2016-17 Teaching Academy

All Rush University Faculty Members
are invited to the 2016-17 Teaching Academy for skill and knowledge enhancement!
Presentations will be held every third Tuesday of the month from 12 – 1 p.m. in Room 994, Armour Academic Center.
Lunch will be provided.

Teaching Academy Workshops/Seminar Series
(Tentative Schedule and Topics)

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 19, 2016</td>
<td>Assessment in Education</td>
</tr>
<tr>
<td>Aug. 16, 2016</td>
<td>Simulation in Health Professions Education</td>
</tr>
<tr>
<td>Sept. 20, 2016</td>
<td>Leadership Skills Focus: Building Constructive Working Relationships</td>
</tr>
<tr>
<td>Oct. 18, 2016</td>
<td>The Convoluted World of “Big”/Messy Data</td>
</tr>
<tr>
<td>Nov. 15, 2016</td>
<td>Cybersecurity Trends in Healthcare and Higher Education</td>
</tr>
<tr>
<td>Dec. 20, 2016</td>
<td>Teaching Strategies to Facilitate Learning</td>
</tr>
<tr>
<td>Feb. 21, 2017</td>
<td>Ethics &amp; Professionalism</td>
</tr>
<tr>
<td>March 21, 2017</td>
<td>Ethics: Dealing with Questions that Don’t Have an Answer</td>
</tr>
<tr>
<td>April 18, 2017</td>
<td>Identifying Learning Styles and Creating Opportunities for Diverse Learning Styles</td>
</tr>
<tr>
<td>May 16, 2017</td>
<td>Healthcare Provider Burnout</td>
</tr>
<tr>
<td>June 20, 2017</td>
<td>Are you Managing Your Email or Is It Managing You?</td>
</tr>
</tbody>
</table>

For more information and to RSVP,
Contact Office of Faculty Affairs at Faculty_Affairs_@rush.edu or (312) 942-8873.
Rush University Teaching Academy

ASSESSMENT IN EDUCATION

Elizabeth Baker, MD, MHPE
Associate Dean of Education
Rush Medical College

Vice Chair for Education
Department of Internal Medicine
At the end of today’s session, participants will be able to:

• Define assessment
• Explain the concepts of reliability and validity
• Describe different types of assessment
• List strengths and weaknesses of commonly used assessment methods
“Any systematic method of obtaining information from tests and other sources, used to draw inferences about characteristics of people, objects or programs.”

Standards for Educational and Psychological Testing
AERA, APA and NCME, 1999
ASSESSMENT

FORMATIVE VS SUMMATIVE
Evidence presented to support or refute the meaning or interpretation assigned to assessment data or results

Messick, 1989
Construct = a hypothesized attribute assumed to be tested by the assessment
Validity and Reliability

Validity

Reliability
Validity Evidence: 5 sources

- Content
- Response Process
- Internal Structure
- Relationship to other variables
- Consequences of testing

Messick, 1989
Validity - Content Evidence

CONSTRUCT OF INTEREST

CONTENT OF ASSESSMENT

Back to Top
Validity - Content Evidence

CONSTRUCT OF INTEREST

CONTENT OF ASSESSMENT

Back to Top
Validity - Response Process Evidence

- QA
- Accuracy of scoring
- Interpretation of scores
- Setting pass/fail decisions
• Internal Data
• Inter-rater Reliability
• Item statistics
Validity - Relationship to other variables

• In classroom-based courses:
  – Quizzes
  – Midterm
  – Final

• In clinical clerkships:
  – Clinical Performance Evaluations
  – Final exam
Validity - Consequences of Testing

Examples:

• Improve patient care
• Decrease graduation rate
Types of Assessments:

- Written tests
- Performance tests
- Observational assessment
- Portfolios
Miller’s Pyramid

- Knows (Knowledge)
- Knows How (Competence)
- Shows how (Performance)
- Does (Action)

Miller, 1990
Written Tests

Knows How (Competence)

Knows (Knowledge)
Written Tests

**Constructed Response**
- Short and long answer
- Easy to write
- Subjective scoring
- Reasoning
- Partial credit

**Selected Response**
- MCQ, T/F, matching
- Hard to write
- Accurate
- Reproducible
- Efficient
Validity Evidence: 5 sources

• Content
• Response Process
• Internal Structure
• Relationship to other variables
• Consequences of testing
Written Tests - Validity Evidence

- Content: Blueprint
- Response Process: QA - quality of items
- Internal Structure: inter-item correlation, item characteristics, inter-rater reliability
- Relationship to other variables: other exams
- Consequences: standard setting
Shows how (Performance)
• Controlled observation of student performance
• Standardized patients
• OSCE- Objective Structured Clinical Exam
• Simulation: ACLS, team training
Validity Evidence: 5 sources

- Content
- Response Process
- Internal Structure
- Relationship to other variables
- Consequences of testing
• Content: Blueprint
• Response Process: QA- quality of items
• Internal Structure: inter-rater (SP) reliability
• Relationship to other variables: written exams, observational assessment
• Consequences: standard setting, pass/fail determination
Observational Assessment

Does (Action)

Shows how (Performance)

Knows How (Competence)

Knows (Knowledge)
Observational Assessment

- Describes learner behavior
- Embedded in the clinical environment
- “Authentic”
Observational Assessment

- Observes
- Interprets
- Records
- Judges
Observational Assessment: Examples

- Direct observation/video-recording
- Mini-CEX
- Medical record audit
- Peer assessment
- 360 evaluation
Validity Evidence: Observational Assessment

- Content
- Response Process
- Internal Structure
- Relationship to other variables
- Consequences of testing
Observational Assessment - Validity Evidence

• Content: Tool must match objectives
• Response Process: Rater training, choice of patient and situation
• Internal Structure: Inter-rater reliability
• Relationship to other variables: Written examinations, OSCE
• Consequences: Standard setting
A collection of evidence documenting progress, accomplishments, and achievements over time

Tekian and Yudkowsky. Assessment Portfolios, Assessment in Health Professions Education. 2009.
Portfolios: Purpose

- A vehicle to promote reflective learning
- Evidence of that reflection and other learning
- Guide development of competencies
- Monitor progress
- Assessment of competency
- Self-assessment/reflection
Portfolios: Content

• Private, reflective responses to learning experiences

vs

• Public compilation of evidence of work samples—learner’s best work
Implementing Portfolios

- Define purpose
- Determine competencies
- Define content
- Develop marking system
- Select and train raters
- Timeline
- Orient students
- Develop guidelines
- Establish validity
- Evaluate system
Validity Evidence: Portfolios

• Content
• Response Process
• Internal Structure
• Relationship to other variables
• Consequences of testing
Portfolios - Validity Evidence

- Content: Match to program objectives
- Response Process: Rater training, scoring - compensatory or conjunctive
- Internal Structure: Inter-rater reliability
- Relationship to other variables: Written examinations, OSCE
- Consequences: Standard setting - high stakes or lower stakes
Threats to Validity

Construct Underrepresentation
Construct-irrelevant Variance = Noise
• Is the performance good enough?
• The process used to create boundaries between categories
  — Pass/fail
  — Pass/high pass/honors
  — Proficient/needs remediation
Cut scores need to be:
• Credible
• Defensible
• Acceptable

Cut score = an operational statement of policy
• Norm referenced ➔ relative

• Criterion referenced ➔ absolute
Standard setting: caveats

- There is no “gold standard”
- The choice of content expert judges is key
- Judges must be trained and understand
- QA is essential
- Iterative procedures may be needed to establish consensus
- In the final analysis, standards are not set by content experts but by policy decision makers
“Any systematic method of obtaining information from tests and other sources, used to draw inferences about characteristics of people, objects or programs.”

Standards for Educational and Psychological Testing
AERA, APA and NCME, 1999
Validity Evidence: 5 sources

- Content
- Response Process
- Internal Structure
- Relationship to other variables
- Consequences of testing

Messick, 1989
Types of Assessments:

- Written tests
- Performance tests
- Observational assessment
- Portfolios
Questions?

Elizabeth Baker, MD, MHPE
Associate Dean of Education
Rush Medical College
Vice-Chair for Education
Department of Internal Medicine

Feel free to contact me at Elizabeth_A_Baker@rush.edu
• Downing and Yudkowsky. 2009. Assessment in Health Professions Education. NY: Routledge.


Simulation in Health Professions Education

Teaching Academy Series – August 16, 2016

Beverley Robin, MD, CHSE
Rush University Medical Center
Department of Pediatrics
Director of Pediatric Interprofessional Education and Simulation
Disclosures

• No disclosures
Objectives

1. Describe the history of simulation in health professions education.

2. Recognize the drivers of simulation-based training in health professions education.

3. Distinguish the various simulation modalities and their application.

4. Describe a framework for instructional design in healthcare simulation.

5. Recognize the benefits of simulation-based education for patient outcomes and safety.
History of Medical Simulation

- Origins in aviation
  - Link trainer (1929)
  - Army (1934)
  - CREW (1978)
- NASA - Apollo first digital simulators
- Nuclear power plants
- 1980s military flight simulators, naval/submarine simulators
History of Medical Simulation

History of Medical Simulation

- 1960s
  - Resusci-Anne
  - Sim-One
  - SPs
  - VR
  - Harvey
- Screen-based simulation
- 1980s prototype mannequin simulators (anesthesia)
Why Simulation?

• Duty hour restrictions
• Fewer inpatients
• Patient acuity
• EMR
• Legal implications
• Patient safety
• Quality improvement
• Ethical imperative?
Why Simulation?


- Pediatric residents (n=449)
- Observed endotracheal intubations
- Competence = successful intubation on 1st or 2nd attempt ≥ 80% of the time
  - 35% of attempts never successful
  - 1st or 2nd attempt success:
    - PGY1 50%
    - PGY2 55%
    - PGY3 62%
  - None reached defined level of competence


- Medical, RT, paramedic students naïve to intubation
  - Observed actual intubations (438)
  - 18 - 35 intubation trials/subject
  - 90% probability for “good” intubation required 47 attempts
Why Simulation?


- Cross-sectional survey (2009)
- Pediatric residents’ resuscitation training and attendance at pediatric resuscitations
- Attendance at resuscitations:
  - PGY1: 2 (1-3)
  - PGY2: 5 (3-8)
  - PGY3: 10 (5-12)
- Discharge defibrillator:
  - 12% on actual patient
  - 33% neither on actual patient nor during training
Why Simulation?


- Pre-licensure nursing students (n=666)
- RCT:
  - Control
  - 25% simulation
  - 50% simulation

- Outcomes:
  1) knowledge
  2) clinical competence
  3) NCLEX pass rates

- Results:
  - No statistically significant differences:
    - knowledge ($p=0.478$)
    - clinical competence ($p=0.688$)
    - NCLEX pass rates ($p = 0.737$)
  - Post-graduation clinical practice
    - no differences in manager ratings of readiness for practice and overall clinical competence
      - at 6 weeks ($p = 0.706$)
      - 3 months ($p = 0.511$)
      - 6 months ($p = 0.527$)
Why Simulation?


- Pediatrics residents (n=70)
- PALS trained
- High fidelity simulation – pulseless V-tach
  - 66% compressions > 1 min of pulselessness
  - 33% no compressions
  - 54% defibrillated ≤ 3 mins of pulselessness
# Pediatric Patient to Learner Ratio for Typical Inpatient RUMC Team (Medical Students and Residents)

<table>
<thead>
<tr>
<th>Inpatient Unit</th>
<th>ADC (n) †</th>
<th>Medical students (n)</th>
<th>PGY1 (n)</th>
<th>PGY2/3 (n)</th>
<th>Learners/team (n)**</th>
<th>Patients: Learners (max)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gen pediatrics ward</td>
<td>11.6</td>
<td>4-7</td>
<td>2-3</td>
<td>2</td>
<td>12</td>
<td>11.6:12</td>
</tr>
<tr>
<td>PICU stepdown</td>
<td>4.7</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>4.7:5</td>
</tr>
<tr>
<td>MBU</td>
<td>10.7</td>
<td>2-3</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>10.7:5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Patients</th>
<th>Total Learners (max)</th>
<th>Total Patients: Learners</th>
</tr>
</thead>
<tbody>
<tr>
<td>27</td>
<td>22</td>
<td>27:22</td>
</tr>
</tbody>
</table>

† Stable over past 3 years. NICU not included
** RN learners and medical students on electives/subspecialty not included
Simulation Modalities

- Task trainers
- On-line computer based
- Cadaveric
- Live tissue
- Virtual reality
Simulation Modalities

- Mannequin
- Standardized patients
- Standardized participants
Simulation Modalities

- Computer-based simulation
- Procedural simulation
- Simulated clinical immersion
- Simulated patient
- Hybrid simulations
Experiential Learning (Kolb)

- Concrete Experience
- Abstract Conceptualization
- Reflective Observation
- Debriefing
- Active Experimentation
Reflection on Action

Concrete Experience

Reflection and abstract conceptualization

Concrete experience – active experimentation

Reflection and abstract conceptualization

Orientation and Pre-brief

Scenario 1

Debriefing

Scenario 2

Debriefing

Wrap up
Deliberate Practice - Ericsson

- Importance of *how* one practices, rather than merely performing a skill multiple times

1. Focused, repetitive performance of psychomotor skill
2. Rigorous skill assessment
3. Specific, focused feedback
4. Repeated performance of the skill

Adult Learners (Malcolm Knowles)

- Internally motivated, self directed
- Motivated by the need to solve problems
- Goal oriented
- Relevancy oriented
- Bring previous experiences and knowledge to new learning experiences
Bloom’s Learning Taxonomy

Cognitive
Increase knowledge

Psychomotor
Build physical/perceptual skill

Affective
Change attitude/behavior
Zone of Simulation

Instructional Design Model


- Objective: To determine the effect of simulation-based mastery learning on central venous catheter insertion skill and prevalence of procedure related complications
- IM and ED residents (n=76)
- Controls (n=26)
- Simulation-based training – internal jugular and subclavian central line insertion
  - Pre-determined minimum passing score
  - Procedural checklist
  - Written pre- and post-test

- Simulation-trained residents:
  - Fewer needle passes (p<.0005)
  - Fewer arterial punctures (p<.0005)
  - Higher success rates (p=.005)
  - Clinical skills:
    - IJ: Pre 50.6% (SD 23.4%) Post 93.9% (SD 10.2%) (p<.0005)
    - SC: pre 48.4% (SD 26.8%) Post 91.5% (DS 17%) (p<.0005)
Simulation-based education – Patient Benefits


- RTC
- Residents (n=12)
- Control (standard training) or simulation-based
- 10 actual patient colonoscopies:
  - Success rate
  - Time to reach cecum
  - Patient discomfort

Results
- **Success rate**: simulation-trained 52% vs. controls 19% (p=0.0011). Simulation-trained OR 4.53
- **Time to reach cecum**: simulation-trained 30 mins (IQR 17-38 mins) vs. controls 40 mins (IQR 25-45 mins) (p = 0.037)
- **Patient discomfort**: simulation-trained, median 4 (IQR 2.5-6) vs. controls, median 5 (IQR 4-7) (p=0.001)
Simulation-based education – Patient Benefits


• Monthly central line infection rates prior to and after simulation-based training
• Infections per 1000 catheter days:
  • Prior to training: 3.82 (20 infections/5235 catheter-days)
  • After training: 1.29 (6 infections/4670 catheter-days) (p=0.02)
• 74% reduction in incidence of central line infections post intervention
Simulation-based education – Patient Benefits


- RTC
- 1st and 2nd year registrars (Ob/gyne)
- Laparoscopic salpingectomy
- Controls vs. simulation-based
- Outcome measures (on actual patients)
  - Technical performance (objective structured assessment of laparoscopic salpingectomy; max 50 points)
    - Simulation trained - median 33 (IQR 32-36), vs. controls 23 (IQR 22-27) (p=0.001)
  - Operating time (mins)
    - Simulation-trained – median 12 (IQR 10-14), vs. controls 24 (IQR 20-29) (p=0.001)
References

Teaching Academy

Leadership Skills Focus:
Building Constructive Working Relationships

Mary M. Nash, PhD
AVP Talent Management & Leadership Development

Dr. Nash has disclosed that there is no actual or potential conflict of interest in regards to this presentation.

The planners, editors, faculty and reviewers of this activity have no relevant financial relationships to disclose.
This presentation was created without any commercial support.
Learning Objectives

At the conclusion of this course participants will be able to

• Express that self-awareness is an important aspect of being an effective leader
• Integrate my personality and behavior styles into an effective leadership strategy
• Interact with and/or manage individuals with respect to personality and behavior style preferences in order to foster acceptance and appreciation
To obtain credit you must:

- Be present for the entire session
- Complete an evaluation form
- Return the evaluation form to staff

Certificate will be sent to you by e-mail upon request.

This course is eligible for 1 (four) AMA PRA Category 1 Credits™

Accreditation and Designation Statement: Rush University Medical Center is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians. Rush University Medical Center designates this live activity for a maximum of 4 AMA PRA Category 1 Credit(s)™ Physicians should claim only credit commensurate with the extent of their participation in the activity.

Rush University is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center's Commission on Accreditation.

Rush University is an approved provider for physical therapy (216.000272), occupational therapy, respiratory therapy, social work (159.001203), nutrition, speech-audiology, and psychology by the Illinois Department of Professional Regulation. Rush University designates this live activity for 4 Continuing Education credit(s).
Think of the most stressful day you’ve had recently.

What did you do to bust that stress?
MBTI
What is **Personality** or **Type**?

- The essence of who you are as an individual
- An organized pattern of characteristics or qualities
- It is reflected in what you say, how you feel about yourself, how you act and how you choose to live your life
Myers-Briggs Type Indicator

- A well-researched, reliable and valid instrument, based on the work of Carl Jung
- Created by mother-daughter team of Katharine Briggs and Isabel Briggs-Myers
- Most widely used assessment by practitioners globally to understand personality preferences
Jung’s Theoretical Base

Much apparently random variation in human behavior is actually quite orderly and consistent, and is based on

– the way people direct their energy,
– gather information,
– make decisions about that information, and
– approach their life
3 more questions
Preferences for Gaining Energy

• **Extraversion**: focus on the outside world to get energy through interacting with people and/or doing things

• **Introversion**: Focus on the inner world and get energy through reflecting on information, ideas and/or concepts
Facets

Extraversion:
- Initiating
- Expressive
- Gregarious
- Active
- Enthusiastic

Introversion:
- Receiving
- Contained
- Intimate
- Reflective
- Quiet
Preferences for Gathering or Becoming Aware of Information

- **Sensing:** Notice and trust facts, details, and present realities

- **INtuiting:** Attend to and trust inter-relationships, theories, and future possibilities
Facets

Sensing:
• Concrete
• Realistic
• Practical
• Experiential
• Traditional

INtuiting:
• Abstract
• Imaginative
• Conceptual
• Theoretical
• Original
Preferences for Deciding or Coming to a Conclusion About Information

• **Thinking**: Make decisions using logical, objective analysis

• **Feeling**: Make decisions to create harmony by applying person-centered values
Facets

Thinking:
• Logical
• Reasonable
• Questioning
• Critical
• Tough

Feeling:
• Empathetic
• Compassionate
• Accommodating
• Accepting
• Tender
Preferences for Dealing with the World Around Us

• **Judging:** Tendency to be organized and orderly and to make decisions quickly

• **Perceiving:** Tendency to be flexible and adaptable and to keep options open as long as possible
## Facets

**Judging:**
- Systematic
- Planful
- Early starting
- Scheduled
- Methodical

**Perceiving:**
- Casual
- Open-ended
- Pressure-prompted
- Spontaneous
- Emergent
Personality Dimensions

Differences in personality can be attributed to preferences for eight paired personality dimensions:

– Extraversion or Introversion (E or I)
– Sensing or iNtuiting (S or N)
– Thinking or Feeling (T or F)
– Judging or Perceiving (J or P)
Myers-Briggs Type Indicator (MBTI)

Energy
What is the source of your energy?

Perception
How do you prefer to gather information?

Judgment
How do you prefer to make decisions?

Environment
How do you deal with the outer world?

(E) Extraverting
(S) Sensing
(T) Thinking
(J) Judging

(I) Introverting
(N) iNtuiting
(F) Feeling
(P) Perceiving
<table>
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<th>ISFJ</th>
<th>INFJ</th>
<th>INTJ</th>
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<tr>
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<td>ENFP</td>
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<tr>
<td>ESTJ</td>
<td>ESFJ</td>
<td>ENFJ</td>
<td>ENTJ</td>
</tr>
</tbody>
</table>

Group Style: [Blank space for group style]
Important to Remember:

MBTI indicates preferences, not ability

Stereotypes, labels – and the key!

No right or wrong answers!
   All are strengths, and all can be drawbacks

You decide your preferences – not the assessment
   (although the assessment is usually an accurate indicator)
Leadership Skills Focus – Building Constructive Working Relationships

Part 2:

DiSC – Understanding Your Behavior Style Preferences
DiSC

- Everything DiSC® is another tool that offers personalized information to help you understand yourself and others better.

- The DiSC model includes four basic **behavioral styles** that describe how people approach their work and relationships.
What is DiSC?

• Describes BEHAVIOR – a person’s manner of doing things

• Behavior is a function of Personality and Environment

\[ B = f (P/E) \]

• Promotes understanding our own behavior, and that of others, for enhanced effectiveness
What is DiSC? (continued)

- A four quadrant model, based on two continuums: speed, and focus (relationships or task)
- NO right or wrong answers!
- ALL styles have strong points, and all have potential weaknesses, especially when “used” to the extreme
- “D”, “i”, “S”, and “C” are the labels for the four quadrants, or dimensions of behavior
- We all use all four styles, and prefer one or two
DiSC Dimensions

Dominance
- Direct
- Results-oriented
- Firm
- Strong-willed
- Forceful

- Analytical
- Reserved
- Precise
- Private
- Systematic

Influence
- Outgoing
- Enthusiastic
- Optimistic
- High-spirited
- Lively

- Even-tempered
- Accommodating
- Patient
- Humble
- Tactful

Conscientiousness

Steadiness
Reminder: MBTI and DiSC Key Principles, Part 1

• All personality and behavior styles are equally valuable, and people with all styles can be effective managers.

• Your management style is also influenced by other factors, such as life experiences, education, and maturity.

• Understanding yourself better is the first step to becoming more effective with your employees and your manager.

