Setting up National Simulation Training. The Neurosurgery Experience

Richard W. Byrne, MD
The Roger C. Bone, MD Presidential Chair
Professor and Chairman
Rush Medical College
Active learning increases student performance in science, engineering, and mathematics

Scott Freeman, Sarah L. Eddy, Miles McDonough, Michelle K. Smith, Nnadozie Okoroafor, Hannah Jordt, and Mary Pat Wenderoth

*Department of Biology, University of Washington, Seattle, WA 98195; and School of Biology and Ecology, University of Maine, Orono, ME 04469

Edited* by Bruce Alberts, University of California, San Francisco, CA, and approved April 15, 2014 (received for review October 8, 2013)

To test the hypothesis that lecturing maximizes learning and course performance, we metaanalyzed 225 studies that reported 225 studies in the published and unpublished literature. The active learning interventions varied widely in intensity and implementa-

I hear and I forget. I see and I remember. I do and I understand.

Confucius

INNOVATIONS IN PILOT TRAINING

Faced with Congressional inaction on the military's budget, Air Force leaders try innovative solutions to ensure pilot training continues.
HISTORY AND DEVELOPING SIMULATION IN MEDICINE

Model-Based Simulation for Early Neurosurgical Learners

BACKGROUND: Restrictions on clinical hours and shift length by the Accreditation Council for Graduate Medical Education and public pressure to reduce complications and to improve success in the clinical educational environment have reduced interest in the use of preclinical and surgical simulators 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.

Practice on an Augmented Reality/Haptic Simulator and Library of Virtual Brains Improves Residents’ Ability to Perform a Ventriculostomy

Rachel Yudkowsky, MD, MPH
Cristian Luciano, PhD
Pot Bensewer, PhD
Alex Schwartz, PhD
Ali Alrou, MD
G. Michael Lamele, Jr, MD
Fady Charbel, MD
Kelly Smith, PhD
Silva Rian, MS
Richard Byrne, MD
Bernard Bandok, MD, FACs
David Fren, MD, PhD

Introduction: Ventriculostomy is a neurosurgical procedure for providing therapeutic choroid plexus fluid drainage. Complications may arise during repeated attempts to placing the catheter in the ventricle. We studied the impact of a simulation-based practice with a library of virtual brains on neurosurgery residents' performance in simulated and live neurosurgical ventriculostomies.

Methods: Using computed tomographic scans of actual patients, we developed a library of 15 virtual brains for the Inntec Neuron Teal: a head- and hand-anchored augmented reality and haptic device. The virtual brain represented a range of lesions, and the level of difficulty could be adjusted.catle

Results: In individual simulator practice on the library of brains including evaluating the 3-dimensional location of the catheter within the brain, the virtual environment allowed participants to gain experience before performing actual surgery. After intervention, the participants demonstrated improved performance in each step of the procedure.

Conclusion: Simulator practice with a library of virtual brains represents a range of anatomy and difficulty levels to improve performance, potentially decreasing complications due to incorrect technique.

Journal of Surgical Education

Fostering and Assessing Professionalism and Communication Skills in Neurosurgical Education

Ricardo B. V. Fontes, PhD
Nathan R. Selden, PhD
Richard W. Byrne, MD
Society of Neurological Surgeons
Committee on Resident Education (CoRE)

• Chair – Rich Byrne
• Subcommittees:
  – Curriculum
    • Chair – Tim Mapstone
  – Portal
    • Chair – Warren Selman
    • Vice-Chair – Nicholas Bambakidis
  – Resident Courses
    • Chair – Greg Zipfel
Gregory J. Zipfel, MD
Professor and Chairman
Washington University School of Medicine
Department of Neurosurgery
Saint Louis, MO
Resident Course Subcommittee

Members:

- Rich Byrne
- Dan Barrow
- Bernard Bendok
- Deborah L. Benzil
- Joseph Ciacci
- Aaron Cohen-Gadol
- E. Sander Connolly
- William T. Couldwell
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- Michael Kaplitt
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- David Limbrick
- Thomas Origitano
- Ali Ozturk
- Vikram C. Prabhu
- Gustav Pradilla
- Ganesh Rao
- Scott Shapiro
- Philip Stieg
- Chris Winfree
- Julian Wu
- Greg Zipfel (Chair)
Resident Course Subcommittee

**National Leadership**

- **PGY1 Intern Boot Camp**
  - Ganesh Rao
- **PGY2 Junior Resident Course**
  - Scott Shapiro
- **PGY5-7 Senior Resident Course (SNS)**
  - Chris Wallace and Deborah Benzil
PGY1 Intern Boot Camp
Director: Ganesh Rao

July 12-13, 2019
• Portland, OR; Directors: J. Ciporen / F.P.K. Hsu / A. Lee
• Houston, TX; Directors: J. Weinberg / J. White

July 19-20, 2019
• Boston, MA; Directors: J. Wu / C. Heilman
• Chicago, IL; Directors: R. Byrne / T. Origitano

July 26-27, 2019
• Atlanta, GA; Directors: G. Pradilla / D. Barrow
• Philadelphia, PA; Directors: A. Ozturk / S. Grady
PGY1 Intern Boot Camp

• Primary Industry Sponsor
SNS Resident Simulation Courses

Tom Origitano, MD, PhD
Professor, Neuroscience and Spine Institute
Kalispell Regional Healthcare
Kalispell, MT

Nate Selden, MD, PhD
Professor and Chairman
Oregon Health and Sciences University
See One, Do One, Teach One

See one, do one, teach one

“Remember the hierarchy of competence – see one, do one, teach one, become a regulator.”
The neurosurgical initiative

• Neurosurgery “boot camp” courses
• 2009: PGY-1 becomes part of neurosurgical programs
• SNS – first neurosurgical society
  – Chairmen, program directors and educational leaders
• Standardize and complement skills of incoming neurosurgery residents
• 2-day courses, 6 regions
  – Focusing on 6 core ACGME competencies
  – 10 hands-on stations
  – 6 craniotomy skill stations
  – Lectures (all material available online)

Selden et al., 2012
Course Description

This Intern Boot Camp will cover an intensive prescribed curriculum, vetted by the SNS CoRE Council members and residency program directors, demonstrating the ACGME milestones, using simulators, and didactic lectures over a 2-day period.

The competencies to be taught include:

- Professionalism
- Appropriate Communications
- Resilience Skills
- Bedside Neurosurgical Procedures
- Patient Care/Technical Skills - Cranial
PGY1 Intern Boot Camp

• Goal
  – Help PGY1 residents transition from medical student to neurosurgery residency
  – Focus on teaching skills / competencies that are difficult for individual programs to provide

• Format
  – “Flipped classroom”
  – Pre-course study
  – Interactive small group sessions
  – Skills / simulation stations
SNS Boot Camp
Fundamental Skills Course
July 12-13, 2013
Chicago, IL

