

# Adherence to heart failure guidelines in an Australian hospital: Can we do more?

Viviane Khalil<sup>1,2</sup>, Melanie Danninger<sup>3</sup>, Wei Wang<sup>4</sup>, Hanan Khalil<sup>5</sup>

1. Medication Safety Pharmacist and Clinical Educator, Peninsula Health, Pharmacy Department, 2 Hastings Road, Frankston, Vic 3199, Australia.
2. Clinical Tutor, School of Pharmacy Postgraduate Studies and Professional Development Unit, Monash University, Parkville, Vic 3052, Australia.
3. Pharmacy student, Karl-Franzens-University, Institute of Pharmaceutical Science, Graz, Austria.
4. Senior Research Fellow (Biostatistician), Peninsula Clinical School, Faculty of Medicine, Nursing and Health Sciences, Monash University, Frankston, Vic 3199, Australia.
5. Senior Lecturer, Faculty of Medicine, Nursing and Health Sciences, Monash Rural Health, Monash University, Clayton, Vic 3168, Australia.



## Background:

The Australian National Heart Foundation Guidelines have been developed to guide clinicians on how to manage chronic heart failure (CHF) patients according to the best available evidence.

## Aims:

The primary aim of this study is to evaluate the proportion of patients prescribed evidence-based therapy (EBT) for CHF on discharge at this hospital. The secondary aims are to assess prescribing patterns on cardiac wards compared to medical wards and to explore the role of the pharmacist in the management.

## Method:

A retrospective cross sectional audit of consecutively admitted patients with a diagnosis of CHF was conducted to examine and evaluate their management against National Guidelines<sup>1</sup> for a period of 6 months from April 2013 to September 2013 in a large teaching hospital. Patients with a discharge diagnosis of CHF as per the International Classifications of Diseases (ICD 10) coding for patients with congestive heart failure (150.0), left ventricular failure (150.1), or hypertensive heart disease with congestive heart failure (111.0) were included in the study.

## Results:

A total of 618 patients met the inclusion criteria. Patients' demographics are shown in **Table 1**. At discharge, a total of 53% (n=323) of patients were discharged on angiotensin converting enzyme inhibitors/angiotensin receptor blockers (ACE/ARB), 49% (n=304) were discharged on  $\beta$ -blockers, 15% (n=96) were on aldosterone receptor antagonists (ARA), 90% (n=559) were discharged on diuretics, and 29% (n=178) were discharged on digoxin. Patients discharged from cardiac wards were more likely to be prescribed EBT than those discharged on medical wards: ACEI/ARB (OR=1.244, 95%CI 0.793-1.954),  $\beta$ -blockers (OR= 2.266, 95%CI 1.403-3.660), ARA (OR= 1.557, 95%CI 0.873-2.777), diuretics (OR= 1.249, 95%CI 0.661-2.361) and Digoxin (OR= 1.399, 95%CI 0.824-2.373). **Refer to Table 2**. Pharmacist reviewed 29% (n=182) of all orders. In this subset of the cohort, a higher percentage of patients were discharged on EBT compared with those who did not have a clinical pharmacist's input: ACEI/ARB (58% vs 50%,  $\chi^2 = 2.191$ ),  $\beta$ -blockers 54% vs 47%,  $\chi^2= 2.509$ ), ARA (19% vs 14%,  $\chi^2= 1.622$ ), diuretics (96% vs 88%,  $\chi^2= 2.891$ ) and Digoxin (35% vs 26%,  $\chi^2= 33.858$ ). **Refer to Table 3**.

Demographics	Total n=618 n (%)	Cardiac ward n = 133 n (%)	Medical wards n = 485 n (%)	
<b>Demographics</b>				
Age (years, Mean $\pm$ SD)	78.9 $\pm$ 11.7	71.9 $\pm$ 13.9	80.9 $\pm$ 10.2	t (172.897)= 7.766**
Male	298 (48.2)	78 (58.6)	220 (45.4)	$\chi^2$ (1)= 6.856**
<b>Co-morbidities</b>				$\chi^2$ (df = 1)
Hypertension	406 (66)	81 (61)	325 (67)	0.638
Atrial Fibrillation	321 (52)	64 (48)	257 (53)	0.806
Kidney Disease	271 (44)	44 (33)	227 (47)	7.434**
Chronic Obstructive Pulmonary Disease	232 (38)	28 (21)	204 (42)	17.052**
Ischaemic Heart Diseases	230 (37)	53 (40)	177 (36)	0.369
Acute myocardial infarction	225 (36)	64 (48)	161 (33)	9.123**
Diabetes Mellitus	216 (35)	53 (40)	163 (34)	2.707
Valvular disease	158 (26)	51 (38)	107 (22)	15.412**
Asthma	100 (16)	17 (13)	83 (17)	0.289

