

Poster Abstracts from the PAEA 2006 Annual Education Forum—Quebec City, Canada, October 25–29

POSTER ABSTRACTS

1. ANALYSIS OF THE LEARNING-STYLE PREFERENCES OF ENTRY-LEVEL, UPPER-DIVISION UNDERGRADUATE/GRADUATE STUDENTS IN ALLIED HEALTH IDENTIFIED WITH ANALYTIC AND GLOBAL FORMAT LEARNING-STYLE ASSESSMENTS. D. Morton-Rias, SUNY Downstate Medical Center.

The purpose of this research was to identify the learning styles of allied health students using analytic and global format learning-style assessment instruments and to examine correlations among the identified learning-style scores and the student's gender, ethnicity, and age. The goal of obtaining this information was to compare learning style preferences identified with two valid and reliable instruments and to provide students, faculty, staff, and administrators with empirical information regarding student learning.

One hundred and fifty-four students enrolled in the College of Health Professions during summer 2004 were invited to participate in the study. The Productivity Environmental Preference Survey (PEPS), and Building Excellence Survey (BE) (Rundle & Dunn, 2000), were completed by a volunteer sample of 87 allied health students.

Correlation analyses confirmed relationships between student learning styles as identified with PEPS and those same students identified with BE ($p < .001$). The following elements evidenced large effect sizes (a) sound, (b) light, (c) temperature, (d) intake, (e) time of day/early morning (f) time of day/afternoon, (g) time of day/late afternoon, (h) time of day/evening, (i) afternoon/late afternoon, and (j) afternoon/evening ($p .001$). Correlations of medium effect size were demonstrated among the following matched elements: (a) design/seating (b) peer-team/small group-team (c) time of day/late morning, (d) mobility, (e) auditory, and (f) tactile/tactile and/or kinesthetic preferences. The study sample evidenced significant learning-style tendencies and preferences with both instruments.

Analysis of variance (ANOVA) and post hoc tests using Tukey's HSD procedures also revealed learning-style characteristics among ethnically diverse students. Students self-identified as Asian/Pacific Islanders evidenced greater

tendencies towards responsibility/conformity. Gender-related learning-style characteristics among the study sample included female preferences for auditory learning and male preferences for cooler temperature and mobility as well as small group and team learning among upper-division undergraduate and graduate allied health students.

Analyses of variance (ANOVA) and the follow-up post hoc tests using Tukey's HSD procedures revealed age related learning-style differences regarding structure, intake, afternoon preference, mobility, auditory preference, seating, and early morning preference. Younger learners (age 20–39) were more auditory and preferred early morning over their older counterparts (age 40 and over). Older learners preferred more structure, intake, afternoon over other times of the day, and mobility while learning new and difficult information. Although learning-style tendencies may be related to age, gender, and ethnicity, the findings demonstrated the overall diversity of learning style tendencies that existed among adult students in allied health as measured by both analytically formatted as well as globally formatted learning-style assessment instruments.

A follow-up qualitative assessment was included in this research design. Themes emerged that revealed students' preferences for the globally formatted, computer-based learning-style instrument. Most students preferred the computer-based assessment tool because of the time of day flexibility and immediacy of the feedback provided. Learners also felt that the computer-based assessment tool provided more descriptive feedback. Finally, the participants expressed appreciation for the opportunity to "learn how they learn." As a result of this research, allied health educators learned exactly how their students preferred to learn. Armed with this information, allied health educators may modify instructional techniques to meet the varied needs of their student body. Students may also be empowered to modify their self-study approaches to reflect their individual learning-style preferences.

2. ASSIGNMENTS AIMED AT DEVELOPING COMPETENCY IN PROFESSIONAL WRITING AND PRESENTATION SKILLS. D. Kortyna, M. Hertweck, J. Laird, S. Hawkins, S. Fortnam, B. Marcieski, Chatham College.

Written assignments have been a standard for evaluating professional competency in PA education. The standard SOAP note, H&P, Op note, procedure note, and discharge summaries have been used as examples of documentation skills for PA students.

Additional assignments can be crafted with the purpose of building competency in scientific writing, publication, and presentation skills.

Two case reports are assigned to be completed during elective clinical rotations. These assignments are meant to be completed in a format to be submitted for journal publication. This has the dual effect of building the skill of writing case reports for refereed journals as well as increasing skills for critical analysis of the literature.

Oral case presentations and grand rounds PowerPoint presentations help students build competency in verbal skills to aid in professional presentations. Additionally, the grand rounds presentations require that students develop the skills necessary to do computer assisted presentations.

Students are encouraged to participate in the PAEA Student Writing Competition. This exercise allows students to explore their skills in professional writing with faculty guidance and feedback.

The combination of these assignments is aimed at providing students with the opportunity to build skills in professional writing and presentation that will enhance their professional role after graduation.

3. COMPARISON OF MEDICAL STUDENT AND PHYSICIAN ASSISTANT STUDENT SCORES OVER THREE YEARS OF STANDARDIZED-PATIENT ASSESSMENTS. T. Hegmann, G. Bergus, D. Asprey, University of Iowa.

Introduction: Standardized patients (SPs) are widely used in medical education for teaching and evaluating clinical skills. Use of SPs holds the promise of allowing comprehensive assessment of clinical skills that cannot be measured effectively by written exams and cannot be measured reliably by subjective faculty clerkship ratings. However, this form of evaluation presents many challenges. These include establishing credible passing scores in the absence of a “gold standard” comparison, the high cost of establishing SP programs, and the difficult task of demonstrating the accuracy, reliability, validity, and utility of SP programs. There is very little research available on PA student performance on SP exams. The goal of this study is to compare the performance of third-year medical students and second-year PA students in a well-established SP testing program.

