

**ROCKY MOUNTAIN CENTER FOR
OCCUPATIONAL AND
ENVIRONMENTAL HEALTH -
EDUCATION AND RESEARCH CENTER
FOR OCCUPATIONAL SAFETY AND
HEALTH**

SUMMARY ANNUAL REPORT

July 1, 2015-June 30, 2016

**NIOSH Training Grant
No. T42 OH 008414**

**SUBMITTED BY:
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Section I

ERC Summary

The RMCOEH is a vibrant, innovative and growing ERC that has been in existence at the U. of Utah since 1977. It is one of only two ERCs in Region 8 (UT, CO, WY, MT, ND, SD), although these states are in the top rankings for occupational fatalities and thus have an urgent need for more OSH professionals. In the past grant period, we have made major progress, including ground-breaking legislation supporting the RMCOEH. We have 2 new endowed chairs (OSH and mining). We have continued to make progress in the past year. We have increased the numbers of PhD students. The quality of graduates has continued to accelerate. We have 5 graduate degrees (MOH, MSOH, PhD in OEH; plus MS and PhD in MEEN). We now have a graduate certificate program in OSH. The RMCOEH has academic programs in OMR, IH, E&S and OIPRT and has over 150 full time, adjunct and other supporting faculty. We are starting a new Targeted Research Training Program in July 2016. We teach the importance of OHN to our trainees. Our CE and Outreach Programs train >6,000 trainees/year. Overall center impacts are over 2,500 businesses annually.

The RMCOEH enjoys unparalleled collaborative relationships with businesses, employee groups, governmental units, and other community organizations. These foster an atmosphere that facilitates state-of-the art training for OSH professionals for the 21st Century. These relationships also provide the external 'laboratories' to test research theories and develop the innovations to provide safer and healthier workplaces. We also have a highly active RMCOEH Advisory Board and a Center Executive Committee that are critical in advancing the RMCOEH's programs. The RMCOEH has the infrastructure to support the NORA II, r2p and other research missions. The RMCOEH's CE and Outreach programs promote and publicize efficacious strategies and help ensure that knowledge is translated into practice.

Relevance

The RMCOEH is among the largest graduate OSH training programs in the US. It serves HHS Region 8 which has among the highest occupational death and injury rates. The RMCOEH's NORA research programs address major deficits in the region/nation's OSH. Research foci particularly include: musculoskeletal disorders, respiratory protection, transportation safety, and mining issues.

Key Personnel

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ERC web link

<http://medicine.utah.edu/rmcoeh/>

Section II

Administration Kurt T. Hegmann, MD, MPH, Center Director

In 2015-16, the RMCOEH continued to meet all goals and objectives. The RMCOEH holds monthly Center Executive Committee meetings, biannual RMCOEH Advisory Board meetings, Advisory Board Executive Committee meetings and an annual RMCOEH retreat. There were several major advances.

- The RMCOEH has matriculated and graduated its 9th class of students in our accredited Master of Occupational Health and Master of Science in Occupational Health Degree Programs.
- We continued our approved Graduate Certificate Program in OSH.
- The center continued implementation of our plan to increase student publications. The numbers of student publications tripled over the past year!
- The RMCOEH continues to admit students into our Ph.D. in Occupational & Environmental Health program that has 3 emphases (Industrial Hygiene, Occupational Injury Prevention and a General emphasis).
- Further work to advance distance-based education is being substantially advanced that started with the arduous task of recording all but 1 course.
- RMCOEH applied for multiple extramural grants. One new R01 was started.

Diversity Recruitment Darrah Sleeth, PhD, MPH, CIH

RMCOEH faculty members continue to work with Dr. Ana Maria Lopez, Associate Vice President for Health Equity and Inclusion at the University of Utah to maintain and increase recruitment from under-represented groups. This includes faculty involvement with the Office of Health Equity and Inclusion Collaborative Group. As part of this increased collaboration, RMCOEH faculty and students presented occupational health career information at a workshop for Future Health Professionals that was targeted at local high school students. In addition, increased contact, including providing program brochures, has been initiated with those involved with diversity at the University of Utah and other universities in Region 8, as well as with various community and student organizations.