• Learning about other people’s personality and behavior style preferences can help you understand their priorities and how they may differ from your own, and help you build more effective relationships.
MBTI and DiSC Key Principles, Part 2

• ALL styles have strong points, and all have potential weaknesses, especially when “used” to the extreme

• Our ultimate goal is to
  – **Understand** all preferences,
  – **Accept** that they may be different from ours, and
  – **APPRECIATE** all styles and preferences and what they bring to the table
  – **ADAPT our own behavior** when it best meets the needs of the relationship or situation
DiSC Dimensions

• Dominance - *How we approach problems and deal with challenges*

• Influence - *How we interact with and attempt to influence people*

• Steadiness - *How we respond to the pace of the environment*

• Conscientiousness - *How we respond to rules and procedures set by others*

• *We all use all four*, and have a preference for one or two
How can I tell other people’s behavior style preferences?

Some “People Reading” Principles:

- Not for labelling – for understanding
- No good or bad styles
- All have strengths and limitations
- Everyone is a mixture of styles
People Reading

Observe actual behavior

  – Body language
  – Tone of voice and expression
  – Choice of words
  – Pace
  – Focus
People Reading

• Think of someone who you have a hard time connecting with, or have some conflict with
• With that person in mind, let’s try to determine their preferred style
People Reading Method

1. FAST-PACED & OUTSPOKEN
   CAUTIOUS & REFLECTIVE

2. QUESTIONING & SKEPTICAL
   ACCEPTING & WARM
People Reading Method

3.
Individually:

• Your preference is _____
• The person you are thinking about seems to have a preference of _____
• How are your preferred styles different?
• In what circumstances do you/might you feel tension with someone with a different DiSC profile?
• How might you adapt your style when collaborating, to best meet the needs of the situation and/or the relationship?
Wrap Up

• Reminder of Key Principles
MBTI and DiSC Key Principles, Part 1

- All personality and behavior styles are equally valuable, and people with all styles can be effective managers.
- Your management style is also influenced by other factors, such as life experiences, education, and maturity.
- Understanding yourself better is the first step to becoming more effective with your employees and your manager.
- Learning about other people’s personality and behavior style preferences can help you understand their priorities and how they may differ from your own, and help you build more effective relationships.
MBTI and DiSC Key Principles, Part 2

• ALL styles have strong points, and all have potential weaknesses, especially when “used” to the extreme

• Our ultimate goal is to

  – **Understand** all preferences,

  – **Accept** that they may be different from ours, and

  – **APPRECIATE** all styles and preferences and what they bring to the table

  – **ADAPT our own behavior** when it best meets the needs of the relationship or situation
Wrap Up

What is one highlight you are taking away from today’s session?
Rush University Teaching Academy
Leadership Skills Focus: Building Constructive Working Relationships

Thank you!!
### Characteristics Frequently Associated with Each Type

<table>
<thead>
<tr>
<th>Sensing Types</th>
<th>Intuitive Types</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ISTJ</strong></td>
<td><strong>INFJ</strong></td>
</tr>
<tr>
<td>Quiet, serious, earn success by thoroughness and dependability. Practical, matter-of-fact, realistic, and responsible. Decide logically what should be done and work toward it steadily, regardless of distractions. Take pleasure in making everything orderly and organized—their work, their home, their life. Value traditions and loyalty.</td>
<td>Seek meaning and connection in ideas, relationships, and material possessions. Want to understand what motivates people and are insightful about others. Conscientious and committed to their firm values. Develop a clear vision about how best to serve the common good. Organized and decisive in implementing their vision.</td>
</tr>
<tr>
<td><strong>ISFP</strong></td>
<td><strong>INFP</strong></td>
</tr>
<tr>
<td>Tolerant and flexible, quiet observers until a problem appears, then act quickly to find workable solutions. Analyze what makes things work and readily get through large amounts of data to isolate the core of practical problems. Interested in cause and effect, organize facts using logical principles, value efficiency.</td>
<td>Idealistic, loyal to their values and to people who are important to them. Want an external life that is congruent with their values. Curious, quick to see possibilities, can be catalysts for implementing ideas. Seek to understand people and to help them fulfill their potential. Adaptable, flexible, and accepting unless a value is threatened.</td>
</tr>
<tr>
<td><strong>ESTP</strong></td>
<td><strong>ENFP</strong></td>
</tr>
<tr>
<td>Flexible and tolerant, they take a pragmatic approach focused on immediate results. Theories and conceptual explanations bore them—they want to act energetically to solve the problem. Focus on the here-and-now, spontaneous, enjoy each moment that they can be active with others. Enjoy material comforts and style. Learn best through doing.</td>
<td>Warmly enthusiastic and imaginative. See life as full of possibilities. Make connections between events and information very quickly, and confidently proceed based on the patterns they see. Want a lot of affirmation from others, and readily give appreciation and support. Spontaneous and flexible, often rely on their ability to improvise and their verbal fluency.</td>
</tr>
<tr>
<td><strong>ESTJ</strong></td>
<td><strong>ENFJ</strong></td>
</tr>
<tr>
<td>Practical, realistic, matter-of-fact. Decisive, quickly move to implement decisions. Organize projects and people to get things done, focus on getting results in the most efficient way possible. Take care of routine details. Have a clear set of logical standards, systematically follow them and want others to also. Forceful in implementing their plans.</td>
<td>Warm, empathetic, responsive, and responsible. Highly attuned to the emotions, needs, and motivations of others. Find potential in everyone, want to help others fulfill their potential. May act as catalysts for individual and group growth. Loyal, responsive to praise and criticism. Sociable, facilitate others in a group, and provide inspiring leadership.</td>
</tr>
</tbody>
</table>

**Extraverts**

<table>
<thead>
<tr>
<th><strong>ISFJ</strong></th>
<th><strong>INTJ</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Quiet, friendly, responsible, and conscientious. Committed and steady in meeting their obligations. Thorough, painstaking, and accurate. Loyal, considerate, notice and remember specifics about people who are important to them, concerned with how others feel. Strive to create an orderly and harmonious environment at work and at home.</td>
<td>Have original minds and great drive for implementing their ideas and achieving their goals. Quickly see patterns in external events and develop long-range explanatory perspectives. When committed, organize a job and carry it through. Skeptical and independent, have high standards of competence and performance— for themselves and others.</td>
</tr>
<tr>
<td><strong>ISFP</strong></td>
<td><strong>INTP</strong></td>
</tr>
<tr>
<td>Quiet, friendly, sensitive, and kind. Enjoy the present moment, what's going on around them. Like to have their own space and to work within their own time frame. Loyal and committed to their values and to people who are important to them. Dislike disagreements and conflicts, do not force their opinions or values on others.</td>
<td>Seek to develop logical explanations for everything that interests them. Theoretical and abstract, interested more in ideas than in social interaction. Quiet, contained, flexible, and adaptable. Have unusual ability to focus in depth to solve problems in their area of interest. Skeptical, sometimes critical, always analytical.</td>
</tr>
<tr>
<td><strong>ESFP</strong></td>
<td><strong>ENTP</strong></td>
</tr>
<tr>
<td>Outgoing, friendly, and accepting. Exuberant lovers of life, people, and material comforts. Enjoy working with others to make things happen. Bring common sense and a realistic approach to their work, and make work fun. Flexible and spontaneous, adapt readily to new people and environments. Learn best by trying a new skill with other people.</td>
<td>Quick, ingenious, stimulating, alert, and outspoken. Resourceful in solving new and challenging problems. Adept at generating conceptual possibilities and then analyzing them strategically. Good at reading other people. Bored by routine, will seldom do the same thing the same way, apt to turn to one new interest after another.</td>
</tr>
<tr>
<td><strong>ESFJ</strong></td>
<td><strong>ENTJ</strong></td>
</tr>
<tr>
<td>Warmhearted, conscientious, and cooperative. Want harmony in their environment, work with determination to establish it. Like to work with others to complete tasks accurately and on time. Loyal, follow through even in small matters. Notice what others need in their day-by-day lives and try to provide it. Want to be appreciated for who they are and for what they contribute.</td>
<td>Frank, decisive, assume leadership readily. Quickly see illogical and inefficient procedures and policies, develop and implement comprehensive systems to solve organizational problems. Enjoy long-term planning and goal setting. Usually well informed, well read, enjoy expanding their knowledge and passing it on to others. Forceful in presenting their ideas.</td>
</tr>
</tbody>
</table>
The Convoluted World of “Big”/Messy Data

Bala Hota MD MPH

10/18/2016
Learning Objectives

• Develop knowledge about the concept of a learning healthcare system, and how large, often messy, data sets are a necessary part of this approach

• Re-evaluate benchmarking data, including the US News and World Report Hospital Ranking, based on limitations in the measures

• Employ critical assessment in the way data are combined and used in various venues
Big data

• What is “Big data”?  
  – Data sets characterized by large volume, complexity, diversity, and generation/timeliness

• Healthcare – digitization/use of electronic records/consumer collection

• The amount of health care data worldwide is estimated to be 25,000 petabytes by 2020  
  – 2 petabytes is the size of all the information in all of the academic research libraries in the US today
Rush Data Warehouse

- Over 100 million rows of data for individual healthcare transactions across the Rush Enterprise

- For research: removed identifying information, which permits use of the data to learn about ways to improve healthcare

- For 2012 – 2013,
  - 2.6 million service encounters,
  - 6.9 million medication orders,
  - 8.7 million medication doses given,
  - 28 million laboratory assessments,
  - 9.3 million diagnoses,
  - And constantly growing
Exhibit 2: Primary data pools are at the heart of the big-data revolution in healthcare.

- **Activity (claims) and cost data**
  - Owners: payors, providers
  - Example data sets: utilization of care, cost estimates

- **Clinical data**
  - Owners: providers
  - Example data sets: electronic medical records, medical images

- **Pharmaceutical R&D data**
  - Owner: pharmaceutical companies, academia
  - Example data sets: clinical trials, high-throughput-screening libraries

- **Patient behavior and sentiment data**
  - Owners: consumers and stakeholders outside healthcare (e.g., retail, apparel)
  - Example data sets: patient behaviors and preferences, retail purchase history, exercise data captured in running shoes

Source: McKinsey Global Institute analysis

“The ‘big data’ revolution in healthcare; Accelerating value and innovation”, McKinsey and Co, 2013
BIG DATA AND QUALITY MEASUREMENT
Medicare's New Hospital Ratings Draw Immediate Ire

Medicare released new hospital ratings Wednesday, but the hospital industry and Congress criticized them.

By Steve Sternberg | Senior Writer    July 27, 2016, at 4:52 p.m.
CMS star rating

• Overall composite score for hospitals based on Hospital Compare Data
• 64 potential quality measures in 7 domains
• Not all measures reported by all hospitals
• In general:
  – Reporting fewer measures was better: fewer than 10% of hospitals reporting fewer than 38 measures included received either 1 or 2 stars
  – AAMCs disproportionately received 1 or 2 stars (62%) (worst)
  – Rush: 4 stars; best AAMC in Chicago area, top 15.8% of teaching hospitals nationally
How measure categories are weighted

For each hospital, a hospital summary score is calculated by taking the weighted average of the hospital’s scores for each measure group or category. The table below shows the weight applied to each measure category. The hospital summary score is then used to calculate the overall rating.

<table>
<thead>
<tr>
<th>Measure Category</th>
<th>Weight Used in Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality</td>
<td>22%</td>
</tr>
<tr>
<td>Safety</td>
<td>22%</td>
</tr>
<tr>
<td>Readmission</td>
<td>22%</td>
</tr>
<tr>
<td>Patient Experience</td>
<td>22%</td>
</tr>
<tr>
<td>Effectiveness of Care</td>
<td>4%</td>
</tr>
<tr>
<td>Timeliness of Care</td>
<td>4%</td>
</tr>
<tr>
<td>Efficient Use of Medical Imaging</td>
<td>4%</td>
</tr>
</tbody>
</table>
Star Rating CMS measure components

- Mortality (MI, CABG, COPD, CHF, PNA, CVA)
- Safety of Care (Central Line Associated Bloodstream Infections [CLABSIs], CAUTI, SSI, MRSA BSIs, C diff, surgical complications and Patient Safety Indicators [PSIs])
- Readmission (unplanned readmissions)
- Patient Experience (Patient Sat Surveys)
- Effectiveness of Care (Vaccination, Screening, Protocol Driven Care)
- Timeliness of Care (ED throughput, time to care for MI)
- Efficient Use of Imaging (Outpatient MRI, CT, and Stress Test Use)

*Calculated from Medicare Billing Data or submitted via direct reporting methods*
Why measure quality? Lots of reasons

• “That which is measured improves. That which is measured and reported improves exponentially.” – Pearson’s Law, Peter Drucker

• Hawthorne Effect

• Section 501(b) of the Medicare Prescription Drug, Improvement, and Modernization Act (MMA) of 2003

• Learning Healthcare System
Learning Healthcare System

• “One in which knowledge generation is so embedded into the core of the practice of medicine that it is a natural outgrowth and product of the healthcare delivery process and leads to continual improvement in care”

IOM; The Learning Healthcare System: Workshop Summary, 2007
Learning Healthcare System

Data Collection and Analysis Systems

Care, using EHR/electronic systems

Optimize Care and Workflows

Research

Analytic Output: Metrics and Measurement
“Automated” measurement

- Presence of an Event
- Clinical Information
  - Electronic Record Data
  - Surveillance Rules = Case Definition
  - Electronic Parsing/Review of Data
  - Human Confirmation/Review
Elements of measurement

• Denominator

• Numerator

• Avoid threats to validity
The central-line associated bloodstream infection (CLABSI) rate

- **Modifiable causes of CLABSI**
  - Infection control (line insertion practice, timely line removal)
  - Unnecessary central-line use

- **Events (Central-line associated BSI's)**
  - **(Numerator)**

- **Central vascular device days (Central-line device utilization rate)**
  - **(Denominator)**

- **Non-modifiable causes of CLABSI**
  - Comorbidities/host factors
  - Necessary central-line use

---

Threats to Validity of Measures for Benchmarking

- Between System Bias in Denominator Specification
  - Are denominator criteria objective and comparable between facilities
- Between System Bias in Numerator Specification
  - Are numerator criteria objective and comparable between facilities
- Small Sample Sizes
  - Wide confidence intervals, point estimate of rate inaccurate
- Case Mix
  - Varying patient populations affect predicted rate
Flaws in measurement

- **Mortality (MI, CABG, COPD, CHF, PNA, CVA)**
- Safety of Care (*Central Line Associated Bloodstream Infections*[CLABSI]*), CAUTI, SSI, MRSA BSIs, C diff, surgical complications and *Patient Safety Indicators*[PSI]*)
- Readmission (unplanned readmissions)
- Patient Experience (Patient Sat Surveys)
- Effectiveness of Care (Vaccination, Screening, Protocol Driven Care)
- Timeliness of Care (ED throughput, time to care for MI)
- Efficient Use of Imaging (Outpatient MRI, CT, and Stress Test Use)

*Calculated from Medicare Billing Data or submitted via direct reporting methods*
Objective measurement using electronic criteria

Quality of Traditional Surveillance for Public Reporting of Nosocomial Bloodstream Infection Rates

Michael Y. Lin, MD, MPH
Bala Hota, MD, MPH
Yosef M. Khan, MBBS, MPH
Keith F. Woeltje, MD, PhD
Tara B. Borlawsky, MA
Joshua A. Doherty, BS
Kurt B. Stevenson, MD, MPH

Context Central line–associated bloodstream infection (BSI) rates, determined by infection preventionists using the Centers for Disease Control and Prevention (CDC) surveillance definitions, are increasingly published to compare the quality of patient care delivered by hospitals. However, such comparisons are valid only if surveillance is performed consistently across institutions.

Objective To assess institutional variation in performance of traditional central line–associated BSI surveillance.

Design, Setting, and Participants We performed a retrospective cohort study of
Figure 4. Relative Ranking of 4 Medical Centers
Distribution of Kappas across ICUs: Study IP Review Compared to Original IP Review and Computer Algorithm

![Graph showing distribution of Kappas across ICUs.](image)

- Infection preventionist
- Computer algorithm

**Point estimate range:**
- Infection preventionist: 0.22 - 0.62
- Computer algorithm: 0.48 - 0.67

**Heterogeneity:**
- Infection preventionist: P = 0.01
- Computer algorithm: P = 0.80

Courtesy Mike Lin, MD, MPH,
Data From JAMA, November 10, 2010—Vol 304, No. 18 2035
Probabilistic Measurement of Central Line–Associated Bloodstream Infections

Bala Hota, MD, MPH; Paul Malpiedi, BS, MPH; Scott K. Fridkin, MD; John Martin, BS, MPH; William Trick, MD

for the CDC Prevention Epicenters Program

OBJECTIVE. To develop a probabilistic method for measuring central line–associated bloodstream infection (CLABSI) rates that reduces the variability associated with traditional, manual methods of applying CLABSI surveillance definitions.

DESIGN. Multicenter retrospective cohort study of bacteremia episodes among patients hospitalized in adult patient-care units; the study evaluated presence of CLABSI.

SETTING. Hospitals that used SafetySurveillor software system (Premier) and who also reported to the Centers for Disease Control and Prevention’s National Healthcare Safety Network (NHSN).

PATIENTS. Patients were identified from a stratified sample from all eligible blood culture isolates from all eligible hospital units to generate a final set with an equal distribution (ie, 20%) from each unit type. Units were divided a priori into 5 major groups: medical intensive care unit, surgical intensive care unit, medical-surgical intensive care unit, hematology unit, or general medical wards.

INTERVENTIONS. Episodes were reviewed by 2 experts, and a selection of discordant reviews were re-reviewed. Data were joined with NHSN data for hospitals for in-plan months. A predictive model was created; model performance was assessed using the c statistic in a validation set and comparison with NHSN reported rates for in-plan months.

RESULTS. A final model was created with predictors of CLABSI. The c statistic for the final model was 0.75 (0.68–0.80). Rates from regression modeling correlated better with expert review than NHSN-reported rates.

CONCLUSIONS. The use of a regression model based on the clinical characteristics of the bacteremia outperformed traditional infection preventionist surveillance compared with an expert-derived reference standard.

## Multivariate Predictors of CLABSI

<table>
<thead>
<tr>
<th>Factor</th>
<th>Estimate</th>
<th>OR</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-2.35 (-2.84--1.95 )</td>
<td>0.1 (0.06-0.14 )</td>
<td>0.0000</td>
</tr>
<tr>
<td>Streptococcus</td>
<td>-1.9 (-2.97--1.2 )</td>
<td>0.15 (0.05-0.3 )</td>
<td>0.0031</td>
</tr>
<tr>
<td>Anaerobes</td>
<td>-1.81 (-3.4--0.98 )</td>
<td>0.16 (0.03-0.37 )</td>
<td>0.0070</td>
</tr>
<tr>
<td>Culture from other site -3 and +7 days of blood culture</td>
<td>-1.25 (-1.99--0.75 )</td>
<td>0.29 (0.14-0.47 )</td>
<td>0.0055</td>
</tr>
<tr>
<td>Number of additional blood cultures in episode beyond first</td>
<td>0.46 (-0.02-0.72 )</td>
<td>1.59 (0.98-2.06 )</td>
<td>0.0536</td>
</tr>
<tr>
<td>Enterococcus</td>
<td>-0.68 (-1.15--0.21 )</td>
<td>0.51 (0.32-0.81 )</td>
<td>0.0577</td>
</tr>
<tr>
<td>Length of Stay &gt; 7 days</td>
<td>0.66 (0.28-1.05 )</td>
<td>1.94 (1.32-2.85 )</td>
<td>0.0421</td>
</tr>
<tr>
<td>Gram Negative Aerobe</td>
<td>-0.45 (-0.92--0.04 )</td>
<td>0.64 (0.4-0.96 )</td>
<td>0.1819</td>
</tr>
<tr>
<td>General Medical Ward Location</td>
<td>0.5 (0.12-0.89 )</td>
<td>1.65 (1.13-2.43 )</td>
<td>0.1108</td>
</tr>
<tr>
<td>Hematology Ward Location</td>
<td>0.71 (0.34-1.09 )</td>
<td>2.04 (1.4-2.98 )</td>
<td>0.0203</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>0.57 (-0.04-1.11 )</td>
<td>1.77 (0.95-3.04 )</td>
<td>0.1939</td>
</tr>
<tr>
<td>SICU Location</td>
<td>-0.11 (-0.63-0.34 )</td>
<td>0.89 (0.53-1.4 )</td>
<td>0.6616</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interaction</th>
<th>Estimate</th>
<th>OR</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staphylococcus aureus in SICU</td>
<td>-1.27 (-1.83--0.28 )</td>
<td>0.28 (0-0.75 )</td>
<td>0.1659</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>c statistic</td>
</tr>
<tr>
<td>Hosmer Lemeshow</td>
</tr>
</tbody>
</table>
Calibration of Incidence, Predicted vs NHSN reported
Learning Algorithm

Positive Blood Culture → Algorithmic Rule → Event Probability

Human Review → Retrain

Event Rate

Summed across time
Case Mix Adjustment

• Adjustment of measures based on illness burden in measured population
• Covariate used to standardize measurement
  – Charlson score, SAPS score etc.
• Observed : Expected ("O:E") ratio
  – Calculate an expected value based on comorbidities or patient factors, compare numerically to measured rate
CMS Mortality, Safety, and Readmission rates based on measured values and case mix adjustment

Denominator
Claims Based (ICD/CPT Code)

Numerator
Claims, Chart Abstraction Based

Risk Adjustment
Expected Rte Claims Based

O:E Ratio
Quality Rank
Contingent on Documentation and Hospital Billing Codes

Back to Top
# The Rush UHC Case Mix

<table>
<thead>
<tr>
<th>Discharge Quarter</th>
<th>Total Cases</th>
<th>CC/MCC</th>
<th>% Capture</th>
<th>UHC Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013-1</td>
<td>2,558</td>
<td>1,226</td>
<td>47.9%</td>
<td>Total</td>
</tr>
<tr>
<td>2013-2</td>
<td>2,735</td>
<td>1,290</td>
<td>47.2%</td>
<td>Mean</td>
</tr>
<tr>
<td>2013-3</td>
<td>2,720</td>
<td>1,300</td>
<td>47.8%</td>
<td>Minimum</td>
</tr>
<tr>
<td>2013-4</td>
<td>2,826</td>
<td>1,338</td>
<td>47.3%</td>
<td>25th Percentile</td>
</tr>
<tr>
<td>2014-1</td>
<td>2,663</td>
<td>1,274</td>
<td>47.8%</td>
<td>50th Percentile</td>
</tr>
<tr>
<td>2014-2</td>
<td>2,799</td>
<td>1,354</td>
<td>48.4%</td>
<td>75th Percentile</td>
</tr>
<tr>
<td>2014-3</td>
<td>2,969</td>
<td>1,287</td>
<td>43.3%</td>
<td>Maximum</td>
</tr>
<tr>
<td>2014-4</td>
<td>3,157</td>
<td>1,333</td>
<td>42.2%</td>
<td>Higher Better</td>
</tr>
<tr>
<td>2015-1</td>
<td>2,989</td>
<td>1,303</td>
<td>43.6%</td>
<td></td>
</tr>
</tbody>
</table>

CMS MSDRG's Complications and Co-morbidities (CC's) and Major Complications and Comorbidities (MCC's) are diagnoses that CMS has determined will increase LOS and/or cost when they are present and therefore also increase MSDRG reimbursement. Many of these CC/MCC are also variables in the UHC risk models. This metric is a combined CC and MCC capture rate for surgical MSDRG's for all payers. Medicare, UHC service-line and more specific CC and MCC capture can be found in the report express CC/MCC reports.

