Background and Recent Advances in Endovascular Repair of Aortic Aneurysms

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Vascular Surgery

Learning Objectives

Upon completion of this activity, participants will be able to:

• Describe signs and symptoms of abdominal and thoracic aortic aneurysms in patients
• Identify the risk factors for aortic aneurysms and rupture
• Differentiate treatment options for patients with identified abdominal or thoracic aortic aneurysms

AAA: Abdominal Aortic Aneurysm

• AAA is defined as a permanent, localized dilatation of the abdominal aorta
  • Exceeds the normal diameter by 50% or >3 cm
• The infrarenal aorta is the most common location for aneurysms

TAA: Thoracic Aortic Aneurysm

• Location of TAA
  • Ascending thoracic aorta—40%
  • Descending thoracic aorta—35%
  • Upper abdomen (“thoracoabdominal aneurysms”—15%
  • Aortic arch—10%
• Aortic dissection
  • Tear in the intimal layer of the aortic wall

Scope of Problem

- Mortality after rupture remains high:
  - Death in 80% who reach hospital and 50% who undergo surgery
  - Rupture accounts for 1-2% of all US deaths
- Cost of medical care >$2.7 billion USD in 2003:
  - 45,986 patients discharged with AAA (without rupture) with aggregate charges of $2.7 billion
  - 6,815 patients discharged with a ruptured AAA with total charges of $640 million

Epidemiology

- AAA:
  - 4%-12.5% prevalence rate in males >65 years old
  - Risk of AAA increases dramatically after age 60
  - 6-fold greater prevalence rate in men vs women
- TAA:
  - Prevalence of up to 4.2% of the general population without hypertension
  - Direct correlation between age and incidence is not sex specific

AAA: Morbidity and Mortality Caused by Rupture

- Sudden death from exsanguination if not repaired immediately
  - 50% operative mortality
- 4% to 5% of sudden death in US is from ruptured AAA
- Women rupture aneurysms at smaller diameters

Annual Risk of Rupture | AAA Diameter
---|---
0% | < 4 cm
0.5 - 5% | 4.0 - 4.9 cm
3 - 15% | 5.0 - 5.9 cm
10 - 20% | 6.0 - 6.9 cm
20 - 40% | 7.0 - 7.9 cm
30 - 50% | ≥ 8.0 cm

Why Should We Care?

- Most aneurysms are asymptomatic
- 1 of 3 aneurysms will rupture
- Most patients with rupture are unaware they have an aneurysm—importance of screening and diagnosis prior to rupture
- Many patients die before reaching the hospital
- Only 50% undergoing surgery for ruptured AA will survive >30 days
## TAA: Etiology

<table>
<thead>
<tr>
<th>Type</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degenerative aneurysms</td>
<td>• Most common&lt;br&gt;• Associated with hypertension, age, smoking</td>
</tr>
<tr>
<td>Atherosclerotic</td>
<td>• More commonly involves the descending aorta and arch</td>
</tr>
<tr>
<td>Genetically triggered aneurysm syndromes</td>
<td>• Marfan syndrome&lt;br&gt;• Loeys-Dietz Syndrome&lt;br&gt;• Bicuspid aortic valve&lt;br&gt;• Turner’s syndrome&lt;br&gt;• Familial non-syndromic TAA syndrome</td>
</tr>
<tr>
<td>Aortitis</td>
<td>• Infectious: syphilis, salmonella, staphylococcal; mycobacterium&lt;br&gt;• Noninfectious/inflammatory:&lt;br&gt;• More common: Giant cell and Takayasu arteritis&lt;br&gt;• Less common: Behcets, Cogan's syndrome, relapsing polychondritis&lt;br&gt;• Rare: Rheumatoid arthritis, spondyloarthropathies</td>
</tr>
<tr>
<td>Trauma</td>
<td>• Typical location is at the aortic isthmus&lt;br&gt;• Complications include rupture, pseudoaneurysm, chronic dissection with secondary aneurysm formation</td>
</tr>
<tr>
<td>Chronic aortic dissection</td>
<td>• Aneurysm due to growth and pressure differential of false lumen</td>
</tr>
</tbody>
</table>

