DEPARTMENT OF OTOLARYNGOLOGY

CENTER FOR VOICE AND SWALLOWING NEWSLETTER

THE FUTURE OF DYSPHAGIA CARE IS NOW

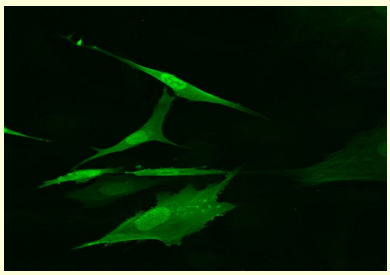
Dysphagia is common and costly. Complications of swallowing dysfunction include dehydration, malnutrition, depression, social isolation, pneumonia, pulmonary abscess, and death. For patients with profound disease, treatment options are limited.

The UC Davis Center for Voice and Swallowing (CVS) is pushing the boundary of research and patient care. CVS clinicians have established close collaborations with the UCD School of Veterinary Medicine, the UCD Institute for Regenerative Cures, The National Primate Center, The National Foundation of Swallowing Disorders, and the UCD Center for Health and the Environment. These collaborations have resulted in millions of dollars in grant funding, 4 patents, 2 startup companies, dozens of publications,4 first in human and 5 first in canine surgeries.

Our mission is to continue to advance the care of patients with disabling disorders of voice, swallowing, and breathing.

Muscle Stem Cells Offer Hope

UC Davis CVS clinicians have embarked on an aggressive campaign to utilize regenerative medicine techniques to rehabilitate swallowing in patients with profound dysfunction. Recently published work from our center has shown that injected autologous muscle stem cells improve tongue strength in a large animal model of dysphagia (Laryngoscope. 2013 Aug 8.). We hope to begin a human clinical trial in the near future.



Healthy implanted muscle stem cells

THE FIRST TOTAL LARYNGECTOMY PERFORMED TO SAVE AN ASPIRATING DOG

Bean is a special pit bull who loves life. The two-year old Staffordshire Terrier began having symptoms of choking and pneumonia early in life. This led to a diagnosis of muscular dystrophy and profound swallowing dysfunction. In an effot to save her life, Drs. Belafsky and Kuhn performed the world's first laryngectomy in a canine with dysphagia.

Bean has been living with her stoma for 6 months and is doing great. She loves playing soccer with her family and wags her tail so hard she falls down. *Bean* attends human laryngectomy support groups as a service dog and has been an inspiration to us all. You can follow Bean's love of life and medical adventure on Facebook at *https://www.facebook.com/HowIsBean?*

NEW ADDITIONS TO THE CENTER FOR VOICE AND SWALLOWING

WE ARE PLEASED TO ANNOUNCE THE FOLLOWING ADDITIONS TO THE CENTER FOR VOICE AND SWALLOWING TEAM...

Dr. Maggie Kuhn

The UC Davis CVS is excited to announce the addition of Dr. Maggie Kuhn to our faculty. After growing up in Chicago, Dr. Kuhn moved to the East Coast to attend college at the University of Pennsylvania. She then moved to New York where she completed medical training at New York University. She remained at NYU to complete a residency training in Otolaryngology. After nearly a decade in New York, she will complete her fellowship in Laryngology & Bronchoesophagology at UC Davis and will join our full-time faculty in July. Dr. Kuhn's clinical interests include the diagnosis and management of complex voice, airway and swallowing problems and in-office treatment of aerodigestive tract disorders. She values her roles as teacher and surgeon scientist and has advanced research pursuits in clinical outcomes and innovative therapies for pharyngoesophageal dysphagia.

Erik Steele

The UC Davis CVS is excited to announce the addition of Erik Steele, MFA, MA, CFY-SLP to our team. Erik is completing his Clinical Fellowship in Speech-Language Pathology at UC Davis Medical Center. He received his bachelors degree from Vassar College and then spent 10 years on Broadway as a performing artist. He left the bright lights of NYC to obtain his master's degree at San Diego State and a graduate internship at the Scripps Center for Voice and Swallowing in La Jolla. He is dedicated to helping patients with complex voice and swallowing disorders and strives to optimize function and improve the quality of their lives. His particular interests include swallowing disorders related to head and neck cancer and neurological conditions, voice restoration following total laryngectomy, and voice therapy for a wide range of conditions, including those related to professional voice. Erik is a former actor whose accomplishments include thirty theatrical productions on and off Broadway and twenty audiobook recordings. Erik seeks to draw on these experiences in the service of his patients and his field.

