Reversing pharyngeal muscle loss in aging through diet and exercise:
A collaborative NIH R01 grant proposal

Sonja Molfenter, PhD
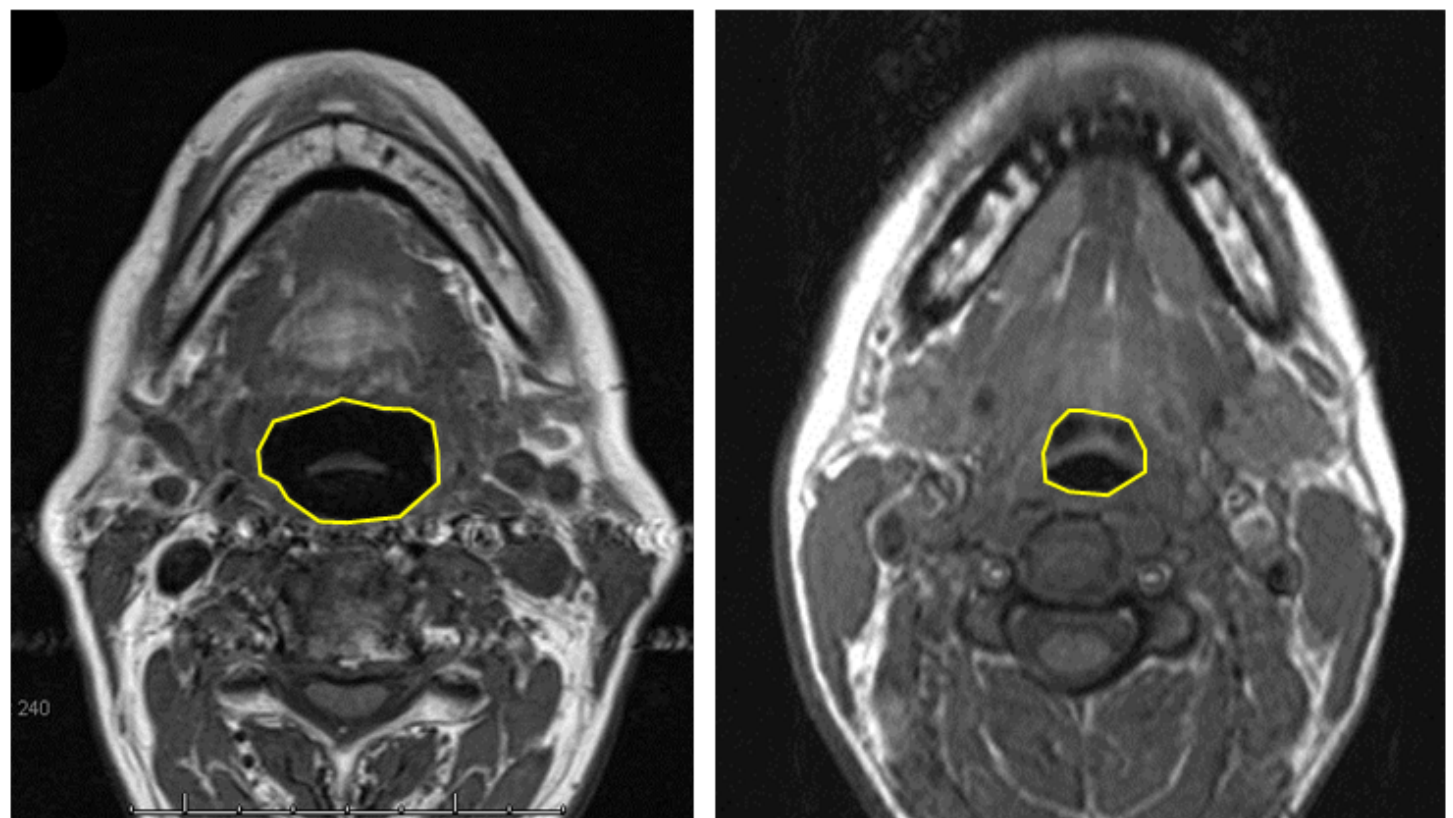(Communicative Sciences and Disorders Department)

and

Kathleen Woolf, PhD
(Nutrition & Food Studies)

Reversing muscle loss in the throat in healthy older adults

- As we age, we loose muscles mass and function in the throat.