Cormorbidities in Surgical Patients: We code below the 25% of UHC hospitals
Algorithmic detection of Comorbidities

Each visit is assigned diagnoses based on physicians’ notes.

Patients may have other conditions from:
- Prior visits
- Lab results

Medicare DRG Payments:
- Diagnoses
- Procedure

ICD9 Code

HRRP and HVBP Incentives:
- Outcome: PN
- Complicating Condition

Existing Info

New Info

ICD9 Code

ICD9 Code

ICD9 Code

ICD9 Code

ICD9 Code

ICD9 Code

ICD9 Code

ICD9 Code

Outcome: HF

Complicating Condition

Complicating Condition

Complicating Condition

Complicating Condition

Complicating Condition

Complicating Condition

Complicating Condition

Complicating Condition

Complicating Condition

Complicating Condition

Complicating Condition

Complicating Condition

Complicating Condition

Outcome: AMI
18 chronic and 3 acute conditions

- These additional codes will ultimately determine whether or not a given episode of care is reclassified to a different DRG code
- Any reclassification will likely result in a greater reimbursement

<table>
<thead>
<tr>
<th>Chronic Conditions</th>
<th>Acute Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer</td>
<td>Hyponatremia</td>
</tr>
<tr>
<td>Major depression</td>
<td>Hyponatremia</td>
</tr>
<tr>
<td>Epilepsy</td>
<td>Hypernatremia</td>
</tr>
<tr>
<td>Hypercholesterolemia</td>
<td>Acute renal failure</td>
</tr>
<tr>
<td>Obesity</td>
<td></td>
</tr>
<tr>
<td>Malnutrition</td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td></td>
</tr>
<tr>
<td>Chronic kidney disease</td>
<td></td>
</tr>
<tr>
<td>Congestive heart failure</td>
<td></td>
</tr>
</tbody>
</table>

- Ischemic heart disease
- Osteoporosis
- COPD
- Osteoarthritis
- Dementia
- Cerebrovascular disease
- Asthma
- Bipolar disorder
- Diabetes mellitus
On average, 2 to 3 ICD9 codes were added to each episode of care
Impact of Conditions on AMI 30-day Mortality

Improved coding impact on AMI 30-day Mortality:
1. Improvement in Rush’s comparison to other hospitals
2. No revenue increase
Impact of Conditions on HF 30-day Mortality

- Hypothetical 0.5% improvement:
  - 99th percentile
  - Original: 97th percentile

- Improved coding impact on HF 30-day Mortality:
  1. Improvement in Rush’s comparison to other hospitals
  2. $51K potential revenue increase in FY15 ($0 in FY16)
Find the Best Hospital for You
To rank the best adult and children's hospitals, U.S. News analyzes data for nearly 5,000 centers.

Hospital name (optional)  City, State, or ZIP

Choose a Specialty  Go

Browse Best Hospitals

For Adults  For Children

By Specialty
Cancer  Neurology & Neurosurgery
Cardiology & Heart Surgery  Ophthalmology
Diabetes & Endocrinology  Orthopedics
Ear, Nose & Throat  Psychiatry

Honor Roll
Hospitals with very high scores in at least six specialties earned a spot on the Honor Roll. Just 15 hospitals made this year's list.
### Orthopedics Scorecard

#### Rank

#6 in the nation

#### Overall Score

68.7 / 100

#### What goes into this score:

<table>
<thead>
<tr>
<th>Reputation with specialists</th>
<th>Significant</th>
</tr>
</thead>
</table>
| % of doctors in this specialty responding to surveys in 2013, 2014 and 2015 who named hospital as among best for very challenging patients. | Score: 12.4%  
Significant: 3.0%-14.9% |

<table>
<thead>
<tr>
<th>Survival</th>
<th>Much better than</th>
</tr>
</thead>
</table>

1653 West Congress Parkway  
Chicago, IL 60612-3833

Full contact info
Patient safety
Prevention of seven types of accidents and medical errors across hospital.

Show fewer

Success in preventing pressure ulcers (skin breakdown due to lengthy bed rest, weight, dressings and other factors).

Success in preventing deaths from treatable complications after surgery.

Success in preventing collapsed lung during biopsy, catheter insertion and other procedures.

Success in preventing major bleeding and bruising after surgery.

Success in preventing respiratory failure after surgery.

Success in preventing surgical incisions from reopening afterwards.

Success in preventing harm to patients during surgery.

Patient volume
Number of high-risk Medicare inpatients in 2011, 2012 and 2013 in selected set of specialty-related procedures and diagnoses.

2015-2016 – vs UHC ranking of #2 in same year
Patient Safety Indicators

• “The Patient Safety Indicators (PSIs) are a set of indicators providing information on potential in hospital complications and adverse events following surgeries, procedures, and childbirth. The PSIs were developed after a comprehensive literature review, analysis of ICD-9-CM codes, review by a clinician panel, implementation of risk adjustment, and empirical analyses.”

http://www.qualityindicators.ahrq.gov/modules/psi_overview.aspx
Patient Safety Indicator Derivation

- EHR
- Claims Data
  - CPT and ICD 9/10 Codes, with POA flag
  - CPT and ICD 9/10 Codes, medications, Dates
- At risk population
- PSI events
PSI dissemination

- Developed by the Agency of Healthcare Research and Quality (AHRQ) through research grants
- Released in 2003; designed to screen for potentially preventable adverse events in inpatient setting
- “indicators” not measures
- Validation studies in 2000’s
- NQF endorsed 10 PSIs as consensus standards in 2010
- Center for Medicare and Medicaid adopted 6 PSIs and a PSI Composite measure (PSI 90) to be publicly reported via Hospital Inpatient Quality Reporting System in 2008
- Tools include SAS code and scripts for site based PSI implementation
A good measure of quality?

<table>
<thead>
<tr>
<th>PSI No.</th>
<th>PSI Name</th>
<th>Sample (n)</th>
<th>PPV (%) (95% CI)</th>
<th>POA (%) in All Flagged Cases</th>
<th>POA (%) in False Positives</th>
<th>Sample w/o POA (n)</th>
<th>PPV w/o POA (%) (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Decubitus Ulcer</td>
<td>112</td>
<td>30 (22–40)</td>
<td>59</td>
<td>83</td>
<td>46</td>
<td>74 (59–86)</td>
</tr>
<tr>
<td>5</td>
<td>Foreign Body Left in During Procedure</td>
<td>93</td>
<td>46 (36–55)</td>
<td>30</td>
<td>56</td>
<td>65</td>
<td>66 (53–77)</td>
</tr>
<tr>
<td>6</td>
<td>Iatrogenic Pneumothorax</td>
<td>112</td>
<td>73 (64–81)</td>
<td>8</td>
<td>33</td>
<td>103</td>
<td>80 (71–87)</td>
</tr>
<tr>
<td>7</td>
<td>Central Venous Catheter-related Bloodstream Infections</td>
<td>112</td>
<td>38 (29–47)</td>
<td>19</td>
<td>30</td>
<td>91</td>
<td>46 (36–57)</td>
</tr>
<tr>
<td>8</td>
<td>Postoperative Hip Fracture</td>
<td>46</td>
<td>28 (15–43)</td>
<td>52</td>
<td>73</td>
<td>21</td>
<td>62 (38–82)</td>
</tr>
<tr>
<td>9</td>
<td>Postoperative Hemorrhage or Hematoma</td>
<td>112</td>
<td>75 (66–83)</td>
<td>8</td>
<td>32</td>
<td>103</td>
<td>82 (73–89)</td>
</tr>
<tr>
<td>10</td>
<td>Postoperative Physiologic and Metabolic Derangements</td>
<td>119</td>
<td>63 (54–72)</td>
<td>18</td>
<td>47</td>
<td>98</td>
<td>77 (67–85)</td>
</tr>
<tr>
<td>11</td>
<td>Postoperative Respiratory Failure</td>
<td>112</td>
<td>67 (57–76)</td>
<td>0</td>
<td>0</td>
<td>112</td>
<td>67 (57–76)</td>
</tr>
<tr>
<td>12</td>
<td>Postoperative Pulmonary Embolism or Deep Vein Thrombosis</td>
<td>112</td>
<td>43 (34–53)</td>
<td>14</td>
<td>25</td>
<td>96</td>
<td>50 (40–60)</td>
</tr>
<tr>
<td>13</td>
<td>Postoperative Sepsis</td>
<td>112</td>
<td>53 (42–64)</td>
<td>14</td>
<td>30</td>
<td>96</td>
<td>61 (51–71)</td>
</tr>
<tr>
<td>14</td>
<td>Postoperative Wound Dehiscence</td>
<td>112</td>
<td>87 (79–92)</td>
<td>0</td>
<td>0</td>
<td>112</td>
<td>87 (79–92)</td>
</tr>
<tr>
<td>15</td>
<td>Accidental Puncture or Laceration</td>
<td>112</td>
<td>85 (77–91)</td>
<td>5</td>
<td>35</td>
<td>106</td>
<td>90 (82–95)</td>
</tr>
</tbody>
</table>

The number displayed is the number of cases in our sample that were flagged for each of these PSIs. For Postoperative Physiologic and Metabolic Derangements, we flagged 119 cases rather than 112 to ensure that we had an adequate number of diabetes patients who developed abnormalities of glucose control to review in addition to those discharges who developed acute kidney injury requiring dialysis. We were not able to flag 112 cases for Foreign Body and Postoperative Hip Fracture because they were relatively rare events. Parentheses contain 95% confidence intervals (CI). Positive predictive value (PPV) represents the proportion of true positive cases divided by the number of flagged cases. POA indicates present on admission.
US News validation project

• Obtained External Data Set
• Determined provenance of data set
  – Limited MedPar
• Compared with source data
  – Claims to CMS
• Compared Discrepancy – determined difference
• Notification to US News
• Simulated national impact
External Data and Validation

• Contacted US News - subcontracted with an external vendor for analytics
  – That vendor subcontracted with a second vendor for the Safety Score piece
• Initially, no means to externally validate data sources
• Series of discussions – can purchase data for validation
Data source for US News

• MedPAR, via ResDAC

- Designed for research use
- Several types of data files
- Have a fully identified version
- Limited MedPAR – limited data set
  = no dates of service – month and year
Compare with Source Data

- Due to restrictions of data use agreement, reidentification of data not allowable

- Approach was to compare counts of cases at global level between CMS submitted claims to data from Limited MedPAR

- Used SAS scripts for validation process
Data peculiarities

• Dates of service missing (by design)
  – For surgical complications, cannot tell whether an event precedes or follows a surgery

• Present on Admission flags missing in 10.1% of records (an error)
  – Any condition present on admission with missing POA flag will be falsely attributed to encounter
Table 2. Patient Safety Indicator (PSI) Rates, *US News* Results Compared with Medicare-Reported Results*

<table>
<thead>
<tr>
<th>Indicator</th>
<th>US News Count</th>
<th>Rush Count</th>
<th>Count Difference</th>
<th>US News Rate</th>
<th>Rush Rate</th>
<th>Rate Difference, 95% CI [AU: OK?]</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSI 3</td>
<td>25</td>
<td>1</td>
<td>24</td>
<td>0.75</td>
<td>0.03</td>
<td>0.72 (0.71–0.72)</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>PSI 4</td>
<td>24</td>
<td>29</td>
<td>-5</td>
<td>0.72</td>
<td>0.86</td>
<td>-0.14 (-0.16–0.14)</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>PSI 6</td>
<td>26</td>
<td>24</td>
<td>2</td>
<td>0.78</td>
<td>0.72</td>
<td>0.06 (0.05–0.07)</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>PSI 9</td>
<td>106</td>
<td>85</td>
<td>21</td>
<td>3.16</td>
<td>2.53</td>
<td>0.63 (0.56–0.69)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>PSI 11</td>
<td>80</td>
<td>71</td>
<td>9</td>
<td>2.38</td>
<td>2.12</td>
<td>0.26 (0.21–0.33)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>PSI 14</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>PSI 15</td>
<td>92</td>
<td>93</td>
<td>-1</td>
<td>2.74</td>
<td>2.77</td>
<td>-0.03 (-0.10–0.03)</td>
<td>0.39</td>
</tr>
</tbody>
</table>


*Indicator descriptions can be found in Table 1.
<table>
<thead>
<tr>
<th></th>
<th>PSI 3</th>
<th>PSI 9</th>
<th>PSI 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept (in Multivariate Model)</td>
<td>1.15 (0.36–1.95)†</td>
<td>0.56 (0.03–1.08)†</td>
<td>-</td>
</tr>
<tr>
<td>Transfer rate (% of Admissions)</td>
<td>0.06 (0.03–0.10)‡</td>
<td>-0.01 (0.03–0.01)§</td>
<td>-0.08 (0.22–0.05)§</td>
</tr>
<tr>
<td>Total Admissions (1,000's)</td>
<td>-0.04 (0.11–0.02)§</td>
<td>0.04 (0.01–0.08)†</td>
<td>-0.07 (0.27–0.14)§</td>
</tr>
<tr>
<td>Baseline PSI 3 Rate</td>
<td>0.28 (0.17–0.73)§</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Baseline PSI 9 Rate</td>
<td>-0.04 (0.14–0.07)§</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Baseline PSI 11 Rate</td>
<td>-</td>
<td>0.02 (0.18–0.22)§</td>
<td>-</td>
</tr>
</tbody>
</table>

*Model developed on simulated data set with dates removed (PSI 9) and present on admission flag removed for 10.1% of records and dates removed for all records (PSI 3). Indicator descriptions can be found in Table 1.
†p < 0.05, included in multivariate model.
‡p < 0.001, included in multivariate model.
§p > 0.05, not included in multivariate model.
January 19, 2016

Omar Lateef, DO
Chief Medical Officer and Vice President
Rush University Medical Center
Chicago, Illinois 60612

Dear Omar,

Thank you for your letter. I want to again thank your group for identifying a limitation of the MedPAR data set that was previously undocumented. After reviewing the implications of the absence of procedure dates in MedPAR, we have committed analytical resources to using a different data set, the SAF LDS, for our calculation of PSIs for the 2016-17 rankings. We believe the use of the SAF LDS will address the issue regarding procedure dates.
## 2016-2017 Ranking

<table>
<thead>
<tr>
<th>Patient safety</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to prevent six types of accidents and medical errors across hospital.</td>
<td>4/5</td>
</tr>
<tr>
<td>See fewer patient safety metrics</td>
<td></td>
</tr>
<tr>
<td>Success in preventing deaths from treatable complications after surgery.</td>
<td>4/5</td>
</tr>
<tr>
<td>Success in preventing collapsed lung during biopsies, catheter insertions and other procedures.</td>
<td>4/5</td>
</tr>
<tr>
<td>Success in preventing major bleeding and bruising after surgery.</td>
<td>Below average 1/5</td>
</tr>
<tr>
<td>Success in preventing respiratory failure after surgery.</td>
<td>Average 4/5</td>
</tr>
<tr>
<td>Success in preventing surgical incisions from reopening afterwards.</td>
<td>Average 2/5</td>
</tr>
<tr>
<td>Success in preventing harm to patients during surgery.</td>
<td>Average 3/5</td>
</tr>
</tbody>
</table>

[Back to Top](#)
Performance Measures

Consumer Rankings and Health Care: Toward Validation and Transparency

Bala Hota, MD, MPH; Thomas A. Webb, BS; Brian D. Stein, MD, MS; Richa Gupta, MBBS, MHSA; David Ansell, MD, MPH; Omar Lateef, DO

The Institute of Medicine (now known as the Health and Medicine Division) has established the critical need to improve patient safety and quality, and to achieve this aim, to use data to measure and improve health care through positive feedback and change. Section 501(b) of the Medicare Prescription Drug, Improvement, and Modernization Act of 2003, with a goal of improving health care quality through measurement and feedback, enabled the Centers for Medicare & Medicaid Services (CMS) to develop the Hospital Inpatient Quality Reporting program, and link payment rates to measures of quality.

The Agency for Healthcare Research Quality (AHRQ; Rockville, Maryland) Patient Safety Indicators (PSIs) illustrate

Article-at-a-Glance

**Background:** Differences between the Centers for Medicare & Medicaid Services (CMS)—measured rates of safety events for Rush University Medical Center (RUMC; Chicago) and the *U.S. News & World Report* (USNWR)—determined patient safety score were evaluated in an attempt to validate the USNWR patient safety score–based ranking.

**Methods:** The USNWR findings for Patient Safety Indicators (PSIs) were compared with findings derived from RUMC internal billing data, and sensitivity analyses were conducted using a simulated data set derived from the Healthcare Cost and Utilization Project (HCUP) state inpatient data sets.
Quality Measurement Is a Journey

Rush University study highlights PSI limitations that spurred this summer’s methodology change.

By Ben Harder | Staff Writer  Oct. 7, 2016, at 4:57 p.m.

When clinicians and healthcare-improvement experts describe the pursuit of quality as a journey, their word choice reflects a central tenet: healthcare quality may never achieve perfection, but it can always be made closer to perfect.

Like quality improvement, quality measurement is mid-journey. My group’s work at U.S. News & World Report to benchmark and publicly report hospital performance is evolving as we and other investigators learn more about the limitations of extant measures and methods.

In the October issue of the Joint Commission Journal on Quality and Patient Safety, Balu Hota and colleagues at Rush University Medical Center have made an important contribution to the healthcare community’s understanding of the Patient Safety Indicators, or PSIs, a group of quality measures used by U.S. News, the Centers for Medicare and Medicaid Services and other organizations that report on hospital performance.

The Rush study focused on the seven PSIs that U.S. News used in the Best Hospitals rankings published in July 2015. The current rankings, published in August 2016, used six of the PSIs studied by Rush; we dropped PSI 03 from our methodology in the 2016 release.

The researchers report finding discrepancies between Rush’s PSI rates used in the 2015 rankings – in particular rates of pressure ulcers, PSI 03 – and the rates calculated by Rush using government-submitted data for the same time period. In theory, the U.S. News-calculated and Rush-calculated rates should have agreed, since they were calculated the same way on data sets that should have been functionally equivalent. Naturally, leaders at Rush were concerned that the rates reported by U.S. News were worse than those the hospital believed to be more accurate.
HHS finalizes streamlined Medicare payment system that rewards clinicians for quality patient care

FOR IMMEDIATE RELEASE
October 14, 2016

MACRA rule will accelerate health care system’s shift toward value
Finalized MACRA Quality Payment Program Requires Big Data Push

By Jennifer Bresnick on October 14, 2016

Big data and population health management capabilities are going to be front and center for providers looking to capitalize on the MACRA Quality Payment Program's incentive options.

On your marks – get set – go grab some data. CMS announced this morning that the MACRA Quality Payment Program (QPP) will indeed go live on January 1, 2017, which doesn’t leave providers much time to read the 2398-page final rule, let alone gather sufficient quality reporting data for accruing maximum incentives.

The final rule codifies the four “pick-your-own-pace” options announced by Acting CMS Administrator Andy Slavitt earlier this year, offering several opportunities to avoid negative payment adjustments without the ability to report on a full year of quality data.
The IHI Triple Aim

- Quality Attainment
  - Population Health
  - Experience of Care
  - Per Capita Cost

- Cost Containment

Social Determinants of Health
- Human Behavior
- Health Teams
- Technology Innovation

Back to Top
PQRS measures

### 2016 Physician Measures and Performance Goals

<table>
<thead>
<tr>
<th>Measure ID</th>
<th>Physician Measure</th>
<th>Performance Goals</th>
<th>Data Source for Measure Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOF #031 CMS # 126</td>
<td>Breast Cancer Screening (Ages 40-69 years)</td>
<td>71%** 76%*</td>
<td>EMR</td>
</tr>
<tr>
<td>NOF #032 CMS # 124</td>
<td>Cervical Cancer Screening (Ages 23-64 years)</td>
<td>76%* 79%*</td>
<td>EMR</td>
</tr>
<tr>
<td>NOF #0018 CMS # 117</td>
<td>Childhood Immunization Status (2 years)</td>
<td>54% 62%</td>
<td>EMR</td>
</tr>
<tr>
<td>NOF #0419 CMS # 68</td>
<td>Documentation of Current Medications in the Medical Record (Ages 18-64 years)</td>
<td>53% 65% 95% **</td>
<td>EMR</td>
</tr>
<tr>
<td>NOF #0043 CMS # 127</td>
<td>Pneumonia Vaccination Status for Older Adults (Ages 65+ years)</td>
<td>78% 82%</td>
<td>EMR</td>
</tr>
<tr>
<td>NOF #0421 CMS # 62 (Modify)</td>
<td>Preventive Care and Screening: BMI Screening and Follow-Up (Ages 18-64 years)</td>
<td>91%* 100%*</td>
<td>EMR</td>
</tr>
<tr>
<td>NOF #0041 CMS # 147</td>
<td>Preventive Care and Screening: Influenza Immunization (Ages 6 months +)</td>
<td>76%* 100%*</td>
<td>EMR</td>
</tr>
<tr>
<td>NOF #0022 CMS # 155 (Modify)</td>
<td>Use of High Risk Medications in the elderly (two medications) (Ages 66+ years)</td>
<td>2% 1%</td>
<td>EMR</td>
</tr>
<tr>
<td>NOF #0024 CMS # 155 (Modify)</td>
<td>Weight Assessment Screening and Counseling for Nutrition for Children and Adolescents (Ages 3-17 years)</td>
<td>64% 75%</td>
<td>EMR</td>
</tr>
<tr>
<td><strong>Diabetes</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOF #0559 CMS # 122</td>
<td>Diabetic HbA1c Poor Control (Ages 16-75 years)</td>
<td>23% 13%</td>
<td>EMR</td>
</tr>
<tr>
<td><strong>Hypertension</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOF #0018 CMS # 166</td>
<td>Controlling High Blood Pressure (Ages 18-85 years)</td>
<td>68% 72%</td>
<td>EMR</td>
</tr>
<tr>
<td><strong>Acute Care</strong></td>
<td></td>
<td></td>
<td>Back to Top</td>
</tr>
</tbody>
</table>
**Performance Highlights**

**Your Quality Composite Score: Average**

Your quality composite score is 26.11, which is in the average range.