Lisa Evangelista

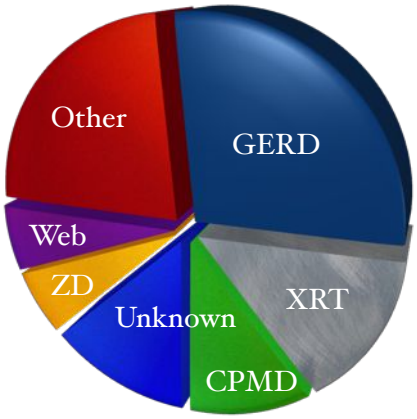
The UC Davis CVS is excited to announce the addition of Dr. Lisa Evangelista to our team. Lisa earned her Doctor of Clinical Science Degree in Medical Speech-Language Pathology from the University of Pittsburgh. She is a practicing Speech-Language Pathologist with a background in providing rehabilitative services to improve swallowing and cognitive function in patients who experienced prematurity or acquired brain injury within the neonatal to young adult population. Her current work is focused on providing therapeutic swallowing intervention for adults with complex swallowing problems resulting from head and neck cancer, esophageal cancer, and intra- and post-operative challenges. Dr. Evangelista joins UC Davis from the University of Pittsburgh where she has served as a Graduate Teaching Assistant and Clinical Faculty in the department of Communicative Disorders and Sciences.

THE MOST COMMON CAUSES OF DYSPHAGIA IN AN OUTPATIENT SWALLOWING CLINIC

Dysphagia can be caused by a innumerable disease processes. It has a significant impact on quality of life, life expectancy, and the utilization of health care resources. The most common causes of dysphagia have not been previously clarified.

UC Davis CVS researchers led by Dr. Belafsky have published work that has documented the most common causes of swallowing difficulty in outpatient dysphagia sufferers (Ann Otol Rhinol Laryngol. 2013 May;122(5):335-8.).

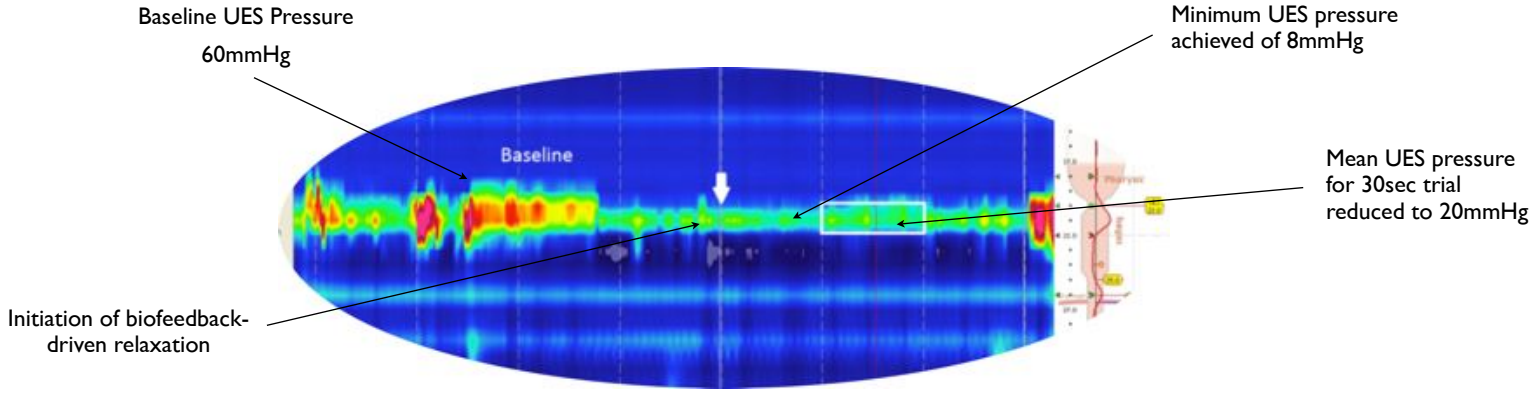
Gastroesophageal reflux was the most common cause of swallowing impairment followed by radiation treatment for head and neck cancer and cricopharyngeus muscle dysfunction. Other less common causes of dysphagia identified by our team include esophageal dysmotility, progressive neurologic disease, hiatal hernia, eosinophilic esophagitis, vocal fold immobility, cervical spine surgery, and achalasia.



