Development or maintenance of dysphagia in older adults

// are there different factors involved?

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Agenda

1. Introduction
2. Framework of factors in dysphagia
3. Clinical and management implications
4. Case Example
5. Q & A

About me

PennState

My motivations in this research area

As a population they are often "missed" when it comes to dysphagia

- Preponderance of research in dysphagia has focused on clinical populations - known disease processes like stroke, Parkinson's disease etc.
- Residents of nursing homes, rehabilitation centers, and patients admitted to hospitals with various clinical diagnoses are also studied for the impact and severity of dysphagia
- Provide valuable data, but only reflect a portion of swallowing difficulties that we might see in older adults
- Do not specifically represent community dwelling older adults (CDOA)

Some key terminology

Community Dwelling Older Adults (CDOA)

//who live independently in their home
// typically, 65+ years
// but changes in swallowing can start in the 4th decade

Pre-Clinical Dysphagia

// unidentified dysphagia i.e. prior to any clinical evaluation

CDOA and dysphagia

- Subset of CDOA develop swallowing difficulties in the absence of clinical diagnoses known to cause dysphagia
- Dysphagia in CDOA not identified until negative medical consequences create a need for hospitalization or institutionalization - this can happen rapidly
- A systematic review of dysphagia in CDOA found a mean prevalence of 15% among high quality research studies

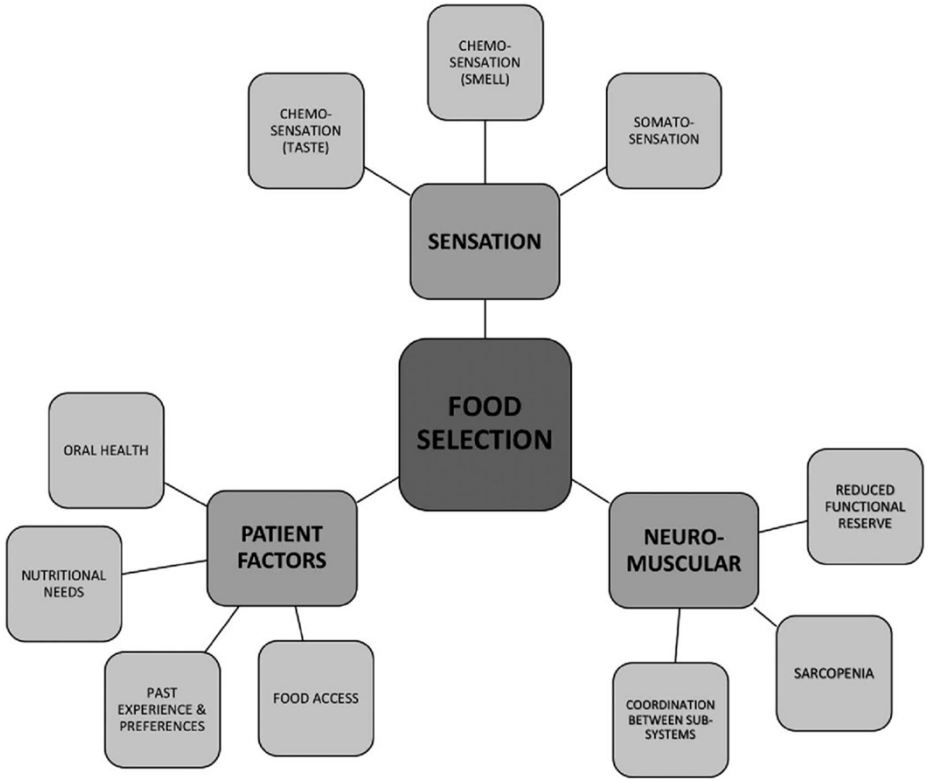
Can we identify problems early by considering other factors that may contribute to causing or exacerbating dysphagia?

CDOA and dysphagia

Older adults apply compensations to their swallowing and eating habits

- “normal part of aging”, thus under-reporting difficulties
- may avoid certain foods, limit intake, restrict food to “easy to eat” choices - ? limited in nutrition
- may further lead to increased difficulties and functional decompensation

I have termed this pre-clinical dysphagia



Reference:
Etter, N. M., & Madhavan, A. (Co-Author, 50%) (2020). Changes in Motor Skills, Sensory Profiles, and Cognition Drive Food Selection in Older Adults with Pre-Clinical Dysphagia. Journal of Speech, Language, and Hearing Research, 63(8), 2723-2730. DOI: https://doi.org/10.1044/2020_JSLHR-20-00098

Older adults

47% ⬆

Number of older adults (65+) projected to increase

from 58 million in 2022
to 82 million in 2050

US population is older than it has ever been – increase in median age

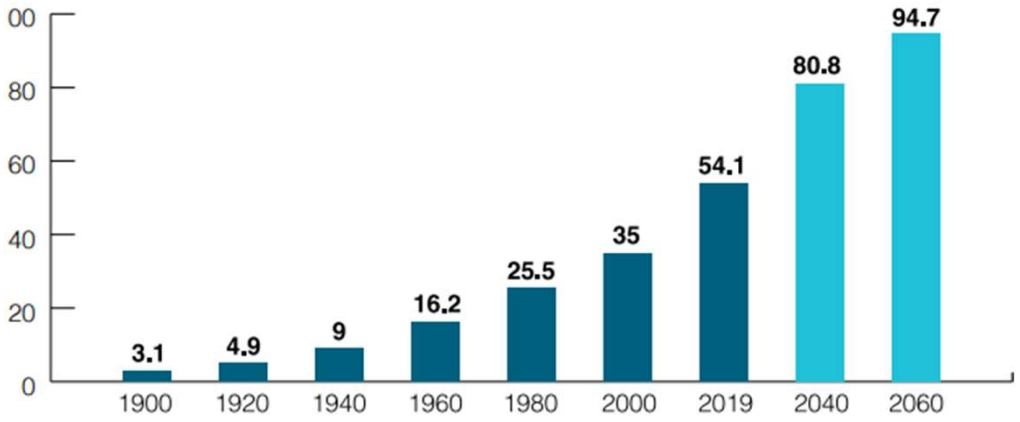
Older adults are working longer

2022 – 24% men and 15% women older than 65 in workforce

Projected to rise further

Longer life also means living with more disease

Number of Persons Age 65 and Older, 1900 - 2060
(numbers in millions)



