

Cardiac & Vascular Services: Are we experiencing the calm before the perfect storm?

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Many cardiac & vascular providers have been experiencing a downturn in procedure volumes over the past 24-36 months. Does this downward trend in procedure volume demonstrate a portent of continuing turbulent times in the future for cardiologists, interventional radiologists, vascular surgeons and cardio-thoracic surgeons? Or, is this just the calm before the perfect storm when added demand for all cardiac, vascular and imaging services is placed on the cardiac & vascular delivery system?

RB&A has examined some of the trends occurring in the cardiac & vascular service market that will affect the level of procedure volumes required in the future. These trends are grouped into the following categories:

- CV risk factor trends
- CV disease cost trends
- CV national payment trends
- Other trends

Cardiac & Vascular Risk Factor Trends

This section of the article will present some of the risk factors that contribute to CV procedure utilization, mortality and morbidity and are the drivers for future increased CV procedure utilization.

Aging of the Population

Cardiovascular disease is a progressive disease which makes aging a critical risk factor. The aging of the US population will be a major driver of future CV service utilization. As shown in

Chart 1, 2011 will be a transition year for the CV population in that this is the year when the first of the “baby boomers” will begin turning 65 years of age.

As shown in Chart 1, the percentage of the population comprised of persons who are in the 45-64 years of age range will begin leveling off and actually trend downward in the future as a percent of population. This population group represents persons who begin to utilize prevention, diagnostic and the interventional CV services with increasing frequency as they age. As shown in the chart, the population group comprised of persons 65 and older begins a significant upward trend as a percent of population in 2011. This age group represents those persons who utilize CV services the most.

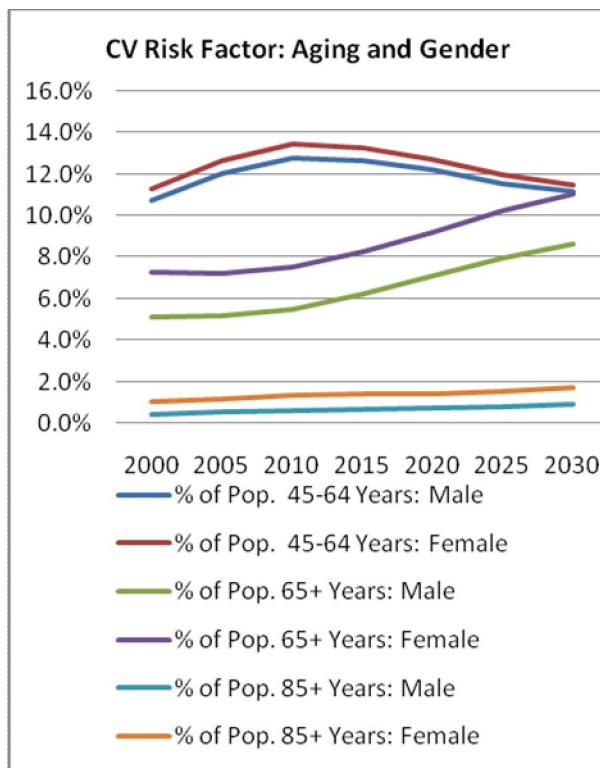
By 2030, the percentage of population in these two groups, 45-64 years of age and 65 and older, will approximate each other at nearly 22.5% of the total population, making this combined group reach approximately 45% of the population by 2030. Today, these two age groups comprise approximately 40% of the total population. Numerically, 40% of the population equates to approximately 125,748,000 in 2008; by 2030, 45% of the population will equate to approximately 163,337,000 persons or an increase of approximately 37,590,000 persons, or as many persons who are currently in the 65+ years of age category today.

During this 20 year period, the number of persons, 65 years of age and older is projected to nearly double while the number of persons

45-65 years of age are projected to peak in 2020 at nearly 84,000,000 persons and decrease by approximately 1.5 million persons by 2030 as they transition into the elderly population group.

Viewing the growth in the number of persons in these age categories in isolation will result in significant demand for CV services over the next 20 years.

