CEPCP

Professional Development

Geriatric Care Part II

Last fall, we introduced “geriatrics” as the self-study topic. While this topic is not new, geriatrics as a medicine specialty continues to grow. In the last self-study we tried to explore the differential diagnosis of a patient’s presentation and many of the confounding factors associated with increasing age. In this self-study, we continue to scratch the surface of geriatrics with a deeper look into falls, hip fractures and pain.

Its 4:00 pm on a pleasant May afternoon. We cut to Marie Anderson’s home where our story begins….

“Oh bother” she thought.

Ok, perhaps the thought bubble may have contained stronger language, but Marie was a dignified person who did not wholly approve of cussing. So “oh bother” would have to do as she looked up at the ceiling, noticing the slight discolouration of the water stain on the kitchen ceiling for the first time. Marie had fallen. The question that she was unsure about was why? Why did this happen? Was she weaker than she thought from the flu-ish feelings she had been experiencing the last couple of days, or had she tripped on that new stylish kitchen floor mat that her daughter-in-law had insisted on? Marie was not entirely sure, but what she did know is that her hip hurt, really hurt, and that trying to get up was impossible.

Marie Anderson is an independent 72 year old who enjoys living on her own. She walks outdoors in the good weather and swims at the local pool on icy winter days when walking is treacherous. She drives her own car, volunteers at the local animal shelter, makes gorgeous baby clothes, and sings in a local choir. She does not smoke, and enjoys one glass of wine, just one, on special occasions. She sees her nurse practitioner once monthly for a B12 shot. Why do I tell you this? Well, it is easy for health care professionals like us to get caught up in the clinical details and evaluations, while underestimating the social impact and how much a person stands to lose following a hip fracture.

Marie’s thoughts wandered to her friend Mel who had fallen last year and fractured her hip. She recalled visiting Mel in hospital, and her pleading for “something, anything” for the pain, reduced to tears and misery. The surgery had gone well enough, but the hospitalization was complicated by a pressure ulcer, then pneumonia, and sepsis. Powerful antibiotics seemed to help the infections, but did nothing for the depression that Mel subsequently experienced. Mel’s children sold her neat little bungalow and moved her into a small grey retirement apartment.

Frustrated by her current predicament and concerned about her own future autonomy, Marie digs into her pocket for her cell phone and contacts the Paramedic Service for help.

Code 3. Possible hip fracture.

A routine enough call, but let's deconstruct it in the context of the elderly patient. We will examine some of the causes of falls and fractures, the assessment and measurement of pain, strategies for safe and effective pain management, the correlation between vital signs and pain, and the paramedic's role in the prevention of delirium.

Between 20% and 30% of seniors, aged 65 and over, fall each year. Falls are the leading cause of hospitalizations from injury among seniors in Canada (Public Health Agency of Canada, 2014). The length of stay in hospital is typically 9 days longer for seniors than it is for younger patients, and the financial burden in Canada is estimated to be 2 billion dollars annually. More importantly, falls precipitate an increase in fear of falling, leading to the loss of independence, social isolation, decreased mobility and depression.

The majority of falls among seniors result in fractured bones. Hip fractures account for over 1/3 of fall-related hospitalizations among seniors. The physical limitations that seniors experience after a hip fracture increases the need for support from caregivers and increases the pressure on the Canadian health care system (Public Health Agency of Canada, 2014)