Methods: Third-year medical students and second-year PA students participated in SP exams at the University of Iowa Carver College of Medicine in 2004, 2005, and 2006. PA students took the exams after completing 36 weeks (3/4) of clinical rotations. Medical students participated as a component of a 12-week ambulatory care rotation. The medical students in this study had completed an average of 36 weeks of clinical rotations at the time of their testing. In 2004, 39 M3s and 25 PA students took three of the same cases; in 2005, 32 M3s and 23 PA students took four of the same SP cases, and in 2006, 30 M3s and 23 PA students took two of the same cases. Specific cases varied from year to year. Scoring was accomplished through checklists completed by SPs.

Results: The overall mean scores of PA and M3 students on the SP exams were compared using SAS to run t tests. No significant differences were found between the two types of students for any of the 3 years. Power analysis revealed a 50% power to detect a true difference between the groups of 1/2 standard deviation (around 3.5 score points) and a 95% power to detect a true difference of 1 standard deviation (around 7 score points).

Discussion: Second-year PA student performance on SP testing was indistinguishable from performance of third-year medical students on the same SP cases. This result would be expected if SP testing truly functions as a measure of clinical experience (rather than knowledge information base), since these groups of students have had comparable amounts of time in clinical rotation settings, though greatly differing amounts of didactic training. Thus, these results add indirect evidence for the construct validity of SP testing. SP testing appears to be a practical and valuable component in the evaluation of clinical competence of PA students.

4. COMPARISON OF STUDENT SELF-EVALUATION TO FACULTY EVALUATION OF SUMMATIVE OSCE PERFORMANCE—AFTER IMMEDIATE FEEDBACK BY FACULTY. N. Miniclier, C. Goldgar, University of Utah.

Purpose: Although self-assessment is an essential skill for self-directed learning activities, for ascertaining one’s own limitations, and for appropriate patient referral decisions, few data exist regarding the ability of PA students to perform this important task. The purpose of this study was to evaluate the ability of the PA students to perform accurate self-assessment during their objective structured clinical examinations (OSCE) for summative evaluation. Secondly we wanted to look at how much—if any—the immediate faculty feedback would affect the students self-

evaluation; with the thought that weaker students might not be able to “see” their weaknesses as easily—even after faculty feedback.

Methods: The sample consisted of a cohort of 34 second-year PA students followed from 2005-2006. As part of UPAP’s summative evaluation, students are tested in two separate OSCEs with standardized patients. These two clinical cases are videotaped by monitors in each clinical exam room. The students were observed live via monitor by a faculty member who evaluated them in real time with an instrument. The instrument assessed X & Y using a Likert scale (1=unacceptable to 7=outstanding). After completing the two OSCEs the students were given a video copy of their performance to review using the same evaluation instrument as their faculty. Likert scores will be correlated between student and faculty pairs. The measures will also compare to objective testing.

5. CREATING PROCEDURAL SKILL TEACHING MODELS ON A SHOE STRING BUDGET. C. Werner, M. White, Saint Louis University.

You are the instructor for your program’s procedural skills course and realize you have no teaching aids for some of the required skills to be taught. You are told there is no money in the budget for any supplies to be purchased for the fiscal year. You are also unsuccessful in locating any resources to borrow on campus. Your course starts in 2 weeks.

Suturing is an important skill for PA students to learn well and requires as much practice as possible. Teaching aids called “artificial skin” that is used for suture practice cost in the range of \$100 or more per item. We created a simple suture board that students can use to practice introductory suturing techniques. The sizes of these boards are approximately six square inches, so the students can take them home to practice also. Materials for creating these boards are readily available and can be obtained free or at minimal cost. Suture material and hardware (needle drivers, etc) can be a cost factor if your program does not already have these materials. We are fortunate to have generous alumni who donate these types of materials on a regular basis.

Other teaching aids we have created on a shoestring budget include a model for local anesthesia technique and a hand model for incision and drainage technique. Likewise, material costs were minimal. There is a time factor involved in creating multiple models, depending on the number of students you have in your course; though a work study student can easily assist in this production.

Although artificial teaching models do not take the

place of learning procedural skills on a human being, they do allow for initial learning of the technique and handling of the instruments. Afterwards, students will be prepared to conduct these procedures on their patients during their clinical phase of the program.

6. DESIGNING AN INTRODUCTORY CLINICAL CURRICULUM TO DEVELOP PATIENT ASSESSMENT SKILLS OF FIRST-YEAR PA STUDENTS. W. DiMatteo, M. Vail, Massachusetts College of Pharmacy and Health Sciences, Mass.

During the first year of PA education, students are taught history and physical examination techniques using a variety of simulated patients and models. The Massachusetts College of Pharmacy and Health Sciences PA Program utilizes an introductory clinical curriculum that transitions students from working with simulated patients and models to actual patient encounters one-semester prior to the start of the clinical clerkship year.

Students gain exposure to a hospital environment where they learn how an MD resident service delivers patient care. They participate in morning report and perform history and physical examinations on assigned patients. These patient exposures provide students the opportunity to refine their history and physical examination skills on patients with varied cultural and socioeconomic backgrounds and medical acuity levels. Students are also provided the opportunity to practice their oral presentation and written documentation skills.

