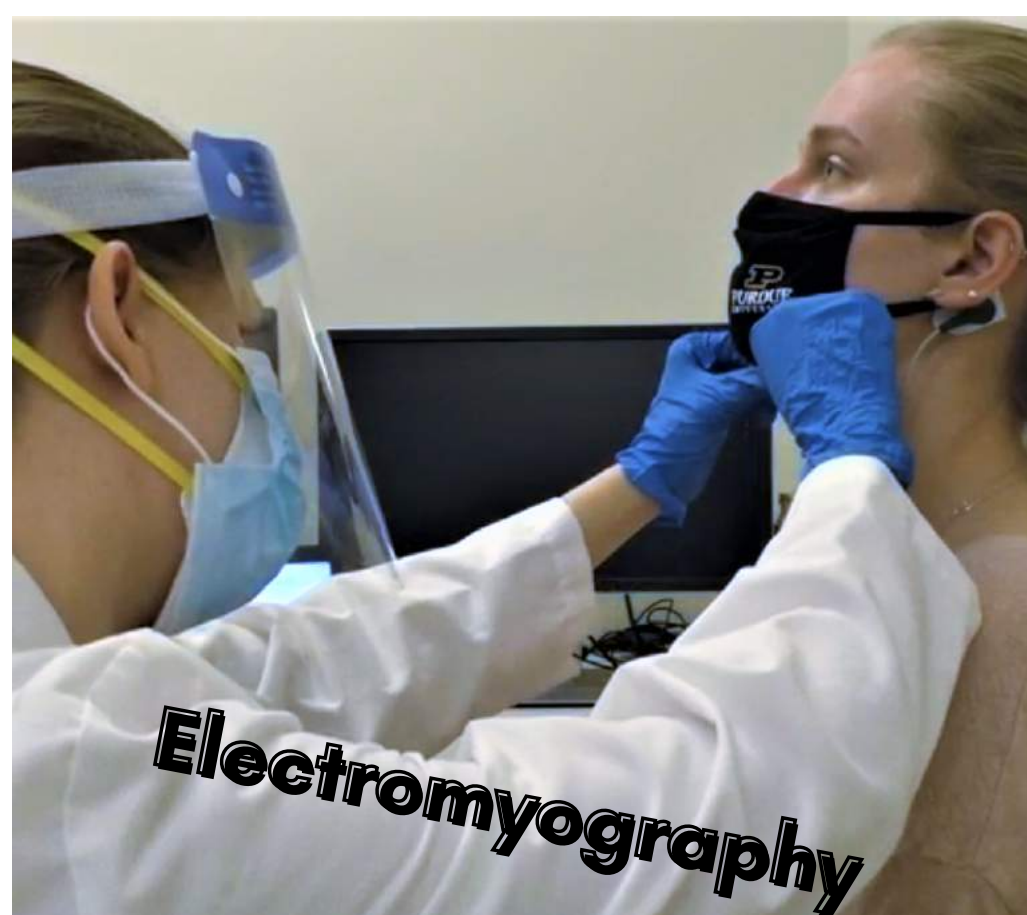
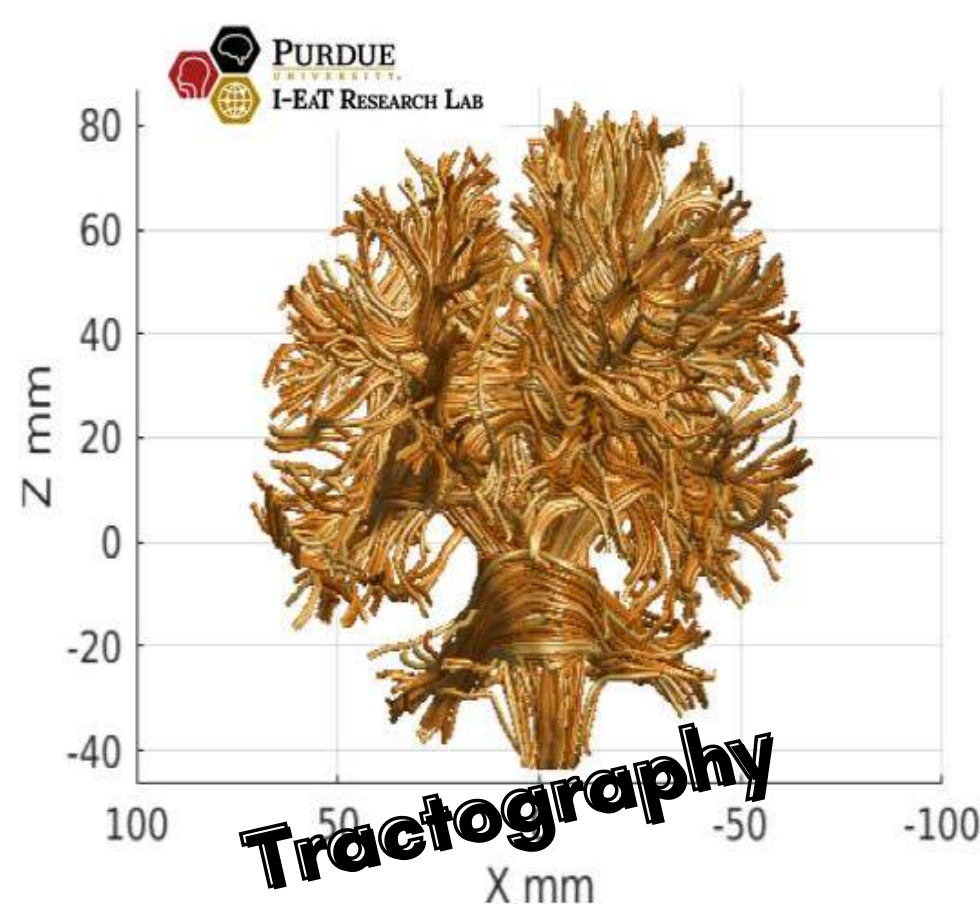


2020 - What a Year!

