Medical Considerations of the Geriatric Patient

- Hector J. Aguado, MD PhD
- Colin V. Crickard, MD

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Objectives

- Understand the medical standard of care to minimize the risk of mortality and complications based on co-management.
- Describe the steps to guide an effective preoperative optimization
- Implement the strategies to guide the post operative management and minimize the impact of the fracture on the patient, the family, the community and the economy.

The burden of Fragility fractures

In the 27 EU countries in 2019:

22.5 million women and 6.5 million men to have osteoporosis

4.24 million new fragility fractures: 827,000 hip fractures

663,000 vertebral fractures

637,000 forearm fractures

2,100,000 other fractures

$43,669 first year (Coronary S. $32,345)

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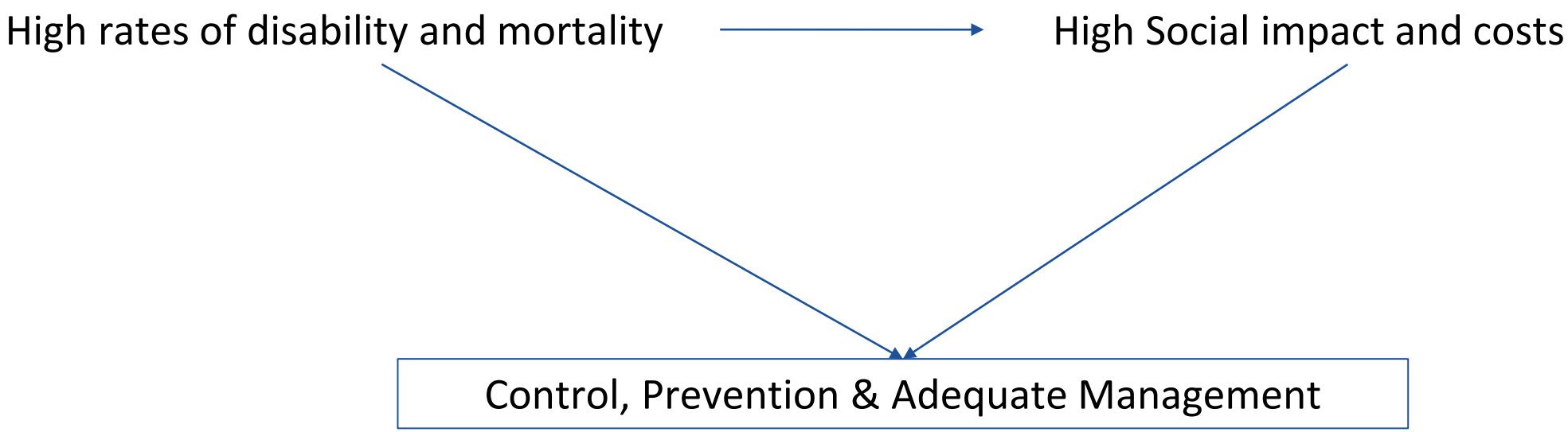
The burden of Fragility fractures



Initial Clinical Assessment

Initial clinical assessment

Objective: optimize patients to perform surgical treatment ASAP, and bring them back to their previous lifestyle

Don´t start studying diseases not related with the fracture, it will not increase survival and will lose time.

Initial clinical assessment

1- Clinical interview: Cause of fall (brain or cardiovascular event?), time on floor (creatinine levels)

2- Physical assessment: test to measure performance in activities of daily living (Katz index,...)

3- Cognitive assessment: Pfeiffer test for cognitive impairment screening.

Don´t misdiagnose cognitive impairment with delirium.

Initial clinical assessment

4- Social assessment: Place of residence, family support, social support, need of institutionalization after hospital

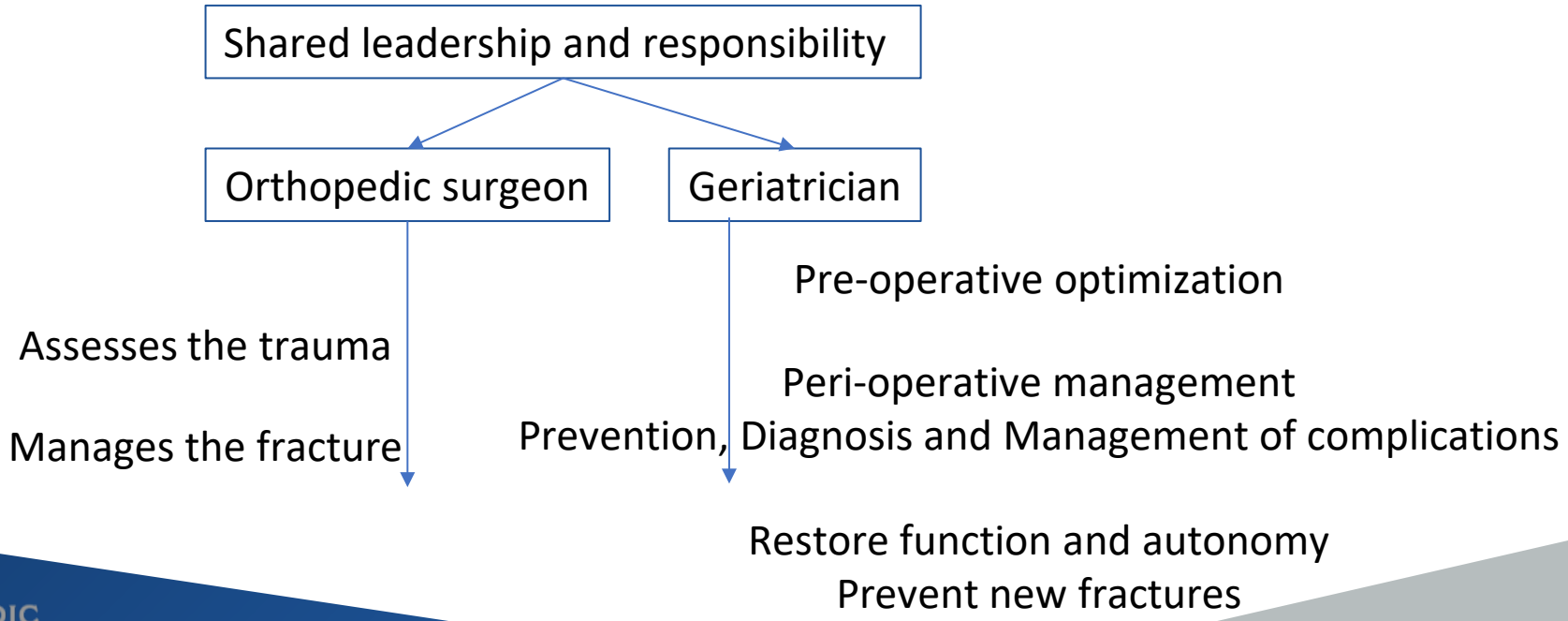
5- Clinical and geriatric syndromes assessment: Fall syndrome, immobility, risk of pressure ulcers, urinary or fecal incontinence, sarcopenia/fragility.

