Intentional Education in Neurological Surgery: *Curriculum, Shared Resources, and Outcomes*

Nathan R. Selden, MD, PhD
Campagna Professor & Chair
Residency Program Director
Department of Neurological Surgery

Baldwin Seminar Series – May 2016
Disclosures

• I have no conflicts of interest to report
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• CoRE Chair, Society of Neurological Surgeons
• Neurosurgery Milestones Group Chair, ACGME
• Past-President, Congress of Neurological Surgeons
Traditional Surgical Education

- Defined *learning environment*:
  - Time-limited exposure
  - Apprenticeship model
  - Minimum standards of individual achievement
New Approach

• Defined **individual outcomes**:
  – Effective in improving individual educational outcomes
  – Effective in improving patient care outcomes
  – Seamless across training and practice for lifelong learning
  – Reasonable to implement
New Approach

• Intentional education
New Approach

• Intentional education
  – Defined, validated curriculum
New Approach

• Intentional education
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  – National resources for teaching and simulation
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  – National resources for teaching and simulation
  – Agreed upon outcomes for individuals and programs
    • Uniform, effective assessment tools
Outline for the lecture

• Intentional education
  – Defined, validated curriculum
  – National resources for teaching and simulation
  – Agreed upon outcomes for individuals and programs
    • Uniform, effective assessment tools
New Approach

• Intentional education
  – Defined, validated *curriculum*
  – National resources for teaching and simulation
  – Agreed upon outcomes for individuals and programs
    • Uniform, effective assessment tools
Society of Neurological Surgeons

- Residency Directors and Chairs Society
  - Founded in 1920 by Harvey Cushing
  - Original neurosurgical society
  - Marked the origin of separate field
Matrix Curriculum

- First comprehensive curriculum validated by the ACGME-recognized neurosurgery Program Directors’ society, the SNS
  - Conceived and designed by Kim Burchiel
  - Implemented by Tim Mapstone
**Matrix Curriculum**

<table>
<thead>
<tr>
<th>Competency</th>
<th>Objective</th>
<th>Teaching Methods</th>
<th>Assessment Tools</th>
<th>Educational Goals</th>
</tr>
</thead>
</table>
| Medical Knowledge (Technical Skills) | • Lumbar Puncture  
• Ventriculostomy  
• CSF Sample  
• Shunt tap  
• Traction  
• Stereotactic frame placement | • AANS/SNS Online modules  
• Conferences  
• Supervised learning  
• Bootcamp | • Faculty and Program Director evaluations | Proficient (4) |

- Comprehensive neurological surgery curriculum
- Includes didactic and procedural material
Matrix Curriculum

• What it is
  – Comprehensive
  – Covers all specialties and competencies
  – Focused on knowledge
  – Defines the ‘core’ of neurosurgery
    • What a reasonably trained young surgeon in any practice should know on general call
    • Relevant scientific foundations of practice
Matrix Curriculum

• What it is *not*
  – A source of didactic content
  – A teaching tool
  – An assessment tool
Matrix Curriculum

- Curricula are not inherently impactful
Matrix Curriculum

• Curricula are not inherently impactful
  – The Matrix curriculum requires a mechanism for implementation that connects to learners
Matrix Curriculum

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    • The *Neurosurgical Portal* will organize and present vetted, peer-reviewed content by Matrix topic
Matrix Curriculum

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    - The ABNS plans to align the written board examination with Matrix topics
    - The *Neurosurgical Portal* will organize and present vetted, peer-reviewed content by Matrix topic… *more in a minute*
New Approach

• Intentional education
  – Defined, validated curriculum
  – National resources for teaching and simulation
  – Agreed upon outcomes for individuals and programs
    • Uniform, effective assessment tools
National Resources

• Example: Boot Camp courses for incoming residents
  – Basic knowledge
  – Professionalism expectations
  – ICU and emergency surgical skills
Educational Resources

