Welcome!

FLS Bone Health ECHO® TeleECHO Clinic

We will be recording this TeleECHO Clinic for educational and quality improvement purposes.

By participating in this clinic you are consenting to be recorded.

If you do not wish to be recorded, please email andrea.medeiros@nof.org at least one week prior to the TeleECHO Clinic you wish to attend.

Please type in your name, location, and email address in the chat.

Clinic will start in less than 15 minutes

Some helpful tips:

Please mute your microphone when not speaking

Position webcam effectively

Communicate clearly during clinic:

- Speak clearly
- Use chat function

Project ECHO's goal is to protect patient privacy

To help Project ECHO accomplish that goal, please only display or say information that doesn't identify a patient or that cannot be linked to a patient.

<u>References:</u>

For a complete list of protected information under HIPAA, please visit www.hipaa.com

Common HIPAA Identifier Slip-Ups and Easy Ways to Protect Patient Privacy

1st – **Names:** Please do not refer to a patient's *first/middle/last name* or use any *initials*, etc. Instead please use the *ECHO ID*.

2nd – **Locations:** Please do not identify a patient's *county, city or town*. Instead please use only the patient's *state* if you must or the *ECHO ID*.

3rd – **Dates:** Please do not use any dates (like *birthdates*, etc.) that are linked to a patient. Instead please use only the patient's *age* (unless > 89)

4th – **Employment:** Please do not identify a patient's *employer*, work *location* or *occupation*. Instead please use the *ECHO ID*.

5th – **Other Common Identifiers:** Do not identify patient's *family* members, *friends, co-workers, numbers, e-mails*, etc.

NOF Staff Disclosures

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Treating the Fracture Includes Treating the Fall

