Highlights of Neurology Education Research 2014

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Themes

Groups of learners
• Medical student education
• Resident education
• CME
• Patient/public education

Strategies for Teaching
• Modeling/hands-on behavior
• Simulation
• Role of testing
• Positive deviance
Scheduled Faculty Modeling of Bedside Skills for 3rd Year Medical Students on the Neurology Clerkship

Robert Thompson Stone MD, Trent Tollefson MD, Ronald Epstein MD, Ralph F. Jozefowicz MD, Jonathan Mink MD PhD
University of Rochester Medical Center

Abstract #2722
Direct observation is an important component to learning clinical skills. Faculty modeling of neurologic bedside skills for third year medical student clerks is often informal and incomplete.

- 2012-2013 academic year – 56 students observed a neurology faculty member conduct a comprehensive history and neurologic examination on a new outpatient.
- Students were given an observation guide to record questions and learning points.
- Observation statements were compiled and categorized into learning themes using qualitative thematic analysis.
Learning Themes (# of statements, % of total statements):

**History-taking Technique**
73 Statements
28.9% of total

**Neurologic Examination Techniques**
103 Statements
40.7% of total

**Detail, Thorough**
45 Statements
18% of Total

**Encounter Flow**
13 Statements
5.1% of total

**Connecting and Communication with Patient and Family**
19 Statements
7.5% of total
Conclusions:

- Formal modeling of a neurologic encounter and allowing “active” observation helped clerks identify and characterize important clinical skill learning themes.
- Implementing formal faculty modeling of the neurologic examination for clerkship students was feasible.
Changing Medical Student Perceptions of Dementia: An Arts-Centered Experience

Hannah J Roberts,1 James M Noble MD MS CPH1,2,3

1Columbia University College of Physicians & Surgeons, 2Arts & Minds, 3Department of Neurology and Taub Institute for Research on Alzheimer’s Disease and the Aging Brain, Columbia University; New York, NY

• P1.318 (Abstract 3907)
• Poster presentation Monday, April 28, 2014 at 5pm
• Study funding: Steve Miller Fellowship in Medical Education (HJR, CU)
• Disclosures:
  – Dr. Noble serves in a volunteer capacity as the president of Arts & Minds (501c3), which served as the vehicle for 2 of the 4 program sites.
    • The effect of Arts & Minds v. other program sites was not explored in this research.
    • Dr. Noble’s relationship with this project has been reviewed by the Columbia University Conflict of Interest Committee and considered to not pose a significant conflict of interest to this work.
Background/Methods

• **Background:**
  – Clinical dementia encounters are principally hospital or clinic based
  – Student *comfort and knowledge of working with dementia* patients
    • Not well described
    • Has potential to impact
      – Subsequent clinical encounters
      – Career choices

• **Methods:**
  – 19 Columbia University preclinical medical students
  – **Dementia Attitudes Survey** (DAS)
    • Taken baseline, post-intervention
    • Subset of students repeated test prior to intervention
      – Assess impact of simply taking the test
  – Intervention: *Single 90 min NY art museum dementia program*
# Key findings

<table>
<thead>
<tr>
<th>Dementia Attitudes Scale Mean (SD)</th>
<th>Baseline</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>range 20 [poor] to 140 [favorable]</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All students (n=19)</td>
<td>97.4 (11.2)</td>
<td>105.8 (11.0)*</td>
</tr>
<tr>
<td>Repeated baseline DAS (n=10)</td>
<td>Initial</td>
<td>95.7 (7.7)</td>
</tr>
<tr>
<td></td>
<td>Repeated</td>
<td>98.7 (7.4)b</td>
</tr>
<tr>
<td></td>
<td></td>
<td>105.1 (10.0) †‡</td>
</tr>
</tbody>
</table>

* p<0.001 baseline v. follow-up testing, all students
† p<0.01 baseline (initial) v. follow-up
‡ p<0.05 baseline (repeated) v. follow-up
b For the repeated baseline testing, p=0.09.

