

Physician Assistant Competencies for Genomic Medicine: Where We Are Today and How to Prepare for the Future

National Institutes of Health
March 29-30, 2007

Meeting Summary

The “Physician Assistant Competencies for Genomic Medicine: Where We Are Today and How to Prepare for the Future” meeting was held at the Natcher Conference Center of the National Institutes of Health (NIH) in Bethesda, MD on March 29-30, 2007. The conference was organized and supported by the National Human Genome Research Institute (NHGRI), with participation of leadership from the Accreditation Review Commission on Education for the Physician Assistant (ARC-PA), the American Academy of Physician Assistants (AAPA), the National Commission on Certification of Physician Assistants (NCCPA), and the Physician Assistant Education Association (PAEA).

The field of genetics and genomics are moving forward rapidly. Within the next few years, we will discover most of the common hereditary factors that play a role in disease, which will lead to the development of many more genetic tests, including ones related to common diseases. The Physician Assistant community is poised to use the power of the human genome to make a difference in public health by bringing genomics into practice. While such developments will soon make genetics increasingly important to the practice of medicine, Physician Assistants are well positioned now, as a vital part of the medical team, to integrate existing genomic tools, such as family history, into current practice.

The goal of this meeting was to develop an outline for how Physician Assistants could utilize current and anticipated knowledge of genetics and genomics as the basis for improving clinical care and make personalized medicine a regular part of patient care.

The NHGRI is pleased to present this summary of the meeting proceedings. We would like to thank all of the presenters, break-out group leaders, and participants for their active participation and for their thoughtful contributions that form the basis for this summary.

The body of this report summarizes each session and concludes with the action plans proposed by each of the four Physician Assistant organizations present at the meeting, as well as other recommendations made by the participants. Included also are Appendix A (meeting agenda), Appendix B (meeting participants), and Appendix C (PowerPoint presentations).

Thursday, March 29

The conference opened with welcoming remarks from Acting Surgeon General Kenneth Moritsugu, Dr. Francis Collins, Director of NHGRI, and Mr. Michael Rackover, PA-C of Philadelphia University.

A series of talks were then presented, with interactive discussion periods following each talk. Brief summaries of the talks follow (also see Appendix C):

Keynote Lecture – Genomic Medicine – Alan Guttmacher, M.D.

Genetic medicine focuses on the impact of single genes on disease, while genomic medicine includes the effect of the entire genome on disease (and health). Genomic medicine is based on the foundation of the Human Genome Project (HGP), which was completed in 2003.

The science and technology related to genetics and genomics are moving forward rapidly. Genomics will change medicine by: creating a fundamental understanding of the biology of many diseases, even many “non-genetic” ones; leading to defining disorders by biology of causation, rather than by symptoms; and providing knowledge of individual genetic predispositions via microarray and other technologies. Genomics will help enable health care providers to treat patients based as the biological individuals they each are.

The family history is a tool we have readily available to personalize medicine now. The U.S. Surgeon General’s Family History Initiative encourages individuals and families to talk about their family medical histories and record information to share with their health care providers.

In anticipation of the increased use of genomics in health care, the Genetic Information Non-Discrimination Act (GINA) is currently being considered in Congress, and President Bush has indicated he would sign such legislation if it reached his desk. If enacted, GINA would limit health insurers’ and employers’ access to, and use of, genetic information.

Accreditation Review Commission on Education for the Physician Assistant (ARC-PA) - John McCarty

The Accreditation Review Commission on Education for the Physician Assistant (ARC-PA) protects the interest of the public and the Physician Assistant profession by defining the standards for Physician Assistant education and evaluating Physician Assistant educational programs within the territorial United States to ensure their compliance with those standards. ARC-PA became a free standing body in 2001. There are currently 136 accredited programs.

The Standards for Physician Assistant Education outline the requirements for an accreditation of programs. The standards are competency based and have specificity regarding curriculum requirements, but do not prescribe a specific academic degree. The current standards were revised in 2006 and include a requirement for instruction in genetic and molecular mechanisms of health and disease.

