Jessica Chandler, Ph.D.

TACHL is excited and proud to welcome our newest Postdoctoral Fellow, Jessica Chandler, who brings to our team expertise in mHealth applications related to physical activity monitoring with a focus on children and adolescents. She comes to us from the University of South Carolina where she played a crucial role in four, large-scale, NIH-funded community-based investigations aimed at increasing healthy behavior in youth. Her expertise is in data analysis and reduction techniques for various physical activity monitors (e.g., ActiGraph, Sensewear, & Polar Heart Rate Monitors) used in global health research initiatives. Not only does she have the experience in using these monitors to analyze physical activity levels of children in large-scale studies, but she also has experience in the calibration and validation of these monitors (i.e., creating meaningful units out of raw data – minutes of physical activity from “counts”/second).

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Jessica Chandler, Ph.D.

TACHL has grown exponentially since its launch in FY11 to the point where we have 12 developers on staff and are currently partnering with faculty and staff on over 30 active projects. TACHL has served as a key partner and/or collaborator on grants totaling $25 million (over $6M of which has funded TACHL personnel), primarily from NIH and other federal sources. With this in mind, we felt it was a good time to ask investigators and providers to help us evaluate their experiences with TACHL. Here are the results of a recent evaluation survey completed by a dozen teams who have worked with us over the past year.

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<tr>
<th>Indicators of Value/Quality</th>
<th>TACHL Performance</th>
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<tr>
<td>Satisfaction with Product</td>
<td>Satisfaction with Performance</td>
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<tr>
<td>Overall Value to Project</td>
<td>Would Recommend Us</td>
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<td>Quality of Product</td>
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<td>Likely to Partner Again</td>
<td>Timely Completion of Product</td>
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<td>Budget was Fair</td>
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TACHL UPDATES AND RESEARCH ACTIVITY


SPOTLIGHT

TACHL is excited and proud to welcome our newest Postdoctoral Fellow, Jessica Chandler, who brings to our team expertise in mHealth applications related to physical activity monitoring with a focus on children and adolescents. She comes to us from the University of South Carolina where she played a crucial role in four, large-scale, NIH-funded community-based investigations aimed at increasing healthy behavior in youth. Her expertise is in data analysis and reduction techniques for various physical activity monitors (e.g., ActiGraph, Sensewear, & Polar Heart Rate Monitors) used in global health research initiatives. Not only does she have the experience in using these monitors to analyze physical activity levels of children in large-scale studies, but she also has experience in the calibration and validation of these monitors (i.e., creating meaningful units out of raw data – minutes of physical activity from “counts”/second).
TACHL is excited to be partnering with two new career development (K) awardees — Drs. Shannon Phillips and Deepak Kumar. Congratulations to both of them!

Dr. Shannon Phillips, PhD, was a recipient of a MUSC KL2 award: A Family-Centered Self-Management Program for Caregivers of Young Children with Sickle Cell Disease. This study seeks to improve physical/psychosocial symptom management and quality of life among children with sickle cell disease (SCD) and their caregivers by facilitating the development of self-management behaviors. This will be accomplished by refining and conducting feasibility pilot testing on a technology-based, family-centered self-management intervention for caregivers of children with SCD ages 0-7 years.

Dr. Deepak Kumar, PhD was a recipient of a Rheumatology Research Foundation Career Development Bridge Funding (K-Bridge) award: Feasibility of Mind Your Walk Intervention for Knee OA. This project will refine and complete acceptability/usability testing of an mHealth app for individuals with knee osteoarthritis using a patient-centered, iterative design approach. This app will be designed to decrease treatment attrition and improve adherence to and satisfaction with interventions that target sustained physical activity in older adult populations.