Purdue Imaging Evaluation and Treatment of Swallowing Research Laboratory Newsletter



Welcome to the 2020 Newsletter

The 2020 newsletter highlights our team's extraordinary efforts to continue our swallowing research agenda during this challenging year. This year our efforts included, not only continuing our top notch research, training, and clinical service, but also helping hundreds of swallowing specialists across the world adopt telehealth as a safe and reliable service delivery model for parts of dysphagia care.

1. Stepping up at a Time of Need
2. Keeping our Work and Motivation Going!
3. Conferences and Presentations
4. Publications and Media
5. Grants and Awards
6. Other Research & Education News
7. I-EaT Research Clinic News & Advocacy
8. About our Team

About Our Research

The faculty and staff of our lab are dedicated to high-level basic and clinical research and improving the health and quality of life of children and adults with swallowing disorders (also known as dysphagia). The research conducted in our lab focuses on the use of advanced imaging to understand the neural underpinnings of swallowing in the normal population and following neurological trauma or intervention, developing and evaluating new neurorehabilitation interventions for neurogenic dysphagia, and the development and validation of telehealth systems to test the effectiveness of providing swallowing rehabilitation from a distance.



Scan the code to access our lab website!

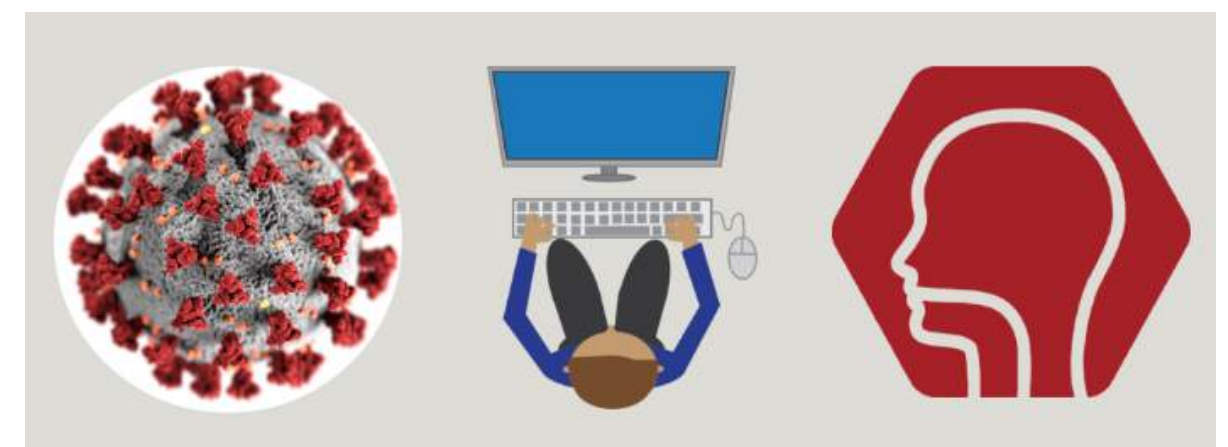


Stepping up at a time of need

This year we start our Newsletter with how our team stepped up at a time of need to help clinicians and patients across the globe.

In March 2020, our world changed suddenly and drastically. For the millions of patients with swallowing disorders across the world – also including COVID-19 survivors – and the thousands of clinicians treating these patients, this meant that sessions had to be triaged, postponed, canceled, or conducted with heavy PPE and/or through the use of telehealth. Although telehealth had been around in different shapes and forms for more than 100 years, its use to provide services for patients with swallowing disorders was rather limited before the COVID-19 pandemic. Our lab, i.e., one of the pioneering labs researching dysphagia telehealth services for several years, and our lab director, Dr. Malandraki, who has 15 years of experience in this area, were called into action to help clinicians across the world. Here is a summary of our efforts in this direction.

- Dr. Malandraki developed **a free comprehensive Telehealth Service Guide for Dysphagia** which is available on our lab website:
 - <https://www.purdue.edu/i-eatlab/telehealth-recommendations-for-dysphagia-management-during-covid-19/>
- Our lab team developed free templates of forms, educational videos, and pictures to help illustrate critical telehealth components for clinicians.
- We helped with the organization of successful webinars on telehealth organized by the Purdue Department of Speech, Language, & Hearing Sciences in Fall 2020.
- Dr. Malandraki was invited and participated in free live webinars organized by the American Speech-Language-Hearing Association & the American Board of Swallowing and Swallowing Disorders & helped to answer questions of hundreds of clinicians.

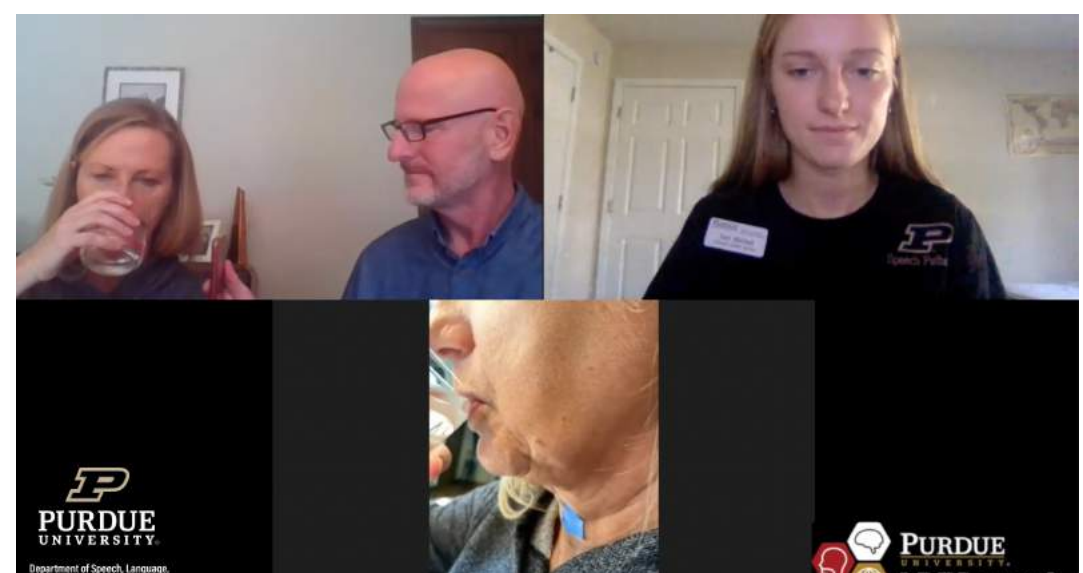


Did you know?