Note: Increments in years are uneven. Lighter bars (2040 and 2060) indicate projections.
Source: U.S. Census Bureau, Population Estimates and Projections

Aging in place

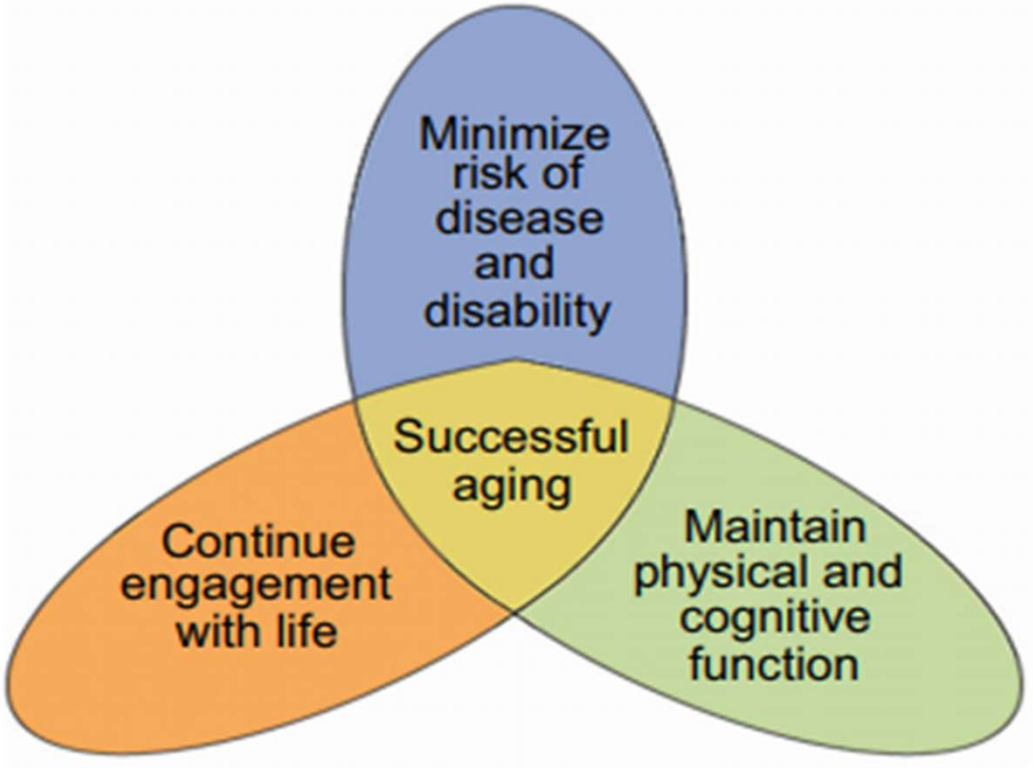
77% adults > 50 prefer to age in place
In the past 20 years, % of older adults living in
traditional housing ⬆
nursing home ⬇

In 2020, 27% of older adults (14-15 million) lived alone

- Increases as they get older
- 42% of 75+ women lived alone

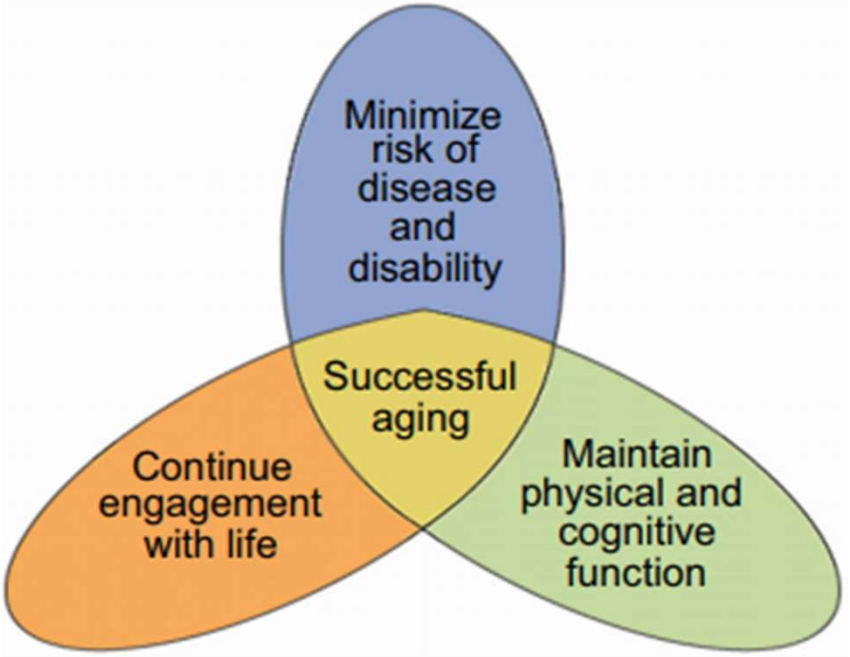
Aging in place expected to grow exponentially

Successful aging? Healthy aging?

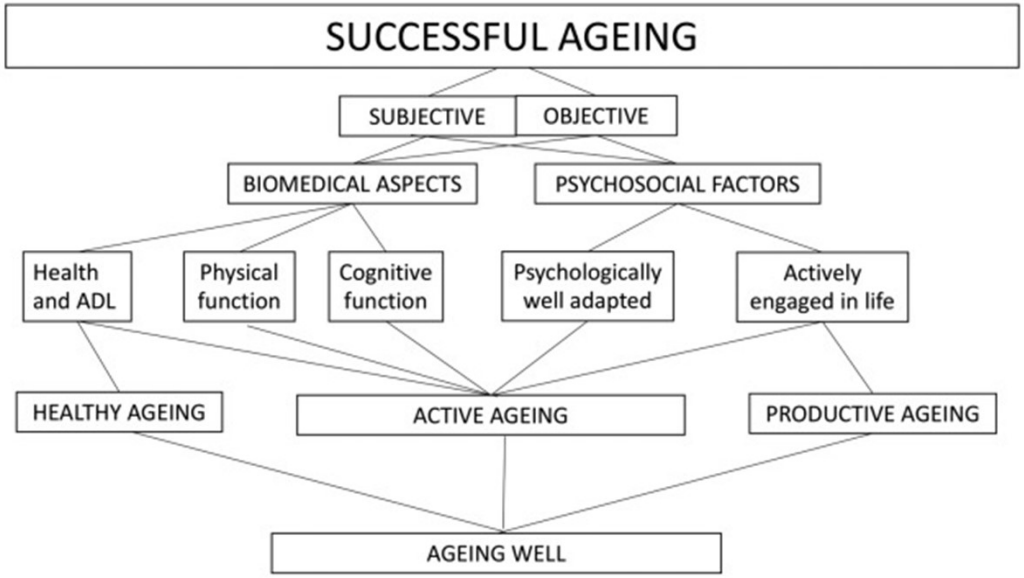


Rowe and Kahn's model of successful aging from 1997

Successful aging? Healthy aging?



