ANNE ARUNDEL MEDICAL CENTER

CERTIFICATE OF NEED

Johns Hopkins Cardiac Surgery at Anne Arundel Medical Center

Matter No. 15-02-2360

RESPONSE TO COMPLETENESS QUESTIONS

MARCH 30, 2015

Anne Arundel Medical Center

Contents

ANNE ARUNDEL MEDICAL CENTER
CARDIAC SURGERY PROGRAM CERTIFICATE OF NEED APPLICATION
COMPLETENESS RESPONSE

MARCH 30, 2015

EXHIBITS

PROJECT DESCRIPTION

QUESTION 1:

The application, on p. 9, states: *AAMC must transfer more than 200 patients each year for cardiac surgical care, a number in excess of the minimum requirement for a program.* This statement is repeated on p. 17, and alluded to elsewhere in the application. Does this mean literally transferred, in an ambulance or helicopter, or does it also include patients who are referred? Please document these numbers.

APPLICANT RESPONSE

Where our application states that AAMC patients "must be transferred," our analysis shows that more than 200 patients were **actually transferred** from AAMC to a cardiac surgery hospital in Fiscal Year 2014. It does literally mean that these patients were placed in an ambulance or helicopter directly from a unit of the hospital for transport to a hospital that provides cardiac surgery. The table below summarizes the number of cases transferred from the inpatient setting and from the outpatient setting. "Inpatient transfers" are those cases transferred from any inpatient care unit of the hospital. "Outpatient transfers" are patients who had an outpatient cardiac cath procedure at AAMC and were transported directly from the cath lab to a cardiac surgery hospital without having first been admitted to Anne Arundel Medical Center.

The transfer numbers were derived from a database of 246 cases coded at AAMC as transfers to another acute care hospital with a product line code of cardiology or cardiac surgery. Validation of the transfer and the reason for transfer, as stated by the transferring practitioner, were confirmed by review of the individual patient records.

The table also shows the number of patients who were not actually transferred, but rather discharged home with a referral for cardiac surgery, after having had an outpatient cath procedure. These data were derived from record review of 512 outpatient cardiac cath procedures. Where referral for cardiac surgery was documented in the procedure note or a progress note, the case was recorded as "outpatient referral for cardiac surgery."

Chart 45
Anne Arundel Medical Center Cardiac Surgery Case Review FY 2014

Transfer By Hospital

Hospital	Total Transfers from AAMC to Cardiac Surgery Hospitals	Total Assumed to Have Had Surgery
George Washington University Hospital	7	4
Johns Hopkins Hospital	40	32
Prince Georges County Hospital	1	0.5
Sinai Hospital	1	0.5
UM St. Joseph Medical Center	1	1
University of Maryland Medical Center	23	15.5
Union Memorial Hospital	2	1
Washington Adventist Hospital	6	3
MedStar Washington Hospital Center	124	84
Total, Inpatient Transfers[1]	**205**	**141.5**
Total, Outpatient Transfers[2]	**19**	**19.0**
TOTAL, ALL TRANSFERS	**224**	**161**

Transfer by Reason

Recorded Reason for Inpatient Transfer	Total Cases	Surgery Assumption	Total Assumed to Have Had Surgery
CABG	52	100%	52.0
Unspecified surgery	15	100%	15.0
Surgery (Valve)	9	100%	9.0
Evaluation for valve surgery	3	50%	1.5
Cardiac Cath for cardiac surgical evaluation	95	50%	47.5
Evaluation for cardiac surgery based on diagnosis	25	50%	12.5
Evaluation for cardiac cath/Valve	4	50%	2.0
Evaluation for cardiac cath/CABG	1	50%	0.5
N/A	1	0%	-
Total, Inpatient Transfers[1]	**205**		**141.5**
Outpatient Transfers[2]	**19**	**100%**	**19.0**
Outpatient Referrals for Surgery	**79**	**95%**	**75.1**
GRAND TOTAL, TRANSFERS AND REFERRALS	**303**		**234**

Notes:
[1] 7 inpatients were referred to non-cardiac surgery hospitals (due to patient request or insurance plan) and were excluded from this analysis
[2] 5 outpatients were transferred directly to another hospital for PCI procedures and were not counted as cardiac surgery cases

PROJECT DESCRIPTION

QUESTION 2:

Please document and quantify the statement on p. 15 that: *The CPORT program at AAMC, providing angioplasty for acute MI, has some of the highest volumes and best outcomes in Maryland, with exemplary door to balloon times, excellent results and outstanding quality of care.* Show those results compared to the compare group.

APPLICANT RESPONSE

Comparative data was obtained from the published data of Mission Lifeline. Mission Lifeline was created by the AHA to address improvement with STEMI patients based on AHA criteria. The data for Mission Lifeline is collected from receiving and referring centers through NCDR's Action GWTG registry and is a subset of data submitted to Action. The focus is on the EMS patients. The Mission Lifeline program was used to establish the standards for MIEMSS when they developed the CIC designation, which AAMC holds. This Mission Lifeline data for Q4-2013 to Q3-2014 is attached along with an Excel file outlining the data. (Exhibit 15).

The 13 hospitals within the AAMC region (Maryland EMS Region III) are not identified by name, only letter and AAMC is letter M. The various hospitals in Region III are listed below and include Johns Hopkins and UMMS, Maryland's two major academic university medical centers. EMS Region III also includes 5 hospitals with onsite cardiac surgery. AAMC ranks #4 of the 13 hospitals for total volume of acute MI patients treated by primary PCI and AAMC ranks #2 for shortest median door to balloon time of the 13 hospitals. These excellent door to balloon times and experience with treating large numbers of acute MI patients with primary PCI are consistent with the criteria used by MIEMSS in evaluating centers for a CIC designation. Excelling in these parameters should result in better outcome for acute MI patients and reflect the excellent integrated quality of care provided by AAMC.

Chart 46

Maryland EMS Region III (Anne Arundel, Baltimore City, Baltimore, Carroll, Harford, and Howard Counties)

AAMC
BWMC
Carroll Hospital Center
Franklin Square Hospital Center
Howard County General Hospital
JH Bayview
JHH
Sinai
St. Agnes
St. Joseph Medical Center
Union Memorial
UMMC

PROJECT DESCRIPTION

QUESTION 3:

The application states, on p. 18, that the service area defined for the proposed program extends beyond the HSCRC's GBR-defined service area. Please provide a list of zip codes in the defined service area, distinguishing between those that are in the GBR-defined service area and those that are not. (The listing in Appendix 2 seems to be the total presumed service area, greater than the GBR-defined service area.)

APPLICANT RESPONSE

The table below lists the complete set of zip codes included in AAMC's defined service area for cardiac surgery, and identifies whether or not the zip code is included in AAMC's GBR-defined service area. The list of zip codes includes:

- Five (5) whole counties of the Upper Shore, representing regions that are currently most distant from an existing cardiac surgery program and regions that Anne Arundel Medical Center is well-positioned to serve
    - The major criteria for defining AAMC's service area was evidence of access problems, as indicated by relatively long drive time to a cardiac surgery provider and heavy reliance on the highest cost hospitals. Utilization patterns by residents of these 5 counties demonstrated these indicators.
- 23 zip codes in Prince George's County and Calvert County that have been formally assigned to Anne Arundel Medical Center as part of its GBR service area
    - Anne Arundel Medical Center is heavily invested in population health efforts and service delivery in this region, and care management for cardiac care is a top priority in these communities

The large majority of zip codes in the cardiac surgery service area represent AAMC's GBR-defined service area. However, the additional communities of Kent, Queen Anne's, Talbot, and Caroline Counties, and the more distant Anne Arundel County zip codes are included as well; this reflects the explicit purposes of the new program to serve those geographic areas demonstrating access problems and provide residents with lower cost options closer to home.