Course Faculty

Course Directors

Thomas Oriqitimo, MD, PhD
Neuroscience and Spine Institute
Kasipell, MT

Richard Byrne, MD
Rush University
Chicago, IL

Faculty

Ali Alrajj, MD
University of Illinois Chicago
Chicago, IL

William Ashley, Jr., MD, PhD, MBA
Loyola University Medical Center
Maywood, IL

Issam Awan, MD
University of Chicago
Chicago, IL

Mostafa Bokaya, MD
University of Wisconsin, Madison
Madison, WI

Bernard Bendok, MD
Northwestern University Medical School
Chicago, IL

Richard Buschel, MD
Saint Louis University
St. Louis, MO

James Chandler, MD
Northwestern University Medical School
Chicago, IL

Robert Dempsey, MD
University of Wisconsin, Madison
Madison, WI

Hamed Farhat, MD
Northshore University Health System
Evaston, IL

Daniel Forrester, MD, MBA
University of Illinois, Peoria
Peoria, IL

David Friez, MD, PhD
University of Chicago
Chicago, IL

Patrick Gablak, MD
University of Chicago Medical Center
Chicago, IL

Arora Ganju, MD
Northwestern University Medical School
Chicago, IL

Malini Gouthama, MD
Wayne State University
Detroit, MI

Leonard Kransier, MD
University of Chicago
Chicago, IL

Behnam Moftakhar, MD
Rush University Medical Center
Chicago, IL

Demetrios Nikou, MD
University of Illinois, Chicago
Chicago, IL

Vikram Prabhu, MD, MS
Loyola University Medical Center
Maywood, IL

Suresh Ramath, MD
University of Michigan
Ann Arbor, MI

Ben Rabinberg, MD
University of Chicago
Chicago, IL

Mitsuh Shub, MD, FACS
Goodman Campbell Brain and Spine
Indianapolis, IN

Course Curriculum

Friday, July 12 - The Woods O'Hare - Madison Room

12:30 pm - Welcome and Lunch
12:45 pm - Professionalism, Supervision, and Pearls for the Junior Resident
1:15 pm - Neurological and Neuroma Assessment
1:45 pm - Emergency Cranial Radiological Assessment
2:15 pm - Emergency Spinal Radiological Assessment
2:45 pm - ICP Management
3:15 pm - Break
3:30 pm - Unstable Neurosurgical Patient: Case Scenarios
4:00 pm - Emergency Evaluation and Management of Hydrocephalus Shunt Patients
4:30 pm - Making the Incision: Surgical Pause to Scale Blood Supply
5:00 pm - Patient Safety and Clinical Communications
5:30 pm - Airway Management and Intubation
6:45 pm - Shuttle to course dinner from the Westin O'Hare
7:00 pm - Course Dinner at McCormick & Schmick's
5320 N. River Road, Rosemont, IL 60018

Saturday, July 13 - The Woods O'Hare - Directors A, Directors B and Directors Parke (Lower Level)

7:30 am - Breakfast
8:00 am - Group A: Bedside Neurosurgical Procedures, Group B: Craniootomy Skills
11:30 am - Lunch
12:00 noon - Group A: Craniootomy Skills, Group B: Bedside Neurosurgical Procedures
1:45 pm - Adjourn
4:00 pm - Shuttle transfer from hotel to O'Hare International Airport (ORD)

Bedside Neurosurgical Procedures and Equipment Stations

- VP Shunt Tap and Valve Programming
- Lumbar Puncture and Lumbar Drain
- Oppenheimer Assessment
- External Ventricular Drain
- Spine and Pneumothorax
- Orbital Fractures, Clinical Decision
- Genital and Anal Gyn
- Clinical Decision Simulator

Craniootomy Skills Stations

- Drilling and Bone Dissection
- Assay
- Dental Assay
- Fracture Assay
- Cephalic Assay
- Tracheal Assay
- Skull Fracture

Important Information

For further information or changes, please contact:

Lisa O'Brien
(lapos@shriners.org)
630-543-6900

Important: neurosurgeons will be provided Saturday for transportation from the Westin O'Hare to the International Airport. Arrangements are strongly provided however at least 24 hours notice required on Sunday. Airfare transportation is not included in the Neuroscience Boot Camp.

Our thanks to the following sponsors for their generous support:

Stryker, Ethicon, Brooks + Associates

This course is authorized for Category 1 credits in the American Board of Neurological Surgeons (ABNS) Continuing Education Program (CEP) and is approved for Neurosurgery by the American Board of Neurological Surgery (ABNS).

Dr. Rizwan Behan, Dr. Shubh Behari, Dr. Harb Bhat, Dr. Mark Haiduc
Dr. Rizwan Behan and Dr. Shubh Behari

Sposors: Medtronic and Stryker Neurovascular
**Objective Structured Assessment of Technical Skills**

**Fig. 1**

**GLOBAL RATING SCALE OF OPERATIVE PERFORMANCE**

Please circle the number corresponding to the candidate's performance in each category, irrespective of training level.

<table>
<thead>
<tr>
<th>Rapport for Tissues</th>
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</thead>
<tbody>
<tr>
<td>Frequently used unnecessary force on tissues or caused damage by inappropriate use of instruments</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Careful handling of tissues but occasionally caused inadvertent damage</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>Consistently handled tissues appropriately with minimal damage</td>
<td></td>
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<table>
<thead>
<tr>
<th>Time and Motion</th>
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<tbody>
<tr>
<td>Many unnecessary moves</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Efficient time/motion but some unnecessary moves</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>Clear economy of movement and maximum efficiency</td>
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<table>
<thead>
<tr>
<th>Instrument Handling</th>
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</thead>
<tbody>
<tr>
<td>Repeatedly makes tentative or awkward moves with instruments by inappropriate use of instruments</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Competent use of instruments but occasionally appears stiff or awkward</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>Fluid moves with instruments and no awkwardness</td>
<td></td>
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<table>
<thead>
<tr>
<th>Knowledge of Instruments</th>
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</thead>
<tbody>
<tr>
<td>Frequently asked for wrong instrument or used inappropriate instrument</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Know names of most instruments and used appropriate instrument</td>
<td>4</td>
<td>1</td>
<td></td>
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<tr>
<td>Obviously familiar with the instruments and their names</td>
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<tr>
<th>Flow of Operation</th>
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</thead>
<tbody>
<tr>
<td>Frequently stopped operating and seemed unsure of next move</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Demonstrated some forward planning with a reasonable programme of procedure</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obviously planned course of operation with effective flow from one move to the next</td>
<td></td>
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<tr>
<th>Use of Assistants</th>
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</thead>
<tbody>
<tr>
<td>Consistently placed assistants poorly or failed to use assistants</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Appropriate use of assistants most of time</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategically used assistants to the best advantage at all times</td>
<td></td>
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<tr>
<th>Knowledge of Specific Procedure</th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Deficient knowledge. Needed specific instruction at most steps</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Knew all important steps of operation</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demonstrated familiarity with all aspects of operation</td>
<td></td>
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</table>
**SNS Bootcamp Course**

**Procedural checklists – Neurosurgical bedside procedures**

- Universal preparation (done for all procedures)
- Ventriculostomy
- Intracranial pressure monitor
- Lumbar puncture
- Placement of lumbar catheter (epidural / subarachnoid)
- Shunt chamber tap
- Transfontanelle / bur hole tap
- Externalization of ventriculoperitoneal shunt
- Hole / suture application, cervical traction

**Universal preparation**

To be utilized for all procedures:

- Position patient
- Review indication, instructions and ensure supervision with Chief Resident / Attending
- Confirm patient parameters – 2 identifiers, lab results, imaging (if applicable)
- Consent patient
- Obtain necessary assistance and equipment
- Start prophylactic antibiotics (if applicable)
- Mask, surgical cap, eye protection
- Prep and drape
- Local anesthetic
- Apply dressing

During procedure:

- Cell for help if necessary

Post-procedure:

- Documentation – orders + procedure report
- Update Chief Resident / Attending / Family

---

**Ventriculostomy**

- Head shave / mark site – Kocher’s point
- Incision + retractor
- Burr hole
- Perforate dura
- Externalization trocar
- Place ventricular cannula, technique details
- Confirm good CSF flow and externalize
- Closure
- Connect system

**Intracranial pressure monitor – bolt type**

- Check monitor status (present and working)
- Head shave / mark site – Kocher’s point or other location
- Burr through skin to dura
- Perforate dura
- Attach bolt to skull
- Adjust “zero” point for monitor
- Pass monitor into desired position
- Tighten bolt, connect system

**Lumbar puncture**

- Anatomic landmarks
- Insert needle, bevel up, aim 10 degrees cephalad
- CSF return – manometry if applicable

---

**This Certificate Recognizes successful completion of Neurosurgical Professionalism, Safety, and Fundamental Skills Exercises.**

«First» «Last», «Degree»

**SNS Boot Camp Fundamental Skills Course**

**July, 2016**
Model-Based Simulation for Early Neurosurgical Learners

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 neurosurgical surgery has taken advantage of model-based systems. The Society of Neurological Surgeons postgraduate year 1 courses have served as a paradigm for designing and using model-based simulation 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 curriculums 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 five procedures under direct supervision appropriate to their training stage.

