



University of Pittsburgh

ID: 3723

Featured Inventors: Heather Bansbach and Timothy Sell, PhD, PT

accelMOTION

Measure · Engage · Optimize

Value Proposition

There is a growing need in Physical Therapy (PT) for reliable, objective assessments. The shift toward value-based care and bundled payments drives PT centers to increase efficiency to remain profitable. Objective measures introduce a reliable way to track, optimize, and implement treatment plans that are evidence-based, allowing PTs to provide the most efficient and effective care to each patient using fewer resources. For PT's who specialize in orthopedic injuries, accelMOTION is the leading edge in rapid, comprehensive and objective assessment of injury and recovery that optimizes 1:1 time with patients, streamlines clinical decision making, individualizes treatment goals and accurately assesses recovery because it provides a portable, reproducible assessment system to evaluate patients and quantify treatment progress.

Market Opportunity

\$32 billion dollars are spent on PT in the U.S. annually, with 25.5K centers and 432K PTs that rely on analysis of subjective measures to remain profitable. Physical therapists see anywhere from 8-15 patients per day. A typical patient receives 8-12 physical therapy sessions, which costs about \$1,200. With an annual subscription of \$50 per physical therapist, our total addressable market is \$21.6 million.

Competitive Landscape

Companies like FOTO have already capitalized on the need for tracking patient data in physical therapy. While this company focuses more on survey tools, they have shown that patient and clinic analytics are desirable and that a subscription model can be profitable in the physical therapy space. Other companies, like Fusionetics, are working on ways to quantify musculoskeletal injury and recovery, but their assessment methods are still somewhat subjective and/or have not been validated against gold-standard measures.



Technology

Our technology leverages over 15 years of experience and research on injury prevention in Special Operations Forces operators and in student athletes. Our unique and prospective multifactorial approach to study musculoskeletal injury has generated a valuable data set with which we can derive injury risk algorithms and generate reports of the quantitative assessments that are in a context that will be useful to the customer. The novel assessments we are developing with the wearable sensors will be validated against the gold standard measurement to ensure that they are reliable, valid measures and are sensitive enough to be discriminatory in our injury risk analysis.

Stage of Development

We are currently working to validate our technology in the laboratory and in a previously injured population.

IP Landscape

A PCT application (PCT/US2016/055635) entitled "Method, Device and System for Sensing Neuromuscular, Physiological, Biomechanical, and Musculoskeletal Activity" was filed on October 6, 2016.

Funding

- \$25,000 – Innovation Works Technology Commercialization Consortium
- \$50,000 – NSF I-Crops
- \$5,000 – 2015 Michael G. Wells Competition
- \$3,000 – Pitt Ventures 1st Gear Program
- \$1,000 – 2016 Randall Family Big Idea Competition

FEATURED INVENTORS:

Heather Bansbach

Heather Bansbach is a fourth year doctoral student in the Department of Bioengineering at the University of Pittsburgh. She is graduate student researcher at the Neuromuscular Research Laboratory. She has experience in biomechanical, neuromuscular, and musculoskeletal assessments. Ms. Bansbach is particularly interested in the role of biomechanical and postural stability factors in the prevention of musculoskeletal injuries. She is also interested in the translation of laboratory tests to clinically friendly tools. She hopes to continue with accelMOTION as part of her thesis.

Education

Ms. Bansbach earned a Bachelor of Science in Biomedical Engineering from the University of Virginia in 2013. She has been working towards her Ph.D. in Bioengineering at the University of Pittsburgh from 2013 to present and anticipates graduating in 2017.

Timothy Sell, PhD, PT

Timothy C. Sell, Ph.D., P.T. is a physical therapist and an Associate Professor in the Department of Sports Medicine and Nutrition at the University of Pittsburgh. He serves as the Associate Director of the Neuromuscular Research Laboratory and holds secondary appointments in the Departments of Bioengineering and Orthopaedic Surgery. During his research career, Dr. Sell has focused on the role of functional joint stability in the prevention of musculoskeletal injuries. Currently he has a four-year (ongoing) study that includes yearly assessment of injury risk and a prospective study of injury in Division I athletes across five different sports. He has conducted post-injury assessments of strength, postural stability, and kinematics of professional athletes who have suffered hip injuries in golf, hockey, baseball, and basketball. He has also assessed the effects of maturation and age on strength, balance, and landing biomechanics in youth athletes. He has extensive experience in biomechanical, postural stability, neuromuscular, and musculoskeletal assessments with a particular focus on lower extremity injuries. Dr. Sell's research has also included the development and validation of injury prevention and performance optimization programs. He has also published and presented extensively on these topics.

Education

Dr. Sell earned a Bachelor of Science in Physical Therapy in 1993 and a Master of Science in Human Movement Science in 2001, both at the University of North Carolina at Chapel Hill. He earned his Ph.D. in Rehabilitation Science in 2004 from the University of Pittsburgh.

Publications

1. Heebner NR, Akins JS, Lephart SM, Sell TC. Reliability and validity of an accelerometer based measure of static and dynamic postural stability. *Gait & Posture*. 2015;41(2):535-539.
2. Sell TC, Akins JS, Opp AR, Lephart SM. Relationship between Tibial Acceleration and Proximal Anterior Tibia Shear Force Across Increasing Jump Distance. *Journal of Applied Biomechanics*. 2014;30(1):75-81.
3. Sell TC, House AJ, Huang HC, Abt JP, Lephart SM. An Examination, Correlation, and Comparison of Static and Dynamic Measures of Postural Stability in Healthy, Physically Active Adults. *Physical Therapy in Sport*. 2012;13(2):80-86.

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