Chart 47

Defined Area Zip Codes

Zip Code	County	AAMC-Defined Card Surg Service Area	GBR Defined Service Area
21122	Anne Arundel County	AAMC Card Surg Service Area	GBR - Extended Service Area
21061	Anne Arundel County	AAMC Card Surg Service Area	GBR - Extended Service Area
21060	Anne Arundel County	AAMC Card Surg Service Area	GBR - Extended Service Area
21144	Anne Arundel County	AAMC Card Surg Service Area	GBR - Extended Service Area
21108	Anne Arundel County	AAMC Card Surg Service Area	GBR - Extended Service Area
21113	Anne Arundel County	AAMC Card Surg Service Area	GBR - Extended Service Area
21090	Anne Arundel County	AAMC Card Surg Service Area	GBR - Extended Service Area
21076	Anne Arundel County	AAMC Card Surg Service Area	GBR - Extended Service Area
20724	Anne Arundel County	AAMC Card Surg Service Area	GBR - Extended Service Area
20755	Anne Arundel County	AAMC Card Surg Service Area	GBR - Extended Service Area
21123	Anne Arundel County	AAMC Card Surg Service Area	GBR - Extended Service Area
20701	Anne Arundel County	AAMC Card Surg Service Area	GBR - Extended Service Area
20758	Anne Arundel County	AAMC Card Surg Service Area	GBR - Extended Service Area
21056	Anne Arundel County	AAMC Card Surg Service Area	GBR - Extended Service Area
21062	Anne Arundel County	AAMC Card Surg Service Area	GBR - Extended Service Area
21077	Anne Arundel County	AAMC Card Surg Service Area	GBR - Extended Service Area
21240	Anne Arundel County	AAMC Card Surg Service Area	GBR - Extended Service Area
20639	Calvert County	AAMC Card Surg Service Area	GBR - Extended Service Area
20736	Calvert County	AAMC Card Surg Service Area	GBR - Extended Service Area
20678	Calvert County	AAMC Card Surg Service Area	GBR - Extended Service Area
20754	Calvert County	AAMC Card Surg Service Area	GBR - Extended Service Area
20732	Calvert County	AAMC Card Surg Service Area	GBR - Extended Service Area
20714	Calvert County	AAMC Card Surg Service Area	GBR - Extended Service Area
20689	Calvert County	AAMC Card Surg Service Area	GBR - Extended Service Area
20610	Calvert County	AAMC Card Surg Service Area	GBR - Extended Service Area
21629	Caroline County	AAMC Card Surg Service Area	GBR - Extended Service Area
21639	Caroline County	AAMC Card Surg Service Area	GBR - Extended Service Area
21640	Caroline County	AAMC Card Surg Service Area	GBR - Extended Service Area
21649	Caroline County	AAMC Card Surg Service Area	GBR - Extended Service Area
21660	Caroline County	AAMC Card Surg Service Area	GBR - Extended Service Area
21636	Caroline County	AAMC Card Surg Service Area	GBR - Extended Service Area
21670	Caroline County	AAMC Card Surg Service Area	GBR - Extended Service Area
21620	Kent County	AAMC Card Surg Service Area	GBR - Extended Service Area
20715	Prince George's County	AAMC Card Surg Service Area	GBR - Extended Service Area
20774	Prince George's County	AAMC Card Surg Service Area	GBR - Extended Service Area

20735	Prince George's County	AAMC Card Surg Service Area	GBR - Extended Service Area
20772	Prince George's County	AAMC Card Surg Service Area	GBR - Extended Service Area
20716	Prince George's County	AAMC Card Surg Service Area	GBR - Extended Service Area
20720	Prince George's County	AAMC Card Surg Service Area	GBR - Extended Service Area
20706	Prince George's County	AAMC Card Surg Service Area	GBR - Extended Service Area
20708	Prince George's County	AAMC Card Surg Service Area	GBR - Extended Service Area
20721	Prince George's County	AAMC Card Surg Service Area	GBR - Extended Service Area
20770	Prince George's County	AAMC Card Surg Service Area	GBR - Extended Service Area
20613	Prince George's County	AAMC Card Surg Service Area	GBR - Extended Service Area
20623	Prince George's County	AAMC Card Surg Service Area	GBR - Extended Service Area
20769	Prince George's County	AAMC Card Surg Service Area	GBR - Extended Service Area
20771	Prince George's County	AAMC Card Surg Service Area	GBR - Extended Service Area
20773	Prince George's County	AAMC Card Surg Service Area	GBR - Extended Service Area
21658	Queen Anne's County	AAMC Card Surg Service Area	GBR - Extended Service Area
21617	Queen Anne's County	AAMC Card Surg Service Area	GBR - Extended Service Area
21638	Queen Anne's County	AAMC Card Surg Service Area	GBR - Extended Service Area
21657	Queen Anne's County	AAMC Card Surg Service Area	GBR - Extended Service Area
21623	Queen Anne's County	AAMC Card Surg Service Area	GBR - Extended Service Area
21607	Queen Anne's County	AAMC Card Surg Service Area	GBR - Extended Service Area
21668	Queen Anne's County	AAMC Card Surg Service Area	GBR - Extended Service Area
21628	Queen Anne's County	AAMC Card Surg Service Area	GBR - Extended Service Area
21644	Queen Anne's County	AAMC Card Surg Service Area	GBR - Extended Service Area
21670	Queen Anne's County	AAMC Card Surg Service Area	GBR - Extended Service Area
21601	Talbot County	AAMC Card Surg Service Area	GBR - Extended Service Area
21625	Talbot County	AAMC Card Surg Service Area	GBR - Extended Service Area
21654	Talbot County	AAMC Card Surg Service Area	GBR - Extended Service Area
21679	Talbot County	AAMC Card Surg Service Area	GBR - Extended Service Area
21401	Anne Arundel County	AAMC Card Surg Service Area	GBR - Primary Service Area
21037	Anne Arundel County	AAMC Card Surg Service Area	GBR - Primary Service Area
21403	Anne Arundel County	AAMC Card Surg Service Area	GBR - Primary Service Area
21012	Anne Arundel County	AAMC Card Surg Service Area	GBR - Primary Service Area
21146	Anne Arundel County	AAMC Card Surg Service Area	GBR - Primary Service Area
21409	Anne Arundel County	AAMC Card Surg Service Area	GBR - Primary Service Area
21114	Anne Arundel County	AAMC Card Surg Service Area	GBR - Primary Service Area
21054	Anne Arundel County	AAMC Card Surg Service Area	GBR - Primary Service Area
21035	Anne Arundel County	AAMC Card Surg Service Area	GBR - Primary Service Area
21032	Anne Arundel County	AAMC Card Surg Service Area	GBR - Primary Service Area
20711	Anne Arundel County	AAMC Card Surg Service Area	GBR - Primary Service Area
21140	Anne Arundel County	AAMC Card Surg Service Area	GBR - Primary Service Area
20764	Anne Arundel County	AAMC Card Surg Service Area	GBR - Primary Service Area
20776	Anne Arundel County	AAMC Card Surg Service Area	GBR - Primary Service Area

20733	Anne Arundel County	AAMC Card Surg Service Area	GBR - Primary Service Area
20778	Anne Arundel County	AAMC Card Surg Service Area	GBR - Primary Service Area
20751	Anne Arundel County	AAMC Card Surg Service Area	GBR - Primary Service Area
21106	Anne Arundel County	AAMC Card Surg Service Area	GBR - Primary Service Area
21405	Anne Arundel County	AAMC Card Surg Service Area	GBR - Primary Service Area
20765	Anne Arundel County	AAMC Card Surg Service Area	GBR - Primary Service Area
20779	Anne Arundel County	AAMC Card Surg Service Area	GBR - Primary Service Area
21402	Anne Arundel County	AAMC Card Surg Service Area	GBR - Primary Service Area
21404	Anne Arundel County	AAMC Card Surg Service Area	GBR - Primary Service Area
21666	Queen Anne's County	AAMC Card Surg Service Area	GBR - Primary Service Area
21619	Queen Anne's County	AAMC Card Surg Service Area	GBR - Primary Service Area
21225	Anne Arundel County	AAMC Card Surg Service Area	
21098	Anne Arundel County	AAMC Card Surg Service Area	
21411	Anne Arundel County	AAMC Card Surg Service Area	
21412	Anne Arundel County	AAMC Card Surg Service Area	
21632	Caroline County	AAMC Card Surg Service Area	
21655	Caroline County	AAMC Card Surg Service Area	
21609	Caroline County	AAMC Card Surg Service Area	
21641	Caroline County	AAMC Card Surg Service Area	
21681	Caroline County	AAMC Card Surg Service Area	
21682	Caroline County	AAMC Card Surg Service Area	
21683	Caroline County	AAMC Card Surg Service Area	
21684	Caroline County	AAMC Card Surg Service Area	
21685	Caroline County	AAMC Card Surg Service Area	
21686	Caroline County	AAMC Card Surg Service Area	
21687	Caroline County	AAMC Card Surg Service Area	
21688	Caroline County	AAMC Card Surg Service Area	
21661	Kent County	AAMC Card Surg Service Area	
21678	Kent County	AAMC Card Surg Service Area	
21635	Kent County	AAMC Card Surg Service Area	
21645	Kent County	AAMC Card Surg Service Area	
21610	Kent County	AAMC Card Surg Service Area	
21650	Kent County	AAMC Card Surg Service Area	
21667	Kent County	AAMC Card Surg Service Area	
21690	Kent County	AAMC Card Surg Service Area	
21651	Queen Anne's County	AAMC Card Surg Service Area	
21656	Queen Anne's County	AAMC Card Surg Service Area	
21663	Talbot County	AAMC Card Surg Service Area	
21612	Talbot County	AAMC Card Surg Service Area	
21673	Talbot County	AAMC Card Surg Service Area	
21671	Talbot County	AAMC Card Surg Service Area	

21647	Talbot County	AAMC Card Surg Service Area	
21662	Talbot County	AAMC Card Surg Service Area	
21676	Talbot County	AAMC Card Surg Service Area	
21606	Talbot County	AAMC Card Surg Service Area	
21624	Talbot County	AAMC Card Surg Service Area	
21652	Talbot County	AAMC Card Surg Service Area	
21653	Talbot County	AAMC Card Surg Service Area	
21665	Talbot County	AAMC Card Surg Service Area	
20601	Charles County		GBR - Extended Service Area
20602	Charles County		GBR - Extended Service Area
20603	Charles County		GBR - Extended Service Area
20695	Charles County		GBR - Extended Service Area

PROJECT DESCRIPTION

QUESTION 4:

Given that existing room(s) will be turned over to be used by a prospective cardiac surgery program, please demonstrate that existing OR use allows for this new program. What % of OR capacity is AAMC currently running at?