SNS Neurosurgical Bootcamp

JULY 9-10, 2010
PORTLAND, OR

Society of Neurological Surgeons

COURSE CURRICULUM

Friday, July 9
12:30 pm – Shuttle to Course Location
1:00 pm – Welcome and Lunch
1:15 pm – Professionalism, Supervision, and Pearls for the Junior Resident
1:45 pm – Neurological and Neuro-trauma Assessment
2:15 pm – Emergency Cranial Radiological Assessment
2:45 pm – Emergency Spinal Radiological Assessment
3:15 pm – ICP Management
3:45 pm – Break
4:00 pm – Unstable Neurosurgical Patient: Case Scenarios
4:30 pm – Emergency Evaluation and Management of Hydrocephalus Shunt Patients
5:00 pm – Making the Incision: Surgical Pause to Scalp Blood Supply
5:30 pm – Patient Safety and Clinical Communications
6:30 pm – Transport to Course Dinner
7:00 pm – Course Dinner at Dr. Nathan Selden’s Residence: 1524 SW Spring St, Portland, OR 97201

Saturday, July 10
7:15 am – Shuttle to Course Location
7:30 am – Breakfast
8:00 am – Group A: Bedside Neurosurgical Procedures, Group B: Craniotomy Skills
11:30 am – Lunch
12:00 noon – Group A: Craniotomy Skills, Group B: Bedside Neurosurgical Procedures
3:30 pm – Adjourn
3:45 pm – Shuttle to Airport

Bedside Neurosurgical Procedures and Equipment Stations
- VP shunt tap
- Lumbar puncture, lumbar drain insertion
- ICP monitor placement
- External ventricular drain placement simulator
- Cervical spine traction and reduction
- The neurosurgical microscope
- Cranial fixation and positioning basics
- Spinal positioning basics
- Basic neurosurgical instrumentation
- Lines – central venous, arterial

Craniotomy Skills Stations
- Drilling, burr holes, bone dissection
- Craniotomy Rats
- Duraplasty and duraplasty
- Craniotomy closure
- Cranioplasty
- Skin closure

THE SOCIETY OF NEUROLOGICAL SURGEONS
Attendance

• 2010
  – 95 programs (96%)
  – 186 residents (94%)

• 2011 - 2015
  – 104 programs (100%)
  – 211 residents (100%)
  – 93 registered faculty
Course Ratings

<table>
<thead>
<tr>
<th>Questions</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fulfill purpose &amp; objectives?</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Subject level appropriate?</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Content relevant &amp; current?</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Hands-on activities support course goals?</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Skills &amp; knowledge improve care?</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Benefits beginning NS residents?</td>
<td>100</td>
<td>0</td>
</tr>
</tbody>
</table>
Items Taught

- pre-bootcamp
- 6 months

P < .0001

% Participants

Number of Correct Answers (out of 11)
A National Fundamentals Curriculum for Neurosurgery PGY1 Residents: The 2010 Society of Neurological Surgeons Boot Camp Courses

SOUND: In July 2009, the Accreditation Council for Graduate Medical Education incorporated postgraduate year 1 (PGY1 intern) level training into all U.S. surgery residency programs.

IVE: To provide a fundamentals curriculum for all incoming neurosurgery PGY1s in ACGME-accredited programs, including skills, knowledge, and attitudes that equalize patient safety and professionalism.

DS: The Society of Neurological Surgeons organized 6 regional “boot camp” courses for incoming neurosurgeons PGY1 residents in July 2010 that consisted of 9


BACKGROUND: Incorporation of the first postgraduate year of training into neurological surgery residencies in 2009 posed new challenges. A “boot camp” course was held in August 2009 to introduce various fundamental cognitive and practical skills.

OBJECTIVE: The effectiveness of this educational survey of all trainees and faculty members.