Chart 1: Aging and Gender

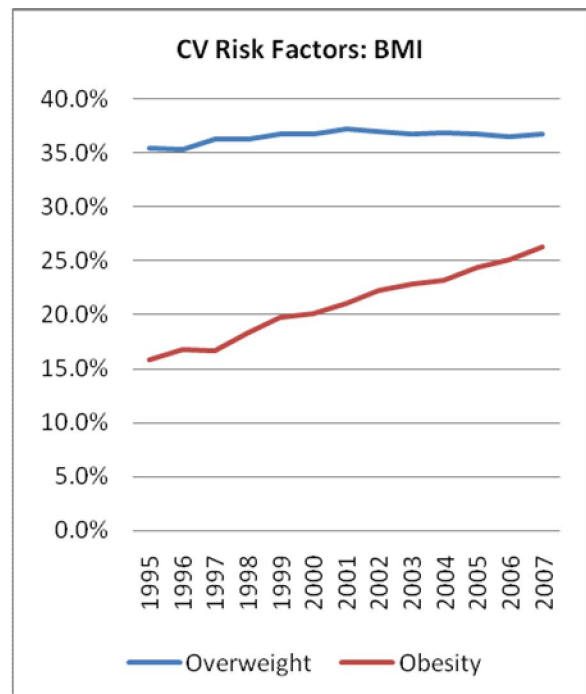


Super-sized America: BMI

America’s fast paced and often chaotic life styles have resulted in a steady increase in size of the waist-lines of most Americans. As measured by BMI, the percentage of the population representing persons who are considered obese as measured by a BMI greater than 30 has trended slightly upward over the period of 1995 to estimated 2007. Today,

approximately 36% of the population is considered obese. From 1995 to estimated 2007 figures, the US population has seen a near steady increase in the number and percentage of persons who are considered overweight as measured by a BMI between 25.0 and 29.9. In 1995, approximately 16% of the population was considered overweight. This percentage has increased to approximately 26% of the population today. Today, nearly 60% of the population is considered overweight or obese. Indeed, we are a “super-sized” nation of people whose healthcare status will be adversely affected by carrying the extra weight. Persons considered overweight and obese are at higher risk for many contributing factors of CV disease to include diabetes, high blood pressure, and sleep apnea, among other conditions.

Chart 2: BMI

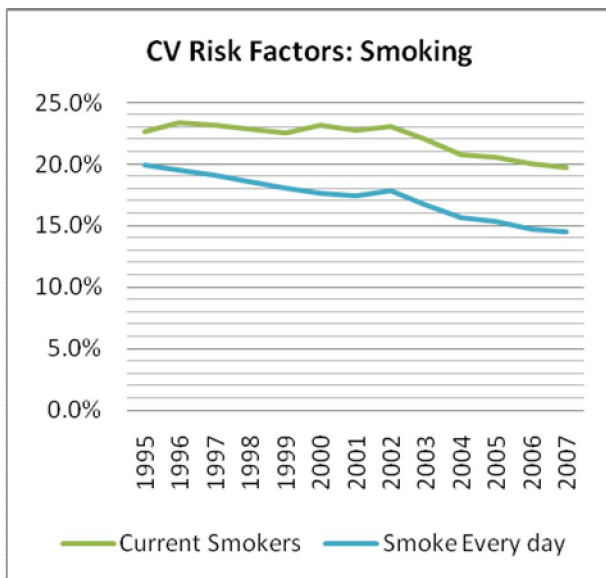


Smoking

One of the positive trends in controllable CV risk factors is in the number of current smokers

and the number of persons who smoke every day. As shown in the Chart 3, the percentage of the US population that is comprised of current smokers had remained fairly stable between 1995 and 2002 but is currently in a declining mode. In 1995, approximately 23% of the US population was considered current smokers; today, less than 20% are current smokers. As shown on the chart, the percentage of persons who smoke everyday has also declined between 1995 and 2007. In 1995, approximately 20% of the US population smoke every day; today, less than 15% of the population smokes every day. In isolation, by controlling this CV risk factor, demand for CV services to include respiratory and oncology services should decrease slightly over the next few years as the number of current smokers continues to decline.

Chart 3: Smoking

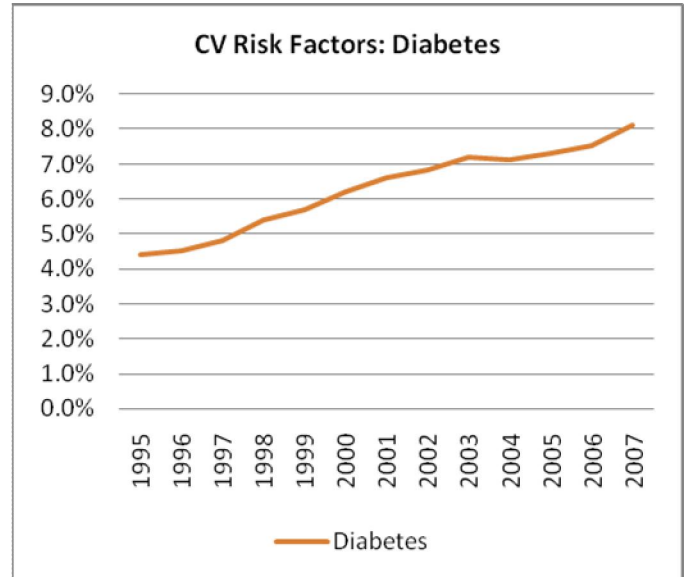


Diabetes

Diabetes is becoming an epidemic in the US. Between 1995 and 2007, the percentage of the population that has been diagnosed with diabetes has almost doubled. As diabetes becomes more prevalent, primarily driven by

the number of persons with BMI's greater than 25, the demand for cardiac and vascular services will increase as will the case severity. Vascular problems associated with diabetes will also increase resulting in increased demand for CV services.