**Your Cost Composite Score: Average**

Your cost composite score is 26.11, which is in the average range.

**Your Beneficiaries’ Average Risk Score: 76th Percentile**

- To account for differences in patient risk and reduce the influence of very high cost beneficiaries, the average per capita costs of your beneficiaries were risk adjusted downward by 26.8 percent.
- Because your Medicare beneficiaries’ average risk score is at or above the 76th percentile of all beneficiary risk scores, your group would be eligible for an additional upward adjustment under the quality tiering approach for serving high-risk beneficiaries.

**Your Quality Tiering Performance: Average Quality, Average Cost**

![Quality Tiering Performance Chart]

**Your Value-Based Payment Adjustment Based on Quality Tiering**

- Based on 2012 performance, electing the quality tiering approach would result in a payment adjustment of +0.6%.

Payment adjustments for each level of performance are shown below:

<table>
<thead>
<tr>
<th>Payment Adjustment</th>
<th>Low Quality</th>
<th>Average Quality</th>
<th>High Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Cost</td>
<td>-0.0%</td>
<td>+2.0%</td>
<td>+3.0%</td>
</tr>
<tr>
<td>Average Cost</td>
<td>-0.5%</td>
<td>+0.0%</td>
<td>+2.0%</td>
</tr>
<tr>
<td>High Cost</td>
<td>-1.0%</td>
<td>+0.0%</td>
<td>+0.0%</td>
</tr>
</tbody>
</table>

Note: x refers to a payment adjustment to budget neutrality requirements.
New horizons

• MACRA – Medicare Access and CHIP Reauthorization Act of 2015
  – Changed the way providers get paid for care for Medicare patients, by consolidating a number of programs into the Quality Payment Program (QPP)
  – Creates two paths: the Merit Based Incentive Payment System (MIPS) and Alternative Payment Models (APMs)

• MIPS combines PQRS, MU provider reporting deliverables, and the Value-based payment modifier program into one.
• Electronic Record Based measures will need to be accurate and valid as they will be publicly reported
• What is the validation science behind PQRS measurement?
• Can we ensure that scores on MIPS actually represent quality?
A plan for ongoing validation

• How can we ensure we have full understanding of surveillance systems in use that are benchmarking and reporting care quality?

• How can we develop internal expertise in reporting systems and data management?

• Build in a culture of skepticism and realism about uses of data and public benchmarking systems
Cybersecurity Trends in Healthcare and Higher Education

November 15, 2016
Introductions

• Andy Reeder, HIPAA Security Officer, Director, HIPAA Privacy

• Steven P. Wightkin, Associate Vice President - IT Operations, Instructor – Department of Health Systems Management

• Jason Torres, IT Audit Manager
Business Challenges Facing Healthcare and Higher Education


Regulatory Compliance culture - then and now (healthcare)

Technology shift
- From administrative to enhancing treatment, payment, and healthcare operations

HIPAA
- 1996 – sets federal “floor” for privacy and security

OIG Guidance
- 1998 – Compliance Program Guidance for Hospitals (OIG, DHHS) – starts healthcare “culture of compliance”

Enforcement

OCR Auditing
- 2011 – Auditing begins; has increased since

We have moved from a culture of weak security with few requirements to one of stronger security with requirements and oversight

Department of Education is also becoming more serious about securing educational records: http://ptac.ed.gov/
Regulatory Landscape

Federal
  OCR
    HIPAA
      Privacy Rule
      Security Rule
      Omnibus
      Meaningful Use
    HITECH (2009)
      Breach Rule (2010)
    Red Flags (2008)
  FTC
    DHHS
      GINA
    FDA
      Research
  SAMHSA
  ED
    FERPA

States
  PIPA (IL)
  AIDS Confidentiality Act
  MHDDCA

What others exist?
Important Concepts/Definitions in Healthcare and Higher Ed

Why is Information in Patient and Educational Records So Sensitive?

*Intimate details* – who should know your personal information?

*Discrimination* – in the workplace; eligibility for insurance/admissions/financial aid

*Identity misuse* – financial records; medical care
Major Themes in Federal Security and Privacy Compliance

- Self-Reporting
- Willful Misconduct
- Enforcement
- Business Associate Compliance
- Encryption/Mobile Device Management
- State Actions
## Cybersecurity - Basic Concepts

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
</table>
| Assets                    | • Institutional information  
                            • Personal Information                                                     |
| Vulnerabilities           | • Weakness or flaw that can be exploited  
                            • People, process, technology, facilities                                      |
| Threats                   | • Human, Nature, Technical, Physical                                           |
| Exploit                   | • The method by which a threat will attempt to affect an asset                 |
| Attack Vector             | • The path by which a threat will attempt an exploit                           |
| Risks                     | • Likelihood of an asset being exploited  
                            • Resulting effects                                                           |
| Risk Mitigation Strategies| • Avoidance, Mitigation, Transfer, Acceptance                                 |
| Safeguards                | • Controls or countermeasures to apply  
                            • Administrative, Technical, Physical                                          |
What is a threat? - anything that can harm an information system or assets
Your poll will show here

1. Install the app from pollev.com/app
2. Make sure you are in Slide Show mode

Still not working? Get help at pollev.com/app/help
or
Open poll in your web browser

Back to Top
What are current cybersecurity threats?

• Shoulder Surfing – when an attacker looks over the shoulder of another person; where could this take place?

• Social Engineering – relies on human interaction

• Phishing and Target Phishing Scams – electronic attacks via email or instant message to steal confidential information (userid; password, credit card numbers, SSN); (Examples: [http://www.it.cornell.edu/security/phishbowl.cfm](http://www.it.cornell.edu/security/phishbowl.cfm))
  – Spear phishing – targets a particular organization
  – Whaling – targets corporate executives
What are current cybersecurity threats?

- Spyware and Keystroke Loggers - secretly gather information
- Logic Bombs – harmful code intentionally left on a computer system; lies dormant until a certain activity or date is triggered
- Backdoors – way to access a computer program or system bypassing normal mechanism; might be forgotten by programmer when software put into production
- Denial of Service Attacks – disrupts information systems; includes “distributed denial of service attack (ddos) – uses multiple “zombie” systems to coordinate an attack
- Advanced Persistent Threats – targeted attempts from external threats including nation states, terrorist groups, and criminal groups
What are current cybersecurity threats?

- Insider snooping – inside employees that attempt to gain unauthorized access to information
- Lost/stolen mobile devices – laptops, smartphones used to process information that are lost or stolen
- Misdirected information – information that is misdirected by email, fax, or some other communications method
- User training – user activity that contributes to the loss of information or downtime based on lack of training or awareness
- Challenges of maintaining an open network of resources for academic pursuits; use of persona devices (BYOD); file sharing; dual infrastructure for University and Medical Center operations
What are current cybersecurity threats?

- Cloud storage – placing sensitive information into personal or public cloud services that are not managed by the institution
- Email – auto forwarding email that may contain sensitive information to personal or non-managed accounts; “Phishing” and “Whaling” delivery of malware
- Ransomware/Malware – software that performs some sort of harmful, unauthorized activity (includes virus, worms, Trojan Horses) (Example: https://blog.malwarebytes.com/101/2013/10/cryptolocker-ransomware-what-you-need-to-know/ )
Cyber Threat Landscape - Healthcare

- 2015 - Anthem (IN), Health Plan; records affected – 78,800,000; Hacking/IT Incident
- 2015 - Premera Blue Cross (WA), Health Plan; records affected – 11,000,000; Hacking/IT Incident
- 2015 - Excellus Health Plan (NY), Health Plan, records affected - 10,000,000; Hacking/IT Incident
- 2011 - Science Applications International Corporation (VA); Business Associate; records affected – 4,900,000; Loss
- 2015 - University of California, Los Angeles Health (CA); Healthcare Provider; records affected – 4,500,000; Hacking/IT Incident
- [https://ocrportal.hhs.gov/ocr/breach/breach_report.jsf](https://ocrportal.hhs.gov/ocr/breach/breach_report.jsf)
Cyber Threat Landscape – Higher Ed

• 2014- Butler University - hackers accessed the institution's network and exposed the personal information of nearly 200,000 people
• 2014- Indiana University - a data breach exposed social security numbers, names, and addresses of 146,000 past and present students
• 2014- Arkansas State University - the leaking of partial and full social security numbers affected approximately 50,000 people
• 2014 - University of Maryland - names, dates of birth, social security numbers, and university identification numbers of 309,079 staff, faculty, and students were compromised through a cyberattack
• 2014 - North Dakota University System - a server containing the social security numbers and names of nearly 300,000 former and current students was illegally accessed in February 2014

https://www.eab.com/daily-briefing/2015/01/20/five-higher-ed-data-breaches-worse-than-sonys
## Cyber Threat Landscape - Summary

<table>
<thead>
<tr>
<th>Rank</th>
<th>Sector</th>
<th>Number of Incidents</th>
<th>Percentage of Incidents</th>
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<tr>
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<tr>
<td>2</td>
<td>Retail</td>
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<td>Insurance</td>
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<tr>
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<tr>
<td>10</td>
<td>Arts and Media</td>
<td>6</td>
<td>2%</td>
</tr>
</tbody>
</table>

**Top 10 Sectors Breached by Number of Incidents**  
Source: Symantec
Mitigating Risk – what can we do?

- Establish a Security Culture
- Protect Mobile Devices
- Maintain Good Computer Habits
- Use a Firewall
- Install and Maintain Anti-Virus Software
- Plan for the Unexpected

[https://www.healthit.gov/providers-professionals-newsroom/top-10-tips-cybersecurity-health-care](https://www.healthit.gov/providers-professionals-newsroom/top-10-tips-cybersecurity-health-care)
TEACHING STRATEGIES THAT FACILITATE LEARNING

Janet Engstrom, PhD, APN, CNM, WHNP-BC, CNE
Rush University, College of Nursing

Objectives

1. Describe teaching and learning strategies that engage students, facilitate the development of critical thinking, and facilitate the achievement of competencies required for the profession.
2. Explain the alignment between teaching and learning activities, formative and summative evaluation, and the desired learning outcomes.
3. Explore the use for formative and summative feedback as teaching and learning strategies.

What can I do to improve my golf game?

Which of the following interventions can help improve my golf game?

- Read a magazine article
- Read a book
- Listen to an audio lecture
- Attend a lecture
- Watch a video
- Play more rounds of golf
- Practice at the driving range and putting green
- Take a group class taught at a driving range or golf course
- Work one-on-one with a golf instructor

What is the most efficient and effective way to improve my golf game?

The answer is... 'It depends'
- It depends on
  - The learner
  - The teacher
  - The learning environment
  - What needs to be learned
Teaching vs. Learning

- We often focus on teaching and teaching strategies
- The focus should be on learning and learning strategies
- Instead of focusing on Teaching Strategies
- The focus should be on Facilitating Learning

- Selection of strategies should be based on the
  - Outcomes desired
  - What knowledge, skills, and/or attitudes need to be learned
  - Student learning style and needs
  - Teachers strengths and weaknesses

Teaching and Learning Strategies

- Flipping
- Engaging
- Gaming
- Simulating
- Reflecting
- Mastery
- Adaptive learning
- Personalized learning
- Problem based learning
- Team based learning
- Outcomes based education
- Competency based education
- Critical thinking

How Learning Works

- Knowledge Construction
- Adult Learning Theory
- Community of Inquiry

Active Learning: Constructing Knowledge

- Described by Rousseau
- Advocated by John Dewey
- Written about by Benjamin Franklin, “Tell me and I forget, show me and I may I remember, involve me and I learn.”
Instructivist, Constructivist, and Behaviorist Models

- **Instructivist**
  - Open someone's head and pour knowledge in

- **Constructivist**
  - Student constructs knowledge
  - Discovery or 'doing' type of learning

- **Behaviorist**
  - Training and repetition

Adult Learning Theory and Principles

- Malcolm Knowles proposed that adults learn differently than children
- Identified 6 characteristics of adult learners
  - Internally motivated and self-directed
  - Bring life experiences and knowledge
  - Goal oriented
  - Relevancy oriented
  - Practical
  - Like to be respected

Adult Learning Theory and Principles

- Knowles recommended learning approaches that are
  - Problem based
  - Builds on previous knowledge
  - Collaborative
  - Emphasizes collegiality between the teacher and learner, 'guide by the side' vs. 'sage on the stage'

Community of Inquiry (CoI)

- CoI was introduced by Pierce in the basic sciences
- Expanded by Dewey in education
- Further elaborated in education by Lipman
- Applied to online learning by Garrison et al.

- Col proposes that
  - Knowledge is always embedded in a social context
  - Inquiry is problem based
  - Inquiry always occurs within a community
Community of Inquiry (CoI)

CoI dispelled the notion that:
- Knowledge was fixed
- Education was about knowledge transmission
- Teachers were the authorities and the transmitters of knowledge

CoI proposes that:
- Knowledge is ambiguous, uncertain, and changing
- Knowledge acquisition involves learning about processes and relationships
- Education is a process of inquiry guided by the teacher

Social Presence

Social presence is characterized by:
- Open communication
- Effective communication
- Group cohesion
- Encouragement of collaboration

Cognitive Presence

Cognitive presence is characterized by:
- Exploration
- Integration
- Resolution

Demonstrated by:
- Information exchange
- Connecting ideas
- Applying new ideas

Teaching Presence

Teaching presence is characterized by:
- Direct instruction
- Facilitating discourse

Demonstrated by:
- Focusing discussion
- Sharing personal meaning

FACILITATING LEARNING
Facilitating Learning

- Remove the barriers to learning
- Create a positive learning environment
- Use effective and varied teaching strategies
- Use effective and varied learning activities

Remove the Barriers to Learning

- Uniform course design
- Standardized, detailed syllabus
- Course materials are organized
- Assignments have clear instructions
- Grading rubrics clearly describe how the assignment will be graded

Creating the Learning Environment

- Polite
- Professional
- Positive
  - Old fashioned word
  - Not personal, you don’t have to reveal anything about yourself. You don’t have to be silly or self-effacing
  - Just be a person

Say Something Nice

- Write a quick note to an exceptional student or a polite student
- Send a class email
  - Acknowledge their work
  - Wish them a nice weekend
- Extend a deadline
- Revise a deadline
Share Something

Best Teaching Practices

- Chickering and Gamson summarized 50 years of educational research and identified 7 characteristics of effective teachers
  - Encourage contact between students and faculty
  - Develop reciprocity and cooperation among students
  - Encourage active learning
  - Give prompt feedback
  - Emphasize time on task
  - Communicate high expectations
  - Respect diverse talents and ways of learning

Characteristics of Effective Teaching

- Knowledge of the content, expertise in the field
- Organization
- Passion for the content and role
- Enthusiasm
- Communication
- Consistency

Use Effective Course and Curriculum Design

- Every module, course, and curricula should be designed
  - designed with the end in mind!!
- Learning activities should be directed towards helping student achieve the desired outcomes
  - Knowledge
  - Skills
  - Attitudes
- Focus learning activities that are effective and efficient
- All instruction and assessment should be student centered

FORMATIVE and SUMMATIVE FEEDBACK
Feedback and Learning

• Feedback is essential
• Feedback should be an ongoing process
• Formative assessments are used to identify student learning needs
• Formative feedback helps students recognize what they do well
• Frequent opportunities for formative feedback
• Using low-stakes assignments worth small percentages of the course grade as a combination of formative and summative feedback
• Summative feedback is used to determine whether the desired learning outcomes (competencies) have been achieved

USE VARIED LEARNING ACTIVITIES THAT INVOLVE MULTIPLE SENSES

Lecture

• The lecture is not dead but it should be used less often and differently
• Mini-lectures
• ‘How to’ lectures
• Enhanced lectures
• Lectures with photos, videos, and other media
• Lectures with real props

Use Multiple Senses

• Learning activities should be varied to facilitate learning
• Present information using more than one media
• Whenever possible have the student ‘do’ something beyond simply receiving information

The Power of a Picture to Help Students ‘See’ Into the Problem

Use Photographs to Depict the Role
Use Pictures to Help Students ‘See’

SIMPLE STRATEGIES THAT COMBINE LEARNING AND ASSESSMENT

Quiz Questions

Simple Learning Activities that are also Low Stakes Assessments

NARRATIVE PEDAGOGY

Narrative Pedagogy

- Uses stories to teach important concepts
- Stories can be real patient or illness narratives, nonfictional events, or fictional stories
- Vicarious learning by reading, seeing, or hearing about the experiences of others
Narrative Pedagogy: How Does it Work?
- Requires reflection, interpretation, and application
- Develops critical thinking
- Develops emotional intelligence
- Heightens cultural awareness
- Useful in complex scenarios
- Helps in addressing scenarios with ethical considerations
- Especially helpful in exploring areas in which students have no lived experiences and no role models
- Associated with higher order learning

Nursing School: Trauma Nursing, 1975
- Radiation burns
- Long term sequelae of radiation exposure
- Burn care
- Building safety
- Fire codes
- Morgue care

PhD Program: Research Seminar, 1982
During the first meeting of a summer research seminar class the course professor handed each of us a paperback mystery and told us to...
Read the book and come back next week and tell the class, “How the analysis fit the design”

Using Fiction to Learn About Reproductive Options

Florence Nightingale: Epidemiologist and Statistician
Measures of mortality in the military hospital

Florence Nightingale
Mary Breckinridge and the Frontier Nursing Service

Saw a major health need, conducted a survey of the population’s health and health care resources, implemented a health care system designed specifically to meet the needs of the population, and documented the health outcomes.

Frontier Nursing Service Statistics

• Maternal mortality rate
  - 9.1 per 10,000 births for FNS
  - 34 per 10,000 births for the United States as a whole

• Low birth weight
  - 3.8 percent for FNS
  - 7.6 percent for the country

My MB Blog: Mary Breckinridge and the DNP Essentials

BTW… she was terrified of math

Illness Narratives: Patient Stories
Concept Mapping

- Mnemonic device designed to make it easier to remember and master presented content
- Demonstrates how you ‘see’ an idea
- Makes students reflect and think about the concepts
- Connects new information to existing knowledge
- Helps students organize learning tasks into smaller, comprehensible chunks of information with connections to previously learned material.
- Can be used to teach concepts
- Can be used as an assignment

Scaffolded Concept Maps

- Students build a concept map across the course

Low Fidelity Simulation: Skill Building by Practicing with Inanimate Materials
World's Largest Childbirth Class: Practicing Skills in a Safe Environment

Maternal-Newborn Simulation

Newborn Assessment and Care

World's Largest Childbirth Class

Maternity Nursing Simulation

Low Fidelity, Low Cost OSCEs: The ‘Mommy’ Calls

- Online audio OSCE typical of the types of call to pediatric ambulatory clinical settings
- Immediate debriefing by the standardized patient
- Recorded and evaluated by faculty
- Added a peer evaluation component
THANK YOU!
Learning through Case Studies

Thomas P. Bleck MD MCCM FAES
Professor of Neurological Sciences, Neurosurgery, Medicine, and Anesthesiology
Director, Clinical Neurophysiology
Rush Medical College
Disclosures

• No conflicts of interest
Objectives

• Selecting cases for teaching
• Presenting cases to students
• Facilitating students’ presentations of cases to a group
Some problems in biomedical education

• You can’t teach everything your students will need to know
• Your students can’t learn everything they will need to know
• Mark Twain never said this, but it’s apt:
  – It ain't what you don't know that gets you into trouble. It's what you know for sure that just ain't so.
• Lectures are boring, including this one.
  – and it is better to give than to receive....
So how to prepare students for what they will need to know?

• Learn how to analyze problems
• Learn how to find information for themselves – and build a scaffold on which they can hang future learning
• Learn how to work in teams

• Solution: Case studies (?)
William Bradford Cannon was born in 1871 in Prairie du Chien, Wisconsin, the site of Fort Crawford, where William Beaumont conducted classic experiments on digestion. Cannon would distinguish himself as a physiologist of Beaumont's rank. Although he was founder of the gastrointestinal roentgen examination and maintained an interest in gastroenterology throughout his life, Cannon's most productive years were spent in the study of the autonomic nervous system and homeostasis. He graduated from Harvard University in 1896 and Harvard Medical School in 1900; he was an instructor in physiology until 1902 and an assistant professor until 1906. From 1906 to 1942, he was George Higginson Professor of Physiology, retiring as Professor Emeritus until his death in 1945.
The Case Method of Teaching Systematic Medicine

By W. R. Goodwin, M.D., Boston, Harvard Medical School.

This article on medical instruction recently published and the widespread interest aroused by the papers are the subject of an article appearing at present deepening the medical schools throughout the country. Among many instructors there is manifest dissatisfaction with the traditional teaching of medicine and the dissatisfaction arising apparently from the belief that the teaching of medicine has not been keeping pace with improvements in the teaching of other subjects. Discussion of all methods and earnest searching after new and more effective methods of preparing and training young men to be practitioners are consequently rife among us. The medical student catches the spirit of this agitation and notes features of his education which seem to him capable of improvement. From a student's point of view, therefore, the present paper on the teaching of systematic medicine is offered.

That clinical instruction alone is too haphazard and uncertain to form a basis for a complete and orderly course in medicine is recognized in most medical schools. The well-rounded preparation for practice which the student must receive demands, therefore, not only from the clinical an organized course of study. With this conclusion, many systematic instruction is needed, medical instruction in the fact that lectures on medical subjects are also, in the main, only what can be found in the most recent textbooks. Now, in case the student does not take notes he is as a passive listener. It is well within the bounds of certainty to affirm that the many points made every week in ten or fifteen lectures on different subjects cannot be fixed permanently in memory by hearing them stated only once. If the student makes up his deficiency, however, by retaining his authorities, he is doing precisely what he might as well have done without spending time listening to lectures. But suppose the student takes notes of what he hears. Then, according to common testimony, he is so busy writing he learns at the same very little of the matter presented by the lecturer. The student, therefore, in a very haphazard state of learning. It is in this case he has already been as much as he can well manage. Furthermore, he not infrequently finds that his own inability to assimilate the lecture's obscurity has resulted in notes that are good enough to trust. In this instance, likewise, he must depend upon his books. The conclusion seems justified, therefore, that the student, driven to the textbook in spite of didactic lectures, will make better use of his hours by learning systematic medicine directly from the printed sources.