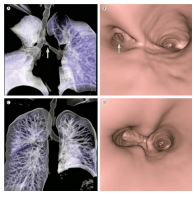
Interestingly, despite the most contemporary state-of-the-art diagnostic equipment, a source of the swallowing complaint could not be identified in 13% of individuals. This highlights the need to differentiate between the subjective symptom of dysphagia and objective evidence of swallowing impairment and identifies room for improvement in our ability to diagnose tertiary causes of dysphagia.

These findings allow clinicians to better allocate health care resources and focus their research efforts to areas that provide maximum patient benefit and quality of life improvement.

CONTROL OF THE UPPER ESOPHAGEAL SPHINCTER IS POSSIBLE WITH BIOFEEDBACK



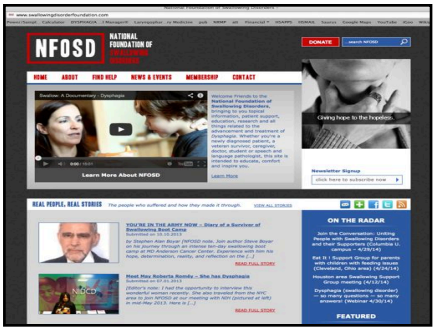
Drs. Kuhn and Belafsky have completed research that suggests that volitional control of the UES is possible with biofeedback. Patients with a high resolution manometry catheter in their pharynx who were placed in front of a biofeedback monitor were able to significantly increase and decrease their baseline UES pressure by 86 and 23 percent respectively. This work may have significant implications in the treatment of oropharyngeal dysphagia, gastroesophageal and laryngopharyngeal reflux, and globus pharyngeus.

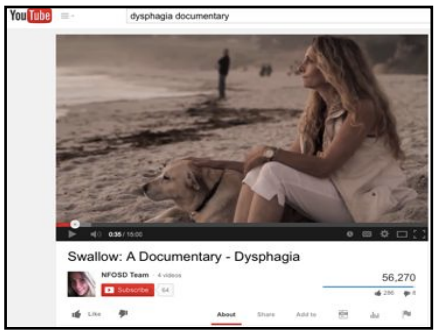


CIRM GRANT AWARDED FOR STEM CELL AIRWAY RECONSTRUCTION

Dr. Peter Belafsky and his team at the UC Davis Primate Center and University College London have received a $4.4 million grant from the California Institute of Regenerative Medicine (CIRM) to perform ground-breaking studies to help patients with complex airway disorders. The money will support pre-clinical work required to initiate a human clinical trial.

THE NATIONAL FOUNDATION OF SWALLOWING DISORDERS





***Swallow: A Documentary* is the #1 viewed dysphagia video in You Tube history.**

We all take eating and drinking for granted. Swallowing an average of two times per minute is effortless for most of us. For those suffering from dysphagia, however, life is forever altered. Affected persons may suffer malnutrition, dehydration, social isolation, depression, and even death. In an attempt to improve the quality of life of affected individuals, we partner with the patient run not-for-profit National Foundation of Swallowing Disorders (NFOSD). In conjunction with the NFOSD, we have produced a documentary on dysphagia. *Swallow: A Documentary* (https://www.youtube.com/watch?v=MrbEUDO6S5U) now has over 50,000 views and is the most frequently watched dysphagia video in YouTube history.