Physician Assistant Education Association (PAEA) - Anita Duhl Glicken, MSW and Connie Goldgar, PA-C, MS

The purpose of the Physician Assistant Education Association (PAEA) is to improve quality of healthcare for all patients by fostering excellence in Physician Assistant education. PAEA represents the 136 accredited Physician Assistant educational programs and provides services for the 1,500 faculty and staff who run them.

Physician Assistant programs average 26 months in length with 1 year of clinical training and 1 year of didactic training. Advances in genetics, as well as other areas of medicine, are leading to new demands on practicing Physician Assistants. PAEA recently conducted a survey of Physician Assistant programs to gather data that might assist in developing specific genetics competencies, genetics curricula, and curricular delivery methods for Physician Assistants and Physician Assistant educators. The web based survey consisted of 18 questions. One-hundred out of the then 134 existing programs responded to the survey (~75%).

A sample of the survey results show the following:

- 74% of programs have stated core and learning objectives for genetics/genomics
- 2/3 of the programs dedicate 7-20 hours to genetics
- The majority of the teaching responsibility for genetics falls on existing faculty
- 81% of programs perceive a need to enhance their genetic curricula
- 62% of programs plan to change their approach to teaching genetics in the near future

The full survey results will be published in the coming months. PAEA sees an opportunity to position Physician Assistant educators as leaders in teaching of genetics in medical education.

National Commission on Certification of Physician Assistants (NCCPA) – William Kohlhepp, MHA, PA-C

The National Commission on Certification of Physician Assistants (NCCPA) is the national certifying agency for Physician Assistants in the United States. Founded in 1975 as an independent not-for-profit organization, NCCPA is dedicated to assuring the public that certified Physician Assistants meet professional standards of knowledge and skills. More than 65,000 Physician Assistants have been certified by NCCPA. All 50 states rely on the NCCPA certification criteria for licensure or regulation of physician assistants. Recertification of Physician Assistants is required in only 23 states; however, about 92% of Physician Assistants maintain their certification.

The current competencies for the Physician Assistant profession were approved in 2005. The Content Blueprint for the Physician Assistant National Certifying Exam (PANCE) does not currently have a section on genetics, but genetic diseases are included as examples and some genetics questions are included on the exam.

American Academy of Physician Assistants (AAPA) – Mary Ettari, MPH, PA-C

The American Academy of Physician Assistants (AAPA) represents the interest of Physician Assistants in clinical practice and educational and research settings. Physician Assistants are

members of the healthcare team and practice with the supervision of a physician. There are 40,000 Physician Assistant and student members of AAPA. AAPA provides CME services to the community. It also has alliances with several other medical organizations.

Some statistics about the profession:

- As of January 2007, there were 75,260 Physician Assistants eligible to practice.
- 63,609 Physician Assistants are in clinical practice, 44% of whom are in a group practice.
- 47% of Physician Assistants are located on the east coast.
- This year, 12,000 students will be trained, 72% of whom are female.

What the Physician Assistant Needs to Know about Genetics and Genomics – Bruce Korf, M.D., Ph.D.

The fields of genetics and genomics are changing rapidly. A modern day view of the genome looks different from the linear set of sequences of ACTG we usually see. The genome involves a complicated network of interactions, and we are just beginning to unravel the relevant biological pathways and metabolic networks.

Patients are catching up to the practitioner, if not already ahead, in terms of awareness of genetics news. Practicing Physician Assistants and students need to be knowledgeable regarding genetics; however, it's not easy to determine how to fit all of the items needed into the curriculum. There are different levels of what the Physician Assistant needs to know about genetics. Three basic items that Physician Assistants should know about genetics are:

- 1) That family history can be a clue to risk (hemochromatosis, as an example)
- 2) Clinical decisions will increasingly rely on results of genetic tests (see GeneTests.org)
- 3) A new medical paradigm will emerge (pharmacogenetics, etc.)

Advances in technology such as pharmacogenetic testing and the \$1,000 genome will enable us to personalize medicine. Use of the Electronic Medical Record will allow results of genetic tests and other medical information to reside in one location for facilitated analysis.

There is a role for all health care providers in genetics. Role models can be useful in getting the rest of the community to “buy into” genetics.

