Minding the gap
in pediatric headache care:
Applying QI Strategies to Achieve Better Outcomes

Scott Turner, RN, DNP, FNP
ACNN 2016 Annual Conference
Objectives

• Discuss the purpose and significance of the 2014 AAN Headache Quality Measures

• Identify basic QI training resources from the Institute for Healthcare Improvement

• Devise a method of sampling to determine how your practice is currently performing on these measures

• Apply the IHI's Model for Improvement to target at least one area of deficiency
Headache is a common problem...

- **Worldwide prevalence data** (Abu-Arafeh, Razak, Sivaraman & Graham, 2010; Buse, 2011)
  - 60% of children & adolescents report recurrent headaches
  - 8-12% meet criteria for migraine
  - 1-2% have chronic daily headache (CM, CTTH, NDPH)

- **Headaches are disabling** (Rothner, 2014)
  - frequent school absences
  - parent lost work time
  - poorer quality of life
  - high rates of anxiety and depression
Headache is a costly problem...

- Headaches are costly to treat (Ross et al., 2015)
  - outpatient care costs of $5.21 billion
  - prescription costs of $4.61 billion
  - inpatient care costs of $0.73 billion
  - ED care costs of $0.52 billion
  ________________
  $11.7 billion

- Headache is often treated poorly
  - > 45% of teens seen in the ED got opioids (DeVries et al., 2013)
  - < 20% get a preventative med when indicated (Lipton et al, 2011)
  - > 50% of children and adolescents presenting to neurology clinic had been imaged without indication (Schor, 2003)
American Academy of Neurology

Headache
Quality Measurement Set

FINAL
MEASURE #9: MIGRAINE HEADACHE RELATED DISABILITY FUNCTIONAL STATUS

Measure Description
Percentage of patients age 6 years old and older who have a diagnosis of migraine headache and for whom the number of headache-related disability days during the past 3 months is documented in the medical record.

This is a system level measure that is to be used for quality improvement purposes only at this time.

Measure Components

<table>
<thead>
<tr>
<th>Numerator Statement</th>
<th>Number of days during the past 3 months, as categorized* by patients or their caregivers, that they are unable to perform common daily activities (e.g., school, work, household chores, social activities, Independent Activities of Daily Living (IADLS), etc.) due to migraine headache.</th>
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<td>*Within the past 3 months range of days of disability due to migraine. 0 to 5 days: Little or no disability 6 to 10 days: Mild disability 11 to 20 days: Moderate disability 21+ days: Severe disability</td>
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≥ 6 y/o
+ diagnosed w/ migraine
+ h/a disability days in past 3 months
+ documented in EMR
### Measure Components

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| Denominator Exceptions | Exceptions:  
- Medication exception for not administering a disability tool (i.e., patient has a cognitive or neuropsychiatric impairment that impairs his/her ability to complete the survey).  
- Patient exception for not administering a disability tool (i.e., patient has the inability to read and/or write in order to complete the questionnaire).  
- System exception for not administering a disability tool (i.e., patient does not have insurance to cover the cost of the quality of life assessment). |

*Note: ≥ 6 y/o with migraine
The goal of this measure is to understand headache related disability (risk adjusted/risk stratified) on the system level to indicate where improvements in the management and treatment of patients with headache should be made.

**Gap in Care**

On the World Health Organization's ranking of causes of disability, this would bring headache disorders into the ten most disabling conditions for the two genders, and into the five most disabling for women.¹ 90% of people with headache have some headache-related disability, and approximately half are severely disabled or require bed rest.²

- Disability:
  - 9 out of 10 people with headache report they can't “function normally” during days in which a migraine headache strikes and 3 in 10 require bed rest.³
  - More than 25% of migraine sufferers missed at least one day of work over the past three months due to a migraine.³
  - Nearly 50% of sufferers report their migraines prevented them from doing household chores.³
  - Approximately 30% of people with headache did not participate in a family or social activity due to a migraine.³
What is Quality?

- Quality is a concept of **relative superiority**
  - *Doing the right thing...*
  - Practice Parameters
  - Clinical Care Guidelines

  - *Getting the best results...*
  - Quality Measures
  - Outcomes
    - Clinical Outcomes
    - Functional Outcomes
    - Financial Outcomes
What is Quality?

- What **outcomes** are important to headache care?
  - *It depends on who you ask...*
    - Providers
    - Patients and families
    - Payers
  - *It depends on how you measure them...*
    - Clinical Outcomes
    - Functional Outcomes
    - Financial Outcomes
Why should I care?

- The healthcare landscape is changing...
  - Fee for service model
  - rewards volume
  - Capitation model
  - rewards cost-savings
  - Value-based reimbursement
  - balances quality with cost
  - The Value Equation (Porter, 2010):
    \[
    \frac{\text{quality of care}}{\text{the cost of care}}
    \]
Why should I care?