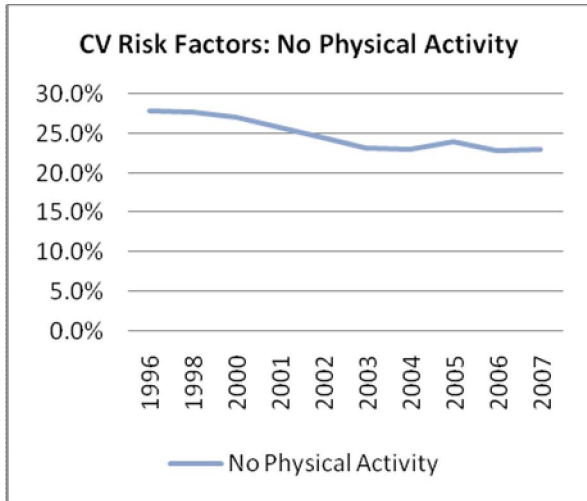
Chart 4: Diabetes



Physical Activity

As a whole, the US population is beginning to take charge of some aspects of their health through physical exercise. Between 1995 and 2007, the percentage of the population comprised of persons who had no physical activity during the week has dropped approximately five percentage points and has remained fairly stable at approximately 23% of the population.

Chart 5: No Physical Activity

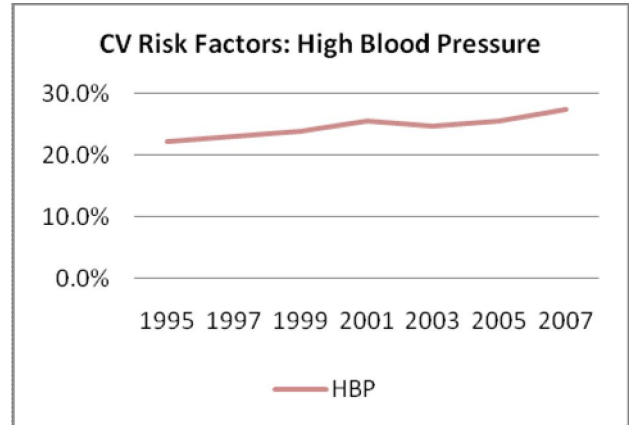


As physical activity increases, other risk factors are positively affected to include weight, diabetes, blood pressure, and enhanced mental/ emotional outlook of the individuals, to name a few benefits of exercise.

High Blood Pressure

The percentage of the population comprised of persons with have been diagnosed with high blood pressure has exhibited a near steadily increase between 1995 and 2007. High blood pressure is linked to genetics and weight. As the percentage of the population considered overweight and obese has increased, so has the number of persons diagnosed with high blood pressure.

Chart 6: High Blood Pressure



Persons with high blood pressure are at risk for increased CAD but also numerous other diseases to include renal and other organ failure, among others.

A Summary of the above risk factors and their affect on the demand for CV services and procedure utilization is shown in Table 1