6- Basic exams: laboratory (hemogram, coagulation, renal function, ions), EKG, chest X-ray

Geriatric Co-management

Older patients with fractures sustain different degrees of Frailty

Frailty: syndrome that affects older person´s physiology → Need of Ortho-Geriatric co-management



Preoperative optimization

1. Anemia
2. Pain management
3. Delirium prevention
4. DVT Prophylaxis
5. Nutritional assessment
6. Sarcopenia status

Pre-operative optimization

Objective: Facilitate prompt surgical treatment and prevent complications

Who: Coordinated orthogeriatric/anesthetic care

How: Address all possible geriatric syndromes

Perioperative Anemia

90% of elderly patients going through trauma or orthopedic procedures:

Bleeding (fracture & surgery): a hip fracture bleeds 400-1600 ml, around 4 gr of hemoglobin
Inflammation blocks erythropoiesis
Low hematic levels in the elder

Perioperative Anemia

Poorer outcome if anemia at admission:

Underlying diseases such as malignancy
Chronic kidney disease
Poor nutrition

Transfusion on an individual basis, taking into account frailty, cardiorespiratory reserve and levels of function.

Perioperative Anemia Management

1- Transfusion	Each concentrate provides 200mg of iron, and should be prescribed by one unit Individualize in heart failure patients
2- Erythropoietin	30.000 IU in one dose and only Preoperative (72 hours to be effective) contraindication: severe carotid stenosis, recent DVT, unstable cardiac ischemia or uncontrolled HTN

Perioperative Anemia Management

3- Iron (venous)	1000mg carboximaltose (1 dose) or 200 mg/48h (3 doses) saccharose iron Only if ferritin levels are <350ng/ml
4- Iron (oral)	At hospital discharge, or 3 weeks after venous iron

Preoperative hemoglobin levels should be >10 gr/dl

Perioperative Anemia Management

Hemoglobin level + vital signs (HR, O2 levels, respiratory,...) + symptoms = individualize

<8-8.5 gr/dl	Transfusion: Hb can be higher if symptoms of anemia
8.5 – 10 gr/dl	1000mg carboximaltose (1 dose) or 200 mg /48h (3 doses) saccharose iron +/- Erythropoietin 30.000 IU

Perioperative Anemia Management

Hemoglobin level + vital signs (HR, O2 levels, respiratory,...) + symptoms = individualize

10 – 12 gr/dl	1000mg carboximaltose (1 dose) or 200 mg/48h (3 doses) saccharose iron
> 12 gr/dl	Oral iron at hospital discharge

Reducing red blood cell transfusion

Adverse events of red blood cell transfusion are more frequent in older patients.

Allogeneic blood transfusions can be avoided in most hemodynamically stable patients with hemoglobin concentrations of more than 70–80 g/L

Restrictive transfusion strategies did not increase or decrease the risk of 30-day mortality when compared with liberal transfusion strategies.

Reducing red blood cell transfusion

Evaluate the risk to benefit ratio in each older individual

Blood should be transfused more slowly and on a unit-by-unit basis.

Prevent perioperative bleeding:	Use of tranexamic acid e.v. Soft tissue care Reduce incisions; incise where needed

Pain Management

Importance of pain control:

- Improves patient´s comfort
- Decreases the risk of delirium
- Favors early mobilization
- Decreases medical complications
- Favors functional recovery
- Shortens hospital stay

Pain Management

Difficult to manage: aging, poly-medication and comorbidities alter pharmacokinetics of analgesic medication

Pre-op: provides comfort

Post-op: restores function

Pain Management: Assessment

Continuous pain evaluation:	Pain increases with mobilization The absence of pain at rest does not mean good pain control Before and after intervention to ensure effective management

Standardized analgesia protocols: ensure pain is properly assessed and appropriately treated

Pain Management: Assessment

Numeric Rating Scales (NRS): oral 0-10 scale, 10 “worst level of pain”

Visual Analogue Scales (VAS): visual line 0-10, 10 “worst level of pain”

Not useful in the geriatric patient:

Communication difficulties
Deafness, blindness
Cognitive impairment

Pain Medication: low or moderate pain

Paracetamol (acetaminophen): Well tolerated, with no interferences.
Hepatic disease or alcoholism maximun 2-3 gr/day

Metamizol: Antipyretic and anti-spasmodic effect
Increases the effect of anticoagulants

Pain Medication: low or moderate pain

Non-steroidal anti-inflammatory drugs, codeine and **tramadol**

Recommended: **Ibuprophen and aspirin**

Caution in renal dysfunction ~40%

Cardiac insufficiency or on antihypertensives

Increase risk of gastric irritation and bleeding

Pain Medication: severe pain

Opioid analgesics: buprenorphine, fentanyl and oxycodone may be preferable to morphine

Side effects: nausea, vomiting, confusion, sedation, and respiratory sedation
Slow metabolism in the geriatric population
Lowest possible dose
But try to avoid their used in older patients

Pain Management: Peripheral nerve block

- Effectively reduce pain: pre- and post-op
- Should be protocolized: administration by non-anesthetist health professionals
- Catheters: for delayed surgery cases; requires expertise

