasian patients.\textsuperscript{17} The recent African American Heart Failure Trial (A-HeFT) confirmed what was believed from earlier studies: that fixed-dose hydralazine-isosorbide dinitrate can be beneficial in African American patients with NYHA class III-IV heart failure.\textsuperscript{18} However, there is hardly any evidence of direct causal relationships, and therefore these associations can be plagued with selection biases (especially when racial categories are often self-reported). To date, there has been limited evidence to suggest that Chinese patients would respond differently to various heart failure medications when compared to other ethnicities. Therefore current treatment approaches in Taiwan still follow the general guidelines generated from professional societies from Western societies such as the American Heart Association and American College of Cardiology.

**Cultural differences**

In Taiwan, patients have three characteristics; those are “quick fix” culture,\textsuperscript{19} “doctor-shopping” culture\textsuperscript{20} and “herbal-drug preference” culture.\textsuperscript{21-23} While these may be acceptable practices in common ailments, it can be largely detrimental in the case of heart failure. Regardless of underlying etiologies, the overall health literacy of patients in Taiwan is far lower than that of their Western counterparts. Physicians operate largely on a paternalistic model without carefully explaining treatment options and providing the necessary counseling for dietary and lifestyle modifications. With the lack of understanding of the chronicity of the heart failure syndrome, many Taiwanese patients only seek the least amount of drugs or procedures to relieve symptoms,\textsuperscript{24} and often fail to understand their responsibilities to alter their long-term lifestyles or adhere to medical advices.\textsuperscript{25} They may also have a limited understanding of the gravity of the diagnosis when undertreated. These may translate into recurrent hospitalizations and unnecessary morbidity and mortality.

**Current evidence-based treatment in heart failure: implications for Taiwan**

**Medical therapies for heart failure**

Our clinical approach to heart failure is a reflection of the conceptual model applicable to the prevalent understanding of the pathophysiology. It is likely that different models may reflect different aspects of the heart failure syndrome, and the relative balance can be different with different individuals and in various clinical settings (Figure 2). The cardio-renal model highlights the importance of congestion as the therapeutic target, and provides the rational basis for the use of diuretics to control the volume status of patients with heart failure. In contrast, the cardio-circulatory model emphasizes hemodynamic alterations as the primary target, and provides the rationale for the use of vasodilators (afterload reduction) or inotropic therapy (augment contractility) to improve cardiac output in order to improve symptoms of heart failure. These two models have been widely applied as major therapeutic strategies to improve signs and symptoms.
and symptoms of heart failure over the past three decades. However, these therapeutic strategies have yet to prevent progression of heart failure, nor have they led to prolonged life for patients with moderate to severe heart failure except vasodilator therapy in selected patients. The “serendipitous” discovery of the importance of antagonizing the renin-angiotensin-aldosterone system has broadened our understanding of the so-called “neurohormonal model,” whereby over-expression of biologically active molecules that are capable of exerting toxic effects on the heart and circulation can be antagonized. Serum norepinephrine, angiotensin-II, vasopressin, and endothelin all have vasoconstrictive properties that are operative in the setting of heart failure. Overactive neurohormonal pathways, via aldosterone and vasopressin (anti-diuretic hormone), can directly result in volume retention. Several approaches have successfully administered adequate neurohormonal antagonism to alleviate such adverse effects without compromising the patients’ well-being (side effects of drug therapy, such as hypotension or azotemia). These medications included: β-adrenergic blockers, angiotensin-converting enzyme (ACE) inhibitors, and aldosterone receptor antagonists. These drugs can halt or even reverse the progressive cardiac dilatation that occurs as heart failure progresses, and many are affordable for broad adoption. Major societies have published extensive guidelines for the treatment of heart failure. These include extensive guidelines from the American College of Cardiology/American Heart Association, European Society of Cardiology, Canadian Cardiovascular Society, and Heart Failure Society of America. These guidelines all emphasize the importance of timely and adequacy of treatment with neurohormonal antagonist, with careful monitoring and maintenance of the euvolemic state. Their recommendations are based on an impressive collection of clinical trials that establish the “evidence” for medical therapy (Table 1), and can be readily applicable in Taiwan.