Qualitative assessment:
Presented as “Word cloud” (Post-intervention)
Conclusions/Future Directions

Conclusions
• Program was associated with improved dementia attitudes
• Value of similar non-clinical student experiences
  – Attendance as observer at Alcoholics Anonymous meetings

Future directions:
• Longitudinal outcomes
  – Attitudes
  – Career choices
• Expansion of approach
  – More students
  – More schools
Methodology for Delivering Feedback to Neurology House Staff on Communication Skills Using AIDET (Acknowledge, Introduce, Duration, Explanation, Thank you)

Austin Katona, B.Sc., Elisabeth J. Kunkel, M.D., Jennifer Jasmine Arfaa, Ph.D., Stephen Weinstein, Ph.D., Christopher Skidmore, M.D.

Thomas Jefferson University Hospital (Philadelphia, PA)
Department of Neurology

Abstract No. 1724

No disclosures made.
Background:
• A pilot study measuring the effectiveness of a new tool
• AIDET™ (Acknowledge, Introduce, Duration, Explanation, Thank you)
• For assessing physicians’ communication behaviors.

Method:
• Direct observation from a single observer (A.K.) of 20 continuity clinic visits at Thomas Jefferson University Hospital (TJUH).
  – Neurology residents (n=10) were observed during one or more one-on-one interactions with new patients
  – Residents were rated using an 18-item instrument based on AIDET™
  – Points (1 or 2 per item) were awarded according to specific behaviors performed or AIDET items addressed.
  – Each physician-patient interaction yielded 5 Domain scores (A-I-D-E-T), and an overall score
  – Overall scores were scaled from 0-27 points, and from 0-100 percent of items addressed
Key Findings:

- Total scores ranged from 14-26 points (51.9-96.3% performance)

- Average percentage of behaviors performed per AIDET™ category:
  - Acknowledge: 86.4%
  - Introduce: 43.3%
  - Duration: 99.0%
  - Explanation: 77.5%
  - Thank you: 58.3%
Conclusions:
• Physicians had the most difficulty with:
  1) Introducing themselves to patients properly (including specialty, role in patient’s care)
  2) Thanking patients (i.e. ending on a gracious note)
• These findings were used to deliver feedback to residents and direct the emphasis of a communication skills training (CST) program to address areas of opportunity.
• Following training, a small sample size of pre-training (n=8) and post-training (n=2) data were analyzed, revealing that performance in the “Introduce” category improved from 29.2 to 75.0%.

Future Directions:
• Direct observation, performance feedback and didactic training may be valuable in improving physician communication skills, which has implications for patient satisfaction and quality of care.
Standardized Evaluation of Didactic Conference Content in Neurology Residency: A New Approach
Abstract Number: 1649

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Saul R. Korey Department of Neurology, Albert Einstein College of Medicine, Bronx, NY
Department of Neurology, University of Rochester Medical Center, Rochester, NY

No disclosures
Background:

- Little is known about the **content of regularly scheduled didactic conferences** in neurology residency education
- An algorithm that standardizes curricular content measurement could allow comparison of didactic session content and methodology across different neurology training programs

Methodology

- We performed a retrospective analysis of the 2012-2013 conference curriculum for two neurology residency programs
- Each conference in each program was analyzed for duration, content, frequency and formally expected resident attendance
- **Exposure to each conference type was recorded in units of residency-program hours (RPH).**
- One RPH represented all residents in each program attending 1 hour of conference
Key Findings

• In two neurology residencies, we identified 26 and 27 different subject matter and conference formats
• Each program contained 210 and 307 Resident Program Hours (RPH) in scheduled conferences for the academic year 2012-2013
• Interactive conference formats (morning report and case conference) represented 52% and 18% of conference content in each program
• Conferences that are designed for multiclass participation and/or occur during protected time have the highest impact in the conference curriculum of each residency overall
• The highest variability in curricular content was noted in neurology advocacy, bioethics and palliative care
• Sleep neurology is amongst the least represented content in both residencies
Conclusion/Future Direction

• This algorithm appears to allow recording, assigning relating weight and comparing curricular content across different neurology residencies.
• Evaluation of an additional residency program could help further assess the validity, generalizability and utility of this curricular assessment tool.
• A next step could attempt to measure differences in conference content and resident knowledge base across programs.
High-Fidelity Simulation Versus Traditional Didactic Techniques for Teaching Neurological Emergencies to Neurology Residents: A Feasibility Study.