## TAA: Symptoms and Complications

- TAAs often present with no symptoms and are typically detected on exams
- Symptoms usually appear when complications develop:
  - Aortic regurgitation
  - Thromboembolism—may cause stroke, abdominal pain (due to mesenteric embolism), or extremity pain
  - Rupture—patients who do not immediately die of a ruptured TAA present with severe chest or back pain and hypotension or shock
  - Dissection—manifests with tearing pain, often radiating to the back

## TAA: Other Risk Factors

- Patients with TAAs often have a history of hypertension, smoking, and COPD
- TAAs are more prevalent in males
- Risk factors for rupture:
  - Increasing risk of rupture after the TAA is >5 cm in diameter
  - Risk of rupture nearly doubles with every 1-cm increment of aneurysmal diameter
  - Relative risk of rupture is increased by a factor of 2.6 for every decade of life

## AAA: Predisposing Factors

- **Age**: steady increase after 6th decade
- **Family history**
- **Male gender**: 4x higher incidence
- **Cigarette smoking**
  - >90% of AAA patients report having smoked
  - Risk of AAA = 2.5x the risk for coronary artery disease (CAD)
- **Atherosclerosis and peripheral vascular disease (PVD)**
- **Hypertension**
- **Hypercholesterolemia**
- **AAA less likely in African-Americans and Asians**
- **Diabetics less likely to have aneurysms**
Cigarette Smoking and AAA


AAA: Signs and Symptoms

• The majority of patients with AAA are asymptomatic
  – Condition is usually discovered during evaluation for some other disorder
  – Patient may be aware of pulsating sensation
• Symptoms are present with rupture or predict increased chance of early rupture
  – Back, chest, groin, testicle, buttock pain
  – Tenderness or pain on palpation

AAA: Comorbidities

• AAA is associated with
  – CAD (53%; P<0.0001)
  – 3-vessel coronary disease (41%; P<0.0001)
  – Male gender (86%; P<0.01)
  – Smoking (88%; P<0.01)
  – COPD (30%; P<0.01)

AAA: Factors Associated With Increased Risk of Rupture

• Most important predictor: size of AAA
• Expansion rate
• Smoking
• Hypertension
• Increased wall stress
• Gender (female)
• COPD
### Risk of Rupture: Size Matters!

<table>
<thead>
<tr>
<th>AAA Diameter</th>
<th>Annual Rupture Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 4.0 cm</td>
<td>0%</td>
</tr>
<tr>
<td>4.0 cm - 4.9 cm</td>
<td>0.5% - 5%</td>
</tr>
<tr>
<td>5.0 cm – 5.9 cm</td>
<td>3% - 15%</td>
</tr>
<tr>
<td>6.0 cm – 6.9 cm</td>
<td>10% - 20%</td>
</tr>
<tr>
<td>7.0 cm - 7.9 cm</td>
<td>20% - 40%</td>
</tr>
<tr>
<td>≥ 8.0 cm</td>
<td>30% - 50%</td>
</tr>
</tbody>
</table>


### AAA: Annual Growth Rate

- Annual growth rate: ~4.0/year
- UK Small Aneurysm Trial
  - 1090 patients with AAA 4.0-5.5 cm
  - Mean risk of rupture increased from 1.6% initially to 3.2% during the last 3 years


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### Physical Examination

- **Thoracic exam**
  - Arterial perfusion differentials, in both upper and lower extremities
  - Evidence of visceral ischemia
  - Focal neurological deficits
  - Murmur of aortic regurgitation
  - Bruits
  - Possible cardiac tamponade

- **Abdominal exam**
  - AAA palpable only 1/3 of the time
  - Depending on AAA size, location, and body habitus
  - Imaging, usually ultrasound, is required for diagnosis
  - Noted usually in epigastrium or mid-abdomen
  - Deep manipulation used to check for tenderness
  - Iliac artery aneurysms harder to detect and are usually in lower quadrants


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### Physical Examination (cont)

- **Popliteal and femoral artery exam**
  - Necessary with aneurysmal disease
    - 14% of AAA patients have popliteal or femoral aneurysms
  - Prominent pulse warrants investigation as femoral and popliteal aneurysms are limb-threatening
  - Abdominal ultrasound is also necessary in cases of peripheral aneurysms because
    - 62% chance of AAA with popliteal aneurysms
    - 85% chance of AAA with femoral artery aneurysms