CONCLUSION: Model-based simulation is particularly effective for early surgical learners as part of a coordinated curriculum. Almost 600 residents have used model-based simulation during the first 3 years of the Society of Neurological Surgeons boot camp courses, with ongoing modification and improvement of individual simulation models.

A National Fundamentals Curriculum for Neurosurgery PGY1 Residents: The 2010 Society of Neurological Surgeons Boot Camp Courses

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

OBJECTIVE: To provide a fundamentals curriculum for all incoming neurosurgery PGY1 residents in ACGME-accredited programs, including skills, knowledge, and attitudes that promote quality, patient safety, and professionalism.

METHODS: The Society of Neurological Surgeons organized 6 regional “boot camp” courses for incoming neurosurgery PGY1 residents in July 2010 that consisted of 9 lectures on clinical and nonclinical competencies plus 30 procedural and 6 surgical skills stations. Resident and faculty participants were surveyed to assess knowledge and course effectiveness.

RESULTS: A total of 166 of 177 U.S. neurosurgical PGY1 residents (94%) and 75 neurosurgical faculty from 56 of 59 programs (95%) participated in the inaugural boot camp courses. All residents and 93% of faculty participants completed course surveys. All resident and faculty respondents thought that the boot camp courses fulfilled their purpose and objectives and imparted skills and knowledge that would improve patient care. PGY1 residents’ knowledge of information taught in the courses improved significantly in postcourse testing (P < .0001). Residents and faculty particularly valued simulated and other hands-on skills training.

CONCLUSION: Regional organization facilitated an unprecedented degree of participation in a national fundamental skills program for entering neurosurgery residents. One hundred percent of resident and faculty respondents positively reviewed the
Resident Surveys

• Did the course meet the course purpose and objectives (100% yes)
• Did the course improve patient care (100% yes)
• Will the course benefit incoming neurosurgery residents (98% yes).
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<tbody>
<tr>
<td>1</td>
<td>ACLS type instruction</td>
</tr>
<tr>
<td>2</td>
<td>Cut out lectures. Focus on case studies</td>
</tr>
<tr>
<td>3</td>
<td>short stay, would appreciate more interaction</td>
</tr>
<tr>
<td>4</td>
<td>Skin closure is really hard to practice, low quality of most skin closures</td>
</tr>
<tr>
<td>5</td>
<td>None</td>
</tr>
<tr>
<td>6</td>
<td>The intubation lecture was ok but I need more management of crashing patient</td>
</tr>
<tr>
<td>7</td>
<td>not enough practice with intubation and shunt interrogation</td>
</tr>
<tr>
<td>8</td>
<td>The skin closure portion - I believe that possibly some of the lectures were given in an unclear manner</td>
</tr>
<tr>
<td>9</td>
<td>None of it</td>
</tr>
<tr>
<td>10</td>
<td>Lectures</td>
</tr>
<tr>
<td>11</td>
<td>Clinical simulation</td>
</tr>
<tr>
<td>12</td>
<td>Introducing lectures were too rushed</td>
</tr>
<tr>
<td>13</td>
<td>Some of the hands on stations were a bit too difficult to follow the example</td>
</tr>
<tr>
<td>14</td>
<td>Lectures</td>
</tr>
<tr>
<td>15</td>
<td>The lecture day is a long day. Would prefer if the topics had a little more depth. I think it would be a lot more beneficial if there was more audience discussion</td>
</tr>
<tr>
<td>16</td>
<td>Some of the skills stations had minimal explanation</td>
</tr>
<tr>
<td>17</td>
<td>I thought it was all worthwhile</td>
</tr>
<tr>
<td>18</td>
<td>Some stations didn't have proctor, like the simulated surgery station - didn't know how to use it or change scenarios</td>
</tr>
<tr>
<td>19</td>
<td>Lecture or PowerPoint style format. Would strongly prefer interacting more with senior faculty</td>
</tr>
</tbody>
</table>

Oct 11, 2013 10:59 AM
Oct 11, 2013 10:58 AM
Oct 11, 2013 10:49 AM
Oct 11, 2013 10:38 AM
“The flipped classroom”......

Mandatory on-line pre-study of lectures and handbook allows for...

• Maximal use of valuable time
• Pre-post SANS tests of basic knowledge results
• Lecture liberation with transition to interactive case based learning
• Assessments: Objective structured assessment of technical skills (OSATS)
Flipped Classroom

Standardized Lecture PowerPoint Files

- Professionalism, Supervision, and Pearls
- Neurological and Neurotrauma Assessment
- Emergency Cranial Radiology Assessment
- Emergency Spinal Radiological Assessment
- ICP Management
- Unstable Neurosurgical Patient: Case Scenarios
- Emergency Evaluation and Management of Hydrocephalus Shunt Patients
- Making the Incision: Surgical Pause to Scalp Blood Supply
- Patient Safety and Clinical Communications
- Airway Management and Intubation

Standardized Lecture PowerPoint Files

- Cerebral Vascular Anatomy
- Disclosure of Medical Errors and Risk Management
- Handoffs Lecture
- ICU Simulator Paper 2010
- Leadership and Professionalism in an Era of Neurosurgical Exceptionalism
- OR Crisis
- Cranial Fixation
- Post-Operative and Chronic Pain Management in Neurosurgical Surgery
- Principles of Neuronavigation: Frame and Frameless
- Quality Improvement in Neurosurgery
- Safety and Surgical Checklists
- Surgical Anatomy of the Spine
- Informed Consent
- Informed Consent Exercise
- ICU Crisis
- ICU Scenarios 1-4
- Goals of Model Based Skills Simulations
- Goals of Cadaver Based Surgical Skills
- Breaking Bad News
- Ventricular Anatomy

The Society of Neurological Surgeons Subcommittee on Boot Camp Courses

- Alex Khalessi
- Bruce Ehni
- Carl Heilman
- Costas Hadjipanayis
- Daniel Barrow
- Gwen Lombard
- James Lister
- Jim Schuster
- Joseph Ciacci

THE SOCIETY OF NEUROLOGICAL SURGEONS
Dear Neurosurgery Resident,

In July you will attend a Fundamentals of Neurosurgical Boot Camp course, designed and sponsored by the Society of Neurological Surgeons and administered by the Congress of Neurological Surgeons. This course is taught by senior faculty and is designed to help you prepare for common situations that you will face in the first year of your residency and beyond. Since 2011, the Boot Camp courses have had 100% attendance by A-PGY-1 neurosurgery residents. Over the next month, you will receive a series of communications with instructions for the course. Prior to the course, with a deadline of June 21, we ask that you take a brief online test of your neurosurgical knowledge. This test should be taken without the aid of any references, books, etc., as it is simply an indication of your baseline knowledge for the course directors to use in adjusting the course curriculum (you will not be evaluated on the results). We would like 100% participation in the baseline testing.

