Improving the quality of pain care

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University of Pennsylvania
Keys to good pain management

- Interdisciplinary vs multidisciplinary
- Shared vision
- Patient-centered
- Evidence based
Are we as good as we think we are?

• Each year an estimated:
  
  – 100,000 patients die of health care-associated infections
  
  – 44,000 – 98,000 dies of other preventable errors, and
  
  – Tens of thousands more dies of diagnostic errors or failure to receive recommended therapies

JAMA 304:204, 2010
Multidisciplinary vs Interdisciplinary

• Teamwork failures are common contributors to harmful errors.

• In many cases, someone knew something was wrong and either did not speak up or spoke up and was ignored.

• It is unclear how many teamwork and communication failures result from arrogance.

JAMA 304:204, 2010
A physician can subjectively assess a patient’s condition, situation, needs, goals and expectations, then intuitively select and execute an ideal course of medical management...
“Standard” practice of medicine

- Series of small, uncontrolled trials
  - N is too small to be valid
  - No informed consent
  - Based on anecdotal data

The plural of anecdote is not “data”
“Standard” practice of medicine

- Series of small, uncontrolled trials
  - N is too small to be valid
  - No informed consent
  - Based on anecdotal data
Traditional Quality Assurance

Before

Quality

better  worse

After

Quality

better  worse

Threshold

Brent James, MD; 2001
We are asking the wrong question

We’re asking:

“Am I good enough?”

When we should be asking:

“Am I the best I can be?”
And by doing so, missing an opportunity to be better

Instead of looking for “who is bad” we should find and implement the best practices.

Looking for “good” changes the work environment.
Quality Improvement

better | Quality | worse

better | Quality | worse

Brent James, MD; 2001
Variability is bad
Variations in clinical practice

- The decision to treat
- What we decide to do (type of care)
- How we go about providing the type of care
The world we work in is rather complex.
Reasons for practice variation

- **Complexity**
- **Knowledge**: We don’t always know what we are doing (yet do it anyway)
- **Actions**: Our decision-making process often varies, and may not be data driven (or is influenced by different things at different times)
Strategy for improving patient outcomes

Reduce variation

- This can be accomplished through the implementation of clinical pathways and a standardized process for providing care

- We can track how we are doing and benchmark ourselves to others

We need to create an environment for continuous innovation
Core questions for improvement

- What are we trying to accomplish?
  - What is our work? What do we do? Who do we do it for? What do they really want from us?

- What changes can we make that will result in an improvement?
  - Hypothesis generation step.

- How will we know that a change is an improvement?
  - Are we able to measure outcome?
What is the biggest challenge?

**Changing physician behavior**

- Sharing outcomes with physicians, allowing them to see how they compare with others
- Linking outcomes with compensation
Managing clinical care

Changing Cardiac Surgery within IHC
**CABG patient process flow chart**

<table>
<thead>
<tr>
<th>Select Patients who</th>
<th>Pre-hospital preparation</th>
<th>Hospital admit / Pre-op preparation</th>
<th>Surgery</th>
<th>Thoracic ICU</th>
<th>Step-down Unit</th>
<th>Floor</th>
<th>Discharge</th>
<th>Follow up</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Specific indications for CABG</td>
<td>• Patient education/expectations</td>
<td>• Pre-anesthesia</td>
<td>• Place lines</td>
<td>• Ventilator Support</td>
<td>• In development stage currently</td>
<td>• Acute care floor</td>
<td>• Discharge to home</td>
<td>• SF-36</td>
</tr>
<tr>
<td>• Full informed consent</td>
<td>• Insurance</td>
<td>• Measure PFT baseline</td>
<td>• Induce anesthesia</td>
<td>• Post-op protocols</td>
<td></td>
<td>• Discharge to home</td>
<td>• Pre-op &amp; 2 months post-op</td>
<td></td>
</tr>
<tr>
<td>(Wennberg-style video disks?)</td>
<td>• Post-op care plan</td>
<td>• Prophylax - infection (LRI, wound, septicemia)</td>
<td>• Expose heart</td>
<td>• Goals:</td>
<td></td>
<td>• Cardiac Rehab Program</td>
<td></td>
<td>4-6 week - surgeon</td>
</tr>
<tr>
<td></td>
<td>• Autologous blood</td>
<td>• DVT/PE</td>
<td>• Expose and remove saphenous vein</td>
<td>• Stabilize pt.</td>
<td></td>
<td>• Activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Classify patient (severity)</td>
<td>• Ulcers/GI Bleed</td>
<td>• Place bypass lines</td>
<td>• Extubate pt.</td>
<td></td>
<td>• Teaching</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Identify special needs</td>
<td>• Place lines</td>
<td>• Go on bypass and Cross-Clamp</td>
<td>• Begin activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Decision made: Pre-Thoracic or Admit</td>
<td>• Education</td>
<td>• Cool heart - stop electrical activity (cardioplegia)</td>
<td>• Restart nutrition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Shower</td>
<td>• Attach grafts (#, place, internal mammary)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enema</td>
<td>• Unclamp</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>• Shave Prep</td>
<td>• Restart heart electrical activity</td>
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<td></td>
<td></td>
<td></td>
<td>• Remove bypass lines and oversew</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>• Close sternum and leg</td>
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<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Off anesthesia</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Pre-hospital preparation**