Sachin Agarwal¹, Neha S. Dangayach¹, Priyank Patel¹, Ashley Roque¹, Melissa Cappert², Dennis Fowler², Stephan Mayer¹, Jan Claassen¹

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Abstract #: 3773
Poster Presentation #: P1.323

Financial Support: This abstract has been supported by the American Academy of Neurology Education grant 2013 and the Apgar grant 2013.
Introduction

• Highly variable exposure to **Neurocritical care** among Neurology residents
• In spite of the proven success of Simulation based learning (SBL) for procedural training, there is a lack of studies evaluating SBL in teaching neurological emergencies

Methods

• PGY-2 neurology residents (N=10) from Columbia University and Weill Cornell
• **Randomized** into SBL and traditional didactic teaching groups
• High-fidelity Sim-Man 3G, simulated realistic scenarios of **acute ischemic stroke, intracranial pressure crisis, and status epilepticus**
• Learning objectives were assessed using crisis resource management (CRM) assessment tools including identification of **key actions**, time to key action, Ottawa CRM checklist, and **knowledge based** pre- and post-intervention tests.
• **Repeated testing was performed at 3 months** to evaluate learner’s retention along with Learner’s satisfaction survey.
Results

FEASIBILITY:
Our study proves that it is possible to teach Neurological emergencies to Neurology residents using Simulation

KNOWLEDGE BASED PRE-, and POST-TEST SCORES:
• Significant difference between Total scores for Stroke, ICP and Status scores individually at baseline
• No significant difference between scores at 3 months
• Both at baseline and at three months, no significant difference between Total, Stroke, ICP or Status scores when comparing cases taught using didactics versus Simulation

KEY ACTION SCORE
No significant difference between total ICP or Status scores BUT there was a trend towards increased Stroke scores in simulation group

TIME TO KEY ACTION SCORE
Comparing didactics and simulation there was a trend towards increased Stroke score at baseline and three months
Conclusions/Future Directions

• Using High-Fidelity simulation for teaching neurological emergencies to new PGY-2 neurology residents is feasible
• Learner retention was observed after 3 months
• Trend towards better learning for acute stroke code in simulation group compared to didactic teaching
• Simulation based learning offers promise as a tool for objectively assessing some of the ACGME competencies that are more difficult to evaluate via traditional means
• A larger sample size is required to validate the use of simulation to formally evaluate performance of critical care skills in real-time
Development of a simulated patient exercise to improve acute stroke care by neurology residents

(Abstract : 4050)

• Authors: Adam G. Kelly, MD; Ralph F. Jozefowicz, MD
• Institution: University of Rochester
• Funding sources: Donald W. Reynolds Foundation, University of Rochester Dean’s Teaching Fellowship program
• Background: Simulation exercises may help residents develop skills necessary for acute stroke care, including **patient/family communication**

• Methods:
  – Baseline survey to evaluate residents’ perceived abilities to provide acute stroke care
  – **Simulation design**: spouse of an acute stroke patient who is risk averse about using IV tPA; resident expected to discuss diagnosis and risks/benefits of treatment
  – **Survey** conducted with resident cohort following simulation exercises
  – **Outcome**: Institution door-to-IV tPA treatment times compared pre- and post-exercises
Education research highlights – 3

• Key findings:
  – Residents felt better suited to discuss risks and benefits of IV tPA following simulations
  – Residents who underwent simulations earlier in training developed self-perceived proficiency to provide acute stroke care earlier than prior classes
  – *Institution door-to-treatment times were improved in the 6 months following simulation (54 vs. 68 minutes, *p* = 0.01)*
• Conclusions:
  – Simulations focusing on communication skills may help residents develop proficiency in acute stroke care earlier in residency
  – Simulation exercises emphasizing communication skills do not result in delayed tPA treatment; instead, they may improve time-based quality improvement metrics
The effect of repeated quizzing on long-term retention in AAN annual meeting courses

