efficiency of study planning, and brought together various experts for studio meetings with investigators. This efficient method can improve study function and execution for early-career investigators resulting in improved study success.

125

Case Series Report: The use of ultrasound in detecting neuromas in amputees with osseointegrated prostheses

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OBJECTIVES/GOALS: Imaging neuromas, benign tumors of nerve tissue, can be difficult in amputees with osseointegrated (OI) prostheses, in which a metal rod is implanted into the residual limb. Magnetic resonance imaging can be inadequate due to the implanted metal. The aim of this study is to assess the use of ultrasound to detect neuromas in patients with OI prostheses. METHODS/STUDY POPULATION: This is a single-institutional observational study of 7 patients undergoing lower limb OI prostheses. Lower extremity nerve ultrasounds with 2-D grayscale and Doppler were completed at postoperative follow-up visits following OI prosthesis implantation. Specifically, the sciatic nerve, tibial nerve, common peroneal nerve, and sural nerve were targeted for imaging. Neuromas found on ultrasound were measured by maximal length in three planes. RESULTS/ANTICIPATED RESULTS: Our study to date includes two patients with OI prostheses. The remaining patients will be accrued by the end of December. The first patient with a left below-the-knee amputation completed imaging 3 years after OI prosthesis implantation. The common peroneal nerve showed preserved fascicular architecture and morphology, with no distinct neuroma formation. However, the sural nerve demonstrated a $6 \times 5 \times 4$ mm neuroma with minimal pain with deep palpation. The tibial nerve demonstrated a $14 \times 11 \times 8$ mm neuroma within the medial calf musculature, with mild pain with deep palpation. The second patient with a right above-the-knee amputation was imaged 10 months after OI prosthesis implantation. The sciatic nerve demonstrated preserved fascicular morphology and terminated in a smooth taper. There was no defined neuroma. DISCUSSION/SIGNIFICANCE OF IMPACT: In conclusion, we have preliminarily shown in the first two patients that ultrasound can successfully image neuromas in patients with OI prostheses in the postoperative period. Furthermore, despite a patient that was 3 years postoperative with two neuromas, the neuromas produced minimal to mild pain with targeted palpation.

126

Characterizing raciolinguistic differences in emotion recognition for post-stroke assessment

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OBJECTIVES/GOALS: To create raciolinguistically sensitive emotion recognition assessment materials, we will (i) identify the prosodic cues that signal differences between raciolects (Black vs. White American English) and (ii) identify the prosodic cues that signal different emotions (angry, happy, and sad). METHODS/STUDY POPULATION: Research evaluating prosodic differences between raciolects and emotions both implicate pitch. For example, Black speakers tend to produce speech lower in pitch, and sad speech tends to be narrower in pitch range. In our study, 50 Black and 50 White American healthy adults will hear manipulated recordings of Black and White speakers uttering pseudoword strings that vary by mean pitch and pitch range. In the race task, participants will choose whether the stimulus was produced by a Black or White speaker. In the emotion task, they will choose whether the stimulus sounded happy, angry, or sad. Linear mixed-effects models will be used to determine the pitch correlates for each emotion by race. RESULTS/ANTICIPATED RESULTS: If mean pitch (high, low) and pitch range (wide, narrow) function as acoustic correlates for emotions but differ by race, we expect the following: first, members in each participant group (Black, White) will converge on correlates that differentiate emotions and race; and second, the emotion correlates will differ between groups. Preliminary results using stimuli from only White speakers suggest convergence across groups for emotions (angry: low mean pitch, happy: high mean pitch, and sad: narrow pitch range) but not race. Ongoing data collection including stimuli from White and Black speakers will be used to conduct planned comparisons as well as test same-race, different-race differences. DISCUSSION/SIGNIFICANCE OF IMPACT: Characterizing the prosodic differences in emotion recognition between races helps us understand disparities in post-stroke aprosodia. Additionally, developing a linguistically informed strategy for assessing deficits between dialects can be readily implemented across diverse linguistic communities.

127

Translational science must connect the dots from output to impact

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OBJECTIVES/GOALS: Despite efforts to support healthcare researchers to navigate translational gaps and achieve health impact, impact remains rare. We were interested in determining whether, when, and how researchers were taking actions to optimize the translational potential and impact of their research. We also wanted to identify ways to support optimization. METHODS/STUDY POPULATION: Our sample was drawn from Tufts CTSI's annual outcomes survey respondents (2017–2022) and included tufts principal investigators who had at least one project that reported an outcome (e.g., publication, presentation, funding application, research products, intellectual property protection, and implementation) on the survey. We excluded individuals no longer based at Tufts, no longer working in research, and holding a non-leadership role in their research. We drew a random sample of 58 researchers from the database. Of these, 11 (19%) were excluded, 32 (55%) did not respond to our invitation, 3 (5%) declined to take part, and 12 (21%) were interviewed. The study was approved by Tufts IRB and semi-structured interviews were recorded via Zoom, transcribed in full, and analyzed using the qualitative software Dedoose. RESULTS/ANTICIPATED RESULTS: We interviewed 12 participants, both male (5) and female (7), from 11 different fields, working in preclinical (2), clinical (6), and public health (4) research at assistant (3), associate (5), and full professor (4) rank. There was variety in the way that researchers conceptualized and anticipated pathways to

