A healthcare professional, seen from the back, is pushing a gurney with medical equipment in a hospital room. The professional is wearing blue scrubs and a white ID band. The gurney has three monitors and various medical devices. The room has a window in the background, and the overall lighting is soft and clinical.

Preventing Deadly Errors in Patients with Malignancy

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**ONE
LAST
TIME**



Minimize The Risk

High risk patients / complaints / situations
What are the “can’t miss” diagnoses?
What shouldn’t we be fooled by?

S

- What is the most **SERIOUS** thing this could be?

P

- What is the most **PROBABLE** thing this is?

I

- What is the most **INTERESTING** thing this could be, or...
- Could this be an **atypical or uncommon presentation of a common condition**?

T

- Are there any **TREATMENTS** needed right now,
- And what **TESTS** do I need to order?

The “STOPS”

Stop 1

- SPIT the differential diagnosis

Stop 2

- Anything not fit? Adjust your differential
- Need more info? Go back and get it
- Decide what you think might be wrong with the patient
- Order appropriate treatments and tests

Stop 3

- Review the response to treatments and test results
- Decide on a diagnosis
- Does everything fit? If not, reassess differential and diagnosis

Stop 4

- Determine the patient's disposition
- Challenge your decision
 - Why are you right? Could you be wrong? Possible condition in evolution?

WHAT

IF

?

!





Take a cognitive pause...
or two...

10 Deadliest Missed Emergencies

- Sepsis/neutropenic sepsis
 - Antibiotics ASAP (within 60 minutes)
- Pulmonary embolism
 - Low threshold to image
- Spinal cord compression
 - MRI emergently, steroids immediately

**What did
I miss?**

10 Deadliest Missed Emergencies

- Brain metastases / hemorrhage
 - Urgent CT/MRI
- Hypercalcemia
 - Aggressive IV fluids
- Tumor lysis syndrome
 - IV fluid early, check uric acid

**What did
I miss?**

10 Deadliest Missed Emergencies

- SVC syndrome
 - Urgent chest CT, vessel imaging
- Pericardial tamponade
 - Bedside ultrasound
- Malignant bowel obstruction
 - CT abdomen

What did I miss?

10 Deadliest Missed Emergencies

- Immunotherapy toxicity
 - Early steroids

**What did
I miss?**



Start with a cognitive
pause...

Initial Cognitive Pause

- Am I attributing the patient's symptoms to "the cancer" without proof?
 - Misses treatable conditions
 - PE
 - Sepsis
 - Spinal cord compression
 - Bowel obstruction
 - Intracranial mets or bleed
 - Tumor lysis syndrome
 - Assume new symptoms are NOT cancer-related until proven otherwise
- Early objective testing

Initial Cognitive Pause

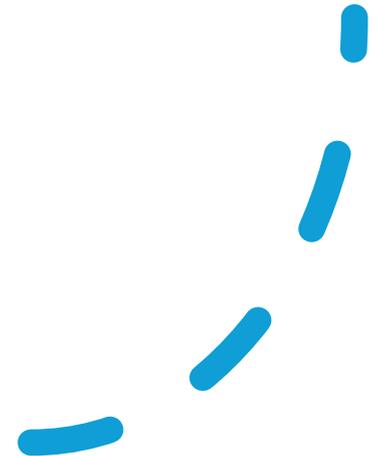
- Could this be a reversible oncologic emergency?
- Misses
 - Spinal cord compression
 - Back pain >> neuro findings
 - Neutropenic fever/sepsis
 - May not have a fever
 - Tumor lysis syndrome
 - Can be spontaneous or after chemo
 - Hypercalcemia of malignancy
 - Confusion, dehydration; short QT
 - Superior vena cava syndrome
 - Dyspnea, facial swelling, syncope

Initial Cognitive Pause

- Have I considered infection even if the patient doesn't have a fever?
 - Cancer patients may have a blunted fever response
 - Fever may be minimal or even absent
 - WBC may be “normal” but dysfunctional (leukemia)
 - Clues
 - Mild hypotension or tachycardia
 - Fatigue (do not attribute to cancer or its therapy)
 - Consider checking a lactate
 - Early antibiotics

Initial Cognitive Pause

- What would my diagnosis be if the patient did NOT have cancer?
 - Cancer patients may still have non-cancer emergencies

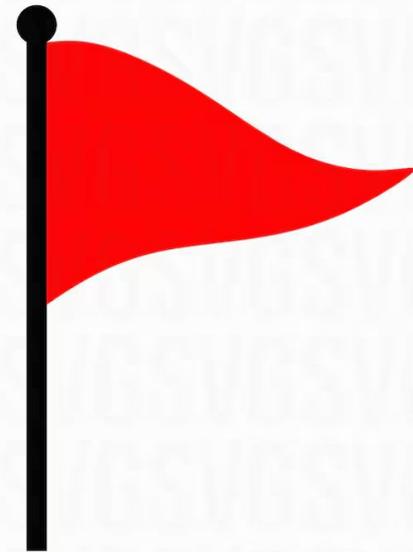


Initial Cognitive Pause

- Could this be related to the patient's cancer treatment?
 - Recent chemo
 - WBC nadirs at 7-10 days (neutropenia/sepsis risk)
 - Radiation
 - Pneumonitis, enteritis
 - Immunotherapy AT ANY TIME
 - Toxicity windows with these agents can be very long (weeks to months)
 - Myocarditis, pneumonitis, colitis, hypophysitis (adrenal crisis)
 - Early steroids may be life-saving

Red Flags

- Mild tachycardia in the immunocompromised patient
 - Borderline hypotension
 - Rising oxygen requirement or increasing respiratory rate
 - New confusion
-



Treat First
→
Call Later

- Cord compression → steroids now
- Neutropenic fever/suspected sepsis → antibiotics now
- Adrenal crisis → steroids now
- Tamponade → cardiology now, IV fluids, prepare for pericardiocentesis if necessary

is it safe?

Disposition Safety Check

- No unexplained tachycardia
- No untreated electrolyte abnormality
- No new neurologic deficit
- PE ruled out if dyspnea, tachycardia unexplained
- Oncology follow-up arranged

Common Deadly Errors

- “It’s just progression of the cancer”
- “It can’t be sepsis – they don’t have a fever”
- “They’re on palliative care anyway”
- Waiting for labs before antibiotics
- Not asking about recent chemotherapy
- Not realizing immunotherapy even months ago may have serious side effects
- Under-triage due to advanced cancer diagnosis



DANGER



You're getting WHAT for your cancer????

A moment about biologic agents for cancer

- The drugs are COMPLICATED, and they're changing all the time
- Their toxicity can be life-threatening
- Know that they can occur months after treatment
- Be familiar with the syndromes
- Low threshold to look them up and call the oncologist or other specialists



What do you need to know about them?

- ANY of the following could be immune-mediated:
 - Dyspnea
 - Diarrhea
 - Chest pain
 - Fatigue
 - Headache
 - → Low threshold steroids
 - → Early oncology and ICU consult





Take a second cognitive
pause...



“If the patient gets sicker or dies within the next 24 hours, what diagnosis will I wish I had ruled out?”