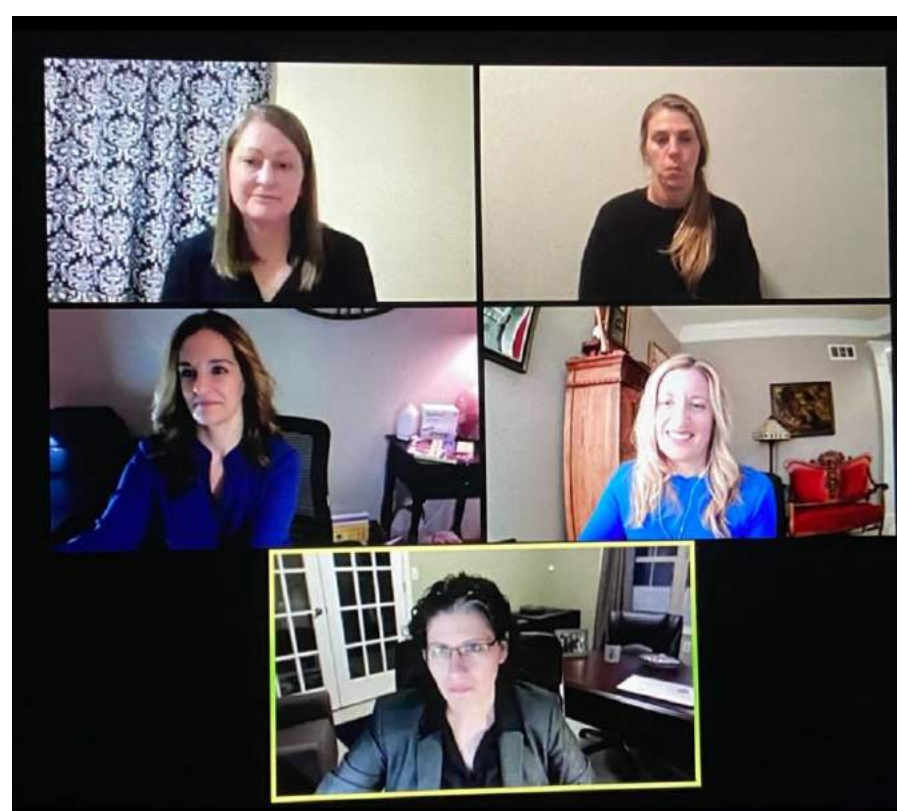
- Our **dysphagia telehealth guide** has been accessed more than **20,000** times and was featured by the Purdue News!
- The two webinars organized by ASHA and ABBSD have been collectively viewed more than **12,000** times!



Our PhD student, Rachel Arkenberg, demonstrating parts of a pediatric telehealth cranial nerve exam.



Our MS student, Sam Mitchell, demonstrating part of a clinical swallowing tele-assessment.



SLHS Fall 2020 Telehealth Webinar 1, featuring Professors: Malandraki, Masters, Simpson, & Van Hyfte

NATIONAL & INTERNATIONAL EFFORTS

- Drs. Malandraki & Mattern (Ball State) were invited to serve as the Indiana Speech Language Hearing Association (ISHA) Telehealth Taskforce **Co-Chairs** & are leading ISHA's efforts to:
 - Advocate for IN telehealth legislature
 - Guide IN clinicians in use of telehealth
- Dr. Malandraki is a member of the international **Dysphagia Research Society (DRS) COVID-19 Taskforce** that has created international guidelines & resources:
 - <https://www.dysphagiaresearch.org/page/COVID-19Resources>

Keeping our work and motivation going!

And we continue by sharing how our lab family kept going during one of the most difficult of times

Adaptations made to keep our work and motivation going

Step 1: At first we used tele-work and tele-motivation!

- We stayed connected on a regular basis
- We paired students to work on projects together
- We organized a biweekly social hour during the summer to just interact and play games
- We supported each other during hard times



One of our first online lab meetings

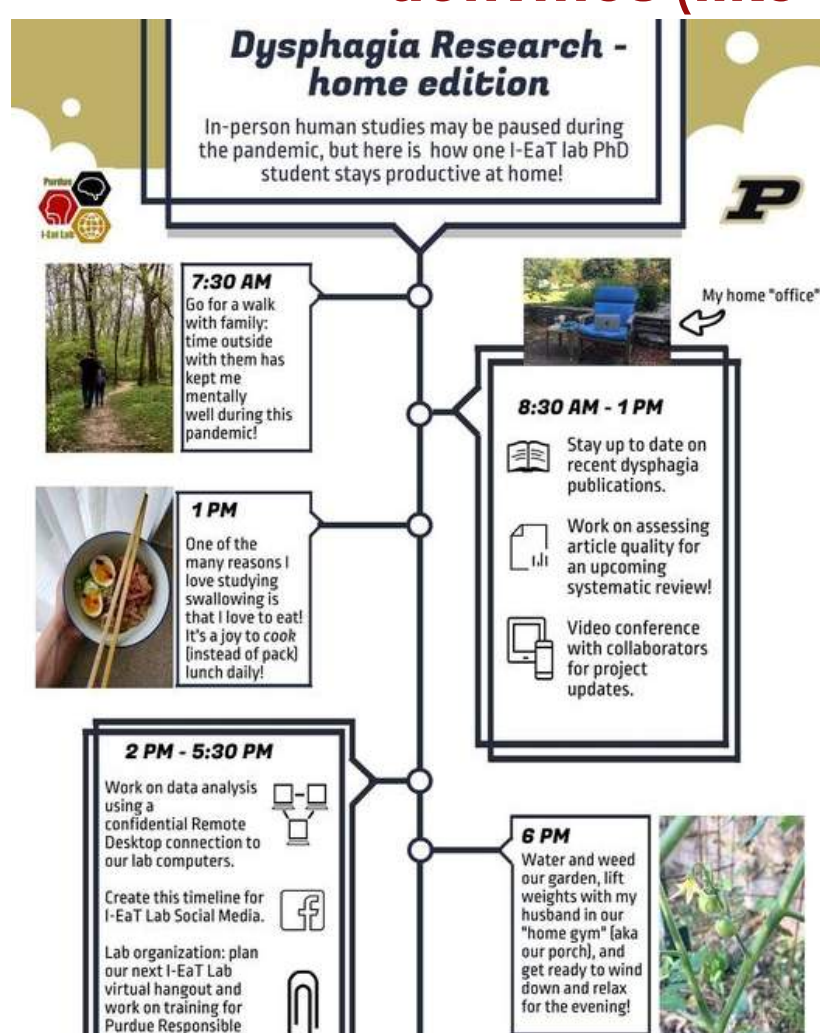
Step 2: Once in-person operations resumed, we had to ensure our personnel could come back and be as safe as possible. We are thankful to our Dept., College, and the Protect Purdue Plan for their support and guidance in these efforts.