Rowe and Kahn's model of successful aging from 1997



Reference:
Urtamo A, Jyväkorpi SK, Strandberg TE. Definitions of successful ageing: a brief review of a multidimensional concept. Acta Biomed. 2019 May 23;90(2):359-363. doi: 10.23750/abm.v90i2.8376. PMID: 31125022; PMCID: PMC6776218.

One of the ways we relate this to dysphagia...

2019 – 22.3% aged 65-74 assessed health as fair or poor

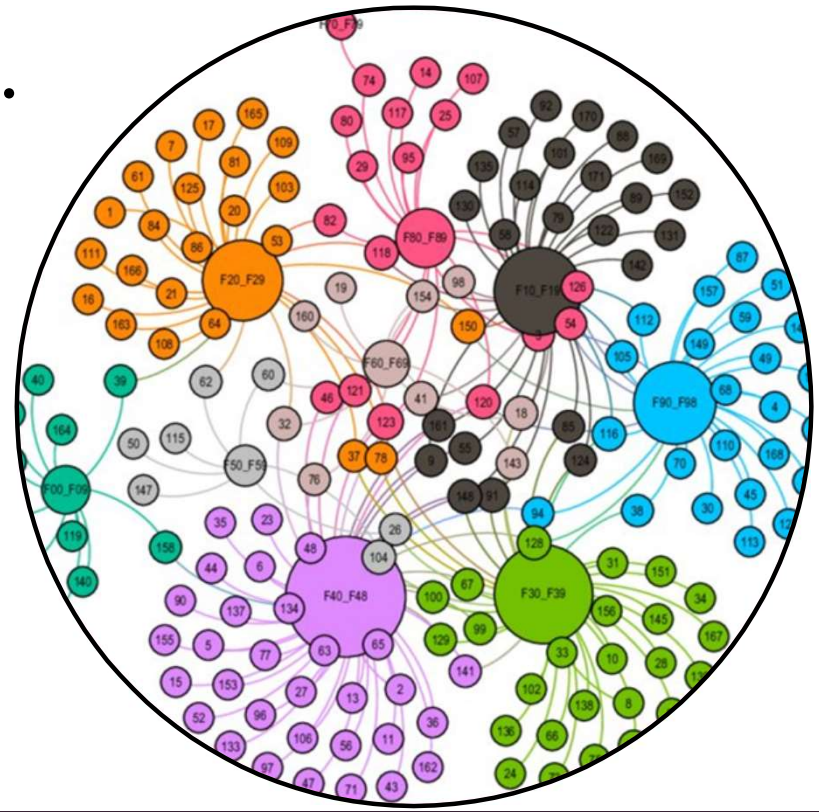
// 29.3% >75

In US, 78% adults > 55 have a chronic condition

// 85% in > 65

Symptoms related to swallowing, but not swallowing changes themselves may be early indicators

This brings me to my premise...



Dysphagia in CDOA is multifactorial.

Dysphagia in older adults is a geriatric syndrome?

"Clinical conditions in older persons that do not fit into disease categories but are highly prevalent in old age, multifactorial, associated with multiple co-morbidities and poor outcomes and are only treatable when a multidimensional approach is used"

Reference:
Cruz-Jentoft AJ, Baeyens JP, Bauer JM, et al. Sarcopenia: European consensus on definition and diagnosis. Age Ageing. 2010;39(4): 412–423

Poll question

Criteria for a geriatric syndrome

1. High prevalence in older adults
2. Combination of symptoms
3. Common risk factors
4. Interaction with other geriatric syndromes E.g., Delirium, dementia, falls, frailty, malnutrition, sarcopenia
5. Impaired outcomes
6. Multicomponent intervention

“

Consider the following case scenario:
A 75-year-old man ends up in the hospital following a fall at home. He was found to be dehydrated and malnourished. His medical history was significant for chronic back pain and hypertension. A clinical swallow examination conducted at the hospital reveals difficulty swallowing several solid foods. The patient reports he avoids most dry, hard, and crunchy foods because they are difficult for him to swallow. He has never discussed these changes with his doctors because he believes difficulty with some foods is a natural part of getting older, and he eats the things he can. Additionally, the patient reports an unintentional 10-lb weight loss in the last 2 months.

”

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Advanced age

Dysphagia prevalence increases with age

- 16% in 70-79 year olds
- 33% in > 80 year olds

Physiologic and functional decline

↓ functional reserve, muscle mass, connective tissue elasticity, strength, range of motion

Decrements in oral moisture, taste, smell - can impact quantity and quality of intake

Older adults are vulnerable to disease and acute illness

// may not cause dysphagia but may exacerbate decline in functional aging swallow

Advanced age

Chen et al. excluded known causes and diagnoses related to dysphagia

- Prevalence 9.5%
- Advanced age predictor for dysphagia

Holland et al. studied healthy aging

- Prevalence 11.4%
- Increasing age as a predictor for dysphagia

Advanced age and polypharmacy

- Simultaneous use of several drugs by a single person

- Coexistence of various health conditions - chronic disease, acute illness, systemic conditions like chronic pain

  // increase with age

- Chances of medications that affect swallow function

  //sedatives, muscle relaxants, antihistamines, opioids, bronchodilators, drugs used to treat high cholesterol

