DEVELOPMENT OF A REGIONAL VASCULAR DATABASE: LESSONS LEARNED IN NORTHERN CALIFORNIA

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NCAL Kaiser Permanente Vascular Surgery

- Approximately 40 vascular surgeons, serve 3.3 million pts, at 17 major medical centers in NCAL
- Conditions treated:
  - Carotid disease
  - Aortic aneurysm
  - Peripheral arterial occlusive disease
  - Venous disease
  - Dialysis access
  - Other (TOS, peripheral aneurysms, carotid body tumors, etc.)

Changes in Clinical Practice

- Less invasive diagnostic testing (vascular lab, MR angio, and CT angio)
- Less invasive intervention: Contemporary vascular surgeon does over 50% of interventions percutaneously (endovascular AAA repair, peripheral arterial stenting, carotid stenting, venous ablation procedures)

Existing Paradigms of Vascular Care in NCAL

- Non-integrative (“Silo” model)
- Lack of screening programs for vascular disease
- Inconsistent quality of diagnostic services
- Lack of tracking of vascular disease before and after intervention
- Lack of outcomes analysis to evaluate which therapies are effective and which are not
- Inadequate compliance with CMS-mandated guidelines (carotid artery stenting and accreditation of carotid stenting sites)
**Treatment Population**

- Same population as Cardiology and CV Surgery
  - Elderly
  - High utilizers of healthcare dollars
  - Medicare population (compliance)
- Non-cardiac vascular beds
- Similar goals i.e. reduce cardio-vascular mortality and morbidity
- Projected increase due to the aging “Baby Boomers”

**Goal for NCAL Vascular Surgery**

- Develop a system of health care delivery for Vascular Surgery that is:
  - integrative
  - of high quality
  - consistent
  - cost-effective
  - sustainable
  - meeting federal compliance standards
- Such a system will help to standardize vascular surgical practice and it will assure consistent high-quality care at all the medical centers in NCAL.

**What We Do Have in NCAL**

- Population and Conditions Tracking System (PACTS)
- NCal Aortic Aneurysm Patient Registry (Stent-Graft Registry)
- Epic HealthConnect

**AAA MANAGEMENT: NORTHERN CALIFORNIA EXPERIENCE**

Kaiser Permanente 4th Annual National Surgical Symposium
April 3, 2008

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Population & Condition Tracking System (PACTS)
http://pscts.kp.org

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Web-based clinical application designed to provide NCAL clinicians with a tool to identify, track, and outreach to populations of high-risk patients with certain disease conditions; to provide a “safety net” to ensure that these patients are not lost to follow-up.

Conditions Currently Tracked

- Abdominal Aortic Aneurysm
  (TAA, AAA, visceral, iliac, femoral, popliteal, dissections)
- Prostate Cancer (PSA)
- Cervical Cancer (PAP)
- Colorectal Cancer (CRC)

Functionality

- Identifies patients (OSCR, ICD-9, CPT & TRRS)
- Care Paths (manual, screening,A1,A2,A3,A4,A5)
- Interfaces with mainframe
- Alarms (yellow, orange, red)
- Patient Lists & Sorting
- Individual Data
- User Alerts
- Patient Contacts
- Summary Reports for Management

Management Algorithm

- (A1) AAA < 3 cm No AAA, closed
- (A2) AAA 3 to 3.5 cm Scan every 2 yrs
- (A3) AAA > 3.5 to 4 cm Scan every year
- (A4) AAA > 4 to < 5 cm Scan & VS referral
- (A5) AAA ≥ 5 cm VS referral
Alarms

- **Yellow** (active alarm 0-30 days)
- **Orange** (active alarm 31-60 days)
- **Red** (active alarm > 60 days)

Current Aneurysm Data in PACTS

- Total patients enrolled: 5,171
- 3-3.5cm: 1,403
- 3.5-4.5cm: 1,566
- > 4.5cm: 706
- Awaiting open repair: 17
- Awaiting endovascular repair: 91
- Post open repair (up to 5 yrs po): 1,221
- Screening or Manual Mode: 167