Deborah M. Kado, MD, MS

Professor, UCSD School of Medicine

Director, UCSD Osteoporosis Program

Disclosures

- None in the past 12 months

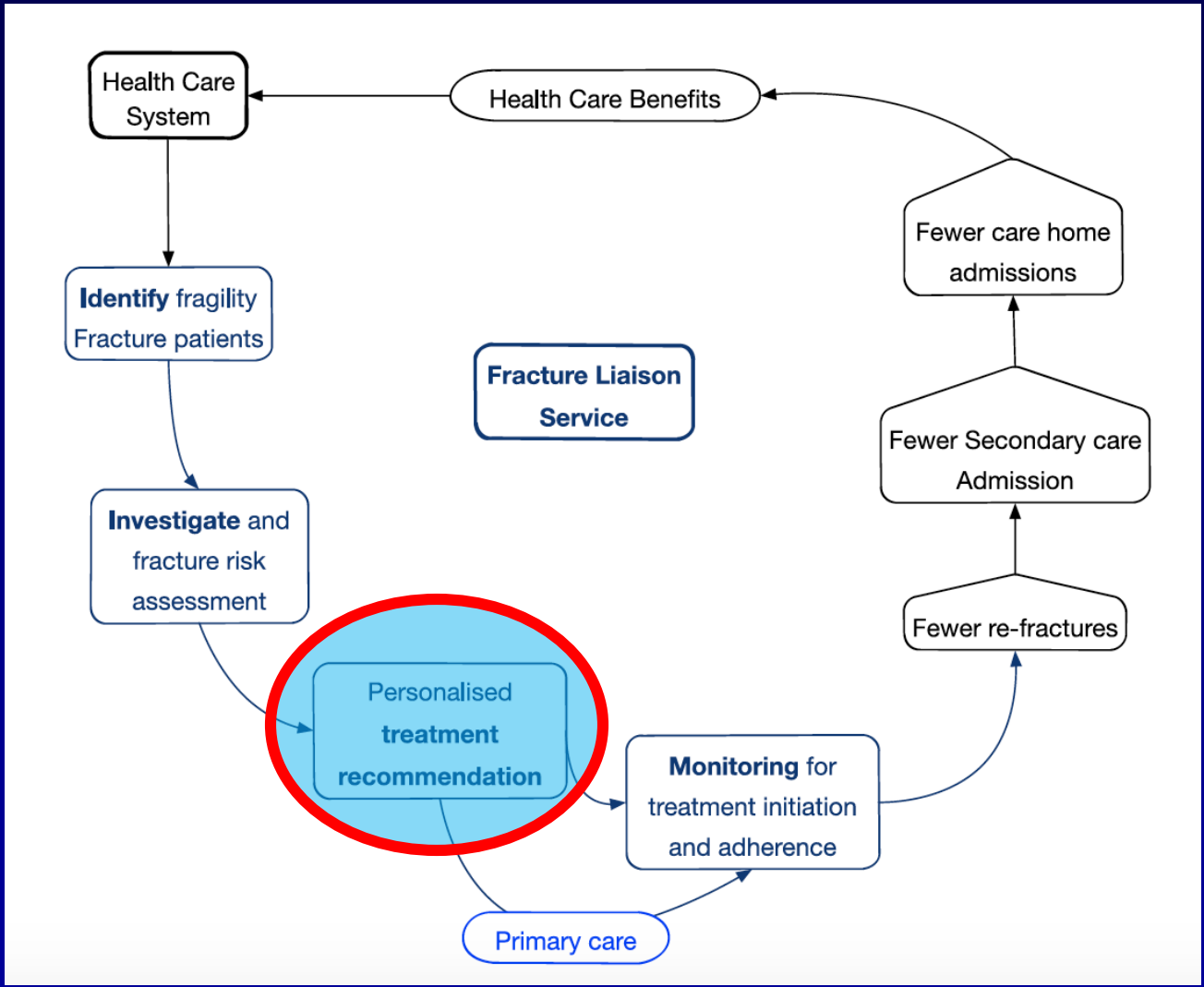
Learning Objectives

- Be able to list at least 5 common fall risk factors in older adults
- Understand the data behind fall prevention recommendations
- Become familiar with the concept of number needed to treat and number needed to harm in terms of fall prevention strategies in comparison with medication treatment for osteoporosis

Osteoporotic Fractures in 2020

- Repeat fractures can be reduced by 50% with osteoporosis medication treatment
- 95% of hip fractures occur because of a fall
- How many could be prevented if no one falls down?

Preventing Osteoporotic Fractures: Fracture Liaison Service



From Javaid et al, Osteoporos Int 2020

Fracture Liaison Services: Current Status of the Field (in Relation to Falls)

- PubMed search, May 2020:
  - –Key words: Fracture Liaison Service, n = 272 articles (59 additional articles published since last year)
  - –Major topics
    - Care pathways
    - Subsequent fracture rates
    - Cost-effectiveness
    - Effectiveness in the oldest old/comorbidities
    - Country/region specific experiences with FLS services
- Overall impression: Paucity of information regarding fall assessment and prevention as it relates to FLS

Fracture Liaison Services: Do they work?

- Meta-analyses of FLS studies done (January 2000-February 2017)
  - –159 articles (74 controlled studies – 16 RCTs; 58 observational)
  - –14 observational and 12 RCTs included

Intervention	FLS	Usual Care
DXA Measure	48%	23.5%
Treatment Initiation	28%	17.2%
Greater Adherence	57%	34.1%
Fall Risk Assessment	n/a	n/a
Outcomes		
Re-fracture	6.4%	13.4%
Mortality	10.4%	15.8%

**Wu C et al, Bone 2018*

Fracture Liaison Service in the Oldest Old

- Inclusion criteria – Fracture patients >85 years, hospitalized at Maastrict University Hospital from 2004-2006 (n = 282 eligible, 122 included)

- Interventions:
  - –DXA
  - –Fall risk assessment:
    - Mobility
    - Balance
    - Handgrip strength
    - Lower limb muscle strength
    - Visual impairment
    - Cognitive state
    - ADL
    - General health (BMI, blood pressure)

- Outcomes: Incident fractures, up to 2 years later
  - –No difference in fracture outcomes in the FLS attenders and non-attenders
  - –**No data on falls**
  - –Some data to suggest lower mortality in the FLS attenders