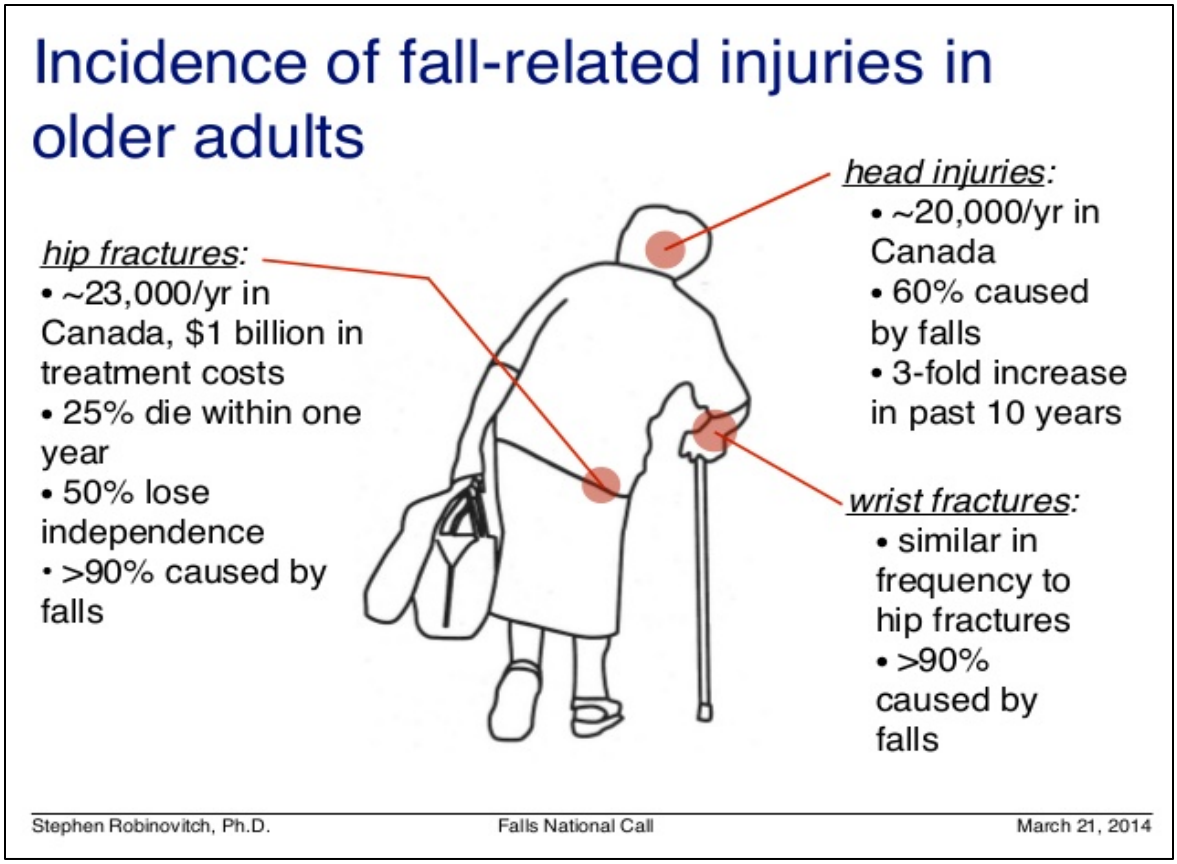

Figure 1 (Rabinovitch, 2014)

Falls

As Marie wondered why she fell, there are numerous factors that increase the risk of falling. Some of the many factors that may increase the risk of falling are:

- Acute illness: Symptoms such as weakness, pain and fever. For example, a study found that urinary tract infections were a precipitating factor in 8% of falls;
- Medications: especially sedatives, hypnotics, and psychotropics that alter the patient's levels of awareness;
- Balance impairments secondary to:
    - Neurological disorders such as Parkinson's disease;
    - Diabetes (neuropathy, retinopathy and nephropathy all contribute to a risk of falls);
    - Arthritis;
    - Cardiovascular disease;
    - Renal disease;
    - Chronic obstructive pulmonary disorder;
    - Stroke.
- Bowel or bladder urgency can lead to rushing to the bathroom, and subsequently increases the risk of falling. Studies find that seniors taking laxatives were twice as likely to fall;
- Foot disorders such as bunions, ulcers, and pain can increase balance and gait difficulties;
- Osteoporosis does not directly affect the risk of falling, but does substantially increase the likelihood of fractures sustained from a fall;
- Cognitive impairment can affect one's ability to anticipate and adapt to environmental stimuli;
- Researchers are beginning to further explore the relationship between falls, gait instability and dementia;
- Delirium, secondary to infection, dehydration, or sensory impairment;
- Visual impairment;
- Muscle weakness (chronic);
- Alcohol, and the interaction of alcohol with medications;
- Fear of falling is in and of itself an important risk factor. Consider as well that a fear of falling may lead to decreased physical activity, followed by muscle weakness and thus an increased risk of falling. 44% of elderly people who fear falling limit their activities to theoretically reduce the risk;
- Malnutrition and dehydration lead to physical weakness, fatigue and frailty. (Public Health Agency of Canada, 2014)

What caused Marie's fall may have stemmed from a myriad of possibilities. How we manage Marie's fall, and experience of pain, will strongly influence how she progresses. Will she bounce back with confidence and strength, or become fearful and subsequently frail? What we do, can make a difference in which direction Marie's treatment and recovery will follow.

