Rehospitalization Is a Major Determinant of Inpatient Care Costs in Adult Congenital Heart Disease

A part of the rapid increase in U.S. health care costs is attributable to the enlarging group of adult congenital heart disease (ACHD) patients (1–3). We examined predictors of annual inpatient cost among patients with ACHD, to better understand which clinical variables have the greatest influence on inpatient spending.

We analyzed data from the State Inpatient Databases from Arkansas (2008 to 2010), California (2003 to 2012), Florida (2005 to 2012), Hawaii (2006 to 2010), Nebraska (2003 to 2011), and New York (2005 to 2012) in the Healthcare Cost and Utilization Project (4). These State Inpatient Databases were selected because they uniquely track hospitalizations in individual patients longitudinally. The primary outcome was financial burden accrued over a 12-month period for care of individual ACHD patients. We identified patients by selecting patients with an age of >18 having a 3-digit ICD-9 code of 745, 746, or 747. To this group of patients we applied a validated hierarchical algorithm described by Broberg et al. (5), excluding any patients who failed to be classified according to this algorithm. We then excluded patients with an index hospitalization within the first or last 12 months (n = 25,703), patients for whom there was no cost data available for any given hospitalization (n = 14,038), and trimming (n = 1,395), this yielded a final sample size of 68,314.

The average age of ACHD patients analyzed was 57.0 ± 18.6 years and 51% were women. Seventy percent of patients were white, and the most common payers at the time of hospitalization were Medicare (42%) and private insurance (38%). Forty percent of patients underwent an operative procedure during the study period.

Readmitted patients had greater annual costs than non-readmitted patients by $23,993 (95% CI: $23,400 to $24,586; p < 0.001). Cost was $16,822 greater for patients having operative procedures (95% CI: $16,151 to $17,493; p < 0.001), with aortic valve operations in particular responsible for $10,795 increased cost (95% CI: $9,728 to $11,861; p < 0.001). The estimated increase or decrease in cost for all variables included in the model are depicted in Figure 1.

In the present study, we investigated the relative contribution of clinical factors to annual inpatient care cost among patients with ACHD. We found that readmission was responsible for the largest portion of cost variability, followed closely by operative procedures. This fact suggests that, unlike the demographic factors driving increases in ACHD spending, some portion of overall expenditure may be preventable and a target for improved efficiency.

There are multiple limitations to the present study related to the use of administrative data, which has unverifiable completeness and accuracy. In addition, tracking of individual patients does not cross state lines and the present analysis does not account for
death; thus, the individual patient costs reported may be an underestimate. Finally, despite the known influence of geography on outcomes, we did not include state of hospitalization as a variable due to incomplete state representation. Limited state representation may have biased our overall results.

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REFERENCES

Thoracic Endovascular Aortic Repair for Type B Aortic Dissection

Analysis Among Acute, Subacute, and Chronic Patients

Thoracic endovascular aortic repair (TEVAR) has been increasingly applied for type B aortic dissection with encouraging results. However, the timing of therapy remains undefined, especially for those who do not need emergent interventions. There was a hypothesis that the dissecting membrane was fragile

| Bar graph depicting the additional annual cost in U.S. dollars of having each of the investigated variables. CAD = coronary artery disease; CHF = congestive heart failure. | FIGURE 1 Increase in Annual Inpatient Cost for Adult Congenital Heart Disease Patients With the Indicated Variables |

- Readmission
- Age (Per year)
- Female gender
- Length of stay (Per day)
- Operative procedure
- Bacterial Infection
- Uncomplicated Diabetes
- Anemia
- Complicated Hypertension
- Pulmonary Heart Disease
- CHF
- Atrial Fibrillation
- Uncomplicated Hypertension
- CAD
- Anemia
- Congestive Heart Failure
- Peripheral vascular disease
- Reactive Airways Disease
- Acute Renal Disease
- Chronic Renal Disease
- Care Complications
- Aortic valve operation
- CAD = coronary artery disease; CHF = congestive heart failure.