METHODS: Eighteen trainees entering the first or second postgraduate year participated. Clinical article

NATHAN R. SELDEN, M.D., PH.D.,1 VALERIE C. ANDERSON, PH.D., M.C.R.,1 SHIRLEY McCARTNEY, PH.D.,1 THOMAS C. ORIGITANO, M.D., PH.D.,1 KIM J. BURCHIEL, M.D.,1 AND NICHOLAS M. BARBARO, M.D.3

1Department of Neurological Surgery, Oregon Health & Science University, Portland, Oregon; 2Department of Neurological Surgery, Loyola University Medical Center, Maywood, Illinois; and 3Department of Neurological Surgery, University of California, San Francisco, California
Boot Camp Model Simulators

• Surgical
  – Drilling
  – Craniotomy
  – Dural closure
  – Cranial fixation
  – Cranioplasty
  – Scalp closure

• Procedural
  – ICP monitor
  – EVD
  – Lumbar drain
  – Shunt tap
  – Central line
Model based simulation

• Example: Drilling
  • Not updated after introduction (no need)
Iterative model improvement

• Example: Dural closure
Iterative model improvement

• Example: External ventricular drain
Iterative model improvement

• Example: Spine surgery
Hands on model based simulation not changed
Hands on model based simulation improved
Decision Simulation

- Clinical decision simulator
- Neurological deterioration with expanding EDH
- Intern arrives in ED
- Assess, diagnose, stabilize, communicate
Simulation in Neurosurgical Education: Present and Future Considerations

Michael J. Strong, MS, MPH, and Nathan R. Selden, MD, PhD

Learning Objectives: After participating in this CME activity, the neurosurgeon should be better able to:
1. Evaluate the role of surgical simulation training in neurosurgery resident education.
2. Integrate surgical simulation training as a way to enhance learning.

Model-Based Simulation for Early Neurosurgical Learners

Nathan R. Selden, MD, PhD*
Thomas C. Ortigiano, MD;
Costas Hadjidjanayis, MD, PhD§
Richard Byrne, MD¶

*Department of Neurological Surgery, Oregon Health & Science University, Portland, Oregon; §Neurological Surgery Division, Loyola University Medical Center, Maywood, Illinois; ¶Department of Neurological Surgery Emory University, Atlanta, Georgia; Department of Neurosurgery, Rush University, Chicago, Illinois

BACKGROUND: Restrictions on duty hours and shift length by the Accreditation Council for Graduate Medical Education and public pressure to reduce complications and to improve outcomes in the clinical educational environment have enhanced interest in the use of procedural and surgical simulation to train neurosurgical residents.

OBJECTIVE: To introduce simple, available, and, when possible, inexpensive model-based simulation for early learners into the initial stages of neurosurgical residency training.

METHODS: Simulation for early-stage trainees in neurological surgery has taken advantage of model-based systems. The Society of Neurological Surgeons postgraduate year 1 courses have served as one paradigm for designing and using model-based simulators for procedural and surgical skill training as part of a purpose-designed overall curriculum. Ongoing surveys of resident and faculty course participants have supported iterative improvements in simulator models and curriculum from year to year.

RESULTS: Simulation for basic neurosurgical and intensive care procedures has been undertaken through the use of available materials, surgical technology, and modifications of related existing model simulators. Simulation of common, standard surgical procedures for early learners may be broken into individual surgical skills and maneuvers to prepare trainees for safe practice of these component skills during live patient situations.
Model Based Simulation

- Very effective modality for early learners
- Technologically simple
- Inexpensive
- Avoid regulatory barriers and materials concerns with cadavers
SNS Boot Camp Courses

Administration  Curriculum

Corporate
Sponsors

Funding
SNS Boot Camp Courses

Administration

Curriculum

Corporate Sponsors

Funding
New Developments

• Iterative course improvements
  – Flipped classroom (with reduced onsite lectures)
  – Systematic pre- and post- course testing of didactic knowledge
  – Technical skills demonstration, mentored practice, evaluation methodology
New Developments

• Iterative course improvements
  – Flipped classroom (with reduced onsite lectures)
  – Systematic pre- and post- course testing of didactic knowledge
  – Technical skills demonstration, mentored practice, evaluation methodology
  – Many others...
New Developments