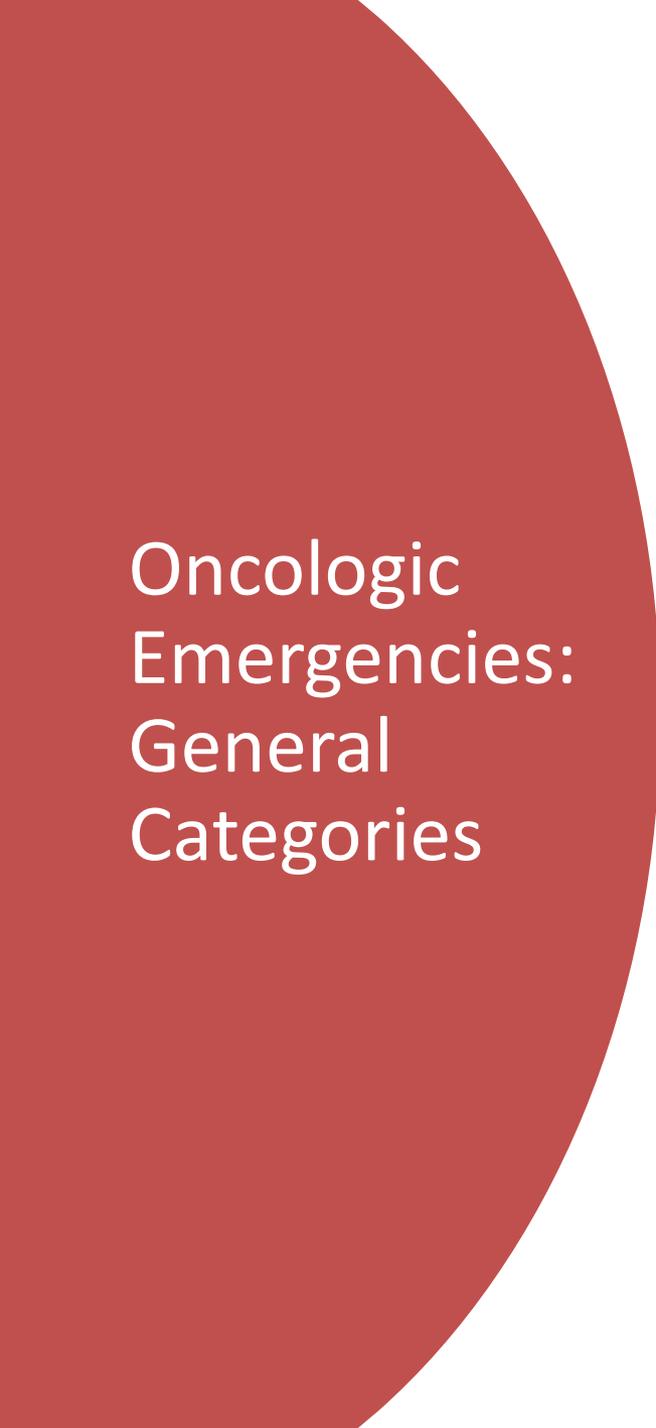
Oncologic Emergencies

A General Principle



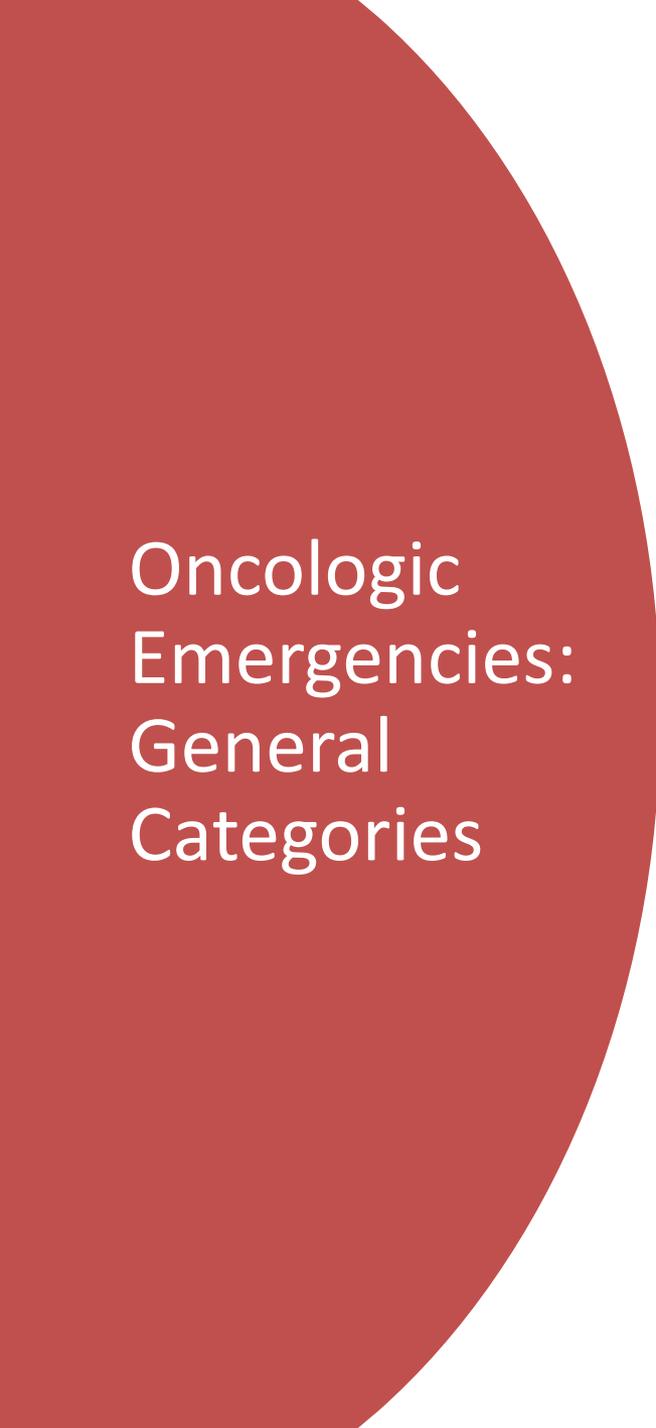
Oncologic Emergencies

- What causes oncologic emergencies?
 - Those resulting from the disease itself
 - Those resulting from cancer therapy
- Another way of looking at it
 - Emergencies that reflect progression of disease
 - Emergencies that, if recognized and fixed, may allow normal life span for the patient



Oncologic
Emergencies:
General
Categories

- Metabolic Emergencies
 - Hypercalcemia
 - Tumor Lysis Syndrome
 - Neurologic Emergencies
 - Malignant spinal cord compression
 - Brain metastases and increased ICP
 - Infectious Complications
 - Neutropenic fever
- 



Oncologic
Emergencies:
General
Categories

- Cardiovascular Emergencies
 - Malignant pericardial effusion
 - Superior vena cava syndrome
 - Superior vena cava syndrome
 - Hematologic Emergencies
 - Hyperviscosity due to dysproteinemia
 - Hyperleukocytosis and leukostasis
- 



“I’m Just So Tired”

“I’m Just So Tired”

- 48-year-old female with lymphoma receiving chemotherapy presents complaining of nausea, vomiting and extreme fatigue. No other complaints.
- PMH: None except lymphoma
- SH: Nonsmoker, nondrinker
- Meds: Ondansetron, ativan



“I’m Just So Tired”

- VS: T=98.6 HR 80 RR 18
110/80
- Normal habitus; looks fatigued, nontoxic
- Has left arm PICC line; looks good
- Total body exam normal except enlarged liver and spleen, palpable cervical and axillary nodes

- Do you need to know anything else?



“I’m Just So Tired”

- Patient states her temperature at home was 98.6
- Last chemo was one week ago
- What would you order in this patient?



“I’m Just So Tired”

- CXR negative
- UA negative
- Labs
 - Chem normal
 - Lactate normal
 - Hgb 10.7, Platelets 170
 - WBC 2.0, 5% PMNs, 90% lymphs, 5% monos
 - What is the ANC?
 - $2000 \times 5\% = 100$



“I’m Just So Tired”

- What do you do now?
 - a) Call Oncology
 - b) Admit for neutropenia
 - c) Pan culture
 - d) Obtain advanced imaging
 - e) Administer neupogen
 - f) Send patient home



G E T

OUTTA

HERE!!!



“I’m Just So Tired”

- Nadir of WBC is 7-10 days post chemo
- Myelosuppression is normal and expected
- Cultures expensive and unnecessary
- If she feels better post IVFs, send home
- Keeping her in ED increases her chance of infection
- Call to oncology is a courtesy only
- Return for fever



“I’m Just So Tired”

- The patient returns the next day because her temperature at home was 101.1
- Now what do you do?



“I’m Just So Tired”

- Strict hand hygiene
 - **Actually WASH your hands!**
- Standard barrier precautions
 - Appropriate use of gloves, gowns, and masks when indicated by clinical circumstances
- Single-patient rooms when available



“I’m Just So Tired”

- Complete exam
- CBC, Chem, UA, lactate
- Blood cultures x 2
 - One through her PICC line
- Urine culture if symptomatic or UA+*
- CXR if symptomatic*
- And...



“I’m Just So Tired”

- Antibiotics within 1 hour of triage
 - Cefepime 2 g IV every 8 hours
 - Meropenem 1-2 g IV every 8 hours (or 500 mg IV every 6 hours)
 - Piperacillin-tazobactam 4.5 g IV every 6 hours
 - Imipenem/cilastatin 500 mg IV every 6 hours



“I’m Just So Tired”

- Vancomycin should be added for
 - Hemodynamically unstable patients
 - Suspected catheter-related infection or skin/soft tissue infection
 - Known colonization with methicillin-resistant *Staphylococcus aureus* (MRSA)
 - Severe mucositis
- ADMIT or CONSULT





“I hurt my back playing with my kids in the park.”



“My back hurts...”

- 37-year-old woman treated for breast cancer 5 years ago with negative surveillance on follow up presents with mid- and low back pain after pulling her children in a wagon all day at the park. Pain improved with ibuprofen. No other complaints.
- PMH: Otherwise normal



“My back hurts...”

- VS normal
- Exam normal except paravertebral TTP lower thoracic and lumbar spine
- What would you do?
- Patient reassured, sent home with prn ibuprofen



“My back hurts...”

- Returns two days later presents to PMD for follow up with worsening pain
- No neurologic complaints
- Exam unchanged except perhaps a bit more TTP midline
- What would you do now?
- Sent home again with same instructions



“My back hurts...”

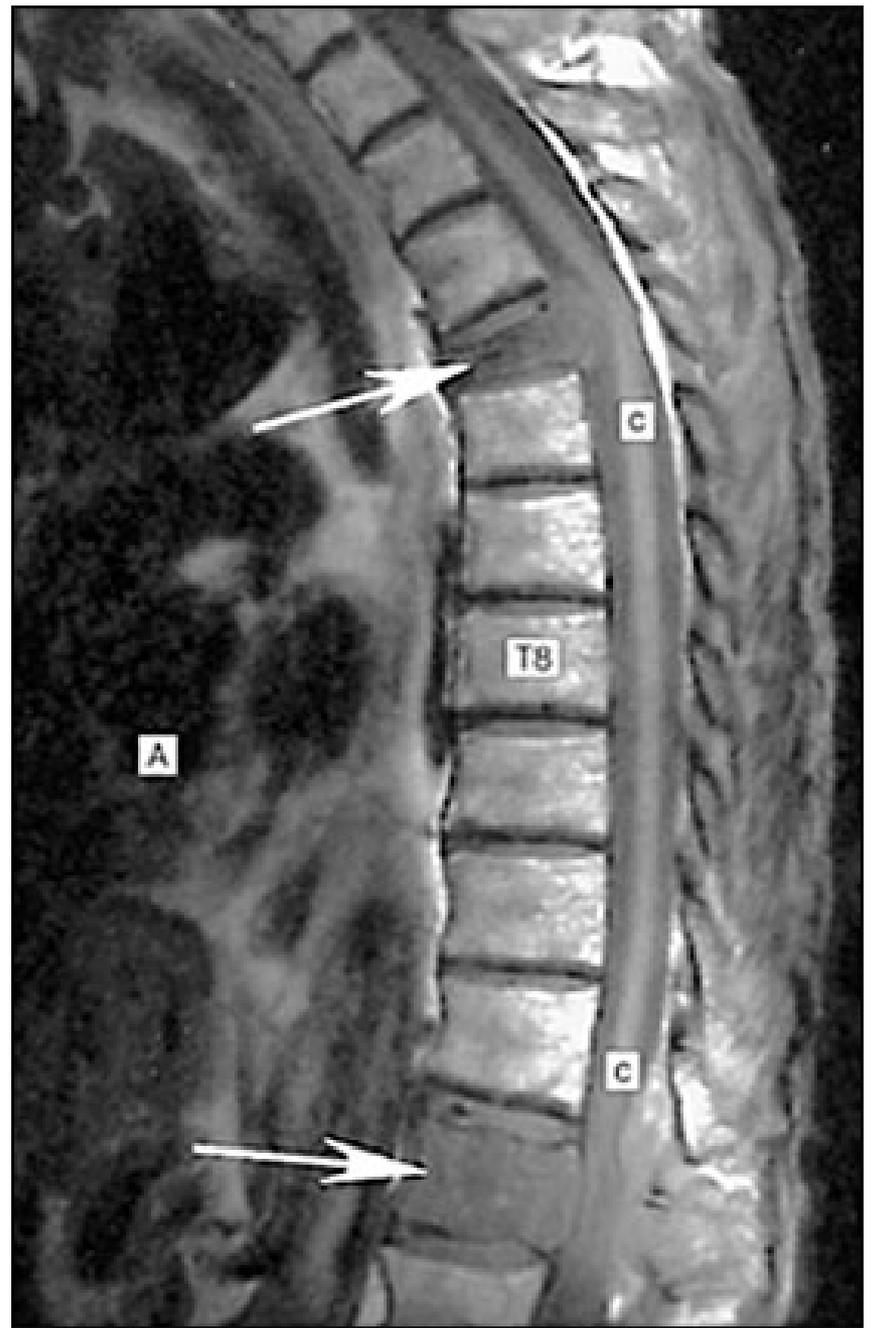
- 3 days later patient is brought to ED because of inability to get out of a chair and urinary and fecal incontinence. Back pain significantly worse.
- VS WNL
- Exam reveals no rectal tone, decreased sensation T10 level down, 2/5 strength bilateral lower extremities



“My back hurts...”