Statistical Economic Evaluation Unit (SEEU) Maureen Murtaugh, PhD

The SEEU served as a resource to the Center in providing the statistical and economic tools for evaluating interventions to improve workplace health and safety. The SEEU continues to contribute through providing insights, including participation in journal club meetings, consultation regarding analysis approach for publications, and participation in grant preparation. We have performed a new graduate student survey (5/2015) and are currently analyzing the results.

Outreach Matthew Hughes, MD, MPH

Outreach continued to be a significant emphasis at the RMCOEH, maintaining the goal of ensuring that knowledge is translated into practice. The Center policy requires measurable outreach activities by each faculty member with thousands of contact hours recorded annually. We logged contact hours in activities that included appointments, presentations, consultations, and participation in career day events for national, regional and academic institutions, local business and trade, insurers, community groups, occupational and environmental health organizations, and the public. The program is continuing to explore how to put an effective but narrow foothold in social media that is useful to target audience(s) while optimizing faculty time required.

Pilot/Small Projects Research Training (PPRT) Maureen Murtaugh, RDN, PhD

We have tracked progress of the prior year grantees. For example, the 2013-14 project "Solubility of Metals in Hard Rock Mine Ores in Simulated Lung Fluids" was completed by Dr. Pahler with the help of graduate students (Jordan Kyle and David Adams) in partial fulfillment of the requirements for their MSOH degrees. The paper is published Journal of Chemical Health and Safety (doi:10.1016/j.jchas.2014.10.003).

The review committee met on June 28, 2016 to discuss the ten pilot proposals that were submitted. The review is aligned with NIH review including use of the NIH review template for R03 projects with attention to NIOSH Research to Practice Initiative. Seven were deemed of sufficient scientific quality, with sufficient promise for support of center research priorities, graduate education and/or external funding, and therefore, worthy of funding. Seven awards were made and awardees were notified the second week of July. One award was made to a Utah State Faculty member, and the balance to University of Utah junior faculty and graduate students. Awards were made in all programs at the center. Members were pleased with grading process, funding levels, and the number and quality of applications.

Ergonomics & Safety (E&S) Andrew Merryweather, PhD

The focus of the E&S Program has shifted to training Ph.D. students. In the past year 9 full time (3 M.S. and 6 Ph.D.) were trained of whom 7 received NIOSH support during the year. Two part-time Ph.D. students continue working towards graduation and did not receive NIOSH support during the year. Three students are expected to graduate this year. All topics (both "highly recommended" and "recommended") included in the NIOSH Guidelines for Graduate Programs in Occupational Safety (by The Occupational Safety Academic Training Program Panel) are covered in the M.S. and Ph.D. program courses (or pre-requisites). A new course in Product Safety was developed by Dr. D'Entremont to improve the training of engineering students in E&S and is planned as a regular academic course elective. Dr. Mark Fehlberg revised ME EN 6130 "Design Implications for Human Machine Systems" to focus more on Human Factors and safety. All E&S students are required to present their research at the successful, annual Regional National Occupational Research Agenda (NORA) Young/New Investigators Symposium, which has been held on the University of Utah campus since 2003. With the focus on Ph.D. research, E&S students were authors on 8 peer-reviewed publications with 2 more submitted and under review 2 in revision and 3 national/international conferences. All NIOSH supported trainees take the interdisciplinary course "Occupational Health Solutions" as the capstone of their course program. The course is team taught by Drs. Wood, Boswick, and Pahler (OM, E&S, and IH cores). This course includes on-site student projects completed by interdisciplinary teams from RMCOEH (IH, OM, OIPRT, and E&S) who visit local manufacturing facilities and work together to solve real world health and safety problems. The off-site ATK M.S. Mechanical Engineering Program includes approximately 10 active students, most of whom focus on Ergonomics and Safety as their area of emphasis and take 3-5 E&S courses. An additional 7 Non Thesis M.S. students are enrolled and declared Ergonomics and Safety as their area of emphasis. An effort to promote ergonomics and human factors design for people with disabilities was launched to train undergraduate engineering students. Dr. Merryweather is leading this effort and has partnered with Dr. Jeffrey Rosenbluth in the school of medicine to promote safety and health among volunteers and care providers who assist individuals with neuromuscular disabilities during rehabilitation.