- SNS Junior Resident Courses
  - 3 regional centers
  - 94% nationwide attendance
  - Surgical and leadership skills
Boot Camp Generation

- We will graduate the first neurosurgical “boot camp generation” this year
  - Residents who began their training with an SNS Boot Camp experience
Future Developments

• SNS Senior and Chief Resident Courses
  – Core advanced operative skills
  – Transition to practice
  – Focused one day experiences occurring at annual national meetings
  – Launching September 2016
Future Developments

• Building a sustainable independent infrastructure
  – National society support for established and recognized value
  – Partial program subscription funding
New Approach

• Intentional education
  – Defined, validated curriculum
  – National resources for teaching and simulation
  – Agreed upon outcomes for individuals and programs
    • Uniform, effective assessment tools
Milestones: Neurosurgery Approach

• Standards of achievement based on:
  – Specific competencies
Milestones: Neurosurgery Approach

• Standards of achievement based on:
  – Specific competencies
    • Not a grade
Milestones: Neurosurgery Approach

- Standards of achievement based on:
  - Specific competencies
    - ‘yes’ or ‘no’ verifiable skill or behavior
Safety and Systems – Systems-based Practice

Sub-Competency

General Competency

Developmental Progression
Or ‘Milestone Set’

Milestone
Milestones: Neurosurgery Approach

- Standards of achievement based on:
  - Specific competencies
  - Developmental progress
Milestones: Neurosurgery Approach

• Standards of achievement based on:
  – Specific competencies
  – Developmental progress
    • Increasing complexity with maturation
ACGME ‘Milestones’

- Neurological Surgery
  - 24 one page milestone sets
  - 8 Medical Knowledge: each specialty
  - 8 Patient Care: each specialty
  - 8 ‘General’ competencies
    - Professionalism (2)
    - Communications (2)
    - Practice Based Learning and Improvement (2)
    - Systems Based Practice (2)
# Neurological Surgery Milestones

<table>
<thead>
<tr>
<th>Neurological Surgery Milestones</th>
</tr>
</thead>
</table>

NATHAN R. SELDEN, MD, PhD  
AVIVA ABOSCH, MD, PhD  
RICHARD W. BYRNE, MD  
ROBERT E. HARBAGH, MD, FAANS, FACS, FAHA  
WILLIAM E. KRAUSS, MD  
TIMOTHY B. MAPSTONE, MD  
OREN SAGER, MD  
GREGORY J. ZIPFEL, MD  
PAMELA L. DERSTINE, PHD, MHPE  
LAURA EDGAR, ED.D, CAE

March 2013
New Neurosurgical Education

• Intentional education
  – Defined, validated curriculum
  – National resources for teaching and simulation
  – Agreed upon outcomes for individuals and programs
  • Uniform, effective *assessment tools*
NEUROSURGERY MATRIX PORTAL

Society of Neurological Surgeons

Sign In

Sign in using your registered account:

Username

Password

Keep me signed in

Sign In

The Neurosurgery Matrix Portal is an initiative of the Society of Neurological Surgeons, produced in cooperation with the Congress of Neurological Surgeons and the American Association of Neurological Surgeons.
Faculty Evaluation:
Pain & Peripheral Nerve Patient Care

<table>
<thead>
<tr>
<th>Evaluation &amp; Work-Up</th>
<th>PARQ</th>
<th>Technical Skills</th>
<th>Peri-Operative Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Performs comprehensive history in a patient with chronic pain or peripheral nerve disorders</td>
<td>Did Not Observe</td>
<td>Requires Development</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>B. Performs an appropriately comprehensive medical examination in a patient with chronic pain or peripheral nerve disorders</td>
<td>Did Not Observe</td>
<td>Requires Development</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>C. Performs an appropriately comprehensive and targeted neurological examination in a patient with chronic pain or peripheral nerve disorders</td>
<td>Did Not Observe</td>
<td>Requires Development</td>
<td>Satisfactory</td>
</tr>
</tbody>
</table>