- What tests do you order now?
- Do you give her any treatment?





Oncologic
Emergencies
Spinal Cord
Compression

- Presentation
 - 90% have back pain
 - 80% have preceding diagnosis of malignancy
 - May have several simultaneous lesions
- **BACK PAIN + MALIGNANCY = SCC!!**

A large red circular graphic on the left side of the slide, partially cut off by the edge.

Oncologic
Emergencies
Spinal Cord
Compression

- Presentation
 - Symptoms
 - Radicular pain
 - Motor weakness
 - Gait disturbance
 - Bowel or bladder dysfunction
 - Imperative to try to diagnose before neurologic dysfunction occurs
- 
- A decorative purple dashed line in the bottom right corner of the slide.

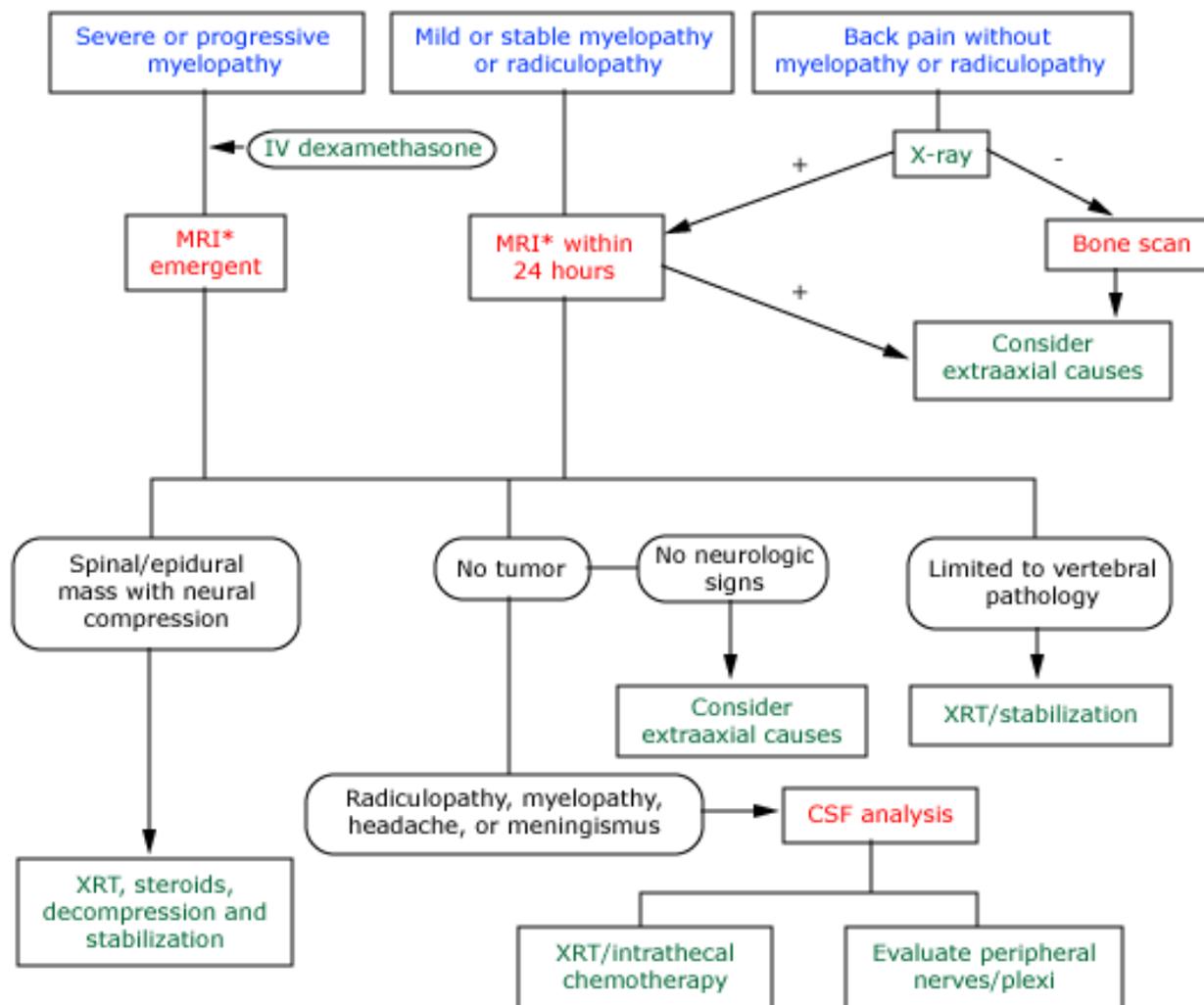
Oncologic
Emergencies
Spinal Cord
Compression

- Evaluation
 - MRI is imaging study of choice
 - Consider imaging entire spine (+/- C spine)
 - CT myelography second choice
 - Plain films / nuclear medicine poor choices
 - Limited sensitivity and specificity
 - Plain films may show bony lesions
 - Negative plain films do NOT rule out SCC

Oncologic
Emergencies
Spinal Cord
Compression

- Treatment
 - Start as soon as possible; need tissue diagnosis
 - Glucocorticoids
 - Dexamethasone 10-16 mg IV, then 4 mg every 6 hours
 - Radiation
 - Mainstay of therapy (?)
 - Surgery may also be indicated (or preferable)

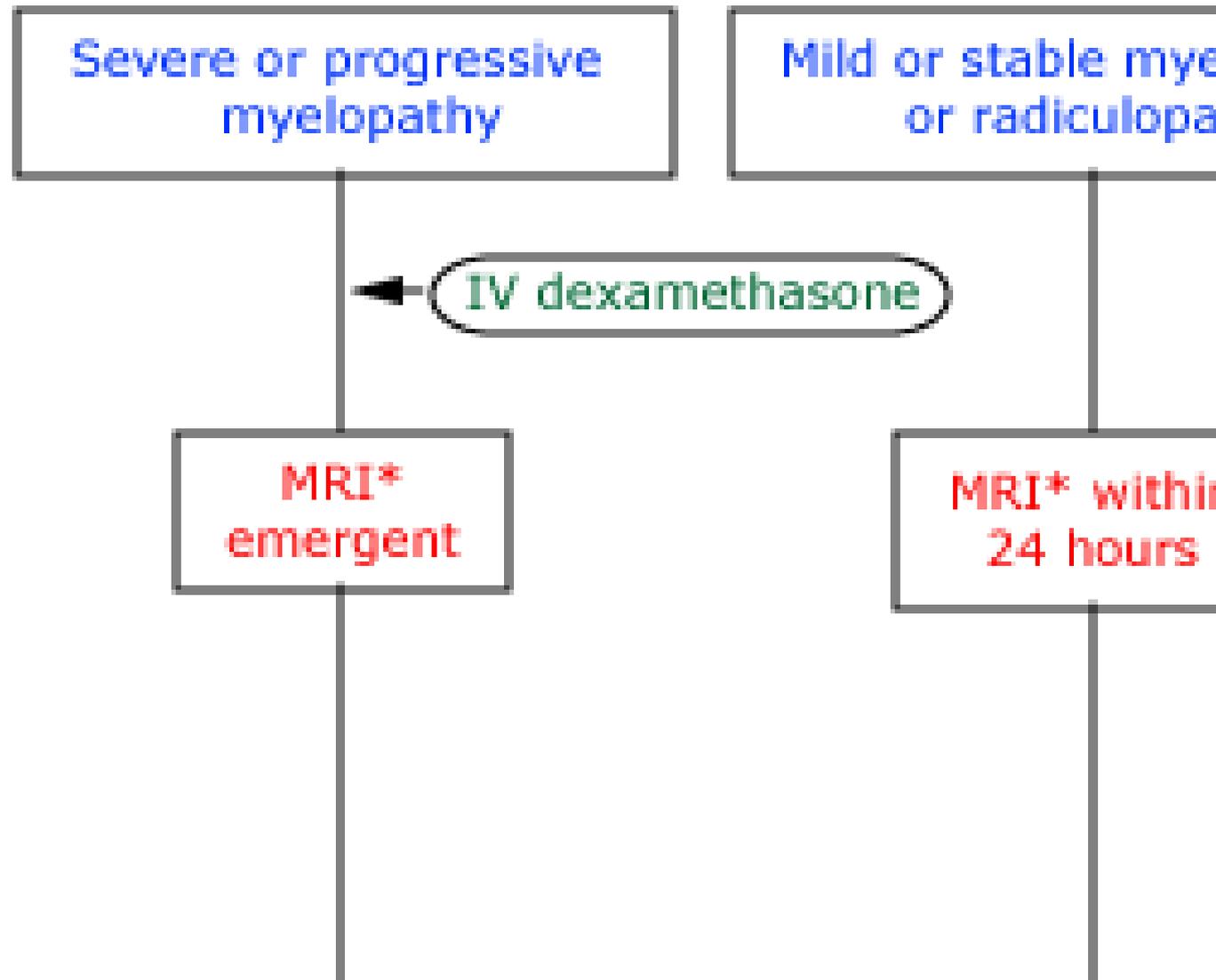
Diagnostic approach to back pain in patients with cancer