Hip Fractures

Important things to recall about hip fractures would include the variety of possible presentations. The "classic" hip fracture presents with a discrepancy in leg lengths (that did not previously exist), and abduction and external rotation of the affected leg, as well as pain at the fracture site and a limited range of motion. There are however, patients with hip fractures who can actually weight bear and walk, and complain of vague pain in the buttock, thigh, groin, or back. For example, a fracture of the lesser trochanter, which is the point of attachment for the iliopsoas muscle, would result in groin pain and a lessened ability to flex at the hip, yet the patient could conceivably be able to walk.

Some common locations for hip fracture are illustrated Figure 2.

A careful physical assessment and a heightened index of suspicion is required on our part as delayed recognition of a hip fracture can result in increased morbidity and mortality (Brunner & Eshilian-Oates, 2003)

We cannot "see" where the suspected fracture is in the field, but the consideration of the mechanism of injury, the variety of possible fracture sites makes comprehensive and detailed assessments necessary.

Pain

We have spent a considerable amount of time recently in CME reviewing the Adult Analgesia medical directive and its intricacies, but now we would like to

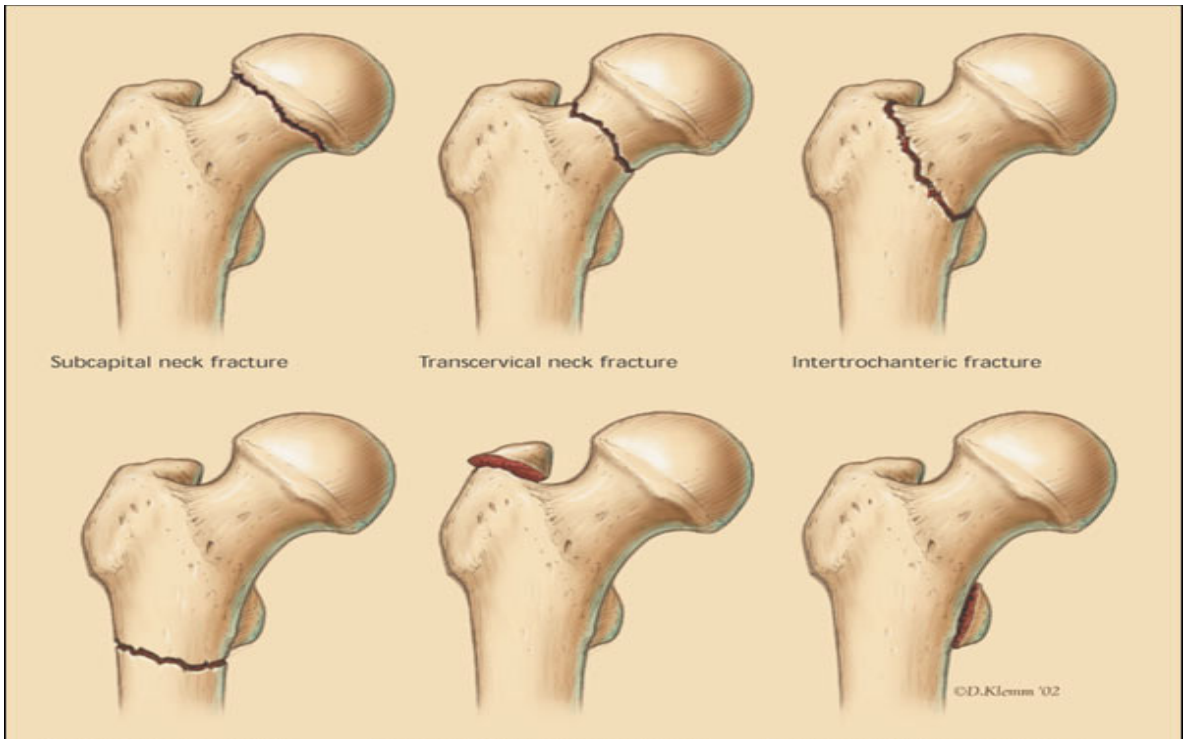

Figure 2 (Brunner & Eshilian-Oates, 2003)

focus specifically on the pain experienced by the elderly person.