The National Office for Victims of Crime awarded a $3.6 million grant to the MUSC National Crime Victims Research and Treatment Center (NCVC) and seven local agencies (Berkeley County Mental Health Center, Charleston County Sheriff’s Office, the City of Charleston Police Department, the Charleston Dorchester County Mental Health Center, the Charleston Coroner’s Office, the Charleston County Clerk of Courts, the Ninth Judicial Circuit Solicitor’s Office) to assist the victims and survivors of the Mother Emanuel AME massacre. As the lead coordinating agency, the NCVC will be responsible for leading efforts dedicated to provide comprehensive and coordinated long-term services to direct and indirect victims of the shooting. A major focus is the promotion of emotional recovery through the development and implementation of services specifically addressing the mental health needs of victims. TACHL is a key partner in this aim, and will work closely with the NCVC team and Mother Emanuel AME church to create a technology-based resource that is designed to provide education, screening, and evidence-based coping material to all victims. Dr. Tatiana Davidson, Assistant Professor in Nursing and Psychiatry, will play a key role as co-investigator in these efforts.

TACHL is excited to continue to meet the demands of intellectual capital in the MUSC community and beyond by recruiting another three developers. Aaron Allsbrook, Ethan Price, and Jameson Burroughs.

RECENT RESEARCH ACTIVITY

TACHL was fortunate to partner with the MUSC Health Innovation Center to solicit and support app development ideas that were submitted by MUSC employees. We reviewed over 125 highly innovative ideas. Three of these ideas were ultimately selected for funding. The campaign was so successful that we hope to repeat it in future years. Special thanks go out to Catherine Flanagan, who coordinated the campaign. We are excited to begin working on the three ideas that were selected for funding:

- **Dr. Aaron Lesher:** MUSC Children’s Hospital offers specialized burn treatment for patients throughout SC. Care often requires repeated dressing changes at home, leading to patient and parent anxiety as well as multiple trips to the burn clinic to assess healing and prevent complications. We will use mobile technology to improve burn care in the home by connecting patients and families with expert burn nurses and physicians at MUSC.

- **Jenny Winkelman and The MUSC Children’s Hospital Pediatric Injury Prevention Advisory Committee** will partner with TACHL to develop an MUSC app that delivers injury prevention education to new parents. The app will feature education via brief messaging that will be made available based on users’ preferred format (e.g., once-a-day texts, pushed content). The app will pave the way for a more comprehensive app that addresses a broader pediatric age range.

- **Cynthia McConnell:** Overwhelmingly, the most frequently submitted ideas were way finding apps. Essentially, this consists of a navigation application for MUSC and its diverse visitors. TACHL will develop and integrate an app to demonstrate feasibility of a system that helps MUSC visitors find where to park, where to walk (both indoors and outdoors), engage visitors with relevant location based content. This has high potential to boost satisfaction of visitors on the MUSC campus.

**MUSC iDEA CAMPAIGN WINNERS**

**TACHL CAPABILITIES AND RECENT PUBLICATIONS**

TACHL is excited and proud to continue to meet the demands of intellectual capital in the MUSC community and beyond by recruiting another six developers. **Andrew Matthews, Andrew West, David Hawkins, Christina Sihildeeth, Marcus Schoultz and Aaron Allsbrook.** Check out their bios at http://tachl.musc.edu.

**RECENT PRESENTATIONS AND PUBLICATIONS**

TACHL, COM and CON mHealth research were well represented at Latest Society of Behavioral Medicine Meeting in Washington DC.


- **Dr. Frank Treiber** was a speaker for a symposium: Promoting Practical Adherence Interventions at the Patient, Provider, and System Levels. His presentation was: mHealth-enabled patient and provider-centered medical regimen adherence solutions for uncontrolled hypertension. Annals of Behavioral Medicine. 2016; 50(Suppl 1), S48.