**Preparing our lab for re-opening:
Creating posts (including funny ones!) & ordering personal and lab protective equipment**



Step 3: Maintaining our mental health

Sharing tips and happy thoughts with each other and on social media and participating in virtual activities (like the ASHF 5K!). These activities were all led by our amazing students!



Reminder  PURDUE I-EAT RESEARCH LAB

Take a break, and call or meet with someone if you can to help de-stress! Sleep is also important. Try to get a full 6-8 hours of rest each night!

You got this!

Reminder  PURDUE I-EAT RESEARCH LAB

Set aside at least 30 minutes per day to do something that fills you up! It may seem counterintuitive to take time off when you feel very busy, but it can really help increase your productivity.

You got this!

In the next few pages you can see what we have been able to accomplish this year. We are more proud of our resilient, big-hearted, and hard-working team than ever!

Conferences and Presentations in 2020

Invited Lectures - National & International (selected)

10th European Society for Swallowing Disorders Congress (virtual congress)

Malandraki, G.A. (2020). Telehealth Recommendations for Dysphagia Management during COVID-19 and beyond.

2020 Oregon Speech, Language, Hearing Association Conference

Malandraki, G.A. (2020). Going virtual for dysphagia management during COVID-19: evidence, reality and opportunities.

University of Pittsburgh, Department of Communication Science and Disorders Research Roundtable

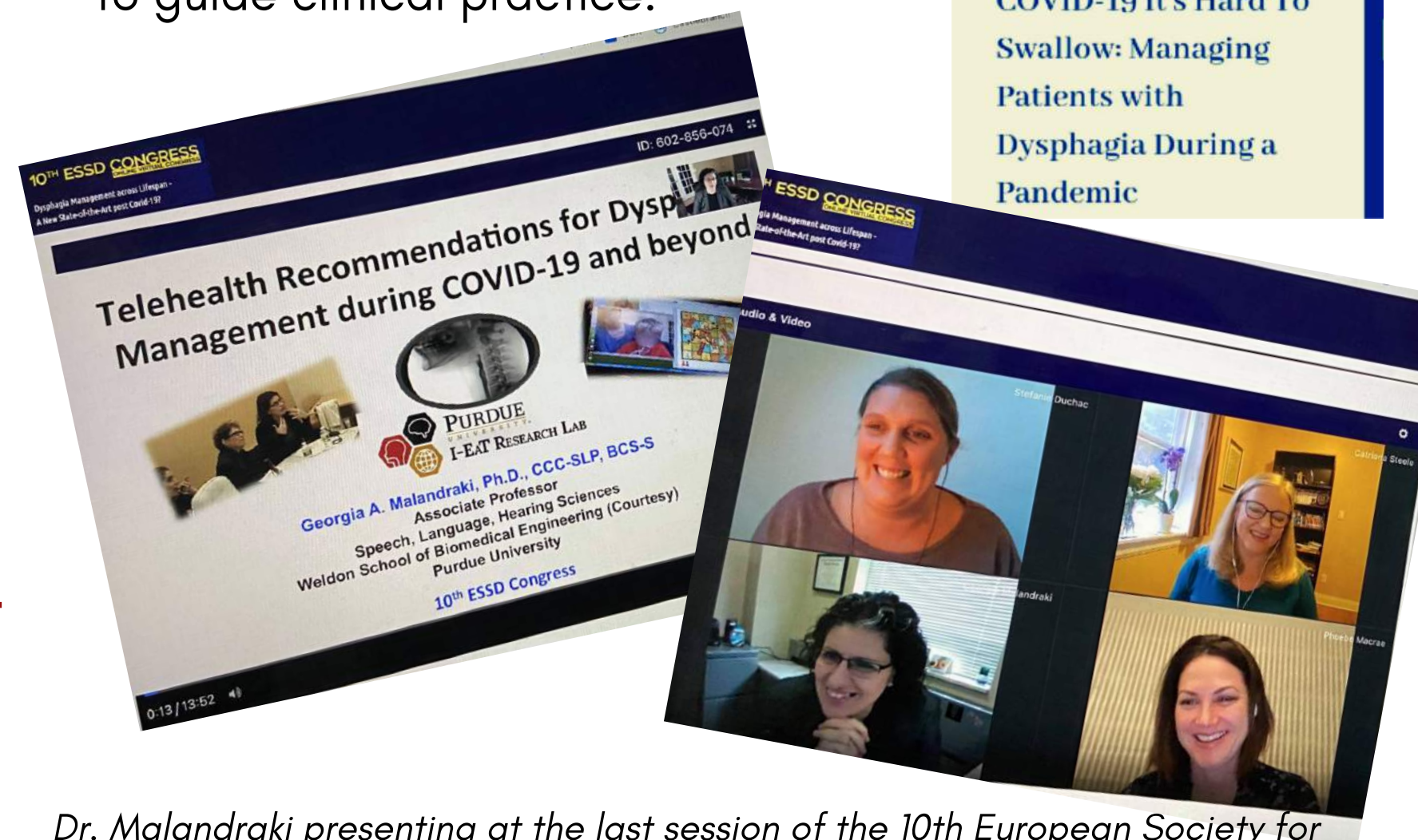
Malandraki, G.A. (2020). Swallowing neurophysiology: a roadmap to improving patient care.