The course has been designed in a progressive fashion that allows students to focus on a single concept each week. Each successive week builds on the preceding week and each week’s patient encounter is evaluated and critiqued. The course begins with the student simply obtaining, presenting, and documenting a comprehensive history and finishes with the student obtaining, presenting, and documenting a problem focused history with three differential diagnoses as well as a definitive diagnosis. Integrated into the course are four workshops. The first is on delivering an oral presentation of a comprehensive history and physical examination; the second is on delivering a problem focused oral presentation. The third and fourth workshops are on developing differential diagnoses and a definitive diagnosis respectively. The course is taught by PA faculty in conjunction with MD residents at a major teaching hospital in Boston, where responsibility is shared for the student’s training and assessment of skills.

At the end of the semester, students are required to complete a competency examination prior to entry into the clinical year. The expectation is that students will

demonstrate stronger performance in history taking, physical examination, oral presentations, and medical documentation, which will position them to be confident and successful when they begin their clinical clerkships.

7. EVALUATING PHYSICIAN ASSISTANT STUDENTS: ONE PROGRAM'S EXPERIENCE WITH THE OBJECTIVE STRUCTURED CLINICAL EXAM.

P. Bunton, Wichita State University.

Introduction: The Objective Structured Clinical Exam (OSCE) is an effective assessment tool in evaluating communication and clinical skills, management of information, and critical thinking. Data from 126 US medical schools shows that there has been an increase in the number using the OSCE for evaluating students' clinical skills from 49 in 1998 to 82 in 2003. It has been used for assessing basic clinical skills as well as evaluation in specific areas such as pharmacotherapeutics, neurology, gynecology, pediatrics, psychiatry, and surgery. Assessment using the OSCE is at the "shows how" or simulation level of Miller's pyramid of knowledge.

It has been suggested that its importance is demonstrated in that it is unchallenged as the assessment instrument at this level and can be used for both formative and summative evaluation, providing feedback to both students and educators. While much of the medical literature describes the use of the OSCE in medical schools and other allied health fields, there is little research reporting its use in evaluating PA students.

Methods: The OSCE is a tool that has been used for formative and summative evaluation at Wichita State University since 2001. Students complete two OSCEs during the program, using cases common in primary care. Each OSCE follows the same format. Standardized patients are used for the history and physical portion of the exam.

Results: Because the class profile for each of the graduating classes from 2003-2006 was virtually the same, all members of those classes were used as one study group. The overall score for the OSCE taken by second-year students (80.18 +/- 6.7) was significantly lower than the overall OSCE score for first-year students (83.00 +/- 7.6). The lowest mean score was in obtaining the medical history (69.6 %) while the highest mean score was in ordering appropriate diagnostic tests (91.8 %). No association was found between graduating class, gender, and health care experience prior to entering the program and case diagnosis.

Discussion: While a statistically significant difference was found between the overall scores of first- and second-year

students, both scores represent passing at an acceptable level and may not be clinically significant. Because of its increasing use as an assessment tool, further research should look for trends in overall scores as well as performance in specific skills, the level of importance that should be placed on the OSCE in formative and summative evaluation, and its use as a predictor of passing the NCCPA certification exam.

8. FACTORS INFLUENCING THE CHOICE TO BECOME A PHYSICIAN ASSISTANT OR A NURSE PRACTITIONER.

K. Haverkamp, T. Evans, D. Brock, K. Wick, University of Washington MEDEX.

Purpose: This project sought to determine factors influencing the choice to become a physician assistant (PA) or nurse practitioner (NP). NP programs are creating educational tracks for individuals without health care experience, increasing the likelihood that PA and NP programs may compete for similar students.

Methods: An anonymous survey of first-year PA (n = 70) and NP (n = 165) students at the University of Washington was conducted. Demographic information, influences on the decision to pursue midlevel training, and factors influencing the choice of either the PA or NP pathway were collected.

Results: The overall response rate was 45% (64 PA and 42 NP students). PA respondents were more likely to be male (48% vs. 7%; P < .001), and a higher percentage of PA respondents reported having at least 5 years of health care experience before admission (81% vs. 64%; P = .05). NP respondents were more likely to have attained a bachelor's degree prior to admission (100% vs. 54%; P < .001).

The top three reasons PA respondents reported choosing their career path were anticipated job satisfaction, future income potential, and clinical autonomy. NP respondents ranked anticipated future job satisfaction, clinical autonomy, and philosophy of training as their top three factors. Both groups rated previous exposure to practitioners in their respective chosen profession as crucial to their decision. By nonsignificant trends, both groups of respondents favored their own professional culture and training philosophy, and both groups agreed that PAs have better working relationships with MDs and that NPs have more clinical autonomy.

Discussion: Both groups rank job satisfaction and increased clinical autonomy as important in their career decisions, while PAs also emphasize future potential income and NPs emphasize training philosophy. In general, PAs report greater diversity and length of prior work experience, but fewer have academic degrees at admission

than do NPs, who primarily worked as nurses and had four-year degrees. Unfortunately, there were too few PA students with nursing degrees to illuminate their choices compared with those in the NP track, and few NP students who considered the PA track. Future studies should survey students in the newer NP programs that do not require a nursing degree as an entrance requirement.

9. FUNCTIONAL, GLOBAL, AND COGNITIVE DECLINE CORRELATES TO ACCUMULATION OF ALZHEIMER'S PATHOLOGY. S. Fleming, K. Cooper, J. Stoehr, B. Reisberg, L. Sue, L. Vedders, T. Beach, M. Sabbagh, Midwestern University Glendale, Ariz.