Dysphagia survivor, UC Davis patient, and past NFOSD President Sonia Blue says in the documentary, "*People are suffering, and people are brave. They are not suffering in vain but in a valiant attempt to have dignity and meaning to a life that has been radically altered. ...This story has to have a better ending.*"

Other initiatives that we support through the NFOSD include patient support groups, education, and research. The foundation caters to affected patients and their families, caregivers and clinicians. A dysphagia webinar series will soon premier on the foundation website.

To become a member of the NFOSD please visit the foundation website at:

NFOSD.com

THE EATING ASSESSMENT TOOL (EAT-10) GOES GLOBAL

Dysphagia is a symptom not a disease. Patients reporting the symptom of dysphagia may lack objective evidence of swallowing dysfunction. In order to accurately quantify the symptom of dysphagia, UC Davis CVS researchers have developed and validated a 10-item self-administered survey instrument entitled the Eating Assessment Tool or EAT-10 (Ann Otol Rhinol Laryngol. 2008 Dec;117(12):919-24.).

Eating Assessment Tool (EAT-10)
Circle the appropriate response

To what extent are the following scenarios problematic for you?	0 = No problem				4 = Severe problem
1. My swallowing problem has caused me to lose weight.	0	1	2	3	4
2. My swallowing problem interferes with my ability to go out for meals.	0	1	2	3	4
3. Swallowing liquids takes extra effort.	0	1	2	3	4
4. Swallowing solids takes extra effort.	0	1	2	3	4
5. Swallowing pills takes extra effort.	0	1	2	3	4
6. Swallowing is painful.	0	1	2	3	4
7. The pleasure of eating is affected by my swallowing.	0	1	2	3	4
8. When I swallow food sticks in my throat.	0	1	2	3	4
9. I cough when I eat.	0	1	2	3	4
10. Swallowing is stressful.	0	1	2	3	4
				Total EAT-10	

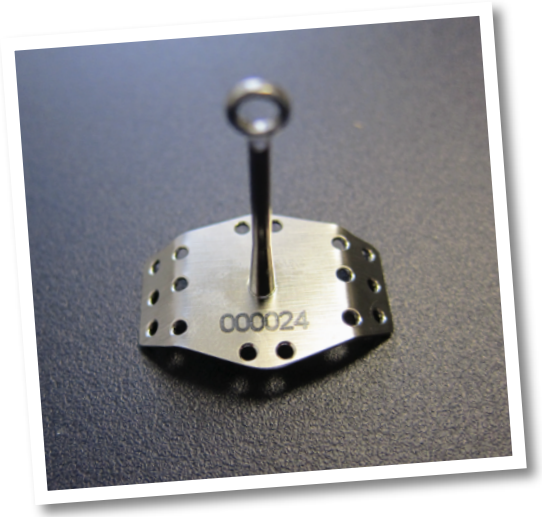
The EAT-10 allows clinicians and scientists to document the degree of patient-reported swallowing-related disability as well as monitor dysphagia treatment efficacy. Normative data suggests that an EAT-10 ≥ 2 is abnormal. The instrument is becoming one of the most commonly used clinical research tools globally for persons with swallowing difficulty and is the primary outcome measure for dozens of investigations and clinical trials. The EAT-10 has been translated into numerous languages, including Japanese, Spanish, Anatolian Turkish, Italian, Chinese, and Portuguese.

Development of a pediatric version of the EAT-10 as well as a version to quantify the degree of swallowing difficulty for dogs and cats is currently underway.