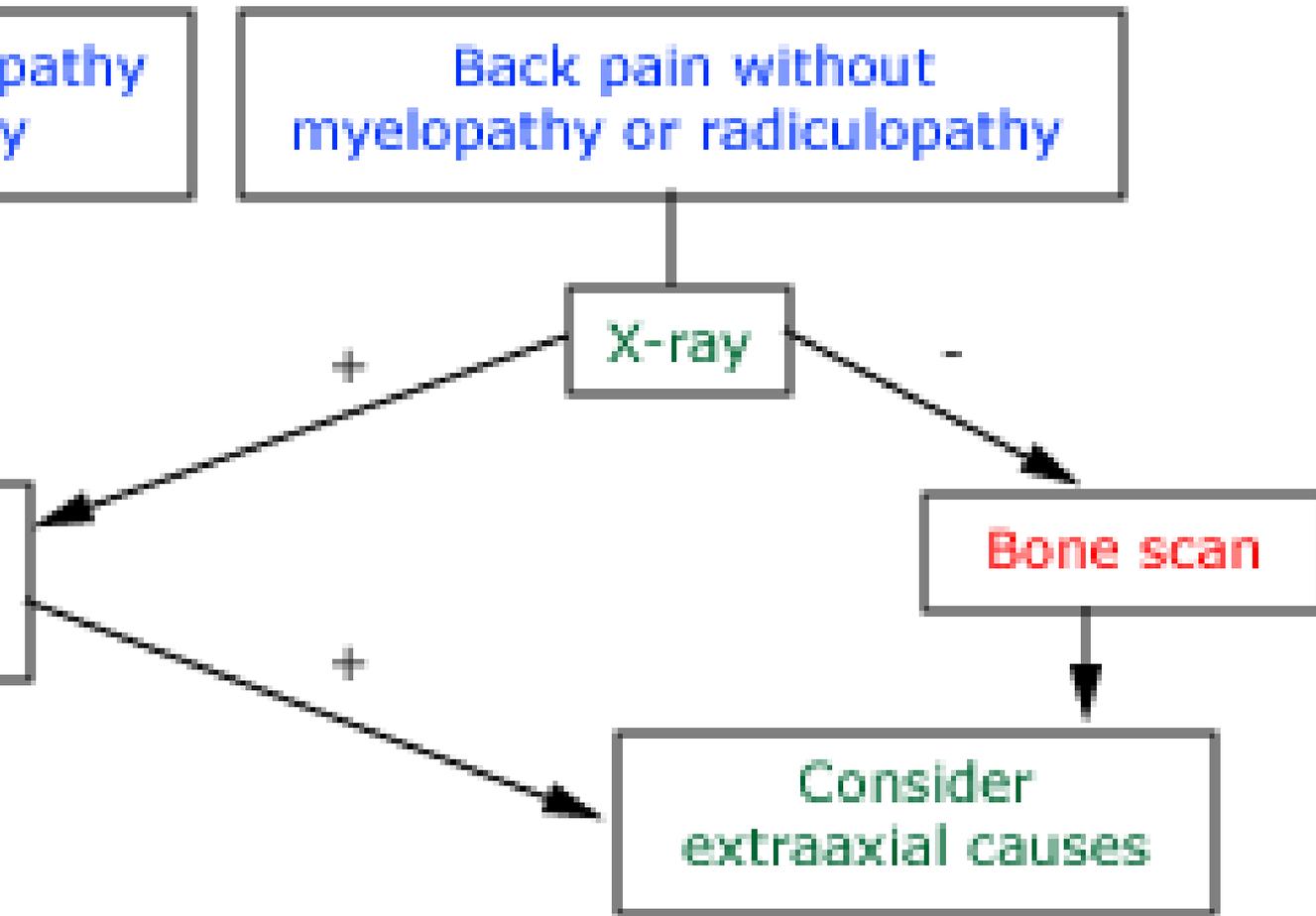
XRT: radiation therapy.

* Combined CT and myelogram may be used in place of MRI if MRI is unavailable or contraindicated.

Diagnostic approach to back pain in



patients with cancer

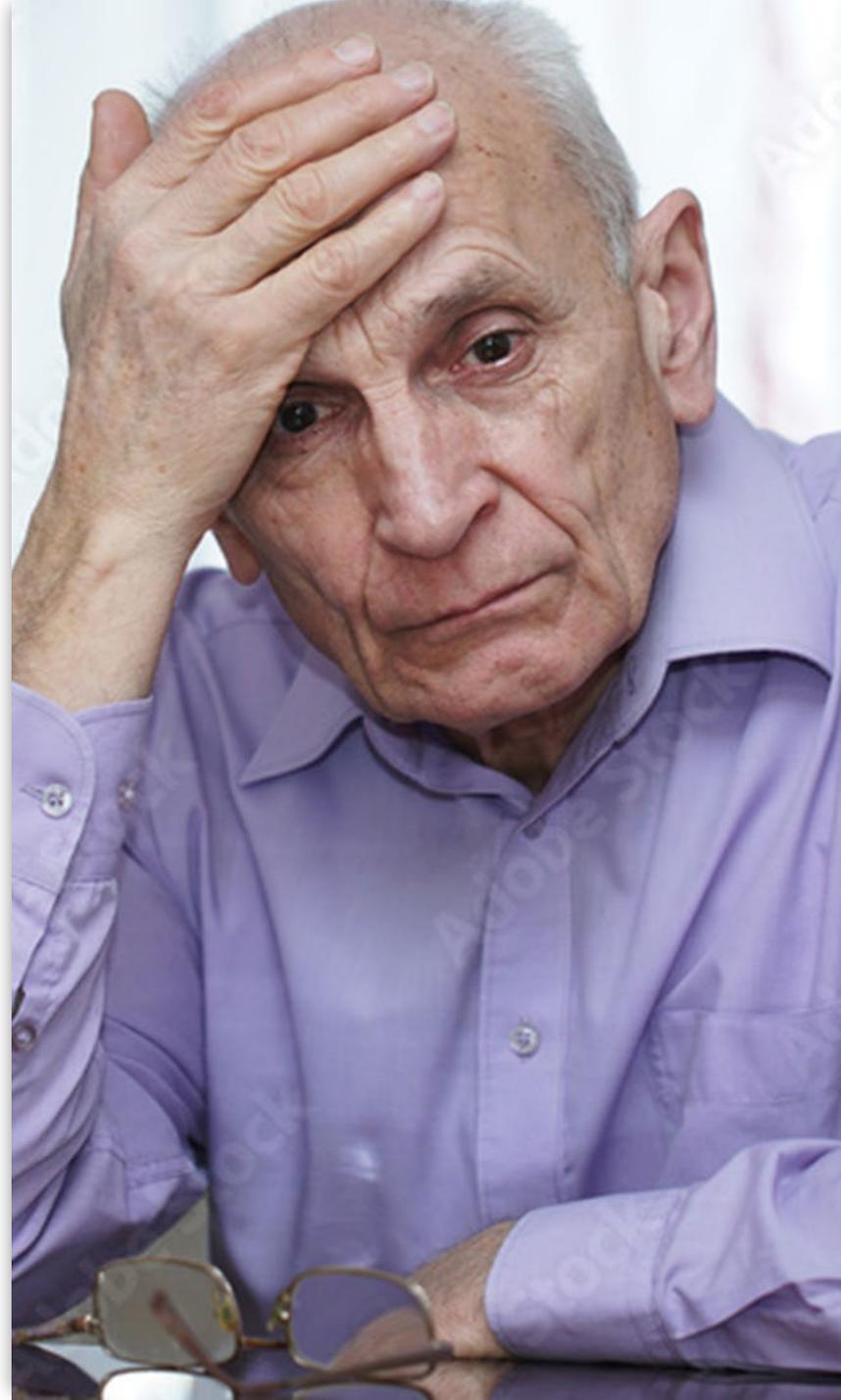




“I think he’s a little confused.”

“He’s confused...”

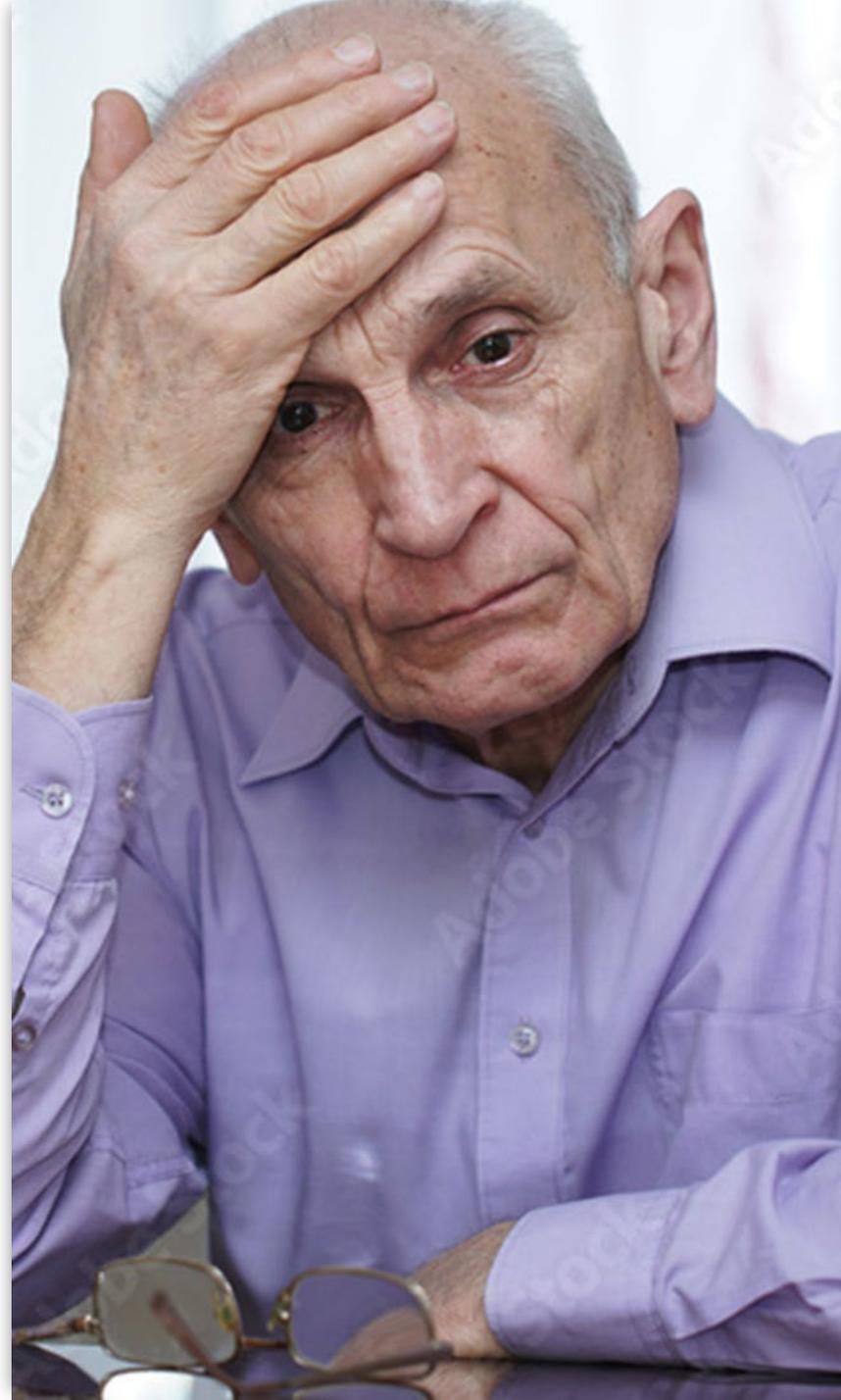
- 72-year-old male with non-small cell lung cancer presents confused. No other complaints except fatigue.
- PMH: Lung cancer with bony mets (femur); HTN, CAD
- PSH: Smoker, social drinker
- All: NKDA



“He’s confused...”