Objective: To correlate the functional, global, and cognitive decline assessed clinically with the neuropathological changes observed in non-demented controls (NC), mild cognitive impairment (MCI), and Alzheimer's disease (AD). This project is intended to test the validity of three related instruments—the Functional Assessment Staging (FAST), Global Deterioration Scale (GDS), and Mini-Mental Status Exam (MMSE)—in relation to established post-mortem neuropathological standards for AD, MCI, NC determination.

Background: Cognitive decline has been extensively correlated with neuropathological changes in the brain. There is evidence that neurofibrillary tangles (NFTs), plaques, and synapse loss correlate with measures of cognition. Global and functional instruments have also been correlated to neuropathological changes in the brain.

Methods: We examined 38 subjects (16 NC, 3 MCI, and 19 AD) subjects that were prospectively assessed and longitudinally followed to autopsy. NC subjects had no demonstrable cognitive or functional impairment. MCI subjects clinically met Petersen criteria. AD subjects clinically met NINDS-ADRDA criteria for AD. MCI subjects were added to the AD subjects as the sample size was too small to make meaningful comparisons. All subjects received the FAST, GDS, and MMSE ante-mortem. The mean interval between last assessment to death was 12.5 ± 8.7 months.

Results: No significant difference in age was found between NC and AD/MCI subjects. Correlations in the number of plaque counts within sample areas and overall totals were highly significant ($p < 0.001$) with the FAST, GDS, and MMSE except for the hippocampus. For NFTs, correlations were highly significant ($p < \text{or} = 0.001$) for all regions and for all three instruments. Braak staging correlated significantly with the FAST, GDS, MMSE.

Conclusions: Accumulation of neuropathology appears to correlate with functional, global, and cognitive decline as people progress from NC to AD. NFT counts were shown

to be a better predictor of functional, global, and cognitive functioning. The GDS may be more robust in predicting pathology than the other instruments.

10. IMPLICATIONS OF JOURNAL CITATION DATA IN PHYSICIAN ASSISTANT EDUCATIONAL LITERATURE. J. Hocking, P.E. Jones, University of Texas Southwestern Medical Center.

Purpose: A descriptive study was performed in an attempt to quantify and document the citation history of a peer-reviewed health profession educational journal to identify potential criteria for evaluation and benchmarking purposes. Although assessment methods exist for biomedical and scientific journals, they have questionable transferability to single-publication professional education journals with dissimilar content.

Methods: Every issue of the *Journal of Physician Assistant Education* and its predecessor, *Perspective on Physician Assistant Education*, published from 1997 to 2006 was hand-searched. All manuscripts (N = 230) were examined to quantify author and journal self-citation rates and to rank-order the count of reference sources. The mean and range of citations per article and issue and the mean percent citation rates for author and journal self-citations were determined.

Results: A total of 132 author self-citations and 99 journal self-citations were identified, for a mean citation rate of 4.6 percent and 3.5 percent per issue, respectively. The number of author self-citations ranged from zero to 13 per article and zero to 17 per issue, and the number of journal self-citations ranged from zero to seven per article and zero to 18 per issue. The rank-order of peer-reviewed journals cited was led by *Academic Medicine* and its predecessor journal, and 71 percent of all references came from biomedical journals with primarily clinical content. These included *JAMA*, *JAAPA*, *Family Medicine*, *Physician Assistant*, and *Annals of Internal Medicine* (in that order), among others.

Discussion: Assessing author and journal self-citation rates and rank-ordering of citation sources may enable health professions to compare and contrast educational journal citation content and frequency distribution in relation to peer group journals. Any attempt to evaluate or measure journal quality or prestige is complicated when a health profession's educational literature is represented by a single journal. Additional research is necessary to determine the usefulness, transferability, and practicality of these and other data in developing methods to evaluate educational journal content.

11. INTER-RATER RELIABILITY OF FACULTY IN RATING OSCE PERFORMANCE IN PA STUDENTS.

C. Goldgar, University of Utah.

Background: The objective structured clinical examination (OSCE) is a tool used widely by PA training for testing the acquisition of clinical skills. Although the OSCE might be considered by students to be more appropriate to evaluating clinical skills than traditional testing, the standardization of tasks that have to be performed can be challenging. Likewise, the ability of raters to be consistent in rating these tasks, whether they are standardized patients or faculty observers, can vary greatly. There has been some debate about the use of checklists vs. global rating scores for grading OSCEs. At UPAP we have chosen to use a combination (hybrid) of both types of grading for OSCEs, with the performance of students being observed and evaluated by experienced faculty. We have made assumptions that faculty examiners grade students for specific skills similarly with this tool.

Objective: The purpose of this study is to examine the inter-rater reliability of faculty examiners using OSCE hybrid checklists. Secondary objectives of this study are to assess standardization of OSCE “hybrid” evaluation instruments, as well as whether specific clinical skill sets are more reliably evaluated with the “hybrid” checklist.

Methods: As part of their summative evaluation, a cohort of 34 clinical year students was videotaped performing two clinical OSCE cases for real-time evaluation by faculty and later self-evaluation of the taped exam by the student. A total of six cases were chosen to represent the range of student performance on the two OSCE cases. Eight faculty were tasked to use the same hybrid (checklist and global) evaluation tool to evaluate the selected taped OSCEs. The evaluation tool consists of a 22-item (case 1) and a 17-item (case 2) checklist using a Likert scale (with 1 being least proficient and 7 being excellent) to measure: knowledge of specific disease processes, clinical decision-making ability, execution of targeted physical examination skills, and communication skills. These data will be analyzed as a nested repeated measures analysis of variance. Overall reliability of raters will be assessed for their similarity on the 39 items, as well as the interaction between raters, skill sets, and case.