Race and Genetics – Vence Bonham, J.D.

Genomic Medicine offers the next major breakthrough in diagnosis, prevention, and cure of disease. Should race be a part of genomic medicine? How do we use race as a concept in thinking about genetics? Many disciplines are engaged in the conversation about race as a concept, and articles in the scientific literature have expanded from commentaries on race to scientific articles on genetic variants.

Personalized medicine is more effective than medicine based on race. When should we use race and ethnicity to assist with personalized health care decisions? There is limited empirical data on health professionals' understanding and beliefs about race and human genetic variation. Thoughtful use of racial and ethnic categories is required in health services, clinical and genetic

research, and clinical care. Developing a deeper understanding of health professionals' knowledge of human genetic variation, attitudes about human genetic variation, and use of race in clinical practice will be instrumental for successfully translating genomics into clinical practice.

Teaching and Learning Genomic Medicine – Joseph McInerney, MA, MS

We've been promising a revolution in health care driven by the Human Genome Project, but it is hard to get students to learn about genetics based only on promise.

A survey by the Genetic Alliance and the National Coalition for Health Professional Education in Genetics (NCHPEG) asked individuals and family members affected with "genetic disease" about their experiences with a variety of health professionals not trained in genetics. The survey results demonstrate a missed opportunity for health professionals to educate patients and families regarding genetics (paper in press in *Genetics in Medicine*).

There are challenges/barriers to expanding and improving education in genetics for health professionals who are not genetics specialists. Barriers to genetics education for health professionals include crowded curriculum, misconceptions about genetics, lack of knowledgeable faculty, a disconnect between basic sciences and clinical experiences during training, failure to integrate genetics across the curriculum, and inadequate representation of genetics on certifying exams. Barriers to the integration of genetics into primary care include a dearth of genetics professionals, lack of knowledge about genetics among primary care providers, lack of confidence, inadequate family histories, lack of referral guidelines, and limited payment for genetics-related services. We need to look at the "other side" of the barriers to identify the drivers for adopting genetics into practice.

Providers need to learn to look for the red flags that can be identified through reviewing a patient's family history.

There is no niche for genetics in curricula; it is actually the information on which everything else rests. Case-based approaches, layered content, relevant clinical guidelines, guidelines for referral, and links to resources can all be very useful in teaching genetics to Physician Assistants. NCHPEG and AAPA are working together to develop the "Genetics in PA Practice" program, which is a case based and interactive tool. The tool is going into field testing in April 2007.

Friday, March 30

On the afternoon of Day 1 (Thursday), each attendee participated in one of two breakout groups. Both of these breakout groups were given the same charge: to focus on the Physician Assistant profession in general (rather than any specific PA organization) and to discuss how to integrate genetics/genomics into Physician Assistant education and practice, as well as to describe obstacles to this integration and ways to surmount these obstacles. Each of these two breakout groups reported back on the morning of March 30:

Break-out Session I, Group B – Reported by Larry Herman, MPA, RPA-C

- For Educators: Develop a genetics/genomics educational toolkit for Physician Assistant programs and educators. Survey shows that 75% of genetics info is being conveyed by core faculty, so need to bring them up to speed. Lecture outlines, standardized cases, question banks and bank of graphics are needed. Need to develop a “capstone course” in genetics as well as weave the content into all courses.
- For Clinicians: Develop a Physician Assistant Dashboard for clinicians to use. There are five to eight areas in which we can make a difference in practice today. The Dashboard can be computer based, PDF downloadable, or as simple as an advertisement run in the AAPA news. Consider compressing the rigorous three-generation pedigree to 1st degree relatives only - triage what is most important. Present to clinicians as time saving. Get clinicians to make effort to take the first step - momentum will build after they become invested.
- Foster mentors and/or thought leaders to bring others along.
- Included genetics in best practices.
- Generate buzz through short pieces in newsletters, journals, etc. Inclusion of this in the AAPA annual conference and the Chapter Lecture Series will also generate interest.
- Need to move genetics today - what can people put into practice immediately. Need to get people excited.
- Identify resources that are already in existence.
- Recognition of risk analysis as leading to prevention.
- Team work - partner PAs with geneticists. Can identify areas where geneticists would most appreciate PAs being involved, perhaps five to eight core areas.

