

Anne Arundel Medical Center

Certificate of Need Application: Cardiac Surgery

DATA SOURCES AND TECHNICAL NOTES

Data sources

Population data

- Nielsen Site Reports
 - Population data for CY2008-2013 and population projections through CY2019 were based on Nielsen Site Reports
- Age cohorts
 - Population projections were prepared by age cohort as defined in COMAR regulations for Specialized Cardiac Services:
 - 15-44 years
 - 45-64 years
 - 65+ years

Zip codes and county classification

- United State Postal Service zip code database
 - Zip code level data was mapped to Maryland counties based on the United State Postal Service zip code database

Hospital discharges

- Maryland hospitals: HSCRC Discharge Abstract Database (CY2008-CY2013)
- Washington, DC hospitals: District of Columbia Hospital Association Discharge Database (CY2008-2013), obtained through the Maryland Health Care Commission

Definitions for cardiac surgery

The definitions for cardiac surgery and for PCI were based on the procedure codes specified in the State Health Plan regulations for Specialized Cardiac Services. All market analyses and utilization trends were documented on the basis of these definitions and limited to age cohorts 15+ years old.

Cardiac surgery discharges were identified as those discharges with any of the following ICD-9 procedure codes:

- 35.00-35.09
- 35.10-35.51
- 35.53-35.95
- 35.97-35.99
- 36.03
- 36.10-36.19
- 36.31
- 36.91-36.99
- 37.10-37.11
- 37.32-37.33
- 37.37

Total adult cardiac surgery discharge volume

Total volume was defined by:

- Patients age 15+ years old
- Discharges with any of the defined procedure codes recorded in any coded position for the discharge
- Discharges at approved cardiac surgery hospitals, only, in Maryland and in Washington, DC

Service area definition for adult cardiac surgery

The proposed service area for cardiac surgery was largely defined in whole county units to align with the definitions adopted in Health Planning Regions for cardiac surgery.

- Level 1 criteria (Whole county definition): Counties neighboring AAMC that demonstrate
 - Geographic access concerns
 - High rates of outmigration
 - Proximity to AAMC and demonstrated utilization of AAMC
- Level 2 criteria to segment Prince George's and Calvert County (Zip code definition): Zip code clusters from these two counties that the HSCRC has formally assigned to AAMC in its Global Budget Revenue contract
 - Includes a total of 23 zip codes from Prince George's and Calvert Counties

The defined service area includes 5 counties within the Upper Shore region and 2 counties within the Metropolitan Washington region.

Use rate calculation for the defined service area

Historical use rates and projected use rates were calculated for the Baltimore Upper Shore segments (5 counties) and for the Washington Metropolitan segments (Prince George's and Calvert County communities) as follows:

- Total cardiac surgery discharges at Maryland and Washington, DC hospitals were documented, by age cohort, for the population in the defined cardiac surgery service area (CY2008-2013)
- Actual and projected population was documented, by age cohort (2008-2019)
- The adult cardiac surgery discharge rate was calculated for the defined service area, by year and by age cohort; an overall use rate was calculated, defined in terms of cardiac surgery discharges per 100,000 population
 - This use rate reflects total cardiac surgery volume generated by the adult service area population, including utilization of Maryland or Washington, DC hospitals
- The average annual change in use rate was calculated across the most recent 6 year period (2008-2013) to provide the basis for projecting cardiac surgery volume, consistent with the projection methodology defined in COMAR regulations

The projected use rate for the defined service area was calculated as follows:

- The 6 year average annual change in use rate (2008-2013) was applied to the projected population (2014-2019) to calculate total projected discharges
- The 6 year average annual change in use rate was calculated separately for the Upper Shore portion and the Washington Metropolitan portion of the cardiac surgery service area population. This defined the total adult cardiac surgery market for the service area population.