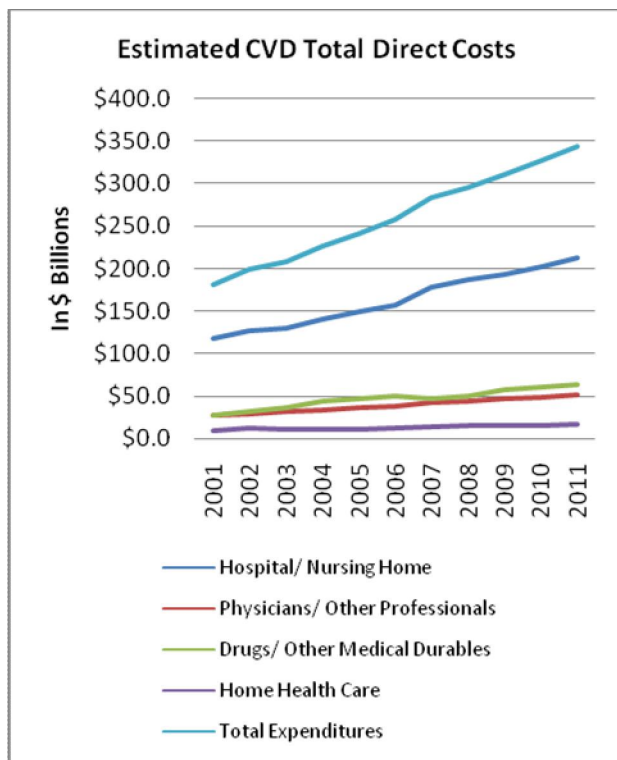
Table 1: Rick Factor Summary Table

Category or CV Risk Factor	Trend for CV Diagnostics & Procedure Growth
Population Growth	↑
Male Aging	
45- 64 Years	↑
65+ Years	↑
85 + Years	↑
Female Aging	?
45- 64 Years	↑
65+ Years	↑
85 + Years	↑
Overweight	↑
Obesity	↑
Current Smokers	↓
Never Smoked	↓
Smoke Every day	↓
Diabetes	↑
No Physical Activity	↓
High Blood Pressure	↑

Cardiac and Vascular Costs

The direct economic costs associated with cardiovascular disease continue to comprise a significant percentage of total health care expenditures. The estimated direct economic costs associated with CVD are projected to continue to increase significantly over the foreseeable future, primarily driven by demand of the aging baby boomer population. The increase in CVD costs are lead by hospital and nursing home costs of providing services. As the baby boomer population reaches 65 years of age, these costs will continue to escalate with CVD costs representing a higher percentage of the health care dollar.

Chart 7: CVD Direct Economic Costs



As shown in the chart above, total estimated direct economic costs associated with CVD will total approximately \$345 billion by 2011 with

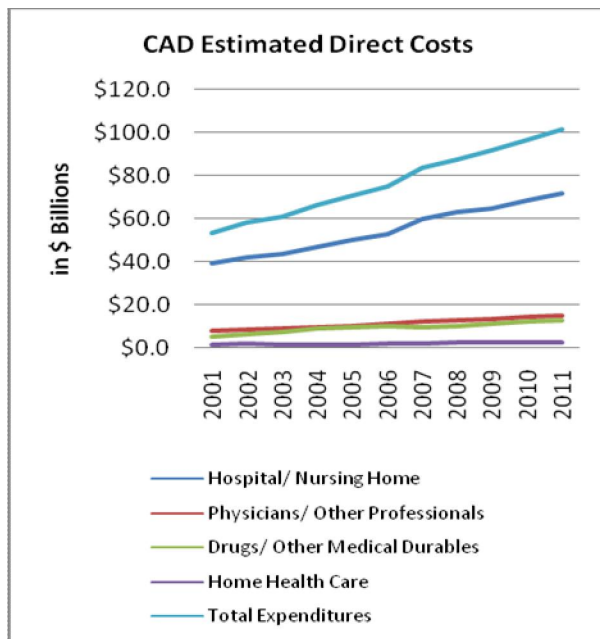
hospital and nursing home costs representing over 60% of these costs. Physician costs will represent nearly 15% of these costs with drugs representing over 18% of the CVD costs.

As a percent of total National Health Expenditures (NHE), CVD expenditures will decrease slightly from 2006 to 2011 from approximately 12.1% of NHE to approximately 11.6% of NHE, respectively. However, the actual dollar amount will continue to rise.

Coronary Heart Disease Costs

The Coronary Artery Disease (CAD) direct costs have increased steadily from 2001 to 2006 and are projected to continue to increase through 2011. As shown in the chart, total direct costs have increased with hospital & nursing home direct costs being the primary source of these costs. Hospital & nursing home costs represent over 70% of the total direct costs of CAD. Physicians & other professionals' costs represent approximately 15% with drugs representing approximately 12% of the total CAD direct costs. Overall, hospital direct costs are forecasted to increase by nearly \$25 billion between 2006 and 2011. Much of the increase in direct cost will involve new technology such as the 256-slice CT scanner and new stents and the manner in which CAD is treated. With more CAD interventions projected over the next few years, higher stent utilization per case and higher acuity CABG cases will drive much of this cost increase.