To take the online test, go to http://www.cns.org and click the Sign Into My Account button in the top left hand corner. Once you are logged in, click on My Learning also in the top left hand corner. You will then see the 2015 Boot Camp Test on the outlined tab. Click on Launch to start the exam.

Thank you and we look forward to your participation in the course.

Sincerely,

Richard W. Byrne MD
National Course Director
Chair, Sub-committee on Bootcamp Courses
Society of Neurological Surgeons

Ganesh Rao, MD
Chair, SANS Committee
Congress of Neurological Surgeons
The Neurological Surgery Milestone Project

A Joint Initiative of
The Accreditation Council for Graduate Medical Education
and
The American Board of Neurological Surgery

NEUROLOGICAL SURGERY MILESTONES

NATHAN R. SELDEN, MD, PhD
AVIVA ABOCH, MD, PhD
RICHARD W. BYRNE, MD
ROBERT E. HARBUGH, MD, FAANS, FACS, FAHA
WILLIAM E. KRAUSS, MD
TIMOTHY B. MAPSTONE, MD
OREN SAGHER, MD
GREGORY J. ZIPFEL, MD
PAMELA L. DERSTINE, PhD, MHPE
LAURA EDGAR, EdD, CAE
### Milestones driven

#### Systems-Based Practice 2: Quality Improvement

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describes basic quality improvement methods and metrics</td>
<td>Participates in local quality improvement initiatives (e.g., surgical site infection (SSI) reduction, care pathway implementation)</td>
<td>Identifies quality improvement opportunities and assists in the development, implementation, and analysis of a quality improvement project</td>
<td>Advances multiple quality improvement initiatives through participation in a quality improvement working group or committee</td>
<td>Creates, implements, and assesses quality improvement initiatives</td>
</tr>
</tbody>
</table>

#### Systems-Based Practice 1: Patient Safety

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describes principles of patient safety, performs safe and effective handoffs and transitions of care in routine clinical situations</td>
<td>Recognizes and reports patient safety events; supervises handoffs and transitions of care in complex clinical situations</td>
<td>Analyzes patient safety events and offers error prevention strategies; advocates for safe and effective transitions of care within and across health care systems</td>
<td>Actively engages teams in process and system modification to prevent patient safety events; improves care transition practices within and across health care systems</td>
<td></td>
</tr>
</tbody>
</table>

#### Interpersonal and Communication Skills 2: Communication in Coordination of Care

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accurately records information in the patient record and safeguards protected health information, coordinates care within the neurosurgical service</td>
<td>Communicates orally and in writing in a respectful, organized, clear, concise, and timely manner with all members of the interprofessional health care team; coordinates care with consulting services</td>
<td>Effectively manages complex, team-based clinical care; coordinates care within a hospital system</td>
<td>Models and mentors others in effective communication, including instructional feedback and conflict resolution; coordinates long-term care, including rehabilitation</td>
<td>Develops or implements strategies for improving communication and teamwork within a health care system; creates care pathways at the health care system level</td>
</tr>
</tbody>
</table>

#### Professionalism: Ethical Behavior

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behaves ethically and professionally and takes responsibility for personal conduct</td>
<td>Employs ethical and legal principles (e.g., informed consent, advance directives, confidentiality, error disclosure, resource stewardship) and appropriately seeks advice</td>
<td>Performs tasks in a thorough, timely, and respectful manner in complex or stressful situations and takes ownership of team outcomes</td>
<td>Recognizes, reports, and helps rectify lapses in ethics or professionalism, including coaching others</td>
<td>Promotes ethical and professional behavior by creating a teaching resource, addressing system-level problems, or serving on an ethics panel or Institutional Review Board</td>
</tr>
</tbody>
</table>

#### Practice-Based Learning and Improvement 3: Mentorship and Teaching

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrates self-awareness and identifies gaps in knowledge, skills, and experience; incorporates feedback</td>
<td>Teaches medical students, other residents, and patients in informal settings; develops faculty mentorship of self</td>
<td>Teaches health professionals in formal settings (e.g., nursing in-service training, residency teaching conference); mentors medical students</td>
<td>Organizes educational activities at the program level; mentors residents and other health care professionals</td>
<td>Designs and implements clinical rotations, curricula, or learning and assessment tools, modules, and teaches mentoring to others</td>
</tr>
</tbody>
</table>

#### Professionalism 2: Well-Being

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describes the importance of personal and professional well-being; manages sleep, nutrition, stress, fatigue, and lifestyle</td>
<td>Evaluates personal and professional well-being; seeks appropriate personal help and fatigue mitigation when needed</td>
<td>Monitors and attempts to optimize professional well-being of the team; adjusts team assignments to mitigate fatigue and promote wellness</td>
<td>Coaches and assists others in meeting professional expectations; recognizes and responds to physical and mental fatigue in self and others</td>
<td>Develops a structured plan or team activity to optimize personal and professional well-being, resilience, and success; participates in a peer support program</td>
</tr>
</tbody>
</table>
Milestones Group

- ACGME suggested sub-competencies tailored to neurosurgical education, including research.
- Fewer elements, cleaner progression of traceable progress compared to Milestones 1.0
- Sub-competencies arranged in a developmental progression of specific behaviors.
- Fellowship/early practice attributes are included in every case at level 5.
Congress of Neurological Surgeons

SNS Boot Camp Fundamental Skills Course
2016 Preliminary Curriculum Outline

Friday
12:00 pm Welcome and Lunch
12:30 pm Professionalism, Supervision, and Pearls for the Junior Resident
1:00 pm Safety and Clinical Communications
1:30 pm ICP Management
2:00 pm Demonstrations (ICP Monitor, EVD, Lumbar Drain, VP Shunt tap, Lines, Positioning)
3:00 pm Unstable Patient Scenarios
4:00 pm Break
4:15 pm Small Group Emergency Case Scenarios
6:30 pm Course Dinner

Saturday
6:45 am Transport to Course Location (if necessary)
7:00 am Breakfast
7:30 am Group A: Bedside Neurosurgical Procedures, Group B: Craniotomy Skills
11:00 am Lunch
12:00 noon Group A: Craniotomy Skills, Group B: Bedside Neurosurgical Procedures
3:30 pm Adjourn
4:00 pm Transport to Airport

Bedside Neurosurgical Procedures and Equipment Stations
VP Shunt Tap and Valve Programming/Assessment
Lumbar Puncture and Lumbar Drain/Assessment
NDC Monitor/Assessment
Internal Ventricular Drain/Assessment
Supine and Prone Positioning, Cranial Fixation, Cervical Tract/Assessment
Central and Arterial Lines/Assessment

Craniotomy Skills Stations
Drilling and Bone Dissection/Assessment
Clinical Decision Simulator (Concurrent with drilling, Friday or Saturday)
Cranial Flaps/Assessment
Dura Closure/Assessment
Flap fixation
Cranioplasty
Skin Closure/Assessment
PATIENT 1

• You are called by an ICU nurse at 22:00 about Pt 1
  – 48 year old man who just underwent clipping of ruptured R MCA aneurysm earlier today
  – Still comatose over an hour after arrival from the PACU, but he was following commands when left for the OR