- This can cause difficulty swallowing can cause pneumonia (when material is misdirected into the lungs during swallowing) and can harm nutrition, hydration, quality of life.

Molfenter, S. et al (2018). Volumetric Changes to the Pharynx in healthy aging: Implications for pharyngeal swallowing mechanics and function. *Dysphagia.*

Representative pharyngeal lumen size differences in aging
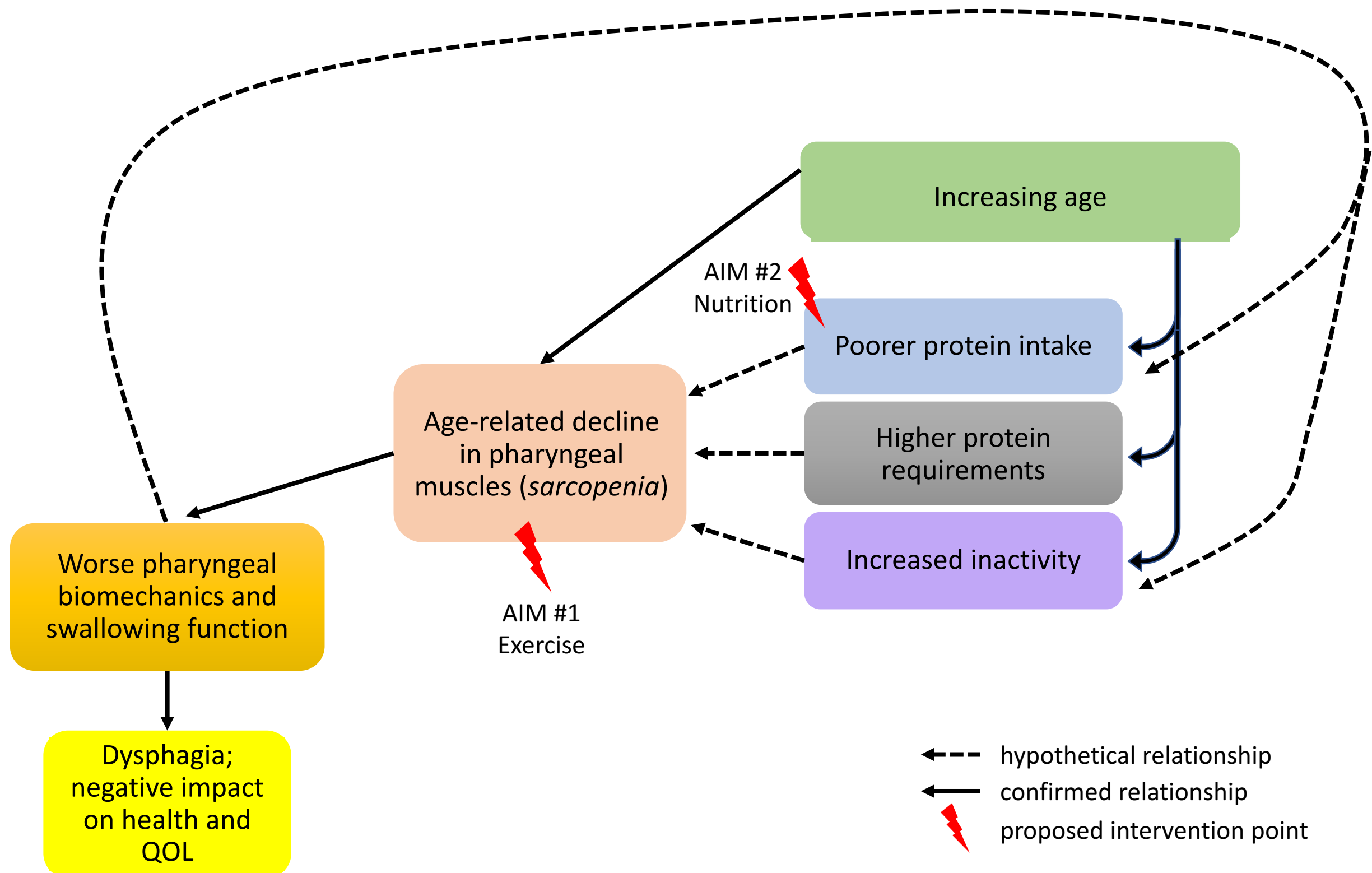71 yr old female   25 yr old female

Molfenter, S. et al. (2015). Age-related Changes in Pharyngeal Lumen Size: A Retrospective MRI Analysis. *Dysphagia. 30*(3): 321-7.