• Quality measures are important...
  ! *They define what “quality” means for headache care*
  ! We want to be involved in defining quality measures
  ! *They measure the relative value of the care you provide*
  ! Your outcomes may affect your insurance contracts
  ! Your outcomes may determine your reimbursement rate
  ! Your outcomes may impact whether patients choose to see you

• Even if it’s not the Headache Quality Measures...
  ! Quality Improvement methods apply to any change
  ! Reducing variation improves quality (Ross et al., 2015)
How do I make these changes?

- Children’s Hospital Colorado / University of Colorado

- Section of Pediatric Neurology
  - 12 advanced practice providers and 21 physicians
  - See over 300 patients every month with headache
How do I make these changes?

Interdisciplinary Team

- Scott Turner, DNP(S), QI Lead
- Neurology Providers
- Neurology Nurses
- Headache Psychologist
- Infusion Center Nurses
- Emergency Physician
- IT/CAS, pharmacy experts

http://www.kotterinternational.com/the-8-step-process-for-leading-change/
How do I make these changes?

DMAIC – The 5 Phases of Lean Six Sigma

Click a Phase icon below for more details on each.

- **DEFINe**
  - Define the problem.

- **MEASURE**
  - Quantify the problem.

- **ANALYZE**
  - Identify the cause of the problem.

- **IMPROVE**
  - Implement and verify the solution.

- **CONTROL**
  - Maintain the solution.

http://www.goleansixsigma.com
1. Define the problem

- **Problem Statement**
  
  Our practice is not consistently meeting all seven of the AAN Headache Quality Measures that apply to children and adolescents.

- **Project Charter**
  
  - **Problem** – What is the problem?
  - **Rationale** – Why and to what extent is this a problem?
  - **Aim(s)** – What measurable outcome are we looking for?
  - **Expectations** – How will this improve our practice?

2. Quantify the Problem

- Improving Quality of Life
- Assessing and treating for headache disability
- Creating effective self-management plans
3. Identify cause of the problem

Did they know the right things to do?
- Outpatient Clinical Care Guideline (Kedia et al., 2013)

Did they have the systems in place to support them?
- PedMIDAS Disability Scales
- Headache Action Plans
Pediatric Migraine Disability Assessment Scale (PedMIDAS)
(Hershey, Powers, Vockell, LeCates, Kabbouche, & Maynard, 2001)


- Three Domains

<table>
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<tr>
<th>PedMIDAS Score Range</th>
<th>Disability Grade</th>
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<tr>
<td>0 to 10</td>
<td>Little to none</td>
</tr>
<tr>
<td>11 to 30</td>
<td>Mild</td>
</tr>
<tr>
<td>31 to 50</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

| Greater than 50      | Severe           |

#### Headache Disability

The following questions try to assess how much the headaches are affecting day-to-day activity. Your answers should be based on the last three months. There are no “right” or “wrong” answers so please put down your best guess.

1. How many full school days of school were missed in the last 3 months due to headaches?

2. How many partial days of school were missed in the last 3 months due to headaches (do not include full days counted in the first question)?

3. How many days in the last 3 months did you function at less than half your ability in school because of a headache (do not include days counted in the first two questions)?

4. How many days were you not able to do things at home (i.e., chores, homework, etc.) due to a headache?

5. How many days did you not participate in other activities due to headaches (i.e., play, go out, sports, etc.)?

6. How many days did you participate in these activities, but functioned at less than half your ability (do not include days counted in the 5th question)?

| Total PedMIDAS Score | 60 |

Headache Frequency

Headache Severity
Headache Action Plans

- Content
  - Headache diagnosis
  - Prevention strategies
  - Acute care strategies

- Validity
  - HAPs have not been studied
  - Asthma action plans reduce ED visits & school absences
  (Ducharme & Bhogal, 2008)
3. Identify cause of the problem
4. Implement the Solution

- The Institute for Healthcare Improvement
  - Data-driven
  - Evidence-based
  - Methodical

http://www.ihi.org/resources/Pages/AudioandVideo/MikeEvansVideoQIHealthCare.aspx
QI Methods

- IHI Model for Improvement

  - Aims & Goals
    - What do we want to improve?
  - Measurements & Outcomes
    - How will we know when we have improved it?
  - Changes
    - What changes will result in this improvement?
Aims

Close the gap in care within our practice, satisfy the AAN HQMs

- **Primary Aim:** Decrease the percentage of established patients seeking acute treatment in the ED by 33%

- **Secondary Aim:** Improve the average disability grade from 1/2 to 1 level on 4-level grading scale
Measures

**Outcome Measures**
- Number of ED visits for headache
- Change in average disability level

**Process Measures**
- Headache Action Plans generated
- PedMIDAS scales completed

**Balancing Measures**
- Infusion Center capacity
- Satisfaction, visit times
- Financial impact

© 2012 Associates in Process Improvement
Changes

**PDSA Cycles:**
- PedMIDAS Distribution
- PedMIDAS Data Entry
- Headache Action Plan Content
- HAP Creation, Tracking (EMR)
- Infusion Center scheduling
- Provider Order Entry

Infusion Center

Infusion Scheduling
- Scheduling Workflow
- Scheduling Order Set
- Nurse Triage Script