A more serious criticism can be brought against the didactic lecture in that it allows a slighting of study during a large part of the year and favors cramming for examinations at the end. Some instructors, indeed, seem to regard this condition as essential, and leave no time in May for preparation for June examinations. The students, as well, count on this cramming, for many of them are preparing with the expectation of May in order to study their accumulated notes for satisfactory grades. The epiphenomenal nature of knowledge gained under such circumstances is too well known to need emphasis. It does not become an organized and
Among the objections to didactic lectures as a means of instructing the student of medicine, perhaps the least important is the contention that attendance on such lectures is not an economical use of the student’s time. This objection, however, is more important in these days of the crowded curriculum than formerly, and is sure to become still more important as, with the advance of medicine, the demand on the student’s time increases. The chief support of the objection lies in the fact that lectures on medical subjects present, in the main, only what can be found in the newest textbook. Now, in case the student does not take notes he sits as a passive listener. It is well within the bounds of certainty to affirm that the many points made every week in ten or fifteen lectures on different subjects cannot be fixed permanently in memory by hearing them stated only once. If this student makes up his deficiency, however, by reading his authorities, he is doing precisely what he might quite as well have done without spending time listening to lectures. But
Apart from his contributions to physiology, Cannon introduced the case method of teaching medicine, later championed by Richard Cabot. Wrote Cannon:

_When I was a medical student in the late nineties it was customary for us to be subjected to four hours of continuous lecturing, from two until six o'clock five days of every week, mainly on subjects concerned with human beings, their diseases, the means of diagnosing the diseases, and the proper modes of treatment. At that time my roommate was a law student, Harry A. Bigelow, later Dean of the Law School at the University of Chicago. I could not help noting the eagerness and zest with which he and his fellow students discussed cases and their implications and comparing this with the dreary and benumbing process we medical students endured as we filled our notebooks. In my senior year in the Medical School I wrote an article which was published in The Boston Medical and Surgical Journal under the title, "The Case System of Teaching Systematic Medicine." The idea of using printed clinical records, that I suggested as a basis for discussing diagnosis and proper treatment, was at once favorably received and put to use. Case books on diseases of the nervous system, on general medicine, and on diseases of children soon appeared. Many of the hours which had formerly dragged in mere passive recording in notebooks what the professor recited—often from another notebook!—now sped away in a lively exchange of views among the students themselves and with their instructors. That reform started about 1900._ (1945)
The Case of Richard Cabot

Charles Stewart Roberts.

Paul Dudley White, the distinguished cardiologist, wrote of Richard Cabot after his death:

In every generation there are restless souls who cannot be made to fit the common mold. A few of these are valuable in keeping their communities and professions in a ferment by their constant challenge to the existing order of man's thought and action. But when, in addition to possessing these attributes, a rare individual is endowed with the divine fire and makes important contributions to the pioneering progress of humanity, then indeed we recognize a great leader. In the thick of the fray such recognition comes slowly but as soon as the smoke of the battle clears the acclaim is universal. (1939)
Case 1-2017: A 70-Year-Old Woman with Gradually Progressive Loss of Language

M.-Marsel Mesulam, M.D., Bradford C. Dickerson, M.D., Janet C. Sherman, Ph.D., Daisy Hochberg, M.S., C.C.C.-S.L.P., R. Gilberto Gonzalez, M.D., Keith A. Johnson, M.D., and Matthew P. Frosch, M.D., Ph.D.
Case 1-2017: A 70-Year-Old Woman with Gradually Progressive Loss of Language

M. Marcel Mesulam, M.D., Bradford C. Dickerson, M.D., Janet C. Sherman, Ph.D.,
Daisy Hochberg, M.S., C.C.C.-S.L.P., R. Gilberto Gonzalez, M.D.,
Keith A. Johnson, M.D., and Matthew P. Frosh, M.D., Ph.D.

PRESENTATION OF CASE

Dr. Bradford C. Dickerson: A 70-year-old woman was seen in the memory disorders clinic of this hospital because of progressive cognitive difficulties involving word finding. She was interviewed with the assistance of her daughter.

The patient had reportedly been well until approximately 8 years before this evaluation, when gradually progressive difficulties with word finding developed, along with associated confusion about the meaning of some words. For example, during a conversation about a recent family event, she did not understand what the phrase “punch bowl” meant. She also had increased egocentric behavior, during which she spoke most frequently about herself. She had a good memory for recent events of her life and could recount multiple stories (at times to an excessive extent during history taking, such that she required refocusing). She had an excellent sense of direction. She had an uncharacteristically matter-of-fact reaction to the death of a sibling and of her dog (being less upset than her family expected). She occasionally had mildly inappropriate behavior, such as saying “I love you” to people to whom she was not particularly close.

The patient was right-handed. Approximately 10 years earlier, she had a tick bite and was treated with antibiotic agents after a test for Lyme disease was positive. When she was 7 years of age, she fell out of a tree and hit her head, but she did not lose consciousness and was not hospitalized. There was no history of recent head injury, stroke, seizure, transient ischemic attack, meningitis, encephalitis, exposure to human immunodeficiency virus, thyroid disorder, heart disease, hyperension, hyperlipidemia, diabetes mellitus, liver disease, kidney disease, cancer, pulmonary disorders, exposure to heavy metals, or learning disability. Her only surgical history included three cesarean sections. Her medications were a multivitamin, vitamin C, ginkgo biloba, calcium, magnesium, and zinc, and she had no known allergies. Since the death of her husband 10 years earlier, she had lived alone (in a different state than her daughter) and was able to perform all activities of daily living independently, including managing her money, paying bills, and volunteering in the commi-
community (i.e., visiting senior centers to play piano and attending regular community choir practices). She drank alcohol once or twice per month and did not smoke or use illicit drugs. She had been a teacher and had later worked in business with her husband until his death. A brother in his 60s had Parkinson's disease, and a sister in her 80s had Parkinson's disease and dementia. Her six children and her grandchildren were healthy.

On examination, the patient was alert, attentive, well-groomed, cooperative, and pleasant. The blood pressure was 120/70 mm Hg, the pulse 78 beats per minute and regular, and the weight 68.6 kg. She had a score on the Mini-Mental State Examination of 28 (with scores ranging from 0 to 30 and higher scores indicating better cognitive function), because she was unable to recall the name of the hospital or the county. She had a score on the Clinical Dementia Rating scale of 0 (with scores ranging from 0 to 3 and lower scores indicating better cognitive function). The neurologic examination was normal, including evaluation of the 2nd through 12th cranial nerves, power, bulk, tone, coordination, stance, and gait; the deep tendon reflexes were 1+ throughout. The platelet count was 362,000 per cubic millimeter (reference range, 150,000 to 350,000), and the fibrin level was 20 mg per milliliter (45 ng per liter; reference range, 3 to 17 ng per milliliter [7 to 39 nmol per liter]). The hematocrit, hemoglobin level, white-cell count, and blood levels of vitamin B₁₂, electrolytes, glucose, calcium, total protein, albumin, globulin, and thyrotropin were normal, as were the results of renal- and liver-function tests. A rapid plasma reagin test was nonreactive, and testing for antibodies to Borrelia burgdorferi was negative. As part of the standard evaluation for a suspected cognitive impairment, the patient was referred for neuropsychological testing, speech pathological evaluation, and imaging studies of the head.

Dr. Janet C. Sherman: On neuropsychological testing, the patient's performance on a screen of nonverbal abilities indicated that she had average premorbid intellectual abilities. Language impairment was evident both through clinical observations and when she performed verbal tasks, including tasks of confrontation naming, verbal fluency (for which she had substantially more difficulty with semantic fluency than with phonemic fluency), verbal abstraction, and comprehension of individual words. Her spontaneous speech was fluent, but she had notable difficulty with word finding and made occasional paraphasic errors. She often had difficulty comprehending words, such as "cork," "misplaced," "bored," and "passivism." Her performance on tests of attention and executive functioning varied; her greatest impairments were evident when the tasks required language mediation, and these impairments contrasted with her generally normal performance on tasks that were not verbally mediated. Similarly, her performance was normal on a test of nonverbal memory but was substantially impaired on a test of verbal memory. Her storage of verbal information was difficult to assess because of her impaired acquisition and anomia. Her storage of nonverbal information was normal, as was her performance on visuospatial tasks. She did not report symptoms of depression or anxiety on self-reported assessments.

Ms. Dagm Haileberg: Speech pathological evaluation revealed that the patient had fluent, articulate speech with pauses for word finding, vague word substitutions, and circumlocutions. She was somewhat tangential in her speech and was fixated on telling stories from her life, such that she often required frequent refocusing on the topic at hand. She had substantial impairment on a test of naming, with superordinate responses, and she had impairment on word-picture matching. Rare phonemic paraphasias were present. Auditory comprehension was impaired for words she no longer recognized and for sentences with complex syntax. Sentence repetition was intact. A written language assessment revealed that she could read normally and had mild agrammatism in written language samples. A semantic picture–picture matching test revealed no evidence of visual agnosia. (A portion of the speech pathological evaluation is shown in Video 1, available with the full text of this article at NEJM.org.)

Dr. Dikeman: A clinical diagnosis was made, and additional diagnostic tests were performed.

CLINICAL DIFFERENTIAL DIAGNOSIS

Dr. M-Mard El-Mesalam: As a behavioral neurologist, my first task is to make a syndromic diagnosis on the basis of the distribution of impaired and preserved functional domains. This 70-year-old, right-handed woman presented with language dysfunction characterized by impairment of word finding, object naming, and word comprehension. She had a few peculiarities of comportment, such as blunted empathy and excessive conviviality, but...
other aspects of behavior and cognition had remained mostly intact. Therefore, her principal diagnostic feature is aphasia.

APHASIA

The differential diagnosis of aphasia includes a long list of left-hemisphere diseases, including stroke involving the middle cerebral artery, hemiplegic migraine, cancer, herpes simplex encephalitis, multiple sclerosis, and many others. However, this patient’s symptoms progressively worsened over an 8-year period, and none of these processes take that long to develop. On the basis of the long time course of her syndrome, we can infer that this patient had a neurodegenerative disease. The only alternative diagnosis to consider is Creutzfeldt-Jakob disease, which can cause a focal progressive aphasia that may evolve over a period of 3 or 4 years but almost never over a period of 8 years.1,2

PRIMARY PROGRESSIVE APHASIA

On the basis of the long time course, we can confidently conclude that she had the syndrome of primary progressive aphasia, an acquired language disorder caused by a neurodegenerative process, with relative preservation of other domains.3,4 In contrast to typical dementias that occur in late life, primary progressive aphasia most commonly starts before 65 years of age and is not associated with memory loss. There are three variants of primary progressive aphasia: agrammatic, logopenic, and semantic.5

The agrammatic variant is characterized by the construction of grammatically incorrect sentences and a loss of fluency in the setting of preserved word comprehension. The logopenic variant is characterized by impairment of word finding, poor language repetition, and fluctuating fluency in the setting of preserved grammar and word comprehension. The semantic variant is characterized by impairment of object naming and word comprehension in the setting of preserved fluency, repetition, and grammar. Pauses for word finding and impaired object naming can occur in each of the variants. The most distinctive feature of this patient’s presentation is the loss of word comprehension, a finding that most closely fits the semantic variant of primary progressive aphasia (Fig. 1).

One alternative clinical diagnosis to consider is the closely related syndrome of semantic dementia, in which the deficit of word comprehension is accompanied by additional associative agnosias (impairments in recognition) of objects and faces.6 These features were not present in this patient.

Asymmetric degeneration of the cerebral cortex in the language-dominant (usually left) hemisphere is a common feature present in all patients with primary progressive aphasia. Cortical areas remaining outside the left-hemisphere language network and nearly all cortical areas of the right hemisphere may remain unaffected for years, which explains why patients with primary progressive aphasia are typically able to perform most activities of daily living, as shown by this patient’s score of 0 on the Clinical Dementia Rating scale (indicating no functional impairment).

Each variant of primary progressive aphasia is associated with a different anatomical site of peak atrophy in the left-hemisphere language network: the inferior frontal gyrus (Broca’s area) in the agrammatic variant, the temporoparietal junction (Wernicke’s area) in the logopenic variant, and the anterior temporal lobe in the semantic variant.7,8 In semantic dementia, preferential atrophy of the anterior temporal lobe also occurs but usually in a more symmetric pattern that involves both hemispheres.9,10

Given that this patient’s presentation is most consistent with a diagnosis of the semantic variant of primary progressive aphasia, I expect that structural magnetic resonance imaging (MRI) will show severe atrophy in the anterior temporal lobe that is much more pronounced on the left side of the brain than on the right side. Furthermore, as part of the standard evaluation for a patient such as this one, I would perform 18F-fluorodeoxyglucose–positron-emission tomography (FDG-PET) to see if there is hypometabolism, particularly on the left side, which can also extend to additional ipsilateral and contralateral cortical areas that are interconnected with the left anterior temporal lobe.

IMAGING STUDIES

Dr. R. Gilberto Gonzalez: MRI of the head (Fig. 2), performed without the administration of gadolinium, revealed asymmetric volume loss of the left temporal lobe—especially its anterior and mesial aspects, including the subcortical white matter, amygdala, and hippocampus—along with corresponding dilatation of the left temporal horn. A fluid-attenuated inversion recovery (FLAIR)
image (not shown) revealed slightly increased hypointensity of the anterior temporal lobe, as compared with the right side, but there was no other signal abnormality.

Dr. Keith A. Johnson: Four months after the patient's initial evaluation, FDG-PET revealed hypometabolism of the bilateral frontal lobes asymmetrically and of the bilateral temporal lobes that was greater on the left side than on the right side (Fig. 3).

**DIFFERENTIAL DIAGNOSIS**

**NEURODEGENERATIVE DISEASES OF THE ANTERIOR TEMPORAL LOBE**

Dr. Mesulam: The anterior temporal lobe is an area of the brain that is critically involved in object naming and word comprehension. Multiple lines of evidence suggest that the left anterior temporal lobe is specialized for word comprehension (recognition), whereas the right anterior temporal lobe may serve a similar function for objects and faces. Disease of the anterior temporal lobe therefore leads to the semantic variant of primary progressive aphasia when it occurs predominantly on the left side, to semantic dementia with extensive impairment of word, face, and object recognition when it occurs bilaterally, and to progressive associative agnosias when it occurs predominantly on the right side. In this patient, the finding of asymmetric atrophy of the left anterior temporal lobe is consistent with the clinical diagnosis of...
Figure 3. 18F-Fluorodeoxyglucose–Position-Emission Tomographic (FDG-PET) Scans.

Four months after the initial evaluation, FDG-PET scans show hypometabolism of the bilateral frontal lobes asymmetrically and of the bilateral temporal lobes that is greater on the left side than on the right side. Panel A shows cortical surface projections of the FDG distribution. Panel B shows cortical surface projections of a statistical analysis derived from comparison of the patient’s scans with a sample of normal scans; the distribution of the patient’s abnormal metabolism in the frontal and temporal lobes is shown in dark blue, and normal variation in visual activation is shown in red and white. The color scale represents standard deviations from the normal scans. The letters surrounding each projection indicate the orientation of the image: A denotes anterior, I inferior, L left, P posterior, R right, and S superior.

the semantic variant of primary progressive aphasia rather than semantic dementia.

In patients with primary progressive aphasia, the underlying pathologic process is usually caused by frontotemporal lobar degeneration or Alzheimer’s disease. Approximately 60% of cases of primary progressive aphasia are associated with frontotemporal lobar degeneration, and 40% are associated with Alzheimer’s disease. PET with amyloid-binding compounds (amyloid PET) would be useful in this patient to determine whether her primary progressive aphasia is likely to be caused by Alzheimer’s disease. A positive result on amyloid PET increases the likelihood of Alzheimer’s disease, whereas a negative result definitively rules out Alzheimer’s disease and makes frontotempo-
The positive result on amyloid PET, I think that this patient's primary progressive aphasia is caused by TDP-associated frontotemporal lobar degeneration, type C, rather than Alzheimer's disease.

Dr. Eric S. Rosenshine (Pathology): Dr. Dickerson, would you tell us your clinical impression when you evaluated this patient and also what happened with her?

Dr. Dickerson: On the basis of our clinical evaluation and imaging studies, our initial diagnosis was primary progressive aphasia. Once this diagnosis was made, we had to deliver the news that, at present, there are no disease-modifying therapies and few symptomatic therapies for primary progressive aphasia. Nevertheless, the cognitive and behavioral symptoms are treatable, and treatment is best determined by a multidisciplinary team of specialists. Treatment includes pharmacologic and nonpharmacologic management of symptoms, management of coexisting conditions, psychosocial support, and education of the patient and family.

As is the case for many patients with primary progressive aphasia, new symptoms beyond those affecting language began to arise in this patient with time. As she progressively lost semantic memory, she was no longer able to carry out instrumental activities of daily living, and she moved to an assisted-living facility when she was 72 years of age. Behavioral symptoms, including compulsivity, disinhibition, and agitation when efforts were made to curb her behavior, became promi-
Citalopram was used with some benefit to treat these symptoms. However, over time, her symptoms progressed and led to her placement in an acute geriatric psychiatry unit, where she was treated with olanzapine and lorazepam. Her symptoms continued to progress, and she was placed in a skilled nursing facility when she was 74 years of age. She had increasing difficulty with recognizing even close family members, as well as urinary and bowel incontinence and diminished ability to carry out activities of daily living, such as showering, dressing, and brushing her teeth. Ultimately, she “forgot” how to walk. When the patient was 77 years of age, she had decreased interest in food and increased difficulty with swallowing, and hospice services were engaged. She was enrolled in a Namaste Care program (i.e., a program for persons with advanced-stage dementia), which provided her with calming, supportive end-of-life care, and she passed away peacefully 1 day before her 78th birthday. A limited autopsy was performed.

**CLINICAL DIAGNOSIS**

Primary progressive aphasia, semantic variant.

**DR. M. MARSEL MESULAM’S DIAGNOSIS**

Primary progressive aphasia, semantic variant, due to TAR DNA-binding protein 43 (TDP-43)-associated frontotemporal lobar degeneration, type C.

**PATHOLOGICAL DISCUSSION**

*Dr. Matthew P. Frucht:* The autopsy was limited to an examination of the central nervous system. The brain weighed 920 g in the fresh state, and there was evidence of atrophy of the temporal lobes that was more severe in the left hemisphere than in the right hemisphere (Fig. 5A). Within the temporal lobes, the atrophy was more severe in the inferomedial portion than in the superior portion. There was mild atrophy involving the frontal lobe, without notable asymmetry. After cutting into the coronal plane, there was evidence of moderate cortical atrophy involving the frontal and superior temporal lobes and extreme atrophy involving the inferior and medial temporal lobes (Fig. 5B and 5C). There was enlargement of the lateral ventricle and of the temporal horn of the ventricle, and there was volume loss in the hippocampus (Fig. 5C). The most severe cortical atrophy resulted in friable tissue without well-defined gray-white distinction.

Microscopic examination of the most severely affected cortical regions revealed near-complete neuronal loss with corresponding extensive reactive gliosis. In areas of the cortical region that had less-severe atrophy on gross examination, there was mild neuronal loss with corresponding mild gliosis. A range of immunohistochemical studies was performed as a routine assessment for neurodegenerative diseases. The most prominent finding was the presence of long TDP-43-positive neuronal threads and dystrophic neurites in temporal and frontal cortices (Fig. 5D and 5E). There were very few neuronal cytoplasmic inclusions and no evident neuronal intranuclear inclusions. In keeping with the presence of TDP-43-positive inclusions, there was severe neuronal loss from area CA1 of the hippocampal formation without accumulation of a substantial burden of neurofibrillary tangles (Fig. 5E); this pattern meets the neuropathological definition of hippocampal sclerosis. The severity of the focal cortical atrophy (lobar atrophy) and the presence of TDP-43-positive inclusions accompanied by hippocampal sclerosis support the neuropathological diagnosis of TDP-43-associated frontotemporal lobar degeneration, type C.

Immunohistochemical assessment revealed the presence of β-amyloid deposits in the neocortex, hippocampal formation, striatum, and brain stem but not in the cerebellum; this distribution corresponds to Thal stage 4 of 5 for amyloid deposition. Immunohistochemical assessment for tau revealed the presence of neurofibrillary tangles in the entorhinal cortex, subiculum, and portions of the cornu ammonis; this distribution corresponds to Braak and Braak stage II of VI. Assessment for neuritic plaques, performed according to the Consortium to Establish a Registry for Alzheimer’s Disease criteria, revealed that plaques were only sparsely present in the cerebral cortex. This combination of results merits a score of A3B0C1 according to the 2012 National Institute on Aging-Alzheimer’s Association guidelines for the neuropathological assessment of Alzheimer’s disease; the score reflects the severity of three variables — deposition of β-amyloid, accumulation of neurofibrillary tangles, and burden of neuritic plaques — on a scale ranging from 0 to
3, with higher scores indicating greater severity. This patient’s score is associated with disease that has a low likelihood of resulting in cognitive impairment.23

The pattern of cerebral cortical atrophy is consistent with the clinical diagnosis of frontotemporal dementia, a clinical syndrome that is categorized as either the behavioral variant of frontotemporal lobar degeneration or primary progressive aphasia. Neuropathological classification of frontotemporal lobar degeneration, the condition that is typically present in patients with frontotemporal dementia, begins with separation into either the group characterized by the presence of tau-containing inclusions in the form of tangles and neuropil threads (in the absence of β-amyloid plaques) or the group characterized by the presence of inclusions composed of TDP-
43.7 TDP-associated frontotemporal lobar degeneration is further classified into subgroups defined according to the pattern of inclusions: type A is associated with the presence of many neuronal cytoplasmic inclusions and short dystrophic neurites, type B with the presence of some neuronal cytoplasmic inclusions and rare dystrophic neurites, and type C with the presence of rare neuronal cytoplasmic inclusions and long dystrophic neurites (as was seen in this patient). Although the clinicopathological correlations are not exact, type C lesions often occur with the semantic variant of primary progressive aphasia, semantic dementia, or the behavioral variant of frontotemporal lobar degeneration.