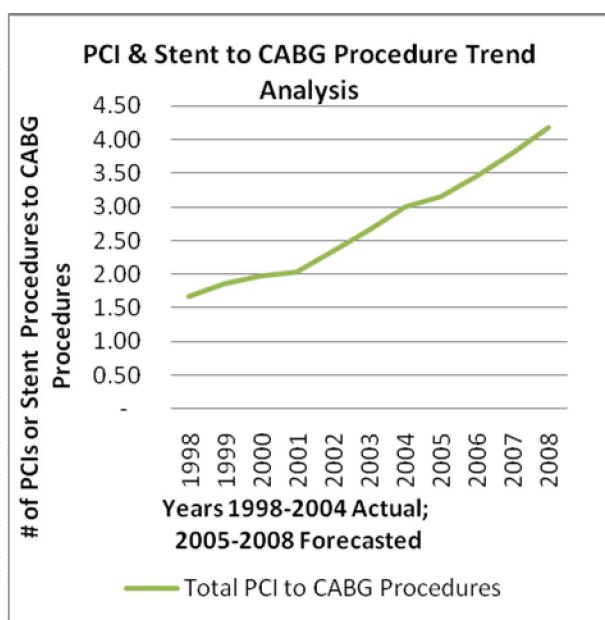
Chart 8: CAD Direct Economic Costs



PCI, Stent & CABG Trends

Over the past decade, the ratio of PCIs to include stents per CABG procedure has increased nearly 260% as shown in the chart.

Chart 9: PCI to CABG Ratio

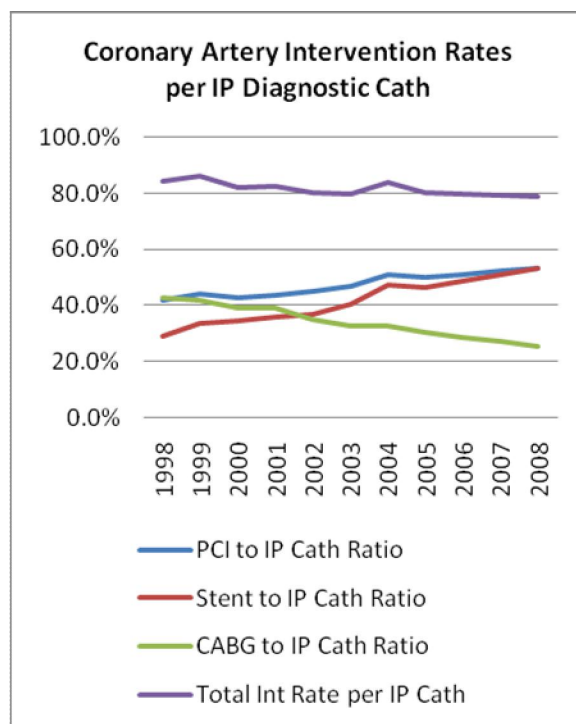


This trend in the ratio of PCI to CABG surgery will continue over the foreseeable future. CABG cases will be of higher severity and acuity involving more complex cases.

CAD Interventional Rate

Examining the percentage of PCIs to include stents and CABGs as a percentage of IP diagnostic cath demonstrates that the overall interventional rate, i.e., PCI + CABGs as a percent of IP diagnostic cath has decreased slightly between 1998 and the projected 2008 percentage; however, the IP cath interventional rate has hovered around the 80% rate for the past three years. Please note that when the OP diagnostic caths are added into the equation, the interventional percentage drops within the range of approximately 50%-60% depending on the applied ratio of IP to OP diagnostic caths.

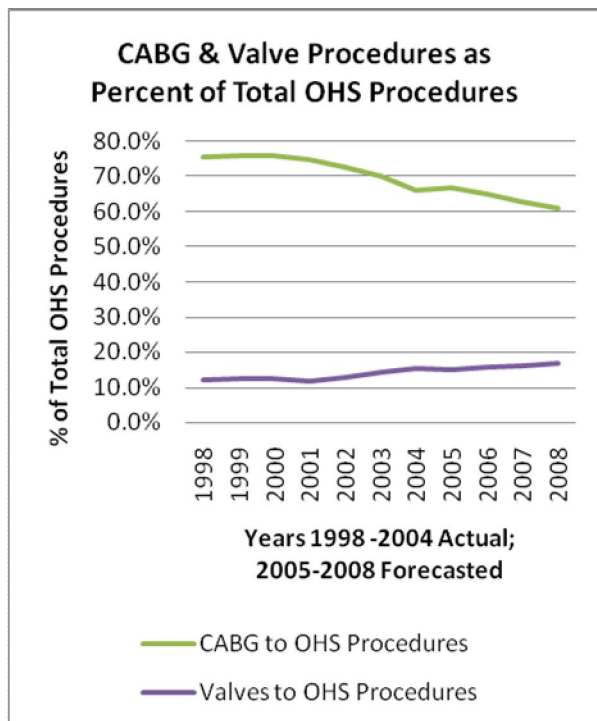
Chart 10: CAD Intervention % of IP Cath



Open Heart Surgery Mix: CABG and Valves

Cardiac surgery volume is down in most programs across the country. Examining the trends in the mix of OHS demonstrates that as a percent of total OHS procedures, CABG surgery has dropped from approximately 77% of total OHS procedures in 1998 to approximately 60% of all OHS procedures in 2008. Valve surgery has increased from approximately 12% of total OHS procedures in 1998 and is projected to represent approximately 18% of all OHS procedures in 2008. This trend is projected to continue, particularly given the increasing number of persons 65 years of age and older who will require valve repair and/or replacement as they age.