APPLICANT RESPONSE

There is ample operating room capacity. The main operating room has 20 ORs. At present 16 are used on a daily basis. The current utilization is 62 % for FY 15 YTD based on 20 operating rooms and 78% for FY 15 YTD based on 16 operating rooms. Additionally, six operating rooms are located in the ambulatory surgery unit. The overall combined utilization is 65.8% FY 15 YTD based on 26 operating rooms.

CONSISTENCY WITH GENERAL REVIEW CRITERIA (COMAR 10.24.01.08G(3))

a) The State Health Plan

COMAR 10.24.10.04 A. – Acute Hospital Services Standards

CHARITY CARE POLICY

QUESTION 5:

Please describe how – other than postings in the hospital -- public notice of information regarding the hospital's charity care policy are distributed through methods designed to best reach the target population and in a format understandable by the target population on an annual basis.

APPLICANT RESPONSE

Our charity care policy can be found on AAMC's website (www.AAHS.org) in several ways:

- From the homepage use the "I want to…" navigation at the top, click "Pay My Bill" and then click on "Billing Policies." Financial Assistance is the first piece of content. https://aamc.ixt.com/BillingPolicies.aspx
- From the homepage, use the "Patients & Families" navigation at the top, then click "Financial Assistance and Billing" " and it will take you to the Financial Assistance & Billing page (http://www.aahs.org/patients-visitors/billing.php) where consumers can find patient financial services information in English and Spanish and find contact information to speak with a financial counselor.
- From the homepage, if you use the "SEARCH" function consumers can type in something like "Financial Assistance" or "Help Paying Bill" and it will take you the Financial Assistance & Billing page (http://www.aahs.org/patients-visitors/billing.php) where consumers can find patient financial services information in English and Spanish and find contact information to speak with a financial counselor.

These educational brochures are also used to communicate our financial assistance/charity care to patients:

- English: http://www.aahs.org/patients-visitors/pdfs/AAMC-PatientBillingBroch6.pdf
- Spanish: http://www.aahs.org/patients-visitors/pdfs/AAMC-PatientBillingBrochSP.pdf

In addition, attached as Exhibit 16 is a copy of the print media public notice regarding our charity policy which was published in the local newspaper and is done on an annual basis.

CHARITY CARE POLICY

QUESTION 6:

The Patient Financial Services – *Hospital Financial Assistance, Charity Care, Billing & Collection Policy* alludes to a Financial Assistance Policy as being posted on the AAMC website.

a) Is there a separate Financial Assistance Policy? It seems instead to be wrapped into the Patient Financial Services – *Hospital Financial Assistance, Charity Care, Billing & Collection Policy*?

b) If there is a separate policy please submit a copy and provide direction to where it is located on the web site.

APPLICANT RESPONSE

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a)

There is not a separate Financial Assistance Policy. AAMC maintains a single policy addressing all areas related to patient financial services. A link to the policy is included below.

b)

The policy can be accessed on the website at: https://aamc.ixt.com/BillingPolicies.aspx

In addition to that direct link, patients access the policy in the following ways:

From the AAMC homepage patients access the policy via the navigation bar by hovering over "I want to…" in the top left-hand corner and selecting "Pay my Bill." After clicking on "Pay my Bill" the patient selects "Billing Policies" on the navigation menu, and the financial assistance policy is the first policy.

From the AAMC homepage patients access the policy via the navigation bar by hovering over "Patients & Families" in the middle and selecting "Financial Assistance & Billing." After clicking on "Financial Assistance & Billing" the patient can click on links to view information on the financial assistance policy in either English or Spanish.

From the AAMC homepage patients can utilize the search bar in the top right-hand corner of the page to search "financial assistance," and that will return a link to information on AAMC's financial assistance policy.

COMAR 10.24.17 Cardiac Surgery Standards

MINIMUM VOLUME

QUESTION 7:

On p. 78 the following statement is made: *Findings: AAMC's current base of affiliated cardiologists generates the volume to support a cardiac surgery program of greater than 200 cases, even after the projected use rate factor has been applied.* Please explain what is meant by the phrase: even after the projected use rate factor has been applied.

APPLICANT RESPONSE

AAMC documented the number of cardiac surgery cases that affiliated cardiologists generated in FY2014, then discounted these FY2014 figures to project FY2017-2019 volume by using the same percentage decline factor projected for cardiac surgery volume in the overall service area. That is, AAMC was careful not to assume that affiliated cardiologists would generate the same volume in FY 2018 as they did in FY 2014, given that the MHCC has projected a use rate decline in the service area over that time period. Yet even after discount factor is applied, the projected referral volume from these 6 cardiology practices will support a cardiac surgery program of greater than 200 cases at Anne Arundel Medical Center.

The two charts below (Charts 8(a) and 8(b)) clarify this point and together replace Chart 8, page 79, of the Certificate of Need application. Following these charts, a more detailed review of the component steps of the methodology is provided.

It is important to point out that submitted with our CON application were over 300 letters of support, of which 12 were from cardiologists who also estimated the referral volume that they expected to direct to AAMC's new program. Attached for convenient reference are the letters from these cardiologists (Exhibit 17(a)).[1] The volume estimated by these cardiologists, alone, well exceeds the minimum volume requirement of 200 cardiac surgery cases.

[1] Attached also – as Exhibit 17(b) – is an additional letter of support from a local health officer, Dr. Jinlene Chan of the Anne Arundel County Department of Health. This letter was received after the submission of AAMC's CON application.

Chart 8(a)
"Base Volume Projection:" Volume from Existing Referral Sources

AAMC-affiliated Cardiology Practices	FY 2014 Cases	Total Projected Practice Referrals[2]			AAMC Estimated Share			AAMC Projected Volume		
		FY 2017	FY 2018	FY 2019	FY 2017	FY 2018	FY 2019	FY 2017	FY 2018	FY 2019
AAMC Cardiology Specialists	105	101	100	100	90%	90%	90%	91	90	90
Annapolis Cardiology Consultants, LLC	105	101	100	100	90%	90%	90%	91	90	90
Chesapeake Cardiac Care, P.A.	27	26	26	26	50%	75%	75%	13	19	19
Bay Cardiology	10	10	10	10	75%	90%	90%	7	9	9
Chestertown Cardiology	55	53	53	52	25%	50%	50%	13	26	26
Cardiology Associates [1]	120	115	115	114	50%	75%	75%	58	86	86
Total, 6 practices	**422**	**407**	**403**	**401**	**67%**	**80%**	**80%**	**274**	**321**	**319**

[1] Estimated based on 12 cardiologists in full time clinical practice @ 10 cases per physician per year
[2] Projections based on FY 2014 cases, adjusted for % change in projected service area discharges (see below)

Chart 8(b): Source and application of discount factor, FY2014-2019

	Actual FY2014	Projected FY2017	Projected FY2018	Projected FY2019
Card Surg: Total Market Volume	930	896	888	883
% change based on MHCC formula		*(3.56%)*	*(0.89%)*	*(0.56%)*
Cardiac Surgery Referrals: Estimated by 6 Card Practices	422	407	403	401
% market change applied		*(3.56%)*	*(0.89%)*	*(0.56%)*

Projections, 2014-2019: Component steps

The projection methodology prescribed in the State Health Plan, under COMAR 20.24.17 ("Specialized Health Care Services – Cardiac Surgery and Percutaneous Coronary Intervention Services") is based very largely on the average annual use rate change for the most recent 6 years of reported data. The 6 year average annual use rate change for each Health Planning Region is calculated based on historical data and applied to the projected population for each defined Health Planning Region to project total market volume (additional factors for inmigration and outmigration are also applied).