Provider Order Entry
- Infusion Protocol
- EMR Order Set

PDSA Timeline

CHCO Headache QIP Timeline

- Preparation phase
- PDSAs PedMIDAS Distribution
- PDSAs PedMIDAS Collection
- PDSAs HAP Letter
- PDSAs WAP Bookmarks
- PDSAs Infusion Center Use
- PDSAs Infusion after order set
- Statistical Analysis
- Data cleansing & reporting

- Data Management
- PedMIDAS
- Headache Action Plan
- Infusion Center
Changing Provider Behavior

• *What motivates health professionals?*
  
  • Self-determination Theory (Deci & Ryan, 1985)
    • Competence – doing the right thing
      • Evidence-based practice, Clinical Care Guidelines
    • Autonomy – being in control, choosing how to act
      • Provider-level audit & feedback
    • Relatedness – being part of something bigger
      • Control charts, goal thermometers

Dan Pink’s Video: https://www.youtube.com/watch?v=u6XAPnuFjJc
Control Charts

Headache Action Plan PDSAs

Baseline Measures
Jun – Dec 2015

Creating HAPs
Apr-Jun 2015

HAP Bookmarks
Oct 15 – Mar 16

Project Kickoff
3/31/15

Write a Letter
Apr – May 15

EMR Note
May – Jun 15

Added
Faculty Mtg

Fixed
Outcome: ED Visits for Headache

ED visits decreased from 22 to 15 patients/month (32%)
Odds Ratio: 1.6388 [95% CI: 1.3452-1.9965], p < .0001
Outcome: PedMIDAS Disability

There was no change in disability grade, $Z = 0.9608$, $p = 0.34$. There is a lag in measurement and seasonal variation.
Outcome: Infusion Center Use

![Chart showing comparison of Emergency Dept vs Infusion Center Average Revenue/Cost per Patient.](chart.png)
Discussion

• **Reduction in ED visits may have been due to:**
  • Widespread use of Headache Action Plans (HAPs)
  • Nurse triage and reinforcement of HAPs
  • Use of the infusion center
  • Raised awareness among nurses and providers
  • A change in practice culture

• **There was no change in disability grade**
  • Collection period was not long enough
  • Use of disability grade rather than score made changes harder to detect
    • *If you start with an “A”* ...
    • *If you start with an “F”* ...

Discussion

Strengths

- First project targeting national quality measures
- Model for Improvement, interdisciplinary team
- Leveraged personnel, EMR templates, order sets
- Shared goals, shift in culture
- Sustainability by building better workflows
Discussion

Limitations

• Did not track ED visits outside of CHCO

• PedMIDAS is not ideal quality of life measure
  ! No social or emotional domains
  ! Poor correlation of PedMIDAS scores over summer
  ! Not available in other languages

• Limitations in ability to use EMR to track HAPs
  ! Balance between workflow and data capture
Future Plans

- Use Quality Measures for OPPE compliance
- Develop a sustainable way to create and track Headache Action Plans (HAPs) using the EMR
- Update 2013 Headache Clinical Care Guideline
- Develop inpatient Clinical Care Guideline
- Study HAPs’ key elements and effectiveness
Conclusion

- Quality Improvement strategies can improve outcomes including a reduction in ED visits
- Use of PedMIDAS did not lead to improved disability, may not have had sufficient time to detect a change
- Engaging an interdisciplinary team, leveraging the EMR, optimizing processes, streamlining workflows, and refining organizational culture
- Use of standardized Headache Action Plans may reduce ED visits and school absences
Thank you

- **Headache Quality Improvement Team**
- Jennifer Disabato, DNP – UC Denver Faculty Advisor
- Amy Brooks-Kayal – Section Chief, Peds Neurology
- Carolyn Green, MD – Medical Director, QI Mentor
- Amanda Foss, CNRN & the Headache Team
- Mike Rannie & Lynn Schultz – Clinical Informatics
- Michelle Akey, Pharm.D. – Clinical Pharmacy
- Jennifer Coffman, RN, JD – NSI Executive Director
- Eric Vaughn & CHCO Neurosciences Institute (NSI) – financial, administrative support of the project
Questions?

MIND THE GAP
Resources

- Lean Six Sigma http://www.goleansixsigma.com
- Institute for Healthcare Improvement http://www.ihi.org
  - Intro to QI http://www.ihi.org/resources/Pages/AudioandVideo/MikeEvansVideoQIHealthCare.aspx
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- Dan Pink’s Video: https://www.youtube.com/watch?v=u6XAPnuFjJc
- AAN Guidelines https://www.aan.com/guidelines/
- PedMIDAS http://www.cincinnatichildrens.org/service/h/headache-center/pedmidas/
Selected Citations


- Ducharme, F.M. & Bhogal, S.K. (2008). The role of written action plans in childhood asthma. *Current Opinion in Allergy Clinical Immunology, 8*(2), 177-88. doi: 10.1097/ACI.0b013e3282f7cd58

Selected Citations