Pain is defined as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage”

Pain is always subjective (Gorczyca, Filip, & Waldzak, 2003).

Pain is not typically congruent with the amount of tissue damage. If you think of it, pain is often disproportionate to tissue damage. Pain may be a protective mechanism or it may be idiopathic or pathological in nature. Pain is described as a multidimensional phenomenon (Gorczyca, Filip, & Waldzak, 2003), or a biopsychosocial experience (Gagliese, 2015).

Pain is influenced by many factors including: previous experiences with pain; affect; and cultural beliefs. The experience of pain is also influenced by the degree of control felt over the pain, coping styles, fear, and social supports (Gorczyca, Filip, & Waldzak, 2003).

So, the experience of pain includes **nociception** (Australian and New Zealand College of Anaesthetists, Faculty of Pain Medicine, 2005) but nociception itself does not explain the biopsychosocial complexities and variances of the pain experience. Nociception refers to the perception of a noxious stimulus, and it can be protective (Latremoliere & Woolf, 2009).

Nociceptive pain, somatic or visceral, results from the stimulation of nociceptors, which are specialized sensory nerve endings. When nociceptors are stimulated as a consequence of tissue damage or inflammation, nociceptive pain is experienced.

If the nociceptive stimulus is intense and ongoing (for example, if pain is untreated), there is an increased excitability of neurons in the spinal cord which leads to central sensitization. This peripheral and central sensitization results in an amplification of subsequent pain stimuli and a *lowered pain threshold* (Latremoliere & Woolf, 2009).

You read that right – untreated pain tends to lead to a lowered pain threshold setting up a vicious cycle of worsening perceived pain. There are many compelling reasons to treat pain, and that is just one of them.

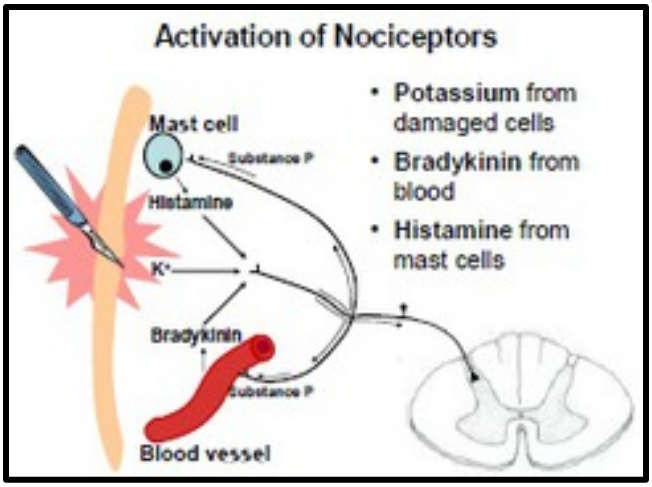

Figure 3 (Physiology of nociception and pain flash cards, 2016)

Key Elements

- Pain is always subjective;
- Pain is a biopsychosocial experience;
- Pain intensity or severity is what the patient tells you it is.

Pain Severity

Part of pain management includes determining what the severity of the pain is. Can we reliably determine pain severity?

When we ask Marie to rate the severity of her pain, we should do so in a way that has validity. Otherwise we can't be confident that the answer we get conveys meaning in a consistent and reliable way. As well, the validity of a pain rating scale ought to have been tested specifically in the specific population it is being applied to, in this case elderly people. When we look at the literature on this, we find that the numeric rating scale ("on a scale of 0 to 10, can you tell me how bad your pain is where zero is no pain and ten is pain as bad as it can be") has been validated for elderly patients by an interdisciplinary expert group (Hadjistavropoulos, et al., 2007).