"Total Market Volume:" Population-Based Projections for AAMC's Service Area (Page 136, Chart 18)

This same projection formula was applied to AAMC's defined service area to project total market volume as follows:

- AAMC defined its cardiac surgery service area and calculated the average annual use rate change for this zip code-defined area consistent with the prescribed formula above (average annual use rate change for CY2008-2013). This average annual use rate change was then applied to the 2014-2019 projected population for this same zip code-defined area.
    - The average annual use rate change was calculated to be a modest decline, but was applied to a growing population. This resulted in a very modest decline in cardiac surgery discharges projected for the defined service area (referred to as total market volume): Discharges are projected to decline from 897 discharges in FY2017 to 883 discharges in FY2019.

Cardiac Surgery Referrals from Existing Referral Sources (Page 79, Chart 8(a))

Alongside the discharge volume documented above, AAMC also documented the number of cardiac surgery referrals estimated by the largest cardiology practices affiliated with AAMC. This volume is referred to as "Base Volume Projections," before any market share growth/further program recognition is considered.

- Based on discussions with cardiologists in the service area, AAMC documented the number of cardiac surgery cases that these clinicians referred in FY2014; this referral volume is documented in Chart 8(a) as FY2014 Actual.
- The number of practice referrals, by practice site, was "discounted" to project the total referral volume equivalent in FY2017-2019; the discount factor represents the percentage decline consistent with the same projected change in total market volume (see page 136, Chart 18 of application for "Population-Based Projections", or Chart 8(b) below):

Chart 8(b): Source and application of discount factor, FY2014-2019

	Actual FY2014	Projected FY2017	Projected FY2018	Projected FY2019
Total Market Volume	930	896	888	883
% Change		(3.56%)	(0.89%)	(0.56%)
Referral Estimates, 6 Practices	422	407	403	401
% Change		(3.56%)	(0.89%)	(0.56%)

- Finally, AAMC market share estimates were applied to reflect assumptions about Year 1 referral volume, followed by further program recognition and program reputation anticipated by FY2018-2019; this is expected to result in a higher degree of patient preference and volume direction by payers and ACOs.

Chart 8(a)
"Base Volume Projection:" Volume from Existing Referral Sources

	FY 2014 Cases	Total Projected Practice Referrals[2]			AAMC Estimated Share			AAMC Projected Volume		
		FY 2017	FY 2018	FY 2019	FY 2017	FY 2018	FY 2019	FY 2017	FY 2018	FY 2019
AAMC Cardiology Specialists	105	101	100	100	90%	90%	90%	91	90	90
Annapolis Cardiology Consultants, LLC	105	101	100	100	90%	90%	90%	91	90	90
Chesapeake Cardiac Care, P.A.	27	26	26	26	50%	75%	75%	13	19	19
Bay Cardiology	10	10	10	10	75%	90%	90%	7	9	9
Chestertown Cardiology	55	53	53	52	25%	50%	50%	13	26	26
Cardiology Associates [1]	120	115	115	114	50%	75%	75%	58	86	86
Total, 6 practices	**422**									

		407	**403**	**401**	**67%**	**80%**	**80%**	**274**	**321**	**319**

[1] Estimated based on 12 cardiologists in full time clinical practice @ 10 cases per physician per year

[2] Projections based on FY 2014 cases, adjusted for % change in projected service area discharges (see below)

The analysis demonstrates that despite the modest decline in overall market volume, AAMC's current referral base of cardiologists - - by itself - - can be expected to support a cardiac surgery program of more than 250 discharges in Year 1, and will support program growth to achieve more than 300 cases by FY2019.

Worth noting is that the volume projections presented in Chart 8(a) are limited to referral volume from local area practices, and do not even include the out-of-area referrals that AAMC expects to serve.

MINIMUM VOLUME

QUESTION 8:

On p. 80 of the application there is a reference to AAMC's review of the records of all inpatient and outpatient direct transfers arranged from AAMC to other hospitals for cardiac surgery. It states that the review included all patients transferred for cardiovascular bypass surgery and valve surgery, as well as a portion of patients transferred specifically for evaluation for cardiac surgery and that "clinicians assumed that 50% of those patients transferred for evaluation for cardiac surgery…received cardiac surgery."

a) How many of these patients were definitively referred for cardiac surgery, and how many for evaluation?
b) What was the basis for assuming that 50% of those referred for evaluation actually had cardiac surgery performed?

APPLICANT RESPONSE

a)

As noted in our response to Question 1, the below table shows the number of patients whose transfer notes definitively stated that they were transferred to have cardiac surgery. These have a surgery assumption of 100%, and include 76 inpatient transfers and 19 transfers from the cath lab following outpatient procedures, for a total of 95. Please note that these are direct transfers; these patients were transported directly from AAMC to the accepting hospital for cardiac surgery.

In addition, there were 79 patients expressly referred for cardiac surgery. These patients were discharged with cardiac diagnoses for which surgery was indicated and were instructed to contact a specific cardiac surgeon or hospital cardiac surgery clinic. Documentation of the referral was identified in the procedure note or a progress note. We have assumed that 5% of them may have chosen to disregard the referral and therefore have counted them as a 95% assumption of surgery, or 75 cases.

Chart 48 Transfer by Reason

Recorded Reason for Inpatient Transfer	Total Cases	Surgery Assumption	Total Assumed to Have Had Surgery
CABG	52	100%	52.0
Unspecified surgery	15	100%	15.0
Surgery (Valve)	9	100%	9.0
Evaluation for valve surgery	3	50%	1.5
Cardiac Cath for cardiac surgical evaluation	95	50%	47.5
Evaluation for cardiac surgery based on diagnosis	25	50%	12.5
Evaluation for cardiac cath/Valve	4	50%	2.0
Evaluation for cardiac cath/CABG	1	50%	0.5
N/A	1	0%	-
Total, Inpatient Transfers[1]	**205**		**140.0**
Outpatient Transfers[2]	**19**	**100%**	**19.0**
Outpatient Referrals for Surgery	**79**	**95%**	**75.1**
GRAND TOTAL, TRANSFERS AND REFERRALS	**303**		**234**

Notes:

[1] 7 inpatients were referred to non-cardiac surgery hospitals (due to patient request or insurance plan) and were excluded from this analysis

[2] 5 outpatients were transferred directly to another hospital for PCI procedures and were not counted as cardiac surgery cases

b)

We estimated that 50% of patients transferred for evaluation for cardiac surgery or for cardiac catheterization had cardiac surgery performed based on the experience of AAMC cardiologists. Over 75% of our inpatient transfers and all of our direct cath lab transfers were made by cardiologists. All of our cardiologists know that we perform cardiac caths here and many perform caths themselves. They do not normally transfer a patient for evaluation or cath unless they believe that surgery will probably be indicated.

MINIMUM VOLUME

QUESTION 9:

Please list the counties making up the "service area that incorporates 5 counties from within the Baltimore Upper Shore region, and segments from 2 counties of the Washington Metropolitan region." (p.85)

APPLICANT RESPONSE

References to Health Planning Regions are based on the definitions included in the State Health Plan, COMAR 10.24.17, "Specialized Health Care Services – Cardiac Surgery and Percutaneous Coronary Intervention Services."

AAMC's cardiac surgery service area includes:

5 counties from within the Baltimore Upper Shore Health Planning Region (whole counties)

- Anne Arundel County
- Talbot County
- Kent County
- Queen Anne's County
- Caroline County

Zip code segments from the Washington Metropolitan Health Planning Region (23 selected zip codes)

- Prince George's County (zip codes included in AAMC's GBR-defined region)
- Calvert County (zip codes included in AAMC's GBR-defined region)

IMPACT

QUESTION 10:

In the *The Effect of Location – Impact on Maryland Hospitals* section the conclusion is drawn that the existing cardiac surgery hospitals operating in Maryland would be expected to have no reduction in their net income from services as a result of cardiac surgery volume shifting to AAMC (p. 90) due to HSCRC policy that you state "is designed so that there will be no adverse financial impact on a Maryland hospital as a result of the hospital losing patients to AAMC's cardiac surgery program" because 50% of the revenue would stay with that hospital. Please react to MHCC staff's belief that -- even if hospitals losing volume were to retain 50% of the associated revenue as AAMC posits – their revenue losses would be significantly greater than the incremental cost (variable cost) of the lost volume.

APPLICANT RESPONSE

It would be appropriate for Commission staff to accept a 50% market share adjustment as a fair rebalancing of revenue for hospitals losing volume to a new program at AAMC.