**Sanli I et al, Aging Clin Exp Res, 2018*

Fracture Liaison Services: Experience with Falls Prevention in the UK

- Gap Analysis Tool used to evaluate two standards from the Clinical Standards of FLS
  - –Standard 2 – patient's need for a comprehensive falls risk assessment should be evaluated within 3 months of an incident fracture
  - –Standard 5 – patients identified at increased fall risk should be referred for fall intervention to reduce future falls

- Data collected from 102 sites across the UK between 2015-2017:
  - –29% did not meet Standard 2
  - –28% did not meet Standard 5

- Main reasons for failing to meet standards
  - –Perception that fall risk assessment places excessive demands on practitioner time
  - –Outside of the scope

**Doyle Ali, Rheumatology 2018*

Fracture Liaison Services: Need for improved fall prevention

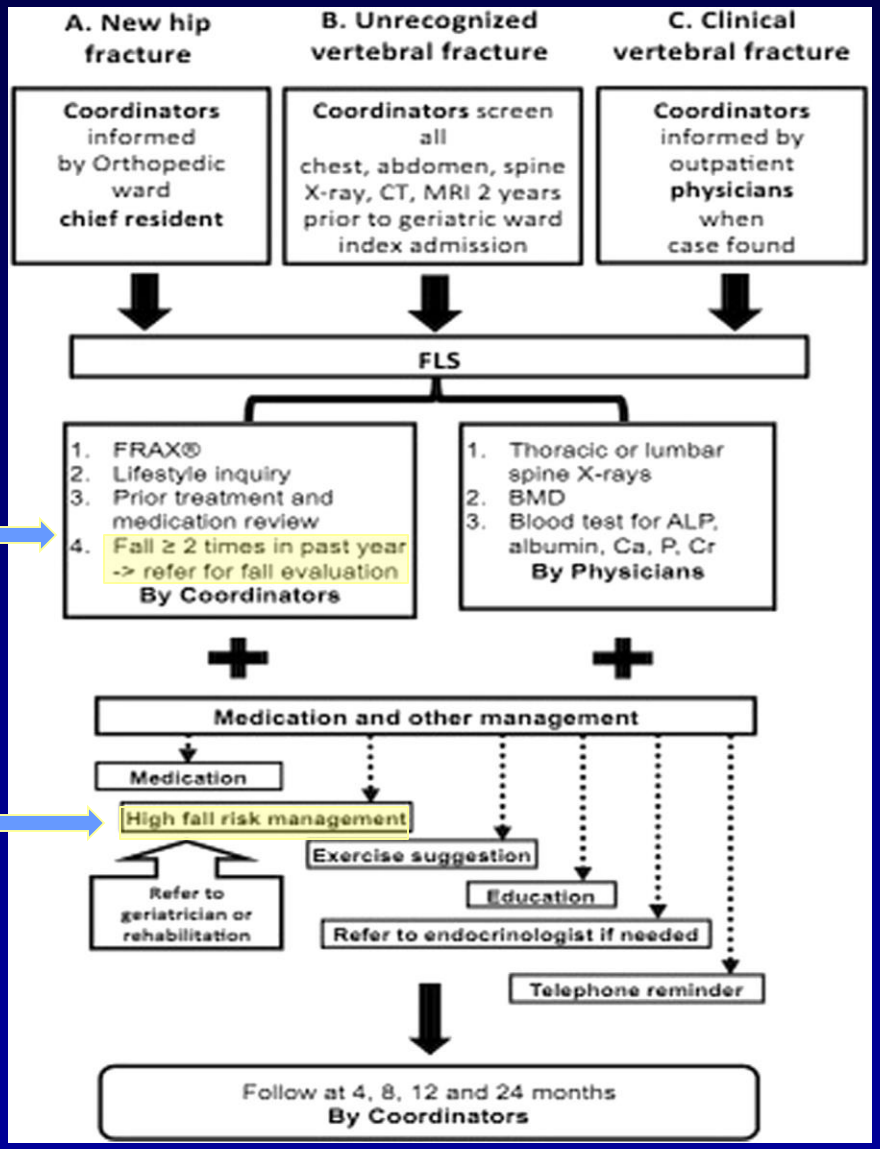
- FLS Program in Taiwan
  - 712 patients screened, 600 (84%) enrolled
  - Mean age 78