- Patient education/expectations
- Insurance
- Post-op care plan
- Autologous blood
- Classify patient (severity)
- Identify special needs
- Decision made: Pre-Thoracic or Admit

**Hospital admit / Pre-op preparation**

- Pre-anesthesia
- Measure PFT baseline
- Prophylax - infection (LRI, wound, septicemia)
- DVT/PE
- Ulcers/GI Bleed
- Place lines
- Education
- Shower
- Enema
- Shave Prep

**Surgery**

- Place lines
- Induce anesthesia
- Expose heart
- Expose and remove saphenous vein
- Place bypass lines
- Go on bypass and Cross-Clamp
- Cool heart - stop electrical activity (cardioplegia)
- Attach grafts (#, place, internal mammary)
- Unclamp
- Restart heart electrical activity
- Remove bypass lines and oversew
- Close sternum and leg
- Off anesthesia

**Thoracic ICU**

- Ventilator Support
- Post-op protocols
- Goals:
  - Stabilize pt.
  - Extubate pt.
  - Begin activity
  - Restart nutrition

**Step-down Unit**

- In development stage currently
- Design will be for long-term vent patient

**Floor**

- Acute care floor
- Telemetry monitoring
- Cardiac Rehab Program
- Activity
- Teaching

**Discharge**

- Discharge to home
- Discharge to home with Home Health
- SNF

**Follow up**

- SF-36
- Pre-op & 2 months post-op
- 4-6 week - surgeon

Brent James, MD; 2001
Fast Track Extubation Protocol

Baselines

Trial

Implementation

Hours on ventilator

Month


LDSH Heart Services
Brent James, MD; 2001
Fast track extubation protocol

Baseline (Jan 1993 – Aug 1993)
Understanding patient flow is critical
But impacting care can become complex
Changing complex processes can be hard

- Berwanger and associates improved the use of evidence-based management using a combination of:
  - Reminders,
  - A checklist,
  - Case management, and
  - Staff education

- Use of proper therapy in the first 24 hours following admission for acute coronary systems in a general hospital setting improved from 49.5% to 67.9%

JAMA 2012; 307: 2041-2049
Leadership, resources, timing

BPCI MODEL STRUCTURE

The Bundled Payments initiative has four models of care that link payments for services in an episode of care:

- The hospital and physician billing revenue cycle DOES NOT CHANGE under the program.