Medical Diagnoses

We know several diagnoses cause dysphagia

- Evidence in CDOA studies, also associated with
  - reflux and esophageal stenosis
  - COPD
  - chronic neck and shoulder pain
  - depression
  - diabetes

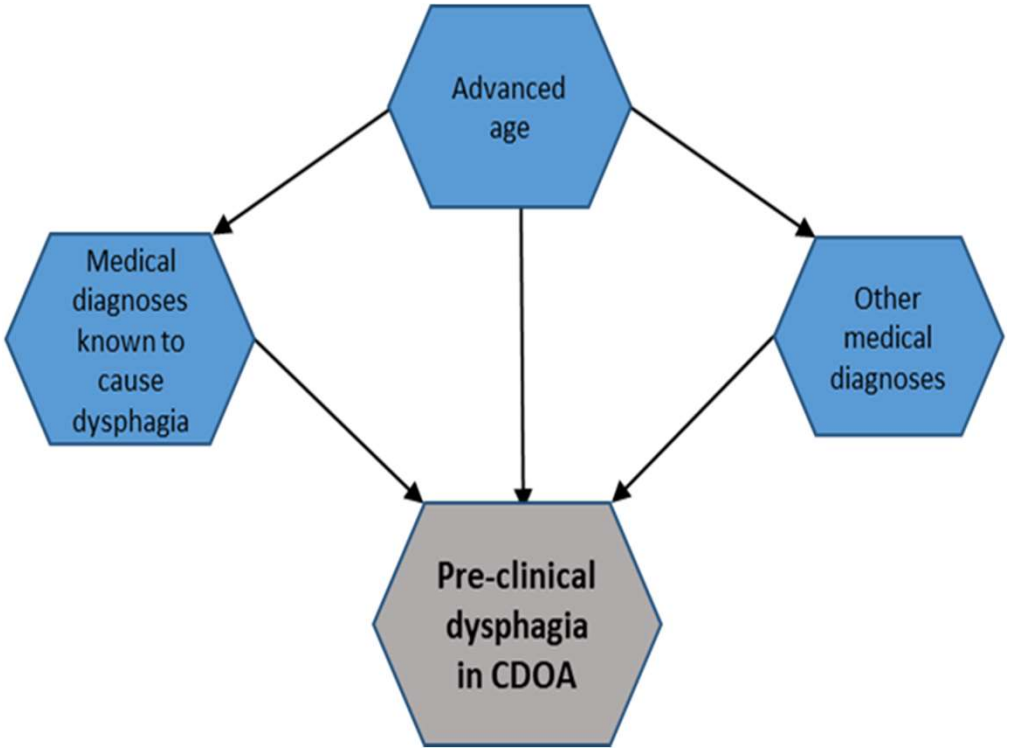
- Not typically thought to be associated with dysphagia, but present with increasing prevalence in aging

Causative evidence

Could age cause dysphagia even in the absence of diagnoses known to cause dysphagia?

Prevalence of diseases increases
// Increase in functional decline

So, if I were to start a framework with causative factors…



Reduced physical function / frailty

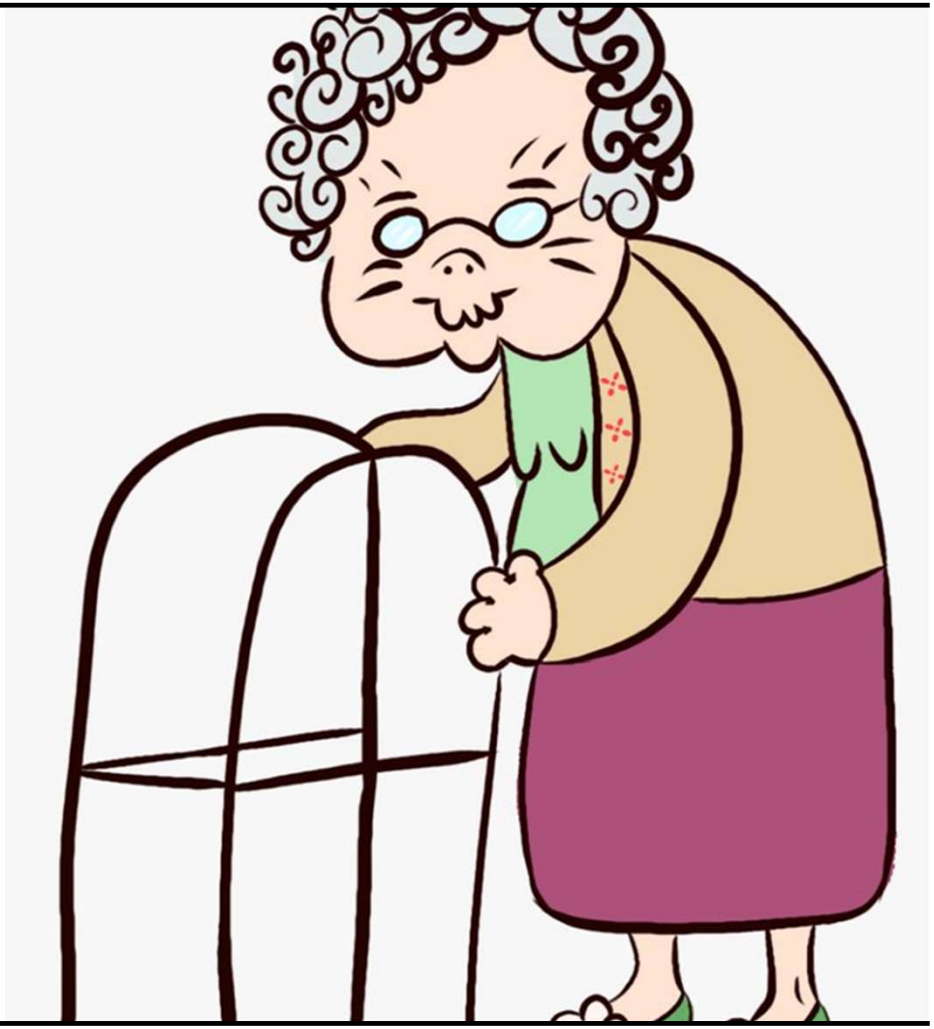
Decline in physical function is in the frailty geriatric syndrome

// 75% of >85 years

Characteristics of frailty include

- self-reported exhaustion
- low physical activity
- slow gait speed
- reduced hand grip strength
- weight loss

Also related to dysphagia and "wasting disorder" as a feature of frailty



Reduced physical function / frailty

Sarcopenia - loss of skeletal muscle mass, strength, and power
// In aging - easily relates to low functional ability

Cha et al. - sarcopenia independent risk factor for dysphagia in CDOA
// Risk was 2.7 times higher
// Those with dysphagia showed more sarcopenia

Feng et al. - significantly reduced geniohyoid muscle
// significantly reduced in aspirators compared to non aspirators
// marker for systemic sarcopenia?
// tongue strength and handgrip strength independently associated (Butler et al., Sakai et al.)