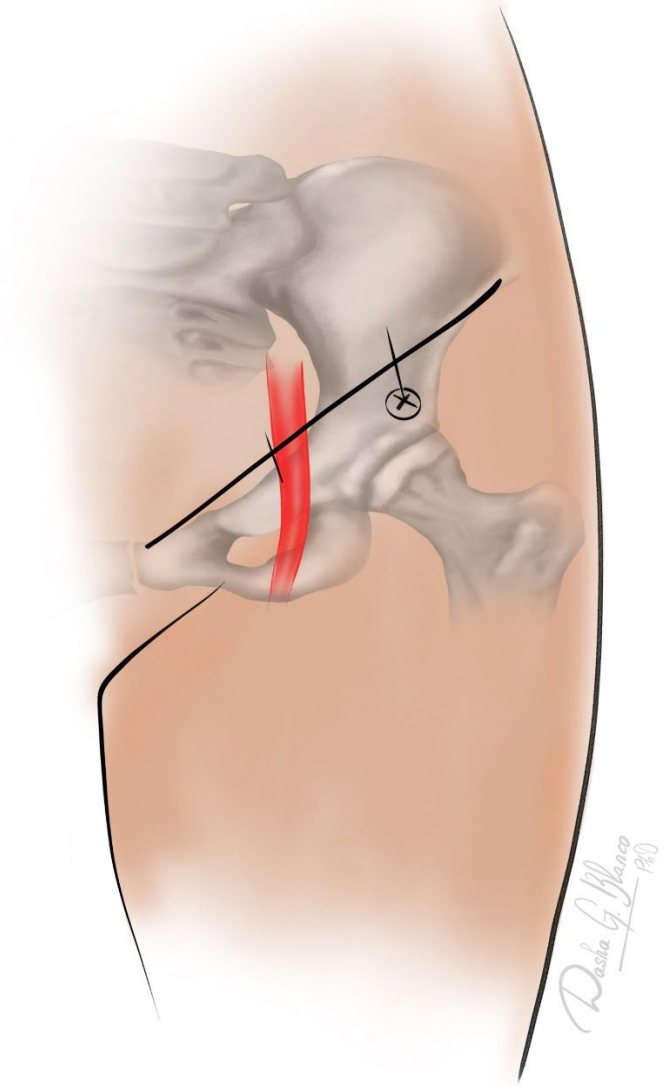


Image Credit: Dasha G. del Blanco, *"Peripheral nerve block"*.

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Pain Management: Peripheral nerve block

Femoral nerve block:	Ultrasound guided Impairs remobilization
Iliac fascia block:	No nerve stimulation nor ultrasound needed Allows early mobilization Line from antero-superior iliac spine to superior border of pubis Divide the line in three equal parts Locate the femoral artery in the medial segment Infiltration site 2 cm distal to mid and lateral segments junction

Delirium

Mental organic disorder in elderly patients within a hospitalization setting.

Acute alteration of the conscious level, attention level, and mental capacity.

Reversible, fluctuating throughout the day, with alterations of the sleep-wake cycle, psychomotor behavior and emotions.

Delirium

Medical complications x3

Hospital stay 33% longer

Higher mortality, functional impairment, and overall costs

Delirium: Risk factors

Fluid and electrolyte balance disorders

Anemia

Infection: Urine, respiratory,...

Sepsis

Fever

Acute pain

Hypoxia

Deep sedation while spinal anesthesia

Delirium: Risk factors

Medication (especially new treatments):
anticholinergics, benzodiazepines, corticosteroids, antiarrhythmics, antihistamines

Delirium: Prevention

1. Identify patients at high risk
2. Revise medication: anticolinergics, sedatives, opioids
3. Setting measures
4. Implement prevention ASAP: more effective
5. Recognize starting symptoms

Delirium: Prevention with setting measures

1. Organize accompaniment
2. Time orientation with a clock and calendar
3. Personal items (family photos) at sight
4. Help with meals and hydration
5. Reduce acoustic disturbance at night

Image Credit: Dasha G. del Blanco, *"Disoriented"*.

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Delirium: Prevention with setting measures

6. Dim light during the night
7. Avoid urinary catheters and e.v. medication if possible
8. Hearing help and glasses at hand
9. Early mobilization and upright position while in bed

+

Adequate pain control

Image Credit: Dasha G. del Blanco, *"Disoriented"*.

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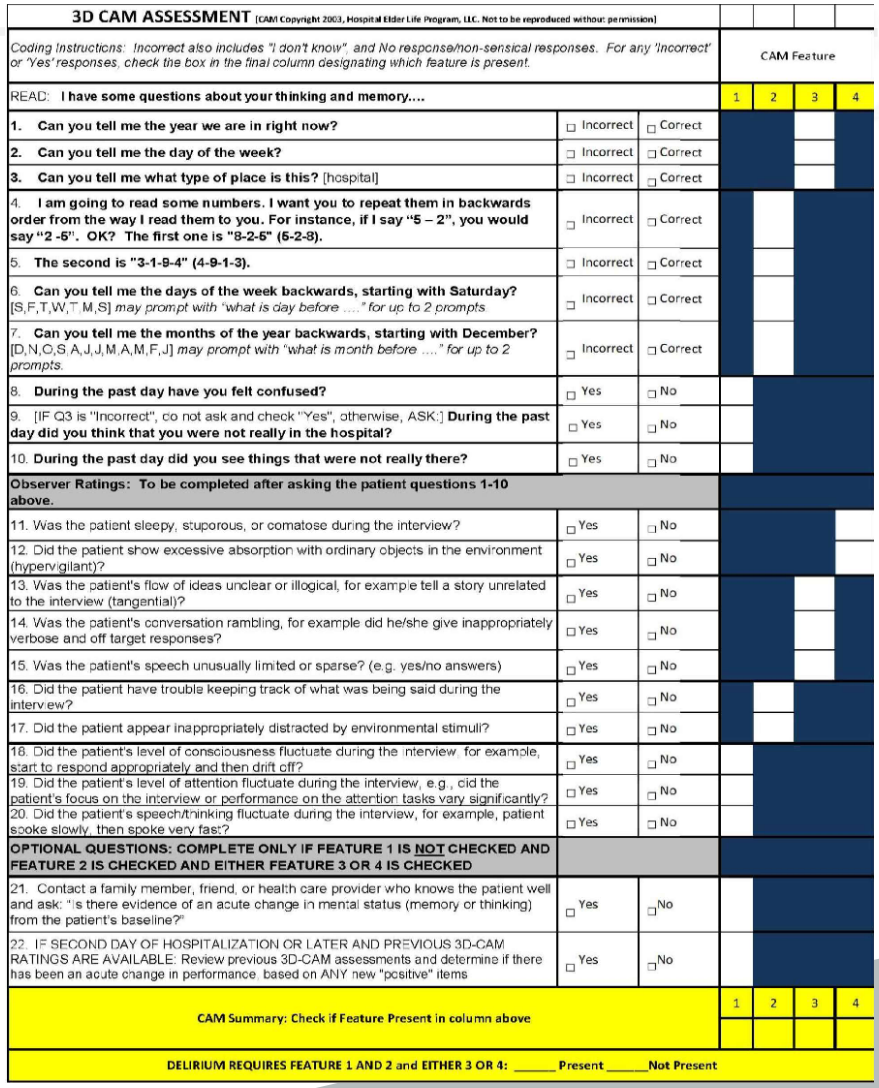
Delirium: Early detection CAM