Chart 11: OHS Procedure Mix



From a study of total procedures performed in the US over the past few years, RB&A found that overall, PCI and OHS volume is up across the nation as a whole. However, the

proliferation of new cath lab and OHS programs that has occurred over the past five years has resulted in procedure volumes per cath lab, per OHS program and/or per CV programs are down, on average. There are a few programs across the country where volumes have remained steady or even increased slightly, but this has mainly been the result of increase market share at the expense of a competing program.

From the above analysis, the main driver for increased procedure volume over the next two decades will be the growth in the number of persons who are 65 years of age and older in the US as a result of the aging of the baby boomer population. As a society, we are getting heavier and have higher incidence rates of diagnosed diabetes and high blood pressure which will also increase the demand for CV services. On the positive side for healthy lifestyles, we are beginning to exercise more and smoke less which will lower the demand for CV services, viewed in isolation from other CV risk factors.

National Average DRG Payment Trends

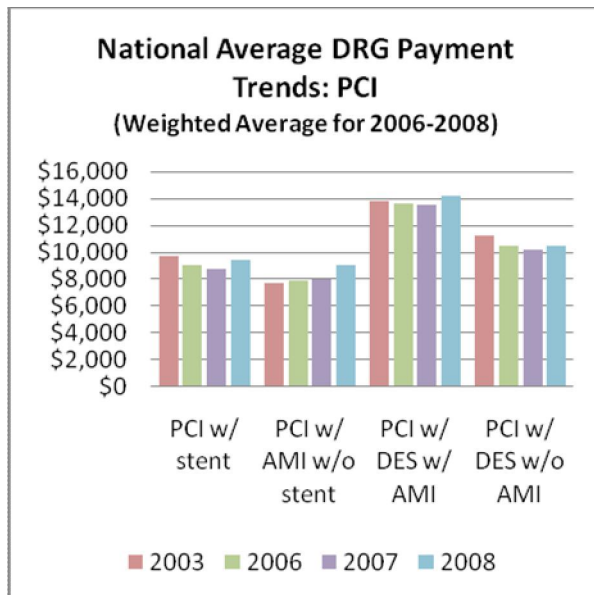
To examine the national average DRG payment trends, RB&A used 2003 National Average Payments and compared three years, 2006, 2007 and 2008 national average payments with the 2003 level by grouping the payments for procedures by 2003 DRG group definition. In 2006 and 2007, major changes to the DRG classification for OHS and PCI occurred. In 2008, MS-DRGs were introduced which were fundamentally different than the previously CV defined DRGs categories.

To make an “apples-to-apples” comparison as much as possible, RB&A grouped the DRGs by description and calculated a weighted average

for the specifically- described procedure groups, e.g., CABG with cath, by using the national average payment for each of the DRGs included in the described group, e.g., CABG with cath, multiplied by the projected case volumes as provided by CMS when determining the DRG values and payment rates and then divided this number by the sum of the total projected procedures in the described group.

As shown for PCI, the 2003 national average payment rates all decreased between 2003 and 2007, with the exception of “PCI with AMI without Stent”. The 2008 MS-DRG national average payment amounts increased from the 2007 levels. Please note that none of the charts presented below are inflation adjusted; they are all in constant dollars. However, when taking into account inflation adjustments, the 2008 national average payments by described procedure group, i.e. CABG with cath, valve without cath, etc., are below the 2003 levels.