Molfenter et al. - larger pharyngeal volumes - ? related to muscle atrophy

Reduced physical function / frailty

Hospital associated deconditioning common in older adults

- // characterized by reduced physical function
- // unrelated to neurologic or orthopedic
- // >70 years old - 30% hospitalized for acute illness are discharged with difficulties in ADLs that they didn't have before

Individuals classified as "pre-frail" (difficulty with ADLs can be a marker here)

- // increased dysphagia

Could dysphagia be a triggering factor in frailty?

Could frailty lead to dysphagia?

Cognitive Decline

Swallowing requires cognitive awareness, visual awareness and recognition of food, physiologic response, motor planning, execution of sensorimotor responses

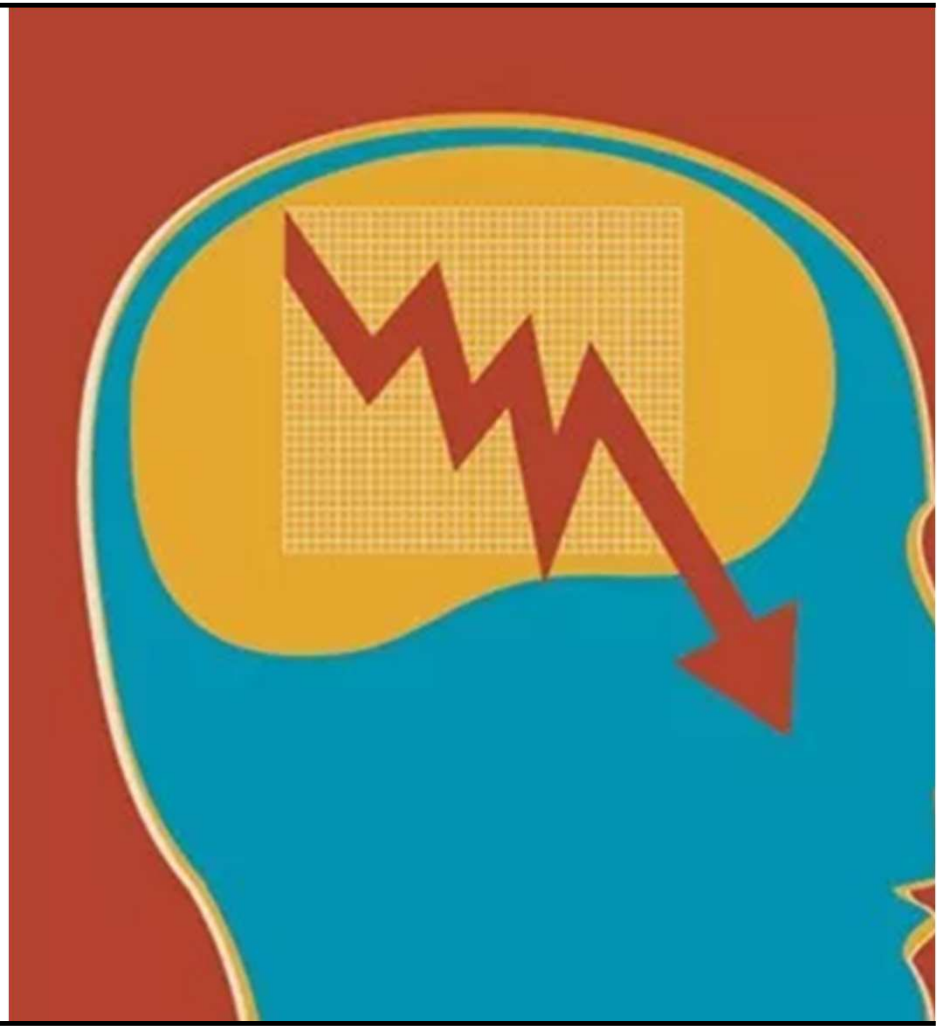
// Overall decline with age

// Transient declines associated with hospitalization, illness, medications

// Cognitive declines can affect oral phase of swallow

// Patients not oriented to time/place or unable to follow simple commands

// Increase in liquid and puree aspiration (Leder 2009)



Undernutrition or Malnutrition

Changes in appetite, limited mobility, social isolation, economic constraints + disease + medications - can adversely affect nutritional status in older adults

// Undernutrition can impact health status, muscle strength, mobility, energy, immune response, physiologic functioning

// Serra-Prat et al., 2012 - Longitudinal study - significant differences in nutritional status between older adults who described swallowing difficulty vs. not

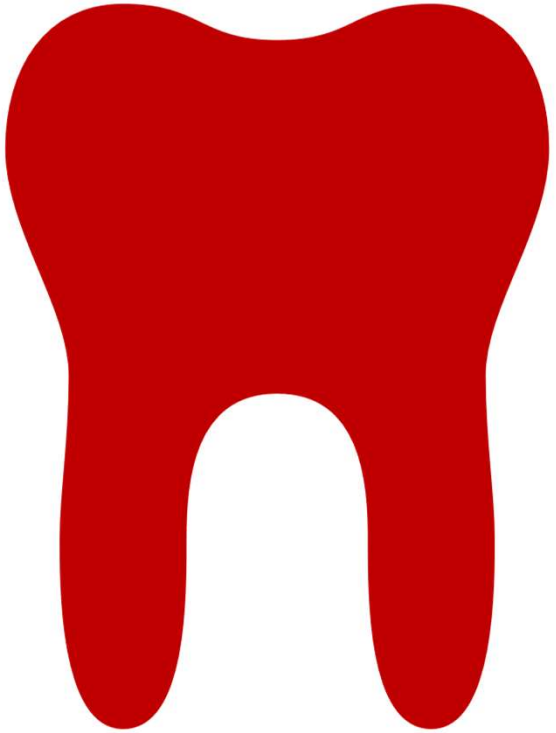
Oral Health

Significant number of CDOA have < 20 natural teeth, and decreases significantly with increasing age
// poor mastication, avoidance of certain foods, limited intake