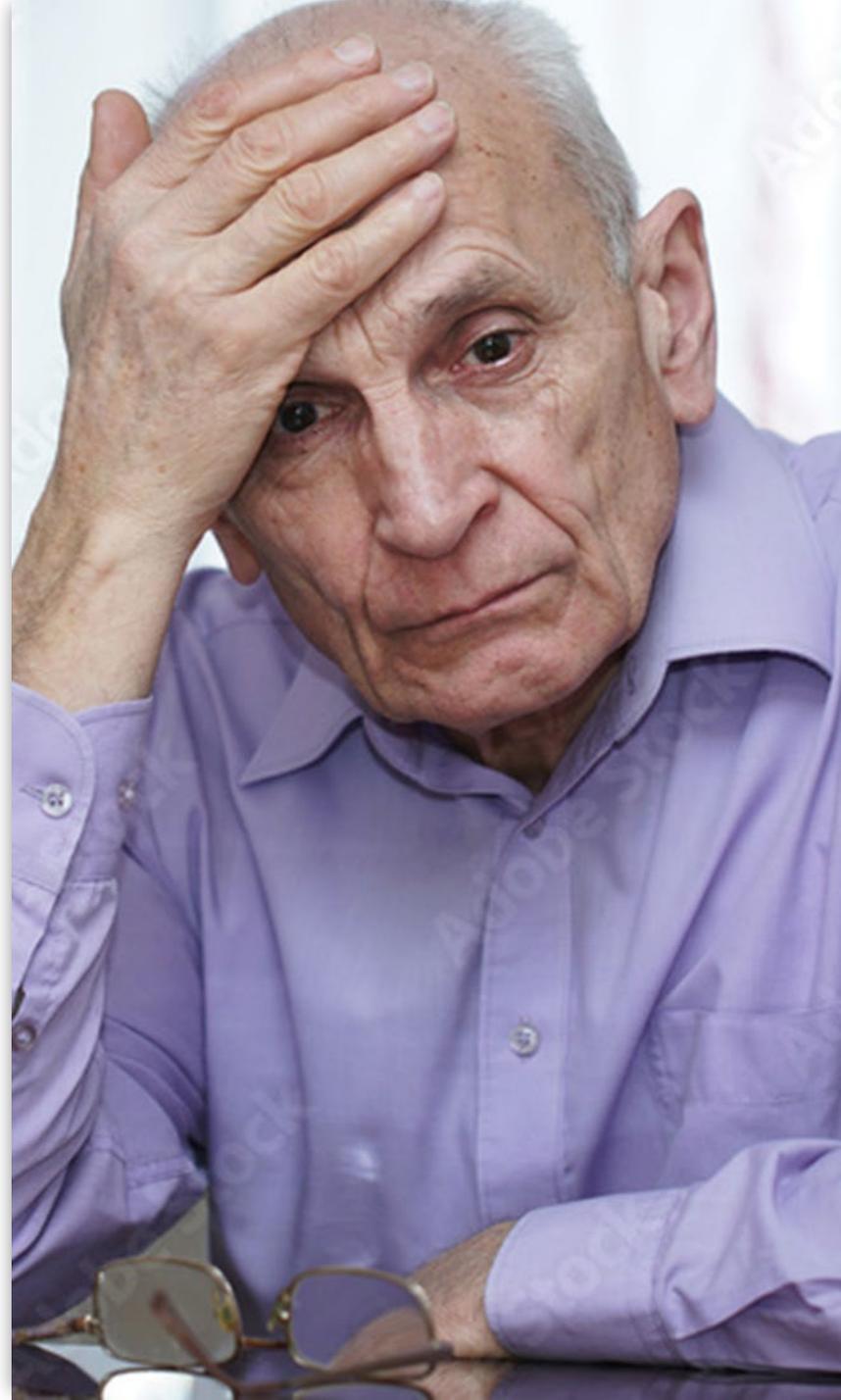
- VS WNL- afebrile
- Thin, comfortable appearing 72 y/o male
- Exam normal except difficulty remembering 3 items at 5 minutes
- Neuro exam nonfocal

- What is your differential diagnosis?
- What are the two most important tests?



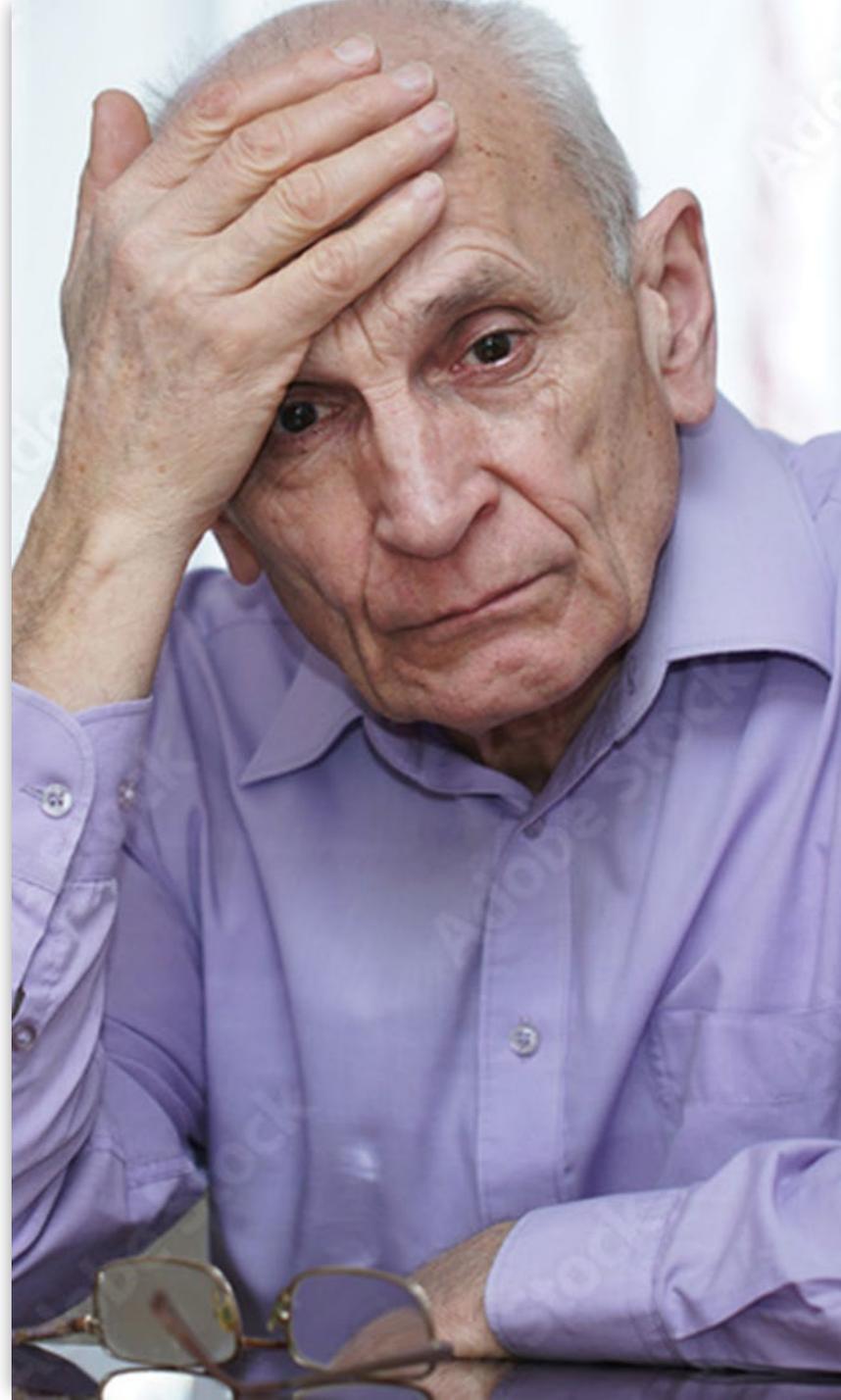
“He’s confused...”

- Head CT negative
- Labs all normal except calcium of 15.9
- What do you do now?