**SPOTLIGHT**

Dr. Brian Bunnell, TACHL’s postdoctoral fellow in CON, was awarded an NIMH F32 grant: Technology Based Solutions to Improve Quality of Care in Child Mental Health Treatment. The problem he is trying to solve is a top priority in the child mental health field. Many effective treatments emphasize skill building where providers teach new skills to families and assign “homework” activities to encourage practice of these skills in the home. Child outcomes are associated with the degree to which homework activities are used and completed during treatment. This F32 grant is the first step in Dr. Bunnell’s plans to develop novel technology-based tools to strengthen families’ understanding and use of skills that are commonly taught by providers in treatment. These tools will simplify for providers the process of assigning practice exercises, and will help families track and engage in these exercises at home. His primary mentors on this award are Drs. Ken Ruggiero, Frank Treiber, and Lynne Nemeth.
This month, we launched the Telehealth Resilience and Recovery Program in collaboration with the Departments of Surgery and Pediatrics and MUSC’s Center for Telehealth. The goal of this exciting new service is to address the unmet mental health needs of adults and children after traumatic injury. More than 20% of these patients go on to develop posttraumatic stress, depression, and other mental health problems. Yet, most trauma care units across the nation do not have mental health programs to facilitate continuity of care. We hope that TRRP will become a model program that, over time, can also reach other acute care centers across South Carolina. Our services include: in-hospital education, brief telephone screening 30 days post-discharge, full telehealth or in-person diagnostic interview for patients with positive screens, and full telehealth or in-person treatment for patients with posttraumatic stress disorder or depression. We also are developing for TRRP a cell-phone-based symptom tracking resource with motivational/educational messaging.

In just one month, the all-star team featured on the left has approached 62 Level A or B trauma patients who are good candidates for our program. Of these, 58 (44 adults, 14 children) received in-hospital education and enrolled in our program for screening and, if needed, telemental health services. These patients have been very engaged in our program. In fact, many have asked us if we would follow up with them before the 30-day screen. We’re excited about the potential for this program to have real impact.

**TELEHEALTH RESILIENCE AND RECOVERY PROGRAM**

**SPOTLIGHT**

Dr. John McGillicuddy, Dr. Prabhakar Baliga, and TACHL partnered on an exciting R01 recently funded by NIDDK: Mobile Technology Medication Adherence Program for Kidney Transplant Patients. Medication non-adherence and blood pressure control are major risk factors in this population for graft rejection, graft loss, and death; these are therefore critical targets for intervention. TACHL will assist in the development of Smartphone Medication Adherence Saves Kidneys (SMASK), a patient-guided, smartphone-based system to improve blood pressure control and medication adherence. SMASK will include automated reminders, tailored text message based motivational feedback and reinforcement, and provider tailored automated reports and alerts. The system will be tested in a 6-month randomized controlled trial with 6-month follow-up with 80 kidney transplant patients with verified medication non-adherence and uncontrolled hypertension.

**TACHL CAPABILITIES AND RECENT PUBLICATIONS**

With the tech bubble explosion in Charleston, the growth roadmap for a software development group can be extremely challenging. “Fortunes favor the brave” is a Latin proverb that TACHL holds dearly. With 4 senior-level software architects and 2 mid-level and 4 junior level developers, the College of Nursing and TACHL has forged a fantastic platform to continue its work in innovative technology in health care. TACHL welcomes its newest recruits: senior developer Jonathan Tindall and junior developers Andrew West, Christina Sithideth, and David Hawkins. They will join our established team of developers: Shantel Parker, Alex Umrysh, and Thomas Hogan. We also welcome our new postdoctoral scholar, Brian Bunnell, Ph.D., who comes to us from the University of Central Florida and recently completed his psychology internship at MUSC.

**RECENT PUBLICATIONS**


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Firefighter behavioral health is an urgent issue and the fire service has devoted significant effort toward building effective and accessible programs to address these needs. However, stigma remains a major barrier to getting help. How can we overcome the resistance of firefighters to getting the help they need when they need it most? TACHL and faculty from the National Crime Victims Research and Treatment Center are partnering with the National Fallen Firefighters Foundation to develop a novel resource, **Firefighters Helping Firefighters**, to address stigma head on with funding from the Department of Homeland Security. Drs. Ken Ruggiero and Angela Moreland co-lead the project.

**Firefighters Helping Firefighters** is a video storytelling resource designed to increase use of behavioral health care among firefighters who need it. It features the personal stories and recommendations of over 30 fire service professionals who have enthusiastically volunteered to share their experiences related to behavioral health and help seeking. It is modeled after **AboutFace**, an award-winning resource for Veterans developed by the National Center for PTSD.

The intervention will be widely and freely accessible via any internet-connected device, and is scheduled for launch in the Fall of 2015. Stay tuned!

