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## Octogenarians' post-acute care use after cardiac valve surgery and recovery: clinical implications

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## ABSTRACT

Octogenarians receiving cardiac valve surgery is increasing and recovery is challenging. Post-acute care (PAC) services assist with recovery, yet services provided in facilities do not provide adequate cardiac-focused care or long-term self-management support. The purpose of the paper was to report post-acute care discharge rates in octogenarians and propose clinical implications to improve PAC services. Using a 2003 Medicare Part A database, we studied post-acute care service use in octogenarians after cardiac valve surgery. We propose expansion of the Geriatric Cardiac Care model to include broader clinical therapy dynamics. The sample (n = 10,062) included patients over 80 years discharged from acute care following valve surgery. Post-acute care services were used by 68% of octogenarians following cardiac valve surgery (1% intermediate rehabilitation, 35% skilled nursing facility, 32% home health). The large percentage of octogenarians using PAC point to the importance of integrating geriatric cardiac care into post-acute services to optimize recovery outcomes.

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## Introduction

Octogenarians are a rapidly growing segment of the United States population, and are projected to reach more than 25 million by the year 2050.<sup>1</sup> It is estimated that 40% of octogenarians suffer from symptomatic cardiac disease<sup>2</sup> that is complicated by multiple comorbidities, frailty, and disability. Many of these patients are referred for cardiac valve evaluation and undergo surgery. However, because of the complex issues associated with aging, recovery is extended and octogenarians face different problems post discharge than younger valve patients.

Following discharge, post-acute care (PAC) services are available and are delivered in intermediate rehabilitation facilities (IRF), skilled nursing facilities (SNF), or home health care (HHC). The majority of older adults over the age of 65 (51%) discharged from an acute-care setting following a cardiac event use PAC.<sup>3</sup> Post-acute care services offer physical and occupational therapy and education for patients to improve activities of daily living (ADL) but typically do

not emphasize cardiac disease management<sup>4</sup> and/or intricacies of noncardiac management that impact cardiovascular recovery.

Self and family management are essential components for successful outcomes following PAC such as reduced re-hospitalizations and improved self-rated health.<sup>5</sup> At discharge from acute care, patients are provided a list of activities that include medication management, diet and activity orders, and information on symptom management. For older adults, self-management is predictably complicated by polypharmacy, physical, psychological, and sensory limitations and reduced social and economic resources.<sup>6</sup> Therefore, family management is often required to assist with self-management.

In cardiology, a model of geriatric cardiac care has been proposed that emphasizes a patient-centered approach, screening for coexisting geriatric syndromes and comorbidity, management of pharmacological regimens, and the emphasis on the importance of transitions of care.<sup>6</sup> We propose expansion of this model to include family and self-management that addresses management of medications, diet, activity, and symptoms. Integrating the Geriatric Cardiac Care model into the services provided during the transition from hospital to home will contribute to successful outcomes following hospitalization for octogenarians after valve surgery.

The current paper provides a clear picture of PAC use in octogenarians after cardiac valve surgery by reporting the proportion of patients who are discharged to IRF, SNF, or home with HHC.

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Implications for clinical practice are provided that integrate geriatric cardiac care.

## Methods

Secondary reporting using data from the 2003 Medicare Part A database (Medicare Provider Analysis and Review, MedPAR) and the Center for Medicare and Medicaid Denominator file was reported previously.<sup>3</sup> The MedPAR is an administrative database that contains all Medicare-reimbursed inpatient hospital stays. This paper highlights the findings for octogenarians following cardiac valve surgery and the clinical implications. Though the data are from 2003, the population of older adults continues to increase and more are receiving invasive surgeries like valve replacements. Furthermore, IRF still has the same requirements for admission today as it did in 2003. As our population continues to age with an increasing number of older adults needing and receiving cardiac surgery, PAC use must be taken into consideration when making healthcare decisions for type of treatment. This data provides a baseline for future comparisons of traditional valve replacement methods and the basis of additions to the Geriatric Cardiac Care model.<sup>6</sup> The original study was determined to be exempt from the University Institutional Review Board.