**Device therapies for heart failure**

The past decade also witnessed an important shift from predominantly pharmacologic management to the broadened use of medical devices. The availability of reliable and compact implantable converter defibrillators (ICDs) has led to enormous advances through the indications established from several clinical trials. Data from several clinical trials have also suggested that chronic right-sided pacing may actually worsen long-term cardiac performance, which has led to improved algorithms of pacing. Other major randomized trials have demonstrated mechanical dyssynchrony as an important target of therapy in some patients with heart failure over standard optimal medical therapy. However, the biggest limitation of broad adoption of ICD and cardiac resynchronized therapy (CRT) therapy remains largely related to the cost. Few communities will be able to afford to treat all patients based on evidence from outcomes trials, and the experience of broad adoption of device therapies has led to significant numbers of patients who were CRT “non-responders,” and effective defibrillation occurring only in less than 20% of implanted ICDs. Furthermore, an integrated and interdisciplinary approach facilitating optimal patient selection, device optimization and careful titration of the medical therapy in the post-implantation period is critical for maximizing the response of device therapies, although the exact protocols for optimization remain to be prospectively validated.

**Surgical therapies for heart failure**

There has been great promise in specialized heart failure surgical interventions, but heart transplantation remains the most effective long-term treatment for patients with refractory heart failure symptoms to date. In large transplant centers, the 1-, 5-, and 10-year survival rates averaged 85%, 70%, and 60%, respectively. Assessment of patient prognosis without transplantation can be reasonably determined by objective measurement of cardiac geometry and performance, hemodynamic abnormalities, degree of neurohormonal activation, and impairment in exercise tolerance. Mechanical assist devices have established clear roles as bridges to heart transplant and in the management of postcardiotomy shock. The first prospective randomized trial of long-term left ventricular assist device (LVAD) support for end-stage heart failure, the Randomized Evaluation of Mechanical Assistance for the Treatment of Congestive Heart failure (REMATCH) Trial, showed a 48% reduction in the risk of death in the LVAD cohort. Progressive LV remodeling may contribute independently to the future deterioration of LV function. Further work is needed in improving the durability of the devices and limiting complications.
Managing co-morbidities

While many doctors have focused on the treatment of the heart failure syndrome, there has been more and more recognition that co-morbidities have greatly affected the clinical outcomes of patients with acute and chronic heart failure. Several important co-morbidities are worth special attention. For example, renal preservation is important both prognostically and therapeutically. Chronic diuretic therapy may be potentially harmful, according to the post-hoc analyses.80,81 Judicious use of diuretics is beneficial when done with careful consideration of optimal volume status. Recent attention has also focused on the contributions of unexplained anemia (or “anemia of heart failure”) in morbidity and mortality and as a potential therapeutic target.82 Indeed, administration of erythropoiesis stimulating agents (such as darbepoetin-alfa) in anemic patients with heart failure has been associated with improved quality of life and

### Table 1.

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<th>Drugs</th>
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| Digoxin                      | Class IIa       | DIG trials46-48                                   | 1. maintaining serum digoxin level 0.5–0.8 ng/mL in men, 0.5–0.9 ng/mL in women.  
2. systolic dysfunction with atrial fibrillation.  
3. Start digoxin despite appropriate therapy, including an ACE inhibitor, and/or beta blocker. |
| Diuretics                    | Class I         | Cochrane review49                                 | 1. furosemide, bumetanide and torsemide.  
2. A continuous infusion of a loop diuretic may improve diuresis and reduce toxicity when compared to intermittent bolus injections.49 |
| ACEI                          | Class I         | CONSENSUS,50  
SOLVD51                                         | 1. asymptomatic or symptomatic left ventricular dysfunction.  
2. Begin therapy with low doses (e.g., 2.5 mg of enalapril twice daily, 6.25 mg of captopril three times daily, or 5 mg of lisinopril once daily). |
| Angiotensin receptor blockade (ARB) | Class Ia (if ACEIs intolerant) | ELITE II,51  
VAL-HeFT,52  
CHARM-Added,53  
CHARM-Alternative,54  
VALIANT,55 ARCH-156 | 1. addition of an ARB, if tolerated, to HF therapy in patients who are still symptomatic on ACE inhibitors and beta blockers.  
2. an ARB should not be added to an ACE inhibitor in the immediate post-MI setting. |
| β-blocker                    | Class I         | MERIT-HF,57,58  
COPERNICUS, U.S. Carvedilol Heart Failure Study,38  
CIBIS II,59,60  
COMET61                           | 1. carvedilol, metoprolol, and bisoprolol.  
2. equivalent survival benefit in patients with stable class IV compared with those with class II and III.36,58,60  
3. improvement in survival is additive to that induced by ACE inhibitors.62 |
| Aldosterone antagonist       | Class IIa (cre < 2.5 mg/dL in men, < 2.0 in women, K < 5.0 meq/L) | RALES,49  
EPHESUS63 | 1. spironolactone and eplerenone.  
2. The role of aldosterone blockade in mild-to-moderate HF has not been defined, and its use is not recommended in such patients.  
3. spironolactone 30% reduction in mortality, eplerenone 15% reduction in mortality in post-MI patients. |
| Hydralazine/Isodil (ISDN-HYD) | Class IIa (who are already taking an ACEIs and β-blocker for symptomatic HF) | VAC,30  
V-HeFT,34,64  
A-HeFT65 | 1. Hydralazine (25 mg tid to 100 mg tid) and isosorbide dinitrate (40 mg tid or qid) or mononitrate (40 to 120 mg QD) produce modest benefit in patients with HF compared to placebo,30 and are less effective than ACE inhibitors.34  
2. benefit of fixed-dose ISDN-HYD in addition to standard therapy, especially in AA.18,65 |
functional capacity, but larger studies are ongoing to provide conclusive evidence.