Feature 1: Acute Onset or Fluctuating Course
Feature 2: Inattention
Feature 3: Disorganized thinking
Feature 4: Altered Level of consciousness

Diagnosis of delirium: requires the presence of features 1 and 2 and either 3 or 4.



3D CAM ASSESSMENT [CAM Copyright 2003, Hospital Elder Life Program, LLC. Not to be reproduced without permission]

Coding Instructions: Incorrect also includes "I don't know", and No response/non-sensical responses. For any 'Incorrect' or 'Yes' responses, check the box in the final column designating which feature is present.

			CAM Feature			
READ: **I have some questions about your thinking and memory....**			1	2	3	4
1. Can you tell me the year we are in right now?	☐ Incorrect	☐ Correct	■	■		■
2. Can you tell me the day of the week?	☐ Incorrect	☐ Correct	■	■		■
3. Can you tell me what type of place is this? [hospital]	☐ Incorrect	☐ Correct	■	■		■
4. **I am going to read some numbers. I want you to repeat them in backwards order from the way I read them to you. For instance, if I say "5 – 2", you would say "2 -5". OK? The first one is "8-2-5" (5-2-8).**	☐ Incorrect	☐ Correct	■		■	■
5. **The second is "3-1-9-4" (4-9-1-3).**	☐ Incorrect	☐ Correct	■	■	■	■
6. **Can you tell me the days of the week backwards, starting with Saturday?** [S,F,T,W,T,M,S] *may prompt with "what is day before ...." for up to 2 prompts*	☐ Incorrect	☐ Correct	■	■	■	■
7. **Can you tell me the months of the year backwards, starting with December?** [D,N,O,S,A,J,J,M,A,M,F,J] *may prompt with "what is month before ...." for up to 2 prompts.*	☐ Incorrect	☐ Correct	■	■	■	■
8. **During the past day have you felt confused?**	☐ Yes	☐ No		■	■	■
9. [IF Q3 is "Incorrect", do not ask and check "Yes", otherwise, ASK:] **During the past day did you think that you were not really in the hospital?**	☐ Yes	☐ No		■	■	■
10. **During the past day did you see things that were not really there?**	☐ Yes	☐ No		■	■	■
Observer Ratings: To be completed after asking the patient questions 1-10 above.			■	■	■	■
11. Was the patient sleepy, stuporous, or comatose during the interview?	☐ Yes	☐ No	■	■	■	
12. Did the patient show excessive absorption with ordinary objects in the environment (hypervigilant)?	☐ Yes	☐ No	■	■	■	
13. Was the patient's flow of ideas unclear or illogical, for example tell a story unrelated to the interview (tangential)?	☐ Yes	☐ No	■	■		■
14. Was the patient's conversation rambling, for example did he/she give inappropriately verbose and off target responses?	☐ Yes	☐ No	■	■		■
15. Was the patient's speech unusually limited or sparse? (e.g. yes/no answers)	☐ Yes	☐ No	■	■		■
16. Did the patient have trouble keeping track of what was being said during the interview?	☐ Yes	☐ No	■		■	■
17. Did the patient appear inappropriately distracted by environmental stimuli?	☐ Yes	☐ No	■		■	■
18. Did the patient's level of consciousness fluctuate during the interview, for example, start to respond appropriately and then drift off?	☐ Yes	☐ No		■	■	■
19. Did the patient's level of attention fluctuate during the interview, e.g., did the patient's focus on the interview or performance on the attention tasks vary significantly?	☐ Yes	☐ No		■	■	■
20. Did the patient's speech/thinking fluctuate during the interview, for example, patient spoke slowly, then spoke very fast?	☐ Yes	☐ No		■	■	■
OPTIONAL QUESTIONS: COMPLETE ONLY IF FEATURE 1 IS NOT CHECKED AND FEATURE 2 IS CHECKED AND EITHER FEATURE 3 OR 4 IS CHECKED			■	■	■	■
21. Contact a family member, friend, or health care provider who knows the patient well and ask: "Is there evidence of an acute change in mental status (memory or thinking) from the patient's baseline?"	☐ Yes	☐ No		■	■	■
22. IF SECOND DAY OF HOSPITALIZATION OR LATER AND PREVIOUS 3D-CAM RATINGS ARE AVAILABLE: Review previous 3D-CAM assessments and determine if there has been an acute change in performance, based on ANY new "positive" items	☐ Yes	☐ No		■	■	■
CAM Summary: Check if Feature Present in column above			1	2	3	4
DELIRIUM REQUIRES FEATURE 1 AND 2 and EITHER 3 OR 4: _____ Present _____Not Present						