Abstract S30.004

Douglas P. Larsen¹
Wint Yan Aung¹
John R. Corboy²
Deborah I. Friedman³
Ann Tilton⁴
Andrew C. Butler⁵

Funding: AAN CME Effectiveness Research Grant

Background and Methods

• Background: **Test-enhanced learning** is a powerful education technique that has been well-studied in various educational contexts but has never been investigated in CME.

• Methods:
  – Attendees at four AAN annual meeting courses took a pre-test over the material for the courses.
  – Course material was divided into thirds.
  – Participants were **randomized** for each third of the material to either be repeatedly quizzed (T), study a review sheet (R), or have no further exposure.
  – Participants received the first quiz and study material immediately after the course and then weekly for three additional weeks.
  – **Final test nearly six months after the initial course.**
Results

- Average pre-test score: 36%
- Average final test scores by follow-up condition:
  - quizzing 55%
  - review 46%
  - no further exposure 44%
- Repeated quizzing significantly superior to review or no further exposure
  - T>R \( p = .01 \) \( d = .49 \)
  - T>NE \( p = .01 \) \( d = .58 \)
Conclusions

• Repeated quizzing produced almost twice the gain in knowledge compared to repeated study or no further exposure.
• Repeated studying did not produce significantly greater gains than no further exposure.
• CME course planners should consider adding follow-up quizzing to their courses to increase long-term retention.
Test-enhanced learning improves retention in medical students

Effect of a Novel Video Game on Stroke Knowledge of 9- to 10-Year-Old, Low-Income Children

Olajide Williams, Mindy F. Hecht, Alexandra L. DeSorbo, Saima Huq, and James M. Noble

Stroke
Volume 45(3):889-892
February 24, 2014
Screenshots from Clot Buster stroke video game

Williams O et al. Stroke 2014;45:889-892
Frequency of correct stroke knowledge responses

Williams O et al. Stroke 2014;45:889-892
Positive deviance for improvement of efficiency and resident satisfaction in Neurology continuity clinic

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Kartavya Sharma, MD
Steven Vernino, MD, PhD
Pravin Khemani, MD

Department of Neurology and Neurotherapeutics, University of Texas Southwestern Medical Center, Dallas, TX, USA, 75235

Abstract P1.310
Positive deviance in neurology clinic

• BACKGROUND:
  – Positive deviance relies on the identification of individuals whose uncommon behaviors and strategies enable them to find better solutions to problems than their peers, while having access to the same resources and facing similar or worse challenges.

• METHODS:
  – In this pilot study, we used face-to-face interviews, online surveys and chart reviews to identify positive deviants displaying advantageous behaviors to improve encounter efficiency and resident satisfaction in neurology clinic.
  – Advantageous behaviors were amplified through quarterly focus groups and written reports, troika consulting group dynamic and orientation sessions.
  – Changes in resident satisfaction and encounter efficiency were measured via chart reviews and online surveys at 1 year.
Positive devianace in neurology clinic

• RESULTS:
  – Post intervention, more residents reported satisfaction with their own clinical performance (35.7% before vs. 73.3% after, p<.01).  
  – The mean encounter time was reduced by 11% (140±2 min before vs. 128±2 min after, p<.001) and more encounters lasted less than 90 min (14.1% before vs. 18.4% after, p < 0.01). 
  – Junior residents (PGY2) showed the largest reduction in mean encounter time (24 min). 
  – More residents reported useful strategies to cope with challenges during clinic (64.2% before vs. 86.6% after, p<.05), including typing a note during the encounter, using note templates and completing documentation at the end of the clinic day.
Positive deviance in neurology clinic

• CONCLUSION:
  – The **positive deviance** approach is an effective behavioral intervention to improve satisfaction and efficiency of neurology residents in the clinic. System-based pedagogic strategies that integrate positive deviance may enhance neurology training and improve patient care.
Timely Initiation of Therapeutic Hypothermia in Post-Cardiac Arrest Patients

Laura Rosow, MD
S. Andrew Josephson, MD

UCSF Medical Center Dept. of Neurology

Abstract #3998
Background and Methods

• Background:
  – Therapeutic hypothermia favorably impacts neurological outcomes after cardiac arrest (NNT = 6)
  – However, it can often be difficult for residents to initiate cooling measures in a timely fashion in these critically ill patients.