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impact. While researchers almost always described their motivation as connected to improved patient care, their ideas of impact were commonly described as research products or outputs, and there was little attention to planning and executing for real-world use. Researchers spoke about challenges related to competing career demands, institutional barriers, organizational culture, and lack of connections. Strategies to address these challenges included mentorship, collaboration, and policy work. DISCUSSION/SIGNIFICANCE OF IMPACT: The disconnect between researchers' ideas of output and impact was notable, and while researchers sometimes mentioned dissemination via publications and committees, use of dissemination and implementation frameworks were very infrequent. Fragmented approaches and implementation science gaps remain significant barriers to health impact.

129

Challenges of monitoring drug use trends and communicating results: Solutions from the National Drug Early Warning System (NDEWS)

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OBJECTIVES/GOALS: To discuss the challenges faced by National Drug Early Warning System (NDEWS; PI Cottler) in monitoring emerging drug trends and disseminating data to maximize public health impact. Drug trends are constantly in flux, with various communities facing different harms. To provide salient information, NDEWS must triangulate data from multiple sources. METHODS/STUDY POPULATION: In 2020, NDEWS was funded at University of Florida through a cooperative agreement with NIDA. A Scientific Advisory Group meets regularly for overall guidance, and 17 Sentinel Sites provide local perspectives. Now in its fifth year, NDEWS has utilized traditional data such as death reporting and drug seizures and has launched several novel surveillance components. Rapid Street Reporting conducts anonymous surveys of drug use in a Sentinel Site or hotspot each month. Machine learning methods applied to Reddit reveal new trends and novel substances. County-level alerts are generated by analysis of 911-dispatch data accessed through biospatial.io. Wastewater-based epidemiology provides city-level data. Findings are disseminated primarily through email weekly briefings and by peer-reviewed articles. RESULTS/ANTICIPATED RESULTS: In its first iteration, NDEWS has expanded available data sources and worked to integrate data to reveal trends that impact communities across the USA. These patterns vary substantially over time and by region and population, complicating analysis, but inclusion of multiple data sources is imperative for a full understanding of the landscape. NDEWS continues to explore novel routes of disseminating information to those who need it, including contacting local health departments with high overdose rates. Establishing networks for bidirectional communication with stakeholder groups such as toxicologists and educational affiliates is underway. NDEWS seeks to deepen ties with survivors unions (those with lived experience) and harm reduction organizations, which can be difficult due to mistrust of research. DISCUSSION/SIGNIFICANCE OF IMPACT: Monitoring the rapidly changing drug landscape in the USA is challenging, and its importance has only grown in recent years as new substances arise and adulterated drug supply has become the norm, promulgating the rise of dangerous substances such as fentanyl and xylazine. Ensuring that information filters out to those who use substances is critical.

130

A supervised strength and outpatient exercise regimen in pediatric patients with acute lymphoblastic leukemia (STRONGER ALL)

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OBJECTIVES/GOALS: To assess the feasibility, safety, and preliminary efficacy of implementing a supervised, outpatient aerobic and strength exercise regimen in newly diagnosed pediatric patients with acute lymphoblastic leukemia (ALL). We hypothesize that early implementation of exercise is feasible and may prevent well-known cardiometabolic late effects. METHODS/STUDY POPULATION: We will enroll 10–20 children (both males and females) with newly diagnosed ALL between the ages of 11–21 years to participate in a 12-month supervised, structured outpatient exercise regimen (STRONGER ALL). This regimen will consist of low- to moderate-intensity aerobic and strength exercises (either in person or coached virtually per patient preference) 3 times a week. This study will include 2 physical fitness assessments: 1) baseline and 2) end of study. Assessments will include resting energy expenditure, peak oxygen uptake, bone density, upper and lower extremity strength, flexibility, and questionnaires (feasibility and quality of life). Additionally, blood and urine specimens will undergo metabolomic analysis to identify biomarkers predictive of future cardiometabolic outcomes. RESULTS/ANTICIPATED RESULTS: We expect that early implementation of STRONGER ALL in children undergoing chemotherapy will be feasible and preliminarily effective at mitigating risk factors for long-term cardiometabolic outcomes in survivors. Feasibility will be defined by recruitment capability (at least 50% of eligible patients agree to enroll), acceptance/compliance (at least 50% of participants complete the program with participation in at least 50% of sessions), data acquisition (collection and outcomes measures are appropriate), and practicability (program shows promise of being successful with pediatric ALL patients as measured by validated surveys administered to patients and caregivers). We anticipate that ALL patients participating in STRONGER ALL will have improved fitness and quality of life. DISCUSSION/SIGNIFICANCE OF IMPACT: Evidence on the benefits of physical activity for ALL patients has not changed clinical practice. We aim to overcome the translational science barrier of patient- and system-level blockade in implementation of exercise in children with ALL. The evidence generated from this research may also be generalizable to other childhood cancer survivors.

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