Delirium: Management

1. Address potential risk factors predisposing to delirium
2. Medication: only if symptoms can make medical management difficult or are stressful for the patient

- Risperidone: 0,25-0,5 mg to 1 mg/4h p.o., effects in 30-45 min
- Haloperidol: half-life 24h, dose 1-2 mg each hour up to max 10 mg/day
- Ketiapine: 12.5 - 50 mg/4-12 h
- Benzodiacepines: if delirium induced by alcohol or sedatives deprivation

Deep venous thrombosis prophylaxis

- Mechanical
  - SCD
  - TED Hose
- Chemical
  - ASA
  - Heparin
  - LMWH
  - VKAs
  - DOACs

DVT Prophylaxis

- How to choose?
  - ASA
    - cheap, easy, effective
  - LMWH
    - Middle ground of cost, ? ease of use.
      Long history of efficacy
  - DOAC's
    - Pricey, easy to use, effective

DVT Prophylaxis

- Complications
  - Bleeding
    - GI
    - Brain
    - Surgical site
      - Drainage, infection concerns

Deep venous thrombosis prophylaxis

- Timing
- Preop
  - Stop? (already taking)
    - ASA/Plavix-No
    - LMWH-Maybe (12-24hrs preop)
    - DOAC-Yes (24-48hrs preop)
- Restart-POD#1
- Window-For DOAC's, VKA
- Bridge-No

Nutritional assessment and management

Malnutrition is frequently present in patients before a fragility fracture (48% in hip fractures)
Fragility fracture: High risk of perioperative malnutrition related to metabolic stress and reduced food intake

Malnutrition in fragility fractures, risk of:	Worse functional outcome Surgical complications Infections Pressure ulcers Longer hospital stay Mortality

Associates muscle wasting & reduced muscle power = Impaired mobility & Sarcopenia

Nutritional assessment

Clinical history & Physical assessment

Anorexia, hyporexia, oral health problems, dysphagia, 5% loss of weight in the previous month.
Mental disorders, tumors, and system´s insufficiency are related with malnutrition.

Diet history: What´s the patient eating regularly? Type of food, quantity, and frequency

Nutritional assessment

Under nutrition Screening: Mini-Nutritional Assessment (MNA)

Screening = 11 points or less, possible malnutrition, continue with assessment
Assessment + Screening = 23.5-17 patient at risk of malnutrition
< 17 malnourishment

Nutritional assessment: MNA (screening)

Screening

A **Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?**
0 = severe loss of appetite
1 = moderate loss of appetite
2 = no loss of appetite

B **Weight loss during last months**
0 = weight loss greater than 3 kg (6.6 lbs)
1 = does not know
2 = weight loss between 1 and 3 kg (2.2 and 6.6 lbs)
3 = no weight loss

C **Mobility**
0 = bed or chair bound
1 = able to get out of bed/chair but does not go out
2 = goes out

D **Has suffered psychological stress or acute disease in the past 3 months**
0 = yes 2 = no

E **Neuropsychological problems**
0 = severe dementia or depression
1 = mild dementia
2 = no psychological problems

F **Body Mass Index (BMI) (weight in kg)/(height in m)²**
0 = BMI less than 19
1 = BMI 19 to less than 21
2 = BMI 21 to less than 23
3 = BMI 23 or greater

Screening score (subtotal max. 14 points)
12 points or greater Normal – not at risk – no need to complete assessment
11 points or below Possible malnutrition – continue assessment

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Nutritional assessment: MNA (Assessment)

Assessment

G Lives independently (not in a nursing home or hospital)
0 = no 1 = yes ☐

H Takes more than 3 prescription drugs per day
0 = yes 1 = no ☐

I Pressure sores or skin ulcers
0 = yes 1 = no ☐

J How many full meals does the patient eat daily?
0 = 1 meal
1 = 2 meals
2 = 3 meals ☐

K Selected consumption markers for protein intake
- At least one serving of dairy products (milk, cheese, yoghurt) per day — yes ☐ no ☐
- Two or more servings of legumes or eggs per week — yes ☐ no ☐
- Meat, fish or poultry every day — yes ☐ no ☐

0.0 = if 0 or 1 yes
0.5 = if 2 yes
1.0 = if 3 yes ☐.☐

L Consumes two or more servings of fruit or vegetables per day?
0 = no 1 = yes ☐

M How much fluid (water, juice, coffee, tea, milk...) is consumed per day?
0.0 = less than 3 cups
0.5 = 3 to 5 cups
1.0 = more than 5 cups ☐.☐

N Mode of feeding
0 = unable to eat without assistance
1 = self-fed with some difficulty
2 = self-fed without any problem ☐

O Self view of nutritional status
0 = views self as being malnourished
1 = is uncertain of nutritional state
2 = views self as having no nutritional problem ☐

P In comparison with other people of the same age, how does the patient consider his / her health status?
0.0 = not as good
0.5 = does not know
1.0 = as good
2.0 = better ☐.☐

Q Mid-arm circumference (MAC) in cm
0.0 = MAC less than 21
0.5 = MAC 21 to 22
1.0 = MAC 22 or greater ☐.☐

R Calf circumference (CC) in cm
0 = CC less than 31
1 = CC 31 or greater ☐

Assessment (max. 16 points) ☐☐.☐
Screening score ☐☐.☐
Total Assessment (max. 30 points) ☐☐.☐

Malnutrition Indicator Score

24 to 30 points	☐	Normal nutritional status
17 to 23.5 points	☐	At risk of malnutrition
Less than 17 points	☐	Malnourished

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Nutritional management

Promotes early rehabilitation

To maintain nutritional status: 1 g protein and 30 calories of energy per kg bodyweight per day

Protein supplementation in commercial protein powder or beverages is safe and low-cost