First, whether variable costs constitute 50% of hospital costs or not, HSCRC policy takes the balance of fixed and variable costs into account in its considered judgment that a 50% market share adjustment is generally appropriate. Indeed, this 50% adjustment methodology is reflected in the HSCRC's latest draft market shift adjustment policy.[1]

In that regard, note that Maryland hospitals face **no** decrease in budget for volume reductions caused by factors other than market share adjustments. For instance, for patients kept healthy, the hospital gets to keep 100% of its budgeted revenue while saving on the variable costs for those patients, thus increasing profitability.

Second, the variable costs of cardiac surgery could be greater than the fixed costs. In particular, cardiac surgery requires the use of costly supplies. A recent DRG-based analysis of Medicare costs found that for major cardiovascular procedures without cardiac catheterization, supplies accounted for ***40%*** of the cost. *See* **"Supply costs dominate high-cost DRGs,"** ***Healthcare Financial Management*** **59.1 (2005): 100** (enclosed as Exhibit 18(e)). For procedures involving medical devices – such as pacemaker device replacement or implantation of a defibrillator – the cost of supplies alone can exceed 50%. *See Id.* Even assuming that non-supply costs are generally fixed (though of course significant costs like wages or not), a 50% revenue adjustment would be adequate compensation.

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[1] MedPAC recently estimated that less than 50% of hospital costs are truly fixed. *See* **Medicare Payment Advisory Commission (US). "Online Appendix: Hospital inpatient and outpatient services: Assessing payment adequacy and updating payments." In *Report to the Congress: Medicare payment policy*. Medicare Payment Advisory Commission (2015): p.3 (enclosed as Exhibit 18(d)).**

Third, lost profitability for Maryland hospitals impacted by the Project would be negligible in any event, given the size of the hospitals' budgets generally.

Indeed, it should be noted that the Maryland hospitals most affected by a new program – JHH and UMMC – have belied this concern. JHH has endorsed AAMC's application. Similarly, UMMS is apparently prepared to absorb the full cost – fixed and variable – of a new program at BWMC. That is, a program at BWMC would take many more cases from UMMC than a program at AAMC, and yet UMMS would receive **no budget increase** for cases lost to BWMC (let alone the 50% adjustment for case lost to AAMC).

A 50% estimate of the final market share adjustment or variable cost factor policy is reasonable.

In AAMC's projection of the financial impact of the relocation of cardiac surgery cases from cardiac surgery hospitals to AAMC, we have assumed that the HSCRC would adjust the Maryland cardiac surgery hospitals' target budgets by either a market shift adjustment or a volume adjustment that would remove 50% of the charges of the relocated cases from the cardiac surgery hospital's GBR target budgets. This 50% adjustment methodology is reflected in the HSCRC's latest draft market shift adjustment policy. These reductions to each Maryland cardiac surgery hospital's target budgets are listed in the last column of Chart 4. For example, Johns Hopkins has 69 cardiac surgery cases that will be relocated to AAMC with aggregate charges of $4,497,006. Therefore, its GBR target budget would be reduced by 50% (the assumed percentage of variable costs) or $2,248,503(50% x $4,497,006).

Under the assumed HSCRC policy, this is the GBR target budget adjustment associated with the AAMC program and the revenue loss that JHH would realize.

As variable costs are assumed to be 50% and actually implied in the HSCRC's draft market shift adjustment policy, JHH would be expected to reduce its costs by 50% of the costs of its 69 relocated cases. Therefore, JHH would lose 50% of the charges (and patient revenue) of the 69 relocated cases, while reducing its costs by 50% of the costs of the 69 cases. This means that the HSCRC policy will result in a virtually negligible effect on JHH's profitability.

COST-EFFECTIVENESS

QUESTION 11:

The response to this standard failed to treat part (c) of the standard, i.e.: ***An applicant shall provide an analysis of how the establishment of its proposed cardiac surgery program will alter the effectiveness of cardiac surgery services for cardiac surgery patients in its proposed service area, quantifying the change in effectiveness to the extent possible. The analysis of service effectiveness shall include, but need not be limited to, the quality of care, care outcomes, and access to and availability of cardiac surgery services.*** AAMC may feel that this analysis is included elsewhere in the application, but it would be useful to summarize it here.

APPLICANT RESPONSE

As the question acknowledges, "effectiveness" reflects a combination of cost, quality, and patient experience factors to produce benefits in clinical outcomes, cost performance, and patient satisfaction. The proposed cardiac surgery program will yield benefits in all three of these dimensions by achieving the following:

(a) Avoid the need to transfer approximately 150-200 patients / year from AAMC to another hospital for cardiac surgery, and strengthen continuity of care for surgery patients. This will yield the following benefits:

- Improve quality of care/patient satisfaction for patients and their families by integrating care at one service site and eliminating the disruptions/delays associated with transfers.
- Reduce duplication and costs associated with hospital transfers (helicopter and ambulance transport) and repeated diagnostics at the receiving hospital.
- Remove delays/barriers to timely care that are now associated with patient transfers
    - Increasingly, patients requiring transfer from AAMC to another hospital for cardiac surgery have been delayed to lack of an intensive care bed or denied due to patient's insurance status (see CON application, Exhibit 7(a)).
- Maintain a single clinical management team and minimize the clinical risks/downsides associated with hospital transfers; improve quality of care by improving continuity of care.

(b) Reduce travel time for an aging and/or frailer patient population and improve longer-term clinical outcomes by providing local access to a comprehensive cardiac care program.

- By CY2020, the elderly population in Anne Arundel County and the midshore counties is projected to comprise 17% of the total population. Thus, driving time for residents from this region will become of increasing concern, as many more cardiac patients will be those in the elderly cohort. In addition, clinicians project that an increasing percentage of elderly patients are likely to qualify for cardiac surgery as new technology/new surgical techniques permit the more fragile population to qualify for surgery. A service site at AAMC will respond to the need to minimize travel time for this more fragile cardiac surgery population.

- The new program at AAMC will reduce travel time for more than 800,000 adult service area residents. The proximity of AAMC's comprehensive cardiac care program will increase patient and family satisfaction, and is also expected to bolster clinical outcomes. A recent study documented a statistically significant relationship between travel distance and surgery outcomes for CABG procedures (Chou, et al. "Travel Distance and Health Outcomes for Scheduled Surgery," Medical Care, 2014), and the proximity of pre-operative and post-operative services at a single site close to home will support patient compliance.

(c) Support more effective care management for residents of this region by providing comprehensive cardiac care services under a single clinical management team.
- The program at AAMC will assure a population of more than 800,000 adult residents with local access to a high quality comprehensive program under a single clinical management team. The program is expected to support effective care management, strengthen compliance, and support patient/family well-being.

(d) Provide service area residents with greater access to new treatment modalities and clinical protocols by extending JHM-sponsored programs more directly to this region.
- The new program will leverage JHM surgical manpower across the region and extend JHM-sponsored research protocols and new technology more directly to service area residents.

(e) Provide patients and payers with a lower cost alternative for cardiac surgery and reduce the per capita costs of specialty care for Maryland residents by shifting volume from Washington, DC hospitals to AAMC and shifting volume from academic medical centers to AAMC.
- In CY2013, more than 80% of total cardiac surgery cases for adult residents of the service area were treated at the three highest charge hospitals in the region (UMMC, JHH, and WHC).
    - A total of 428 cases were performed at Maryland's two academic medical centers, where the average charge is approximately 50% higher relative to community hospitals in Maryland.
    - A total of 339 cases were performed at the Washington Hospital Center, where the average charge per case is 30% higher relative to community hospitals in Maryland.

- In sharp contrast, AAMC will operate as one of the lowest charge cardiac surgery providers in the region, on a casemix adjusted basis, reflecting its comparatively low rate structure. This assertion is documented in the CON application through a comparison of AAMC's Fiscal Year projected charge per case at a CMI of 1.0 to the average charge at current hospital providers of cardiac surgery. **AAMC's average projected payment rate for cardiac surgery will be nearly 40% lower relative to the estimated payment rate at the WHC for a comparable case mix (approximately $23,000 lower payment per discharge) and will be nearly 50% lower relative to the average payment per**

discharge at Maryland's academic medical centers for a comparable case mix (approximately $30,000 lower payment per discharge).

(f) Achieve the improvements in access and quality of care outlined above while positively impacting Maryland's performance under the Medicare performance test

- The combined benefits outlined above can be achieved with a favorable impact on the Medicare waiver test under Maryland's Demonstration Model. As documented in the CON application, Maryland's cost performance will be advantaged by the shift of cardiac surgery volume to the new cardiac surgery program at AAMC.

(g) Achieve a net reduction of $7.7 million in "total health care spend" for hospital services, savings expected to accrue to both patients and payers.