Screening

TAA: Screening

- Low threshold for TAA screening because most cases are asymptomatic and difficult to detect on physical exam
- CTA is required to adequately visualize the affected aorta
- No cost-benefit analysis of screening in these populations


AAA: Appropriate Indications for Imaging

- Pulsatile abdominal mass
- Peripheral or thoracic aneurysms
- High-risk individuals
  - Male smokers and age >65
  - Female smokers and age >70
  - Family history of AAA and age >55
- Abdominal ultrasound best for initial diagnosis unless the patient is very large

Medicare AAA Screening Reimbursement: The SAAAVE Act of 2006

- Effective January 1, 2007
- Free, 1-time, ultrasound screening for AAA in qualified seniors linked to their Welcome to Medicare Physical Exam (WTMPE)
  - Men who have smoked at least 100 cigarettes during their life
  - Men and women with a family history of AAA

Mortality Benefit Associated With AAA in Screening Trials

<table>
<thead>
<tr>
<th>Study/Region</th>
<th>Aneurysm Detected, n (%)</th>
<th>Aneurysm Detected, n (%)</th>
<th>OR (95% CI)</th>
<th>Event, %</th>
<th>95% CI Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fleming County (51)</td>
<td>6/63 (9.5)</td>
<td>6/63 (9.5)</td>
<td>1.3</td>
<td>0.34 (0.05-2.37)</td>
<td></td>
</tr>
<tr>
<td>Captopril (25)</td>
<td>12/13 (92.3)</td>
<td>2/2 (100)</td>
<td>10.3</td>
<td>0.06 (0.01-0.98)</td>
<td></td>
</tr>
<tr>
<td>Asymetra (21)</td>
<td>14/19 (73.7)</td>
<td>4/6 (66.6)</td>
<td>16.4</td>
<td>0.50 (0.22-1.17)</td>
<td></td>
</tr>
<tr>
<td>Kent (15)</td>
<td>6/10 (60)</td>
<td>11/13 (84.6)</td>
<td>65.5</td>
<td>0.26 (0.09-0.76)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>99/163 (60.9)</td>
<td>17/142 (12.0)</td>
<td>116.8</td>
<td>0.07 (0.01-0.47)</td>
<td></td>
</tr>
</tbody>
</table>

MASS=Multicentre Aneurysm Screening Study; OR=odds ratio.

Sustained Benefit of Screening


Surveillance

- Aortic diameter
  - < 3 cm
  - 3 - 4 cm
  - 4 - 4.5 cm
  - > 4.5 cm

- Interval for follow-up
  - No further testing
  - Every 12 months
  - Every 6 months and Consider referral to Vascular surgeon
  - Referral to Vascular Surgeon


Treatment

Goals of Treatment

1. Prevent rupture
2. Prevent death

• Diagnosis of rupture is usually clinical (pain and hypotension)

### TAA: Size Location for Elective Surgical Intervention

<table>
<thead>
<tr>
<th>Condition</th>
<th>Location and Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degenerative thoracic aneurysm</td>
<td>Descending aorta &gt;6 cm</td>
</tr>
<tr>
<td>Chronic aortic dissection*</td>
<td>Descending aorta &gt;6 cm</td>
</tr>
<tr>
<td>Chronic traumatic dissection/Pseudoaneurysm*</td>
<td>Descending aorta &gt;6 cm</td>
</tr>
<tr>
<td>Intramural hematoma*</td>
<td>Descending aorta &gt;6 cm</td>
</tr>
<tr>
<td>Penetrating ulcer*</td>
<td>Descending aorta &gt;6 cm</td>
</tr>
<tr>
<td>Marfan Syndrome</td>
<td>Descending aorta &gt;6.5 cm</td>
</tr>
<tr>
<td>Vascular Ehlers Danlos</td>
<td>Descending aorta &gt;6.5 cm</td>
</tr>
<tr>
<td>Turner Syndrome</td>
<td>Descending aorta &gt;6.5 cm</td>
</tr>
<tr>
<td>Bicuspid aortic valve</td>
<td>Descending aorta &gt;6.5 cm</td>
</tr>
<tr>
<td>Familial TAA and dissection</td>
<td>Descending aorta &gt;6.5 cm</td>
</tr>
<tr>
<td>Loeys Dietz syndrome</td>
<td>Descending aorta &gt;6.5 cm</td>
</tr>
</tbody>
</table>

*Most typical location is in the descending aorta.