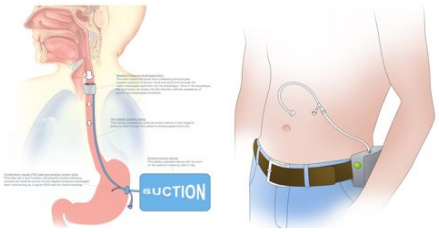
DR. BELAFSKY RECEIVES FDA APPROVAL FOR SWALLOW DEVICE CLINICAL TRIAL

Manual control of the upper esophageal sphincter (UES) is possible with a simple implant placed on the cricoid cartilage. The swallow expansion device (SED) has been shown to increase UES opening to greater than normal proportions (Laryngoscope 2010 Apr;Suppl 1:S1-S16.). The SED is placed on the cricoid cartilage through a small cervical incision. Implantation takes the technical expertise and time required to perform a simple tracheotomy. A small post protrudes through the skin that, when pulled forward by the patient, opens the UES to super-physiologic proportions. The device has proven safe and effective in eliminating aspiration in cadavers and in a large animal model of oropharyngeal dysphagia. Initial work in persons with swallowing dysfunction suggests that patients readily adapt to manual UES control. Training with the device is expected to be performed with the assistance of a speech and language pathologist under fluoroscopic guidance.

The FDA has granted approval for a Phase I open label clinical trial on a limited number of patients with profound feeding tube dependent oropharyngeal dysphagia. If this initial investigation establishes that the device is safe and effective, the trial will be expanded to a larger cohort of persons with dysphagia.



RETRO-ESOPHAGEAL SUCTION ELIMINATES ASPIRATION



CVS researchers have discovered that suction placed below the upper esophageal sphincter can eliminate aspiration in a cadaver model of oropharyngeal dysphagia.

In work presented at the Dysphagia Research Society, our team has shown that catheters of various sizes placed retrograde up the esophagus through a gastrostomy eliminated 100% of barium aspiration in a cadaver model of profound oropharyngeal dysphagia.

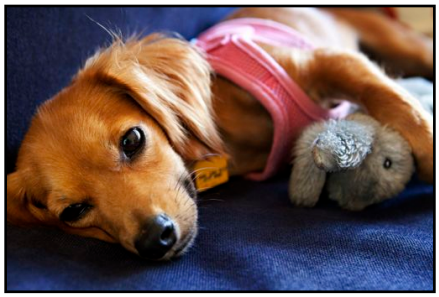
Dr. Belafsky envisions a modified feeding tube with a dual function. The tube would serve as a traditional PEG tube for enteral nutrition. In addition, the tube would have an accessory catheter positioned retrograde up the esophagus at the level of the upper esophageal sphincter. The tube would be connected to a suction device affixed to a belt or clip. It could be placed in the office with a transnasal esophagoscope (TNE). The suction would assist with transport of a bolus from the pharynx (throat) into the esophagus. Once in the esophagus, the bolus would travel into the stomach by peristalsis and gravity.

Although our research has established proof of concept, challenges remain and funding source for further prototype development has not been identified.

THE CLINICIANS GUIDE TO SWALLOWING FLUOROSCOPY

Drs. Belafsky and Kuhn have recently completed work on a comprehensive textbook of swallowing fluoroscopy. Topics covered include videofluoroscopic evaluation of oral, pharyngeal and esophageal phases of swallowing describing established CVS protocols and objective measurements. The book will be published by Springer and released this summer.

UC Davis One Health Initiative



We realize that the health of domestic animals, wildlife, and people are inextricably linked with each other and to the environment. The *One Health Initiative* is a movement whose mission is to integrate human, veterinary, and environmental medicine to advance the health and well being of all living things and the planet. We believe that this inter-species approach to medicine and surgery will yield significantly larger health benefits than policies targeting health challenges individually and in isolation. To advance this initiative, the CVS has developed close interdisciplinary collaborations with the School of Veterinary Medicine, The National Primate Center, and the Center for Health and the Environment. Drs. Belafsky and Kuhn treat dogs and cats with life threatening swallowing problems.

Appointments

To schedule an appointment at the UC Davis Center for Voice and Swallowing please contact our CVS coordinator Traci Piazza at 916-734-8763 or traci.piazza@ucdmc.ucdavis.edu.

Make a difference

We need your help. Much of our research is funded by philanthropic gifts from grateful patients. Your support will directly help the millions of individuals suffering from complex disorders of voice and swallowing worldwide. Join the movement of hope and help make a difference now. Please contact the Center for Voice and Swallowing Director of Development Antoinette McLean at 916-734-9714 or eamclean@ucdavis.edu.

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