- This analysis of "Total Health Care Spend" is presented in the CON application under "Preference in Comparative Review Section – COMAR 10.24.17.

ACCESS

QUESTION 12:

The application cites an article published in the Journal of Medical Care in 2014 which the application states: "documents that longer travel time to the hospital for cardiac surgery and subsequent care may have significant effects on clinical outcomes." The results encapsulated in the article's abstract state: "*We found that patients living near a CABG hospital with acceptable quality traveled significantly less and if they were high risk, had lower in-hospital mortality rates. Readmission rates in general are not affected by patients' travel distance.*" While it is difficult to find a definition of what was considered living near or far from a CABG hospital in this study, it seems, however, that the article was speaking about patients who lived hundreds of miles from one, not the "up to 40 minutes in normal traffic and even longer during heavy traffic" that the application states that Anne Arundel County patients must travel to a cardiac surgery program in Baltimore City (p.110). Please discuss.

APPLICANT RESPONSE

The article "Travel Distance and Health Outcomes for Scheduled Surgery" in the Journal of Medical Care in 2014 uses the expansion of CABG in Pennsylvania from 1995-2005 to demonstrate that decreasing a patient's travel distance for one-time, scheduled[2] cardiac surgery – even by a few miles – can decrease mortality.[3]

The sample is divided between patients who lived within **ten miles**[4] of a graded[5] CABG hospital ("near") and those who did not ("far"). Line 3 of Table 2 shows that the median distance for "near" patients was 0.088 hundreds of miles, i.e. 8.8 miles, while the median distance for "far" patients was 0.233 hundreds of miles, or 23.3 miles.[6] Note that many in AAMC's service area are similarly fifteen miles or more closer to AAMC than to the nearest hospital providing cardiac surgery.

Even though the relevant travel distances in the article were generally under one hundred miles, the authors of the study chose to "rescale" the travel distance variable "from miles to hundreds of miles to make the coefficients easier to read"[7] – though perhaps at the cost of confusing readers.

The results are stark. Line 1 of Table 2 of the study shows that "near" patients had a mortality rate of .019 (or 1.9%), while "far" patients had a morality rate of .022 (or 2.2%), a 15%

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[2] "We…eliminated patients admitted from the emergency room, so as to focus on the health impacts of travel in nonemergency situations." p. 251.
[3] Note that this large, long-term "natural experiment" gave the study an enormous sample size of over 100,000 CABG patients (p. 252). The study also chose to exclude all rural patients from its analysis (see p. 251).
[4] p.252.
[5] A graded hospital was one that performed thirty or more cardiac surgery cases. See p. 252.
[6] p. 253
[7] pp. 253-254.

increase.[8] These two sets had "no systemic differences" in "mean patient characteristics" that could plausibly account for the difference.[9]

[8] p. 253.
[9] p.253.

ACCESS

QUESTION 13:

The application references a program partnership with Johns Hopkins Medicine (JHM) that would be part of the proposed new cardiac surgery program that will leverage the assets of the JHM cardiac surgery program and extend existing resources from Baltimore to the Anne Arundel County region, thus providing residents of the proposed service area with improved access to JHM surgical staff, new treatment modalities, and clinical care protocols. Please discuss why such a partnership and its resulting benefits could not be established through an alliance that included shared clinics and care plans and protocols and electronic medical records without establishment of a second cardiac surgery site.

APPLICANT RESPONSE

It is true that the partnership that has been in place between JHM and AAMC for 8 years has included joint clinics, shared care plans, protocols and sharing of electronic medical records. This partnership provides for the establishment of a patient-centered "cardiac team" approach to cardiac surgery patient care.

Without the cardiac surgery site at AAMC, however the fractured care process that exists now will persist. Our goal is to create a seamless, high quality, low cost environment that is truly patient-centered, offering access to cardiac surgery to AAMC patients at AAMC. Patients currently transferred by ambulance, helicopter or referred to other institutions will be able to stay in the care of their entire cardiac team. The most efficient setting for the patients, families and clinical cardiac team including the cardiac surgeons will be to allow patients to receive all of their cardiac care at AAMC.

The benefit of increased access through a second cardiac surgery site is realized not just for patients suffering transfers, but also for patients who need pre-operative and post-operative care and may fail to receive it due to distance. Although ideally all patients would persevere through any access barrier, the fact is that travel distance makes a difference in whether patients actually receive necessary care.

The mutual goal of a program that is committed to patient-centered care cannot be realized without the establishment of a second cardiac surgery site at AAMC.

NEED

QUESTION 14:

The table in the middle of p.130 lacks a heading, making the point it is meant to illustrate unclear; please submit that table with headers.

APPLICANT RESPONSE

Chart 49
Anne Arundel Medical Center
Proposed Cardiac Surgery Service Area

Health Planning Region	Proposed Service Area	Defined
Baltimore Upper Shore	**5 county subregion** (Anne Arundel + 4 "Midshore" Counties)	Anne Arundel, Talbot, Kent, Queen Anne's, and Caroline Counties
Washington Metropolitan	**Contiguous communities assigned to AAMC** (PG/Calvert communities assigned to AAMC)	23 zip codes in Prince George's and Calvert Counties Formally assigned to AAMC's service area under its GBR contract

NEED

QUESTION 15:

The application projects the number of diagnostic cardiac catheterizations on AAMC patients that would be expected to result in cardiac surgery, using 11.4% as the proportion that would result in surgery, and calls that 11.4% "consistent with national practice patterns and clinical expectations." Please cite and quote the source of this information.

APPLICANT RESPONSE

The statement that 11.4% of cardiac catheterization (cath) patients at AAMC subsequently are referred for cardiac surgery was derived from our internal clinical reviews and it is consistent with national practice patterns and clinical expectations as evidence by the following articles:

1. Circ. Cardiovasc. Quality Outcomes. 2011 March 1: 4(2): 193-197. (Exhibit 18(a)). In this article the authors perform a retrospective study using data from CMS from 2001 through 2009. This study includes national data on the number of angiograms, PCI, IVUS, and CABG surgery procedures in Medicare patients from 2001 to 2009. On the included Table (Page 11 of the article), in 2009, which is the most recent year reported, the total number of catheterizations is 1,398,079 annually with a total of 203,025 CABG surgeries during the same time period. Since nearly all CABG patients will require a cardiac catheterization prior to surgery, this represents an incidence rate of 14.5% of cardiac cath patients going on to CABG surgery. This number is very consistent with the estimated number of 11.4% presented by AAMC in the CON application, accounting for some slight decrease in CABG procedures from 2009 to the current time frame. See #3 below.
2. American Heart Journal 2011; 162: 932-7. (Exhibit 18(b)). In this article the authors from Duke University looked at all cath, PCI and CABG procedures performed in North Carolina from 2003 to 2009, using data reported in the annual North Carolina State Medical Facilities Plan. In Table 1, the total number of cath procedures in 2009 (most recent year reported) was 64,161 and the number of CABG procedures was 8762, yielding a CABG/cath ratio of 13.6%, which is very consistent with the CMS data in reference 1 above and consistent with AAMC data, accounting for a slight decrease in CABG procedures to the current time frame.
3. Circulation 2015; 131:362-370 (attached). "Trends in Coronary Revasc. Proc. Among Medicare Beneficiaries Between 2009 and 2012" (attached). (Exhibit 18(c)). This article documents a 12.3% decline in CABG procedures for all Medicare patients from the years 2009 to 2012. If the number of cardiac catheterizations remained constant (worst case scenario) then the percent of patients undergoing cardiac catheterization in 2009 who subsequently went on to CABG (14.5% in Ref. #1, above) should decline to approximately 12.7% in 2012. This is very consistent with our 2014 data at AAMC.

PREFERENCE IN COMPARATIVE REVIEW

QUESTION 14 (2):

Please provide a more concise description and summation of the case that AAMC built regarding cost effectiveness and the Medicare and All-Payer Waiver Tests, between pp. 166 and 172.

APPLICANT RESPONSE

A cardiac surgery program at AAMC (the "**Project**") will help Maryland satisfy the terms of the All-Payer Model Agreement (the "**Medicare Waiver**"), as explained below.

A. The Medicare Waiver

The Medicare Waiver permits Maryland to continue to set Maryland hospital rates for all payers (including Medicare) from 2014 through at least 2018, but only so long as Maryland passes two tests of cost savings: the "**All-Payer Test**" and the "**Medicare Expenditure Test**."