**T A C H L  S P O T L I G H T**

Ecological momentary assessment (EMA) has emerged as a valuable tool with great potential to advance science and practice, including the development of personalized health technology solutions. It allows repeated sampling of individuals’ behavior and experiences in real time, in their natural environments, thereby reducing recall bias and increasing ecological validity relative to retrospective assessment. TACHL has partnered with at least 4 research teams on funded grants in which we have developed SMS-, web-, and smartphone-based EMA tools for children and adults with chronic pain, opioid addiction, and uncontrolled asthma. Feel free to contact us for an EMA consult.

**TWO NEW K AWARDEES!**

Congratulations to Carla Kmett Danielson, PhD, and Zack Adams, Ph.D., who were awarded K grants from the National Institute on Drug Abuse in the last quarter. Dr. Danielson was awarded a mid-career K24 grant to provide mentorship to junior investigators and lead the development of eHEARTT: **electronic HIV- and Addiction Risk for Traumatized Teens**. eHEARTT will be a technology-based toolkit to enhance delivery of HIV and substance use prevention resources for adolescents. Dr. Adams was awarded a K23, **mHealth Tools to Enhance Treatment of Teen Substance Abuse and Mental Illness**. This grant will give him the resources he needs to launch a line of research to evaluate mobile health technologies in treatment of youth with substance use disorders and comorbid mental illness. TACHL is partnering on 6 currently funded K awards, including the innovative grants that these outstanding scientists are leading.
Hypertension is a major risk factor for cardiovascular diseases. Prehypertension affects 30–37% of U.S. adults and reflects high risk for developing hypertension. Prehypertensives need novel, scalable health care solutions to improve blood pressure control and delay or possibly prevent eventual onset of hypertension. This is what TACHL Director Frank Treiber, PhD, had in mind with Tension Tamer, a smartphone application that is designed to engage users in stress-reduction activities to reduce blood pressure.

Dr. Treiber’s multidisciplinary team of scientists, health care providers, patients, and TACHL software developers has produced the app using a careful, patient-centered, iterative process. Native iOS and Android versions of the app have been developed for Tension Tamer, both of which are being used and tested with a diverse sample of African American and White prehypertensives.

“A lot of mobile apps have been developed for stress reduction, but most have undergone little or no testing. Health care providers and consumers need access to scientific data about the benefits of these resources before they are widely disseminated,” Treiber said. Tension Tamer is currently being tested in a 5-year study funded by the National Heart, Lung, and Blood Institute.

**TENSION TAMER TRACKS HEART RATE DATA THROUGH REFLECTIVE PHOTOPLETYSMOGRAPHY USING THE PHONE’S VIDEO CAMERA.**

**TACHL CAPABILITIES AND RECENT PUBLICATIONS**

We are excited to announce that TACHL has integrated its patient centered health management architecture with Interactive Voice Response (IVR) capabilities. IVR offers the ability to send and receive automated voice calls to patients and research participants via touch tone responses and voice recognition. TACHL can work with health care teams and researchers to use IVR to facilitate scheduling, sending alerts, conducting assessments (particularly brief assessments such as EMA), and delivering messages and education. This extends TACHL’s communication ability with SMS/MMS, push notifications via mobile applications, video conferencing, and email protocols.

**RECENT PUBLICATIONS (MUSC: send us your recent technology-related citations and we’ll list them)**


**TACHL SPOTLIGHT**

**NEW APP LAUNCHED!**

MUSC partnered with Fuzzco and the National Fallen Firefighters Foundation to develop a new smartphone app to address suicide risk among fire service professionals. The app, Rapid Intervention Team (RIT) tools for firefighter suicide prevention, launched earlier this month and is now freely accessible at http://pocketpeer.org. It has two key components— one gives assistance to fire service peers who have concerns that a fellow firefighter is at risk of suicide; the other gives self-help education. Development of the app was funded by the Department of Homeland Security via FEMA. The project, led by Ken Ruggiero, PhD, Co-Director of TACHL, involved several collaborators from MUSC’s College of Nursing and the National Crime Victims Research and Treatment Center.

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