• You ask for a CT scan
  – It will take about 10-15 minutes to disentangle yourself from the ED
  – The nurse reassures you that Pt 1 is still mechanically ventilated from the OR; and that airway, breathing and circulation are adequate

• Per your sign-out sheet
  – Pt 1 arrived earlier this morning as a H&H Gr III, Fisher Gr III with moderate hydrocephalus
  – Had a ventriculostomy drain placed
  – Received 1000mg of fosphenytoin and 60 mg of nimodipine prior to going to the OR for clipping
Management of the Comatose or Neurologically Deteriorating Patient

- ABCs
- History
- Physical Examination
- Check your equipment
- Fix the fixable
  - Check medications
  - Malfunctioning drains and monitors
  - Treat seizures
  - Fix abnormal lab values
- Imaging
- Intervention
Respiratory Failure

• Classic indications for mechanical ventilation
  – Respiratory criteria
    • Hypoxia: PaO2<70 on 40% O2/significant desaturation on maximum supplemental O2
    • Ventilatory failure: PaCO2>60 on ABG (unless compensated COPD);
      Vital capacity < 10-15 cc/kg (Can the patient count to 10 at least?);
      NIF < -25cm H2O
    • Tachypnea/respiratory distress: RR>30
  – Neurologic criteria
    • Decreased mental status (GCS<9, or trending toward decline), as from increasing intracranial pressure
    • Cranial nerve dysfunction leading to aspiration risk
Spinal Epidural Hematoma (SEH)

- Usually asymptomatic
- Risk factors include
  - Multilevel laminectomies, preoperative coagulopathies and vascular anomalies, pre-operative NSAID use, intraoperative blood loss of more than 1 liter, age >60 years old, those with Rh + blood types; intraoperative Hgb levels less than 10 g/dL, or an INR>2 within the first 48 post operative hours
- Want to get an MRI to visualize the SEH as soon as it is suspected
  - Early surgical exploration and evacuation gives the best chance for recover
Management of Cerebral Vasospasm

- Oral nimodipine (60mg q 4hrs) from the time of admission until PBD #21 reduces poor outcome related to SAH
- Treatment of cerebral vasospasm begins with early management of the ruptured aneurysm, and in most cases, maintaining normal circulating blood volume/avoiding hypovolemia
- One reasonable approach to symptomatic cerebral vasospasm is hypertensive, hypervolemic therapy (add hemodilution to get “triple-H” therapy)
- Cerebral angioplasty and/or selective intra-arterial vasodilator therapy may be reasonable after, together with, or in the place of triple-H therapy, depending on the clinical scenario
  - Consider angiogram for angioplasty if there is a focal deficit
Case #1 – FC, 38yoF

- 38 year old female
- Sudden headache 7 days ago
- Brought in comatose, 8 hours after ictus:
  - GCS 8
  - Moves extremities symmetrically
  - PERRLA, no cranial deficits

What would you do next?
Case #2 – CCB, 18yoM

- Transferred from another hospital
- CT (unavailable), MRI
- What next?
Case #3 – RD, 6yoM

- 6 year old male
- Myelomeningocele
  - Correction + shunt at birth
  - 3 revisions, most recent 3 months ago
- “Fussy” all day, fever 104 F, vomiting
- Called by pediatrics ER
  - Sleepy
  - Became apneic andunarousable in the CT scanner

CT – 1 month ago

www.neuroradiologycases.com
Case #3 – RD, 6yoM

- 6 year old male
- Myelomeningocele
  - Correction + shunt at birth
  - 3 revisions, most recent 3 months ago
- “Fussy” all day, fever 104 F, vomiting
- Called by peds ER
  - Sleepy
  - Became apneic and unarousable in the CT scanner
- What next?
Case #5 – 65yoF

• 65 year old female

• You are called to Internal Medicine floor 2 hours post-LESI

• Patient drowsy since arrival (sedation received during injection) but following commands

• Strength 5/5 in upper extremities, 3/5 in bilateral lower extremities

• What next?

Ahn et al., 2009
Case #6 – 43yoM

- 43 year old male
- Smoker, hypertensive, obese
- Right hemiparesis, aphasia
- Acute onset, 2 hours ago
  - Received IV tPA at outside hospital, 1 hour ago
  - No improvement
- Initial CT is provided

www.radiopaedia.org
Workplace Hazards specific to Neurosurgery

- Radiation Exposure (covered separately)
- Needlesticks/sharps exposure
- Eyesplash

- It is estimated that up to 60,000 cases HBV, 16,000 cases HCV, and 2000 cases HIV transmitted to healthcare workers worldwide annually from occupational exposure
- Bloodborne pathogen training is designed to help educate and reduce the risk of these occurrences
Course Logistics

February 22, 2016

Stryker
750 Trade Centre Way, Suite 200
Portage, MI 49002

Dear Grants Committee:

The Congress of Neurological Surgeons in conjunction with the Society of Neurological Surgeons will again administer a series of six Resident Boot Camps July 8-23, 2016.

These regional basic skills courses, each led by Residency Program Directors in the region, are designed to prepare PGY1 Residents for their first year of training. Each course includes craniotomic skills training as well as bedside procedures. Approximately 200 incoming PGY1 neurosurgical residents (essentially all incoming residents in ACGME accredited programs) will participate along with 75 faculty members.

The CNS requests that Stryker support the 2016 SNS Boot Camps through an in-kind donation of equipment for the hands-on portion of the course. We are specifically requesting the following equipment, which is attached.

Enclosed, please find the in-kind grant agreement, shipping information details will follow. To confirm your participation, please sign and return the agreement no later than May 5, 2016.

We look forward to your participation in this essential resident course.

Sincerely,

Richard W. Byrne, MD
SNS Boot Camp National Courses Director
### Task List

<table>
<thead>
<tr>
<th>Date</th>
<th>Task Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>Send email to Course Directors to request list of faculty and presentation assignments</td>
</tr>
<tr>
<td>June</td>
<td>Send Resident and Faculty Confirmation Emails (Hotel/Course location, Air Travel, Transportation, Agenda, Expense Form)</td>
</tr>
<tr>
<td>June</td>
<td>Send the following to vendors: confirmed equipment, shipping address and contact for each city</td>
</tr>
<tr>
<td>June</td>
<td>Handbook to print</td>
</tr>
<tr>
<td>June-Last week</td>
<td>Brochures Print</td>
</tr>
<tr>
<td>Ongoing</td>
<td>Harbour side invoice received and paid</td>
</tr>
<tr>
<td>June</td>
<td>Function book production complete</td>
</tr>
<tr>
<td>June</td>
<td>Create station tables for Bedside Procedures Lab</td>
</tr>
<tr>
<td>June</td>
<td>Badges Printed in house</td>
</tr>
<tr>
<td>June</td>
<td>Certificates Printed in house</td>
</tr>
<tr>
<td>2nd Friday in June</td>
<td>Deadline for attendee flights to be booked</td>
</tr>
<tr>
<td>June-Last week</td>
<td>Function Sheet summaries sent to course directors</td>
</tr>
<tr>
<td>June-1st week</td>
<td>Email to all Residents - overview of pre-test, checklists, study materials, etc.</td>
</tr>
<tr>
<td>June-1st week</td>
<td>Pre-Test sent to all residents</td>
</tr>
<tr>
<td>June</td>
<td>Send guarantee, menus and room setup to restaurant. Request BEO.</td>
</tr>
<tr>
<td>Varies by City</td>
<td>Room list due to hotel, request confirmation numbers</td>
</tr>
<tr>
<td>June</td>
<td>Catering Orders reviewed and finalized</td>
</tr>
<tr>
<td>June</td>
<td>Restaurant BEO reviewed and finalized</td>
</tr>
<tr>
<td>June/July</td>
<td>All check requests complete for pre payment</td>
</tr>
<tr>
<td>July-1 week prior to each course</td>
<td>Confirm transportation details</td>
</tr>
<tr>
<td>July-1 week prior to each course</td>
<td>Final communication/confirmation sent to faculty and residents</td>
</tr>
<tr>
<td>July-1 week prior to each course</td>
<td>Send any last minute reservations to hotel and cancel dummy reservation</td>
</tr>
<tr>
<td>July-1 week prior to each course</td>
<td>Shipment to facility (Badges, sign in sheets, handbook, reg. materials)</td>
</tr>
<tr>
<td>August</td>
<td>Final Check Requests Complete for all Vendors</td>
</tr>
<tr>
<td>August</td>
<td>Send reminder to Residents and Faculty who have not submitted expenses</td>
</tr>
<tr>
<td>July/August</td>
<td>Hotel master bills received and paid</td>
</tr>
</tbody>
</table>