Projected volume shifts by hospital

- Cohort A: Existing hospital patients at AAMC
 - Projected volume shifts by hospital based on the distribution of actual FY2014 transfers from AAMC to other hospitals
- Cohort B: Additional JHH shift of 50% of service area volume served at JHH
 - Total projected cases assumed to shift from JHH
- Cohort C: Further market share growth to achieve 40% market share
 - Projected volume shifts by hospital based on the same distribution by hospital as FY2014 transfers from AAMC to other hospitals
- Cohort D: Out of area volume
 - Projected volume shifts by hospital assumed to correspond to distribution of service area volume, by hospital

Projected volume shifts by payor

- FY2014 Medicare proportion of case volume was documented, by hospital, then increased by the annual rate of population growth for the 65+ age cohort, and renormalized to reflect the differential growth rates for the 0-64 and 65+ age cohorts

Projected DRG mix and utilization profile at AAMC

- The projected DRG mix, length of stay, and CMI at AAMC were based on the composite profile of adult cardiac surgery discharges at non-academic medical centers during FY2014. The DRG mix excludes heart transplants and left ventricular assisted device procedures.

Projected average charge per cardiac surgery case at AAMC

- The projected charge per case at AAMC was based on the product of the projected casemix of AAMC's cardiac surgery cases (3.4209) and AAMC's charge per casemix adjusted discharge (\$10,962).
 - AAMC's projected casemix of cardiac surgery patients was based on the DRG-specific casemix of cardiac surgery cases at non-academic medical centers.

Estimated Medicare payment for cardiac surgery at the Washington Hospital Center

- Based on MedPAR data (2013)
 - Actual payments, by DRG, documented from the CY2013 MedPAR database, including outlier payments
 - Average Medicare payment for WHC calculated based on the projected mix of cases at AAMC (for a weighted mix of DRG payments)
 - Federal market basket update applied in order to price level forward to FY2014

Estimated commercial payment for cardiac surgery at Washington Hospital Center

- Based on purchased claims analysis from a national vendor (CY2013 data)
 - Claims analysis based on patients served in the Washington, DC and Arlington jurisdictions in FY2013
 - FY2013 estimated payment, by MS DRG, trended to CY2014
 - MS DRG payments per case aggregated using the casemix of projected cardiac surgery cases at AAMC

Comparative payment across Maryland and Washington, DC hospitals

- Payment rates for Maryland hospitals were calculated as a weighted average of non-Medicare charges per case for cardiac surgery and 92% of charges per case for cardiac surgery services to Medicare beneficiaries (6% Medicare discount and 2% sequestration reduction) to equal the blended payment rate of 95.6%
- Average payment at the Washington Hospital Center was calculated based on DRG-specific payments
 - Medicare payment per discharge: Derived from MedPAR data and applied to the DRG mix of cases projected for AAMC (see above)

- Commercial payment per discharge: Documented through purchased claims analysis from a national vendor (see above))
 - Average payment calculated by MS-DRG, and applied to the DRG mix of cases projected for AAMC

Related market share analyses cited

- Joint replacement surgery (inpatient)
 - Defined by any of the following DRGs:
 - 461 Bilateral or multiple major joint procedures of lower extremity w MCC
 - 462 Bilateral or multiple major joint procedures of lower extremity w/o MCC
 - 466 Revision of hip or knee replacement w MCC
 - 467 Revision of hip or knee replacement w CC
 - 468 Revision of hip or knee replacement w/o CC/MCC
 - 469 Major joint replacement or reattachment of lower extremity w MCC
 - 470 Major joint replacement or reattachment of lower extremity w/o MCC
- Bariatric surgery (inpatient)
 - Defined by primary diagnosis code of 278.01 (Morbid obesity) alongside any of the following principal procedure codes:
 - 43.82
 - 44.38
 - 44.95
 - 43.89
- Percutaneous Coronary Intervention volume (PCI)
 - Volume defined by any of the following ICD-9 procedure codes:
 - 36.01
 - 36.02
 - 36.05-36.07