- Interventions:
  - DXA measures
  - Treatment initiation: 38% versus 17.2%
  - Fall risk assessment: if ≥ 2 falls in past year → referred for fall evaluation (geriatrician or rehabilitation)

- Outcomes assessed up to 2 years later
  - **Falls: 199 (33%)**
  - Re-fracture: 36 (6%)
  - Mortality: 85 (14%)

**Chao CT et al, JAMDA 2019*

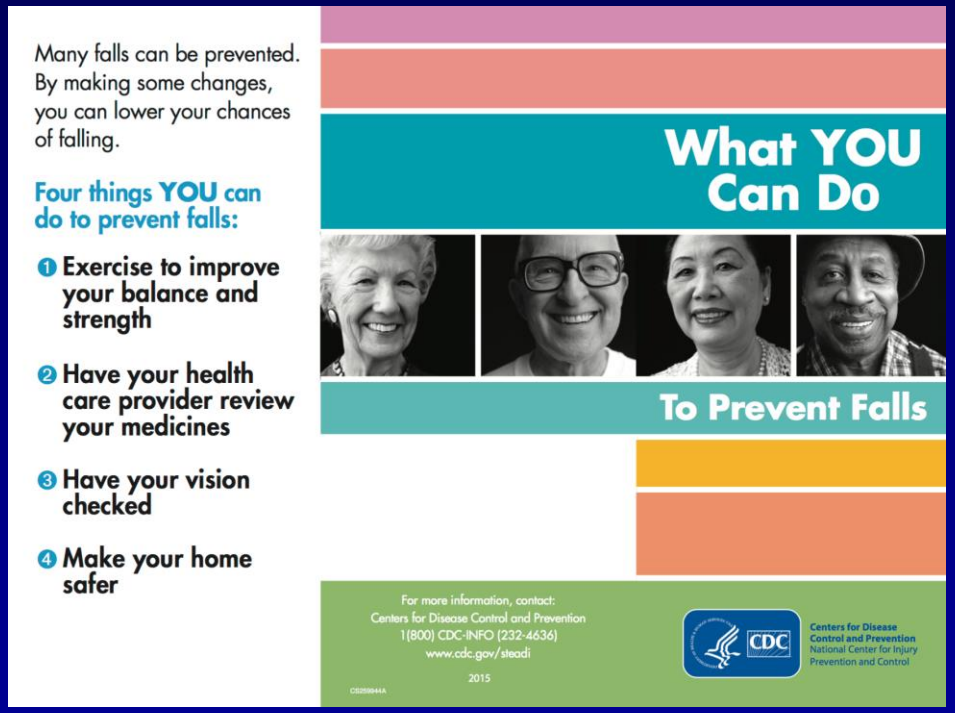
FLS algorithm that incorporates falls:



Chao et al, JAMDA 2019

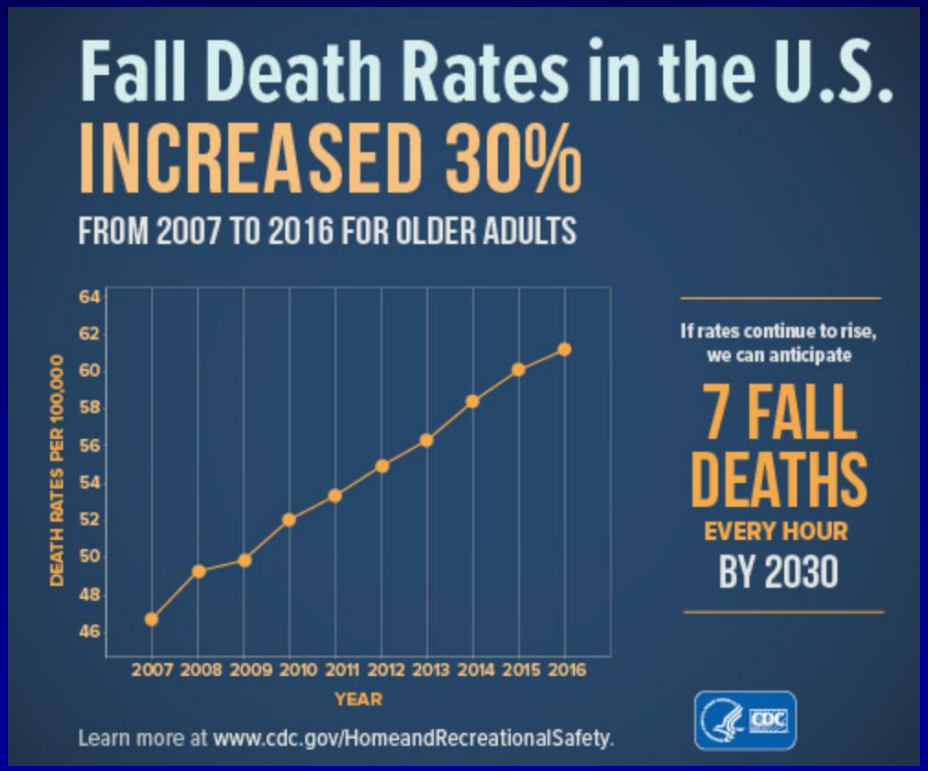
Fracture prevention is not just drug treatment