<table>
<thead>
<tr>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payment of facility and target price</td>
<td>Inpatient stay plus post-discharge services</td>
<td>Inpatient stay plus post-discharge services</td>
<td>Inpatient stay plus post-discharge services</td>
</tr>
<tr>
<td>Hospital payments are based on payment for service</td>
<td>Hospital payments are based on payment for service</td>
<td>Hospital payments are based on payment for service</td>
<td>Hospital payments are based on payment for service</td>
</tr>
<tr>
<td>Clinical remittances for episode</td>
<td>Clinical remittances for episode</td>
<td>Clinical remittances for episode</td>
<td>Clinical remittances for episode</td>
</tr>
<tr>
<td>All-cause 30-day readmissions</td>
<td>All-cause 30-day readmissions</td>
<td>All-cause 30-day readmissions</td>
<td>All-cause 30-day readmissions</td>
</tr>
<tr>
<td>Proposed to replace</td>
<td>Proposed to replace</td>
<td>Proposed to replace</td>
<td>Proposed to replace</td>
</tr>
<tr>
<td>5% of fee-for-service payments</td>
<td>5% of fee-for-service payments</td>
<td>5% of fee-for-service payments</td>
<td>5% of fee-for-service payments</td>
</tr>
<tr>
<td>Payment for services is provided</td>
<td>Payment for services is provided</td>
<td>Payment for services is provided</td>
<td>Payment for services is provided</td>
</tr>
<tr>
<td>Traditional hospital service reported to Medicare, subject to reimbursement with potential target price</td>
<td>Traditional hospital service reported to Medicare, subject to reimbursement with potential target price</td>
<td>Traditional hospital service reported to Medicare, subject to reimbursement with potential target price</td>
<td>Traditional hospital service reported to Medicare, subject to reimbursement with potential target price</td>
</tr>
</tbody>
</table>

Disease teams cover the range of services

with representation from throughout the clinical spectrum

- Orthopaedics
- Rheumatology
- Pain Medicine
- PM&R
- Radiology
- Family Medicine

- Degenerative Arthritis (e.g., Osteoarthritis)
- Inflammatory Arthritis (e.g., Rheumatoid Arthritis, Psoriatic Arthritis)
- Acute Trauma & Fracture Care (e.g., Tibia/Fibula Fracture, Skull Fracture)
- Sports & Performance Injury (e.g., Meniscus Tear, Rotator Cuff Repair)
- Systemic Rheumatic Diseases (e.g., Vasculitis, Lupus, Scleroderma)
- Bone Diseases (e.g., Pathological Fracture, Paget’s Disease, Osteoporosis)
- Chronic & Regional Pain (e.g., Pain in Shoulder)
Disease teams expand the horizon

Disease teams cover the range of services

with representation from throughout the clinical spectrum

Orthopaedics
Rheumatology
Pain Medicine
PM&R
Radiology
Family Medicine

Degenerative Arthritis (e.g. Osteoarthritis)
Inflammatory Arthritis (e.g. Rheumatoid Arthritis, Psoriatic Arthritis)
Acute Trauma & Fracture Care (e.g. Tibia/Fibula Fracture, Skull Fracture)
Sports & Performance Injury (e.g. Meniscus Tear, Rotator Cuff Repair)
Systemic Rheumatic Diseases (e.g. Vasculitis, Lupus, Scleroderma)
Bone Diseases (e.g. Pathological Fracture, Paget’s Disease, Osteoporosis)
Chronic & Regional Pain (e.g. Pain in Shoulder)
Core methods to improve outcomes: Basic principles

- Some form of trial and error learning helps to accelerate growth in knowledge
- Everyone can help, and almost everyone wants to help if given the opportunity

Entropy wins unless leaders lead

JAMA 2012; 307: 2093-2094
Core methods to improve outcomes: Basic principles

- Knowledge of systems helps people identify smart changes to try
- Measuring (but not too much measuring), correctly interpreted, helps guide productive change
Outcome management – where do you start?

If you don’t measure it, you can’t manage it
Three types of outcomes

- **Physical outcomes** (quality)
  - medical outcomes: complications and therapeutic goals
  - includes functional status measures

- **Service outcomes** (satisfaction)
  - includes access issues (phone, appointment waiting times, time to treatment)

- **Cost outcomes**
  - cost of good care as well as cost of bad care (or no care)
Creation of program dashboards

### Outcomes Data

#### Patient Demographics

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>TOTAL</th>
<th>Tuttleman</th>
<th>Perelman</th>
<th>PMUC</th>
<th>Valley Forge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lumbosacral</td>
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<tr>
<td>Cervical</td>
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<tr>
<td>Extremity: Arm</td>
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<tr>
<td>Extremity: Leg</td>
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<tr>
<td>Abdomen</td>
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<tr>
<td>Knee</td>
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<tr>
<td>Etiology</td>
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<tr>
<td>Post-op</td>
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<tr>
<td>Neuropathic</td>
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<tr>
<td>CRPS</td>
<td></td>
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<tr>
<td>Cancer-related</td>
<td></td>
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</tr>
</tbody>
</table>