### Attendee Count

<table>
<thead>
<tr>
<th>City</th>
<th>Residents</th>
<th>Faculty</th>
<th>Facility Staff</th>
<th>Corporate</th>
<th>CNS Staff</th>
<th>Total Attendees by city</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portland</td>
<td>32</td>
<td>13</td>
<td>12</td>
<td>11</td>
<td>1</td>
<td>69</td>
</tr>
<tr>
<td>Chicago</td>
<td>39</td>
<td>17</td>
<td>0</td>
<td>9</td>
<td>1</td>
<td>66</td>
</tr>
<tr>
<td>Boston</td>
<td>39</td>
<td>21</td>
<td>5</td>
<td>11</td>
<td>1</td>
<td>77</td>
</tr>
<tr>
<td>Houston</td>
<td>33</td>
<td>12</td>
<td>2</td>
<td>13</td>
<td>1</td>
<td>61</td>
</tr>
<tr>
<td>Philadelphia</td>
<td>38</td>
<td>11</td>
<td>3</td>
<td>11</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>Atlanta</td>
<td>41</td>
<td>14</td>
<td>2</td>
<td>12</td>
<td>1</td>
<td>70</td>
</tr>
<tr>
<td><strong>Total By category</strong></td>
<td><strong>222</strong></td>
<td><strong>88</strong></td>
<td><strong>67</strong></td>
<td>6</td>
<td><strong>407</strong></td>
<td></td>
</tr>
</tbody>
</table>
THURSDAY

Arrive - go to check-in and check out
Staff - all changes to resume account
Residents & Faculty - Room and Time to Meet
Residents and Faculty will make their own transportation arrangements.

After check-in
Meet with Resident Coordinator for tree of facility (all rooms came with 3 to 4 laptop sockets), 10:00 to confirm appointments.

While on site, instructors will be on site and will be leading the course. All equipment should arrive Thursday or Friday morning in the morning.

Check out laptop lab storage with 4 laptops. Laptops will be on site with wireless access. Check out laptop lab storage with 4 laptops. Laptops will be on site with wireless access.

Late afternoon
Call Transportation Company to confirm departure date and time for Friday's departure.
Call Transportation Company to confirm departure date and time for Friday's departure.
Call Transportation Company to confirm departure date and time for Friday's departure.
Call Transportation Company to confirm departure date and time for Friday's departure.

FRIDAY

All day:
Student equipment and all equipment is delivered to the appropriate lab rooms.

8:30 am
Arrive at facility, walk or cab taxi.

9:00 am
Conformation transport on hotel to facility and other site’s sister phone number, if applicable. To Portland and Atlanta only.

1:30 pm
Report to the laboratory to set up equipment in the endoscopic lab rooms. Residents and students will be responsible for the set up.

12:10 pm
Lecture begins

1:00 pm
Materials & sets up

5:45 pm
Bus arrives for dinner transportation (Portland, Atlanta, Chicago) 6:15pm departure time for all.

10:30 pm
Lecture

10:55 pm
Check in on setup of lecture rooms and make sure all AV is working properly.

11:30 pm
Registration set up complete. Contact Transportation Service to confirm departure time from hotel and show expected number of passengers.

1:15 am
Lecture begins

12:00 am
Bus departs hotel or course location, if applicable. To Portland and Atlanta only.

12:00 pm
Lecture begins

1:00 pm
Check and check on shuttle going to airport

2:00 pm
Place certificates at registration table – one for each attendee.

3:00 pm
Bus arrives for airport transfers

5:00 pm
Check in on shuttle going to airport

GENERAL INFORMATION

Sign in Sheets
Each student must sign in and out each day. Sign in sheets to keep on file at the office. 

Reimbursement for Faculty

80% covers airfare, auto mileage for driving, hotel and shuttle transportation to airport on Saturday. Reimbursement for all other related travel expenses is the responsibility of the individual attending the program, including parking, tax from airport to central hotel and other meals.

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PGY2 Junior Resident Course

• Goal
  – Help PGY2 residents in their transition from intern to neurosurgery junior resident
  – Focus on teaching skills / competencies that are difficult for individual programs to provide

• Format
  – “Flipped classroom”
  – Pre-course study
  – Simulation-based training
  – Professionalism, leadership, communication
This course was made possible through an educational grant provided by:
Junior Resident Course
Director: Scott Shapiro

April 4-5, 2019
– UC San Diego; Directors: A. Khalessi / J. Ciacci

April 24-25, 2019
– IU Indianapolis; Directors: S. Shapiro / D. Limbrick

May 30-31, 2019
– Weill-Cornell NY; Director: M. Kaplitt / C. Hadjipanayis
Kurt Yaeger¹, Stephan A. Munich², Richard W. Byrne², Isabelle M. Germano¹
Accepted, in press: Neurosurgery Focus Dec 2019

Introduction of Milestone Program

Values after 2011-2012 reflect Senior and Lead Surgeon roles
* Due to changes in ACGME case log classifications, values for "Total Spine" prior to 2012-2013 reflect the sum of procedures classified as Spinal Procedures - "disc and/or spondylosis," "tumor/vascular lesion," and "trauma"
**Values for ventriculostomy reflect all clinical roles
PGY2 Junior Resident Course

Vessel Anastomosis

Spine Basics
PGY2 Resident Course

Prosection

Intraoperative Catastrophe Management
Junior Resident Course

• 2019 [to date]
  ❖ Highest Rated Simulations:
    • Sagittal sinus injury simulation
    • Endovascular simulators
    • Vessel anastomosis simulation

❖ New This Year:
  • Spine Skill Basics – 2 levels
  • Prosection Enhanced – 3 specimens
# Most useful simulation

<table>
<thead>
<tr>
<th>Simulation Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model Based Simulation – Endoscopy</td>
<td>0.0%</td>
</tr>
<tr>
<td>Model Based Simulation – Endovascular</td>
<td>8.0%</td>
</tr>
<tr>
<td>Model Based Simulation – Stereotactic Frame Placement</td>
<td>0.0%</td>
</tr>
<tr>
<td>Cadaver Based Cranial Simulation – Suboccipital</td>
<td>0.0%</td>
</tr>
<tr>
<td><strong>Cadaver Based Cranial Simulation – Pterional</strong></td>
<td><strong>40.0%</strong></td>
</tr>
<tr>
<td>Cadaver Based Cranial Simulation – Fronto-Orbital</td>
<td>12.0%</td>
</tr>
<tr>
<td>Cadaver Based Cranial Simulation – Cranial Plating for fronto-orbital</td>
<td>0.0%</td>
</tr>
<tr>
<td>Basic Spinal Approaches - Laminectomy</td>
<td>4.0%</td>
</tr>
</tbody>
</table>
Least useful simulation

