

April 4, 2007

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Dear Dr. Queener,

I appreciate the invitation and opportunity to review the proposal for a PhD Program in Rehabilitation Science. I also appreciated being one of the external reviewers on the proposal prior to this iteration. It is clear that the faculty and administration responded to many of the suggestions and feedback received from the external review committee. I see most of the recommendations from this committee are in fact incorporated into this iteration of the proposal. You asked me to address the following questions in my review:

Is the curriculum appropriate to the campus and the area?
Is the program sufficiently rigorous to be a PhD program?
How does the program compare with similar programs nationally?
Are faculty resources adequate?
Are the equipment and physical plant adequate?
Is the pedagogical model realistic?
Will this degree adequately prepare students for meaningful professional career opportunities?

I will answer each question separately and then conclude with a recommendation.

1. Is the curriculum appropriate to the campus and the area?

The objectives of this PhD program are to develop scholars who, through leadership and research, contribute to the knowledge base of health and rehabilitation sciences. The proposal is aligned with both national initiatives in rehabilitation science, like the IOM report *Enabling America* and the strategic life sciences goals of Indiana University. Rehabilitation research has direct relevance to many of the 15 overarching goals listed in the University's Life Sciences Initiative Strategic plan. For example, goals 5 & 7: *Indiana University should build its research programs in neurosciences- basic research, translational research, advanced clinical care- so they are ranked in the top tier nationally. And Indiana University should engage in research and education- particularly state and federally funded education efforts- that will help residents of the state of Indiana to lead healthier, better, and longer lives.* The program provides focus and helps to evolve and further develop the Mission of the School of Health & Rehabilitation Sciences which is to develop and maintain a scholarly and competent faculty who will provide excellence in: The teaching/learning process for programs in

fields related to health professions; The advancement of knowledge through research, scholarship and creative activity, and; The development of lifelong commitment to civic engagement locally, nationally and globally. *The proposed Ph.D. program in Health and Rehabilitation Sciences will be housed in the Department of Health Sciences located in the School of Health and Rehabilitation Sciences.* That department administratively houses two M.S. research degrees offered by the Indiana University Graduate School and is the administrative home for the Indiana Center for Rehabilitation Sciences and Engineering Research. *The proposal has been endorsed by the School's Academic Studies and Research Development Committee and received formal approval by unanimous vote of the entire faculty of the School.* Given the strategic directions in the area of life sciences it the proposed curriculum is appropriate to the campus and the area.

The curriculum itself proposes the following outcomes for its graduates. Graduates shall:

1. Articulate the theoretical frameworks of rehabilitation with particular focus on relevance to their clinical discipline and area of concentration.
2. Describe theories of health promotion and disease prevention, particularly as they relate to disability.
3. Demonstrate enhancement of their knowledge base of health and rehabilitation sciences from an interdisciplinary perspective.
4. Analyze health services methodological approaches to rehabilitation.
5. Critically evaluate research in rehabilitation.
6. Access systematic reviews and meta-analysis databases so as to deepen their knowledge of best practices in rehabilitation.
7. Engage in substantive research in rehabilitation as it relates to their area of concentration. Students will identify a line of inquiry and develop hypotheses; choose appropriate methodology such as research design, instrumentation, and statistical analysis; collect and analyze data; and disseminate results.
8. Demonstrate an ethical approach to research activities.
9. Submit a research grant to an external agency.
10. Submit a manuscript to a peer reviewed publication.
11. Demonstrate the use of evidence based practice concepts to include the importance of considering patient/client values and preferences in their approach to rehabilitation.
12. Teach others about rehabilitation as it relates to their clinical discipline and area of concentration.

To achieve these program outcomes the faculty have developed a 90-92 hour curriculum. *Actually this is an issue as PhD programs are 90 hours.* I do believe that that to conform to other IU PhD programs the faculty is going to have to reconsider the 92 hours and confine the degree to 90 hours post baccalaureate? The proposed program consists of Twelve (12) credits of Health and Rehabilitation Sciences Core Courses. Thirty (30) credits from Health and Rehabilitation Sciences Areas of Concentration which include the focus areas of 1) Pathology and Impairment Research; 2) Functional Limitation Research; and 3) Disability Research and 4) Health Services Research.