### St. Charles Case #1

• 60M with aortic tear following MCC
St. Charles Case #2

- HPI: 88F with known Type B dissection in ER with 10/10 chest and back pain.
- SBP >280 mmHg
### TEVAR vs Open Surgical Repair

<table>
<thead>
<tr>
<th>Complication</th>
<th>Endovascular Stent Grafting (n=140)</th>
<th>Open Surgical Repair (n=94)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality: ≤ 30 d or in hospital</td>
<td>2.1 (n=3)</td>
<td>11.7 (n=11)</td>
<td>0.004</td>
</tr>
<tr>
<td>Respiratory failure</td>
<td>4</td>
<td>20</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Postoperative myocardial infarction</td>
<td>0</td>
<td>1</td>
<td>0.40</td>
</tr>
<tr>
<td>Renal failure</td>
<td>1</td>
<td>13</td>
<td>0.01</td>
</tr>
<tr>
<td>Wound infection/dehiscence</td>
<td>4</td>
<td>11</td>
<td>0.07</td>
</tr>
<tr>
<td>GI (ileus, bowel ischemia obstruction)</td>
<td>2</td>
<td>6</td>
<td>0.16</td>
</tr>
<tr>
<td>Peripheral vascular</td>
<td>14</td>
<td>4</td>
<td>0.015</td>
</tr>
<tr>
<td>Neurologic CVA</td>
<td>4 (n=5)</td>
<td>4 (n=4)</td>
<td>&gt;0.99</td>
</tr>
<tr>
<td>Paraplegia/paraparesis</td>
<td>3 (n=4)</td>
<td>14 (n=13)</td>
<td>0.003</td>
</tr>
</tbody>
</table>

#### Length of stay (days), mean ± SD

<table>
<thead>
<tr>
<th></th>
<th>Intensive care unit</th>
<th>Hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intensive care unit</td>
<td>2.6±1.6</td>
<td>5.2±7.2</td>
</tr>
<tr>
<td>Hospital</td>
<td>7.4±17.7</td>
<td>14.4±13.8</td>
</tr>
</tbody>
</table>

*Data are presented as percentage of patients.


### EVAR

- Measurements by minor axis
- AAA should be treated when >5 cm
- Women should have their AAA repaired at a smaller size than men
- 4.5-5.0 cm size is an appropriate size for repair in women

### Variables Associated With Small AAA Rupture

<table>
<thead>
<tr>
<th>Baseline Variable</th>
<th>Hazard Ratio (95% CI)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yrs)</td>
<td>1.02 (0.93-1.13)</td>
<td>0.67</td>
</tr>
<tr>
<td>Female sex</td>
<td>4.5 (1.98-10.2)</td>
<td>0.000</td>
</tr>
<tr>
<td>AAA diameter (cm)</td>
<td>2.51 (1.08-5.80)</td>
<td>0.032</td>
</tr>
<tr>
<td>Current smoker</td>
<td>2.11 (0.95-4.67)</td>
<td>0.066</td>
</tr>
<tr>
<td>Mean blood pressure</td>
<td>1.04 (1.02-1.07)</td>
<td>0.002</td>
</tr>
</tbody>
</table>

The risk of rupture was independently and significantly associated with female sex ($P<0.001$). Despite decline in mortality from 1994-2003 and improved operative techniques, women continue to have significantly higher mortality from OPEN repair and ruptured AAA.