- **FRACTURE PREVENTION**
  - Diagnosis – identify those at high fracture risk
  - Medication – to decrease the risk of fractures
  - **Fall prevention –** to decrease the risk of fractures
    - 95% of hip fractures result from a fall



Geriatrician's perspective: Fall prevention is key to fracture prevention

- **Facts about falls in older persons**
  - About 30% of community-dwelling older adults aged > 65 report falling each year
  - 50% aged > 80 fall each year
  - 1 in 5 falls are injurious
    - Broken bones
    - Head injuries



Falls: Epidemiology

More facts about falls in older persons

- Men and women tend to fall in equal proportions, but women more likely to suffer an injury
- About 5% of falls lead to hospitalization
- Who is at risk for falling?
  - Older persons
  - Those who have fallen previously
  - Those on multiple medications
  - Those with decreased muscle strength
  - Those with mobility disorders
    - 15% of those > 60 years of age
    - 80% of those > 85 years of age

Kado D et al, Current Geriatrics Diagnosis and Treatment, 2014.

Falls: Clinical Evaluation
Keeping it simple for FLS

Risk Factor	Modifiable
Previous falls	No
Balance impairment	**Yes**
Decreased muscle strength	**Yes**
Visual impairment	Maybe
> 4 medications or psychoactive medication use	**Yes**
Gait impairment or walking difficulty	Maybe
Depression	Maybe
Dizziness or orthostasis	Maybe
Functional limitations (ADL disabilities)	Unlikely
Age > 80 years	No
Female	No
Low body mass index	Unlikely
Urinary incontinence	Maybe
Cognitive impairment	Unlikely
Arthritis	Maybe
Diabetes	Unlikely
Pain	Maybe

Data from Tinetti, M. JAMA 2010

Falls: Clinical Evaluation

- Orthostatic vital signs
- Visual acuity
- Cognitive status
- **Medication review**
- Feet and footwear assessment
- **Gait and balance assessment**
  - **Chair stand**
  - **Semi-tandem stand**
  - **Full-tandem stand**

Falls Prevention: USPSTF Review of the Interventions

- Effectiveness and Harms of Fall Prevention Interventions
  - Who? Community-dwelling adults >65 years of age
  - What? Randomized controlled trials
  - Which outcomes?
    - Number of falls
    - Number of injurious falls
    - Incident fractures
    - Hospitalizations
    - Institutionalizations
    - Changes in disability
    - Treatment harms

- Results: 62 RCTs (n = 35,058)
    - Multifactorial interventions (26 trials)
    - Exercise interventions (21 trials)
    - Vitamin D supplementation (7 trials)