Comments
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Duis facilisis tortor non arcu hendrerit, in eleifend lectus blandit.
My Dashboard

Level 3 Milestones

- indications for electroencephalography (EEG) monitoring
- indications for & risks of endotracheal intubation/ventilation
- the pathophysiology & treatment of systemic critical illness
- indications & complications for decompressive craniectomy, CSF drainage, & barbiturate coma in traumatic brain injury
Level #3 Milestones
status: started

- Describes indications for electroencephalography (EEG) monitoring
- Discusses indications for and risks of endotracheal intubation/ventilation
- Describes the pathophysiology and treatment of systemic critical illness (e.g., hypertension, coagulopathy, electrolyte imbalance, alcohol withdrawal)
- Lists indications and complications for decompressive craniectomy, CSF drainage, and barbiturate coma in traumatic brain injury (TBI)
Level 3 - Milestone #4

List indications and complications for decompressive craniectomy, CSF, drainage, and barbituate coma in TBI.

Matrix Curriculum and Education Content: C. Injury of the Nervous System

Describe the pathophysiology of intracranial hypertension from trauma, ischemia, neoplasm, hydrocephalus, etc., and explain a plan for its management, including arguments for and against various treatments.

- Decompressive craniectomy
- Sedation/paralysis
- Osmotic agents
  - Pre-Activity SANS Questions
  - Decompressive Cranectomy: Controversies & Timing, S. Timmons, MD
  - Post-Activity SANS Questions
Clinical Competency Committee

- Evaluations
- Exams
  - Part I Boards
  - NSurg Portal
- Portfolio
- Case Data
Background

• Milestone performance data provide one element in the Next Accreditation System (NAS) to determine whether residents are sufficiently progressing.

• The goal of each residency program is to enable attainment of Level 4 Milestone performance targets by graduation for all residents in the program.

• Level 4 attainment per se is not a requirement for graduation.
Introduction

• Consistency in the interpretation of Milestones by individual residents, faculty and others in the teaching program is important to ensure validity.¹

• An overview inspection might yield valuable insight into the validity of the initial Milestones dataset.

Preliminary Analysis of Milestone Data for 2013-2014 Academic Year

Kenji Yamazaki
Updated on 12/11/14
Outline

• Initial investigation of the utility of Milestone data

• Topics:
  • Validity of rating patterns
  • Performance levels of senior-most residents
Number of Residents

- Milestone data from (as of 12/11/14):
  - Neurosurgery (NS, N = 1,272)
  - Orthopedic surgery (OS, N = 3,574)
  - Emergency Medicine (EM, N = 5,806)
  - Diagnostic Radiology (DR, N = 4,686)
  - Urology (URO, N = 1,167)
  - Internal Medicine (IM, N = 23,915)
  - Internal Medicine / Pediatrics (IM/PEDS, N = 1,448)
  - Pediatrics (PEDS, N = 8,837)
## # of Sub-Competencies per Specialty

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Total # Sub-comp</th>
<th>PC</th>
<th>MK</th>
<th>SBP</th>
<th>PBLI</th>
<th>PROF</th>
<th>ICS</th>
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<td>8</td>
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</table>
Data Extraction and Analysis

- For each resident (across all PGY-levels), we determined whether they had attained the recommended Level 4 (or higher) for all sub-competencies within a core competency.
- Then we determined the percentage of residents within a specialty who attained Level 4 across all programs, in each main competency.
Residents Attaining Recommended Graduation Targets

Percent of Senior-most Residents who Attained Level 4 or Higher

<table>
<thead>
<tr>
<th></th>
<th>IM (N=7157)</th>
<th>DR (N=1140)</th>
<th>NS (N=113)</th>
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<th>OS (N=691)</th>
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<tbody>
<tr>
<td>PC</td>
<td>77%</td>
<td>85%</td>
<td>54%</td>
<td>77%</td>
<td>60%</td>
</tr>
<tr>
<td>MK</td>
<td>81</td>
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<td>86</td>
<td>83</td>
<td>82</td>
<td>89</td>
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</tbody>
</table>