Clinical Translational Institute of Indiana Retreat, West Lafayette, IN

Malandraki, G.A. (2020). Wearable technologies for the rehabilitation of swallowing disorders.

2020 Meet the Masters Event organized by the American Board of Swallowing & Swallowing Disorders

Malandraki, G.A. (2020). Dysphagia tele-management during COVID-19: Contemporary evidence & standards to guide clinical practice.



Dr. Malandraki presenting at the last session of the 10th European Society for Swallowing Disorders Congress, along with Drs. Steele & Macrae while Dr. Duchac is moderating.

National & International Peer-Reviewed Presentations (selected)

European Society of Swallowing Disorders 10th Annual Congress (virtual)

Mitchell, S., Fujiki, R., Oliver, A., Craig, B., & Malandraki, G.A. (2020). Effects of the head lift and recline exercises on the neuromuscular control of swallowing.

American Speech-Language-Hearing Association Convention, San Diego, CA (Convention canceled but our lab had 5 presentations accepted!)

Mitchell, S., Fujiki, R., Oliver, A., Craig, B., & Malandraki, G.A. (2020). The Recline and Head-Lift Exercises: Comparing potential neuromuscular drivers in healthy older adults.

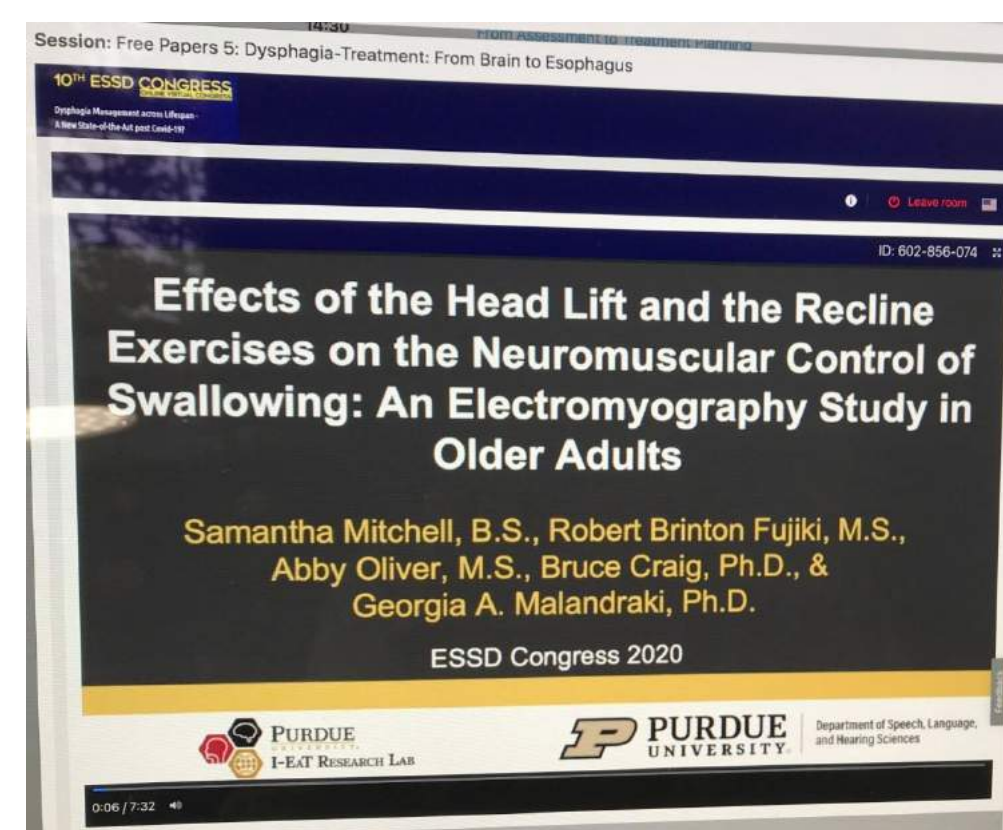
Hahn Arkenberg, R., Mitchell, S., Brown, B., Goffman, L., & Malandraki, G.A. (2020). Neuromuscular development of swallowing and speech: a prospective cross-sectional study.

Smith, C., Exner, A., Huber, J., & Malandraki, G.A. (2020). The impact of functional swallowing and speech interactions on swallowing timing: A pilot study.

Bryan, J., Wetzel, D., Bauer Malandraki J., Wagner, E., & Malandraki, G.A. (2020). The development and impact of a pilot simulation-based dysphagia training on student confidence and performance.

Indiana Speech Language & Hearing Association Convention (virtual)

Bryan, J., Wetzel, D., Bauer Malandraki J., & Malandraki, G.A. (2020). The Impact of Virtual Simulation-Based Training on Speech-Language Pathology Graduate Students. Poster presented.



Our MS student, Sam Mitchell, presented part of her MS thesis work at the 10th European Society for Swallowing Disorders Congress.

Publications in 2020

- Malandraki, G.A., Hahn Arkenberg, R.E., Mitchell, S., & Bauer Malandraki, J.L. (in press). Telehealth for dysphagia across the life span: Using Contemporary Evidence and Expertise to Guide Clinical Practice during and after COVID-19. *American Journal of Speech Language Pathology*.
- Borders, J., Sevitz, J.S., Bauer Malandraki, J.L., Malandraki, G.A., & Troche, M. (in press). Objective and Subjective Clinical Swallowing Outcomes via Telehealth: Reliability in Outpatient Clinical Practice. *American Journal of Speech Language Pathology*.
- Kantarcigil, C., Kim, M. K., Chang, T. Smith, A., Craig, B., Lee, C.H., & Malandraki, G.A. (2020). Validation of a novel wearable electromyography patch for monitoring submental muscle activity during swallowing: A randomized crossover trial. *Journal of Speech, Language, & Hearing Research*, 63, 3293-3310.
- Venkatraman, A., Fujiki, R.B., Craig, B.A., Sivasankar, M.P., & Malandraki, G.A. (2020). Determining the underlying relationship between swallowing and maximum vocal pitch elevation: A preliminary study of their hyoid biomechanics in healthy adults. *Journal of Speech, Language, & Hearing Research*, 63, 3408-3418.
- Miles, A., Connor, N., Varindani Desai, R., Jadcherla, S., Allen, J., Brodsky, M., Garand, K., Malandraki, G.A., McCulloch, T. Moss, M., Murray, J., Pulia, M., Riquelme, L., & Langmore, S. (2020). Dysphagia care across the continuum: A multidisciplinary Dysphagia Research Society Taskforce report of service-delivery during the COVID-19 global pandemic. *Dysphagia*.
<https://doi.org/10.1007/s00455-020-10153-8>.
- Zimmerman, E. Carnaby, G., Lazarus, C., & Malandraki, G.A. (2020). Motor Learning, Neuroplasticity, Strength and Skill Training: Moving from Compensation to Retraining in Behavioral Management of Dysphagia. *American Journal of Speech Language Pathology*, 29, 1065-1077.