Nutritional management

Feeding assistance

Family involved in mealtime assistance

Multiple small meals and snacks

Sarcopenia

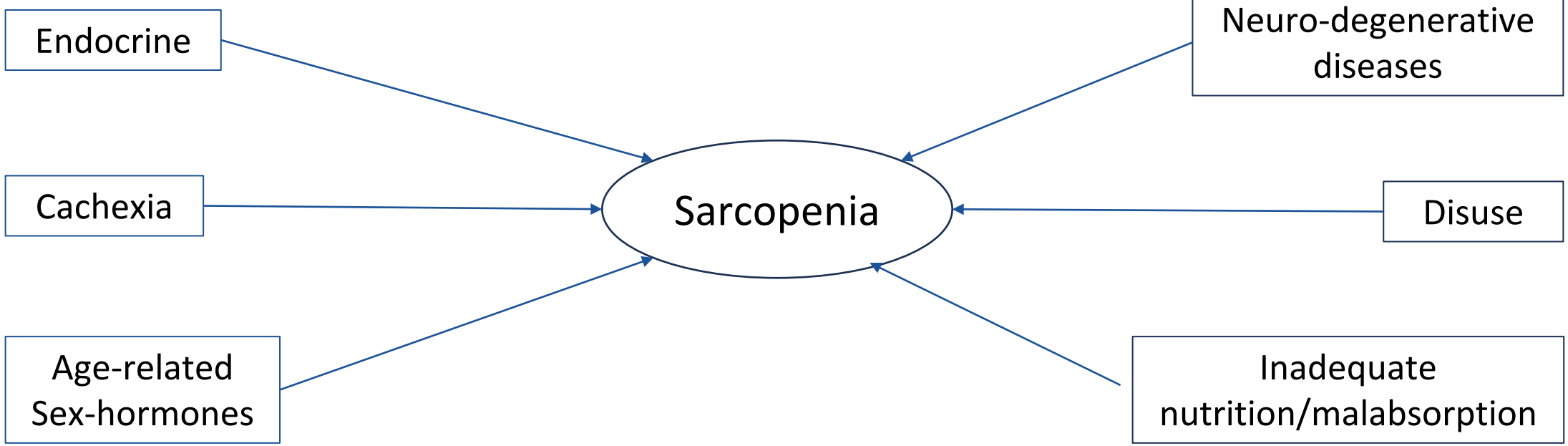
Motor-neurone loss: ↓ strength & ↓ muscle mass per motor unit
Function is more important than mass for physical performance

Epidemiology: 1-29% in the community and 14-33% in healthcare institutions

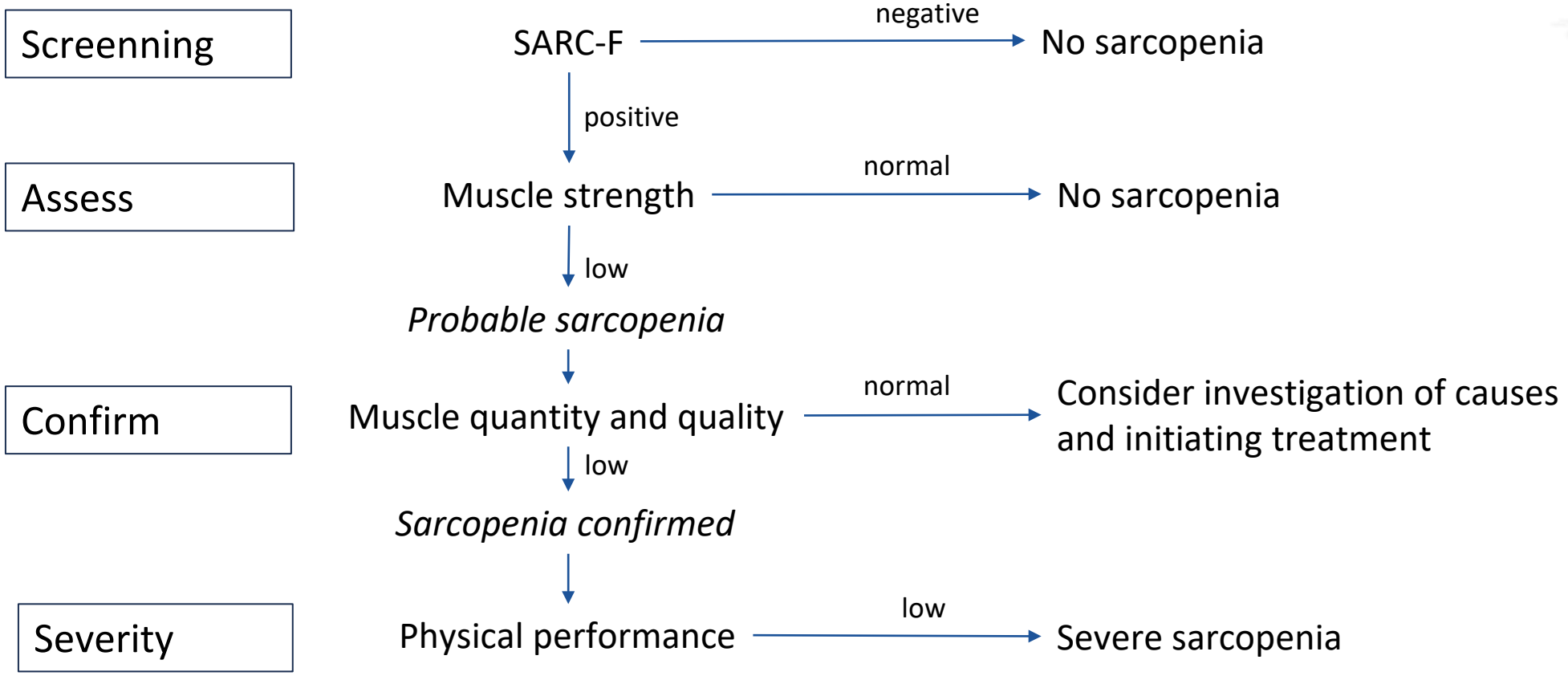
Influence on:
- Falls
- Fractures
- Recovery

Risk of falling more predictive of fracture than bone mineral density

Sarcopenia: factors



Sarcopenia: Assessment



Sarcopenia: management

Improves gait and balance, alertness, overall health and strength

Resistance Training:

- Moving your body against gravity
- Moving in the water, progressive resistance
- Pulling against resistance bands
- Weightlifting (small weights)

Sarcopenia: management

Fitness training: includes aerobics, endurance and resistance training components walking, yoga, swimming, hiking, jogging and cycling, fitness, tolerable intensity

Protein-rich food: nutritious and balanced diet, with sufficient protein and micro-nutrient daily intake. 1.2g of protein per day for each kg of body weight

Preoperative optimization - comorbidities

1. Antiplatelets and anticoagulant medication
2. Diabetes

Anti-platelets and anticoagulant medication

Local protocols: wide range in the number of days to stop anti-platelets and anticoagulants before surgery.