<table>
<thead>
<tr>
<th>Simulation Type</th>
<th>Response Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioral Simulation – Breaking Bad News</td>
<td>8.0%</td>
</tr>
<tr>
<td>Model Based Simulation (Sim Man) – ICU Crisis</td>
<td>4.0%</td>
</tr>
<tr>
<td>Model Based Simulation – Operating Room Crisis</td>
<td>0.0%</td>
</tr>
<tr>
<td>Model Based Simulation – Tumor resection</td>
<td>44.0%</td>
</tr>
<tr>
<td>Model Based Simulation – Endoscopy</td>
<td>0.0%</td>
</tr>
<tr>
<td>Model Based Simulation – Endovascular</td>
<td>0.0%</td>
</tr>
<tr>
<td>Model Based Simulation – Stereotactic Frame Placement</td>
<td>28.0%</td>
</tr>
<tr>
<td>Cadaver Based Cranial Simulation – Suboccipital</td>
<td>0.0%</td>
</tr>
<tr>
<td>Cadaver Based Cranial Simulation – Pterional</td>
<td>0.0%</td>
</tr>
</tbody>
</table>
Surgical robotics

Pipeline

Gamma brain mapping

embolectomy

LITT

Who will lead the future of neurosurgery?

2010

Disc replacement

MGUS

Optune

Biologic glues

2020

2030

Millenials in Neurosurgery: Is there Hope?

Perhaps nothing makes established medicine groan and hang their collective heads in disapproval like bringing up the subject of millennials. Neurosurgery is no exception. However, millennials are here to stay: as the future generation with numbers greater than the baby boomers, they will greatly

11 that occurred for them between 10 and 20 yr of age, increased media coverage of school mass shootings, the Great Recession, high levels of unemployment among young people, stock market crash, foreclosure crisis, rise of social media, and full integration of technology into daily life. In addition, parents of middle class
Concerns about the coming generation

Hesiod, 8th Century BC

“I see no hope for the future of our people if they are dependent on frivolous youth of today, for certainly all youth are reckless beyond words. When I was young, we were taught to be discreet and respectful of elders, but the present youth are exceedingly disrespectful and impatient of restraint.”

Assyrian Clay Tablet, 2800 BC

“Our Earth is degenerate in these later days; there are signs that the world is speedily coming to an end; bribery and corruption are common; children no longer obey their parents; every man wants to write a book and the end of the world is evidently approaching.”

Seneca, 1st Century AD

“Our young men have grown slothful. There is not a single honorable occupation for which they will toil night and day. They sing and dance and grown effeminate and curl their hair and learn womanish tricks of speech; they are as languid as women and deck themselves out with unbecoming ornaments. Without strength, without energy, they add nothing during life to the gifts with which they were born – then they complain of their lot.”

Socrates, 5th century BC

“The children now love luxury. They have bad manners, contempt for authority; they show disrespect for elders and love to chatter in place of exercise.”

3,000,000 BC

Complaint of an australopithecine father: *Kids today! All they wanna do is walk erect.*

Edward Chilton.
Burnout and Satisfaction With Work-Life Balance Among US Physicians Relative to the General US Population

Tait D. Shanafelt, MD; Sonja Boone, MD; Lijten Tan, PhD; Lotte N. Dyrbye, MD, MHPE; Wayne Sotile, PhD; Daniel Satele, BS; Colin P. West, MD, PhD; Jeff Sloan, PhD; Michael R. Oreskovich, MD

Figure 1. Burnout by specialty.

Figure 2. Satisfaction with work-life balance by specialty.
Kurt Yaeger¹, Stephan A. Munich², Richard W. Byrne², Isabelle M. Germano¹
Accepted, in press: *Neurosurgery Focus* Dec 2019

<table>
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<tr>
<td>Graduating (%)</td>
<td>13.8</td>
<td>14.1</td>
<td>13.2</td>
<td>11.9</td>
<td>14.1</td>
<td>12.3</td>
<td>12.8</td>
<td>13.8</td>
<td>13.4</td>
<td>13.1</td>
<td>13.3</td>
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<tr>
<td>NS Attrition (%)</td>
<td>3.0</td>
<td>4.1</td>
<td>3.0</td>
<td>2.6</td>
<td>2.1</td>
<td>1.9</td>
<td>3.0</td>
<td>2.3</td>
<td>2.4</td>
<td>2.0</td>
<td>2.6</td>
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What is leadership?

• “A process of social influence in which one person can enlist the aid and support of others in the accomplishment of a common task” – Chemers, 1997

• Theories:

• Trait
• Situational – 19th and 20th century, Spencer, Marx, Fiedler

Different situations (and followers) call for different traits

Leadership styles:

<table>
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<th>-</th>
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<tr>
<td>Authoritarian</td>
<td>Crisis, war</td>
<td>Day-to-day</td>
</tr>
<tr>
<td>Democratic</td>
<td>Consensus</td>
<td>Crisis, dissent</td>
</tr>
<tr>
<td>“Laissez-faire”</td>
<td>Freedom</td>
<td>Organizational problems</td>
</tr>
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</table>
Communication Skills for Neurosurgeons: Neurosurgery Boot Camp 2

Michael M. Haglund MD, PhD, FCS (ECSA)
Distinguished Professor of Neurosurgery, Neurobiology, & Global Health
Program and Training Director, Duke Neurosurgery
Co-Director Uganda Neurosurgery Training Program
Surgical Director, Duke Epilepsy Center

and

Neil Prose MD
Professor of Pediatrics and Dermatology

Duke University Health System
Durham, North Carolina

Supported by a Dr. Dzau Duke GME Innovation Grant
53 paid registrants

Course offered as a flipped classroom

Topics divided into 3 Topical Areas:
I. Getting the Right Job and Building a Career – 13 modules
II. Medicolegal and Ethics Considerations in Neurosurgical Practice – 9 modules
III. Personal Finance – 4 modules

Residents provided with modules in advance of the course allowing live course to be used for discussion and Q and A only, eliminating lectures and maximizing interaction with faculty. Residents were presented with a pre-course survey upon entrance course to determine preparedness—3/11 reviewed 75% or more of the 26 modules and ratings of the materials were rated above average.

Format well received; overall post-course evaluations were high.

Course Faculty: J. Bean; D. Benzil; J. Cheng; W. Couldwell; A. Dehdashti; S. Pelofsky; J. Ratliff; J. Rosman; M. Stippler; L. Tumialan; R. Whitmore; C. Winfree; R. Wohns
SNS/AANS Transition to Practice for Senior Residents
Saturday, April 13, 2019 8am-12noon, San Diego, CA

Course Co-Directors:
Deborah L. Benzil, MD, FAANS, FACS, Cleveland Clinic
Christopher J. Winfree, MD, FAANS, Columbia University

Dear Residents: This course is being offered as a flipped classroom. Course faculty have prepared a variety of modules to prepare you for the interactive sessions that will be held during the live course in April. Taking the time to review each module in advance will make the upcoming course more effective. You are encouraged to write down questions related to the material. Our goal in providing this as a flipped classroom is to devote our time together to discussion and Q&A while referencing the modules.