12. A NATIONAL COMPARISON OF CHARACTERISTICS OF PATIENT VISITS ATTENDED BY PHYSICIAN ASSISTANTS OR PHYSICIANS IN OFFICE-BASED CARE. P. Morgan, M. Albanese, J. Strand, Duke University Medical Center.

Introduction: Given the growing role of PAs in the health workforce and predicted physician shortages, nationally generalizable analyses of PA activities are needed for medical workforce planning. Rapid growth of the PA profession has been accompanied by an expanding scope of practice, and analysts have noted that PA activities increasingly overlap with those of physicians. One means of examining this trend is to determine whether patients attended by PAs are becoming more similar to those of physicians. This project analyzed national survey data to address the following research questions: (1) How do patients seen by PAs and physicians compare with regard to demographic, geographic, socioeconomic, insurance status, and health status? And (2) What are the trends in these characteristics between 1996 and 2003?

Methods: This project uses data from the Medical Expenditure Panel Survey (MEPS) to compute weighted national estimates of patient characteristics and examine trends in the case mix of patients seen by PAs and physicians between 1996 and 2003.

Results: Patients who saw PAs were slightly younger and healthier, of higher economic status, and more likely white, female, rural, insured, and covered by managed care organizations. With the exception of rurality, these differences were small. Accounting for the large difference in rurality (35% of PA patients vs. 19% of physician patients) explains some of the differences found in other patient characteristics. Patient-reported diagnoses are similar between the two groups.

Analysis of trends revealed that the differences in age and education level between patients seen by physicians or PAs disappeared between 1996 and 2003. There were no statistically identifiable trends in other variables.

Discussion and Conclusions: This analysis of national data found that differences in characteristics of patients attended by PAs or physicians were small, with the exception that a larger proportion of PA patients lived in rural areas. Some differences in PA and physician patients disappeared between 1996 and 2003. Findings from this study may alter prevailing assumptions regarding the types of patients attended by PAs and contribute to accurate assessments of the future role of PAs.

13. PACKRAT AND PANCE: A COLLABORATIVE ANALYSIS OF PREDICTIVE SCORES ABSTRACT.

C. Shallenberger, R. Hutchinson, Seton Hill University; B. Howlett, Idaho State University; T. Peterson, C. Bruce, DeSales University; B. Ingell, UC Davis; W. Kennedy, Jefferson College of Health Sciences; C. King, University of Utah.

Purpose: The purpose of this study was to determine the relationship between individual student scores on the PACKRAT at two administration points and their pass/fail performance on the PANCE. **Methods:** The PACKRAT examination was administered to PA students at two data points: near the end of the didactic curriculum and near the end of the clinical curriculum. The PACKRAT scores at each administration point were then compared to the PANCE pass/fail outcome for the same students using a logistic regression model.

Results: Analysis of the data reveals that both PACKRAT 1 and PACKRAT 2 scores are significant predictors of passing the PANCE ($p < .005$, $\alpha = .05$, $n = 638$). The mean score on PACKRAT 1 of those who failed the PANCE was 118 and of those who passed was 145. The mean score on PACKRAT 2 of those who failed the PANCE was 127 and of those who passed was 155. The overall pass rate on the PANCE among those taking either the PACKRAT 1, the PACKRAT 2, or both was 89.4%.

Discussion: Performance on the PACKRAT examination is a significant predictor for passing the PANCE as evidenced by the low p -value resulting from the logistic regression. The large sample size ($n = 638$) far exceeded the 323 valid cases needed, determined by a preliminary sample size and power calculation, to achieve sufficient sensitivity to detect significance. The combined data that makes up the sample also represents a diversity of program types and settings with no differences demonstrated between individual schools. The data allow for identification of goal PACKRAT scores for the didactic and clinical year administrations that are associated with high likelihood of passing the PANCE. This allows for early detection of students in need of additional preparation prior to taking the PANCE.

14. REDESIGN AND INTEGRATION OF THE LABORATORY MEDICINE CURRICULUM. S. Spear, V. Schaffer, P. Dieter, K. Hills, Duke University Medical Center.

Introduction: The laboratory medicine unit has been an integral part of the Duke PA program's curriculum for over 33 years. Clinical diagnostic methodologies have undergone tremendous advancements during that same time. Demand for laboratory and radiographic studies in primary care settings, even in rural areas, has also progressed dramatically. In clinical practice, it is increasingly necessary to interpret complex diagnostic studies associated with varying disease states. Rising health care costs, with a focus on efficient utilization of the health care dollar necessitate effective procurement and interpretation of

relevant diagnostic data. The Duke University PA Program is committed to providing clinical educational tools to prepare their graduates to meet the challenges faced in clinical practice today.

Methods: Initially, the current curriculum was reviewed by Duke PA program faculty. Solicited feedback was obtained which indicated two specific areas of focus. First, all faculty members agreed it was important to maintain the integration of the laboratory medicine material with the clinical medicine unit. These courses have been taught in parallel for a number of years. The faculty also felt it would be beneficial for the students to incorporate all diagnostic modalities into a single course. Historically, radiology and related tests, EKG, and laboratory medicine were all separate entities.

Results: Following intensive evaluation, an integrated "comprehensive" course emerged, which was named Diagnostic Methods. The course will augment and parallel the organ system based didactic clinical medicine unit. Goals and objectives for the new course were defined. A structure for the use of different educational venues was established. The redesigned course will be implemented with the incoming class in the fall of 2006. Data will be collected over the ensuing year, including student and instructor evaluations, course grades, as well as PACKRAT and PANCE scores for comparison with the prior curriculum.