PUBLICATION HIGHLIGHTS!

We had 2 manuscripts published in the October 2020 issue of one of our field's flagship journals, the *Journal of Speech, Language, & Hearing Research*. Together, the 2 articles have been downloaded more than 600 times in less than 2 months!



<https://pubs.asha.org/toc/jslhr/current>

I-EaT Lab in the Media (selected)

"Not just a reflex: Swallowing is complicated but this researcher is making it easier" (2020). Purdue University News. Abbey Nickel. Access using link:
<https://www.purdue.edu/newsroom/releases/2020/Q3/not-just-a-reflex-swallowing-is-complicated,-but-this-researcher-is-making-it-easier.html>

"A patch acts as a portable monitor to identify swallowing diseases" (2020). SaluDigital. Nacho Cortés. Access using Link:
<https://www.consalud.es/saludigital/194/parche-actua-monitor-portatil-identificar-entermedades-deglucion-74418-102.html>

"Purdue lab creates free resources for providing telehealth services" (2020). Purdue press release story on the telehealth resources Dr. Malandraki created for clinicians as soon as the pandemic hit. Available at:
<https://www.purdue.edu/newsroom/releases/2020/Q2/purdue-lab-creates-free-resources-for-providing-telehealth-services.html>



Dr. Malandraki was one of the featured speakers on 3 podcasts:

- ASHA Voices podcast on wearable technologies and dysphagia (Feb 2020)
- Speech Uncensored podcast on telehealth and dysphagia (July 2020)
- ASHA Voices podcast on COVID-19 and dysphagia (Dec 2020)

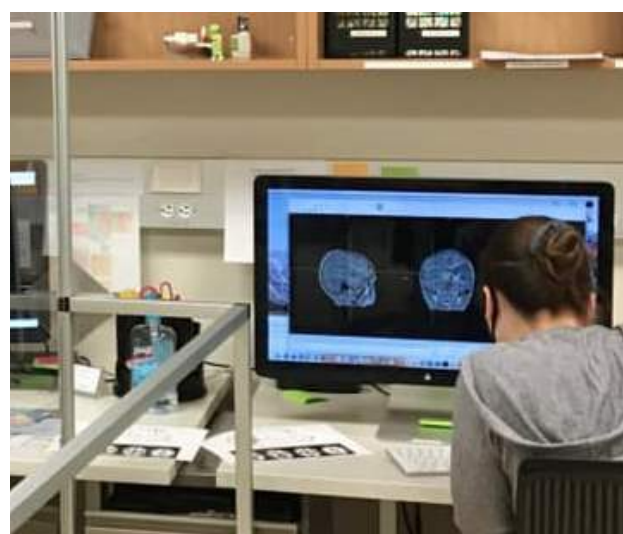
Grants and Awards in 2020

Research Progress:

We have been continuing our NIH-funded studies and we are happy to share exciting updates

- **Cerebral Palsy and Typical Development Research**

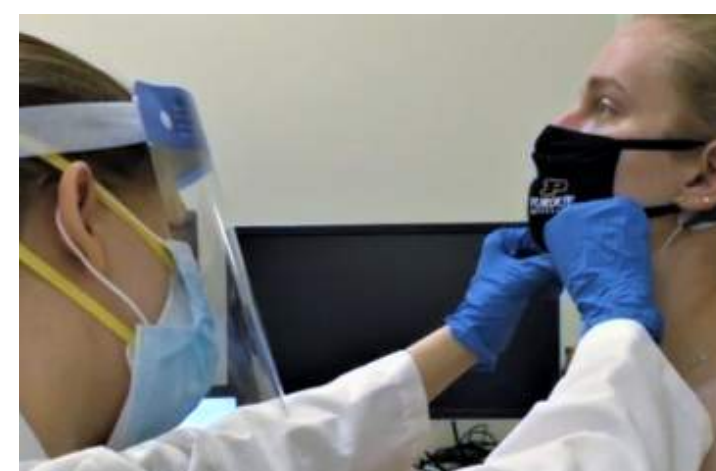
- All data collection & analysis has been completed
- Lots of writing in progress! Stay tuned!



PhD students, Anny Alvar & Rachel Arkenberg, hard at work (and safely) analyzing brain imaging data

- **Wearable technologies for dysphagia (collaborative grant)**

- Data collection & analysis are in progress
- Two manuscripts have been published



MS students, Sam Mitchell & Jennine Bryan, hard at work (and safely) testing our wearable technology data collection protocol

New Research Grants: We have secured 3 more internal grants in 2020

Purdue College of Health and Human Sciences COVID-19 Rapid Response Grant:

Telehealth for the management of dysphagia during COVID-19 and beyond (PI: Malandraki)

CEREBBRAL Pilot Grant:

Real-world interplay of speech and swallowing in neuromotor disorders (PIs: Malandraki and Huber)

SMART Consortium:

Intrinsically Stretchable and Flexible Electronic Polymer Sensors for Global Health (PIs: Malandraki, Boudouris, & Lee)

Grants and Awards Received by Lab Students



Our students presenting at the 2020 Research Fair for undergraduates in early spring

Mackenzie Zorn

Purdue Office of Undergraduate Research (OUR) Scholarship

Caroline Sarbieski

Purdue Office of Undergraduate Research (OUR) Scholarship

Carey Smith

2020 Indiana Lions McKinney Club Research Award

Jennine Bryan

Area Health Education Center (AHEC) Scholar

Purdue Office of Undergraduate Research (OUR) Top Abstract in "Innovative design, technology, and entrepreneurship"

Awards & Honors Received by Our Lab Director (Dr. Malandraki)

- 2020 Ruth and M.D. Steer Outstanding Teacher Award, SLP Graduate Instructor, Department of Speech, Language and Hearing Sciences, Purdue University
- 2020-21 Faculty Entrepreneur Learning Academy Fellowship, Purdue University
- 2020 Erskine Fellowship, University of Canterbury, Christchurch, New Zealand (canceled d/t COVID-19)

Other Research & Education News!