Tooth loss associated with undernutrition and increased odds of swallowing difficulty

> 65 years - 30% hyposalivation and xerostomia
// difficulty chewing solids, oral transport, food avoidance, discomfort with dentures, increasing oral infections and dental caries

Okamoto et al. - significant association of swallowing difficulty with increased perception of oral dryness



Oral Health

We also know about increased oral bacterial colonization and risk for aspiration pneumonia

// reduced salivary flow increases oral bacterial colonization

Hagglund et al. - swallowing dysfunction and poor oral health independently associated with mortality

// Both - 35% mortality - 2.6 times higher than individuals without either

Associative evidence

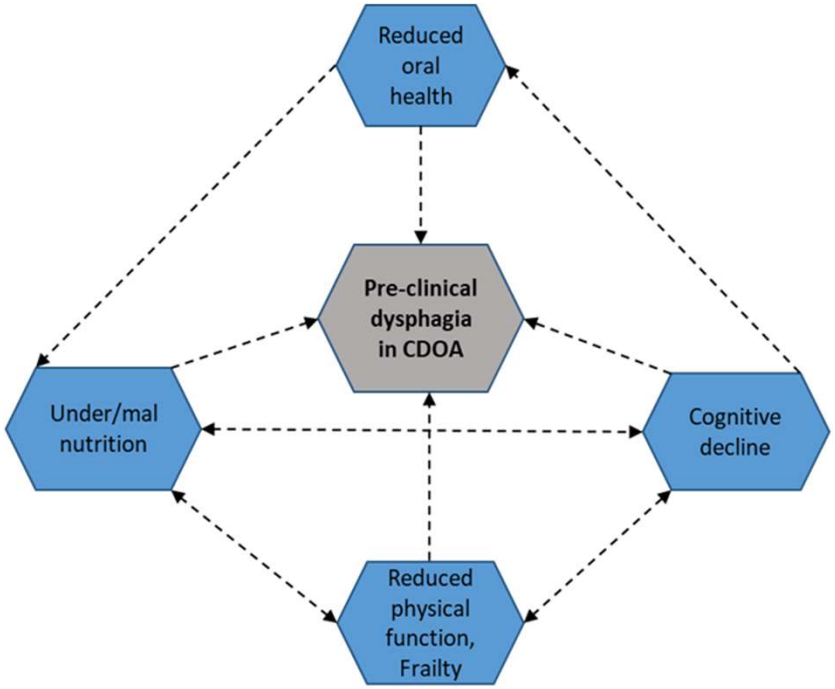
Cognition and motor function have a cyclical relationship

Independent association between frailty and dementia
// Increasing frailty associated with faster cognitive decline

Cognitive decline impacts nutrition

Older adults with frailty and cognitive declines are further at risk for hospital acquired confusion and delirium
// also independently associated with adverse outcomes

Cognitive decline associated with progressively worsening oral health, ability to perform ADLs



So, if I were to build a framework with associative factors…

Social Support

Diverse social networks, availability and satisfaction of social support - large positive influence on health and functional decline

Considered an “asset” in some models of frailty - and “assets can outweigh deficits”

Older adults without adequate social support
- // fear of falling
- // slowed gait speed
- // impaired balance
- // limitations in abilities to carry out ADLs

Can impact access to medical and dental care, meal procurement and preparation, consumption of a varied diet (Huang et al., Wang et al.)

Sensory Loss

In swallowing - afferent input adjusts efferent output

With increasing age

// Reductions in taste and smell due to decreased regeneration of olfactory and gustatory cells

// Reductions in oral somatosensation - cheeks, lips, tongue

Can restrict food choices, create food avoidances, reduce intake, reduced motivation to eat and drink

// Common in CDOA

// Can lead to weight loss, nutritional deficits → functional decline

Speculative evidence

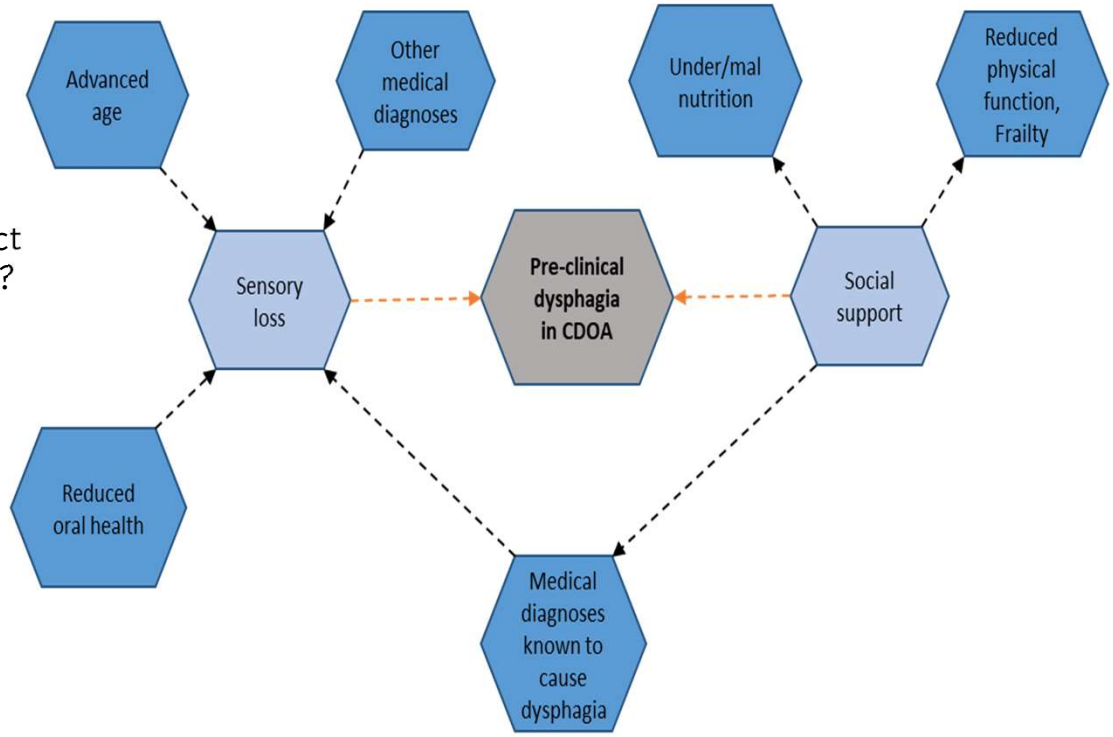
Individuals' sensory profiles influence food preferences

// direct relationship between sensory loss and food choices in older adults?