*PC*-patient care; *MK*-medical knowledge; *SBP*-systems-based practice; *PBLI*-practice-based learning and improvement; *PROF*-professionalism; *ICS*-interpersonal and communication skills.
Residents Attaining Recommended Graduation Targets

Percent of Senior-most Residents who Attained Level 4 or Higher

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<td>ICS</td>
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<td>83</td>
<td>82</td>
<td>89</td>
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</tbody>
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PC-patient care; MK-medical knowledge; SBP-systems-based practice; PBLI-practice-based learning and improvement; PROF-professionalism; ICS-interpersonal and communication skills.
Attainment of Level 4 Graduation Targets by Senior-Most Residents

- **NS (# resident=113; # sub-competencies=24)**
  
  ![Bar Chart](chart.png)

  - Met on all items = 44
  - Missed by 1 item = 21
  - Missed by 2 items = 16
  - Missed on all items = 1
Residents Attaining Level 4 or Higher

Neurological Surgery

Proportion

PGY1 PGY2 PGY3 PGY4 PGY5 PGY6 PGY7

PC MK SBP PBLI PROF ICS
Possible Interpretation:

- **Neurological Surgery**
  
  - Competence in PC is the most difficult to attain
  - Is this due to a single subspecialty area (i.e. PC sub-competency), which is less available at some programs?
    - Access to experience is known to be limited for some programs in Functional and Stereotaxis, and Pain.
Neurological Surgery

Level 4 Attainment per Patient Care Sub-Competency

Neurological Surgery (June 2014)

Key

<table>
<thead>
<tr>
<th>Q1</th>
<th>Brain Tumor</th>
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<tbody>
<tr>
<td>Q2</td>
<td>Critical Care</td>
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<tr>
<td>Q3</td>
<td>Epilepsy and Movement Disorders</td>
</tr>
<tr>
<td>Q4</td>
<td>Pain and Peripheral Nerves</td>
</tr>
<tr>
<td>Q5</td>
<td>Pediatric Neurological Surgery</td>
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<tr>
<td>Q6</td>
<td>Spinal Neurosurgery</td>
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<tr>
<td>Q7</td>
<td>Vascular Neurosurgery</td>
</tr>
<tr>
<td>Q8</td>
<td>Traumatic Brain Injury</td>
</tr>
</tbody>
</table>

Proportion

PGY1  PGY2  PGY3  PGY4  PGY5  PGY6  PGY7

Q1  Q2  Q3  Q4  Q5  Q6  Q7  Q8
Discussion:

• Variation between competencies in reaching level 4 may reflect:
  1. variation in scoring by observers,
  2. differential skill development of residents,
  3. differential exposure to a subspecialty, or
  4. other curricular factors

• Program Directors need to have granular data in order to:
  1. Improve assessment, and
  2. Modify clinical rotations or other aspects of the curriculum
Milestones-based versus Likert

Milestone-Based Assessments Are Superior to Likert-Type Assessments in Illustrating Trainee Progression

• Traditional Likert scale based assessments do not reliably differentiate even between post-graduate training years
• Milestone based assessments (here in Pediatrics) significantly discriminate level of training and progress across all 6 competencies

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Kathleen A. McGann, MD

JGME March 2015
Future Directions:

• Examine outliers (e.g. with phone interviews) to investigate variations in:
  ▪ assessment mechanisms
  ▪ contextual factors
  ▪ consistent use of the Milestones language

• Correlate individual milestone results with board examination scores or patient outcome metrics as a benchmark for validation

• Correlate program milestone results with aspects of curricular design or case material availability (via case logs)
# Neurosurgery Milestones