Guirguis-Blake et al, JAMA 2018

Falls Prevention:
Updated US Preventive Services Task Force Report

- **Multifactorial interventions (**n = 15,506)
  - Initial comprehensive geriatric assessment or falls risk factor assessment
    - Balance, gait, vision, cardiovascular health (postural blood pressure, carotid sinus stimulation)
    - Medication
    - Environment (home hazards, personal needs)
    - Cognition and psychological health
  - Treatment interventions
    - Exercise (unsupervised or supervised, group or individual)
    - Psychological (cognitive behavioral therapy)
    - Nutrition therapy
    - Knowledge (pamphlets)
    - Medication management
    - Urinary incontinence management
    - Environmental modifications
    - Referral to PT/OT, social services, specialists (e.g. ophthalmology, neurology, cardiology)

Guirguis-Blake et al, JAMA 2018

Falls Prevention:
Updated US Preventive Services Task Force Report

- Multifactorial interventions – Do they work?
  - Reduced incidence of falls by 21%
  - But, no reduction observed in fall-related morbidity or mortality

Guirguis-Blake et al, JAMA 2018

Falls Prevention:
Updated US Preventive Services Task Force Report

- Exercise interventions (n = 7297)
  - Mean duration was about one year, and most common frequency was 3 exercise sessions per week
  - Exercise type
    - Gait, balance and functional training
    - Group as well as home-based individual exercises

Guirguis-Blake et al, JAMA 2018

Falls Prevention:
Updated US Preventive Services Task Force Report

- Exercise interventions – Do they work?
  - Reduced incidence of falls by 11%
  - Reduced injurious falls by 19%
  - No reduction in mortality

- Few of the trials reported fall-related fractures
  - Three that did (n = 2047) reported reduced fall related fractures
  - 5 trials reported reduced injurious falls
  - No reduction in mortality

Guirguis-Blake et al, JAMA 2018

Falls Prevention:
Updated US Preventive Services Task Force Report/VITAL Trial Results

- Vitamin D interventions (n = 33,402) – No benefit for fall prevention
  - Vitamin D3 (differing formulations)
    - 700 or 800 IU daily to 150,000 IU every 3 months, to 500,00 IU annually, versus calcitriol or 1-hydroxy cholecalciferol
  - No significant effect in reducing falls, even when conducting multiple sensitivity analyses, including excluding the one trial of 500,000 IU annually that demonstrated harm
  - Incident fractures and quality of life rarely reported

≠ **Fall Prevention**

Falls Prevention:

- **Extrinsic Modifiable Risk Factors**

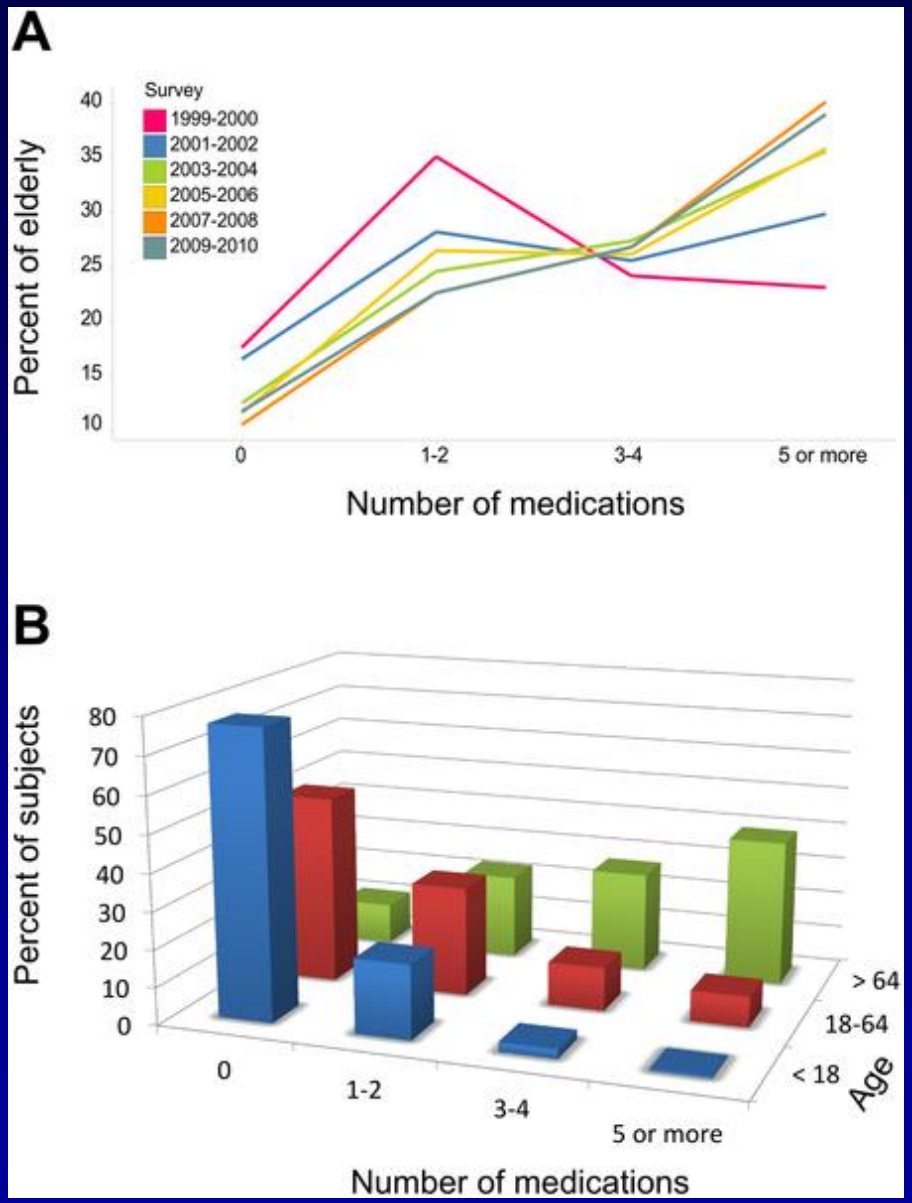
Extrinsic Risk Factors	Management
Home environmental hazards	**Ideally, PT/OT referral can assess home safety and make recommendations for safety improvement (e.g. grab bars in shower, reaching devices, adequate lighting)**
Footwear	Advise to wear well-fitting shoes with low heel height and high surface contact area