Conclusion: Based on advancing technologies that subsequently impact clinical practice, our faculty concluded that a revision of the laboratory medicine course was necessary. The diagnostic methods unit will employ several different educational venues to deliver a comprehensive, clinically relevant course for our students. Our program's goal is to develop excellent diagnostic skills that will prepare our graduates for clinical practice.

15. RELATIONSHIP BETWEEN PERFORMANCE IN PREREQUISITE ANATOMY AND PHYSIOLOGY AND PERFORMANCE IN PA PROGRAM COURSES.

D. Sayre-Stanhope, K. Cook, Saint Louis University.

One of the requirements for admission to the Saint Louis University PA Program has been the completion of prerequisite courses in physiology and, more recently, anatomy. These prerequisites were added under the assumption that familiarity with these complex subjects would result in higher grades and easier assimilation of the material at the graduate level. To test this hypothesis, the students' performance in their prerequisite courses was compared with their performance in the program's courses. In addition, the course level (eg, upper vs. lower division) was considered. Prerequisite anatomy courses were unequally divided

between levels with 72% taking a lower division course and 28% taking an upper division (junior) course. Only one student had taken a 400 or senior level course. The mean grade for prerequisite anatomy was 3.60 while the mean grade for the PA anatomy course was 3.46. The correlation between prerequisite and program course performance of 120 master's candidate students was examined using the Spearman rho. There was no statistically significant relationship between students' performance in the prerequisite and the program anatomy course. A similar examination of physiology was conducted. More than half (54%) of the students took physiology as an upper division course with 28% percent completing the physiology prerequisite at the senior level, and the remainder (46%) completing a lower division course. Correlation with performance in the program physiology course was greater and was significant at the .001 level ($p=.005$). These findings, although preliminary, suggest that there is minimal return to the student in requiring prerequisite undergraduate anatomy although there may be value in requiring an upper division physiology course prior to matriculation. Further evaluation of other variables such as the amount of time between completion of the prerequisite courses and matriculation is warranted.

16. RESOURCE SELECTION AND REVISION UTILIZING STUDENT FEEDBACK REGARDING REQUIRED AND RECOMMENDED RESOURCES.

D. Kortyna, M. Hertweck, J. Laird, S. Hawkins, Chatham College.

Resources utilized for learning during PA school are initially identified to incoming students by the faculty through a required and/or recommended book list and the syllabi for specific classes. Because of the increasing need for good evidence-based, peer-reviewed learning tools for self-directed adult-learners, faculty need to be aware of the resources that are available, what resources PA students are actually using. Traditionally text books have been utilized, but due to changing technology other resources—such as CD-ROMs, DVDs, PDAs, and multiple Web/computer-based resources are increasingly being used by faculty, students, and clinicians.

We have developed and used a tool which gathers the students' evaluation of the multiple required and recommended resources, as well as other resources that the students use. This tool is given to the students at the end of both the didactic and clinical portions of the program since the use of resources can differ for the varied portions of the program. After compiling this information, the faculty use this input in generating the resources to be

required and recommended for the incoming class of students.

Dissemination of student evaluations and comments (as well as faculty comments) to the incoming class is accomplished by posting the compiled information on the class Web site as well as having the information available in the book store. Resource evaluation is an integral portion of shaping student self-directed learning. Formal student resource evaluations provide necessary input into the resource selection process and improve student learning by the use of appropriate resources. Knowledge that peers have provided input in the choice of resources may increase student satisfaction with required and recommended resources.

17. SENIOR SEMINAR: A CAPSTONE CURRICULUM.

K. Hills, P. Dieter, V. Kaprielian, E. Rothschild, V. Schaffer, Duke University Medical Center.

Introduction and Rationale: In spring of 2004, at a Duke University PA Program faculty retreat, the concept of a senior seminar was conceived. Based on student and alumni evaluation feedback and changing needs in the program, the final clinical preceptorship would be phased out and replaced with a PANCE review course and capstone activities, which together would be called the senior seminar.

Methods: A task force was convened and a board preparation course developed. The class of 2005 was the last class to have a final clinical preceptorship and served as the pilot group for the board review curriculum. The class of 2006 was the first class to complete the senior seminar in full. Curriculum components include: board review topics in radiology, pharmacology, dermatology, cardiology, pulmonology, hematology, gastroenterology, endocrinology, neurology, infectious disease, nephrology, pediatrics, psychiatry, orthopedics, obstetrics and gynecology, plus test-taking techniques and strategies. Capstone activities include lectures on advising patients on Medicare Part D, mandatory reporting laws and legal issues, medical liability, dealing with the pharmaceutical industry as a practicing clinician, common prescribing errors and medication safety, DEA, and personal finances. Small group activities address coding and ethical cases in clinical practice. Graduate panels present job search strategies, pearls to survive the first 90 days on the job and alumni expectations. The week culminates with a certificate of completion ceremony. Student feedback and pre- and post-test data provide ongoing information for course evaluation. **Results:** Out of 41 students in the class of 2006, 38 completed the board preparation course evaluation. Ninety-

four percent of them agreed that the course was well organized with clear learning objectives and reasonable course demands. Student comments reflected an appreciation of having key components of complex medical topics emphasized for board preparation. Thirty-one students completed the overall senior seminar course survey. Ninety-one percent indicated that the senior seminar was an effective way to bring closure to their time at the PA program. They had specific suggestions on how the days could be structured including earlier start times and additional topics that could be covered.

