

[KAART]

KENTUCKY APPALACHIAN ASSISTIVE AND
REHABILITATION TECHNOLOGY CENTER



A PROSPECTUS



The mission of the Kentucky Appalachian Assistive and Rehabilitation Technology Center is to partner with the community to improve quality of life and function, and provide opportunities for engagement for people with disabilities—as well as those without—through research, service and education.

A center committed to the needs of the many people living with disabilities in central and eastern Kentucky is desperately needed. A center that serves these people while training and educating current and future health care practitioners is ideal. A center that simultaneously prepares health care practitioners, serves those with disabilities and increases the accessibility of equipment is, in Kentucky parlance, a trifecta.

KENTUCKY APPALACHIAN ASSISTIVE AND REHABILITATION TECHNOLOGY CENTER

A coalition of health care providers, educators and people with disabilities are focused on making this center, the Kentucky Appalachian Assistive and Rehabilitation Technology Center (KAART), happen. The needs that drive the shared passion to create KAART are reflected in the data from our state:

- In Kentucky in 2016 the overall estimated level of disability was **29.2 percent** or **1.28 million** residents.
- On average, each year **30,000 Kentuckians** survive a traumatic brain injury.
- In a single year approximately **24,000 Kentuckians** will suffer a stroke and more than **200** will survive a spinal cord injury.
- Kentucky has the **highest cancer death rate** and the **highest cancer incidence rate** in the nation. Cancer-related fatigue up to **6 years** post-treatment is associated with high levels of disability.
- According to the Center for Disease Control and Prevention, **26.7 percent** of Kentucky health care costs were related to disability, accounting for **\$5.821 billion** in 2016.

KAART will address the needs related to the Commonwealth's high rates of disability through research, education, equipment accessibility, and work force development





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RESEARCH

A **primary** area of research at KAART will be performance, physical activity and function. **Research** efforts will include people who use wheelchairs or other assistive devices, who have impairments as well as those who do not have impairments.

Research would include any of the following:

- Analysis of physical activity
- Examination of effects of adaptations to durable medical equipment and assistive technology on function and in functional settings
- Assessment of seating designs through pressure mapping
- Treadmill training including body weight support

Evaluations include 3D motion analysis, balance analysis and training, electromyography, telemetry and isokinetic analysis.

KAART researchers will study effective **pain management**. Researchers will test innovative interventions using multiple disciplines including physical therapy and psychology in a functional setting in order to reduce dependence on medications (e.g. opioids) for the treatment of pain.

Researchers will study cancer rehabilitation, especially in the following areas:

- Lymphedema prevention and management
- Voice rehabilitation
- Dysphagia prevention and management
- Fatigue
- Physical activity
- Secondary musculoskeletal and neurological complications

In the exciting and promising applications of **virtual reality technology** in rehabilitation, KAART will test its applications in real world settings.

Research in **applied nutrition** will help address issues related to management of chronic disease and best practices for nutritional support to prevent muscle wasting – a concern for many people with disabilities.

KAART researchers will contribute to studies of **frailty prevention**, specifically, the impact of nutritional support for bone and muscle health, the prevention and management of osteoporosis and optimization of physical activity and functional mobility.

While contributing to the development and testing of new **durable medical equipment and assistive technology**, faculty, researchers and staff at the Center will demonstrate proper use of new equipment and materials. This work opens opportunities for partnership with Kentucky Valley Education Cooperative and the Hazard Community and Technical College.

The KAART team will work in the development of innovative methods and increased access to equipment for **sports, recreation and community activities** to support participation especially for those individuals with disabilities.



EDUCATION

The KAART facility will create many opportunities for **University of Kentucky students**. Physical Therapy students at the Hazard campus will now have access to laboratories to study human performance, participate in and conduct rehabilitation research, and prepare to present research at national conferences, including the American Physical Therapy Association national conference. Students in programs such as Communication Sciences and Disorders, Special Education, and Engineering will have the opportunity to study interprofessional assessment and development of communication systems and assistive technology for persons with complex needs. Other possibilities include the development of a physical therapy residency program for rural health and interprofessional collaborations in research and experiential education.

The facility creates opportunities for continuing education for **community/regional clinicians**. New skills are essential for health care professionals working with an aging patient population—especially those with physical and/or cognitive disabilities. Educational materials will be developed and disseminated in rural areas to support the utilization of assistive technology including augmentative and alternate communication devices and durable medical equipment. Continuing education will also be available for special education teachers and health care providers.

Collaborations will be fundamental to the center and will include:

- Kentucky Community and Technical Colleges to provide an environment for real world training and participation in health science research.
- Kentucky Valley Education Cooperative (includes Students Transforming Appalachian and Real-world Solutions, Appalachian Renaissance Initiative, Appalachian Leadership Laboratory, Appalachian Technology Institute and Appalachian Innovations Collaborative) to interest high school students in health care careers, promote research, and provide practical experience.
- UK HealthCare and partners in Kentucky Health Collaborative.



FABRICATION, ADAPTATION, AND ASSESSMENT OF EQUIPMENT AND TECHNOLOGY

Space within KAART will be dedicated to adapting, developing, prototyping, and fabricating medical equipment and assistive technology. This area will also provide the space and tools to restore and refurbish durable medical equipment such as wheelchairs. This work is done through Project CARAT in Hazard at the Center for Excellence in Rural Health by students in the UK Physical Therapy Program.

The KAART Center will also be a convenient location in eastern Kentucky for people with disabilities to be fitted for equipment so that function is optimized without requiring travel to Lexington or long wait times often necessary for travel.

SERVICE/TREATMENT

In keeping with its mission to empower people impacted by disability, KAART is dedicated to collaborating with organizations and individuals in its work. Partnerships to provide access to equipment for treatment and assessment could include local health care providers (both private and public). Collaborations to provide assessment, adaptations and fittings could be developed with KVEC, the local school systems, and the State Office of Vocational Rehabilitation. These collaborations create opportunities for translational work and provide a funding stream into the center for sustainability.

WORK FORCE DEVELOPMENT

KAART will work with regional colleges and community colleges to provide an avenue to develop support personnel in the rural communities. The Center's work with KVEC will promote innovative idea development with local high school students. KAART will partner with the community to improve quality of life and function, and provide opportunities for engagement for people with disabilities—as well as those without—through research, service and education.



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