- SNS Pilot Feedback Group

<table>
<thead>
<tr>
<th>Duke Hospital</th>
<th>University of Michigan</th>
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<tbody>
<tr>
<td>Hofstra North Shore LIJ School of Medicine</td>
<td>University of Minnesota</td>
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<tr>
<td>Medical University of South Carolina</td>
<td>University of Tennessee at Memphis</td>
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<td>OHSU</td>
<td>University of Utah</td>
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<tr>
<td>UCLA</td>
<td>Washington University in St. Louis</td>
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<td>UCSF</td>
<td>West Virginia University</td>
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<tr>
<td>University of Maryland</td>
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</tbody>
</table>
SNS PD-PC Milestones Pilot Group

• Feedback on Milestones Data for Resident Improvement
  – Evaluations are much more relevant
  – They discriminate between residents well
  – Resident buy in is generally strong
  – Feedback to residents on milestones is educationally valuable
What to do with the data?

- Specific diagnosis of resident problems
  - Focused, planned interventions
  - Tracking of progress
  - High stakes decisions
High stakes decisions

• Failure to progress
  – Remediation very specifically tied to milestone-identified competency deficiencies
    • Assign mentor
    • Require additional reading, testing, SANS
    • Assign skills lab and simulator practice
    • Add or modify rotations
    • Support for stress, health or emotional problems
  – Repurposing or separation
PD Suggestions

- Emphasize the wisdom and judgment of faculty educators about trainees
PD Suggestions

- Emphasize the wisdom and judgment of faculty educators about trainees
  - Informed by the assessment, milestones and other data, not replaced
SNS PD-PC Milestones Pilot Group

• Feedback on Milestones Data for Program Improvement
  – Good source of identifying program deficiencies
  – Deficiency identification guides PEC in designing specific rotation and curricular improvements
SNS PD-PC Milestones Pilot Group

- Feedback on Milestones Data for Program Improvement
  - Good source of identifying program deficiencies
  - Deficiency identification guides PEC in designing specific rotation and curricular improvements
  - In fact, at OHSU we follow CCC meeting immediately with the PEC
“Missing” milestones

• Patient Care – Critical care (1e)
  – Performs a brain death examination
“Missing” milestones

• Patient Care – Critical care (1e)
  – Performs a brain death examination
  – Fulfilled by a competency module with didactic content and practical skill observation, that is tracked
“Missing” milestones

• PBLI – Research (3b)
  – Participates in clinical outcomes data gathering and analysis
“Missing” milestones

- PBLI – Research (3b)
  - Participates in clinical outcomes data gathering and analysis
  - CNS team developed a QI science module for the Neurosurgical Portal
  - Residency programs are partnering with institutional GME offices for resident QI project involvement
“Missing” assessment

• IPCS – Relational
  – Describes methods to compassionately break bad news (1b)
  – Participates in breaking bad news to a patient or family (2b)
  – Breaks bad news to a patient or family member (3b)
  – Manages and documents and unexpected outcome (4b)
  – OHSU resident developing a mentored competency exercise
Milestones – Next Steps

• Neurosurgery Milestones Outcomes Study
  – Collaboration with:
    • Eric Holmboe, EVP Milestones, ACGME
    • Stanley Hamstra, VP Milestones Research and Education, ACGME
    • ACGME research and data team
  – Study launched early 2015
    • IRB approved - OHSU
    • Validated surveys
    • Structured PD/PC interviews
    • Early milestone data analysis
Preliminary Ideas

• Assessment
  – CCC incorporates diverse, inter-professional input
  – More objective, comprehensive and systematic
  – Assessment is an art but is supported by new system

• Continuous improvement
  – More faculty development for assessment skills needed
  – Many programs are still working on adapting assessments to milestones
Preliminary Ideas

• Curriculum
  – Macro: Re-design of national courses to match milestones
  – Program level: More attention to resident development
    • Targeted didactics, resident-focused conferences
    • Curricular and rotation re-design