#### Chronic Opioid Therapy

<table>
<thead>
<tr>
<th></th>
<th>TOTAL</th>
<th>Tuttleman</th>
<th>Perelman</th>
<th>PMUC</th>
<th>Valley Forge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number receiving OIT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Process measures</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Opioid agreement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>UPN last visit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MED</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>MED &gt; 100 mg / day</td>
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</tr>
</tbody>
</table>

#### Patient outcomes

|                        |       |           |          |      |              |
| Pain Intensity (Avg WK) |       |           |          |      |              |
| Physical functioning   |       |           |          |      |              |
| PHQD                   |       |           |          |      |              |

#### Goals of treatment

|                        |       |           |          |      |              |
| Established / documented|       |           |          |      |              |
| Met                    |       |           |          |      |              |
Measuring outcomes in chronic pain

- **Pain Intensity**
  - Average, least and worst
  - Time period (within the last week)

- **Pain Relief**
  - Since last visit
  - Since start of therapy

- **Pain Interference**
  - Physical functioning
  - Mental functioning
  - Sleep

- **Mood**
  - Depression
  - Anxiety

- **Global response to Treatment**
  - Since the last visit
  - Since the start of therapy

- **Satisfaction with care**
Careful selection of PRO measures

- Carefully select domains to be measured
- Balance robustness of data with collection burden on patient and program
- Results must be meaningful to both the patient and the providers
Penn pain outcome survey

- Survey completed via Internet at home, or in the office at the time of the visit
- PRO immediately available for review and use by provider
- PRO electronically imported into EHR

PRO data collection process developed through the service line
Tracking individual outcomes data over time

<table>
<thead>
<tr>
<th>Allergies: E-myocin, Egg or Chicken-derived Drugs, Penicillin, Penicillins</th>
<th>Reviewed on 9/28/2015: Mark as Reviewed</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZZZ AAA (446107203) Sex: Female DOB: 2/10/1950 Age: 65</td>
<td></td>
</tr>
<tr>
<td>BP: P:</td>
<td>T: Srv Resp:</td>
</tr>
</tbody>
</table>

**Past Interventions**
- Pain relief since starting treatment
- Pain relief since last visit
- Global relief of pain
  - Mood: PHQ 9
  - Pain Intensity (EOL)
  - Pain Intensity: Mood
  - Depression
  - Anxiety

**Sleep**
- Sleep Quality
- Pain Intensity: Sleep
- OSA
  - OSA Screening (refer for sleep study if 3 or more are checked)
  - OSA Diagnosed
  - Using CPAP / bi-level PAP

**Function**
- Global Function Rating
- Pain Intensity: Function
- Work / Disability Status

**Opioid Monitoring**
- Global Assessment of opioid efficacy
- Urine Drug Screen Results (RP)
- Abnormal Urine Drug Screen
- Methadone Monitoring
- OTC
- ADRB
- Testosterone
- MED Calculation
Documentation of care & treatment response

Onset/Course: Chronic pain of LE's

Pt has history of Bilateral LE CRPS s/p MVC in 2000. Since then she has been on multiple therapies including opioids, antidepressents, physical therapy and psychotherapy. She says her pain is currently stable. She is willing to cut down on her opioids as she is planning on getting pregnant next year. Her mood has been ok, but is willing to start an antidepressent as she is not on any now. She has heard about methadone and is scared of its side effects. Pt is currently try to lose weight with a personal trainer and appears very motivated.

Chief Complaint: Burning Bilateral Leg Pain

PAIN:

0-10 Rating (0=No Pain, 10=Extreme Pain) of Intensity - Average Week (RP): 9
0-10 Rating (0=No Pain, 10=Extreme Pain) of Intensity - Worst Week (RP): 10
0-10 Rating (0=No Pain, 10=Extreme Pain) of Intensity - Best Week (RP): 6

MOOD:

Depression (RP): Yes
Anxiety (RP): Yes
Her mood has been ok, but is willing to start an antidepressent as she is not on any now.

SLEEP:

Pt has been able to sleep well on ambien and would like to continue it.