### Medical Treatment for AAA

- **Observation**
  - Safe in men for AAA up to 5.5 cm (level A evidence)
- **Beta blockers?**
  - Propranolol does not slow aneurysm growth (level A)
- **Smoking cessation**
  - Smoking increases aneurysm expansion
- **HTN control**
  - Sounds like a good idea—animal data only
- **Statins may inhibit aneurysm expansion**
  - Level B and C evidence
- **Doxycycline/Roxithromycin** (level B evidence)
  - Lowers MMP levels and slows aneurysm growth in animals

### OPEN Repair of AAA

1. Abdomen opened anteriorly or from a liberal retroperitoneal approach
2. Aorta clamped, preferably below the renal arteries; common iliac arteries clamped
3. Aneurysm sac opened longitudinally; backbleeding lumbar arteries and inferior mesenteric artery are typically sutureligated
4. Prosthetic graft sutured in place proximally and distally
5. Bifurcated graft used in >50% of cases with distal anastomoses
6. Aneurysm sac closed over graft to provide separation from intestines

### OPEN Repair of AAA (cont)

- **Technically, all AAAs can undergo open repair**
- **Limited by**
  - Cardiac disease (mostly coronary)
  - Pulmonary disease (especially $O_2$ dependent)
  - Hostile abdomen: colostomy, multiple procedures
  - Difficult anastomoses
  - Inflammatory aneurysms
  - Systemic diseases
  - Cirrhosis

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EVAR Repair of AAA

1. Stiff wires introduced through common femoral arteries over which a fabric covered stent (stent-graft) is introduced
2. Proximal graft positioned just below the renal arteries
3. Stent-graft initially constrained in a low-profile state until deployment
4. A modular device is depicted in which a separate component for the left iliac limb is inserted through and overlaps with a docking limb on the main device
5. Seal zone in the normal infrarenal aorta and bilateral iliac arteries, which excludes AAA

OPEN vs EVAR Repair: UK EVAR 1 Trial

- 1082 patients suitable for both procedures
- Randomized from 1999-2003 at 41 hospitals
- >60 years old with AAA >5.5 cm

<table>
<thead>
<tr>
<th></th>
<th>OPEN</th>
<th>EVAR</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-day mortality</td>
<td>4.7%</td>
<td>1.7%</td>
<td>0.01</td>
</tr>
<tr>
<td>Secondary procedures</td>
<td>5.8%</td>
<td>9.8%</td>
<td>0.02</td>
</tr>
</tbody>
</table>
PEVAR vs EVAR Repair of AAA

- PEVAR procedures, compared with EVAR, have been shown to result in better outcomes with respect to the following characteristics
  - Shorter operative times
  - Fewer wound complications (infections or clinically significant hematomas that delayed discharge or required transfusion)


EVAR for Infrarenal AAAs

Indications for Use

- Adequate iliac/femoral access
- Infrarenal aortic neck treatment diameter range of 19-32mm (36 mm)
- Minimum aortic neck length of 10 mm
- Proximal aortic neck angulation ≤60°
- Iliac artery treatment diamete >8mm
- Distal seal zone – minimum 10 mm of healthy iliac

EVAR Planning

Measurement Form
  - Diameters
  - Lengths
  - Angles

EVAR Measurement Techniques
Good Anatomy: Chipshot!

Overview of Anatomy Challenges

Special Considerations

- Access challenges
- Infrarenal aortic neck
- Accessory vessels
- Iliac Aneurysms
- Narrow aortic bifurcation
Access Challenges

- Iliofemoral access issues include:
  - Calcified vessels
  - Small vessels
  - Tortuous vessels
  - Focal stenoses
  - Combination of above

Small and Stenotic Iliac Arteries

- Serial dilatation with graduated dilators
- Balloon angioplasty
- Conduits
  - Open conduits
  - Endo conduits

Calcified vessels

Tortuous Iliacs
St. Charles Case #3

- HPI: 56F with 5.3 cm AAA and severe claudication.
- PMH
  - CAD (first MI in early 30’s)
  - CABG x 2 x 2
  - LV dysfunction
  - HTN
  - HLD
St. Charles Case#4

- HPI: 73M with bilateral rest pain and >5 cm AAA
- PMH:
  - CAD s/p CABG 30 years ago
  - Stroke
  - Brain aneurysm
  - Seizure disorder
  - HLD
  - HTN
Infrarenal Aortic Neck

- Infrarenal neck: the most likely site of failure
  - Angulation of the infrarenal aortic neck
  - Length of the infrarenal aortic neck
  - Presence of reverse taper
  - Renal pathology
Disclosure