Conclusions: The Duke PA Curriculum Committee reviewed the senior seminar course at the August 2006 meeting. Areas of strengths and opportunities for improvement were discussed and will be taken into consideration in future curriculum planning. Overall, the senior seminar was a successful and well-received addition to the curriculum.

18. STUDENT CLINICAL TRACKING OF PSYCHIATRIC AND BEHAVIORAL DIAGNOSES IN PRIMARY CARE. A. Glick, G. Merenstein, J. Nieman, University of Colorado at Denver and Health Sciences Center.

Objective: Accreditation standards for PA students require clinical experience in psychiatry/behavioral medicine. Unlike most medical education programs, the Child Health Associate PA program has a unique 2-year didactic curriculum in psychosocial/behavioral medicine. In order to demonstrate that all students received significant psychiatric/behavioral medicine clinical experiences in required rotations and to determine if the didactic curriculum matched student clinical experiences, we developed a clinical log to inform our educational process.

Method/Technique: Interns electronically logged patient encounters for two required rotations, family medicine and pediatrics. Thirty students logged an average of 240 patients, representing a total of 20 contact days per student. The log requires students to enter a variety of information including patient and site demographics, type of exam, and activities of student and preceptor. Of interest to this project is the student identification of a primary patient diagnosis. In addition to differentiating between general diagnostic categories, 14 behavioral medicine-related diagnostic subcategories were specified including depression, anxiety, panic attacks, domestic violence, and others.

Results: The results documented that the logs provide a useful overview of the content and nature of students'

learning experiences in psychiatric/behavioral medicine in these two primary care rotations. Data revealed 946 visits with a primary diagnosis of behavioral-medicine. General behavioral issues accounted for 35% of the diagnoses, followed by depression (16%) and stress (14%). An additional 8% of visits centered on a primary diagnosis of drug and alcohol abuse, 5% on tobacco abuse, with 4% each focused on anxiety and attention deficit disorder. Other diagnoses accounted for the rest of the visits.

Conclusions: A clinical log documenting student encounters with patients with a variety of psychiatric/behavioral diagnoses supports the need for didactic instruction in psychosocial aspects of health care. The log also documents that students receive considerable experience in primary care rotations in these areas of practice.

19. THE UNIVERSITY OF UTAH PHYSICIAN ASSISTANT PROGRAM'S MODEL OF CLINICAL EXPERIENCE DURING THE DIDACTIC YEAR FOR PHYSICIAN ASSISTANT STUDENTS. N. Miniclier, D. Keahey, University of Utah.

Background: Initially conceived as a "coattailing" experience, during the didactic year, UPAP students commence the one day a week Friday clinical experience 8 months before the second year starts. Students are paired with a family practice PA in the community and work with him or her every Friday from January until August. They are expected to perform histories, physical examinations, and formulate, with the PA preceptor, differentials and treatment plans. Students formally present patients to their PA preceptor.

Each Wednesday, students participate in 2-hour small group sessions to further hone their presentation skills and discuss the outcomes of cases from their Friday clinics. The Friday clinic experience dovetails with the objectives of the Wednesday session that includes integrated and focused physical examination skill development and clinical problem solving.

The Friday clinic experience includes an on-site student evaluation by a faculty member who also assesses the Friday preceptor's teaching methods. A variety of techniques have been developed over the years to attract, develop, reward, and maintain a cadre of experienced primary care PAs. Many of these precepting PAs benefited from the Friday clinical experience during their own training. Friday PA preceptors are offered free CME as well as adjunct faculty status. Small tokens of recognition have been surprisingly effective in recognizing their contribution to the profession.

By giving first-year PA students an opportunity to have a regular formative clinical experience with continuity in the didactic year, they are able to lay down a stronger clinical foundation. This also serves to enhance their didactic training when they “see” what they are studying and learning in the classroom. From the inception of Friday clinics as a coattailing experience to the truly clinical experience that it has become, this program has enriched our students’ training and has enabled them to start their clinical year in a much more prepared and productive manner.

20. THE USE OF GIS IN PHYSICIAN ASSISTANT RESEARCH. L. Allison, Le Moyne College. J. Benitez, University of Rochester School of Medicine and Dentistry.

Introduction: Geographical Information Systems (GIS) is a system for input, storage, processing, and retrieval and analysis of spatial data; it provides a method to track events and activities relative to their location. GIS mapping is used to illustrate data that have spatial relationships. It is a tool that has been used to illustrate the changing spatial organization of disease incidence; health care needs, access, and outcomes; other health care services; and other health and health services issues.

Methodology: This paper explores the potential application of GIS to PA research. A simple example utilizing an existing data set of students’ origin on admission to a PA program and where they initially go to practice following graduation is illustrated using GIS. Steps in creation of the dataset are described and the final product showing a GIS choropleth map is shown. Comparison of a printout of the same data illustrates the relative ease of interpreting the data in tabular format vs. GIS mapping.

Discussion: GIS tools help the researcher visually interpret any georeferenced data. Physician assistant programs may utilize GIS systems to analyze their students’ demographics, clinical rotations, patient demographics, or graduate deployment. Other examples of GIS analysis that may be used in PA research include tracking application and admissions data, especially focusing on those applicants who come from health care shortage areas; clinical training sites and affiliation agreements; outreach activities by students and faculty; faculty and graduate research projects, especially epidemiological studies and policy studies; graduate deployment data, again focusing on those who practice in health care shortage areas; other deployment and workforce data; and other applications as researchers become more aware of the power of this application to provide visualization of the spatial relationships of their data.