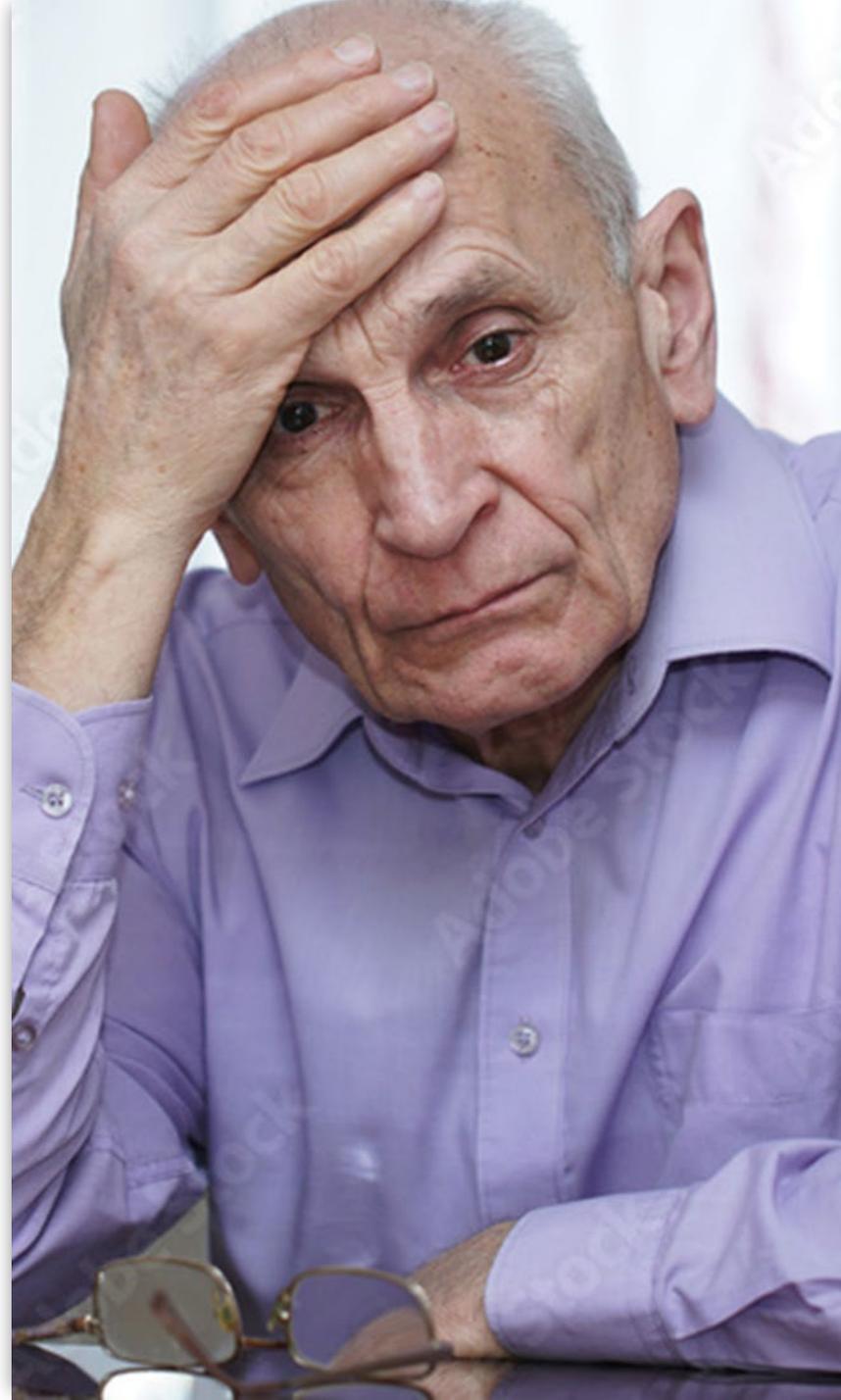
“He’s confused...”

- Occurs in 10-30% of cancer patients
- Usually seen in patients with known cancer
- Carries a poor prognosis
- Most commonly seen in
 - Breast cancer
 - Lung cancer
 - Multiple myeloma
- 3 types
 - Humoral hypercalcemia of malignancy
 - Via PTHrP (parathyroid related hormone)
 - Most common mechanism (33-88%)
 - Local bone destruction
 - Tumor production of vitamin D analogues



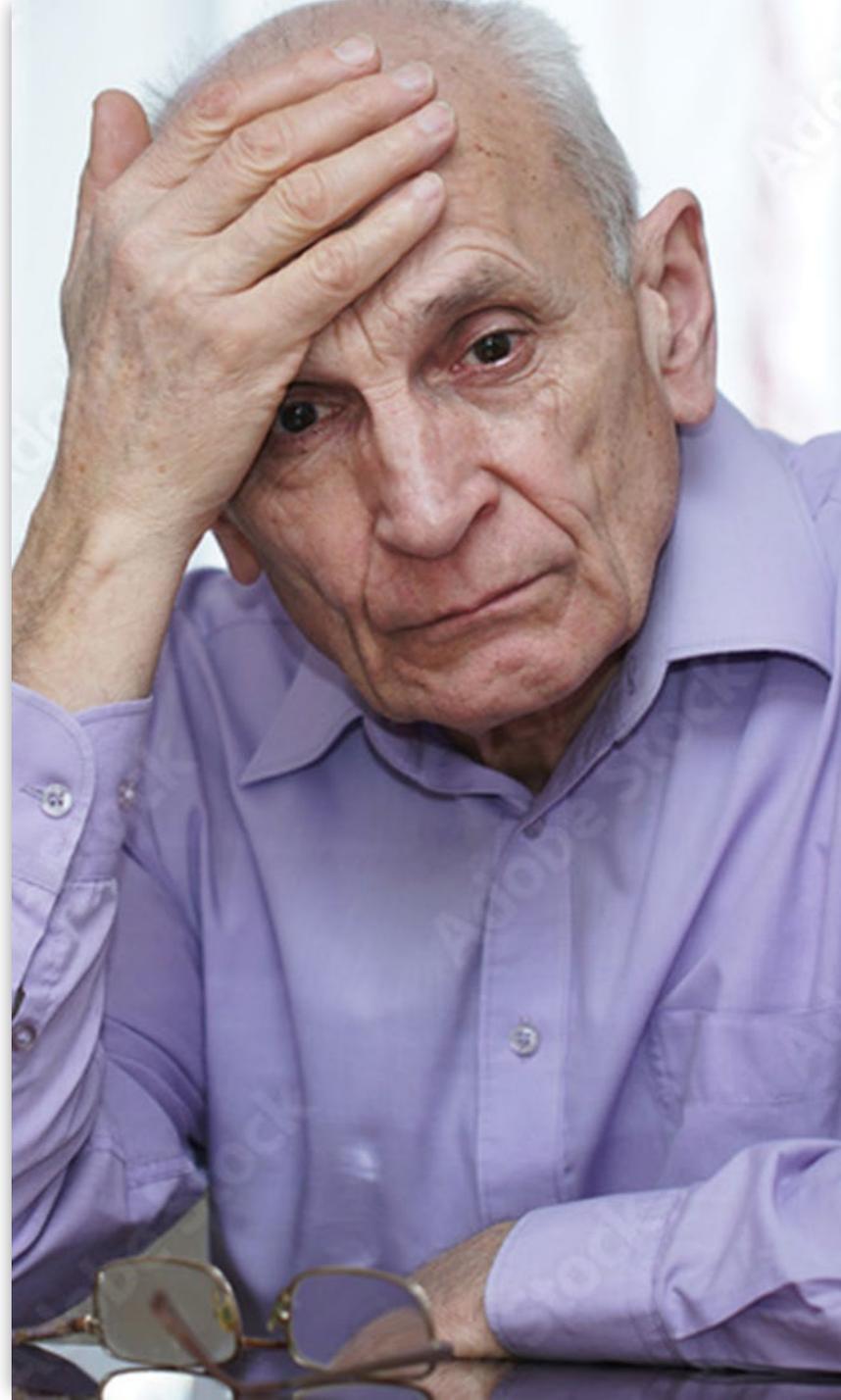
“He’s confused...”

- Presentation
 - Multiple, nonspecific symptoms
 - Lethargy, confusion
 - Anorexia, nausea
 - Constipation
 - Polyuria, polydipsia
- Some correlation with rapidity of onset and degree of hypercalcemia



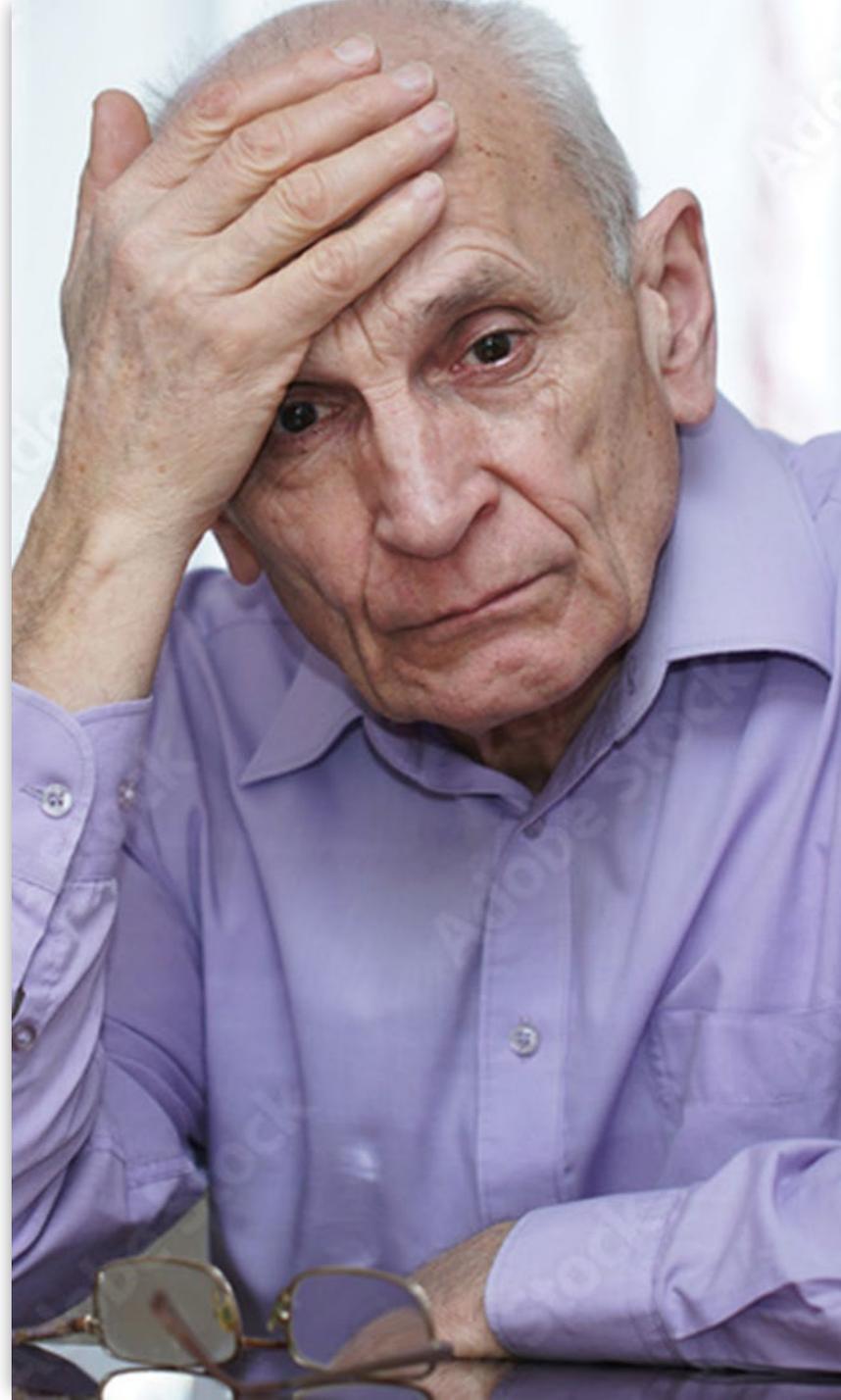
“He’s confused...”