• Goal of project:
  – Decrease the amount of time between neurological consultation for therapeutic hypothermia and initiation of cooling measures
  – Target 80% within 30 minutes

• Methods:
  – Residents educated on importance of prompt cooling and on systems-based strategies to help initiate cooling measures quickly
  – Utilized a financial incentive system for quality improvement supported by UCSF Office of Graduate Medical Education
  – Pilot data collected over 3 months, primary data over 12 months
Findings

- 22 consults during primary data collection that resulted in initiation of therapeutic hypothermia
- In 20 out of 22 patients, cooling initiated (or continued if started in the field) within stated goal time of 30 minutes.
  - Improvement from 3 out of 7 patients in pilot dataset ($p = 0.006$)
Conclusions

• Under incentive program, residents successfully decreased time to cooling in a significant number of post-cardiac arrest patients.

• Residents felt that having a stated time goal helped them advocate more aggressively for these patients.

• Moving forward:
  – Financial incentive programs can be applied to additional time-sensitive neurocritical care scenarios (e.g., management of status epilepticus; lowering BP in intracerebral hemorrhage)
Summary

• There is a wide range of neurology education research occurring
  – Covers many types of learners
  – Covers many approaches/philosophies of education
• Lots of creativity
• Much of it is being done by residents/fellows
• Much of it is pilot, single or few center, non-randomized
• Much of it has been funded by AAN, local institutions, other foundations
Possible roles for new junior faculty interested in medical education

• Developing a medical school elective
• Developing a medical school experience – e.g., an Objective Structured Clinical Examination (OSCE), a problem-based learning module, a neurological exam sequence in a physical examination course, a simulated patient lumbar puncture exercise, or a direct observation experience
• Advising your institution’s Student Interest Group in Neurology (SIGN)
• Developing or coordinating your department’s Clinical Skills Evaluations (CSEs) – the exercises within residency training that have replaced the oral board examination
• Developing or coordinating a residency experience – e.g., a rehabilitation rotation or a research experience
• Organizing a departmental lecture series
• Becoming a member of a departmental committee – e.g., neurology clerkship committee, residency selection committee, or residency program evaluation committee
• Becoming a member of a medical school committee – e.g., curriculum committee or admissions committee
• Giving lectures to other departments within the institution
• Giving lectures at other local institutions
• Teaching in or organizing local continuing medical education (CME) courses

AANI MERTF Key Points

- Education research broadly defined
- Includes: medical students, residents/fellows, CME, interprofessional health care teams
- $65 K with up to $10 K for tuition
- Eligible
  - AAN Member
  - >5 years from last training position
- Mentor: can be from another institution
- Submit:
  - Research plan (3 pages)
  - Training plan (1 page)
  - Mentor letter
  - Chair’s letter
  - Reference letter

DUE 8/1/14! Funding starts 10/1/2014!

Apply at aan.com/view/EducationRFA

The American Academy of Neurology Institute (AAN Institute), the education subsidiary of the American Academy of Neurology, is pleased to announce a one-year Medical Education Research Training Fellowship. The fellowship will consist of a commitment of $45,000 for one year. Up to $10,000 of the fellowship funds may be used for tuition to support formal education in education research methodology at the applicant’s institution or elsewhere. Supplementation of the stipend with other grants or by the fellowship institution is permissible, but fellows may not accept other fellowships, similar awards, or have another source of support for more than 30 percent of their research salary while holding an AAN Institute Medical Education Research Training Fellowship. Only direct costs will be funded by this fellowship.