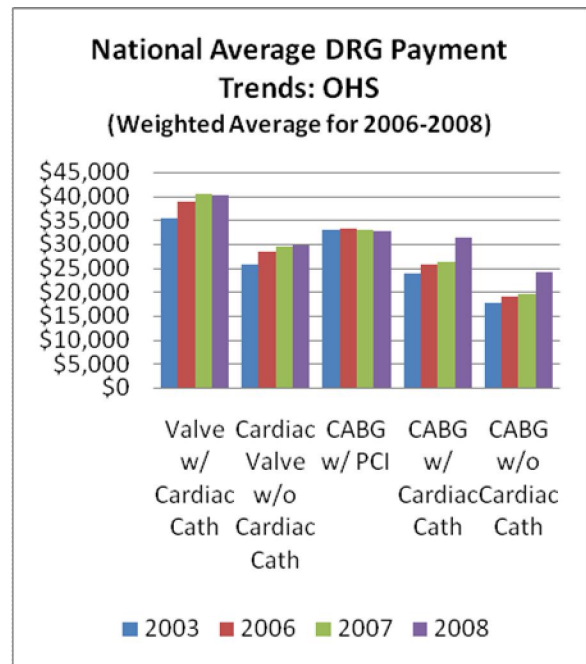
Chart 12: PCI National Average Payment



As shown in the charts below, CABG and cardiac valve surgery reimbursement has increased

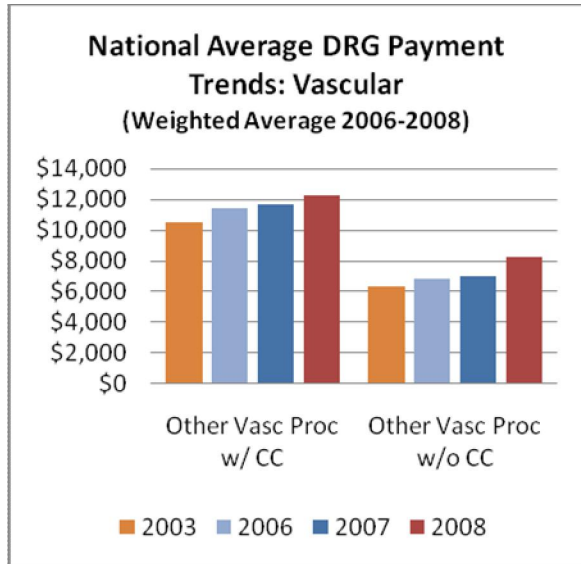
over the 2003 levels in all cases with the exception of CABG with PCI. The main reason for this is that the acuity and severity level of OHS has gone up; rarely is a simple CABG performed today.

Chart 13: OHS National Average Payment



The payment trend for vascular DRGs has been positive with the national average payments for vascular-described DRG groups increasing in each of the years analyzed, as shown below.

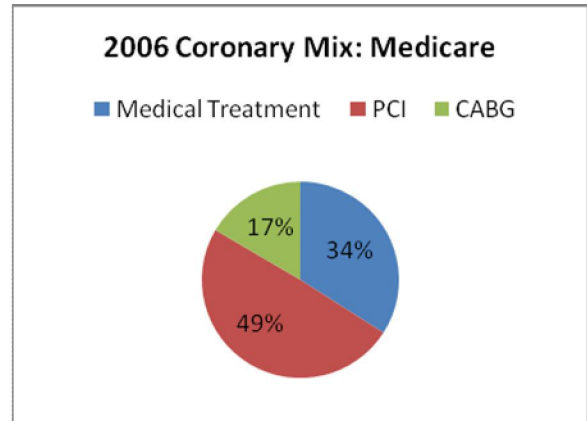
Chart 14: Vascular National Average Payment



Coronary Treatment Mix

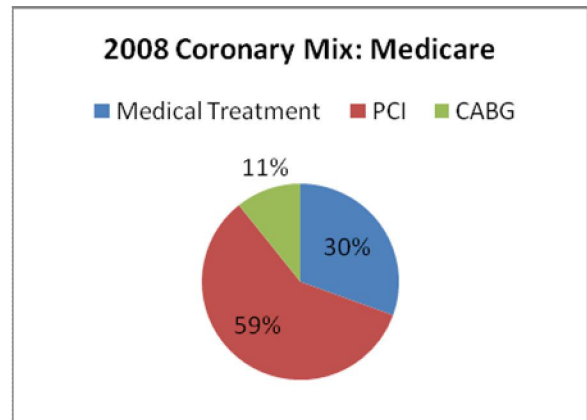
Looking at the coronary treat mix provides insight into how patients are being treated for their CAD. The coronary treatment mix is comprised of the patients who receive PCI, CABG and medical treatment for acute coronary problems. A sampling of the available Medicare data demonstrates that the use of PCI in treating CAD is increasing while medical and CABG treatments are decreasing. The two pie charts comparing 2006 and projected 2008 show the trends in the Medicare coronary treatment mix.

Chart 15: 2006 Coronary Treatment Mix



The two pie charts for coronary treatment mix show that for Medicare patients, PCI has increased by 10 percentage points as the treatment of choice for CAD while CABG dropped six percentage points and medical treatment has dropped four percentage points over the two years analyzed.