Industrial Hygiene (IH) Rod Handy, MBA, PhD, CIH

This last funding period (July 1, 2015 to June 30, 2016) the IH program met its goals and objectives. Five total students graduated from the IH Program, with four students funded by the NIOSH ERC training grant and one funded by a R01 grant. All graduated with Master of Science in Occupational Health (MSOH) degrees having an emphasis in industrial hygiene. Eight (8) full-time and one (2) part-time IH students (all MSOH with emphases in IH degrees) began matriculation as new students this same period. Returning students included four full-time students in the Fall 2015 semester. There are two returning part-time student in the MSOH degree program for Fall 2016. In addition, regarding our diversity recruiting program, the black/African American student in our MSOH degree program graduated during this funding period but has returned as a student in our Ph.D in Occupational and Environmental Health (OEH) degree program. In addition, we had three Ph.D.s in OEH return for this funding period, and another that is a returning Ph.D. in OEH student who does not receive NIOSH funding. Thus, including the four (4) MSOH IH students that graduated, the ten (10) new or returning MSOH IH students, and the three (3) Ph.D. in OEH students with IH emphases for the last funding period, the total number of students in the IH program for this funding period was 17. Examples of the IH Program research projects conducted this last funding period included: A Pilot Study Predicting Gastrointestinal Temperatures of Smelter Workers with Thermal Imagery and Infrared Thermometry; Evaluation of Physiological Strain in Hot Work Areas Using Thermal Imagery; Comparison of New Low-Cost Inhalable Sampler and IOM Sampler for Field Testing of Smelter Workers; and Wind Tunnel Testing of a Disposable, Inhalable Aerosol Sampler at Two Sampling Rates. We are currently accredited by ABET-ASAC

and had our site visit by an accreditation evaluation team in September, 2010. On August 2, 2011 we received official notice of renewal of our accreditation to September 30, 2017. Our ABET ASAC visit for the next renewal of our accreditation is scheduled for November of 2016.

Occupational Injury Prevention & Research Training (OIPRT) Matthew Thiese, PhD

The OIPRT program continued to meet its goals and objectives. The program included 3 PhD level trainees during the AY and 1 graduate. Dr. Shorti successfully defended his work related to Truck Driver Biomechanics during Cab Egress. The OIPRT program continues to provide quality Occupational Safety Engineering (OSE) and Occupational Injury Epidemiology (OIE) emphases academic programs, and accomplish NORA-related OSE and OIE research and translate it into practice (r2p). The academic program integrates engineering and epidemiology, with students in the OSE program emphasizing engineering and students in the OIE program emphasizing epidemiology. One of the students is focusing his research on Low Back Injury Modeling and Exposure Assessment using wearable sensors, another is evaluating the role of cardiovascular diseases in the prevalence of truck crashes, and the last worked towards better understanding of behavioral safety in the construction sector. Another student is identifying ergonomic hazards within the commercial trucking industry, and planning a study to assess exposures and potential risks while adjusting for confounding factors. The third student's dissertation will focus on cardiovascular and dietary exposures and associations with negative health outcomes among commercial motor vehicle drivers. OIP students contributed to work published in 1 peer-reviewed journal publication. In addition to journal submissions, students are required to present their research at the annual Regional National Occupational Research Agenda (NORA) Young/New Investigators Symposium, which has been held on the University of Utah campus since 2003. The program continues to increase its training opportunities as demonstrated by launching an online course in Occupational Epidemiology taught by Dr. Thiese, who was appointed as Program Director for OIPRT. Dr. Thiese's efforts to make more course materials available for remote and distance based learning is gaining more traction and will produce additional resources in future years.