ELIGIBILITY
1. For the purpose of this fellowship, medical education research is defined as ‘medically oriented education research with the goal of developing efficient and effective psychosocial and behavioral interventions to improve teaching, learning, and health care practice to ultimately impact patient and family outcomes.’
2. Applicant must be an AAN member (Active or Junior) embarking on a career in medical education research who has completed a neurology, child neurology, or neuro-developmental disabilities residency or neurology fellowship within the past five years.
3. The primary mentor may be from a different institution; Mentors from other disciplines of education research are welcome.

MATERIALS FOR APPLICATION
Submit one complete set of the following application materials via the AAN.com website: AAN.com/View/EducationRFA.
1. Letter of nomination from the chair of the department of neurology or child neurology, including assurance that at least 50 percent of the fellow’s time be dedicated to the research of the fellowship.
2. A three-page research plan, including brief statements of aims, background, and the contemplated approaches to methodology and data. The research plan should be written by the applicant and should represent his/ her original work; however, the applicant is expected and encouraged to develop this plan based on discussion with the proposed mentor. If appropriate for the proposed work to be related to the mentor’s ongoing research, but not required.
3. Up to one-page statement of the training plan which may consist of formal coursework and/or informal training by the mentor including: Quantitative and qualitative education research methodology, biostatistics, study design, data analysis, and ethics.
5. One letter of reference supporting the applicant’s potential for an academic education research career and qualifications for the fellowship. Letter of reference is in addition to the three-page research plan.
6. Listing of the applicant’s current and pending support, other than this fellowship, using NIH format.
7. Listing of the mentor’s current and pending support, other than this fellowship, using NIH format.
8. Letter from proposed mentor detailing his/her support of and commitment to the applicant and the proposed research and training plan. The letter should specifically indicate the mentor’s role in the development and preparation of the applicant’s research plan and should describe:
   - Expertise and experience in the area of education research proposed and the nature of the mentor’s proposed time commitment to the supervision and training of the applicant.
   - Mentor’s prior experience in the supervision, training, and successful mentoring of education researchers.
   - Potential for applicant’s future medical education research career.
   - More than one mentor is permitted. One mentor should be designated as primary and be responsible for administrative issues.
10. Additional letters of support/endorsement from key collaborators or stakeholders are permitted but not required (if more than one letter of support/endorsement, combine all into one pdf).

EVALUATION AND SELECTION
Applications are evaluated by members of the AAN Institute’s Education Research Subcommittee based on the following criteria:
- Applicant’s ability and potential as a medical education researcher based on prior record of achievement and career plan, letters of reference, and curriculum vitae (30 percent).
- Quality and nature of the training to be provided (30 percent).
- Quality and originality of the research plan (40 percent). Priority will be given to plans evaluating educational outcomes impacting learning and medical practice change, population health outcomes, and patient quality or safety outcomes. The intervention population may be medical students, residents, practicing physicians (i.e., CME), or interprofessional health care teams.

Funding begins October 1, 2014, after executing a signed agreement prepared by the AAN Institute, between the AAN Institute, the recipient, and the recipient’s institution; half of the funding will be in 2014, and half will be in early in 2015.

ANNUAL AND FINAL PROGRESS REPORTS
A progress report will be due by May 30, 2015. A one-year, no-cost extension may be awarded only with approval of the AAN Institute’s Education Research Subcommittee. Additionally, a final research report and a final expenditure report are due by February 28, 2016. The institution must prepare the final expenditure report.

DEADLINE AND ADDRESS
All applications and supporting materials must be received by August 1, 2014. All materials must be submitted online. Apply now at AAN.com/View/EducationRFA.

Notification of recipients: October 2014.
For more information, contact Nancy Fischmann, Manager, Education & Travel, at nfischmann@aan.com or (612) 986-4103.

Please note: For the 2015 fellowship, the application deadline will be February 1, 2015. Notification of the recipient will take place in April 2015. All 2015 funding will be dispersed in 2015.