Another important co-morbid condition commonly found in Taiwan is diabetes mellitus. While the primary focus of many studies has been on the impact of diabetes mellitus on coronary ischemia, it has been well established that the diabetic myocardium is prone to a wide spectrum of abnormalities, and the use of several anti-diabetic medications (such as metformin, thiazolidinedione, and even insulin) in patients with underlying heart failure has been challenging. The side-effects of fluid retention, edema and congestive heart failure have been reported in the literature with regard to the use of PPARγ agonists (or thiazolidinediones). There is also relatively good documentation in the literature that thiazolidinediones do not produce adverse haemodynamic consequences. Thiazolidinediones-induced fluid retention is often sub-acute in nature, developed over weeks to months following initiation. Current approval of thiazolidinedione use in patients with mild (NYHA class I-II) and stable heart failure is supported by existing literature and clinical experience. To date, the appropriate goals and ranges of glycemic control in patients with advanced heart failure are still not established, but it is reassuring that all evidence-based medications have been shown to be equally effective in the diabetic population.

**Medical therapies for decompensated heart failure**

For most patients presenting with acute decompensated heart failure, adequate tissue perfusion and relief of congestion are still the mainstay therapeutic goals. According to the cardio-circulatory model, there are two strategies: an early and sustained reduction in filling pressures by vasodilator therapy, and in some cases an overdrive of existing contractile apparatus by inotropic therapy. These strategies were designed decades ago, and had not been rigorously tested in modern-day clinical trials. Over the past years, it is becoming clearer and more benign form of parenteral support for acute decompensated heart failure than inotropic therapy, as a large proportion of patients present with vascular alterations and/or diastolic dysfunction rather than worsening contractile impairment. In contrast, the weight of current evidence supports the hypothesis that drugs acting to increase intracellular cyclic adenosine monophosphate in the myocardium are associated with adverse long-term outcomes, most prominently increased mortality. Even overzealous use of intravenous diuretics in this setting may promote rather than suppress the neurohormonal response to heart failure.

Vasodilators have fallen out of favor with many physicians, but their beneficial effects have been well established. Nitroglycerin acts by increasing intracellular levels of cyclic guanosine monophosphate (GMP), resulting in venous and, for higher doses, arterial vasodilation. The advantages of nitroglycerin include low cost, patient comfort, and a proven safety profile. Sub-optimal dosing aside, there are two primary obstacles to the effective use of nitroglycerin, the phenomenon of tolerance and its effect on neurohormonal pathways. Sodium nitroprusside has been proven to effectively and rapidly reduce filling pressures and increase stroke volume through venous and arterial dilation. However, the use of sodium nitroprusside requires frequent titration, and careful monitoring of hemodynamic alterations have to be achieved via a pulmonary artery catheter. The risk of thiocyanate toxicity has been widely quoted, although clinically, patients appear to tolerate sodium nitroprusside infusions well. Synthetic analogues of natriuretic peptides such as nesiritide in the United States and carperitide in Japan have also been used as vasodilators with ancillary properties in the setting of acute decompensated heart failure. Short-term infusion of nesiritide has been shown to substantially improve hemodynamics and heart failure symptoms in a randomized, controlled comparison with nitroglycerin in patients with decompensated advanced heart failure. However, recent post-hoc meta-analyses linking nesiritide use and adverse effects, specifically, worsening renal function and death, has prompted concerns about long-term safety.