New Collaborations in 2020

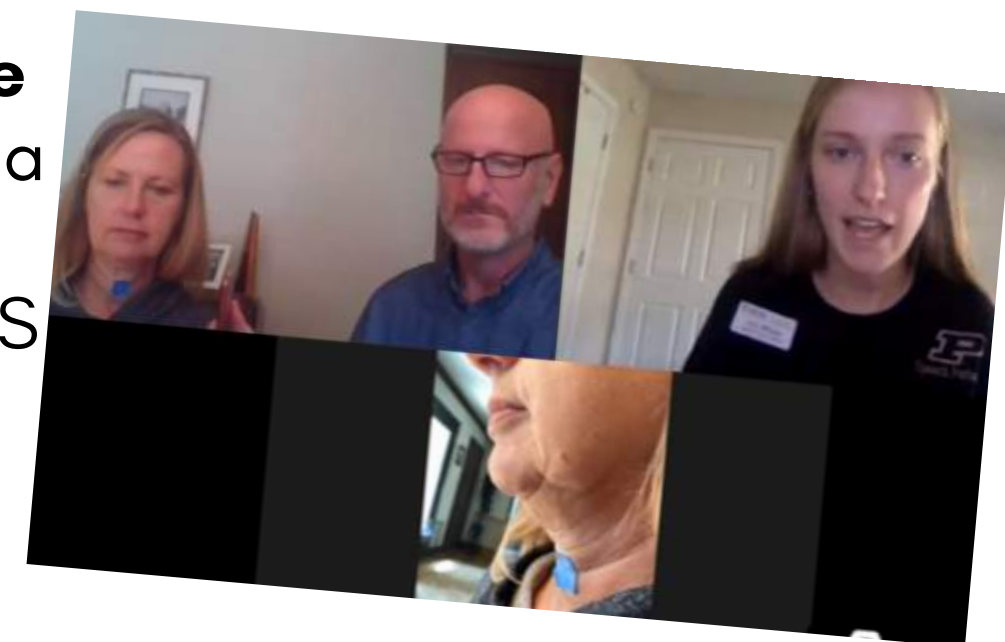


Dr. Michelle Troche

In May 2020, we initiated a research collaboration with the Upper Airway Dysfunction (UAD) lab, directed by Dr. **Michelle Troche** (Teachers College, Columbia University), focusing on a series of studies in the area of telehealth for dysphagia management. Two studies (partially funded by the Purdue HHS Rapid Response COVID-19 grant) are currently underway:

- A clinical tele-assessment study
- A web-based survey

These studies are in also collaboration with our long time collaborators, Drs. Jessica Huber and Bruce Craig.

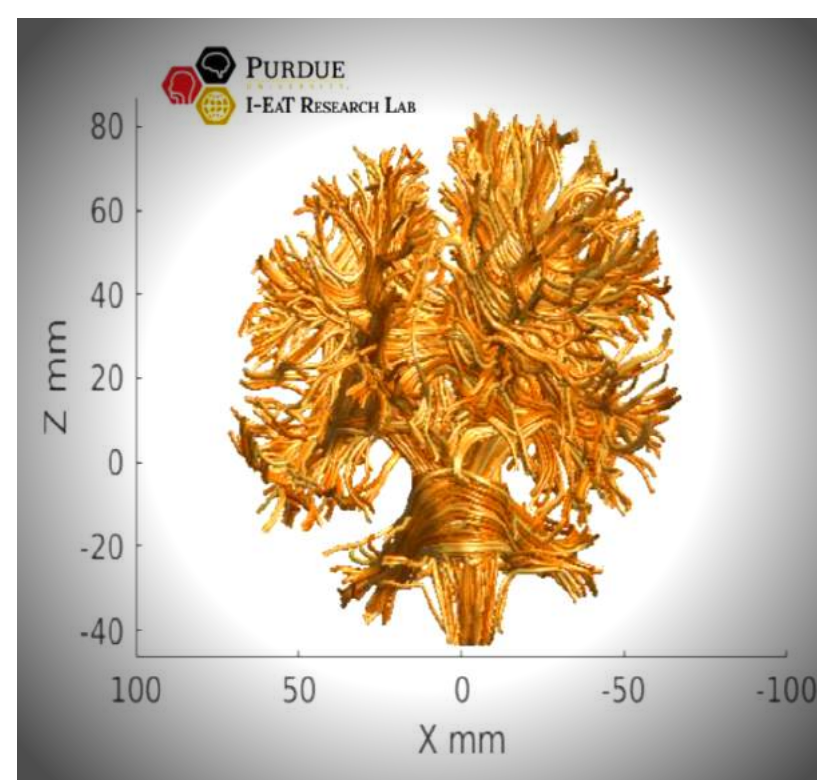


New Methodologies in 2020

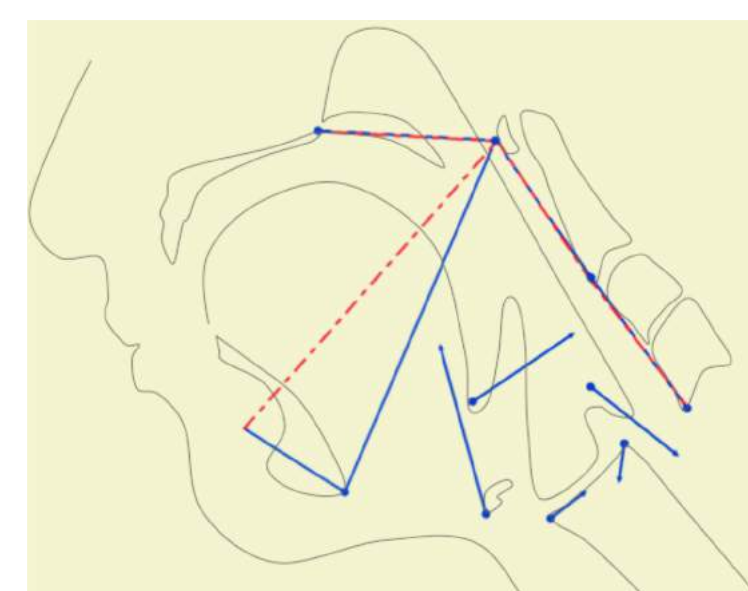
In 2020 our lab further adopted new methodologies to strengthen our analyses procedures for:

- our MRI data, with the guidance of Drs. **Zhongming Liu, Tom Lu, and Hu Cheng**, &
- for analyzing morphometric and kinematic videofluoroscopic swallowing and pitch data with the guidance of Dr. **Bill Pearson**

We are excited to share the data from these new analyses methods in the upcoming months. You can get a taste in the photos!



Tractography data of our NIDCD funded project in Cerebral Palsy, beautifully showing the plasticity of white matter tract connections in a child with unilateral CP.



Data comparing two aerodigestive tract functions using Computational Analysis of Swallowing Mechanics (CASM).

Educational Innovations during the Pandemic

How did Dr. Malandraki move a clinical graduate Dysphagia course online during the pandemic with success? By...

- Moving all lectures online and adding several video case examples to the lectures
- Creating experiential lab assignments that students could complete at home
- Creating interactive virtual patients using special software so that students could practice their clinical skills even from a distance

This innovative educational endeavor was possible because of the help provided by MS student Jennine Bryan and other lab members, and by the support from the Purdue Health and Human Sciences' Patsy J. Mellott Teaching Innovation Award that Dr. Malandraki received in 2018. You can read the full story here: https://www.purdue.edu/newsroom/releases/2020/Q2/purdue-classes-make-strong-switch-to-online-during-covid-19.html?fbclid=IwAR203VX_lvbAmETaqHUKOUjfLewac_cA-uXf6pDN_NJQee5UIW1BdiuhsIE

Purdue Dysphagia Course Virtual Simulation Patients



Simulated Patient / Actor



Developed by Dr. Malandraki and her team

A graduate student clinician completes an evaluation of a real-life virtual simulated patient developed using GoReact software.

I-EaT Research Clinic News & Advocacy

The Purdue I-EaT Clinic

The Purdue I-EaT Clinic serves adult and pediatric populations with difficulties in swallowing (also known as dysphagia) that may have occurred, for example, as a result of a stroke, traumatic brain injury, treatment for head and neck cancer, or because of disorders/diseases such as Parkinson's disease, cerebral palsy, inflammatory myopathies, and multiple sclerosis, among others.

The in-house clinic features cutting-edge assessment and treatment equipment. Our clinical faculty consists of one of the best multidisciplinary teams of dysphagia experts in the state.

2020 I-EaT Clinic Updates

The Purdue I-EaT Clinic is led by our Clinical Director and Board Certified Specialist in Swallowing and Swallowing Disorders, Jaime Bauer Malandraki.

Here are some of our 2020 clinic updates:

- We provided comprehensive evaluations to more than 12 new patients and provided ongoing treatment to several of them.
- We successfully conducted our first dysphagia telehealth screening & treatment sessions!
- The Purdue I-EaT Clinic was preparing for a medical SLP study abroad program in Greece in May 2020 that was unfortunately canceled. We will be hard at work in 2021 to reschedule this unique experience for 2022! Stay tuned!

Purdue University's Dysphagia Study Group (soon virtual!)

Our lab is committed to serving the community by creating a support network for local clinicians. In the Purdue Dysphagia Study Group, clinicians are welcome to partake in discussions about clinical cases, recent research findings, and hot topics in dysphagia. To learn more, please contact the facilitators: Jaime Bauer-Malandraki and Dawn Wetzel.

Email: PurdueDysphagiaGroup@gmail.com

Scan the code to access the clinic's website!



Jaime Bauer-Malandraki dons proper PPE to protect herself and clients before completing instrumental evaluations in the Purdue I-EaT Clinic.



TEAM ADVOCACY EFFORTS

- **Advocacy Day:** Members of our team traveled to Indianapolis to speak with legislators about current laws affecting SLPs in Indiana.
- **ASHFoundation Virtual 5K Walk/Run:** Lab members walked/ran and donated to support the American Speech-Language-Hearing Foundation.



About Our Team

Current Lab Team

Director:

Georgia A. Malandraki, PhD, CCC-SLP, BCS-S

Core Doctoral Student:

Rachel Hahn Arkenberg, MS, CCC-SLP

Doctoral Students co-Mentored:

Shie Kantor, MM, MA, CCC-SLP

Anny Alvar, BS

Research Associate:

Barb Brown, MS, CCC-SLP

Master's Students:

Samantha Mitchell, BS

Jennine Bryan, BS

Undergraduate Students:

Mackenzie Zorn

Caroline Sarbieski



Additional highlights for 2020!

- Dr. Malandraki was elected as the Secretary/Treasurer of the Dysphagia Research Society!
- Rachel Arkenberg had her 1st first-authored manuscript published!
- Sam Mitchell & Rachel Hahn Arkenberg had their first lab publication accepted!
- Anny Alvar & Rachel Hahn Arkenberg had a shared first authorship paper submitted!
- We started a lab Journal Club, led by Caroline Sarbieski!



Dr. Malandraki was elected the 2020 Secretary/Treasurer of the international Dysphagia Research Society, and is in line to be President of the Society in 2 years.

Recent Alumni: Where are they now?

Nicole DeJong: Nicole graduated with a BS from Purdue and is attending St. Xavier University for her Master's Degree in SLP.

Jennine Bryan: Jennine graduated with a BS from Purdue and joined the Purdue MS-SLP 2022 cohort this fall.



To learn more about our lab, our work, and our current studies

Scan the code
to access our
lab website!



Or visit: <https://www.purdue.edu/i-eatlab/>