Good news... the scale we have been using for years at CEPCP demonstrates really good validity. Of course the use of the numeric rating scale depends on the patient having intact cognition. In the presence of confusion, delirium or dementia, pain becomes much more challenging to measure, and there are no current well-validated tools for measuring pain in that setting. It is however important to remember that there is no evidence that dementia is associated with less pain (Gagliese, 2015). It is also important to avoid the assumption that elderly people experience less pain than younger people as this reflects a common bias that has no scientific support (Herr & Farand, 2001).

Remember:

"Without any known biological markers or diagnostic tests that measure pain, the patient's self-report remains the only reliable indicator of the existence of pain and its intensity" (Hanks-Bell, Harvey, & Paice, 2004)**.**

The patient alone knows what the severity of their pain is. We don't know unless we ask them.

Given the multidimensional nature of the pain experience, it is not surprising that there is often a poor correlation between the patient's assessment of pain and the health care professionals' estimate of the pain that the patient is experiencing. The best pain measures involve self-reporting by the patient rather than observer assessment.

OK, so pain is complex and an observer cannot reliably estimate a patient's pain intensity. How about some clues in the

vital signs? Let's take a look at Marie's vital signs.

Heart rate is regular and 92, respiratory rate is 20, and blood pressure is 130/90.

Well well.... does it appear that Marie may be exaggerating the intensity of her pain when she says it is 8/10? Is she (gasp!) a "drug seeker"?

Myth:

If the patient is experiencing pain, you can validate the truth of their complaint by comparing their vital signs to the normal values.

Busted:

This seems to be a widely-held belief amongst health care professionals, and unfortunately leads to the under-appreciation and under-management of pain. Studies show no statistically significant correlation between vital signs and a patient's report of pain. As one study succinctly concludes "A lack of any meaningful correlation between pain scores and changes in vital signs in this population demonstrates **that these signs cannot be used to validate the severity of pain reported by adult patients"** (Lord & Woollard, 2010). Our provincial experience correlates this, thus the advocation for the treatment of a patient even in minor or mild pain.

Important Points:

- Pain is a complex biopsychosocial experience;
- Only the patient knows the severity of "their" pain;
- Vital signs cannot be used to validate pain severity;
- Asking the patient to rate their pain from 0 to 10 is a scientifically validated way to assess pain severity.

Pain Management

Elderly people in particular are at risk for poor pain management. Studies show the following about elderly people and pain:

- They are asked about their pain **less** often than their younger counterparts;
- They are given analgesia **less** frequently;
- If there is a dosing range, they are given a **lower** percentage of the prescribed dose;
- They are more likely to have analgesia withheld

Barriers

So we see that there are barriers to the effective management of pain in elderly people. A lot of work has been done by researchers to try to determine what these barriers are (Hanks-Bell, Harvey, & Paice, 2004). In order to improve on our record of pain management, we need to acquire a good grasp of what the barriers are so that we can work toward overcoming them. We can break the barriers down into 3 major categories:

1. **Health care profession barriers**
    - Lack of education regarding pain assessment and management;
    - Concern regarding regulatory scrutiny;
    - Fears of opioid related side effects;
    - Assumption that pain is part of the aging process and cannot be managed;
    - Lack of ability to assess pain in the cognitively challenged patient.

2. **Patient and family barriers**
    - Fear of medication side effects;
    - Concerns related to addiction (there are prevalent misunderstandings about the important differences between drug tolerance, physiologic dependence, and addiction);
    - Concerns that by discussing pain they will be perceived to be a "bad patient";
    - Fatalism that pain is part of the aging process.

3. **Health care system barriers**
    - Cost;
    - Time;
    - Cultural barriers regarding opioid use. (This may become increasingly problematic as deaths by overdose of opioids like Fentanyl become daily news) (Hanks-Bell, Harvey, & Paice, 2004).

Let's get back to Marie and some thoughts about managing her pain.

Pain, we recall is a subjective experience, and a biopsychosocial phenomenon. Even with vital signs within normal limits, we accept Marie's reported pain severity of 8/10.

If her pain had been reported to be mild or moderate in nature, we might have given some thought to co-administering Acetaminophen and Ibuprofen together (once any contraindications had been assessed and ruled out of course).