\*P < .05 and \*\*P < .01

	ACEI/ARB Odds ratio (95%CI)	B-blockers Odds ratio (95%CI)	ARA Odds ratio (95%CI)	Diuretics Odds ratio (95%CI)	Digoxin Odds ratio (95% CI)
Male Gender	0.664* (0.465-0.947)	1.093 (0.767-1.558)	0.754 (0.466-1.218)	1.093 (0.694-1.722)	OR=1.138 (0.745- 1.738)
Age	0.977** (0.961-0.994)	0.978** (0.961-0.995)	0.964 (0.945-0.984)	1.009 (0.988-1.030)	0.993 (0.972-1.015)
Acute myocardial infarction	0.742 (0.507- 1.086)	1.925** (1.328- 2.790)	0.922 (0.548-1.550)	1.215 (0.745-1.980)	0.923 (0.595-1.432)
Diabetes mellitus	1.736** (1.198- 2.515)	1.566* (1.084- 2.261)	1.399 (0.847-2.312)	2.389** (1.340-4.231)	1.231 (0.801-1.891)
Atrial Fibrillation	1.264 (0.889- 1.798)	1.928** (1.351 -2.753)	0.860 (0.520-1.421)	1.038 (0.638-1.691)	9.107** (5.652-14.675)
Kidney disease	0.387** (0.271- 0.554)	1.094 (0.766- 1.564)	0.409** (0.241-0.694)	0.696 (0.432-1.121)	0.682 (0.452-1.028)
Hypertension	1.848** (1.279- 2.670)	1.275 (0.889- 1.828)	0.558* (0.344-0.907)	1.295 (0.813-2.062)	1.049 (0.695-1.585)
Ischemic heart disease	1.216 (0.837-1.767)	1.220 (0.847- 1.757)	1.244 (0.737-2.101)	1.276 (0.764-2.131)	0.955 (0.624-1.461)
Valve disease	1.099 (0.735-1.642)	1.050 (0.703- 1.567)	1.784* (1.066-2.987)	1.069 (0.627-1.824)	1.269 (0.792-2.033)
Chronic Obstructive Pulmonary Disease	0.853 (0.591- 1.231)	0.598** (0.415- 0.862)	1.325 (0.797-2.202)	1.293 (0.791-2.114)	1.605* (1.054-2.444)
Asthma	1.903** (1.166- 3.106)	1.253 (0.770- 2.037)	1.119 (0.596-2.101)	0.649 (0.360-1.172)	0.716 (0.411-1.247)
Cardiac wards	1.244 (0.793-1.954)	2.266* (1.403- 3.660)	1.557 (0.873-2.777)	1.249 (0.661-2.361)	1.399 (0.824-2.373)

\*P < .05 and \*\*P < .01

	Pharmacist input Number n = 182 n (%)	No pharmacist input n = 436 n (%)	$\chi^2$ (df = 1)
ACEI/ARB	104 (58%)	219(50%)	2.191
B Blockers	99 (54%)	205(47%)	2.509
ARA	34(19%)	62(14%)	1.622
Diuretics	175(96%)	384(88%)	2.891
Digoxin	63(35%)	115(26%)	33.858*

## Conclusion

This study highlighted existing gaps between EBT and prescribing practice in this hospital. There is further opportunity to assist in closing gaps in prescribing practice by promoting adherence to CHF guidelines.

## Reference:

1. Khalil et al. An audit of adherence to heart failure guidelines in an Australian hospital: A pharmacist perspective. J Eval Clin Pract. 2017 May 17. doi: 10.1111/jep.12760.