NCal 2007 AAA Ruptures

- AAA size: 7.6 cm ± 1.6 mm
- AAA previously known in 20%
- 7 (28%) were treated at hospitals outside KP
- One pt refused surgery
- 16 (67%) survived surgery
- 4 (17%) had EVAR
- 20 (83%) had open repair, 70% survival

NCal KP Rupture Rates

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Ruptures</th>
<th>Average Annual Membership (age ≥ 30)</th>
<th># Ruptures per 100,000 Members</th>
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NCal Aortic Aneurysm Patient Registry

Created by the Web Development/Applications Engineering Group

Adrian Blakely, Lead Engineer 8-447-2636
Ann Rhoades RN, Consultant

NCal Stent Graft Registry

• EVAR Centers:
  - Fresno
  - Hayward
  - Oakland
  - Sacramento
  - Santa Clara
  - San Francisco
  - South Sacramento
  - Vallejo
  - Walnut Creek

What We Don’t Have in NCAL

• A “Workflow Database” that interfaces seamlessly with Health Connect
  - Generates clinic notes, Vascular Lab reports, operating room and interventional procedure reports among others. The data captured during while documenting our daily work will in essence build the database.
  - Enables collection of data prospectively as a patient is initially evaluated, treated, and then followed for surveillance.
  - Flexible enough to allow query of data in a variety of different formats
  - Built-in outcomes analysis capability that can produce reports for facilities and individual surgeons based on overall practice or single procedure types
  - Research component that will facilitate interfacility and interregional collaborative clinical studies

NCal Stent Graft Registry

• Data collection: 2000-2007
• Total patients entered: 1,155
What We Don’t Have in NCAL

• Other desirable features in a comprehensive vascular database:
  – Image capture and image archive capability with a user interface for data input and data/record retrieval virtually anywhere,
  – Facilitates appropriate revenue capture,
  – Facilitates telecommunications/teleconference between Physicians with simultaneous voice and image viewing,
  – Helps to maintain a Physician’s Caselog,
  – Available for QA Reviews and Educational Conferences,
  – Enables tracking of equipment and device/disposables inventory,
  – Optimizes the use of high-definition computer monitors to improve information access and streamline workflow efficiency - see the "big picture" at once instead of toggling between individual windows,
  – System is useful to other physicians who are not vascular surgeons but who manage the same patients.

THE KAISER PERMANENTE VISION FOR VASCULAR SURGERY IN THE NEW MILLENNIUM

Bradley Hill, MD and Rishad Faruqi, MD

Implementation

• Will involve a multi-year project with regional administration.
• The vision for the new millennium will include:

  1. Screening and preventative measures
  2. Diagnostic imaging, reporting, and coding
  3. Tracking of preoperative patients for timely intervention
  4. Management and Intervention
  5. Tracking of Patients Post-Intervention for Timely Re-intervention To Prevent Complications
  6. Optimizing management algorithms using quality and outcomes data
  7. Research and publication

SCREENING AND PREVENTATIVE MEASURES
Carotid Disease

In NCAL Kaiser every hour and 15 minutes, someone has a stroke!

- 7,000+ stroke victims per year
- 1,600 deaths (3rd leading cause of death) per year
- 2,700 survivors with permanent disabilities per year
- 300 new permanent admissions to nursing homes per year
- Over 40 thousand living survivors of stroke
- Estimated cost for 2006: $600 million

(Estimated from American Stroke Association statistics and reference article: Stroke 2006; suppl 3.)

Carotid Screening

  - 394 pts
  - All > 60 yr old
  - Risk factors:
    - HTN, heart dz, current smoker, family hx
    - # risk factors:
      - pts with ICA stenosis ≥ 50%
      - 0: 1.8%
      - 1: 5.8%
      - 2: 13.5%
      - 3: 16.7%
      - 4: 66.7%

No KP screening program for carotid disease despite known benefit

Screening for Abdominal Aortic Aneurysm (AAA)

- AAA screening is reimbursed by Medicare.
- NCAL has no screening program for AAA.
Screening for Peripheral Arterial Disease (PAD)

- PHASE Program fully implemented in 2005.
- Currently there are no screening programs for PAD.
- Under recognized problem, known to be an independent risk factor, with a higher risk for cardiovascular death than CAD!
- No screening program for PAD despite known benefit.
- Medicare reimbursement for new diagnosis of PAD ($3,182 if PAD alone; $9,153 if PAD + DM; $9,791 if PAD + CKD).