Dr. Meulam: If the patient has a type of primary progressive aphasia that is frequently associated with Alzheimer's disease and biomarker studies are a positive for Alzheimer's disease, medications such as cholinesterase inhibitors (e.g., galantamine, rivastigmine, and donepezil) and memantine would be indicated. However, there is no convincing evidence that these medications help the aphasia. A rigorous trial that includes only patients with primary progressive aphasia who have clinical and biomarker evidence supportive of Alzheimer's disease remains to be done.

ANATOMIC DIAGNOSIS

Primary progressive aphasia, semantic variant, due to TAR DNA-binding protein 43 (TDP-43)-associated frontotemporal lobar degeneration, type C.

This case was presented and discussed at the 87th Annual Harvard Medical School Continuing Medical Education course, "Eminestia: A Comprehensive Update," organized by Alireza Atri, M.D., Ph.D., and Krishna C. Dickerson, M.D.

The neuropathological evaluation in this case was supported by the Massachusetts Alzheimer's Disease Research Center (PS 01 AG005135).

No potential conflicts of interest relevant to this article were reported.

Disclosure forms provided by the authors are available with the full text of this article at NEJM.org.

We thank Dr. David H. Louis for his review of the Pathological Discussion of the manuscript.

REFERENCES


Copyright © 2016 Massachusetts Medical Society.
Cases used for Rush AC neuroscience course and UVa neurology clerkship

1. Multiple sclerosis
2. Guillain-Barré syndrome
3. Patient with breast cancer and epidural abscess
4. Apparent coma due to locked-in syndrome
5. Seizure due to meningioma
6. Dementia due to Jakob-Creutzfeldt syndrome
7. Tremor due to Wilson’s disease
8. Migraine
Problem 1 - Page 1

A 26 year old right handed female nurse stops you in the hall to inquire about numbness in her hands. For the past two months, she has noted numbness and paresthesiae in both hands. When typing, adjusting IVs, or performing other tasks requiring dexterous hand movements, she feels clumsy. On one occasion she dropped a cup of coffee for no apparent reason, but does not feel that her hands are weak. She has no other complaints.

Past medical history is unremarkable.

Allergies: penicillin caused a rash.

Medications: oral contraceptives.

Habits: she smokes one pack of cigarettes daily, drinks about six cans of beer per weekend, and has a nightly glass of wine with dinner. She used marijuana, cocaine, LSD, and MDA in college, but not during the past five years. She is sexually active in a serially monogamous fashion: she has been with the same man for three years and is contemplating marriage. She denies exposure to solvents and other toxins.

Questions:

1. List three potential causes of her hand numbness, and discuss how you would work them up.

2. Discuss the neurologic complications associated with oral contraceptive agents, and their relationship to tobacco use.
Problem 1 - Page 2

Physical examination reveals a well-developed, well-nourished woman in no distress.

Skin: no lesions
HEIGHT: normal
Neck: supple, no abnormal sensations associated with neck; movement
Lungs: clear
Breasts: no masses
CV: S1, S2 normal; no S3 or S4; + midsystolic click; without a murmur. Peripheral pulses are intact.
Abdomen: scaphoid, without masses or organomegaly
Back: normal
Extremities: no cyanosis, clubbing, or edema
Pelvic & rectal exams: normal

Neurologic exam:
Mental status: alert, cooperative, oriented x 4; language, judgment, and memory normal.
Cranial nerves: pupils 4 mm round, and briskly reactive to light and accommodation. Extraocular movements are intact. Her visual acuity and visual fields are normal. There is no weakness or sensory loss.
Motor: strength, tone, and bulk are normal.
Reflexes: 3+, symmetric, without clonus or pathologic reflexes.
Sensory: normal
Cerebellar: normal
Gait: normal
Questions:

3. The patient asks you for you diagnostic impression. What will you tell her?

4. Describe and discuss the significance of the following pupillary findings: Argyll-Robertson pupils, Adie’s pupil.
The patient marries four months later. Two months after this she calls you to report the acute onset of left eye pain and visual loss. You question her about other problems and she admits that for the past two weeks she had experienced intermittent diplopia on right lateral gaze which she attributed to fatigue.

Her examination is now remarkable for:

Cranial nerves: neither pupil constricts in response to light in the left eye, but both constrict briskly when light is shined into the right eye. Visual acuity: OS 20/200. OD 20/20. The left optic disc is swollen and gray. The positions of the eyes at rest and on left lateral gaze are normal. On right lateral gaze, the left eye does not adduct past the midline; the right eye abducts fully but develops nystagmus. The other cranial nerves are normal.

Motor: normal
Reflexes: 3+ except 4+ at both ankles. Bilateral Babinski signs are now present.
Cerebellar: normal
Gait: normal
Questions:

5. Draw the pathways subserving the pupillary light reflex, indicating the point at which you think this patient’s problem is located.

6. Draw the pathways coordinating conjugate lateral eye movement. Where do you think this patient’s lesion is located? How does the anatomy of vertical gaze differ from that of horizontal gaze?

7. What is your differential diagnosis at this point?

8. What diagnostic studies should be performed now?
CBC. Chemistries. U/A, RPR, ANA, ESR, and complement levels are normal.

An MRI scan of the brain and spinal cord reveals six areas of increased T2 signal in the cerebral white matter.

Visual evoked responses yield no response from the left eye and delayed conduction on stimulation of the right eye.

Brainstem auditory evoked responses reveal a delay between waves III and V on right ear stimulation.

Somatosensory evoked responses show normal latencies from each median nerve to the brachial plexus and cervical spine, but bilaterally delayed conduction from the cervical spine to the cortex.

CSF: opening pressure 12 cm CSF:
protein 40 mg dL.
glucose 70 mg dL (serum 95 mg dL);
cell counts: 0 RBCs, 7 WBCs, All lymphocytes
IgG:albumin ratio: 0.24 in CSF, 0.11 in serum
High resolution CSF electrophoresis: 4 oligoclonal bands
Myelin basic protein: present

You admit the patient to the hospital for corticosteroid treatment.
Questions:

9. What effect(s) does corticosteroid treatment have on this condition? By what route and for how long should it be administered? What are the risks?

10. Discuss the neuroimmunology of this condition.

11. Discuss the significance of each of the abnormal findings detailed above.

12. Which of the above tests contributed something useful in this patient’s diagnosis and which were superfluous?
She completes her course of treatment. Two weeks later, her right eye acuity is 20/100 and remains stable thereafter. Her diplopia gradually resolves; her left eye adducts normally on right lateral gaze, but the right eye continues to demonstrate some nystagmus.

Questions:

13. What is the sequence of pathologic changes occurring in her nerves?

14. Discuss the natural history of this condition. What sorts of courses may her disease run over the next 20 years? What is the effect of pregnancy on the natural history of this condition?
Objectives

- Selecting cases for teaching
- Presenting cases to students
- Facilitating students’ presentations of cases to a group
Selecting cases for teaching

• Any case is good for teaching something
  – Select your teaching points
  – Riff on your student’s questions and responses
Objectives

- Selecting cases for teaching
- Presenting cases to students
- Facilitating students’ presentations of cases to a group
Presenting cases to students

• In a classroom
  – Pros: you can change the history, exam, lab data, treatment
  – Cons: not as immediate as a bedside presentation

• At the bedside
  – Pros: real life; patient may be able to participate, answering questions you didn’t anticipate
  – Cons: real life is messy
Objectives

• Selecting cases for teaching
• Presenting cases to students
• Facilitating students’ presentations of cases to a group
Facilitating students’ presentations of cases to a group

• With preparation
  – Do all students get the case in advance, or just the presenter?
  – Should you coach the student?
    • Paper case
    • Live case

• Without preparation
  – Paper case
  – Live case
Does it matter whether education is case-based or lecture based?

• Are they better practitioners throughout their careers?
• How do they perform on standardized tests?
An Experiment in Medical Education
A Critical Analysis Using Traditional Criteria

Larry J. Goodman, MD; Erich E. Brueschke, MD; Roger C. Bone, MD; William H. Rose, PhD;
E. Jane Williams, PhD; Harold A. Paul, MD

In 1984, in addition to its standard traditional curriculum, Rush Medical College
(Chicago, Ill) developed a Socratic problem-based method of teaching basic
science material called the alternative curriculum. As part of an evaluation of this
new curriculum, students in the two curricula were compared using three traditio-

nal measurements: (1) test scores from the National Board of Medical Exami-
ners, Part I; (2) test scores from the National Board of Medical Examiners, Part II;
and (3) performance on an oral examination. Alternative curriculum students did
not differ significantly from their traditional curriculum classmates on National
Board of Medical Examiners, Part I and Part II total scores, although their subset
scores on Part I did tend to be lower, reaching significance in one subset area.
Differences in performance favoring the traditional curriculum were primarily
seen in the early years of the program. Alternative curriculum students in the
class matriculated in 1987 scored significantly higher in three of five categories
on the oral examination.

METHODS
Once admitted, students interested in the AC were interviewed and in-
formed about the design of the program, its goals, and its experimental nature.
Since its pilot year, 18 positions in each entering class of 120 students were
available in the AC. Of matriculated students, between 18 and 30 requested
a position in the AC each year. Students were selected based on their enthusi-
asm for the described program and on
Table 1.—Unadjusted and Adjusted Mean Scores for NBME I by Curriculum Type*

<table>
<thead>
<tr>
<th>Subject Area</th>
<th>Unadjusted</th>
<th>Adjusted†</th>
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<th>Year</th>
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<td>TC (N = 501)</td>
<td>AC (N = 72)</td>
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<td>AC</td>
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<td>Anatomy</td>
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<td>459 (86)</td>
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<tr>
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<td>491 (92)</td>
<td>481</td>
<td>486</td>
<td>.58</td>
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<tr>
<td>Biochemistry</td>
<td>492 (90)</td>
<td>473 (91)</td>
<td>492</td>
<td>474</td>
<td>.10</td>
</tr>
<tr>
<td>Pathology</td>
<td>521 (99)</td>
<td>497 (95)</td>
<td>522</td>
<td>490</td>
<td>.01</td>
</tr>
<tr>
<td>Microbiology</td>
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<td>488 (86)</td>
<td>479</td>
<td>486</td>
<td>.54</td>
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<tr>
<td>Pharmacology</td>
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<td>518 (92)</td>
<td>495</td>
<td>511</td>
<td>.18</td>
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<td>Behavioral science</td>
<td>492 (97)</td>
<td>501 (97)</td>
<td>494</td>
<td>489</td>
<td>.63</td>
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<td>Total</td>
<td>489 (93)</td>
<td>485 (90)</td>
<td>489</td>
<td>480</td>
<td>.40</td>
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*Includes classes matriculated from 1984 through 1988, first administration scores. NBME I indicates National Board of Medical Examiners, Part I; TC, traditional curriculum; and AC, alternative curriculum.
†Adjusted for gender, age, undergraduate grade point average, presence of a higher degree, and Medical College Admission Test scores used as covariates; C × Y indicates curriculum by year.
‡Probabilities from curriculum by year analyses of variance (2 × 5), including interaction term (C × Y).
Fig 1.—Comparative adjusted alternative curriculum (AC) and traditional curriculum (TC) National Board of Medical Examiners (NBME), Part I, scores for classes matriculated 1984 through 1988.
Table 2.—Unadjusted and Adjusted Mean Scores for NBME II by Curriculum Type*

<table>
<thead>
<tr>
<th>Subject Area</th>
<th>Unadjusted</th>
<th>Adjusted‡</th>
<th>P†</th>
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<tbody>
<tr>
<td></td>
<td>TC (N = 297)</td>
<td>AC (N = 36)</td>
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<tr>
<td>Medicine</td>
<td>490 (91)</td>
<td>475 (90)</td>
<td>489</td>
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<tr>
<td>Surgery</td>
<td>494 (87)</td>
<td>474 (87)</td>
<td>493</td>
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<tr>
<td>Obstetrics/gynecology</td>
<td>480 (90)</td>
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<tr>
<td>Public health</td>
<td>484 (86)</td>
<td>503 (117)</td>
<td>487</td>
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<td>Pediatrics</td>
<td>491 (94)</td>
<td>478 (83)</td>
<td>491</td>
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<tr>
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<td>531 (93)</td>
<td>514 (97)</td>
<td>530</td>
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<tr>
<td>Total</td>
<td>494 (83)</td>
<td>483 (83)</td>
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</tbody>
</table>

*Includes classes matriculated from 1984 through 1986, first administration scores. NBME II indicates National Board of Medical Examiners, Part II; TC, traditional curriculum; and AC, alternative curriculum.

†Adjusted for gender, age, undergraduate grade point average, presence of a higher degree, and Medical College Admission Test scores used as covariates; C × Y indicates curriculum by year.

‡Probabilities from curriculum by year analyses of variance (2 × 3), including interaction term (C × Y).
Fig 2.—Comparative adjusted alternative curriculum (AC) and traditional curriculum (TC) National Board of Medical Examiners (NBME), Part II, scores for classes matriculated 1984 through 1986.
Problem-Based Learning and Medical Education Forty Years On

A Review of Its Effects on Knowledge and Clinical Performance

Alan J. Neville

McMaster University, Faculty of Health Sciences, Hamilton, Ont., Canada

Key Words
Problem-based learning · Medical education · Self-directed learning · Memory and cognitive architecture · Guided learning · Outcome assessment · Clinical competency

Abstract
Problem-based learning (PBL) has swept the world of medical education since its introduction 40 years ago, leaving a trail of unanswered or partially answered questions about its benefits. The literature is replete with systematic reviews and meta-analyses, all of which have identified some common themes; however, heterogeneity in the definition of a 'problem-based learning curriculum' and its delivery, coupled with different outcome measurements, has produced divergent opinions. Proponents and detractors continue to dispute the merits of the cognitive foundation of a PBL approach, but, despite this, there is evidence that graduates of PBL curricula demonstrate equivalent or superior professional competencies compared with graduates of more traditional curricula.

adopted the method in whole or in part. This revolution in medical education has had a huge impact on the development of the medical school curriculum, and yet when it was introduced there was no philosophical or cognitive theoretical underpinning explicitly stated by the founders of the McMaster Medical School. Indeed, Howard Barrows [1], who developed the PBL experience at McMaster, had no background in educational psychology or cognitive science, and the rationale that he and his colleagues proposed for the McMaster curriculum, which included learning in small groups for the study of clinical problems, was that it would make medical education more interesting and relevant for their students. Even more remarkable was the widespread adoption of this educational theory and its endorsement by the Association of Medical Colleges and the World Federation of Medical Education without any real evidence at the time that the PBL-trained learner would become a better doctor [2, 3].

Over the ensuing 40 years, there has been a large number of publications related to the use of PBL, and several systematic and non-systematic reviews of PBL curriculum, covering groups and data from 1992, and 2002 [4-10]. It is
Abstract
Problem-based learning (PBL) has swept the world of medical education since its introduction 40 years ago, leaving a trail of unanswered or partially answered questions about its benefits. The literature is replete with systematic reviews and meta-analyses, all of which have identified some common themes; however, heterogeneity in the definition of a ‘problem-based learning curriculum’ and its delivery, coupled with different outcome measurements, has produced divergent opinions. Proponents and detractors continue to dispute the merits of the cognitive foundation of a PBL approach, but, despite this, there is evidence that graduates of PBL curricula demonstrate equivalent or superior professional competencies compared with graduates of more traditional curricula.
Professional Virtue
and the Root of Inner Wisdom

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Objectives

- At the conclusion of this activity learners will be able to:
  - Distinguish role-specific professional obligations and ethical principles.
  - Differentiate principlism from virtue ethics in professional life.
  - Engage in reflection, dialogue and praxis on one’s professional ethical commitments.

- I have no conflicts of interest to disclose.
Thomas Merton

1915-1968
What’s at Stake

“The rush and pressure of modern life are a form ... of ... innate violence. To allow oneself to be carried away by a multitude of conflicting concerns, to surrender to too many demands, to commit oneself to too many projects, to want to help everyone in everything is to succumb to violence. The frenzy of the activist ... destroys the fruitfulness of his own work because it kills the root of inner wisdom which makes work fruitful.”

Human Person as:

- BIO
- PSYCHOS
- SOCIAL
- SPIRITUAL

Features of a Profession

- Training
- Intellectual Rigor
- Service
- Other Features
  - Licensure
  - Professional Autonomy
  - Monopoly granted
  - Self-regulated
Professional Ethics

- Normative Standards
- Consulting vs. Scholarly Professions
- Professional Values Codified
  - AMA, ABA, ANA Codes of Ethics, Standards of Practice, e.g.
  - Your Professional Code . . .
- Ethical Principles
  - To fill the gaps/ make the rules
Professionalization Values

- Praxis between
  - Principles/Rules
    - “talking the talk”
  - Character/Virtue
    - “walking the walk”
- Education & Training
- Technical Competence
- Service vs. Profit
Bioethics

**Principles**
- Autonomy
- Nonmaleficence
- Beneficence
- Justice

**Other Values**
- Community/Relationality
- Caring, kindness, devotion, compassion
- Love, altruism, sacrifice, conscience
- Preferential option for weak, poor


Based on Meilander G. *Body, Soul and Bioethics* (South Bend, IN: Notre Dame Press, 1995)
Role Accountability

- **Patient/Client = 1°:** The person who comes to you seeking your services
- **Employer/Payor:** The person or entity who purchases your services
- **Other Professionals/Professional Community**
- **Family**
- **Society**
- **Self**
Two Ethical Questions

- What ought to be done in this situation, all things considered?
  - “Snapshot ethics”
  - Main focus of professional ethics

- How ought I live a life of moral excellence in my chosen profession?
  - “Video ethics”
  - Main focus of professionalism
  - “Virtue Ethics”
What Are Virtues?

- Excellence in function (Aristotle)
  - “Habits of the Heart” (Bellah)
  - Human, professional behaviors
  - Virtue as Practice (*praxis*)
- Represent core moral values
- One tries to live a life so that one’s daily behavior exemplifies those core values
- “Obituary test”
  - (inherently biographical view)
Classical Virtues

- Cardinal Virtues (Plato)
  - Prudence
  - Justice
  - Temperance
  - Fortitude/Courage

- Theological Virtues (Paul/Augustine)
  - Faith
  - Hope
  - Love
A Caution from Merton

“Some of the most virtuous [people] in the world are also the bitterest and most unhappy because they have unconsciously come to believe that all their happiness depends on their being more virtuous than [others].”

Values & Personal Meaning

- Identity/Integrity
- Community
- Connectedness
- Intimacy/Trust
- Forgiveness
- Truth
- Freedom
- Service
- Generosity
- Magnanimity
- Humility
- Self-Care
- Healing
- Compassion
- etc. . . .
The Virtuous Student/Clinician

- Competence
- Honesty
- Compassion
- Respect for Professionals
- Professional Responsibility
- Social Responsibility
The Ethical Professional . . .

- Practice of
  - Reflection
  - Dialogue
  - Praxis
A Famous Musician

“If I don’t practice for one day, I know it. If I don’t practice for two days, the critics know it. If I don’t practice for three days, the audience knows it.”

“Fine discernment” and virtue
Fine Discernment

- Virtue ideally involves doing the right thing, in the right way, for the right reasons, with the right attitude
- Like becoming a music virtuoso, achieving optimal virtue is a life-long project of *becoming*
- Irony: The more virtuous one is, the better one can detect even slight lapses
“A great deal of virtue and piety is simply the easy price we pay in order to justify a life that is essentially trifling. Nothing is so cheap as the evasion purchased by just enough good conduct to make one pass as a "serious person" . . . But it is precisely this idea that a serious life demands "time to live" that is the root of our trifling.”

Your Work as:

- JOB
- CAREER
- PROFESSION
- VOCATION
“Ethics: Dealing with questions that don’t have an answer”

Clayton L. Thomason, J.D., M.Div.
Bishop Anderson Professor of Religion & Ethics in Medicine
Chair, Dept. of Religion, Health & Human Values
Director, Program in Healthcare Ethics
Rush University Medical Center

Clayton_Thomason@rush.edu
Objectives

1. Identify major sources of moral beliefs in health care ethics.
2. Distinguish between medical certainty and moral certainty.
3. Distinguish between moral disagreement and moral relativism.
4. Assess the importance of reason to moral argument in health care ethics.

I have no conflict of interest to disclose.
Moral Reasoning

- Moral WORLDVIEW
- Moral THEORY
- Moral PRINCIPLES
- Ethical RULES
- ACTS
Principles of Bioethics

- Autonomy
- Nonmaleficence
- Beneficence
- Justice

Moral Theory: What’s Right-making?

- Deontological Theories
- Teleological Theories
Ethical Tensions between . . .

- **Clinical Ethics**
  - Based on principle of Respect for Patient Autonomy, benevolence, nonmaleficence
  - Focus on best interests of individual patient

- **Public Health Ethics**
  - Based on Justice, fairness, communitarian values
  - Focus on best interests of society at large
### Hard Choices

- **Easier:** Good vs. Bad Outcomes
- **Harder:** Good vs. Good Outcomes
- **Hardest:** Bad vs. Bad Outcomes

<table>
<thead>
<tr>
<th></th>
<th>+</th>
<th>-</th>
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</thead>
<tbody>
<tr>
<td>+</td>
<td>Harder</td>
<td>Easier</td>
</tr>
<tr>
<td>-</td>
<td>Easier</td>
<td>Hardest</td>
</tr>
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</table>
Four Topics:
Case Analysis in Clinical Ethics

Six Steps: a Process for Ethical Decision-Making

1. Get the Story Straight -- Gather relevant information
2. Identify the Type of Ethical Problem
3. Use Ethics Theories or Approaches to Analyze the Problem(s)
4. Explore the Practical Alternatives
5. Complete the Action
6. Evaluate the Process and Outcome

Some Ethical Issues in Healthcare

- Confidentiality, Truth-telling, Trust
- Decision-making Capacity, Competence
- Informed Consent - Treatment, Research
- Refusal of Treatment
- Research Ethics
- Futility, Medically Inappropriate Treatment
- Withholding, Withdrawing Treatment
- Euthanasia, Physician-Assisted Dying
- Advance Directives
- Palliative Care, Hospice, End-of-Life Care
- Special Populations
  - Pediatrics, Disabled, ICU, etc.

cf., http://www.bioethics.net
Best Practices: Healthcare Ethics Committees (HEC)

- Interprofessional
- Diverse perspectives in complex cases
- Ethical issues are the business of everyone who cares for patients
- Give voice to the practical wisdom of experienced clinicians as well as lay members
- Forum for new, unusual cases, or in absence of policy or policy exceptions

Goals of Ethics Consultation

- Help resolve uncertainty and disagreements over ethical issues in clinical care
  - ex.) Ethics consultations in ICU cases involving value conflict reduce length of hospitalization and are viewed as helpful by family members
    - JAMA 2003;290(9):1166-1172
Best Practices: Integrated Ethics Program

- Ethics Consultation
  - Responding to clinical ethics concerns

- Preventive Ethics
  - Addressing healthcare ethics on system level

- Institutional/Organizational Ethics
  - Fostering a positive healthcare environment

The Ethical Professional . . .

