Quality indicators: Gauging and assessing quality

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Disclosures:
- President, ASDIN 2010-2011
- Chair, The Renal Network 4,5,10 VAAP
- Medical director, FMC Peoria downtown unit
- Off label use discussion: None

Purpose of data monitoring

Outcome reporting filters required in a good database

We must manage quality data across the continuum of care ... Patient centric

Where do we get our continuous quality improvement standards?

We must manage quality data across the continuum of care ... Patient centric

QA for the patient ... not just the procedure

I must have data from all physicians and facilities participating in care so that I can identify and address the problems

Triple Aim

- Improve the individual experience of care
  - Safety, quality and service
- Improve the population health
  - Maintain productivity, reduce disease, decrease mortality
- Reduce costs
  - Better interventions, reduced repeat encounters, lower hospitalization

Outcome reporting filters required in a good database

- Time frame
- Facility
- Physician
- Access type
- Procedure

We must manage quality data across the continuum of care ... Patient centric

Where do we get our continuous quality improvement standards?

- Target
  - The ultimate goal
    - Set by peer reviewed literature, clinical practice guidelines, governmental agencies, or others (NQF, IOM, etc)
- Benchmark
  - What are others doing?
    - ASDIN registry and/or internal data
- Threshold
  - The level at which more intensive review is initiated
    - Set locally by individual priorities or circumstances
Sources used for benchmarking in this lecture

1. Guidelines, literature or CMS
2. ASDIN registry
3. Renal Intervention Center internal data

ASDIN Quality Benchmarking Registry

- 88 registered users
  - 67 access centers
  - 14 group physician practices
  - 7 individual physicians
- 168 physicians total
- Half of participants are ASDIN members
- Data collected for over 1 year
- ~45,000 cases included so far

Purpose of data monitoring

Quality and Safety

- Universal protocol
- Procedure success
- Procedure complications
- Access placement by type
- Patient falls
- Medication errors
- Hospitalization
- Moderate sedation complication
- Infection within 30 days
- Patient burns
- Radiation exposure

Quality definitions

<table>
<thead>
<tr>
<th>Outcome parameter</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procedure success</td>
<td>Patient leaves the procedure area with the procedure believed to have been successful at correcting the presenting problem.</td>
</tr>
<tr>
<td>Immediate patency</td>
<td>The access is able to be successfully used for dialysis at least one-time subsequent to the procedure.</td>
</tr>
<tr>
<td>Functional patency</td>
<td>The access is able to be successfully used for dialysis at least one-time subsequent to the procedure.</td>
</tr>
<tr>
<td>Procedure complications</td>
<td>ASDIN scale: More complex divisions of types (1-10) of complication and grade (severity)</td>
</tr>
<tr>
<td>Access placement</td>
<td>SIR scale: Fewer divisions of types of complication with more focus on grade (severity)</td>
</tr>
<tr>
<td>Fistula</td>
<td>Incidence: the % of new patients in a given period who have a fistula placed, used, etc</td>
</tr>
<tr>
<td>Graft</td>
<td>Prevalence: the % of all patients with a fistula placed, used, etc. at a specific point in time</td>
</tr>
</tbody>
</table>

Procedure success benchmark data

- Varies by procedure
  - Many should have threshold of 100%
    - Catheter, surveillance, etc
  - Any failure prompts unanticipated event peer review
  - Some cannot be defined with “functional success”
    - Immature fistula
  - Thrombectomy Benchmarks
**Procedure complication benchmark data**

- Two scales
  - ASDIN
    - Type I-X (specific type or category of complication)
    - Grade 1-4 (severity least to most)
  - SIR
    - Separates by severity only (Minor A-B; Major C-F)

- Complication Benchmarks

**Access placement benchmark data**

<table>
<thead>
<tr>
<th>Measure</th>
<th>FFBI goal</th>
<th>National</th>
<th>ASDIN</th>
<th>RIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incident patients</td>
<td>avg</td>
<td>maximize</td>
<td>19%</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>avg</td>
<td>9%</td>
<td>NA</td>
<td>8%</td>
</tr>
<tr>
<td></td>
<td>cahr</td>
<td>minimize</td>
<td>72%</td>
<td>NA</td>
</tr>
<tr>
<td>Prevalent patients</td>
<td>avg</td>
<td>&gt;60%</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>avg</td>
<td>20%</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>cahr</td>
<td>&lt;10%</td>
<td>NA</td>
<td></td>
</tr>
</tbody>
</table>