Screening and Preventative Measures

**DESIRED SCREENING GOALS**

- Carotid screening in high-risk individuals
- AAA screening of Medicare population
- PAD screening of “at-risk” individuals, at the PCP level

Diagnostic Imaging, Reporting, and Coding
Accuracy in Diagnostic Imaging & Reporting

• With the implementation of E&M coding, accuracy in diagnostic reporting, with associated, coding and billing is becoming vitally important. Training and ongoing education for vascular surgeons is needed for successful revenue capture (Appendix 5).

• A comprehensive database with the appropriate coding for vascular interventions built in, will be critical in allowing appropriate revenue capture and minimizing medico-legal exposure.

Tracking of Patients Post-Intervention for Timely Re-intervention To Prevent Complications
Tracking of Postoperative Patients for Timely Intervention To Prevent Complications

- The recent explosion of the use of carotid stents led to the Center for Medicare Services (CMS), issuing very strict guidelines for intervention (Appendix 2).
- CMS requires centers that perform CAS to have a database to track CAS procedures and monitor their long-term outcomes.

AAA – Stent Graft Registry
- > 1700 patients enrolled at present.
- Only includes AAA but not any other type of aneurysms i.e. thoracic aortic or iliac, femoral or popliteal.
- Does not interface with Health Connect or any comprehensive database to allow for outcomes tracking and analysis.
- Requires daily checks for alerts. Labor-intensive.
- Outcomes analysis is laborious.
- Will become more cumbersome as the numbers increase with the ageing baby-boomers.
Optimize Management Algorithms

Research/Publication

DESIRED Interventions

Tracking of Postoperative Patients for Timely:

- Hemodialysis Access:
  - Surgery, Interventional Radiology and Vascular
  - Tailor and Integrate these databases into the care delivery
  - This requires the establishment of a comprehensive
    database that will integrate the care delivery
    throughout the hospital
  - Make available to health care team of the vascular
  - Data entered into an Excel spreadsheet that is not
  - Currently tracked by the renal service

Interventions for PAD:

- Address a lot of these issues:
  - Data acquisition of devices/continuous used across the region
  - No integration of devices/continuous used across the region
  - No outcomes analysis for effectiveness of intervention
  - Are tracked in some centers and not others
  - Projected to increase with time
  - Expectation...
Optimizing Management Algorithms & Research and Publications

- Currently no system exists to do this. This leads to:
  - Continued use of interventions that are not effective.
  - Random use of expensive devices/equipment.
  - Lack of standardization and consistency in care across the region.
  - Lack of ability to compare our outcomes with the traditional academic “centers of excellence”.
The KP patient population needs the tools to implement a screening program for vascular disease and a comprehensive database for tracking and outcomes analysis, so that we can optimize care.

- The care within KP has to mature to be comprehensive, widely distributed and uniform across the region.
- This will be a cost-effective solution based on problem and hence cost-avoidance, charge capture and improvements in treatment algorithms that are evidence-based.
- This comprehensive database will become part of our CMS compliance for carotid stenting, AAA screening and any future compliance needs mandated for the growing number of retiring baby boomers and Medicare enrollees.
CONCLUSION

• Establishing a comprehensive Vascular Information Network is the first step in the right direction.
• KP is uniquely positioned to implement an integrative approach to the treatment of cardiovascular disease, which is the leading cause of mortality in the Western world.
• With the aging of the baby boomer population, we should not wait any longer to implement this plan. This is the right time for us to take this first step to becoming the model of excellence in the care for vascular disease within KP and across the nation.
• It is a plan that we cannot afford not to have.