- Clinical Competence
- Ability to act in ways that advance the best interests of the patients entrusted to their care
- Ability to hold themselves and their colleagues accountable for their practice
- Ability to work collaboratively to advocate for patients
... The Ethical Professional

- Ability to mediate ethical conflict among the patient, family, health care team, payers, and other interested parties
- Ability to recognize the ethical dimensions of practice and identify and respond to ethical problems
- Ability to critique new health care technologies and changes

Taylor C. What it means to be ethical. Case Management Advisor 1999; 141.
The Ethical Professional practices . . .

Reflection

Dialogue

Praxis
Identifying Learning Styles and Creating Opportunities for Diverse Learning Styles

Teaching Academy Series
Rush Office of Faculty Affairs
April 18, 2017

Beverley Robin, MD CHSE
Director of Pediatric Interprofessional Education/Simulation
Assistant Professor, Rush Children’s Hospital

Dina Rubakha, MEd
Project Assistant, Office of Faculty Affairs
Rush University Medical Center
No Disclosures
1. Identify your own learning style.

2. Create learning opportunities to meet the needs of learners with diverse learning styles.
Kolb’s Cycle of Experiential Learning moves through 4 stages

1. Concrete Experience (an event)
2. Reflective Observation (what happened)
3. Abstract Conceptualization (analysis/conclusions, new ideas)
4. Active Experimentation (application of new ideas)

Part of Kolb’s cycle addresses how people *process* an experience, whether through action or observation.
The second part of Kolb’s cycle addresses how people respond to an experience, whether emotionally or analytically.
By determining how an individual processes and perceives a task, you can determine your learning style.
<table>
<thead>
<tr>
<th>Learning Style</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Divergers</strong></td>
<td>• Favor experience and reflection and particularly enjoy engagement and discussion that exposes many different viewpoints (feel and watch)</td>
</tr>
<tr>
<td><strong>Assimilators</strong></td>
<td>• Favor reflection and conceptualization and use theories, guides, flow charts, and checklists to develop their understandings (think and watch)</td>
</tr>
<tr>
<td><strong>Convergers</strong></td>
<td>• Favor conceptualization and active experimentation and enjoy applying material to solve problems and devise plans (think and do)</td>
</tr>
<tr>
<td><strong>Accommodators</strong></td>
<td>• Favor active experimentation and experience and enjoy immediate immersion into activity and self-assessment (feel and do)</td>
</tr>
</tbody>
</table>
Educational methods to meet learning styles

• At your table, consider the types of educational methods you would employ to meet all learning styles

• Choose one:

  1. Physiology of the red blood cell
     OR
  2. Teaching normal heart sounds

The Learning Style Inventory

An important aspect of communication is an understanding between the Student and the Field Instructor about learning styles. Most teachers adopt a style of teaching which matches their own learning style, but which may be different than that of the Student’s. Many misunderstandings can be avoided if both the Student and Field Instructor take the time to complete the Learning Style Inventory. Not only can misunderstandings be avoided, but also through awareness of your own learning style an expansion of both learning and teaching styles may take place. This is important since one of the roles of the social worker is to educate, and our clients and colleagues will have a variety of learning styles that we need to understand.

The Learning Style Inventory is derived from an experiential theory and model of learning developed by Kolb (1984)* and based on the seminal contributions of John Dewey, Kurt Lewin & Jean Piaget. It is a practical self-assessment instrument that can help us assess our unique learning styles, and has the advantage of only taking 30-45 minutes to complete. It tells us our preferred approach to learning in everyday life.

**The Model**

In this experiential model, learning is viewed as a continually recurring problem solving process in the four-stage cycle depicted below. *Concrete Experiences* are followed by *Reflective Observations* that lead to the formulation of *Abstract Concepts and Generalizations* that lead to *Active Experimentation* to test the hypotheses that have been developed. This is an ongoing process, and may be entered anywhere in the cycle.

Concrete Experience

```
Concrete Experience

| Active Experimentation | Reflective Observation |
```

Abstract Conceptualization

Our learning styles become second nature, and we are often unaware of how we approach problem solving. Our learning becomes a tacit way of knowing, largely influenced by our past experiences. The Learning Style Inventory is one tool the Student and the Field Instructor can use to make your learning styles explicit. As noted earlier, we often teach based on our preferred styles of learning.

The Learning Style Inventory

Instructions: It will take 30-45 minutes to complete the Learning Style Inventory and develop your Learning Style Profiles. As you complete the Learning Style Inventory remember that there are no right or wrong answers. The Inventory gives you an idea of how you learn; it does not evaluate your learning ability.

1. Rank order each set of four works (going across) in the 10 items listed below. Assign a 4 to the word which best characterizes your learning style, a 3 to the next best, a 2 to the next, and a 1 to the least characteristic word. Assign a different number to each of the four words. Do not make ties.

1. _____ involved _____ tentative _____ discriminating _____ practical
2. _____ receptive _____ impartial _____ analytical _____ relevant
3. _____ feeling _____ watching _____ thinking _____ doing
4. _____ accepting _____ aware _____ evaluating _____ risk-taker
5. _____ intuitive _____ questioning _____ logical _____ productive
6. _____ concrete _____ observing _____ abstract _____ active
7. _____ present-oriented _____ reflecting _____ future-oriented _____ practical
8. _____ open to new experiences _____ perceptive _____ intelligent _____ competent
9. _____ experience _____ observation _____ conceptualization _____ experimentation
10. _____ intense _____ reserve _____ rational _____ responsible

(for scoring only) _____ (CE) _____ (RO) _____ (AC) _____ (AE)

2. Total the rank numbers you have given to the ten words in each of the four columns (add all of your scores going down). The sum of the first column gives you your score on **CE: Concrete Experience**; the second column gives you your score on **RO: Reflective Observation**; your score on the third column is for **AC: Abstract Conceptualization**; and the fourth column is your score on **AE: Active Experimentation**.

3. Transfer each of your scores to the Learning Style Profile on the next page by placing a mark by the number you scores on each of the four dimensions. Connect these four marks with straight lines.
## LEARNING STYLE PROFILE

<table>
<thead>
<tr>
<th>Concrete Experience</th>
<th>Accommmodative</th>
<th>Divergent</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td></td>
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<tr>
<td>30</td>
<td></td>
<td></td>
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<tr>
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<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
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</table>

<table>
<thead>
<tr>
<th>Active</th>
<th>Reflective</th>
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<tbody>
<tr>
<td>10</td>
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</table>

<table>
<thead>
<tr>
<th>Experimentation</th>
<th>Observation</th>
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<tbody>
<tr>
<td>10</td>
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</tr>
<tr>
<td>15</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Convergent</th>
<th>Assimilative</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
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<tr>
<td>35</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Abstract Conceptualization</th>
</tr>
</thead>
</table>

### Interpretation:
Your individual scores provide you with a measure of the relative emphasis you give to each of the four different learning modes. Kolb (1984) defines each mode as follows:

**Concrete Experience (CE)** -- A CE orientation focuses on being involved in experiences and dealing with immediate human situations in a personal way. It emphasizes feeling more than thinking; a concern with the uniqueness and complexity of present reality over theories and generalizations; and intuitive, "artistic" approach over a systematic, scientific approach to problems.
Reflective Observation (RO) -- An RO orientation focuses on understanding the meaning of ideas and situations by carefully observing and describing them. It emphasizes reflection and understanding over action and practical application; a concern with what is true or how things happen over what will work.

Abstract Conceptualization (AC) -- An AC orientation focuses on using logic, ideas, and concepts. It emphasizes thinking rather than feeling; a concern with building general theories rather than intuitively understanding unique, specific areas; a scientific more than an artistic approach to problems.

Active Experimentation (AE) -- An AE orientation focuses on actively influencing people and changing situations. It emphasizes practical applications as distinct from reflective understanding; a pragmatic concern with what works rather than with what is absolute truth; an emphasis on doing, more than observing.

Your dominant learning style, how you resolve the tensions between conceptualizations and experience, and between action and reflection, is determined by locating the quadrant with the largest enclosed space on your Learning Style Profile. The quadrant is labeled on the Learning Style Inventory in italics.

Kolb (1984) describes the characteristics of each style based on both research and clinical observation.

Convergent -- The convergent learning style relies primarily on the dominant learning abilities of abstract conceptualization and active experimentation. The greatest strength of this approach lies in problem solving, decision-making, and the practical application of ideas. The style works best in situations where there is a single correct answer or solution to a question or problem. The style suggests a preference for task accomplishment or productivity rather than for more socio-emotional experiences.

Divergent -- The divergent learning style has the opposite learning strengths from the convergent. It emphasizes concrete experience and reflective observation. Its greatest strength lies in imaginative ability and awareness of meaning and values. The primary adaptive ability of divergence is to view concrete situations from many perspectives and to organize many relationships into a meaningful "gestalt." The emphasis in this orientation is on adaptation by observation rather than action. It is called divergent because it works best in situations that call for generation of alternative ideas and implications, such as a "brainstorming" idea session. The style suggests a preference for socio-emotional experiences over task accomplishment.

Assimilative -- In assimilation, the dominant learning abilities are abstract conceptualization and reflective observation. The greatest strength of this orientation lies in inductive reasoning and the ability to create theoretical models, in assimilating disparate observations into an integrated explanation. As in convergence, this orientation is focused less on socio-emotional interactions and more on ideas and abstract concepts. Ideas are valued more for being logically sound and precise than for their practical values. It is more important that the theory be logically sound and precise.

Accommodative -- The accommodative learning style has the opposite strengths from assimilation, emphasizing concrete experience and active experimentation. The greatest strength of this orientation lies in doing things, in carrying out plans and tasks and getting involved in new experiences. The adaptive emphasis of this orientation is on opportunity seeking, risk taking and action. This style is called accommodative because it is best suited for those situations where one must adapt oneself to changing immediate circumstances. In situations where the theory or plans do not fit the facts, those with an accommodative style will most likely discard the plan or theory.

Although each of us may have a dominant learning style it is important to remember that a learning style describes how we learn, not how well we learn. No particular style is intrinsically better or worse than another -- only different. Understanding the commonalities and differences between your learning style and those you are working with may be useful in communicating more effectively. It can also give you an idea of your strengths and where you can grow.
Teaching Normal Heart Sounds

Accommodative (feel & do)
- Hands on listen with stethoscope
- Provide sound byte of normal heart sound
- Practice on real people
- Listen to patient to identify abnormal heart sounds
- Just do it
- Hands on X 2 (Day 1 & Day2)
- Reflect on right/wrong

Convergent (think & do)
- Use heart sound-let them reflect and ingest the sound
- Show heart diagram
- Recording of heart sounds and identify
- YouTube videos
- Simulation lab/ Online-with identification
- Practice on yourself and peers
- Cartoon/drawing
- Teach heart sound

Divergent (feel & watch)
- Lecture about heart sound with images
- Listen/watch video of heart sound
- Case study-looking at whole patient
- Textbook learning; what to look for
- Group projects
- Reflection heart sounds
- Incorporate emotional experience to learning
- Ultrasound heart sounds
- Watch different life stages of active heart sounds

Assimilators (think & watch)
- Draw the tracing of normal heart sound
- Listen to patient to identify abnormal heart sounds (watch someone listen)
- Case Study
- Observation
- Textbook; Lots of reading (detailed description)
- Watch person/video doing activity
- Lecture
- Written description of what to expect/ materials
Physiology of Red Blood Cells

**Accommodative (feel & do)**
- Video (YouTube)
- Demonstration interactive
- Lab-watch and manipulate function

**Convergent (think & do)**
- Case Study
- Checklists
- Role play-cell activity
- Lab-watch and manipulate function

**Divergent (feel & watch)**
- Venn Diagram
- Word cloud
- Process checks
- Matrix Analysis
- Computer simulation
- Video of activity

**Assimilators (think & watch)**
- Flow Chart
- Outline
- Cause/Effect Chart
- Watch how carry oxygen to tissue
Healthcare Professionals & Burnout

Patricia Normand, MD
Director, Wellness & Integrative Health
Road Home Program: Center for Veterans and their Families
Rush University Medical Center
Disclosures
Burnout

Not a simple topic....

No easy answer...

Multidisciplinary
SECOND OPINION

WHAT SEEMS TO BE THE PROBLEM, MRS. JOHNSON?

I FEEL THE WAY YOU LOOK!

PHYSICIAN BURNOUT
Social workers tend to need a larger than average 'stress ball'.
Jerome Stone shows nurses their 'inner oomph'
What is burnout?

• Emotional exhaustion
  Emotionally overextended and exhausted by work

• Depersonalization
  Negative, cynical attitude, treating patients as objects

• Sense of low personal accomplishment
  Feelings of incompetence, inefficiency & inadequacy
Stress

- Non specific reaction
- Transient reaction
- Heightened reaction - urgency

Burnout

- To one specific role
- Longer lasting, pervasive to situation
- Blunted reaction

Medical disorder ICD-10 code (Z73.0 – Burn-out, state of vital exhaustion)
No DSM V diagnosis
Stressed Eric  Burnt out Eric

(Eric was too tired to pose for this cartoon, apologies)
Burnout or Depression

Burnout - Effects work life & spares personal life

Depression - Effects both personal and work life

If accompanied by:
- Sleep and appetite disturbance
- Decreased interest in most activities
- Persistent loss of energy
- Observable agitation or being slowed down
- Frequent feelings of worthlessness or inappropriate guilt
- Decreased concentration
- Thoughts of self harm
Resources

• Primary care provider

• EAP
  Employee, student, family
  (800) 292-2780
  www.ers-eap.com
  User Name: rush
  Password: rush

• Counseling Center
  Students & house staff
  312/942-3687
Prevalence of Burnout

- 25% - 60% of practicing physicians (many)
- 76% of internal medicine residents (Shanafelt 2003)
- 45% of 3rd year students (Dyrbye 2006)
- 50% critical care nurses (Sexton 2009)
FIGURE 2. Changes in burnout and satisfaction with WLB in physicians and population year are shown on the x axis. Burnout (A) and satisfaction with WLB (B) are shown on the y axis. WLB = work-life balance.
Physician Burnout Relative to US Population

(n = 7288)

Burnout
48.8% vs 28.4% < .001

Suicidal ideation past 12 mo.
7.2% vs 4.0% < .001

Work schedule leaves me enough time for my personal/family life:

Strongly agree
7.6% vs 22.8% < .001

Shanafelt 2015
Why?
How do you spend your time?

Sinsky et al. 2016

57 physicians - after hours diary

For every 1 hour direct clinical face time with patients,
2 additional hours is spent on EHR and desk work

Another 1 to 2 hours of personal time each night doing
additional computer & other clerical work.

AMA 2013

Physicians average 37 PA/week
Average 16.5 hrs/week all staff time
<table>
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<th>Task Category, by Activity During Office Hours</th>
<th>Tasks, n</th>
<th>Mean Time to Complete Task, s</th>
<th>Tasks per Hour, n</th>
<th>Time Spent (95% CI), %</th>
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<td>Direct clinical face time</td>
<td></td>
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<td>Total*</td>
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<tr>
<td>With patient</td>
<td>4483</td>
<td>93</td>
<td>10</td>
<td>33.1 (31.9-34.5)</td>
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<td>With staff and others (patient not present)</td>
<td>2121</td>
<td>45</td>
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<td>EHR and desk work</td>
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<td>By Task Category</td>
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<td>Test result</td>
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<tr>
<td>Other order</td>
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<td>Administrative tasks</td>
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<td>&lt;1</td>
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<td>Other (aggregated)</td>
<td>969</td>
<td>183</td>
<td>2</td>
<td>-</td>
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<td>Transit</td>
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<td>Personal</td>
<td>902</td>
<td>109</td>
<td>2</td>
<td>-</td>
</tr>
</tbody>
</table>

EHR = electronic health record.

*Total sums to 103.3% because the Work Observation Method by Activity Timing platform allows recording of 2 tasks done in parallel. Multitasking results in overlapping time records, which are additive. Thus, the total task time is >100% of the total time observed.
Causes of Burnout- Systemic

- Increased performance measurement
- Increasing complexity of medical care, medical knowledge
- Electronic health records (EHRs)
- Patient care vs documentation
- Work load - # patients, turnover, hours - “fictive schedule”
- Low control/ high responsibility
- Loss of autonomy – schedule, practice setting, decisions
## Work Engagement

<table>
<thead>
<tr>
<th>Resources</th>
<th>.29</th>
<th>.18</th>
<th>.35</th>
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<th>4.20</th>
<th>.29:.30</th>
<th>-.12:.71</th>
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<th>136620</th>
<th>4284.71***</th>
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<td>Social support</td>
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<td>.04</td>
<td>.37</td>
<td>.02</td>
<td>73.34</td>
<td>.31:.33</td>
<td>.27:.36</td>
<td>32</td>
<td>35243</td>
<td>43.63*</td>
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<tr>
<td>Autonomy/Control</td>
<td>.23</td>
<td>.26</td>
<td>.27</td>
<td>.31</td>
<td>2.54</td>
<td>.37:.83</td>
<td>.21:.24</td>
<td>26</td>
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<tr>
<td>Organizational climate</td>
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<tr>
<td>Self-efficacy</td>
<td>.50</td>
<td>.16</td>
<td>.59</td>
<td>.18</td>
<td>10.77</td>
<td>.48:.52</td>
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<tr>
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<td>.12</td>
<td>.44</td>
<td>.13</td>
<td>18.37</td>
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<td>5</td>
<td>1799</td>
<td>27.21*</td>
</tr>
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</table>

Halbesleben 2010
Causes of Burnout - Personal

- Sleep deprivation
- Imbalance between personal and professional life
- Lack of supports - in and out of work
- Lack of self care (but also part of systemic culture)
<table>
<thead>
<tr>
<th>Item/question</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Had gone to work while sick during the past year</td>
<td>207 (74%)</td>
</tr>
<tr>
<td>Number of times having worked despite feeling the need to use sick leave</td>
<td></td>
</tr>
<tr>
<td>1–2</td>
<td>130 (47%)</td>
</tr>
<tr>
<td>3–4</td>
<td>72 (26%)</td>
</tr>
<tr>
<td>5+</td>
<td>14 (5%)</td>
</tr>
<tr>
<td>Perception that coming to work while sick exposes patients to risk</td>
<td>255 (91%)</td>
</tr>
<tr>
<td>Existence of a specific departmental policy related to working while sick</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>131 (47%)</td>
</tr>
<tr>
<td>No</td>
<td>92 (33%)</td>
</tr>
<tr>
<td>Don't know</td>
<td>56 (20%)</td>
</tr>
</tbody>
</table>
Graph 1. Percentage of most common reasons for sickness presenteesim.
Cost of Burnout - Systemic

Direct - Turnover, early retirement, reducing work hours

Indirect - Quality:

Medication Fahrenkopf 2008 and other errors
Unnecessary testing and referrals
Greater malpractice risks
Possibly higher admissions/readmissions
Urinary tract & surgical site infection Cimiotti 2012
LOS Schaufeli 1995
Post discharge recovery time Halbesleben 2008
Suboptimal patient care procedures Shanafet 2002
Mortality rates Welp 2015

Back to Top
Medical Errors

FIGURE 1: Percent of major errors among physicians by levels of emotional exhaustion and depersonalization.

Shanafelt 2010
Indirect -

Clinical effort:

1 point increase in burnout score, 43% reduction clinical effort in the following 24 months (Mayo)

Replacement cost:

Recruitment, training, lost revenue

Physician - $200,000 - 1,000,000
Nurse - upwards of $90,00000
FIGURE 1. Personal and professional repercussions of physician burnout.
Cost of Burnout - Individual

Accidents

Depression, suicide, SUD

Hypertension

Decreased responsiveness to home demands

Lower quality of relationships/ marital satisfaction

Loss of medicine as a calling
FIGURE. Reporting “true” to survey items assessing physicians’ sense of calling by degree of professional burnout.
How to prevent and treat?
Interventions

National

Organization

Individual
Which?

Panagioti 2016
20 studies
Small but significantly improved effects for organization-directed interventions but these interventions were rare.

West 2016
15 randomised controlled trials and 37 cohort studies
Significant reductions in burnout with both individual-focused and organizational strategies
The Reciprocal Domains of Physician Well-Being

Chart illustrating the 3 domains of physician well-being, with each domain reciprocally influencing the others.

Culture of Wellness

Efficiency of Practice

Personal Resilience

Source: Patty Purpur de Vries
NEJM Catalyst (catalyst.nejm.org) © Massachusetts Medical Society
FIGURE 2. Key drivers of burnout and engagement in physicians.

- Burnout:
  - Exhaustion
  - Cynicism
  - Inefficacy

- Engagement:
  - Vigor
  - Dedication
  - Absorption

Driver dimensions:

- Workload and job demands
- Control and flexibility
- Meaning in work
- Work-life integration
- Social support and community at work
- Organizational culture and values

Less optimal → More optimal
Level of Intervention: National
AMA Joy in Medicine Summit

1. Research to establish links among physician burnout, well being and patient outcomes

2. Research to estimate the economic cost of physician burnout. referral patterns, test ordering, prescribing practices, and work inefficiencies related to EHS, order entries.

3. Well funded and structured consortiums – healthcare delivery systems, finding agencies, foundations, community, insurers, employers, patients to address physician burnout, may facilitate tailoring to individual institutions.

4. Use common metrics to measure meaning in work and professional fulfillment, burnout, engagement, fatigue, stress, quality of life, well-being, work-life integration.

5. Develop a comprehensive framework with individual and organizational components to facilitate individual responsibility for self care and organizational responsibility for work environment.