CAN WE PREVENT AND/OR REVERSE THIS PHENOMENON?

A proposed model…

Muscle Protein Synthesis - Diet and Exercise!

- Can we exercise the muscles in the throat to strengthen them for improved swallowing function?
- Can we provide increased protein to impact muscle mass and improve swallowing function?

Proposed Design

Treatment Groups

- EXERCISE GROUP [4 swallowing exercises, 3x week for 8 weeks with daily homework

- PROTEIN GROUP [8 weeks of supplemental protein]

- COMBINED GROUP [swallowing exercises and protein supplementation for 8 weeks]

Outcome Measures – Time points

- Delayed baseline [within subject control]
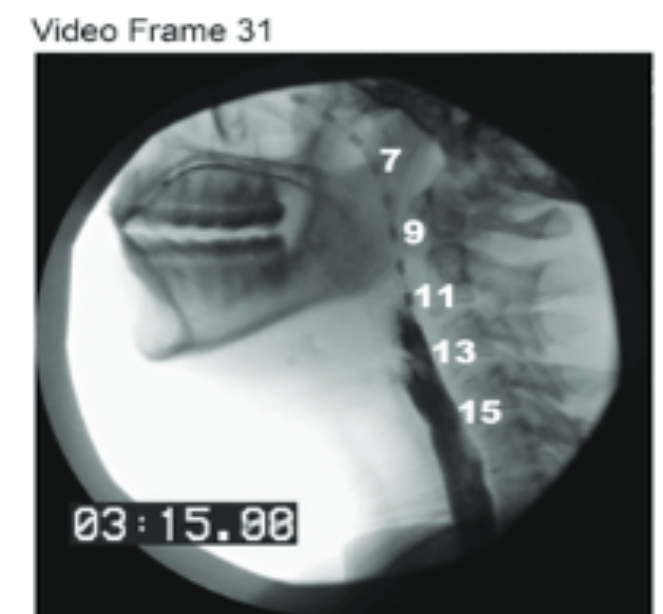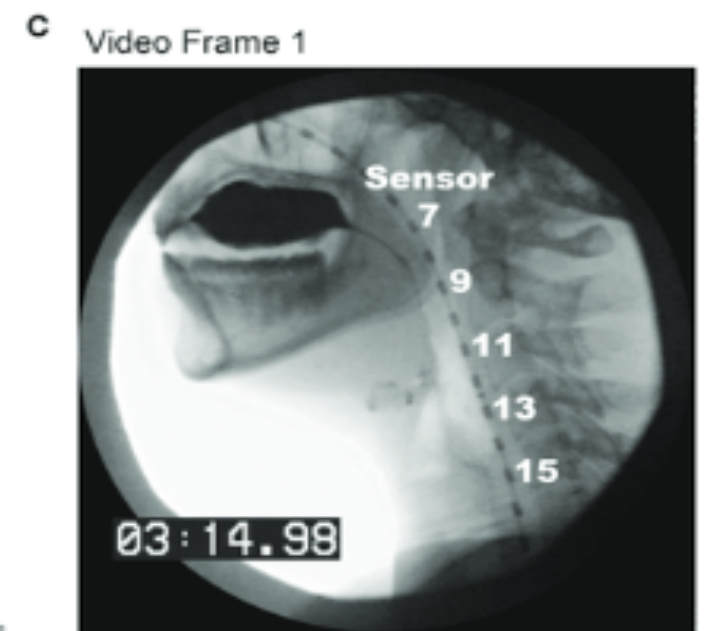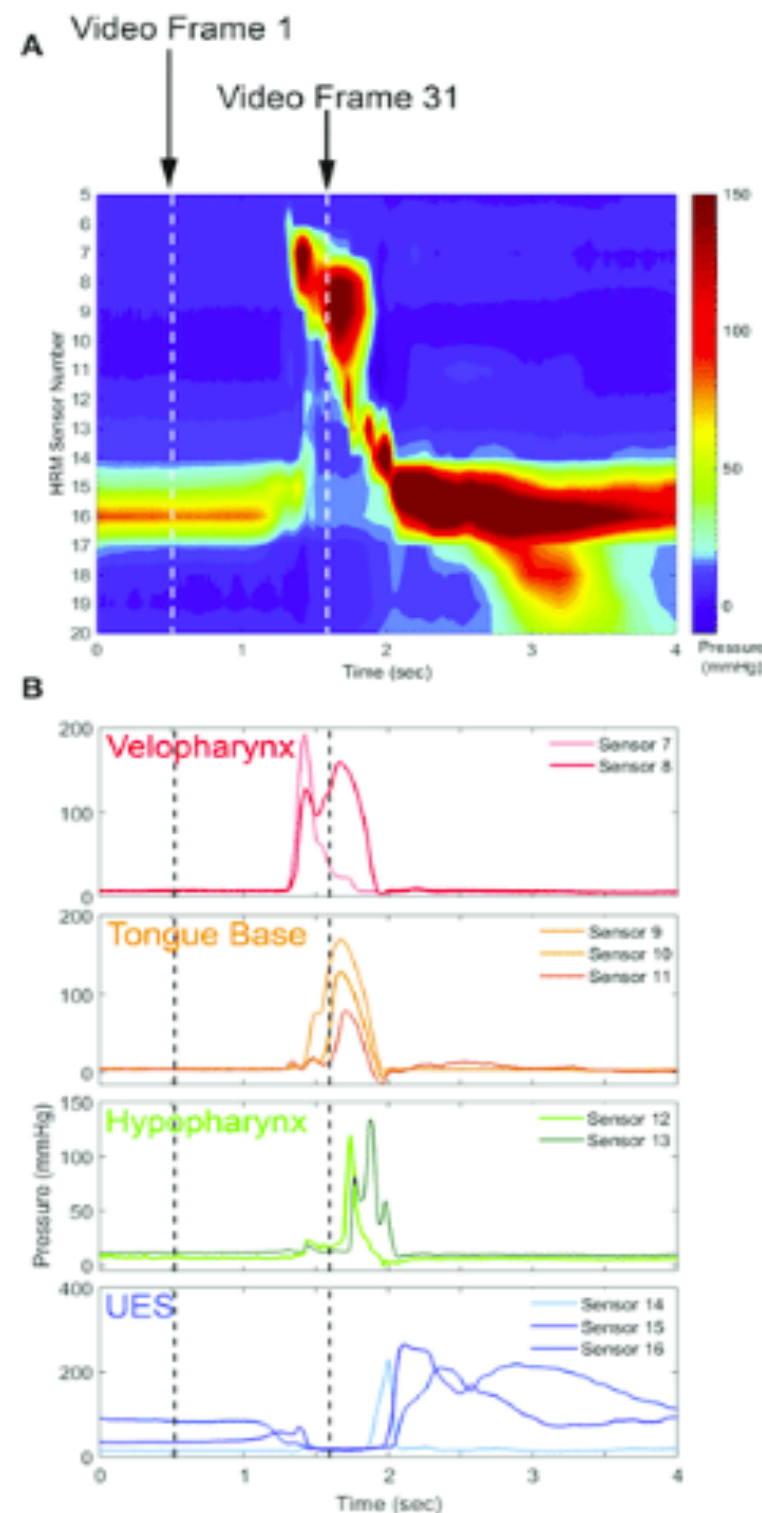
- Pre-Treatment

- Post-Treatment

Outcome Measures (all repeated measures, various conditions)

PRIMARY OUTCOME MEASURE:

- Peak Pressure (mmHg)

SECONDARY OUTCOME MEAURES:

- Normalized Residue Ratio Scale

- Pharyngeal shortening

- Pharyngeal constriction

- Pre-albumin

- Physical function, strength

Recruitment:

- Local Senior Centers, NORCs, Community Centers

Recruit 12-15 participants per senior center, randomize the participants to group.

QUESTIONS:

- What is the proper statistical approach to analyze the data?

- 3 groups, within-subject control, repeated measures, various bolus conditions, nested within senior center

- What is an accurate approach for the power analysis?