



A Grumpy Old Man

by
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From behind the curtain of an ER cubicle, we overhear the following dialogue:

- Ernest:* (Groans with pain) When's that doctor going to come back? He said he'd only be a few minutes. I want to go home. I'm missing *Golden Girls* and it's that episode where Rose tries to coach the peewee football team.
- Robyn:* Dad, you have a badly broken wrist. Remember, the doctor showed you the X-ray and said you need surgery. You're not going home anytime soon. I know you love Betty White but I'm sure you can watch TV tomorrow.
- Ernest:* Surgery? He didn't say anything about surgery. And my wrist is fine. Just a little sore, nothing a little ice and an ace bandage won't fix. Why, I got hurt a lot worse back when I played football in...
- Robyn:* (Sighs) Yes, Dad, I know you were the toughest linebacker Guilford High ever had. But your wrist is shattered and no ace bandage is going to fix it. And the doctor was really concerned about your blood calcium levels, so you'd be staying in the hospital anyway. I don't know what he meant about a "PTH test," but we have to wait for the results of that.
- Ernest:* Well, that lady in the teddy bear smock certainly took enough blood the second time. And that doctor didn't say anything about calcium. That's in milk. I hate milk. Come to think of it, where is he? He's probably playing golf somewhere, the quack. C'mon, let's go home.
- Robyn:* Dad, the doctor certainly did mention your calcium level because it was 11.8 the first time and 11.3 when they retested. I don't have a clue what those numbers mean but apparently they're not normal, and the doctor said you can't go home until we get that figured out. And your wrist; the doctor says it shattered so badly because your bone density is really low. You stopped taking your calcium supplements, didn't you?
- Ernest:* I know, Robyn, you've told me about that osteo... osteo-post-its stuff a hundred times. But I saw on *The Dr. Oz Show* that it's really only old ladies who get that. And if you had to take as many pills a day as I do, maybe you'd skip some too.
- Robyn:* Men can get osteoporosis too, Dad. I know it's hard getting old but you—
- Ernest:* (Interrupting) Oh, you don't have to tell me. Nothing works right anymore when you're 84. That dang arthritis in my hips, cataracts so I can't drive, fiber pills when I can't poop, hemorrhoids when I do. And a bleeping kidney stone every other month. What's next, Depends? I bet Betty White doesn't need Depends.
- Robyn:* (Laughs) Who knows, maybe Betty White takes fiber pills just like you. But seriously, you just haven't been yourself recently; you tire more easily, you fly off the handle at little things—
- Ernest:* They're not little things! The newspaper should be delivered on my porch, not in my shrubbery!
- Robyn:* But you didn't have to turn the hose on the poor kid.
- Ernest:* Ehhhh, maybe not. (Sighs) It just seems like things were better when your momma was alive. I wish she was here. Or better yet, I was with her.

- Robyn:* You know you can talk to someone about that, Dad. Or there's the grief support group at church. It's been three years since Momma died, but you could still go.
- Ernest:* (*Grunts and winces in pain*) The only person I want to talk to is that blasted doctor. Any fool could have played 36 holes by now.
- Robyn:* Maybe the results for that PT-something test haven't come back yet. While we're waiting, I can try to stream *Golden Girls* on my phone.
- Ernest:* Oh, good! Betty White was something else when she played Rose. And while I'm watching, you can ask someone for an ace bandage so we can go home.
- Robyn:* Oh, Dad.



Questions

- Ernest's abnormal blood calcium levels indicate there may be a problem with a particular endocrine gland. Which gland is the doctor likely concerned about? Where is it located?
- Calcium is crucial for the proper function of a number of body systems, so blood levels must be tightly controlled. Predict the three body systems that are most affected by abnormal calcium.
- What is PTH? What is its function and how does it carry out that function?
- The following questions pertain to the regulation of calcium levels in the blood.
 - Use your text or websites to find the normal range of blood (serum) calcium in adults (express your answer in mg/dL).
 - Are Ernest's calcium levels of 11.8 mg/dL and 11.3 mg/dL too high (a condition known as hypercalcemia) or too low (hypocalcemia)?
 - Based on Ernest's calcium levels, draw and explain a homeostatic feedback loop that shows what should *normally* happen between calcium levels, the PTH-secreting gland, and PTH levels.
 - Assume that Ernest's PTH-secreting gland is not functioning as it should. Based on your answer regarding his calcium levels in part (b), predict whether his PTH levels are likely to be increased or decreased. Explain your answer (include a feedback loop).
 - Suppose the patient in the adjacent ER bed had a calcium level of 10.1 mg/dL and normal gland function. How would her PTH level compare to Ernest's? Explain your answer.
 - What might you conclude if Ernest's PTH levels are within normal limits (not too high and not too low)? Explain your answer.
- Given your answer to question 4(d), research the typical signs and symptoms you might observe in a patient who has PTH levels like Ernest. Which of these does he exhibit? Predict how the abnormal gland activity could be related to his signs and symptoms.
- If the doctor's suspicions are correct, what is the most common method of treating Ernest's condition? What are the potential risks or side effects?