Break-out Session I, Group A – Reported by Bob McNellis, MPH, PA

- Education/Training: Need a culture shift for faculty. Barriers include limited content expertise, low comfort levels, misconceptions about genetics (i.e., focus on Punnet squares and peas), and lack of information about what is currently being taught. Solutions include faculty development, such as a short course for faculty, building a cadre of educators with increased comfort and expertise, and identifying champions at the institutional and organizational level to drive culture shift. Overarching theme: Integration across the curriculum. Faculty development should be PAEA “sponsored” with collaborative development of core materials involving all four organizations to ensure linkages between education and practice.
- Curriculum for Students: Barriers include overcrowded curricula and development of resources. Solutions include: development of a touchstone course to integrate into existing curriculum (much like integration of cultural diversity/competence into the curriculum as an

example); pre-packaged curricula so that programs can use whichever elements they need (perhaps more accurately described as “reusable learning objects”); and linking to information technology (use of EHR and PHR).

- **Assessment:** Begin to look at how the certifying exam can be used to encourage integration of genetics material into curriculum. Look at the exam blueprint and find existing opportunities. Initially add unscored questions to assess baseline knowledge. Begin to recruit content expertise onto test writing committees. Link questions with practice. Revise practice analysis to look for more detail on use of genetic knowledge and skills in practice. Ultimately, use expertise from the genetics community (e.g., American College of Medical Genetics, National Society of Genetic Counselors, International Society of Nurses in Genetics) to influence practice, assessment, and curriculum development.
- **Continuing Education for Physician Assistants:** Focusing on practicing PAs, especially those who serve as preceptors, is important. Preceptors can reinforce student learning and validate the importance of the family history to students. Likewise, students can reinforce the importance of family history to their preceptors, resulting in a useful synergy of learning. Ways to reach current practitioners include: publish articles in *Journal of the American Physician Assistant Association (JAAPA)* to increase interest; offer CME sessions at annual conference, use genetics as a presidential theme for AAPA; Chapter Lecture Series; introduce issues of race and genetics; make content of *NEJM* series on Genomic Medicine available; use content experts for a new series on genetics for *JAAPA*; use the concept of a “primer” to get Physician Assistants interested in the topic; identify other journals and publications of potential interest to Physician Assistants (e.g., *Genetics in Medicine*); and develop a list of resources and bibliography.
- **Build on the Surgeon General’s Family History Tool:** If possible, integrate into the tool some simple analytic processes to deal with common genetic risks. Develop a form that can be used in charts for PA practice. Develop a module that can be integrated into EMRs or encourage lower tech strategies, like scanning forms into the medical record.
- **Community of Learning:** Perhaps make available to students and clinicians a “community of learning” for people to explore and discuss the challenges and successes of learning to practice in the age of genomics – “Wiki-genomics.”

After discussion of these presentations, the meeting attendees split into new breakout groups - this time, four groups sorted by Physician Assistant organization - to discuss how each organization might implement the recommendations from the first set of break-out groups. Each of these four breakout groups reported back, as follows:

Break-out Session II, AAPA – Gregor Bennett, MA, PA-C

- **Perception:** Survey of the House of Delegates to find out current knowledge and interest in genetics. Survey results will be used to formulate plans. Promote the U.S. Surgeon General’s Family History Initiative at the upcoming conference. Work with NCHPEG. Update genomic webpage on AAPA website. Review genetic testing policy paper and update as needed.
- **Positioning the profession:** Collaborative efforts with ACMG, NSGC, and ISONG. Expand effort to other medical groups to gain enthusiasm. Enhance relationship with AAFP, AAP, ACP, etc.
- **Practice:** Add components to the Chapter Lecture Series. Launch a series of articles in *JAAPA*. Distribute information in *Clinical Watch*, *AAPA News*, *JAAPA*. Interview a Physician

Assistant Genetic Counselor and highlight in “a day in the life” article. Establish more resources for clinicians in daily practice.