Chart 16: Proj. 2008 Coronary Treatment Mix



Since the cardiologists typically control the CAD patient, the move towards catheter-based intervention over medical treatment or CABG is expected. RB&A’s initial perception of the increasing use of hospitalists was that hospitalists might attempt to treat CAD patients medically rather than sending the patients to

the cardiologists. However, the role that hospitalists play in the treatment of CAD appears to mirror the treatment of the cardiologists with more hospitalists referring patients to the cardiologists for catheter-based interventions over medical treatment, which reflects current thinking on best-practices of treating CAD.

Other Trends

Other trends that are continuing and/or emerging in the health care arena include lower reimbursement, increasing physician/ hospital integration and boutique CV service offerings.

Every election year brings a new round of discussions on health care reform. As all of us know, the current situation in health care is a non-sustainable model. Reimbursement for services is fragmented and is not keeping pace with technology advances. Third-party payer systems deflect personal accountability away from the individual for his/her health status.

In a recent newspaper article, our healthcare system was compared to the purchasing of a car where the buyer takes “ownership” of the car and then 30 days later receives bills from each of the individual part suppliers of the car. Bills are sent by the suppliers for tires, the chassis, the steering wheel, the transmission, etc. You get the picture. In reality, our healthcare system isn’t too much different than this. After a hospital discharge, patients receive a hospital bill, and bills from anesthesiologists, radiologists, and the attending physicians/ surgeons, and so on.

As a result of the current fragmented billing and collection process and the increased pressure put on payers by patients, global or packaged billing and payment will become more common

in the future than it current is—remember the Medicare global pricing CABG project—well it may be coming back on a large scale basis for all CV procedures! Businesses and industry will demand that they receive a single bill for each episode of care versus multiple bills from each provider who attended to the patient.

Integration of providers either through practice affiliation and /or purchase by hospitals and multispecialty groups will continue to accelerate. As we mentioned, purchasers of healthcare services will demand global or packaged billing which will fuel the trend towards provider integration. Lessons learned from past integration efforts will be key to the successful implementation of current integration strategies. Cardiology practices, which were once perceived to be impervious to hospital purchases, are now becoming prime targets for practice purchase arrangements. Providers will need to be aware of and understand valuation techniques to ensure that “win/win” practice purchase arrangements occur.

Another driving factor in the integration of providers is the increased demands in time and business skills in administering practices resulting from increasing legislation and regulatory requirements. Many physicians will be looking to others to manage the day-to-day operations and overhead of the practice allowing them to concentrate on the clinical aspects of delivering high quality patient care. Many physicians will also seek increasing opportunities to enter the administrative ranks of the “C” suite in hospitals and clinics.

Boutique Service Offerings

As cardiovascular providers experience downward reimbursement trends, which given

the current chaos in the economic markets will surely affect healthcare, many providers will begin seeking additional ways to augment their current revenue streams. Boutique service offerings such as Vein & Vascular Clinics which provide the attendant “spa type” treatments such as massages, manicures/ pedicures, etc., will become even more common place than they are currently. Holistic approaches to treating cardiovascular disease to include here-to-for non-traditional service offerings such as anti-oxidant and cholesterol lowering dietary supplements and juices will be offered in the office/ clinical setting. Exercise and stress management services, products and offerings requiring out-of-pocket expenditures by patients will be offered as well.

Summary

The seas of healthcare today are relatively calm compared to the storms that are forming on the horizon. The primary winds that are driving the developing storm include the trade winds of the aging population which will begin to blow ever more forcefully as the baby boomers begin turning 65 in 2011. The wind of the aging population will be augmented and strengthened as it passes over the warm seas of the gulfs of controllable risk factors such as overweight, obesity, and diabetes. Add in precipitation factors of demands for new technology such as the 256-slice or next generation CT scanner with its capital requirements and lack of reimbursement initially and combined this with lower investment yields results in a perfect storm brewing that could reach hurricane proportions if the CV providers don't take precautionary efforts now to proactively plan for the coming storm.

To safely navigate the coming perfect storm will require that CV programs revisit their strategic planning efforts and use the compass of mission, the helm and rudder of vision, the sails of leadership and the hull of increased operational and organizational efficiency and effectiveness. Remember, as Benjamin Franklin said: “Beware of small expenses; a small leak will sink a great ship”.

Cardiac, vascular and imaging providers must instill a new directive to assess and examine all aspects of the CV service line (operational, financial, organizational, technological and quality) to ensure that the ship is seaworthy and remains afloat. Preparing for the perfect storm must occur now; trying to weather the storm without proper planning and leadership will result in many ships dashed against the reefs of operational and financial insustainability.