### Study population

The secondary report include Medicare beneficiaries 80 years of age and older who survived an incident hospitalization for cardiac valve surgery in 2003 (N = 10,062). Cardiac valve surgery was identified from the entire MEDPAR 2003 database according to the *International Classification of Diseases, Ninth Revision, Clinical Modification* diagnosis code. The original study population did not include patients enrolled in Medicare Managed Care as their primary health insurance was not available in the database. Beneficiaries were excluded if they were hospitalized for two or more cardiac events, or were 90 years of age and older and not receiving Medicare Part B (since these individuals are considered to be deceased). The last exclusion criterion was suggested by the Research Data Assistance Center for use in deleting invalid cases. Furthermore, disabled and end-stage renal patients were excluded since PAC use may have been related to these diseases and not the primary diagnosis.

### Variables

The outcome variable, post-acute care type, was derived from the MedPAR database and categorized as (1) IRF, (2) SNF, and (3) HHC. Since this variable is not a billing-based field and MedPAR is designed for billing purposes, the PAC variable required validation prior to statistical analysis. This was done by matching a destination code with a hospital discharge date and subsequent PAC admission date. Matches were found for 96.4% of the records and those not validated were excluded from further analysis.

### Statistical analysis

The original analysis included merging of the MedPAR and the denominator file using patient identifiers. Variables were examined using descriptive statistics and chi-square tests. Analyses were completed with SAS 9.1 for UNIX (SAS Institute Inc., Cary, NC). For this secondary analysis, descriptive statistics were compared.

## Results

Overall, 68% of octogenarians after cardiac valve surgery used PAC. Types of PAC used following hospitalization for cardiac valve

**Table 1**

Post-acute care service use in octogenarians.

PAC Service	Total N (%)
Skilled Nursing Facility	3540 (35)
Intermediate Rehabilitation Facility	105 (1)
Home Health Care	3207 (32)
Home	3210 (32)

surgery in Medicare beneficiaries 80 years of age and older are displayed in [Table 1](#). The proportion of patients discharged to SNF was 35.2% (n = 3540), but only 1% (n = 105) for IRF. Patients discharged home and home with HHC were 31.9% (n = 3210) and 31.9% (n = 3207), respectively.

## Discussion

Sixty-eight percent of octogenarians used PAC after cardiac valve surgery. This proportion of PAC use after discharge from valve surgery in octogenarians is significantly higher compared to prior work on all people ages 65 and greater.<sup>3</sup> Notable findings also included low use of IRF.

Octogenarians use PAC for several reasons. First, octogenarians typically have multiple comorbidities and disabilities that complicate or prolong a patient's surgery and compromise recovery. Also, this group is known to be more frail than younger patients, particularly among women.<sup>7</sup> This could be the reason a disproportionate amount of women who used SNF services when compared to men. Furthermore, with increased need of assistance in activities of daily living, older persons may not have available family members to assist in care at home and; therefore, need a place to recover to return home independently. The original study reported that octogenarians after valve surgery were seven times more likely to be discharged to skilled nursing facilities.<sup>3</sup> Future research is needed to determine why such a high percentage of patients need extensive services post-discharge.

Surprisingly, the number of octogenarians discharged to an IRF was extremely low at 1%. This low rate is most likely due to the lack of reimbursement from Medicare. Cardiac valve surgery is not a reimbursable diagnosis-related code for IRF services.<sup>8</sup> In-patient rehabilitation facilities generally cost more than a SNF and provide intense rehabilitation therapy three times each day. Therefore, it seems likely that if a Medicare policy change was initiated, use of IRF would increase. More research is needed to determine the benefits of octogenarians' use of IRF programs to determine the benefits of this intensive rehabilitation.

After experiencing surgery, octogenarians typically face longer hospitalizations, increased resource use, and, in some studies, more than double face discharge to a SNF when compared with lower age groups.<sup>1</sup> While some assume that technical advances in valve repair and replacement may ease the challenges of post-acute care, the opposite is more likely. Indeed, surgical techniques are improving with generally better acute outcomes. Moreover, older patients are increasingly being referred for transcatheter aortic valve replacements or mitral clip repairs, which are generally better tolerated procedures than traditional valve surgery. However, such technical advances are serving to broaden accessibility of valve replacement and repairs to patients who previously were considered too frail, functionally impaired, or too medically complicated for these options. However, while many more are likely to survive the valve procedure, it is uncertain if they will yield true clinical benefit (e.g. longevity, function, quality of life) as a consequence thereafter. Future

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