FUNCTION:

Able to continue her daily activities. Pt is currently try to lose weight with a personal trainer and appears very motivated.

RESULTS
PRO and other data presentation allows for improved process of care
Putting Outcomes Data Collection Into Action
Variability in opioid prescribing patterns

<table>
<thead>
<tr>
<th></th>
<th>CA</th>
<th>DE</th>
<th>FL</th>
<th>ID</th>
<th>LA</th>
<th>ME</th>
<th>OH</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescription rate / 1000 residents</td>
<td>596</td>
<td>829</td>
<td>703</td>
<td>777</td>
<td>1021</td>
<td>855</td>
<td>888</td>
<td>596-1021</td>
</tr>
<tr>
<td>% receiving MED &gt; 100</td>
<td>10.3</td>
<td>16.0</td>
<td>13.2</td>
<td>12.0</td>
<td>9.2</td>
<td>15.0</td>
<td>8.1</td>
<td>8.1-16.0</td>
</tr>
<tr>
<td>% with multiple provider episode</td>
<td>0.8</td>
<td>15.7</td>
<td>9.3</td>
<td>2.1</td>
<td>0.3</td>
<td>5.7</td>
<td>14.5</td>
<td>0.3-15.7</td>
</tr>
<tr>
<td>% receiving opioids + benzodiazepines</td>
<td>12.0</td>
<td>12.4</td>
<td>14.5</td>
<td>12.7</td>
<td>12.2</td>
<td>11.7</td>
<td>14.4</td>
<td>12.0-14.5</td>
</tr>
</tbody>
</table>

MMWR 2015: 64: 1-13
Impact of outcomes data on the process of care

- Introducing PRO and the Pain Data Flow Sheet into practice lowered variability of care

- Process generated meaningful dialog among faculty, and with other team members
Standardized process for chronic opioid therapy

- COT program includes:
  - PRO to document patient’s response to therapy
  - PRO to establish and track treatment goals
  - Data flow sheet to track MED and UDS
  - Data collection process to create practice COT dashboard (MED, consent, UDS, goal)
  - “Side projects” include: screening for OIAD, QTc with methadone
## Monitoring for ADRB

<table>
<thead>
<tr>
<th>ORT Risk for ADRB</th>
<th>No ADRB Observed n (%)</th>
<th>ADRB Observed n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>65 (61%)</td>
<td>41 (39%)</td>
</tr>
<tr>
<td>MODERATE</td>
<td>6 (43%)</td>
<td>8 (57%)</td>
</tr>
<tr>
<td>HIGH</td>
<td>1 (20%)</td>
<td>4 (80%)</td>
</tr>
</tbody>
</table>

Method used to identify aberrant drug-related behavior (n=53)

<table>
<thead>
<tr>
<th>Identification Method</th>
<th>Number (%) patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urine drug screen only</td>
<td>32 (60.4%)</td>
</tr>
<tr>
<td>Physician-identified behavior</td>
<td>7 (13.2%)</td>
</tr>
<tr>
<td>Both physician-identified behavior and UDS</td>
<td>14 (26.4%)</td>
</tr>
</tbody>
</table>
Monitoring QTc for methadone and other prescribed medications

- QTc intervals of 500 msec or more are predictive of an increased risk for torsade de pointes, which can lead to sudden cardiac death

- Methadone can prolong QTc.
  - This prolongation is most often clinically significant in high doses (> 100 mg/day), but can occur at lower doses

- QTc prolongation can also occur following the administration of may other medications


Screening for OSA (and perhaps CSA)

- Other changes in the process of care introduced:
  - Use of STOP-BANG screening tool in every patient through the data flow sheet
  - Establish process for ordering and then ensuring patients are engaged in proper care once diagnosed
  - “Side projects” include: Change in policy regarding use of benzodiazepines with opioids; screening for CSA; monitoring of ventilation using smart monitors in inpatients
Screening and treatment of depression

- Other changes in the process of care introduced:
  - Use of PHQ9 to screen for depression and monitor response to treatment
  - Use of treatment guidelines for medication management of depression
  - Identification of resources outside of the program for patient referral when needed
The process starts with…

- The development of a unified vision
- The institution of meaningful data collection and analysis
- The development and implementation of a process of care to improve outcomes