Under the All-Payer Test, the growth in regulated *Maryland* hospital revenues per Maryland resident may not exceed 3.58% per year.[10]

Under the Medicare Expenditure Test, Medicare total hospital expenditures per Maryland Medicare beneficiary[11], *regardless of the state in which the service was provided*, must be, in the aggregate, $330,000,000 less over the five performance years of the Medicare Waiver (2014-2018) than those expenditures would be if they grew at the same rate as Medicare's total hospital expenditures per beneficiary *nationally*.[12]

The Medicare Expenditure Test is the harder test for Maryland. The HSCRC cannot easily predict, and cannot control, Medicare expenditures at District of Columbia hospitals, let alone nationwide Medicare expenditures. Therefore, actual savings achieved in Medicare spending per beneficiary are more valuable to the HSCRC in preserving the Medicare Waiver. In contrast, Maryland currently has a wide cushion under the All-Payer Test. Moreover, the HSCRC has many levers to address the All-Payer Test, because that test measures only the revenues of Maryland hospitals. Further, the Medicare Waiver permits Maryland to request that the All-Payer Test be adjusted to account for the increase in hospital revenues associated with one-time events, such as the construction of a new hospital.

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[10] The 3.58% limit represents the compound annual growth rate of Maryland's per capita gross state product, measured over the previous ten years for which data is available (initially, between 2002-2012, but Maryland may request an update as gross state product data becomes available).

[11] Expenditures for beneficiaries enrolled in Medicare Part C (Medicare Advantage) are not counted.

[12] Essentially, Medicare's hospital expenditure per Maryland beneficiary – including expenditures at *non-Maryland hospitals* – must grow *slower* than Medicare's hospital expenditure per Medicare beneficiary generally.

B. Impact of the Project

The Project will help Maryland improve its performance on the Medicare Expenditure Test with only a negligible impact on the All-Payer Test.

The Project will improve Maryland's performance on the Medicare Expenditure Test because Medicare will pay AAMC less for cardiac surgery cases than Medicare would pay to other hospitals in the absence of the Project, even accounting for market share adjustments.

For example, as established in the calculations below Medicare will save **$2,141,753** on FY 2018 hospital expenditures for Maryland residents, spending an additional $4,820,900 at AAMC, but saving (i) $1,849,373 at other Maryland hospitals (after market share adjustments), and (ii) $5,113,280 at District of Columbia hospitals. This would represent a **.036%** improvement in Medicare hospital expenditures for Maryland residents for that year alone.

At the same time, the Project would reduce the available space under the All-Payer Test by .041%, for two reasons. First, although AAMC will charge patients less than Washington Hospital Center – improving performance under the Medicare Expenditure Test – any shift in revenue from non-Maryland hospitals to Maryland hospitals necessarily impacts the All-Payer Test (a measure of Maryland hospital revenues). Second, the increase in AAMC's budget ($9,475,784) will be less than fully offset by the decrease in other Maryland hospital budgets (-$3,635,059) because market share adjustments mean that Maryland hospitals lose only 50% of their revenue attributable to lost cases.[13]

It is important to note the case that AAMC has built regarding overall cost effectiveness. The Project should be measured in terms of lower total healthcare spending in the healthcare delivery system, including for patients and their insurers. As explained on pages 172 – 173 of AAMC's CON application, the full impact of the new cardiac surgery program is estimated to be a net reduction of $7.74 million in hospital spending.

Set forth below are the data and estimates underlying AAMC's conclusions regarding the Medicare Waiver.

C. Supporting Calculations

1. Increased AAMC Revenue under the Project – All-Payers: $9,475,784

AAMC estimates that its GBR target budget will increase **$9,475,784** in FY 2018. AAMC derived this estimate by (a) calculating the total charges for its FY 2018 cardiac surgery cases

[13] In FY 2018, regulated Maryland hospital revenue is estimated to be $14,100,000,000; $9,475,784 minus $3,635,059 is $5,840,725, or .041% of $14,100,000,000

(multiplying its charge per case by the estimated number of cases), (b) subtracting existing budgeted revenue for those patients[14], and (c) applying an 85% market share adjustment.

Chart 50

FY 2018 AAMC BUDGET INCREASE - TOTAL

	Step	Result
1	Estimated Cardiac Surgery Cases	337
2	Charge Per Case	$37,501
3	Aggregate Charges: (1) x (2)	$12,637,837
4	Existing Revenue from Transferred Patients	$1,489,856
5	Incremental Budget Increase before MSA: (3) – (4)	$11,147,981
6	Market Share Adjustment	85%
7	Actual Incremental Budget Increase (5) x (6)	$9,475,784

2. Increased AAMC Revenue – Medicare only: $4,820,900

AAMC estimates that the $9,475,784 increase in its FY 2018 target budget will include **$4,820,900** of additional expenditures by Medicare. This is based on the following analysis:

First, AAMC projected the total number of cardiac surgery cases at AAMC in FY 2018 if the Project is approved.

Second, AAMC projected the number of *Medicare* cardiac surgery cases at AAMC in FY 2018 if the Project is approved based on the projected volume shifts, by hospital, and projected population growth.

Third, AAMC applied case mix indexes (CMIs) for Medicare and for all payers to estimate the severity of Medicare cases, and thus the portion of the FY 2018 target budget increase attributable to Medicare patients.[15] AAMC multiplied the Medicare CMI by the estimated total

[14] That is, for patients who are admitted to AAMC but are ultimately transferred to another hospital for cardiac surgery, AAMC's budget still includes revenue to provide care to those patients from admission through the time of transfer. So, for that subset of patients (admitted to AAMC then transferred for surgery), the $37,501 charge per case is not all an incremental increase in revenue.

[15] It would be incorrect to assume that Medicare cases would generate charges in portion to their number (i.e., 172 /337 = 51%). Although AAMC will have an *average* charge per case, Medicare cases will be more severe, requiring

number of FY 2018 Medicare cardiac surgery cases at AAMC to generate the case mix adjusted discharges (CMADs) for Medicare patients at AAMC. AAMC similarly multiplied the general CMI for all cardiac surgery cases – Medicare or non-Medicare – by the projected number of FY 2018 cardiac surgery cases at AAMC to generate the CMADs for all patients at AAMC.

Fourth, AAMC used the ratio of Medicare CMADs to total CMADs as the ratio of charges attributable to Medicare vs. total charges to derive the portion of AAMC's FY 2018 incremental budget increase attributable to Medicare.

Finally, AAMC applied Medicare's discount of 8% (6% HSCRC discount plus 2% sequestration discount) to derive Medicare's incremental increase in actual expenditures at AAMC.[16] The results are displayed on the chart below.

Chart 51

FY 2018 AAMC BUDGET INCREASE - MEDICARE

	Step	Result
1	Estimated Medicare Cardiac Surgery Cases	172
2	Medicare CMI	3.71
3	Medicare CMADs: (1) x (2)	638
4	Estimated Total Cardiac Surgery Cases	337
5	Total CMI	3.4209
6	Total CMADs: (4) x (5)	1152
7	Ratio of Medicare CMADs to Total CMADs: (3) / (6)	55.3%
8	Actual Incremental Budget Increase (Previous Table)	$9,475,784
9	Medicare Share of Incremental Increase in Budget: (7) x (8)	$5,240,109
10	Medicare Responsibility after 8% Discount	92%
11	Actual Increase in Medicare Expenditure: (9) x (10)	$4,820,900

more resources and thus generating higher charges, while non-Medicare cases will be less severe, requiring fewer resources and thus generating lower charges.

[16] Under the Medicare differential, Medicare receives a 6% discount on charges. An additional 2% is withheld under the Budget Control Act of 2011 (sequestration).

3. Decreased Maryland Hospital Revenue (AAMC Excluded) – All-Payers: **$3,635,059**

AAMC estimates that other Maryland hospitals performing cardiac surgery will have an aggregate **$3,635,059** decrease in their FY 2018 GBR target budgets as a result of the projected volume shifts. AAMC derived this estimate for each hospital by: (a) calculating the average charge for each case shifting to AAMC (the product of AAMC's projected CMI times the after hospital's FY 2014 charge per CMAD), (b) multiplying that average charge per case by the number of cases shifted, and then (c) applying a market share adjustment of 50%.