- Physical exam usually unhelpful
 - May see lethargy
 - May see dehydration
- Laboratory
 - Check creatinine, other electrolytes, alkaline phosphatase
 - Low serum chloride suggestive of hypercalcemia of malignancy
 - Must correct total serum calcium for albumin
 - Measured total Ca + [0.8 x (4.0-albumin)]



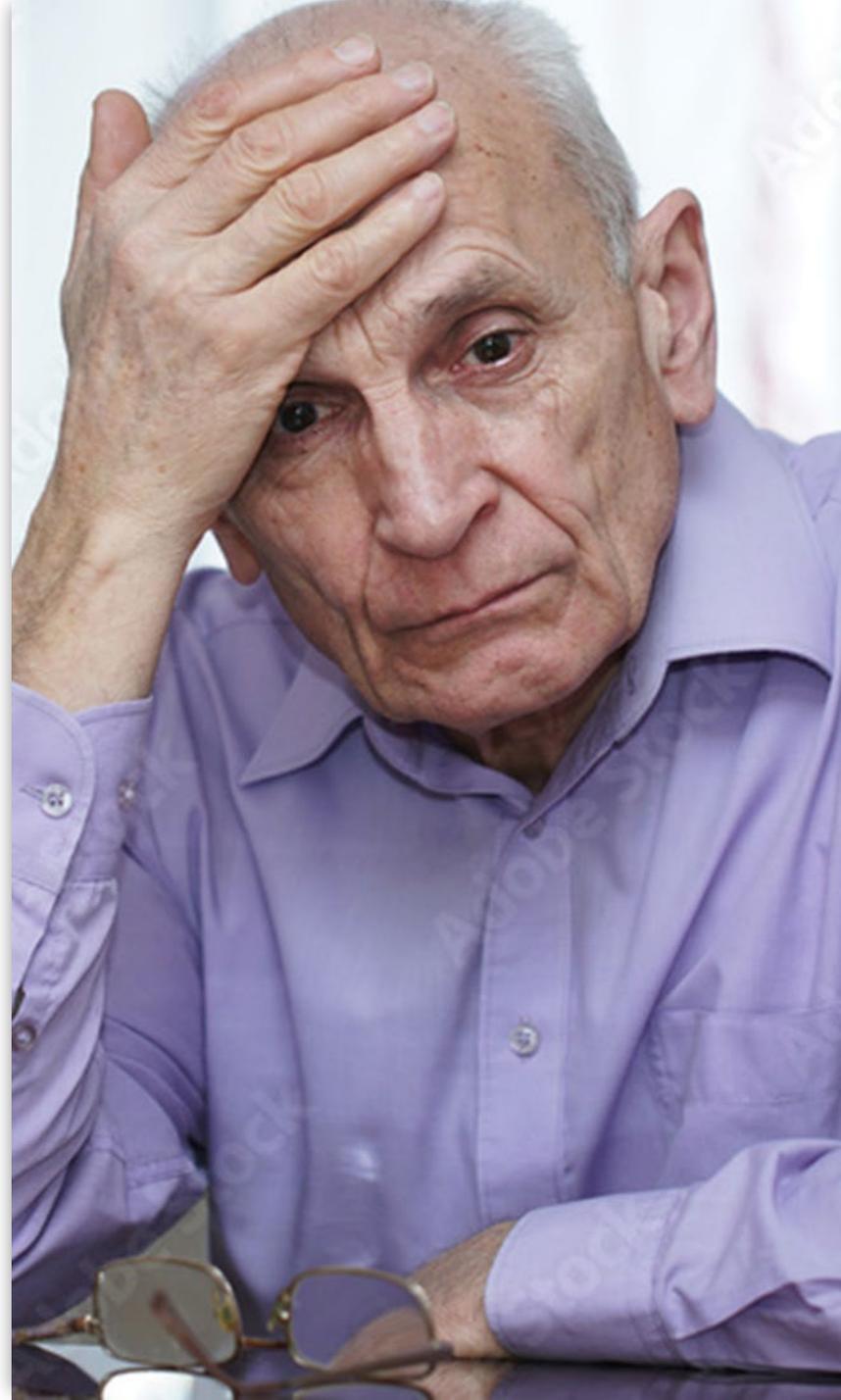
“He’s confused...”

- Treatment
 - Consider the big picture; comfort measures only may be appropriate
 - Hydration with normal saline first step
 - Patients often very volume depleted
 - Avoid loop diuretics until euvolemic



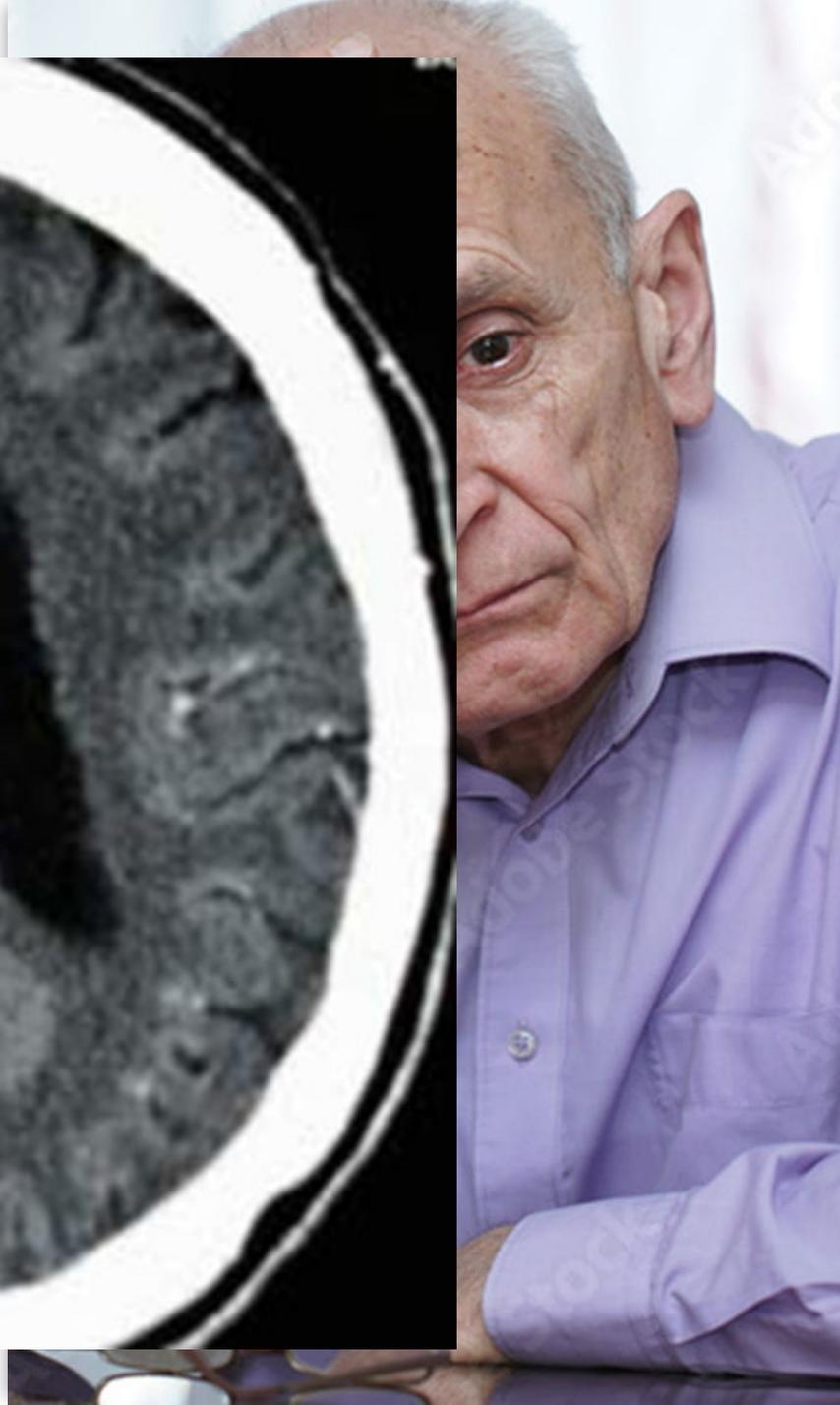
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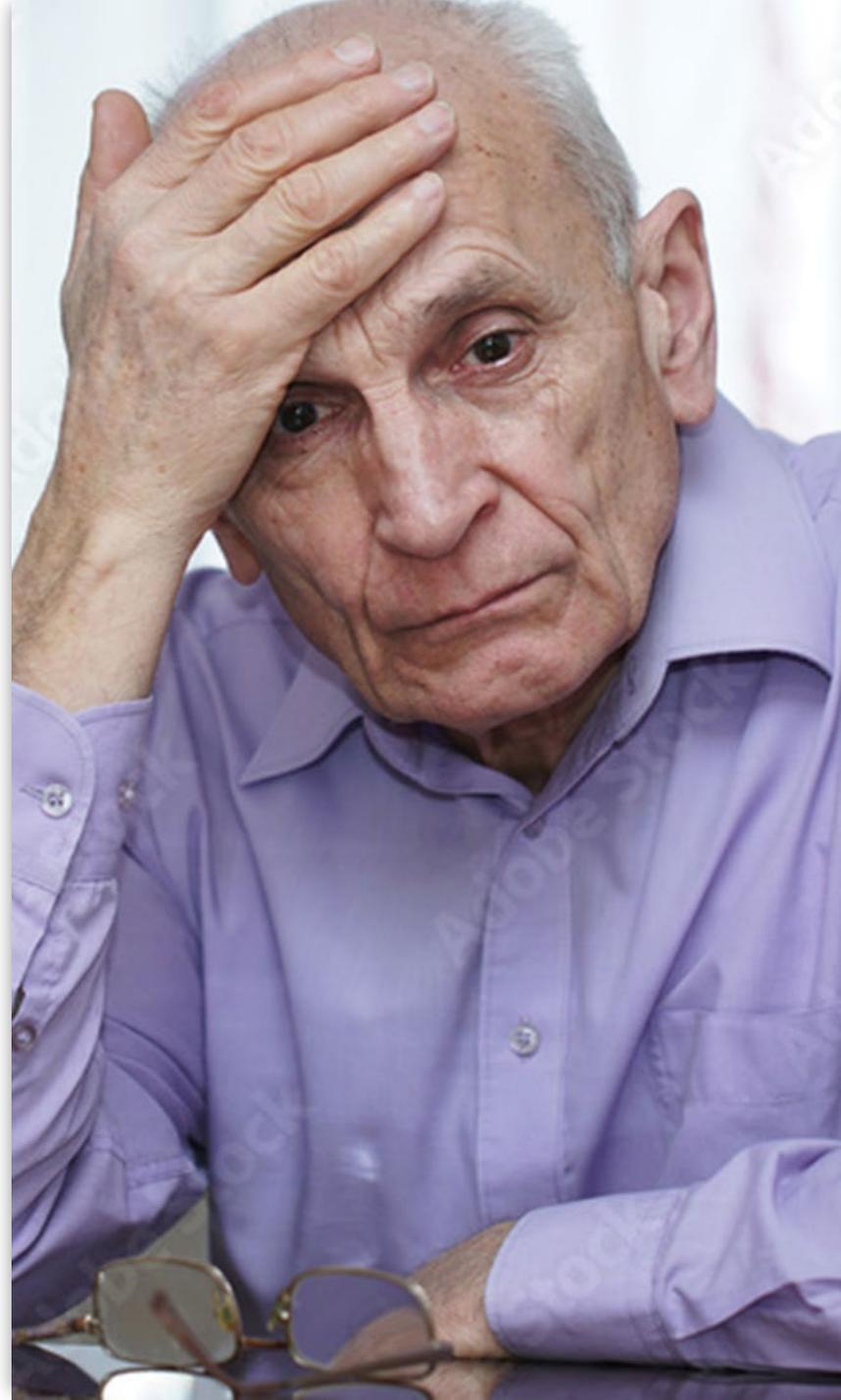
“He’s