Access, availability, affordability of nutritious foods affect food selection - default to easier options in the moment?

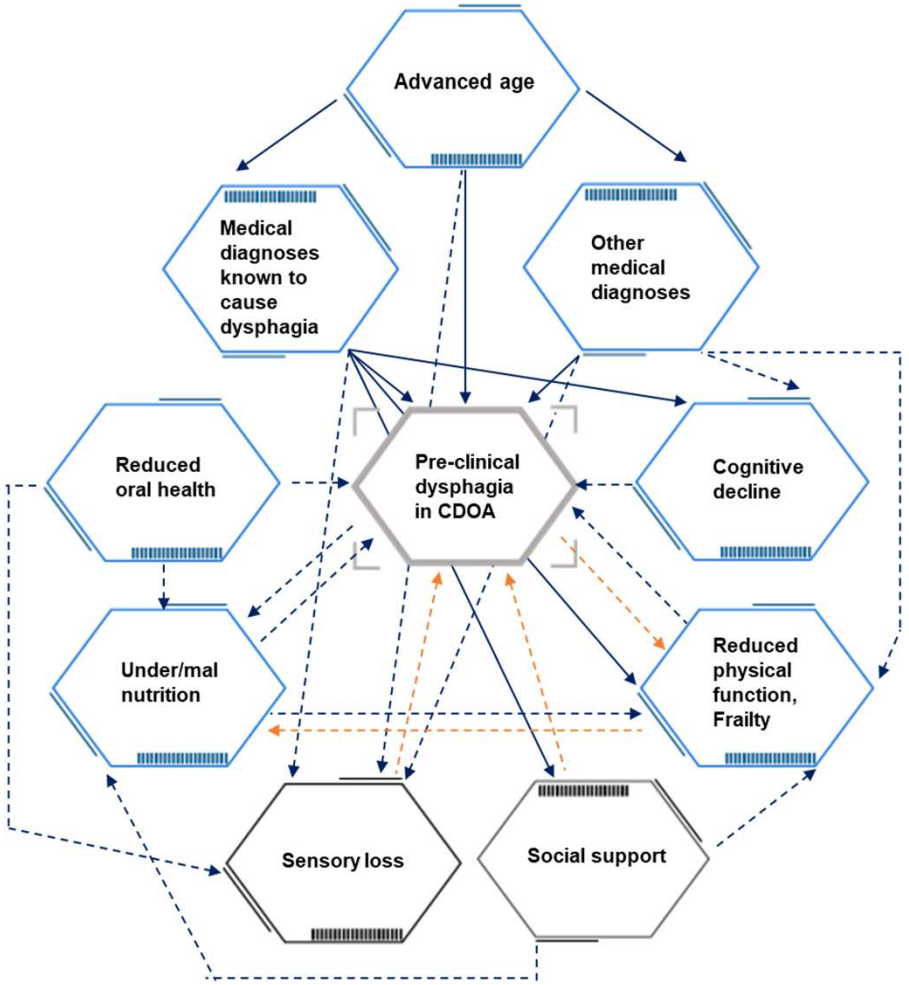
// heavily influenced by social support

Theoretical and clinical knowledge on this is clear, but no direct evidence - So, if I were to fit these potential factors into the framework...