21. TRENDS IN RELIGIOUS AND SPIRITUAL INDICATORS IN PHYSICIAN ASSISTANT STUDENT APPLICATION ESSAYS. C. Robohm, University of Colorado at Denver and Health Sciences Center.

Introduction: Spiritual and religious values and beliefs continue to receive a great amount of deliberation within popular culture. The United States remains a very religious society with 60% of Americans considering religion “important” in their daily lives. A large study of college students found that in general, college students show a high level of spirituality and religious involvement. In addition, with two-thirds of medical schools implementing educational curriculums addressing spirituality and faith in relation to medicine, the spirituality and religious values of PA students deserve attention. The purpose of this qualitative study is to identify and evaluate spiritual and religious statements within admissions essays of PA students for one program.

Methods: As part of the admissions application, applicants to the Child Health Associate/Physician Assistant Program at the University of Colorado were required to submit an autobiographical statement and essay describing their most stressful experience and its outcome. Qualitative review of essays of program matriculants from 1994-95, 1999-2000, and 2004-05 admissions cycles identified statements of spiritual conviction, religious conviction, and religious involvement. Statements were further categorized as reflective of spiritual quest, religious engagement, and religious commitment. Individual statements were evaluated for statements reflecting life change, declarations of faith, and activities of evangelism. The three admission cycles were evaluated for a change in the quantity and quality of statements over time.

Results: Over a 10-year period, there was an increase in the percentage of applicants writing statements of a spiritual or religious nature and a difference of quality was noted in the most recent essays. Examples of statements and results tables will be provided.

Discussion: Many applicants self-identify and set life goals as a result of spirituality and religion with a change in quality over 10 years. Further study of religion and spirituality and the affect upon PA students in learning, discrimination, and quality and delivery of care is needed.

22. WHAT DO PA STUDENTS KNOW ABOUT TUBERCULOSIS? THE RESULTS OF A SURVEY OF THE CONFIDENCE AND KNOWLEDGE OF PA SENIOR STUDENTS REGARDING TUBERCULOSIS.

M. Davison, University of Oklahoma College of Medicine, Tulsa; D. Brown, Nebraska Medical Center.

Statement of the Problem and Introduction: Tuberculosis (TB) continues to be a leading cause of infectious mortality globally. Over 50% of all TB cases in the United States are in foreign-born patients. In 2003, the National Tuberculosis Curriculum Consortium (NTCC) was established through the NIH National Heart, Lung and Blood Institute (N01-HR-36157). The NTCC aims to improve knowledge, skills, and attitudes in the management and control of active and latent TB among health professions students by standardizing TB education and by providing educational materials to be used by health educators.

Method of Investigation: This multidisciplinary project administered a survey to senior PA students to learn how much they know and how comfortable these soon-to-be graduates are in their knowledge of TB. A 42-item survey was developed by a panel of TB physicians and PA educators in the NTCC. After IRB approval at each school, students voluntarily completed the survey.

Results: Results were analyzed by the NTCC and reported in aggregate form. Preliminary results analyzed thus far from 205 students indicate that they consider TB education to be important in their academic program.

Approximately half of the students have been involved in the care of patients with either active or latent TB. The majority of the students report that they feel at least somewhat confident in interpreting results of diagnostic tests for TB, in formulating a treatment plan for patients with active or latent TB, and in communicating effectively with patients with TB and their families.

Conclusions: There is still much room for improvement in knowledge, attitudes, and confidence about TB by PA students who responded to this survey. By knowing what students think and how confident they are in their knowledge, PA educators can address issues that may improve knowledge of TB in their students.

23. WHEN DO APPLICANTS LEARN ABOUT THE PHYSICIAN ASSISTANT PROGRAM? ONE PROGRAM'S NINE-YEAR EXPERIENCE.

C. Robohm, J. Bowser, University of Colorado at Denver and Health Sciences Center.

Introduction: As a profession, the importance of planning

and implementing recruitment strategies to address the needs of the PA profession in the context of providing care to all populations is paramount. The roots of career choice and postsecondary career planning start as early as eighth grade, making early career education an important task. To date, little data is available on recruitment methods to evaluate the success of current strategies in an effort to continue or develop new strategies. The purpose of this study is to evaluate when applicants first learn about the PA profession.

Methods: At the University of Colorado Child Health Associate/Physician Assistant Program, data has been collected on various aspects of applicant knowledge of the PA profession. Short term recruitment variables were collected as part of the application during cycles from 1997-98 to 2005-06. Data were evaluated to determine when applicants first learn about the PA profession and if applicants are learning about the PA profession earlier in their academic careers.

Results: Applicants to this program in the 2005-06 cycle learned about the PA program significantly earlier in their academic careers than those in the 1997-98 cycle ($p=0.001$). During the 1997-98 cycle ($n=246$), 27.2% learned about the profession after college, 58.5% during college, 12.2% during high school, and 2.0% during grades one through eight. In the 2005-06 cycle ($n=157$), 18.5% learned about the profession after college, 53.5% during college, 26.1% during high school, and 1.9% during grades one through eight. With descriptive analysis, there is a trend towards younger ages throughout the 9 years.

Discussion: From this small sample, it appears that recent applicants are learning of the PA profession earlier than those 9 years ago. In the earlier application cycles of 1997-98 and 1998-99, the majority learned about the profession in or after college. The trend has now shifted to high school and college. Further research is required to determine reasons applicants may be learning about the profession earlier. This may be due to increased recruitment efforts aimed at high school populations or exposure to the profession through health care delivery.