**Safety definitions**

<table>
<thead>
<tr>
<th>Outcome parameter</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universal protocol</td>
<td>Any violation of procedure verification, time out, or procedure done on wrong site</td>
</tr>
<tr>
<td>Patient falls</td>
<td>Any patient or family fall in the center building or grounds</td>
</tr>
<tr>
<td>Medication errors</td>
<td>Administration of the wrong medication, wrong dose of medication, or medication to which patient is allergic</td>
</tr>
<tr>
<td>Hospitalization</td>
<td>Non-elective (ambulance-transfer) hospitalisation of patient from the center either before or after the procedure</td>
</tr>
<tr>
<td>Moderate sedation complications</td>
<td>Any complication arising from the administration of moderate sedation which is severe enough to require treatment (fluids, pressors, airway support, reversal agent)</td>
</tr>
<tr>
<td>Infection within 30 days</td>
<td>Infection of the procedure site or access within 30 days of the procedure</td>
</tr>
<tr>
<td>Patient burns</td>
<td>Burns suffered due to cautery, electrical or other operative events. Proposed by CMS in 2015</td>
</tr>
<tr>
<td>Radiation exposure</td>
<td>Patient exposure to ionising radiation. No current guideline or benchmark beyond ASDIN</td>
</tr>
</tbody>
</table>

**Safety benchmark data**

- Never events (Target and threshold 0%)
  - Wrong site surgery, patient fall, medication error
- Other events
  - Hospitalization (per 1000 cases)
    - ASDIN
    - RIC
  - Moderate sedation complication (per 1000 cases)
    - ASDIN
    - RIC
  - Infection within 30 days (per 1000 cases)
    - ASDIN
    - RIC

**Purpose of data monitoring**

- Business and marketing
- Service and Satisfaction
- Regulatory compliance
- Quality and Safety

**Regulatory compliance**

- Procedure indications
  - Is the need for each procedure clearly documented?
    - Clinical indication AND physical abnormality
  - Are procedure indications consistent with the standard of care?
- Procedure volumes
  - Relative proportion of various cases
- Coding accuracy
**Procedure indications by procedure type (RIC data)**

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Angiogram fistula</th>
<th>Angiogram graft</th>
<th>Thrombectomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decreased flow</td>
<td>29%</td>
<td>61%</td>
<td>83%</td>
</tr>
<tr>
<td>Abnormal exam</td>
<td>23%</td>
<td>10%</td>
<td>11%</td>
</tr>
<tr>
<td>Difficult cannulation</td>
<td>11%</td>
<td>8%</td>
<td>5%</td>
</tr>
<tr>
<td>Prolonged bleeding</td>
<td>10%</td>
<td>5%</td>
<td>1%</td>
</tr>
<tr>
<td>Maturation failure</td>
<td>9%</td>
<td>6%</td>
<td>1%</td>
</tr>
<tr>
<td>Needle infiltration</td>
<td>4%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Pseudoaneurysm</td>
<td>3%</td>
<td>2%</td>
<td>1%</td>
</tr>
<tr>
<td>Low arterial pressure</td>
<td>3%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>High venous pressure</td>
<td>2%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Low adequacy</td>
<td>2%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Steal symptoms</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
</tr>
</tbody>
</table>

N = 653  N = 385  N = 261

**Relative procedure volume data**

<table>
<thead>
<tr>
<th>Outcome parameter</th>
<th>Definition</th>
<th>Benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>35475/35476</td>
<td>Percentage of arterial angioplasty compared to venous angioplasty</td>
<td>CMS* 18%</td>
</tr>
<tr>
<td>35475-6/36147</td>
<td>Percentage of angioplasty compared to all diagnostic angiograms</td>
<td>89%</td>
</tr>
<tr>
<td>37205-6/35475-6</td>
<td>Percentage of stent placement compared to all angioplasties</td>
<td>7%</td>
</tr>
</tbody>
</table>

*2011 CMS Physician supplier procedure summary files – nephrology only

**Location of procedures - 36147**

Of 361,440 performed:
- Office = 50%
- HOPD = 39%
- Inpatient = 10%
- ASC = 1%

**36147 by specialty**

CMS 2011 Physician supplier procedure summary master files

**36870 by specialty**

Of total 368,676 performed:
- Radiology = 52%
- Nephrology = 27%
- Surgery = 18%

CMS 2011 Physician supplier procedure summary master files

**35475-6 by specialty**

Of total 354,346 performed:
- Radiology = 43%
- Nephrology = 32%
- Surgery = 25%

CMS 2011 Physician supplier procedure summary master files
Cost of these procedures in 2011