Falls Prevention:

- **Intrinsic Modifiable Risk Factors**

Risk Factors	Management
Vision	Check acuity and for cataracts, refer to ophthalmology if indicated; advise to avoid multifocal lenses while walking
Postural hypotension	Reduce medications, rule out dehydration, advise to change positions slowly, consider fludrocortisone if above 3 interventions don't work
Cardiovascular	Medical management, consider dual chamber cardiac pacing if carotid induced hypersensitivity >3 second pauses
Neurologic	Consider neuroimaging with MRI/CT, medical management as needed
Arthritis	Medical management, consider PT/OT referral, assistive devices as appropriate
Balance or gait impairment	**Referral to PT and/or OT for progressive strength, balance and gait training**
Psychoactive medications	**Eliminate or reduce dose of as many sedatives, antidepressants, anxiolytics, and antipsychotics as possible**
Other medications	**Eliminate or reduce dose of as many medications as possible, including: a) antihypertensives; b) antihistamines; c) anticonvulsants; and d) opioids**
Other medical conditions (cognitive impairment, depression, etc)	Medical management as indicated

Prescription Trends by Age & NHANES Survey Period



Sutherland JJ, et al. PLOS ONE (2015) Co-Prescription Trends in a Large Cohort of Subjects Predict Substantial Drug-Drug Interactions.

Falls Assessment & Prevention: Bottom Line Keeping it as simple as possible for FLS

- Ask if 2 or more falls occurred in the past year
  - If yes, then

- Employ the most effective interventions

Intervention	Physician	Coordinator
Medication reduction	X	
Physical therapy		X
Home Safety Modifications		X

Thinking about NNT (number needed to treat)

- First, to give some context:
  - Statin use to prevent one death over 1-6 years: NNT = 250, NNH = 197

Osteoporosis Medication			Fall Intervention			FLS Program
Alendronate	NNT = 16	NNH = 2,000	Exercise/PT	NNT = 9	NNH = 0	NNT = 20
Zolendronic acid	NNT = 15	NNH = n/s	Multifactorial intervention	NNT = 11	NNH = 0	
Denosumab	NNT = 21	NNH = 353	Medication review	NNT = 7*	NNH = n/a	
Teriparatide	NNT = 11	NNH = 33	Home hazards	NNT = 5	NNH = 0	
Abaloparatide	NNT = 28	NNH = n/s				
Raloxifene	NNT = 28	NNH = 250	Syncope Rx	NNT = 4	NNH= n/a	