American College of Physicians
Reducing Administrative Tasks in Healthcare

1. Stakeholders - payers, governmental and other oversight organizations, vendors and suppliers, and others to provide financial, time, and quality-of-care impact statements for public review and comment – of existing and new administrative tasks. Tasks that are determined to have a negative effect on quality and patient care, unnecessarily question clinician judgment, or increase costs should be challenged, revised, or removed entirely.

2. Administrative tasks that cannot be eliminated from the health care system must be regularly reviewed, revised, aligned, and/or streamlined in a transparent manner, with the goal of minimizing burden, by all stakeholders involved.

3. Stakeholders must collaborate with professional societies, frontline clinicians, patients, and electronic health record vendors to aim for measures that minimize unnecessary clinician burden, maximize patient and family centeredness, and integrate performance measurement of and reporting on performance with quality improvement and care delivery.

4. Stakeholder should collaborate in making better use of existing health information technologies as well as developing more innovative approaches to facilitate the elimination, reduction, alignment, and streamlining of administrative tasks.

5. Stakeholders should review and consider streamlining or eliminating duplicative administrative requirements as healthcare system evolves.

6. Rigorous research on the effect of administrative tasks on our health care system in terms of quality, time, and cost; physicians, other clinicians, their staff, and health care provider organizations; patient and family experience; and, most important, patient outcomes.

7. Research on best practices to help clinicians reduce administrative burden within their practices and organizations. Stakeholders, including clinician societies, payers, oversight entities, vendors and suppliers, and others, should actively be involved in the dissemination of these evidence-based best practices.
Figure 2. Taxonomy of administrative tasks external to the practice and health care environment.

- Star: Task is worthwhile.
- Question Mark: Task requires careful consideration of alternatives.
- No Symbol: Task should be eliminated.

Each circle indicates a characteristic of an administrative task.
Encourage government/regulators to address the increasing regulatory burden driving inefficiency, redundancy, and waste in health care & to proactively monitor and address new unnecessary and/or redundant regulations.

Encourage and support the AMA/national organizations:
To work with regulators and technology vendors to align technology and policy with advanced models of team-based care and to reduce the burden of the EHR on all users.

In developing initiatives by compiling and sharing best practices from institutions that have successfully begun to address burnout, profiling case studies of effective well-being programs, efficient and satisfying changes in task distribution, and outlining principles for achieving the well-being of health professionals.

Continue to educate our fellow CEOs & stakeholders in the health care ecosystem about the importance of reducing burnout and improving the well-being of physicians as well as other health care professionals.

Support and use organizational research at our centers to determine the most effective policies and interventions to improve professional well-being among our physicians and other health care professionals.
Level of Intervention: Organization
Acknowledge and assess the problem
Harness the power of leadership
Develop and implement targeted work unit interventions
Cultivate community at work
Use rewards and incentives wisely
Align values and strengthen culture
Promote flexibility and work-life integration
Provide resources to promote resilience and self-care
Facilitate and fund organizational science

**FIGURE 5.** Organizational strategies to reduce burnout and promote physician engagement. "Often will focus on improving efficiency and reducing clerical burden but should focus on whichever driver dimension (Figure 1) deemed most important by members of the work unit (Figure 3)."
Regularly measure physician well-being using a standardized, benchmarked instrument.

Incorporate measures of physician well-being into performance metrics.

Monitor the institutional costs of physician turnover, early retirement and reductions in clinical effort.

Emphasize the value of leadership development for physicians and managers.

Understand and address the clerical burden and misallocation of work that contributes to the exhaustion component of burnout.

Support collaborative, team-based care models that maximize physician expertise and delegate tasks to other appropriate care team members.
Level of Intervention: Individual
Stress: a transaction between a person and his or her environment that is appraised (perceived) as being taxing or exceeding one’s resources and endangering one’s sense of well being

Lazarus & Folkman

Resilience: capacity to handle adversity/stress
Self awareness
Self care
Mind-Body Practices
Compassion
3 Good Things - Gratitude
Social supports
Self care

• Sleep
• Time off
• Physical activity
• Nutrition
• Social supports
• Health - PCP, Dental

“That physician will hardly be thought very careful of the health of his patients if he neglects his own.” Galen 130-200 A.D
Mind-Body Practices

Mindfulness & meditation

Relaxation techniques:
- Breath control
- Progressive Muscle Relaxation
- Relaxation Response

Yoga
What is Mindfulness?

Moment to moment nonjudgmental awareness

Paying attention, to the present moment, on purpose, without the story.

Knowing what you’re experiencing while you’re experiencing it

Having your mind and body in the same place at the same time
“I reside in New York, but my mind is based in L.A.”
Mindfulness

- Intentional cultivation of attention
- Open and non judgmental attitude
- Acknowledging present moment, whether pleasant or unpleasant without getting caught up in thoughts about, or emotional reactions to it
- An approach to stressful situations which promotes response rather than automatic reaction
- Basis for emotional intelligence
For example...
Rush University Medical Center
Meditation Room

Mindful Meditation       Thursdays 12-12:30
# Mindfulness and Burnout

## Positive Effect

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Occupation</th>
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<tbody>
<tr>
<td>Mackenzie</td>
<td>2005</td>
<td>Nurses and nurses aides</td>
</tr>
<tr>
<td>Cohen-Katz</td>
<td>2005</td>
<td>Nurses</td>
</tr>
<tr>
<td>Krasner</td>
<td>2009</td>
<td>Primary care physicians</td>
</tr>
<tr>
<td>Goodman</td>
<td>2012</td>
<td>Healthcare providers</td>
</tr>
<tr>
<td>Fortny</td>
<td>2013</td>
<td>Primary care physicians</td>
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<tr>
<td>Asuero</td>
<td>2014</td>
<td>Primary healthcare providers</td>
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<td>Verweij, Duarte</td>
<td>2016</td>
<td>GP’s</td>
</tr>
<tr>
<td>Duarte</td>
<td>2016</td>
<td>Nurses</td>
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## No Effect

<table>
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<th>Author</th>
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<th>Occupation</th>
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<tr>
<td>Milstein</td>
<td>2009</td>
<td>House staff</td>
</tr>
<tr>
<td>Moody</td>
<td>2013</td>
<td>Multidisciplinary but subjective reports of improvement</td>
</tr>
</tbody>
</table>
Empathy & Compassion

Empathy:
En- in
Pathos = feeling,
In the feelings of the other

Compassion:
Com - with
Passion - Pati = to suffer(also the root of patient)
Present with suffering
I realize that a high-volume, high pressure setting tends to stifle a caregiver’s inherent compassion and humanity. But the briefest pause in the frenetic pace can bring out the best in a care giver and do much for a terrified patient .... Makes the unbearable, bearable.

Kenneth Schwartz 1995
Self Compassion & Healthcare Providers

8 studies  self compassion and work related stress

3 studies  self compassion  on resilience

Self compassion:  burnout, compassion fatigue, stress symptoms

Limitations re methods and measures

Self compassion trainings

Sinclair, S et al. 2017
Change on many levels....

We’re all in this together....
If you always do what you always did, you will always get what you always got.

Albert Einstein
Evolution of burnout recovery

burnout... rising slowly... on feet... full recovery
EXPAND YOUR INFLUENCE

HOW TO BECOME A PUBLIC THOUGHT LEADER ONLINE

MONA SHATTELL, PHD, RN, FAAN • REBECCA DARMOC, MS
OVERVIEW

1. A New Perspective for Academia
2. Influence, Twitter & Personal Branding
3. Consume, Share, Create
4. Tips to Expand Online Influence
Self-promotion means owning your hard work, expertise, and authority to accomplish your mission of helping others.

“Self-promotion in science: poll results and commentary
At this point we’ve probably gotten about as many responses as we’re going to get to our poll on self-promotion in science. Thanks to everyone who took the poll! Here are the results, w...
dynamicecology.wordpress.com

“We’re not being selfless when we avoid promoting. We’re just undercutting our own mission.” — Michael Hyatt
Long-Haul Sweatshops

By ANNE BALAT and MONA SHATTELL MARCH 9, 2018

IT might seem like a good time to be a long-haul trucker: More than ever, the American economy relies on hundreds of thousands of 18-wheelers to move goods across the country. But the industry is in crisis, with drivers leaving in droves because of low pay and poor working conditions.

A big part of the problem is that when it comes to long-haul trucking, the government’s focus has been almost entirely on road safety. That’s not a misplaced concern; highway accidents involving semis kill about 5,000 people per year. But it overlooks a critical concern: the well-being of the drivers themselves.
TIP: MEASURE WITH "KLOUT"

Mona Shattell

Dept Chair @RushUniversity #Nursing. Editor @JPNJournal. Views are my own. @HuffPo blogger. @theopedproject #mentalhealth #publicvoices #social #leadership

- Critical Thinking: Expert
- DePaul University: Expert
- Hospitals: Expert
- Medical Schools: Expert
- Nursing: Expert
- Psychiatry: Expert
- Public Health: Expert
- Trucking: Expert
- Academics
- Activism
- Blogging
- Chicago
- Feminism
- Gender Justice
- Health
- Health Care
- Higher Education
- Lake Michigan
- Medicaid
- Medicine
- Mental Health
- Progressive Politics
- Public Speaking
- Racial Inequality
- Social Justice
- Social Media
- Teaching
- Travel
- Writing

Beginners
0-30

Moderate Influence
31-49

High influence
50+

Top 5% of Klout accounts
63+

Students

RUSH

AM

MAYO CLINIC

Back to Top
THE EVOLUTION OF INFLUENCE

Corporate control  Consumer control
72% of Americans consume news online

63% of Twitter users get news from the app

24% of verified Twitter accounts are journalists/media
WHY TWITTER?

• Connect anywhere, anytime

• Your community of peers is already on Twitter - sharing and collaborating

• Reach a larger audience; your message is not limited to academia/publications = help more people.

• Adds another layer to what you are already doing. A “must” in the age of digital influence.
The Power of Twitter
International Revolutions

Social Media Sparked, Accelerated Egypt's Revolutionary Fire

Anti-government protesters celebrate in Tahrir Square in downtown Cairo Friday. Fireworks burst, and Egypt exploded with joy and tears of relief after pro-democracy protesters brought down President Hosni Mubarak with a momentous march on his palaces and state TV. Emilio Morenatti/AP

If three decades of violent repression and despotism were kindling for the Egyptian revolution, social media was both a spark and an accelerant for the movement.
Social Movements
Corporate Accountability

Martin Shkreli, the CEO who jacked up prices on an HIV drug, was arrested this morning
As Anger at O’Reilly Builds, Activists Use Social Media to Prod Advertisers

Laura @ljeash: 2h
@ADT please stop advertising on @reallly factor

ADT @ADT

Replies to @ljeash

Laura-We hear you 100% & do not support these views. We’ve pulled our ads from this show

Sara Gangel @saragangel: 12h
@hulu please pull your ads from O’Reilly and don’t carry his show.

Hulu Support @hulu_support

Replies to @saragangel

Hey, Sara. We've looked into this, and our ads are no longer running on the O'Reilly Factor.
PERSONAL BRANDING

Personal brand is what people say about you when you leave the room.

- Jeff Bezos, Founder, Amazon.com

How can faculty use Twitter to gain exposure? The first step is to develop your own brand.
The true essence of a brand is all of the word associations left over in people’s minds after they have an encounter or experience with you.

Write down words that you want people to remember about you. Start by thinking about:

1 - your expertise/knowledge/ideas/passions: what words describe these for you?

2 - your audience: industry colleagues, general health care community, patients, media? What drives that specific audience and what are their needs?

3 - what ideas do you want to share with them?

Becoming an influencer is about providing value.
BUILDING YOUR BRAND ONLINE

- Add key words
- Add photo
- Add Rush faculty profile URL
- Add “Opinions are my own” at end of bio
NOW WHAT?
STEPS TO TWITTER INFLUENCE

Consume
Share
Create
STEP 1

**Consume**

**Share**

**Create**
EXPAND YOUR REACH

MENTION
• Influencers
• Colleagues
• Organizations
• Conferences
• Journalists

DISCOVER
• Key topics
• Community connections
• Social movements

ENGAGE
• Comments
• Conversations
TIP: HASHTAG & MENTION

TOPICS
COMMUNITIES

PEOPLE
ORGANIZATIONS
NO VISIBILITY

#hunger #cravings #motivation #EmotionalEating

Rush University @RushUniversity · May 16
Are you an adult w/ a chronic health condition + interested in being a health mentor for our students? Email ipe@rush.edu for more details.

#SeniorLiving #longevity #volunteer #Chronicillness
RushUNursingCollege @RushUNursing · May 31
An off-duty #RN, a stroll in #Wrigley, & a #naloxone kit @ home. She never imagined what would happen next...
#opioid chicagotribune.share.ntv.io/sponsored/an-o...

RushUNursingCollege @RushUNursing · Jun 13
Transitioning from hospital to home: this team approach to #heartfailure improves #patientcare. bit.ly/2swxAuw #cardiology #nursing
TIP: HEALTHCARE HASHTAG PROJECT

Healthcare Hashtag Project

Healthcare Hashtag Project, a free open platform for patients, caregivers, advocates, doctors and other providers that connects them to relevant conversations and communities.

The influencers of #mentalhealth

Top 10 by Mentions
1. @healingmb 2,543
2. @amira_31 2,157
3. @sece_mind 1,505
4. @psychcentral 914
5. @camhnews 537
6. @ukhospitallaw 509
7. @ukhouseofflours 450
8. @respectyoursel 447
9. @eminem 436
10. @electroboyusa 432

Top 10 by Tweets
1. @adrianchalmers 845
2. @brainstormpsych 756
3. @butterflymum83 447
4. @mymnthealth 435
5. @electroboyusa 397
6. @ptsdforum 351
7. @mhcd_careers 281
8. @rhynolida 275
9. @charitynewsuk 272
10. @tomsweet89 260

Mentalhealth Hashtags

<table>
<thead>
<tr>
<th>Hashtag</th>
<th>Type</th>
</tr>
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<tbody>
<tr>
<td>#mentalhealth</td>
<td>Regular</td>
</tr>
<tr>
<td>#MentalHealthMatters</td>
<td>Regular</td>
</tr>
<tr>
<td>#MHChat</td>
<td>Healthcare Tweet Chats</td>
</tr>
<tr>
<td>#MentalHealthReform</td>
<td>Regular</td>
</tr>
<tr>
<td>#psych</td>
<td>Regular</td>
</tr>
<tr>
<td>#SPSM</td>
<td>Healthcare Tweet Chats</td>
</tr>
<tr>
<td>#MensMentalHealth</td>
<td>Healthcare Conferences</td>
</tr>
</tbody>
</table>
TIP: SYMPLUR SIGNALS

Strengthening the quiet voices in healthcare
Incredible value and wisdom await those with a willingness to listen.

Built from academic research, trusted by policy makers

Years of published academic research has sharpened the capabilities of the platform now relied upon by government clients in the U.S. and Europe.
TIP: SYMPLUR SIGNALS

The #Health2017 Influencers

Top 10 by Mentions
- @post_health 210
- @colin_hung 201
- @healthisconf 147
- @hackinghealthto 142
- @hackinghealthca 141
- @picardonhealth 132
- @markcasselman 126
- @chrisolic 115
- @tiwari007 114
- @ayyoga 112

Top 10 by Tweets
- @post_health 150
- @colin_hung 129
- @healthisconf 120
- @hackinghealthto 114
- @hackinghealthca 113
- @picardonhealth 112
- @markcasselman 111
- @chrisolic 110
- @tiwari007 109
- @ayyoga 108

Top 10 by Impressions
- @colin_hung 3,694
- @post_health 2,603
- @tiwari007 2,233
- @chrisolic 634
- @markcasselman 632
- @healthisconf 479
- @chrappe 442
- @heathrusings 214
- @picardonhealth 144
- @tiwari007 143

The Numbers
- 13,099M
- 3,042
- 875
- 547
- 3

Symplur Signals

Learn from specific healthcare stakeholder voices

Cut through the noise of the crowd by focusing on specific stakeholder voices. Uncover needs and perceptions by employing our stakeholder algorithm that differentiates between Doctors, Patients, Caregivers, Pharma, Government, Academia, and more.

Our focus on healthcare takes you places others can’t go

The advantage of using a platform created purely for healthcare is that everything you see, everything you touch is optimized for our industry. From sentiment algorithms calibrated for healthcare to the user interface – it’s all built for answering your health specific questions.
Instant Feedback on Hashtags

Get color indication of hashtag strength as you type.
TWITTER ETIQUETTE:  “GIVE TO GET”

Reciprocity expands your reach:
Follow people back
Give likes
Give retweets
Give comments
TWITTER ETTIQUETTE: RESPOND & ENGAGE

@MonaShattell and @BecDarmoc. Thoughts? Should we self promote research?

Ash Paul @pash22
Nine reasons why researchers need to embrace Twitter via @Saxinstitute & @DrBFreeman, saxinstitute.org.au/news/nine-reas...

Rebecca Darmoc @BecDarmoc · Jun 9
Replying to @JBradyScott @MonaShattell @pash22 We're conditioned to think "self promotion" = "self serving" = distasteful. Not true in research.

Brady Scott @JBradyScott · Jun 9
Agreed! That's why I am so hesitant! Goal: Share ideas, help others... not self-promotion. Seems like a fine line...

Rebecca Darmoc @BecDarmoc · Jun 9
Replying to @JBradyScott @BecDarmoc @pash22 -interesting. But extra step of #blogging your OWN #research isn't selfpromo; it creates accessibility & impact 4 others.

Wrenetha Julion @wrenethajulion · Jun 10
Doesn't do much good for academicians to only talk to each other. We conduct research to make evidence-based change. #SpreachTheWorld
### TIP: MASLOW MESSAGES IN 140 CHARACTERS

<table>
<thead>
<tr>
<th>Safety</th>
<th>Belonging</th>
<th>Esteem / Prestige</th>
<th>Self-Actualization</th>
</tr>
</thead>
<tbody>
<tr>
<td>I want to avoid risk so appeal to my concerns about missing out or my need to be safe.</td>
<td>Embrace my need to be a part of the group. I want to know what my peers know.</td>
<td>Help me stand out from my peers and give me &quot;inside knowledge&quot; that makes me feel special.</td>
<td>Give me hope, advice, or encouragement on achieving my life goals; think of my highest level aspiration.</td>
</tr>
</tbody>
</table>

FNPs: here's what you need to know about...

How one university is using 3D printing to educate....

Dream of going global? Next level career advice from...

5 tips for managing millennials
TIP: SHORTEN LINKS - BITLY
Finkley Sentencing Memo
3 pages available for preview

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF MICHIGAN
SOUTHERN DIVISION

UNITED STATES OF AMERICA,

Plaintiff,

v.

CHRISTOPHER FINKLEY,

Defendant.

CHRISTOPHER FINKLEY’S SENTENCING MEMORANDUM

2. The Life of a Long-Haul Truck Driver

At the age of 21, Mr. Finkley got the “job of his dreams” driving trucks, first, with Big M Transportation, and then with Auto Truck Transport USA, LLC. PSR ¶ 27–28. Long-haul trucking is a tough profession. (See Ex. A, Anne Ballay & Mona Shattell, PTSD in the Driver’s Seat, Atlantic (Mar. 22, 2016).) The job demands that Mr. Finkley spend a month at a time on the road followed by only three days at home with family.
TIP: Hootsuite

These two messages have been added to Hootsuite & scheduled to auto-post on Twitter at specific times.
Start Now with Twitter

1. Download the app and sign up. Use your first & last name.

2. Create a bio. Include a picture.

3. Find and follow influencers.

4. Consume and share their content.

4. Start with 10 minutes per day.

5. Reach out with questions.

@MonaShattell   @BecDarmoc   #RushTweets   @RushUniversity   @RushMedical
Social Media

Social media is an important tool that supports Rush University’s communications strategy and our ability to engage with relevant audiences, including students, prospective students, faculty, staff, alumni, community partners and colleagues in the Rush system.

While social media provided a way to tell our story in fresh and interesting ways, the University community should take a thoughtful approach with defined goals and structure to help protect our brand and reputation.

Personal and Official Accounts

1. Personal accounts that reference a person or group’s affiliation to Rush but that do not use the Rush logo.
2. Official, fully branded accounts.

When does a personal account make sense, and when would an official site make sense? The following chart provides details to help you make an informed decision:

<table>
<thead>
<tr>
<th>Access to Rush logos, images and video assets</th>
<th>Personal Account</th>
<th>Official Account</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to analytics reports provided on a regular basis</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Required training for social media management</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Support services from Marketing and Communications</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Compliance with Rush’s official social media policies</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Agreement to help cross-promote important news, events or other University content that’s relevant to your audiences</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Rush reserves the right to decommission official accounts that do not comply with the University’s social media policies or that have fallen into disrepair or neglect.
Social Media Do’s and Don’ts for Personal Accounts

Do’s:

- Use your name on your Twitter account; replace the “egg” avatar with an image of you.
- Include a disclaimer if you mention your affiliation with Rush in your profile, for example: “Opinions/tweets are my own, not Rush’s.”
- Associate your Twitter account with your Rush University faculty profile. For more information, contact Mark Donahue (mark_donahue@rush.edu) in Marketing and Communications.
- Follow @RushUniversity, @RushMedical and @RushUNursing on Twitter.
- Follow peers at Rush and other hospitals and universities.
- Use @RushUniversity and @RushMedical tags in your tweets when appropriate (along with Rush hashtags, e.g., #HowMedicineShouldBe).
- Review Rush’s social media policy at rsh.md/rushsocialpolicy.

Don’ts:

- Don’t accept “friend” requests from patients.
- Don’t post patient information on social media, in accordance with HIPAA guidelines. Make sure images don’t include identifying patient information.
- Don’t record patient information on personal devices.
- Don’t use a Rush logo (including Rush University Medical Center, Rush University, and the College of Nursing) in your personal social media profile. A photo from the Rush campus (e.g., the Tower) is okay.
- Don’t create a social media account for a University or Medical Center department or program without permission from Marketing and Communications. We have only a handful of authorized Rush accounts. For more information, email Thurston Hatcher (thurston_hatcher@rush.edu) in Marketing and Communications.
- Don’t discuss workplace concerns in social media forums.

Video Policies

All marketing — or storytelling videos — should either be relatable to Rush’s brand pillars, to decision factors, or both. In addition, videos should comply with the video-specific guidelines included in Rush’ Corporate Identity and Graphic Usage Standards.

Recommendations for Video Length

There is no “catch-all” answer for how long video should be, but a good rule of thumb for is between 30 seconds and four and a half minutes. Videos within this window will typically retain 60 to 80% of audiences for the full length of the video.