The challenges to identify effective drug therapies highlight the difficulties facing clinical drug development, regulatory approval, and clinical applications, particularly in the setting of acute decompensated heart failure. The Acute Decompensated Heart Failure National Registry (ADHERE) shows that most hospitalizations for acute decompensated heart failure are due to congestion in patients refractory to oral diuretics. Approximately 25% to 30% of patients may develop diuretic resistance, defined as reduced diuresis and natriuresis (serum creatinine [sCr] ≥ 1.5 mg/dl, high daily oral diuretic...
doses [furosemide > 80 mg, torsemide > 40 mg, or bumetamide > 2 mg], or both).98 Therapies for diuretic resistance have had limited success. Ultrafiltration is an alternative treatment that has been shown to reduce right atrial and pulmonary artery wedge pressures and increase cardiac output, diuresis, and natriuresis without changes in heart rate, systolic blood pressure (SBP), renal function, electrolytes, or intravascular volume.99 Early ultrafiltration in patients with fluid overload and diuretic resistance have been shown to favorably decrease length of stay and re-hospitalizations in high-risk heart failure patients.100 An optimal strategy utilizing continuous renal replacement therapy can dramatically improve the patient’s clinical condition, mitigate the neurohumoral stimulation, increase urinary output and promote absorption of excessive extravascular fluid.101

Improving the focus and organization of care (Figure 3)
Heart failure disease management clinics

Although numerous studies have shown that medications and lifestyle modifications may reduce mortality in chronic heart failure, adherence to these interventions is often below optimal levels. Granger and colleagues assessed the association between adherence and clinical outcome in the CHARM (Candesartan in Heart failure: Assessment of Reduction in Mortality and morbidity) programme. They found that good adherence to medication (> 80% of their prescribed drugs) was associated with a lower risk of death than poor adherence in patients with chronic heart failure irrespective of treatment or placebo groups.102 This is a very important observation to illustrate that discovering an effective drug can only be effective if the drug is being utilized, and compliance itself (in other words, closer attention to self-management) is associated with improvement in outcomes.

When studied in the context of multidisciplinary teams, often led by cardiologists, nurse specialists have been shown to contribute significantly to improving outcomes.103-105 Three elements are crucial to the success of these programs. First, specially trained nurses should be key components of any heart failure intervention.106-108 In the United States, nurses often assume the role as “specialists” who are trained to manage patients with heart failure as physician extenders, and are able to monitor patients’ volume status and titrate various heart failure medications, as well as triage and sometimes avert admissions. In Taiwan, the nursing specialists have helped make a 41.8% total cost reduction in an organized heart failure management in one University hospital.108 Second, efforts should be made to educate patients and their caregivers about the self-management of heart failure, precipitating factors, and the need for compliance with medication and dietary advice (particularly because most heart failure re-admissions are caused by factors that patients can be taught to recognize and avoid).109 Finally, there must be ready access to clinicians with an interest and expertise in treating patients with heart failure, especially in complex levels of care when faced with end-stage strategies of transplant, end-of-life issues, or mechanical support.

Evidence-based practice implementation in hospital setting

Despite the compelling clinical trial evidence and guideline endorsements regarding the use of ACE inhibitors and β-blockers in chronic heart failure, these agents continue to be largely underused.110 Recent trends have identified the hospital as an ideal setting for initiating these therapies, and systematic improvement in the process of care may be more effective than identifying novel therapies. For example, the Initiation Management Pre-discharge Process for Assessment of Carvedilol Therapy for Heart Failure (IMPACT-heart failure) trial demonstrated that in-hospital initiation of β-blockade resulted in a significantly greater use of β-blockers at 60 days after randomization compared with post-discharge initiation at the physician’s discretion.111 This is in contrast with clinical practice a decade ago, when β-blockes