• Feedback
  – More structured, in-depth conversations
  – Comparing self- and faculty-assessments important
  – Danger of losing the ‘narrative’
  – Milestones driven feedback may be more important than data
Preliminary Ideas

• Accountability
  – Milestones help demonstrate competence and standardize evaluations
  – Accurate, comprehensive, reflect the continuum
  – Help frame remediation and re-purposing decision making
  – More system development is needed:
    • Best practices
    • Benchmarking and validation
    • Wider dissemination of early findings
Preliminary Ideas

• Facilitators and Barriers
  – PC and MK work well at most program, with greater variability for the other competencies
  – Milestones have reduced the abstract nature of the competencies but streams do not always perfectly correspond to all program rotation designs
  – Hard for residents and faculty to move away from time based paradigm
  – Conflicts with apprenticeship model and ‘no news is good news’ culture of neurosurgery; requires self-reflection
  – Familiarity has increased acceptance amongst faculty members and residents
Preliminary Ideas

• Practical concerns
  – Reporter fatigue
  – Data prep time
  – Successful CCC meeting require good prep to allow focus on consensus discussion
  – Potential administrative burden on programs
Milestones 2.0

• Milestones strategic initiatives
  – Proposal for alpha-testing of milestone set revisions
    • Consolidate to a single MK milestone set (from 8)
    • Coordinate all level 5 milestones with CAST fellowship goals
      – Done in original milestones for Critical Care as pilot
      – Aligned with SNS-ACGME data partnership
Intentional surgical education

• Neurological Surgery desires to innovate to improve surgical education
  – Matrix curriculum
    • Specialty wide consensus, peer review
  – Boot Camps
    • First specialty wide effort in United States
  – Milestones outcomes
    • Neurosurgery one of 7 early adopters
    • Opportunity to help shape development process
Education in neurosurgery

• Education is gaining ground as a defined academic and leadership ‘niche’ in organized neurosurgery
Education in neurosurgery

• Education is gaining ground as a defined academic and leadership ‘niche’ in organized neurosurgery
  – Recognition that educational improvements are singular opportunity to improve the care actually delivered to patients
Thanks

- Milestones Group
  - Aviva Abosch (Functional)
  - Richard Byrne (Tumor)
  - Robert Harbaugh (Critical Care)
  - William Krauss (Spine)
  - Timothy Mapstone (Pediatrics, Matrix Curriculum)
  - Oren Sagher (Pain & Peripheral Nerve)
  - Nathan Selden (General Competencies) - Chair
  - Gregory Zipfel (Vascular)
Milestones Team

- **Milestone Development and Revision**
  - Laura Edgar EdD (Executive Director)
  - Megan Bluth BS
  - Sydney Roberts BS

- **Research and Evaluation**
  - Stan Hamstra PhD (VP for Milestones R&E)
  - Kenji Yamazaki PhD (statistician)
  - Lisa Conforti MPH
  - Nicholas Yaghmour MPP
  - Eric Holmboe, MD (SVP for Milestones R&E)
Thanks

- SNS Advisory Group
  - Dan Barrow – ABNS Past-Chair
  - Hunt Batjer – Past-Chair, RRC
  - Kim Burchiel – RRC Chair, Past-President, SNS
  - Ralph Dacey – Past-President, SNS
  - Arthur Day – SNS Past-President
  - Allan Friedman – SNS Past-President
  - Fred Meyer – ABNS Chair
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- Bob Harbaugh – SNS President
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- Kim Burchiel – Chair, RRC
- Pam Derstine – Executive Director, RRC
- Ralph Dacey – Former SNS President
- Nick Barbaro – SNS Secretary
- Art Day – SNS CAST
- CoRE Subcommittee Chairs:
  - Mapstone, Byrne, Selman, Bambakidis, Connolly, Zipfel
- Heidi Waldo – PC, OHSU
“Better is possible. It does not take genius. It takes diligence. It takes moral clarity. It takes ingenuity. And above all, it takes a willingness to try.”

Atul Gawande, 2007