Anne Arundel Medical Center
Adult Cardiac Surgery: Service Area Definition

<u>County</u>	<u>Zip code</u>	<u>Town</u>
Anne Arundel	20701	Annapolis Junction
Anne Arundel	20711	Lothian
Anne Arundel	20724	Russett/Laurel
Anne Arundel	20733	Churchton
Anne Arundel	20751	Fort Meade
Anne Arundel	20755	Fort George
Anne Arundel	20758	Friendship
Anne Arundel	20764	Shady Side
Anne Arundel	20765	Galesville
Anne Arundel	20776	Harwood
Anne Arundel	20778	West River
Anne Arundel	20779	Tracy's Landing
Anne Arundel	21012	Arnold
Anne Arundel	21032	Crownsville
Anne Arundel	21035	Davidsonville
Anne Arundel	21037	Edgewater
Anne Arundel	21054	Gambrills
Anne Arundel	21056	Gibson Island
Anne Arundel	21060	Glen Burnie
Anne Arundel	21061	Glen Burnie
Anne Arundel	21062	Glen Burnie
Anne Arundel	21076	Hanover
Anne Arundel	21077	Harmans
Anne Arundel	21090	Linthicum
Anne Arundel	21098	Hanover
Anne Arundel	21106	Mayo
Anne Arundel	21108	Millersville
Anne Arundel	21113	Odenton
Anne Arundel	21114	Crofton
Anne Arundel	21122	Pasadena
Anne Arundel	21123	Pasadena
Anne Arundel	21140	Riva
Anne Arundel	21144	Severn
Anne Arundel	21146	Severna Park
Anne Arundel	21225	Brooklyn
Anne Arundel	21240	BWI Airport
Anne Arundel	21401	Annapolis
Anne Arundel	21402	Annapolis
Anne Arundel	21403	Annapolis
Anne Arundel	21404	Annapolis
Anne Arundel	21405	Sherwood Forest
Anne Arundel	21409	Annapolis
Anne Arundel	21411	Annapolis
Anne Arundel	21412	Annapolis
Anne Arundel	20610	Barstow
Calvert	20639	Huntingtown
Calvert	20678	Prince Frederick
Calvert	20689	Sunderland

<u>County</u>	<u>Zip code</u>	<u>Town</u>
Kent	21610	Betterton
Kent	21620	Chestertown
Kent	21635	Galena
Kent	21645	Kennedyville
Kent	21650	Massey
Kent	21661	Rock Hall
Kent	21667	Still Pond
Kent	21678	Worton
Kent	21690	Chestertown
Prince George's	20613	Brandywine
Prince George's	20623	Cheltenham
Prince George's	20706	Lanham
Prince George's	20708	Laurel
Prince George's	20715	Bowie
Prince George's	20716	Bowie
Prince George's	20720	Bowie
Prince George's	20721	Bowie
Prince George's	20735	Clinton
Prince George's	20769	Glenn Dale
Prince George's	20770	Greenbelt
Prince George's	20771	Greenbelt
Prince George's	20772	Marlboro
Prince George's	20773	Upper Marlboro
Prince George's	20774	Largo/Kettering
Queen Anne's	21607	Barclay
Queen Anne's	21617	Centreville
Queen Anne's	21619	Chester
Queen Anne's	21623	Church Hill
Queen Anne's	21628	Crumpton
Queen Anne's	21638	Grasonville
Queen Anne's	21644	Ingleside
Queen Anne's	21651	Millington
Queen Anne's	21656	Price
Queen Anne's	21657	Queen Anne
Queen Anne's	21658	Queenstown
Queen Anne's	21666	Stevensville
Queen Anne's	21668	Sudlersville
Talbot	21601	Easton
Talbot	21606	Easton
Talbot	21612	Bozman
Talbot	21624	Claiborne
Talbot	21625	Cordova
Talbot	21647	McDaniel
Talbot	21652	Neavitt
Talbot	21653	Newcomb
Talbot	21654	Oxford
Talbot	21662	Royal Oak
Talbot	21663	Saint Michaels

Calvert	20714	North Beach
Calvert	20732	Chesapeake Beach
Calvert	20736	Owings
Calvert	20754	Dunkirk
Calvert	21609	Bethlehem
Caroline	21629	Denton
Caroline	21632	Federalsburg
Caroline	21636	Goldsboro
Caroline	21639	Greensboro
Caroline	21640	Henderson
Caroline	21641	Hillsboro
Caroline	21649	Marydel
Caroline	21655	Preston
Caroline	21660	Ridgely
Caroline	21670	Templeville
Caroline	21681	Ridgely
Caroline	21682	Ridgely
Caroline	21683	Ridgely
Caroline	21684	Ridgely
Caroline	21685	Ridgely
Caroline	21686	Ridgely
Caroline	21687	Ridgely
Caroline	21688	Ridgely

Talbot	21665	Sherwood
Talbot	21671	Tilghman
Talbot	21673	Trappe
Talbot	21676	Wittman
Talbot	21679	Wye Mills