![Figure 3. Heart failure care algorithm.](image-url)
kers were contraindicated in the setting of acute decompensation and physicians often waited until patients became “stable” in the ambulatory care setting – in many cases without restarting. Several studies have demonstrated that in-hospital initiation of evidence-based, guideline-recommended lifesaving therapies has markedly improved treatment use, long-term patient compliance, and clinical outcomes in patients with cardiovascular disease. The benefits of in-hospital drug initiation has been confirmed by the Organized Program to Initiate Lifesaving Treatment in Hospitalized Patients with Heart Failure (OPTIMIZE-HF) program, which contains a hospital tool kit with evidence-based best practices algorithms, critical pathways, standardized orders, discharge checklists, pocket cards, chart stickers, and a variety of other elements to assist hospitals in improving heart failure management. Using these toolkits, increased rate of carvedilol use at discharge has been associated with an early survival benefit. The benefits of exercise training have been reported in skeletal muscles, respiratory and cardiovascular systems, and in their physiological responses to exercise. A systematic review of 81 published studies, including 2387 exercising heart failure patients, and a meta-analysis of nine randomized, parallel-controlled trials, including 801 patients, has recently concluded that properly supervised training programs are safe and associated with clear evidence of an overall reduction in mortality. In this setting, symptom-limited CPET has the following uses: (1) definition of exercise tolerance; (2) selection of exercise training intensity; (3) assessment of improvement in functional capacity; and (4) prognostic evaluation.

**Current challenges for Taiwan**

Despite increasing heart failure disease burden in Taiwan, several factors may account for a wide treatment gap between clinical practice guideline recommendations and actual clinical practice in the care of patients with heart failure. Efforts should be made for doctors in centers as well as of primary care to be aware of and familiar with the existing clinical practice guideline recommendations. In addition, the overall health literacy issue in Taiwan society may require the setting up of a nationwide registration and education program to improve the awareness of heart failure self-management. This extensive patient educational program may require the involvement of non-physician healthcare providers with direct care responsibilities in the format of disease management programs, as seen in Western societies. However, the global budget payment system challenges the resources needed to further care and education for patients with heart failure.

Taiwan’s National Health Insurance (NHI) program, which was implemented in 1995, is planning a hospital case payment system to avoid unnecessary utilization. The vast discrepancies in the quality of care provided by different medical institutions have prompted the proposal of “pay for performance,” whereby reimbursements for medical services rendered is rewarded by a graded pay scale. The experience of heart failure center in National Taiwan University Hospital has demonstrated a decrease in hospital expenditure, ambulatory clai-
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nic visiting rate, and days of hospital’s stay. The 5-year survival rate has also increased from 50% to 66%.108

The NHI in Taiwan is going to apply the concept of Diagnosis Related Groups (DRGs) throughout the health care system in 2008. Quality control will be a rising issue in the new payment system. It is suggested that the NHI should design and execute the clinical pathway along with the new DRG system to monitor and control the quality of heart failure care. The disease management program with patient education should be a necessary element in the heart failure treatment, which has been proven to be cost-effective in various literature.108

CONCLUSION

Heart failure is a costly disease with an increasing prevalence, and will likely pose a significant burden in the coming decades in Taiwan. Although there have been great strides in the development and application of evidence-based treatment strategies, the prognosis for patients with heart failure is still poor, in some cases worse than many of the cancer diagnoses. Changes in the concept of the heart failure syndrome have transformed this once-believed terminal illness into a manageable chronic condition, readily responsive to special therapies and counseling. However, the treatment of heart failure (as well as the organization of heart failure care) has received far lesser attention and recognition in Taiwan, in part because there is no single procedure or therapy that has been embraced by physicians specialized in taking care of patients with heart failure. The multidisciplinary approach with coordinated care is novel in Taiwan, and the training of heart failure nurse specialists and establishment of rehabilitation programs are urgently needed.

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改善心臟衰竭病人的治療 — 臺灣可以更進步

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心臟衰竭是一個成長中的全世界性問題，由於心臟疾病治療的改善以及心臟衰竭治療的日趨複雜，我們必須正視此問題的重要性，若不妥善處理，無論病人數及其花費將節節攀升，此篇綜論主要討論西方國家與台灣在心臟衰竭治療之異同，在不同的面向上討論我們有那些地方可以改善並進而增進病人的福祉。

關鍵詞：心臟衰竭、臺灣、整合治療。