Break-out Session II, NCCPA – William Kohlhepp, MHA, PA-C

- Treat genomics like topic of surgery. Make blueprint say up to ___ % of questions in exam should come from genomics.
- Analysis of coding bank to evaluate if questions are from genetics/genomics.
- Make sure current questions don't have distracters that are now wrong in the genome era
- Make sure item writers are prepared to write questions on this topic. Do inventory of current item writer backgrounds to see if need more expertise.
- Change practice analysis questions to learn if PAs are using genomics already in practice.
- Procedure logging - add pedigree to log.
- Look at the types of CMEs PAs are earning already on genomics.
- Have NCCPA Chairman mention that the organization fully supports genomics initiative in speech to AAPA House of Delegates.
- Link current competencies.
- Use NCCPA computer portal to drive information to the PA programs.
- Talk with PAEA to see how can support programs in writing questions.
- Have NCCPA Foundation build competencies on genomics.
- Develop post card to send out to PAs regarding USSGFHI and pedigree.
- Request for proposals on research topics regarding genetics.
- Develop best practices in history and physical skills, counseling, etc.
- Items for other groups: Medical documentation, possible post graduate training in genetics for PAs, address this topic at the AAPA meeting or House of Delegates.

Break-out Session II, PAEA – Timi Agar-Barwick

- Spring 2007: Report outcomes of this meeting to the network; work with Connie Goldgar to beta test the website of tools; establish an interest group on genetics; promote the web link for NCHPEG as a resource to members; work with the test writing committee (student self-assessment) to evaluate area on genetics.
- Summer 2007: Publish an editorial in the *Journal of Physician Assistant Education* on the survey results; include in faculty development website; charge faculty development institute to use existing web resources.
- Fall 2007: Present for approval to membership the final competencies document; implement the “put the face on genetics” campaign at the annual meeting; do a demo of NCHPEG web product; participate in a genetics discussion at follow-up meeting.
- Winter 2007-2008: Investigate a mentorship program for preceptors; consider an additional plenary session for October 2008 meeting; establish an oversight committee on genetics.

Break-out Session II, ARC-PA - Tim Evans, M.D., Ph.D.

- Standards committee added requirement regarding genetics in September 2006, but do not prescribe what content needs to be there.

- All programs are required to show where in their curricula they teach how to take a complete family history.
- Consider adding a requirement that programs formally submit syllabi for courses on genetics during the application process.

The entire group then discussed these four breakout group reports, as well as other “next steps,” as follows.

Wrap-up Summary and Next Steps - Francis Collins, M.D. Ph.D., Moderator

A lot has been accomplished in this short meeting. The Physician Assistant community is very cohesive and well suited for the opportunity to be change agents. NHGRI would like to be partners in this endeavor through the following:

- Visibility of the U.S. Surgeon General’s Family History Initiative at the upcoming AAPA Annual Meeting. Consider making laptops and printers available for attendees to view the “My Family Health Portrait” website and complete their own family history at either the 2007 or 2008 annual AAPA meeting.
- As schedules allow, NHGRI staff would be willing to attend various Physician Assistant meetings to give presentations on genetics. The talks should be associated with pre-meeting announcements and follow-up activities.
- Formulate a Coordinating Council with representation from each Physician Assistant group, NHGRI and the Office of the Surgeon General to update one another on progress in this arena.
- Plan another meeting for this group in September 2007. Additional organizations to consider including are ACMG, NCGC, ISONG, etc. In advance of the meeting, the Coordinating Committee should assess which action areas identified at this meeting have been accomplished.

Additional recommendations to keep the momentum going:

- Develop the “face of genetics” campaign for 5-8 cases. Use NCHPEG to help build connections to patients and families for this campaign. Consider building connections to NSGC for help with development of content.
- Develop a “top 10 list” regarding genetics in health and disease for Physician Assistants.
- Develop a partnership between the Physician Assistant community and the genetics community. Opportunity to leverage a lot of the medical community through the PA community. Establish liaisons. Establish partnerships in education and practice. Bruce Korf, President-Elect of ACMG will get in touch with ACMG leadership to establish more formal liaisons with the PA community.
- NCHPEG to build on current relationships that have been developed through the “Genetics in PA Practice” program.