Please note that within this Dropbox link, you will find that the content modules are divided into 3 Programmatic Areas to mirror the live course:

**Area #1 Getting the Right Job and Building a Career**
- Approaching Your Job Search – Trends in NS Practices and Hospital Employment - prepared by Judy Rosman, JD
- How to make the Most of Your Interviews, Negotiate Your Contract, and Succeed in Your New Practice - prepared by Judy Rosman, JD
- Negotiation Essentials (Job focused) – prepared by Deborah Benzil, MD
- Conquering Oral Boards – prepared by William T. Coudwell, MD, PhD
- Building A Successful Practice 101 - prepared by Stan Pelofsky, MD
- Medical Economics – 101 – prepared by Deborah L. Benzil, MD
- Medical Economics and Billing Basics: Parts 1-3-3 – prepared by Luis M. Tumialan, MD, John K. Ratiliff, MD and Deborah Benzil, MD
- Staying Out of Trouble – prepared by Robert T. Whitmore, MD
- Resilience and Well-Being – prepared by Martina Stippler, MD
- Physician Burn Out -JM - submitted by Martina Stippler, MD
- Burnout as a Business Case – submitted by Martina Stippler, MD
- Mayo Burn Out – submitted by Martina Stippler, MD

**Area #2 Medicolegal and Ethics Considerations in Neurosurgical Practice**
- Code of Ethics – submitted by James R. Bean, MD
- Conflict of Interest -Professional Medical Associations and Their Relationships with Industry – submitted by James R. Bean, MD
- EMTALA Fact Sheet – submitted by James R. Bean, MD

**Area #3 Personal Finance**
- Personal Finance – prepared by Christopher J. Winfree, MD
Sustainable Funding

New Cost Structure

<table>
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<tr>
<th>Year</th>
<th>PGY1</th>
<th>PGY2</th>
<th>PGY4/5</th>
<th>PGY6/7</th>
<th>Total</th>
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<tr>
<td>2016</td>
<td>$320,000</td>
<td>$458,000</td>
<td>$45,000</td>
<td>$27,000</td>
<td>$850,000</td>
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<tr>
<td>2018</td>
<td>$256,382</td>
<td>$212,933</td>
<td>$22,000</td>
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<td>$491,315</td>
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$360,000 reduction

Registration fees for PGY-2 course net $37,000/yr for SNS course reserves for a total of $110,000 to date
2018 – Major Changes

2017

- PGY1 $250,000
- PGY2 $196,000
- PGY7 $27,000
- Total $473,000

Projected Savings = $377,000
“Passing neurosurgery from one generation to the next is the highest calling you have.”

Thomas J Nasca, MD
CEO, ACGME
Suggestions

• One leadership structure in one society, one large inclusive committee to create curriculum.
• Include members linked to Milestones, Matrix, written and oral boards
• Survey your senior residents to see what they think would be most useful.
• Hands on curriculum, flipped classroom, small groups, senior faculty
• Pilot a single course at one level through one society supported by one company
• Survey residents, faculty and industry partner for annual improvements
• Videotape the best material and keep it on line for reference
• Enjoy some face-to-face teaching time with the next generation of your specialty!
Thank you
The 2015 RUNN Course Curriculum: Tradition and Innovation

The founding mission and core values of the RUNN Course remained unchanged. The NIN Executive Committee (representing North American Residents Program Directors) reaffirmed its commitment to the course and its legacy.

In response to recent course evaluations and discussions with Program Directors and residents, the course was shortened in 1999 from two weeks to one week with travel days on adjacent weekends. The one and one-half hour length of individual lectures allows for stimulating interaction between the lecturers and the participants. Two such lectures are given each morning, two each afternoon, and one each evening. Curriculum content was reorganized to include lectures covering the spectrum of molecular, cellular, and systems neuroscience. Lectures covered topics on molecular genetics, signaling and receptors, brain cells, cell death, regeneration, neurotransmitters, glial barriers, vascular tree and phagocytes, cognitive information science, circuit modeling, and higher cortical function. Although many of the lectures were, their material is surprisingly fresh reflecting new discoveries made in their labs. Many of the lecturers were given by practicing neurosurgeons with active clinical laboratories. There were tours of the NIH laboratories and the very popular egad giant squid dissection lab. There were discussions on academic career development, grantmanship, history and philosophy of science and the scientific method, and history of the NIH. And there were the traditional opening get-acquainted reception and Course Orientation, and the annual lobster bake and barbecue ceremony.

We acknowledge generous grants from:

Education Grants 2015 RUNN Course

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<th>Company</th>
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<tr>
<td>Integra Foundation</td>
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<tr>
<td>Stryker Corporation (CMF &amp; Neuro, Spine, ENT (NSE))</td>
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<td>Stryker</td>
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<td>Zimmer/Biomet</td>
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<td>Arbor Pharmaceutical, L.L.C.</td>
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<td>DePuy Synthes Codman Neuro</td>
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<td>Mizuho America</td>
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<td><strong>TOTAL</strong></td>
<td><strong>$32,000.00</strong></td>
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These grants subsidized faculty travel and honoraria costs.

2018
Alan Friedman, MD NREF HYM fund
Course Finances
2017– Major Changes

- Proposed changes reviewed and approved at SNS Interim Meeting – **December 3, 2016**
  - Programs cover travel costs
  - PGY2 course changes:
    - Continue 1.5 days
    - Only arm specimens retained
    - $195 registration fee imposed
  - Reduction in meeting administration fee
  - Merge PGY4-5 and PGY6-7 courses
Making it relevant and making it SNS

- For senior residents
- Unique
- Practical
- Inexpensive
- Knowledge gap
- Milestones driven
- Matrix driven
- Flipped classroom
- Interactive
Senior Resident Course

Join us Sunday, April 29, 2018 at the AANS Annual Meeting in New Orleans, LA

SNS Senior Resident Course: Transition to Practice
Co-Directors: Aaron Cohen-Gadol and William T. Couldwell

7:00-7:10 Introduction
7:10-8:45 Where Will You Work? Hospital/Academics/Privademics
8:45-9:10 Fundamentals of Medical Billing
9:10-10:00 Building a Neurosurgical Team- Community and Academic Settings Incorporating APPs into your Practice
10:00-10:10 Coffee Break
10:10-10:40 Contemporary Spine “case-based discussion
10:40-11:05 Managing Outpatient Practices
11:05-11:40 Economics of SurgiCenters
11:40-1:10 Working Lunch (includes new technologies hands-on showcase)
1:10-1:35 Certification and MOC
1:35-2:15 Regulatory and Malpractice Primer
2:15-3:00 Staying out of Trouble in Practice/
Work Life Balance 3:00-3:40 Personal Finance and Investment
3:40-3:50 Coffee Break
3:50-4:10 Cranial Nuance “case-based discussion
4:10 -4:30 Future of Healthcare
Junior Resident Course

Highest rated simulations:
- SSS injury
- Endovascular
- Vessel anastomosis

New in 2018
- Spine skills-pedicle screws
- Extremity prosection
- Shunts moved to PGY1

2018 revenue $258,607-$212,933=$20,673 pass back
I WAS A MILLENNIAL

I Replaced ‘Cat’ With ‘Millennial’ in a Bunch of Cat Facts and it Turns Out They’re All True!

WHEN YOU SCOLD YOUR DOG WHEN YOU SCOLD YOUR CAT

THE SOCIETY OF NEUROLOGICAL SURGEONS