Cost of these procedures in 2011

<table>
<thead>
<tr>
<th></th>
<th>TOTAL</th>
<th>Paid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performed</td>
<td>36147</td>
<td>300,840 $ 65,569,667</td>
</tr>
<tr>
<td>Paid</td>
<td>36870</td>
<td>69,857 $ 39,050,066</td>
</tr>
<tr>
<td>Paid</td>
<td>35475-6</td>
<td>334,366 $ 219,943,896</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$ 324,563,629</td>
</tr>
</tbody>
</table>

Purpose of data monitoring

Purpose of data monitoring

- Business and marketing
- Service and satisfaction
- Regulatory compliance
- Quality and Safety

Service and Satisfaction

Service and Satisfaction

- Appointment analysis
  - Time from referral to procedure
  - Cancellations
    - Reason?
- Time analysis
  - Preop, procedure, postop, and total time
- Patient satisfaction
  - Ongoing assessment of perspectives of new and established patients
- Process evaluation
  - Time from arrival in HDU to referral for perm access
  - Time from referral to surgery consult
  - Time from surgery consult to surgery
  - Vessel map utilization and timing

Patient satisfaction

Patient satisfaction

- Scheduling
- Timing/waiting
- Temperature
- Pain control
- Education/communication
- Physician issues
- Staff issues

Purpose of data monitoring

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- Business and marketing
- Service and satisfaction
- Regulatory compliance
- Quality and Safety

Business and Marketing

Business and Marketing

- Thrombosis rate
- Access outcome
  - Primary failure
  - Maturation
- Case costs
Business and marketing definitions

<table>
<thead>
<tr>
<th>Outcome parameter</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thrombosis rate</strong>&lt;br&gt;Procedures/patient</td>
<td>Number of thrombosis events expressed as events per patient per year. Average number of procedures required per patient to maintain dialysis access (all access procedures included).</td>
</tr>
<tr>
<td><strong>Access outcome</strong>&lt;br&gt;Primary failure Procedures/patient</td>
<td>Percentage of accesses placed that fail without ever being able to be used. Average number of procedures done per patient on that access prior to the access failing and being abandoned.</td>
</tr>
<tr>
<td><strong>Maturation</strong>&lt;br&gt;Primary maturation Procedures/patient</td>
<td>Percentage of accesses placed that mature and are able to be used with no additional procedures. Average number of procedures per patient done on new accesses that develop adequately for use to augment maturation.</td>
</tr>
<tr>
<td><strong>Secondary maturation</strong>&lt;br&gt;Procedures/patient</td>
<td>Percentage of accesses placed that are able to be used only after one or more additional procedures to augment maturation.</td>
</tr>
<tr>
<td><strong>Case costs</strong>&lt;br&gt;</td>
<td>Average cost for each case (supplies, personnel, fixed costs). Expressed as cost/case and % of net revenue.</td>
</tr>
</tbody>
</table>

Thrombosis rate benchmark data

<table>
<thead>
<tr>
<th>Outcome parameter</th>
<th>KDOQI</th>
<th>ASDIN</th>
<th>RIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thrombosis rate avg&lt;br&gt;Procedures/patient</td>
<td>&lt; 0.5</td>
<td>NA</td>
<td>.44</td>
</tr>
<tr>
<td>Thrombosis rate avf&lt;br&gt;Procedures/patient</td>
<td>&lt; 0.25</td>
<td>NA</td>
<td>.02</td>
</tr>
</tbody>
</table>

Access placement benchmark data

<table>
<thead>
<tr>
<th>Outcome parameter</th>
<th>Literature</th>
<th>ASDIN</th>
<th>RIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary failure avg&lt;br&gt;Procedures/patient</td>
<td>&lt; 15% *</td>
<td>NA</td>
<td>10%</td>
</tr>
<tr>
<td>Primary failure avf&lt;br&gt;Procedures/patient</td>
<td>20-60% *</td>
<td>NA</td>
<td>19%</td>
</tr>
<tr>
<td>Primary maturation avf&lt;br&gt;Procedures/patient</td>
<td>NA</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>Secondary maturation avf&lt;br&gt;Procedures/patient</td>
<td>NA</td>
<td>1.6</td>
<td></td>
</tr>
</tbody>
</table>

* KDOQI; * Literature

Summary

- Quality and safety cannot be assessed without accurate data
- Data related to vascular access care crosses the continuum of patient care
  - Office, access center, hospital, dialysis facility
- A robust database and dedicated staff time is required
- The benefits include
  - Better quality
  - Greater safety
  - Increased business