**Appendix**

Direct healthcare costs calculations

The cost analyses were conducted from a perspective of the Australian healthcare system and the use of all healthcare resources were measured during the 12-month follow-up period. Costs were calculated in Australian Dollars and were grouped into three types: hospital-based costs, community-based costs and heart failure (HF) specific management costs.

Hospital-based costs: This included components for acute rehospitalization, rehabilitation and palliative care, non-admitted emergency and outpatient department services. All rehospitalizations were standardized and categorised based on the Australian Refined Diagnosis Related Groups (AR-DRG) version 8.0 (1). Costs were calculated using the National weighted average unit ($4,883) in 2016-2017 multiply by the ‘price weights’ for admitted acute patients and adjusted for the duration of hospital length of stay (2). An additional $982 was added to those admitted via the emergency department (as an unplanned admission) and the cost of $442 was applied to all non-admitted emergency department cases (2). Rehabilitation and palliative care costs were calculated by the ‘price weights’ for admitted sub-acute and non-acute patients. Costs for outpatient department services were calculated based on the Tier 2 classification system for non-admitted services according to assessment of both nature and speciality of healthcare professional providing the service (2).

Community (out of hospital) costs: The costs for all allied health visits, general practitioner visits (including one health assessment and one care management plan per patient per annum), nursing home / aged care (high versus low dependency plus an additional rate for patients with behaviour problem or require complex care) were multiplied by the respective unit costs (Table 1). The costs for pharmaceuticals were estimated from the Pharmaceutical Benefits Scheme (PBS) drug costings multiplied by duration of use of the composite of these medications.

HF-specific management costs: This was based on specialist CHF nurse delivering HF-specific management of care based on the WHICH I program (3) to both study arms, structure telephone support (STS) for the rural dwelling patients allocated to the standard management (SM) and for all patients allocated to the intensified form of HF management programme (INT-HF-MP). The costs of home visit travels were calculated at baseline for all INT-HF-MP patients. Brain Natriuretic Peptide (BNP) tests were assessed at 3, 6 and 9 months and a combination of repeat home visits and STS was reapplied at 6 to 12 month follow-up.

**Supplementary Table 2 WHICH? II Study health expenditure calculation**

|  |  |  |
| --- | --- | --- |
|  | **Description / cost calculation** | **Source** |
| **Hospital costs** National weighted average unit: $4883 (base) | | |
| Acute readmissions  Elective vs. unplanned | **Inlier** = base x inlier + $986 (if unplanned) **Long stay** = base (inlier + outlier of long stay) x (LOS - upper bound of inlier LOS) + $986 (if unplanned)  **Short stay** = base (short base + outlier of short stay) x LOS + $986 (if unplanned) | Price weights for admitted acute patients - AR-DRG V8.0 (2) |
| Rehabilitation | **Inlier** = base x inlier  **Long stay** = base (inlier + outlier of long stay) x (LOS - upper bound of inlier LOS)  **Short stay** = base (short base + outlier of short stay) x LOS | Price weights for admitted sub-acute and non-acute patients - AN-SNAP V4.0 (2) |
| Palliative care |
| Emergency department costs – admitted cases | Weighted average of admitted ED cases, weighted by historical numbers of admitted ED patients according to triage categories: $986 | NHCDC Round 18 Emergency Department by Urgency Related Group (4) |
| Emergency department costs – non-admitted cases | Weighted average of non-admitted ED cases, weighted by historical numbers of non-admitted ED patients according to triage categories: $442 | NHCDC Round 18 Emergency Department by Urgency Related Group (4) |
| Outpatient department service costs | Weighted average of clinic and procedure cases, weighted by historical numbers of patients for the clinic attended and procedure undertaken: $283 | NHCDC Round 18 Non-admitted Tier 2 class version 2.1 (4) |
| **Community-based costs** | | |
| Allied health practitioner | Consultation: $62.25 | The Australian Government Department of Health Medicare Benefits Schedule – Allied Health Services - item numbers 10950-10955 (5) |
| General practitioner | Consultation: $37.05 (level B consultation) | The Australian Government  Department of Health Medicare Benefits Schedule Book (Operating from 01 November 2016) - item number 23 (5)  Item number 703 (5)  Item number 721 (5) |
| Annual health assessment: $137.90 |
| Annual care management plan: $144.25 |
| Pharmaceuticals | PBS drug cost data | Schedule of Pharmaceutical Benefits (6) |
| Nursing home / aged care | High dependency care: $110.55 per day  Behavioural problem: $36.19  Complex care: $67.32 | The Australian Government Department of Health Aged Care Subsidies and Supplements New Rates of Payment from 1 July 2016 -  Residential Aged Care Subsidies and Supplements (7) |
| Low dependency care: $79.80 per day Behavioural problem: $36.19  Complex care: $67.32 |
| **Heart failure specific management costs** |  |  |
| Multidisciplinary program of care | $121 per patient per month FU for all patients allocated to the INT-HF-MP and SM | Maru et al. Int. J. Cardiol. 2015 201, 368-375. (8) |
| Home visits | Cost of travel – petrol reimbursement: $0.73 per km for patients allocated to the INT-HF-MP arm at baseline and additional home visits 6-12 months FU | ACU Finance Office |
| Structure telephone support | Telephone consultations: $8,798.52 per month  for rural patients (SM) and all patients (INT-HF-MP) | Heart Foundation Cost Recovery |
| BNPs | $22 per test to monitor patients aged <75 years old (INT-HF-MP) | Alere Triage® BNP Test |

**Legend:** ACU, Australian Catholic University; AR-DRG, Australia-refined diagnostic related grouping; BNP, brain natriuretic peptide; ED, emergency department; FU, follow-up; INT-HF-MP, intensified form of heart failure management programme; length of stay; NHCDC, National Hospital Cost Data Collection; PBS, pharmaceutical benefits scheme; SM, standard management; STS, structure telephone support. All costs are reported as 2014 values.

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