Forty to forty-two (40-42) credits of Research Core Courses that include 9 credit hours of statistics and research design courses at the graduate level. *The examples cited in the proposal were illustrative and seemed more focused on skills courses like writing for publication and grant writing, I suspect the proposal could be stronger if other exemplars were chosen that focused more specifically on research methods and design courses many of which are available and would be suitable in collaboration with other campus departments, thus strengthening the interdisciplinary thrust of research today.* Specific examples to consider might be found in Nursing like R603 Foundations of Research and R604 Experimental and Quasi-experimental Design or R605 Advanced Research Design. Students in this curriculum have six (6) hours of electives and nineteen (19) hours of dissertation.

Overall the curriculum seems logical and well organized. As noted there research core could be strengthened and might benefit from more specific attention to courses that focus on research design and methods as well as measurement and/ or instrumentation issues in the discipline. Courses must be approved by the student's Advisory Committee as part of the student's plan of study. There is an extensive evaluation plan embedded in the document and the faculty and administration appear to be committed to continuous evaluation, and assessment of the quality of experience and outcomes associated with the program.

2. Is the program sufficiently rigorous to be a PhD program?

Yes, the proposed outcomes noted above in #1 as well as the areas of research concentration, in addition to the cadre of faculty and ongoing research projects provide evidence that the program is sufficiently rigorous to be a PhD program. Additionally, several faculty have who have ongoing research projects and funding have been identified with specific focus areas for example: Stuart Warden, Ph.D., PT through the Musculoskeletal Research Laboratory researches normal and abnormal functioning of the bone, muscle, tendon, and ligament using animal and human models; Tracy Dierks, Ph.D. through the Motion Analysis Research Laboratory examines the biomechanics and motor control of running and walking specific to intervention techniques to reduce injuries; Michael Justiss, Ph.D., OTR through the Driver Assessment Laboratory focuses on approaches to driver assessment, rehabilitation/remediation, and counseling for driver alternatives and community mobility options, particularly in an aging population; Daniel Vreeman, DPT, PT through the Medical Informatics Research Laboratory focuses on the investigation of medical informatics applications to improve healthcare delivery and research, including application to rehabilitation.

3. How does the program compare with similar programs nationally?

Based on the data submitted it appears as if there are no comparable programs within the region or the state. The closest comparable programs currently in existence or being developed are in adjoining states—Ohio State University, University of Kentucky, and University of Illinois-Chicago. Given, Indiana's commitment to Life Science initiatives it does seem as if this program will contribute to research productivity in this area.

4. Are faculty resources adequate?

The proposal makes note of the fact that one new senior faculty member position will be required, not later than fall 2008 and this person will have a split appointment between the Indiana Center for Rehabilitation Sciences and Engineering Research (50%) and the Department of Health Sciences, School of Health and Rehabilitation Sciences. This additional faculty resource seems vital as this person will have oversight of the Ph.D. program and will deliver 2 core courses in rehabilitation in the Ph.D. curriculum. Additionally the School of Health and Rehabilitation Sciences has recruited new faculty over the past three years with post-doctoral training that support and enhance the viability and future development and growth of the proposed PhD program. New faculty include: Ashraf Gorgey, Ph.D. (Physical Therapy) - National Institute of Disability and Rehabilitation Research Post Doctoral Fellow in Spinal Cord Injury. Lorrie Ippensen Vreeman, DPT (Physical Therapy)- Maternal & Child Health Post Doctoral Fellow in Pediatrics ;Michael Justiss, Ph.D. (Occupational Therapy)- Department of Transportation Post Doctoral Fellow in Driver Safety; Arlene Schmid, Ph.D. (Occupational Therapy)- Veteran Affairs Post Doctoral Fellow in Health Services Research; Stuart Warden, Ph.D. (Physical Therapy)- National Health & Medical Research Council Post Doctoral Fellow in Musculoskeletal Research; Daniel Vreeman, DPT (Physical Therapy)- National Library of Medicine Post Doctoral Fellow in Medical Informatics. There is also a note that one additional faculty member with post doctoral training will be added in the 2007-08 academic year. Supporting Faculty within the School of Health and Rehabilitation Sciences are available to serve on committees to lend special expertise in health and rehabilitation sciences. There is a great deal of young talent that can contribute to the development of this program as well as senior level faculty who are in a position to facilitate learning and contribute to next generation faculty development.