Chart 52

FY 2018 MARYLAND HOSPITAL BUDGET DECREASE - TOTAL

	Step	UMMS	JHH	Other	Total
1	Average Charge per CMAD	$20,427	$19,929	$13,145	
2	CMI of Cases Lost to AAMC	3.4209	3.4209	3.4209	
3	Average Charge per Case Shifted: (1) x (2)	$69,878	$68,174	$44,971	
4	Cases Shifted	29	69	12	
5	Incremental Budget Decrease before MSA: (3) x (4)	$2,026,462	$4,704,006	$539,649	
6	Market Share Adjustment	50%	50%	50%	
7	Actual Incremental Budget Decrease: (5) x (6)	$1,013,231	$2,352,003	$269,825	$3,635,059

4. Decreased Maryland Hospital Revenue (AAMC Excluded) – Medicare only: **$1,849,373**

AAMC estimates that the $3,635,059 aggregate decrease in the FY 2018 target budgets of the other Maryland hospitals performing cardiac surgery will result in **$1,849,373 savings** in expenditures by Medicare. AAMC derived that estimate by applying the same ratio of Medicare

vs. total charges to the $3.6 million aggregate decrease that is projected, and then applying the same Medicare discount.[17]

Chart 53
FY 2018 MARYLAND HOSPITAL BUDGET DECREASE - MEDICARE

	Step	Result
1	Actual Incremental Budget Decrease (Previous Table)	$3,635,059
2	Ratio of Medicare CMADs Lost to Total CMADs Lost	55.3%
3	Medicare Share of Incremental Decrease in Budget: (1) x (2)	$2,010,188
4	Medicare Responsibility after 8% Discount	92%
5	Actual Decrease in Medicare Expenditure: (3) x (4)	$1,849,373

5. Decreased Medicare Expenditure – Washington Hospital Center: **$5,113,280**

AAMC estimates that Medicare will spend **$5,113,280** less for cardiac surgery cases at Washington Hospital Center (WHC) in FY 2018 as volume is shifted to AAMC. AAMC derived this estimate by (a) calculating the average payment for each Medicare case shifted to AAMC (multiplying AAMC's projected CMI by WHC's payment per CMAD as derived from the MedPar data), then (b) multiplying that average payment per case by the number of cases projected to shift to AAMC.

Chart 54
FY 2018 MEDICARE SAVINGS - WASHINGTON HOSPITAL CENTER

	Step	Result - WHC
1	Average Payment per CMAD	$12,885.50
2	CMI of Cases Shifted to AAMC	3.4209
3	Average Payment per Case Shifted: (1) x (2)	$44,080
4	Cases Shifted	116
5	Medicare Savings	$5,113,280

[17] This symmetry makes sense. By definition, the CMADs of the Medicare cases gained by AAMC from other hospitals equal the CMADs of the Medicare cases lost by the other hospitals to AAMC.

PREFERENCE IN COMPARATIVE REVIEW

QUESTION 15 (2):

The application (p.165) cites the research, training, and education that JHM would bring to this project. Please explain how this would "meet a local or national need" that JHM would not otherwise be meeting. Also elaborate on how "the applicant's circumstances offer special advantages."

APPLICANT RESPONSE

The Project will provide critical, but otherwise unavailable, hands-on training opportunities for resident and trainee health care practitioners. The Project will also provide opportunities for AAMC care teams to collaborate and engage in mutual learning with JHM care teams in the community hospital setting. Finally, the collaboration will allow JHM to bring surgery-related clinical trials to the patient in the patient's preferred care setting with the patient's preferred care team, expanding enrollment and improving retention.

The Johns Hopkins Thoracic Training Program will be one of the primary beneficiaries of the JHU- AAMC program. This joint program will provide Hopkins residents the opportunity to be exposed to cardiac surgery in the community hospital setting, and at a hospital with a strong track record of high quality, efficiency and cost effective care not commonly seen in the University hospital setting. This type of opportunity is not currently available to JHM trainees, and given the current health care environment and the increased emphasis on the Triple AIM, it is critically important. The system can no longer afford to produce highly skilled practitioners who have not received training outside of the academic setting. Currently, Hopkins residents train at the University Hospital with no outside rotations. Unlike many other thoracic surgery training programs nationally, Hopkins does not have an affiliated Veterans Administration or public hospital where residents can train in cardiac surgery. In the current medical environment, cardiac surgery and cardiology are moving towards percutaneous hybrid approaches for the treatment of cardiovascular diseases. It has been identified nationally that cardiac surgery trainees need increased exposure to catheterization laboratories and hybrid operating room suites to gain the knowledge and skills required to use new and developing technologies to treat cardiovascular diseases as members of "heart teams".

At the University hospital, there is a limited number of cases for cardiology and vascular surgery trainees to participate in hybrid cases and complex interventions in the cardiac cath lab. At AAMC there are currently no cardiology or vascular surgery fellows. Once a joint training program has been established, cardiac surgery residents will be able to work in the cardiac catheterization laboratory at AAMC to gain wire and catheter based skills. It will also provide the cardiac surgery residents with the opportunity to work closely with AAMC cardiologists and cardiac surgeons without competition from other trainees. This will be valuable to the individual fellows and residents, but it is also critical to the entire health care delivery system. It is imperative that modern physicians enter the workforce with a broader set of clinical

experiences. Trainees will experience real-world application of the concept of delivering care at the right time, in the best setting for a particular patient, and in the most cost efficient manner. They will be part of a team delivering patient-centered care in an alternative setting. In addition to the benefits of the expanded training opportunities for residents, the ability to offer more clinical trial sites for patients will be realized by the cardiac surgery site at AAMC. As described in the CON application research assistants at AAMC will expand enrollment of patients in the clinical trials. Hundreds of patients who would not otherwise enroll in the research studies due to geographic limitations or treatment location preference, would now have a local option available to them. As noted by the National Institutes of Health website (https://www.clinicaltrials.gov/ct2/about-studies/learn, Exhibit 19), maintaining a relationship to one's usual health care provider while enrolled in research studies is a critical success factor for patients.

Advancing research, supporting discovery and innovation for new techniques, providing early diagnosis and treatment of cardiac disease at AAMC will accrue benefits to the patients and families served in this region and continues the legacy of excellence in health care in which both Johns Hopkins Medicine and AAMC have a long standing tradition.

B) NEED

QUESTION 16:

Please explain the a) 16.7% increase in ER visits projected between FY14 and FY19, and b) the 37.4% increase in same day surgery over the same period. Please show historical volumes for each of these services, beginning with FY10.

APPLICANT RESPONSE

Chart 55

AAMC ER/Surgical Volumes

AAMC Volumes	Actual FY10	Actual FY11	Actual FY12	Actual FY13	Actual FY14	Annualized FY15	Projected FY16	Projected FY17	Projected FY18	Projected FY19	FY14 to FY19 Change
O/P Emergency Room Visits	63,493	62,632	74,787	79,397	79,291	82,852	84,635	87,441	89,830	92,546	
% Change from Prior Year		-1.4%	19.4%	6.2%	-0.1%	4.5%	2.2%	3.3%	2.7%	3.0%	16.7%
				Cumulative FY13 to FY15		10.8%					
				Average FY13 to FY15		3.5%					
Same Day Surgery Visits	14,052	12,894	12,512	13,483	15,068	16,555	17,549	18,777	19,716	20,702	
% Change from Prior Year		-8.2%	-3.0%	7.8%	11.8%	9.9%	6.0%	7.0%	5.0%	5.0%	37.4%
				Cumulative FY13 to FY15		32.3%					
				Average FY13 to FY15		9.8%					

a)

The supplemental chart above provides the historical volumes requested, the change in volumes each year as well as cumulative and average volume percentage change over the last three years. The growth in emergency room volume has been significant over the past several years since completion of the AAMC hospital and ER expansion in FY11. Prior to opening the expanded facility and in particular during construction, AAMC experienced a drop off in volumes in this area attributable to capacity constraints during construction. However, the significant rebound in FY12 was followed by approximately 11% growth in the subsequent three years. The average growth per year was 3.5%. We see this growth trajectory leveling off over the next several years to only modest increases (2-3%) with our deliberate expansion of access in the community, or 16.7% cumulative from FY14 through FY 19 as you point out.

b)

The historical volumes for Same Day Surgery have been provided above in the chart in a similar fashion to emergency room volumes. The growth of 5-7% over the next several years (the cumulative 37.4%) is based on the anticipated changes in the care process for certain inpatient surgery procedures, moving them to an outpatient classification. The growth is further bolstered by the growth in program and medical staff. We believe that the growth is appropriately reflected in the future years.

VIABILITY OF THE PROPOSAL

QUESTION 17:

What accounts for the negative $31,684,793 shown for non-operating income in **Tables G and H**?

APPLICANT RESPONSE

In November 2014, the Anne Arundel Health System advance refunded its Series 2009A bonds to take advantage of favorable interest rates and reduce future interest costs to the organization. Given that the Series 2009A bonds are not callable until July 1, 2019, the Health System funded an escrow account with the amount required to call the bonds at the future date. In connection with the advance refunding, the Health System recognized a non-cash, non-operating loss on extinguishment of debt of approximately $32M which primarily related to the write-off of the unamortized deferred financing costs and discount related to the 2009A bonds as well as the interest rate arbitrage on the 2009A bonds for the period of time between the legal defeasance in November 2014 and the call date in 2019.