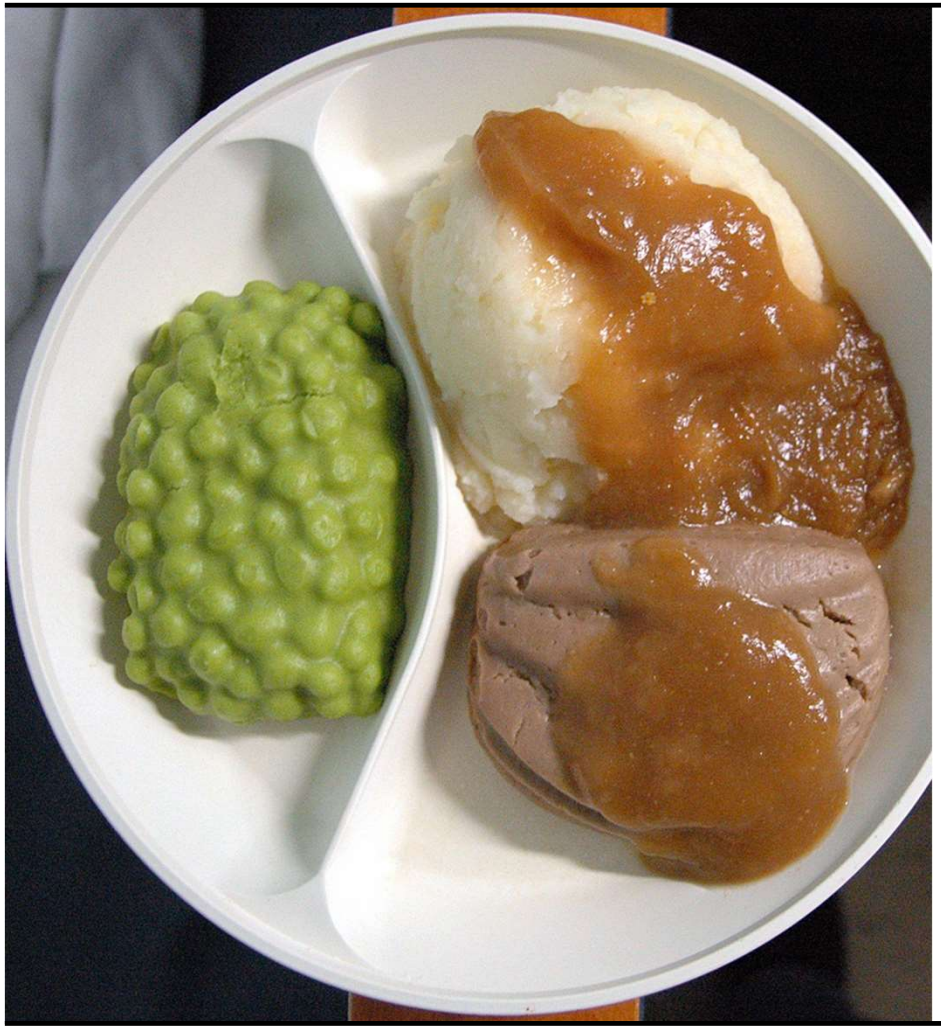


Putting it all together

Makes it complicated, but we cannot minimize the interrelationships among the factors and how they build into dysphagia



Poll question



What about clinical management

What do SLPs do

SLPs receive a referral when swallowing difficulties suspected

If dysphagia confirmed, modified diets are one of the most common management choices (Garcia et al., Steele et al.)

// Not well accepted → lower consumption
// increasing risk for dehydration and nutritional decline
// disuse atrophy
// further worsening the underlying dysphagia is possible

In geriatric syndromes one single factor can contribute to declines in other factors → increasing overall decline

Could SLP management practices contribute to this cyclical decline, exacerbating deficits?

SLPs who work with older adults

Consider if these other factors may be the key to early identification

Could improvement in one factor improve overall symptoms and overall health

Could a “minimum set” of factors be key to early identification of dysphagia in CDOA

Back to our case:

A 75-year-old man ends up in the hospital following a fall at home. He was found to be dehydrated and malnourished. His medical history was significant for chronic back pain and hypertension. A clinical swallow examination conducted at the hospital reveals difficulty swallowing several solid foods. The patient reports he avoids most dry, hard, and crunchy foods because they are difficult for him to swallow. He has never discussed these changes with his doctors because he believes difficulty with some foods is a natural part of getting older, and he eats the things he can. Additionally, the patient reports an unintentional 10-lb weight loss in the last 2 months.

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Poll question

One possibility of progression

Prefrailty and ? reduced social support →

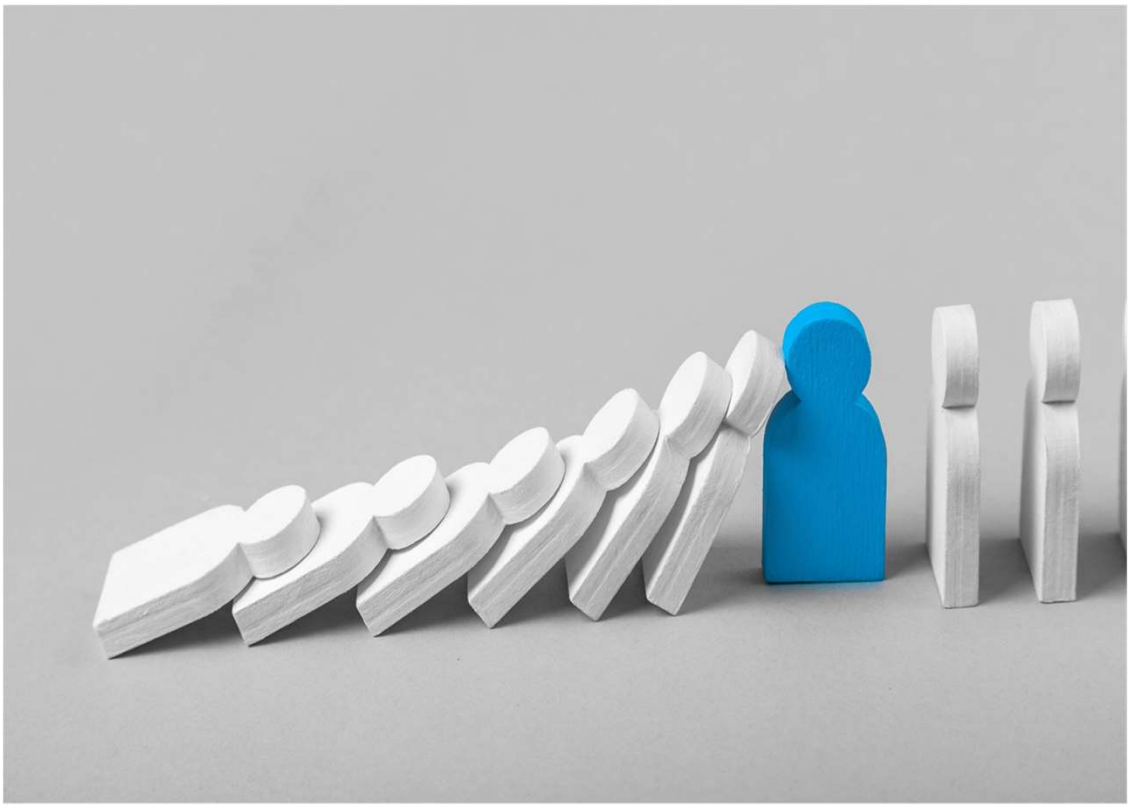
difficulties with swallowing and making “easy meal choices” →

malnutrition and dehydration →

furthering functional decline in physical abilities →

fall

Fall precipitated the hospitalization.



Poll question

My future research

Determining what that “minimum set” of factors might be that give us the “biggest bang for our buck”.

Implementation
Use as a screening tool to determine which CDOA are at greatest risk.
// at doctor’s offices, outpatient clinics, senior centers etc.

Preventing decline?
Once we know who is at risk, can we implement strategies to stave off dysphagia?
// Education and Awareness
// Exercise
// Overall health and wellness

Recap of key takeaways

Dysphagia in CDOA

// is complicated

// result of interaction between multiple factors

// knowledge of the interrelationships between these factors may be helpful in management of dysphagia

// improved management can mitigate negative morbidities associated with dysphagia

Any questions?

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Thank you.