Occupational Medicine (OM) Eric Wood, MD, MPH

In total, the OM residency program has trained (11) highly skilled OM physicians filling a critical need to NIOSH Region 8, which is underserved by OM specialists. During the period of 07/01/15-06/30/16, (11) residents were enrolled in the program. This total includes (5) residents in the PGY2 year, and (6) residents in the PGY3 year. Two residents transitioned from PGY2 to PGY3 during this period: (1) in October 2015, and (1) in January 2016. Both are included as PGY3 residents. Two residents graduated off-cycle: (1) in August 2015, and (1) in December 2015. We plan to train (9) OM residents and (1) Aerospace Medicine resident in the 2016-2017 academic year. Academic training consists of completion of graduate education over a period of two semesters leading to the MOH degree. Training in the clinical practice of OM is conducted in both years. One PGY3 OM resident completed the MOH degree in December 2015, and three PGY2 OM residents completed the MOH degree in May 2016 (a fourth OM resident completed the MOH degree in August 2016). In addition to ERC funding, the program successfully competed for funding from the US Health Resources and Services Administration (HRSA) to support the increased total number of OM residents. The combination of ERC and HRSA funding provides leverage and an economy of scale to significantly enhance training opportunities for all residents as well as the complementary interdisciplinary graduate training programs at RMCOEH. Clinical and research activities continue with a focus on work-related musculoskeletal research, and commercial motor vehicle operator (truck driver) health and safety. One resident and faculty mentor (PD) competed successfully for funding to conduct research on breastfeeding and the workplace. The program has also increased training activities in occupational health and safety in the Mining Sector, a critical industry in NIOSH Region 8. The program takes the lead role in the development of state-of-the-art evidence based occupational medicine practice guidelines through work with the American College of Occupational and Environmental Medicine (ACOEM) to improve care of injured and ill workers.

Continuing Education (CE) Connie Crandall, MA, MBA

The CE Program met its goals and objectives for 2015-2016. Attendance remained high with 3516 trainees attending 208 CE activities. This includes both traditional (3494 trainees) and online (22 trainees) activities. The program continues to successfully offer the online Ethics and Professional Practice of Industrial Hygiene

course; in addition, the Occupational Epidemiology online academic course has been recorded; the course is being fine-tuned to be made available as a marketable continuing education offering, either as individual modules or a complete course. Over this past grant period, we have sponsored courses in other states that include ID, MT, ND and Wyoming. In an attempt to attract attendees from surrounding states, courses will continue to be held outside of Salt Lake City (Clearfield, Dugway, Moab, Murray, and Brigham City, and St. George). Courses continue to be held annually in Eastern Idaho to accommodate the needs of those requiring asbestos training in that area (although not Region 8, it is geographically proximate). The Occupational Medicine Journal Club meets twice a month with impressive attendance from both academic students and the community. Two needs assessments (one conducted with all 18 ERCs) were conducted during the reporting period and information from both will be used to guide future programming. New courses offered during this period include 1) The Heart of Collaboration in Safety and Health; 2) Operational Risk Management; 3) They Made you the Safety Person! Now What? and 4) Practical Approaches to Troubleshooting Common Ventilation Programs. The program continues to successfully offer initial Lead Safety for Renovation, Repair and Painting courses since 2010 but has eliminated the refresher courses. Finally, collaboration with the Utah Chapter of the AIHA, Utah Section of the ASSE, Utah Safety Council and Utah Association of Occupational Health Nurses remains strong.