- Calci
- Head



“He’s confused...”

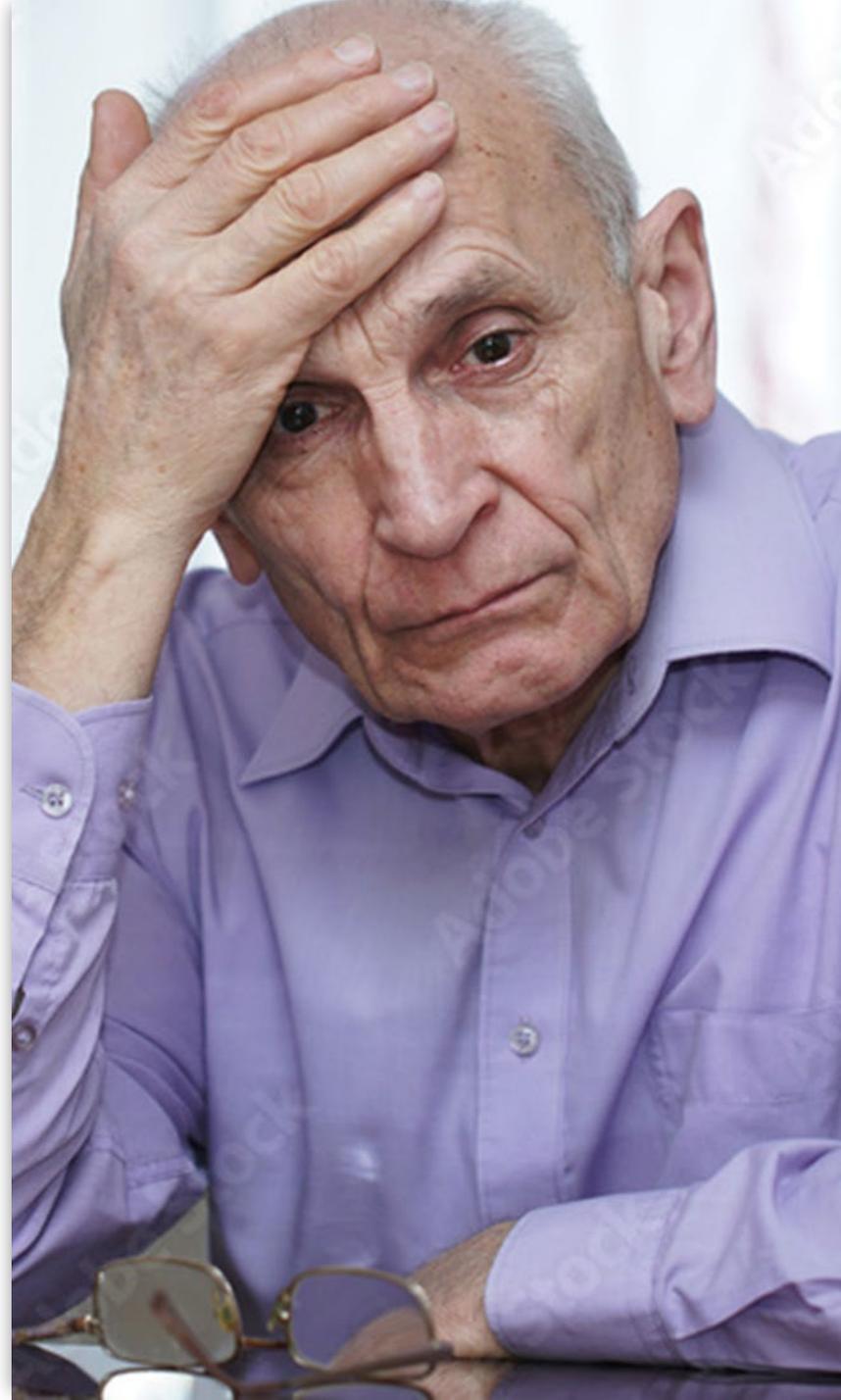
- Seen in up to 20-25% of terminal cancer patients
 - Lung, breast, melanoma
- Wide range of neurologic complaints, BUT
 - 50% will not have a headache
 - May be subtle
- Confers a poor prognosis in most cases, BUT
 - Newer therapies may be very useful
- MRI preferred study, but initial CT okay



“He’s confused...”

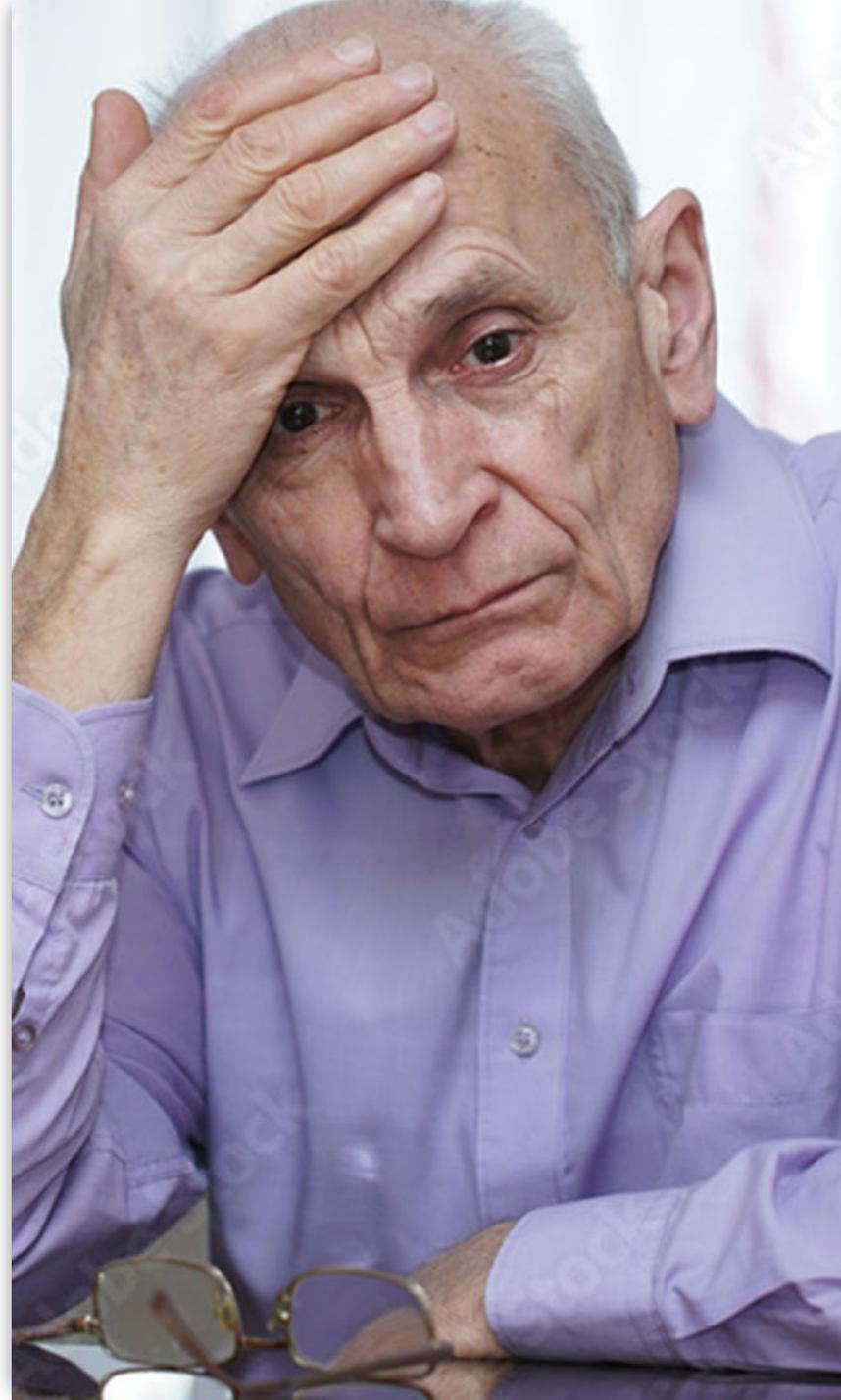
- Treatment

- May want to consider palliative treatment only
- Steroids for symptom management
- Antiepileptics as needed
- Whole brain irradiation may be indicated



“He’s confused...”

- Patient received dexamethasone and one round of whole brain irradiation
- Home hospice care discussed with patient and his family / patient placed on home hospice with comfort care
- Patient died peacefully at home surrounded by his family 6 days after positive head CT scan



“He’s confused...”

- Patient received dexamethasone and one round of whole brain irradiation
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- Patient died peacefully at home surrounded by his family 6 days after positive head CT scan



A Personal Note

- Discussions regarding end-of-life care crucial in terminal diseases
- Hospice care, especially home hospice care, provides comfort and addresses quality of life
- Goal is to help the patients live comfortably on their own terms and choose how **they** want to **LIVE** the rest of their lives



**Thank
You**