Studies have been done to test the efficacy of Acetaminophen and Ibuprofen together, and the results are quite good. A review by Cochrane (a global independent network of researchers, professionals, patients and people interested in health) found 3 clinical trials with a total of 1647 people treated for pain following the extraction of wisdom teeth. (Just a side note – studies about pain often use wisdom teeth extraction as representative of moderate to severe pain) The findings of these studies concluded that 70% of patients treated with *a single dose combination of Acetaminophen and Ibuprofen experienced effective pain relief* (Derry & Moore, 2013).

Acetaminophen is recommended by the American Geriatric Society as a first line treatment for pain (American Geriatric Society Panel on Chronic Pain in Older Persons, 2002). Acetaminophen has both analgesic and anti-pyretic properties without the risk of gastro-intestinal bleeding that comes with NSAIDS (non-steroidal anti-

inflammatory drugs). However, what Acetaminophen lacks, is a strong anti-inflammatory effect. NSAIDS are strong anti-inflammatory medications and offer relief from pain and inflammation through the inhibition of prostaglandin synthesis. Thus, it makes sense to co-administer Acetaminophen and Ibuprofen when possible.

Given that Marie's pain is severe, we should consider administering the NSAID Ketorolac or co-administering Ketorolac and Morphine.

Here is something to consider when using Morphine to treat pain. We know that Morphine binds to the mu opioid receptors, which are proteins in the cell membrane that influence the behaviour of cells in order to decrease the perception of pain. It turns out that males have higher levels of mu receptors than females do. This means that women require more Morphine to achieve a similar degree of analgesia to men. One trial, as reported in *Anesthesia & Analgesia*, concluded "that women have more intense pain and require 30% more Morphine to achieve a similar degree of analgesia compared with men" (Cepeda & Carr, 2003).

There are also some non-medicinal interventions that may prove to be helpful in getting your patient's pain down to a comfortable level. It may come as a bit of a surprise, but swearing increases pain tolerance (That is, the patient's swearing, not the paramedic's). So if sweet Marie, who isn't typically one to use profanity, starts sounding like a belligerent sailor, well, perhaps we ought to let her. Swearing is associated with negative emotions, which creates a limbic system activation, and triggers a physiological alarm reaction. With the fight or flight system activated, there is a reduced sensitivity to pain. Bottom line, swearing can reduce the intensity of the pain experience (Stephens, Atkins, & Kingston, 2009).

Ok, pop quiz.

What is the most frequent medical complication observed in patients hospitalized with hip fracture?

Here are some hints:

- The frequency is 13 to 61%.
- It is associated with delayed recovery.
- It increases mortality.
- It affects physical and cognitive functions months after the fracture.

The answer is **delirium.**

Historically there was some thought that giving opioids to elderly patients caused delirium, so you can understand why health care professionals would avoid using opioids. However, recent research has shed some light on the situation. The big contributors to delirium following hip fracture include **undertreated pain** and using very low, ineffectively low, doses of opioids, or avoiding opioids altogether (Morrison, et al., 2003). In one study of patients with

hip fracture, the presence of severe untreated pain resulted in a 900% increased risk of delirium (Morrison, et al., 2003).

Last Key Points:

- Falls are a major problem, particularly for elderly patients.
- Hip fractures occur frequently with falls, and their presentation may not be obvious or classic.
- Pain is a complex biopsychosocial experience with many factors contributing to the pain experience.
- Pain is subjective, and only the patient can rate the severity of the pain they are experiencing.
- The under treatment of pain in elderly patients can lead to delirium.
- Effective pain management is an important part of high quality patient care from paramedics.

Now let's put it all together for Marie:

- We recognize that when elderly people fall, they frequently fracture bones.
- Our physical assessment is thorough, with a high index of suspicion for fracture.
- We ask Marie about the severity of her pain, knowing that her answer is the only valid measurement of her pain.
- We assess vital signs as we do with every patient, but do not use the vital signs to validate the pain severity.
- We recognize that there may be a sex-based difference in the amount of opioid analgesics needed to treat pain.
- We may play an important part in preventing delirium; and
- We treat her pain.

Now that you have completed the reading, please proceed to the questions section. Thank you for completing this assignment. We hope that you have found the information of interest and reinforces your understanding of pain, specifically in the elderly, and the benefits of treating their pain.

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