• The use of currently approved endografts in several countries, including the U.S.A., for fenestrated/branched endovascular aortic aneurysm repair (FEVAR) should be considered a modification of the standard technique (off-label use)

• The purpose of this presentation is to present my experience of endovascular treatment of thoracoabdominal aortic aneurysms (TAAAs) for high risk patients with no other options of treatment
chт1  In Notes, please flesh out bracketed annotation information for Minion et al.
cht. 4/24/2008
Modified Fenestrated Stent Grafts: Device Design, Modifications, Implantation, and Current Applications

Gustavo S. Oderich, MD and Joseph J. Ricotta II, MD

Abstract

Patients with aneurysms with short or angulated necks and those with involvement of the renal, visceral, and hypogastric arteries may not be candidates for endovascular treatment using traditional stent grafts. Fenestrated stent grafts and reinforced fenestrations permit the incorporation of the visceral and renal arteries into the endovascular repair, enabling an adequate proximal landing zone. These devices require a 4- to 9-month period for customization and are not currently commercially available in the United States. Modified fenestrated stent grafts may have a future role in the compassionate treatment of select high-risk patients with complex aneurysms who otherwise would not have access to a premanufactured fenestrated graft, or for those in need of urgent or emergent repair because of expanding or contained rupture, rapidly expanding or extremely large aneurysms. The authors have used modified fenestrated stent grafts in patients with large or normal infrarenal aortic aneurysms. In this article, the authors summarize the principles applied for device design and procedure planning as well as the technique for device modifications and implantation.

Thoracoabdominal Aortic Aneurysms
Results of Fenestrated-Branch Endograft Repair

<table>
<thead>
<tr>
<th>Author (year)</th>
<th>n vessels</th>
<th>Technical Success</th>
<th>30-d mortality</th>
<th>Dialysis</th>
<th>E-leak</th>
<th>Vessel patency</th>
<th>FU months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greenberg (2006)</td>
<td>119/302</td>
<td>100%</td>
<td>0.8%</td>
<td>10%</td>
<td>90%</td>
<td>96%</td>
<td>19</td>
</tr>
<tr>
<td>Semmens (2006)</td>
<td>58/147</td>
<td>91%</td>
<td>3.4%</td>
<td>0%</td>
<td>10%</td>
<td>91%</td>
<td>18</td>
</tr>
<tr>
<td>Muhs (2006)</td>
<td>38/116</td>
<td>97%</td>
<td>2.6%</td>
<td>0%</td>
<td>10%</td>
<td>96%</td>
<td>28</td>
</tr>
<tr>
<td>Ziegler (2006)</td>
<td>60/211</td>
<td>94%</td>
<td>1.6%</td>
<td>0%</td>
<td>1%</td>
<td>93%</td>
<td>24</td>
</tr>
<tr>
<td>Fenestrated</td>
<td>283/776</td>
<td>96%</td>
<td>2.1%</td>
<td>1%</td>
<td>15%</td>
<td>94%</td>
<td>22</td>
</tr>
</tbody>
</table>
Perfection!!!!!

1-year results:
- Freedom from endoleak, 85±9%
- Freedom from re-intervention, 84±7%
- Target vessel patency 96±9%
- Patient survival 73±8%
- Sac shrinkage (>5mm) was noted in 9 of 12 (78%) patients with >6 months follow-up
Upcoming Technology

- Not approved for sale in the U.S.
- CAUTION—Investigational device. Limited by Federal (or United States) law to investigational use.

Iliac Branch

P-Branch

T-Branch
Goal of the Vascular Program

• Be Oregon’s premiere center for vascular care

Thank you

• St. Charles Medical Center
  – Administration
  – Operating room team
  – Cath/Angio team
  – Radiology team
  – Hospitalist/ICU teams
• BMC
  – Administration
  – Vascular Surgery Department
  – Hospitalist/ICU teams
• Industry Partners
QUESTIONS & COMMENTS

The gate open!

They were very excited for our tour and looked very happy in their shirts.

They said, "We're so happy!"

Can we go to the park next?

Yes! It's a beautiful day!

The boys all shouted together.

Yes! Yes! Yes!

Sara