Waiting for consensus from the Anesthesiology societies

Limits open procedures and spinal anesthesia, but general anesthesia should be OK

Bone keeps bleeding, until fractures are fixed

Anti-platelets and anticoagulant medication

Warfarin is usually stopped five days before surgery.
Acenocoumarol is usually stopped three days before surgery.

INR	Reverses with
<1.5	Vitamin K

Apixaban, Rivaroxaban and Edoxaban: between one and three days

Dabigatran between one and four days

Diabetes

Often associated vascular damage with ischemia

Injuries below the knee are at increased risk of wound complications and vascular compromise

Images credit: Héctor J Aguado

Medical considerations in Anesthesia

Orthogeriatric anesthesia

- Echo indications
  - ACC
- Anesthetic Choice
- Comanagement

- ACC Guidelines->4 mets and no HF/VHD, no workup needed
- <4 mets and known HF/VHD and no eval in past 3-7m then needs new TTE
- 4 mets= Walking up stairs

Orthogeriatric anesthesia

- Spinal
- General
- Regional

- Spinal with less dementia
  - Technically challenging
- General-Ease of use

Orthogeriatric Anesthesia

- Comanagement is key
  - Geriatrician and anesthesia communication
  - Cardiology as needed

- Decreased time to OR
- Decreased LOS

Orthogeriatric anesthesia: Nerve blocks

Peripheral nerve blocks:	Iliac fascia block, femoral nerve or local anesthesia minimizes opioid co-administration
Before anesthesia:	Reduces pain when positioning laterally for spinal anesthesia
During anesthesia:	Reduces dose of subarachnoid opioids (reduces respiratory depression and urinary retention) Reduces maintenance doses of general anesthesia
Post-op analgesia:	Effective post-op analgesic control

Orthogeriatric anesthesia: Techniques

Spinal anesthesia	Unilateral blockade to a sensory level of T10-T12 Maximum 2h Beware of hypotension

Orthogeriatric anesthesia: Techniques

General anesthesia	Risk of hypotension and cardiovascular incidents Reduce dose with peripheral blocks Risk of mechanical ventilation or aspiration pneumonia

Orthogeriatric anesthesia: Techniques

Avoid Sedation:

Minimum dose to avoid post-op sedation
IV bolus for specific moments (hammering, cutting, relocation)
Propofol preferred for rapid metabolism

Post operative management

1. Osteoporosis
2. Early mobilization
3. Fall prevention

Osteoporotic management

- Identification is key
  - Screening
    - DEXA
  - Follow Up after fragility fracture
- Treatment
  - Multi Disciplinary team
    - Geriatrician

Treatment Options

- Nutrition
- Exercise
- Lifestyle changes
- Fall prevention
- Anti-osteoporosis medications