*Result not statistically significant

Chou R et al, AHRQ 2016; Silva M, Clin Ther 2006; Holder K et al, Am Fam Physician 2008; Scott MA et al, Am Fam Phy 2013; Lewiecki EM et al, J Clin Dens 2014; Gillespie et al, Cochrane Database Syst Rev 2009; Nakayama et al Osteo International 2016

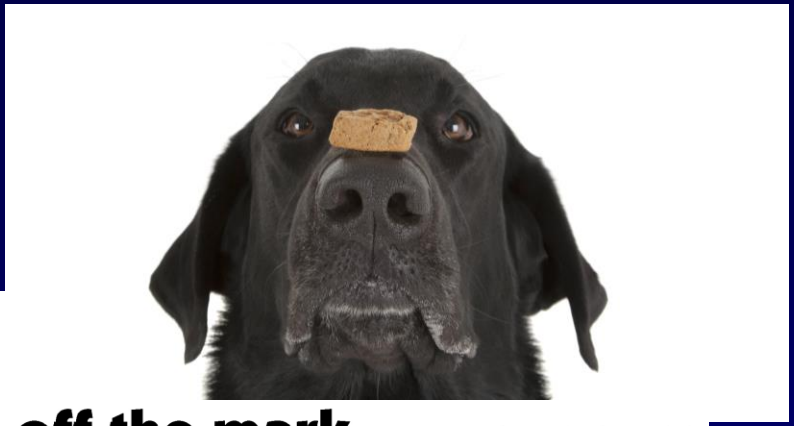
Concluding Remarks:
FLS in the Future – There is Hope

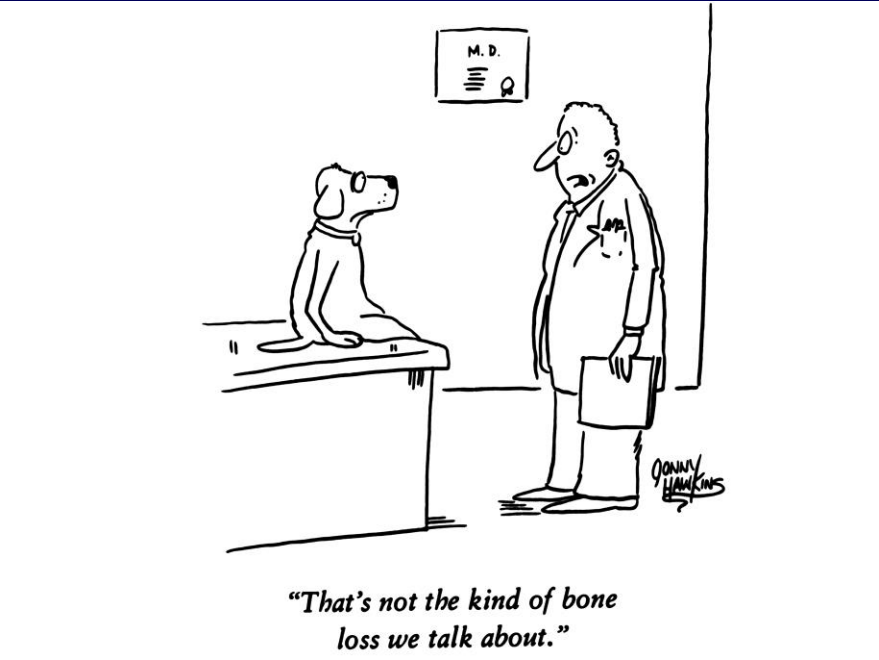
- Having a vision that is clear and achievable

- Bringing interested stakeholders together
  - –Patients
  - –Providers, multidisciplinary teams
  - –Health Policy experts
  - –Health Economists

- Key to this success of vision: **Flexibility in health care organizations to accommodate changes**

Questions?





"That's not the kind of bone loss we talk about."