5. Are the equipment and physical plant adequate?

It is noted in the proposal that no additional learning resources are needed. Of note is the role of the Indiana Center for Rehabilitation Sciences and Engineering Research (ICRSER) will play as an additional resource to promote program development. ICRSER is an Indiana University approved center chartered by 7 schools on the IUPUI campus (Health & Rehabilitation Sciences, Engineering & Technology, Medicine, Nursing, Physical Education & Tourism Management, Science, Informatics), the Rehabilitation Hospital of Indiana (RHI), and the Roudebush VA that researches new strategies, devices, and technology relevant to rehabilitation and mobility. Other collaborators in ICRSER include the Purdue University Discovery Park, Ball State's Human Performance Laboratory and biotech organizations such as Cook Biotech, Inc. and Biocrossroads. *The inclusion of the Ph.D. program within the Department of Health Sciences which also houses ICRSER provides students with collaborators in their research activities—through partnerships established by ICRSER.* Some of the

departments and laboratories where ICRSER has interfaced include: Department of Orthopaedic Surgery; Department of Anatomy and Cell Biology; Center for Regenerative Biology and Medicine; Biomedical Engineering Program; Department of Electrical and Computer Engineering; Department of Mechanical Engineering; Informatics Research Institute; Human Performance and Biomechanics Laboratory; Regenstrief Institute, Inc; Indiana University Center for Health Services Research; VA Center for Excellence in Health Services Research; Center for Aging Research.

6. Is the pedagogical model realistic?

It appears as if the program is organized around a mentor-mentee relationship model. Credentials to Serve as Primary Advisor have been delineated. In this pursuit of research and scholarship, the faculty member and student collaborate with the purpose of contributing to and advancing scientific knowledge in the content area. Mentoring faculty must demonstrate an active research program within their discipline representing significant addition of new knowledge or unique application of existing knowledge in the solution of problem(s) pertinent to Health and Rehabilitation Sciences. The primary research advisor of a doctoral student must have earned a traditional research doctorate (Ph.D. or equivalent) or in the case that the terminal degree is a clinical doctorate, the individuals must have had formal post-doctoral research training with the objective of becoming an independent researcher. At a minimum, the primary mentor needs to have published his/her original research in a peer-reviewed journal as first or senior author. Primary advisors will be selected by faculty having official IU Graduate School "Endorsement" to chair doctoral dissertation committees.

7. Will this degree adequately prepare students for meaningful professional career opportunities?

Yes, it seems that students would be prepared for meaningful career opportunities. There is a shortage of qualified faculty at the doctoral level in the health and rehabilitation sciences fields. A 2005 national survey of 116 physical therapy educational programs produced the following data: Of the 116 programs, almost half (52) were searching for faculty in that one year. 36 programs were searching to fill 1 vacancy, 12 were searching to fill 2 vacancies, 3 programs were searching to fill 3 vacancies, and 1 program was searching to fill more than 3 vacancies. The mean length of time that these vacancies had been open was nearly 9 months. Nationally, the current vacancy rate for occupational therapy faculty is 25% with an estimated increase to 35% by 2012. Based on 2005 survey data, only 7% of registered dietitians are employed in education and research and only 4% of all registered dietitians hold doctoral degrees.

This program proposes to prepare the future university faculty in Health and Rehabilitation Sciences. There is a documented need for doctoral-educated individuals who can teach at universities and conduct research necessary to further the body of knowledge in a variety of settings including universities, hospitals, and the biotechnology industry. Because of the strong research component of this program and the alignment of specialties with nationally-articulated needs in research and scholarship, graduates of this

program are likely will be sought by other major research institutions that are building graduate programs in rehabilitation sciences as well as sizable rehabilitation hospitals and clinical facilities that seek to undertake research studies to inform their practice. Additionally, graduates of this program would be eligible for post-doctoral fellowships in rehabilitation within their area of concentration.

Thanks for the opportunity to review this proposal. I support its approval with attention to the issue of the attention to 90 versus 92 credit hours for the degree and the issue of strengthening the choices, exemplars or illustrative examples of courses that better meet the intentions of the research core requirements for the degree.