Must Break the Fragility Fracture Cycle

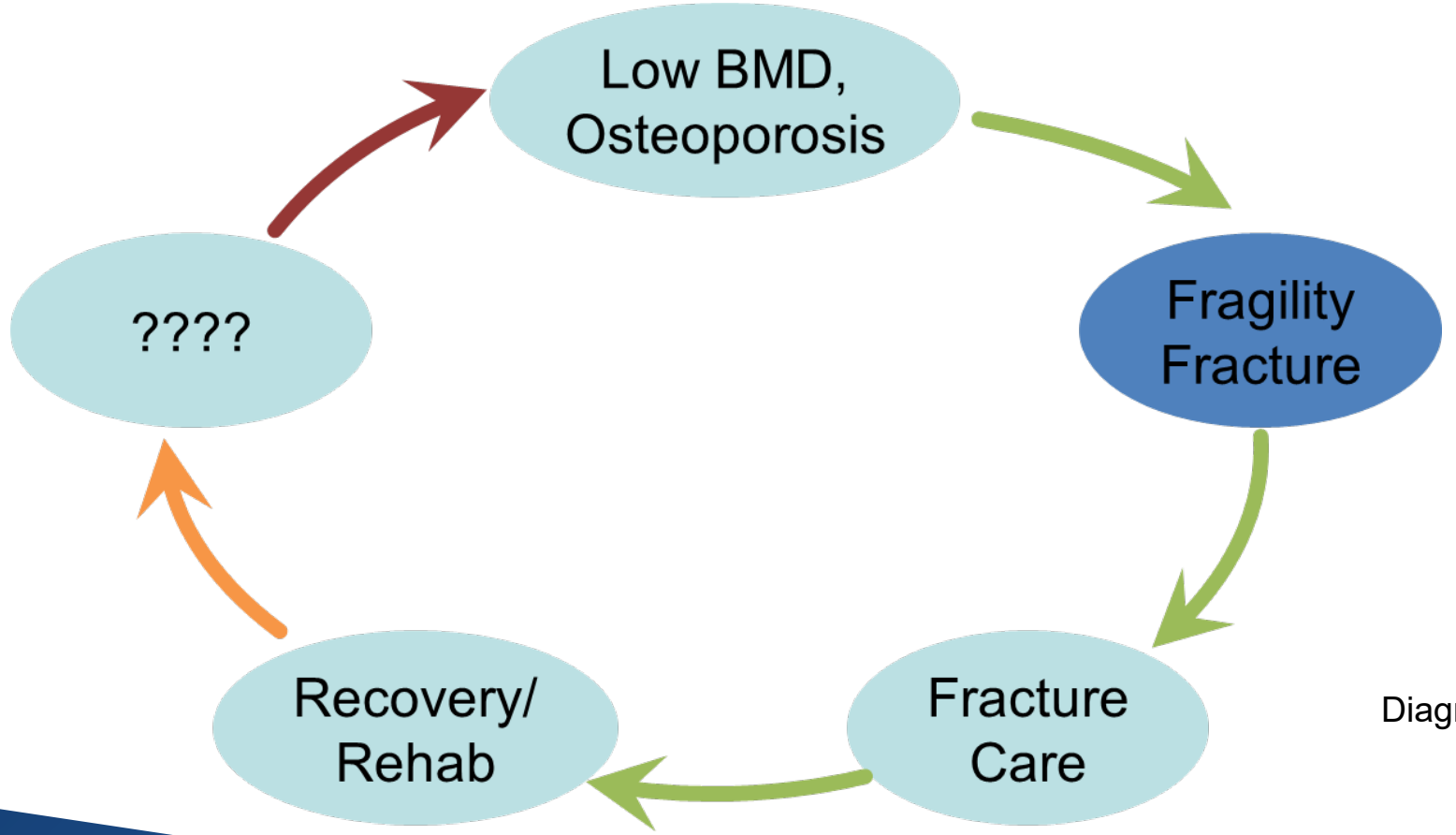


Diagram credit: Aaron Perdue

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Osteoporotic medication

- Antiresoptive medications
  - Bisphosphonates (oral and IV)
  - Selctive estrogen reuptake modulators (SERMs)
  - Calcitonin
- Anabolic medications
  - Parathyroid hormone analog (Teriparatide)
  - Parathyroid hormone related protein analog (Abolopaeratide)
  - Sclerostin Inhibitors (Romososumab)

Improving mobility after fracture

50% of older patients who were independent prior a hip fracture:

Don't recover their pre-fracture ability to walk and to remain autonomous

Objective: Return home and carry out usual activities to remain autonomous

Improving mobility after fracture

Strategies for long-term rehabilitation:

- Start in the acute phase and goes beyond
- Multidisciplinary teams
- Family involvement
- Motivation

Early mobilization after fracture

Patients should start mobilization no later than the day after surgery

Reduces length of hospital stay and complications:
thrombosis, pneumonia, respiratory failure, delirium and pressure sores.
Impacts on the long-term functional status
Improves the likelihood of achieving full ambulation recovery

Early mobilization after fracture

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Impacts on the long-term functional status
Improves the likelihood of achieving full ambulation recovery

Who? physiotherapist or nursing team and family

Essential condition: Stable surgical repair that allows to bear weight as tolerated (standard of care)

Fall prevention programs

50% of hip fracture patients visited ER in the year prior to fracture, a quarter of them for a previous fall

Psychological consequences:
- Fear, loss of confidence
- Self-restricted activity levels
- Reduction in physical function and social interactions
- Major strain on the family

Main cause of admission to a nursing home

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Image Credit: Dasha G. del Blanco, "*Fall*". Reproduced with permission from the artist.

Fall prevention programs

Falls and fractures are often preventable

Who is at risk of falling? Screening

Prevent and monitor falls with available programs

Fall prevention: who is at risk of falling?

Falls counseling after visiting ED, a fracture or a positive screening

Screening:
1- Have you fallen in the past year?
2- Do you feel unsteady when standing or walking?
3- Do you worry about falling?

3 “No´s” low risk
1 “Yes” Moderate or High risk of falling

+

- Timed up and go test (TUG) < 12csec
- One-leg stand < 5 sec
- Five chair-rising < 12 sec

Low risk: 3 “No´s” + 3 tests OK
High risk: 1 “Yes” + 1 test failed
Moderate risk: spectrum between low and high risk

Fall prevention: who is at risk of falling?

Short Physical Performance Battery (SPPB):

1- Sit-to-stand performance
2- Walking speed
3- Balance performance

Image Credit: Dasha G. del Blanco, *"Balance"*.

ORTHOPAEDIC TRAUMA ASSOCIATION

How can we prevent falls? Low risk

Education:

Medications should be regularly reviewed
Vitamin D supplements
Physical activities that improve balance ,lower limbs muscle strength (like Tai Chi) and confidence
Eyes check once a year
Check feet once a year
Home safety

How can we prevent falls? Low risk

Community exercise programs to maintain or improve balance and strength:

Tai-chi

Otago Exercise Program

Lifestyle-integrated

Functional Exercise

Falls Management Exercise programme

Ossebo program

NICE Guidelines

How can we prevent falls? Moderate & high risk

Education :

NICE guidelines recommend to implement measures to enhance “fall awareness”
Fall hazard intervention

Exercises supervised by a physiotherapist or in a community fall prevention program:

Challenging, progressive, regular exercise in the long term
Tai-chi, resisted exercises in the water

Image Credit: Dasha G. del Blanco, “*Tai-chi class*”.

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How can we prevent falls? Moderate & high risk

Modification of fall risk-increasing drugs:

- sedatives
- hypnotics
- antidepressants
- antipsychotic medications
- antiepileptics
- opioids

&

Foot problems

Vision optimization

Vit D Supplementation

Image Credit: Dasha G. del Blanco, "*Tai-chi class*".

Understanding the Geriatric patient

High rates of frailty; 25% are in their last year of life.

The patient and their next of kin: realistic understanding of which treatments may result in benefit

Functional systems are at their end stage. Organ failure can be expected after the overload stress of the fracture, anesthesia and the surgical treatment.

Understanding the Geriatric patient

Pre-operative assessment of patients with fragility fracture requires skill, time and effort.

Multi-disciplinary co-management is in the benefit of the patient

Surgery without delay is in their best interests: medical instability will progress poorly controlled pain and inability to sit upright

Take home message

- The standard of care to minimize the risk of mortality and complications in geriatric patients is based on co-management
- The preoperative optimization includes: Anemia, Pain management, Delirium prevention, DVT Prophylaxis, Nutritional assessment an Sarcopenia status
- The optimal postoperative management should implement: Osteoporosis management, early mobilization and fall prevention

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