Self-Study Fall 2015 Reading

CEPCP

Professional Development

Geriatric Care

Preamble

Elderly patients challenge our skills as paramedics. Even the best clinician will at times be confounded by the complexities of caring for aged patients. The physical assessments differ from that of younger patients, comorbidities add to case complexity, and medications, both over the counter and prescription further complicate what we, as clinicians, are seeing. The vital signs may fall within normal range even when the patient is critically ill. Altered pain perception may serve to mask the nature and the gravity of the presentation. The elderly patient is often more concerned about their spouse, their animal companions, or the security of their household than their own well-being. They are even more likely to decline your offer of transport to hospital than other demographics, even when they are critically ill. It truly requires skilled, knowledgeable and compassionate paramedics to provide consistently appropriate care to our ever growing aged patient population.

"*Caring for our seniors is perhaps the greatest responsibility we have. Those who walked before us have given so much and made possible the life we all enjoy."*

John Hoeven

Elderly patients, for the purpose of this illustration, are over 60 years of age and currently account for more than 20% of the Canadian population, but a significantly larger percentage of our call volume.

The following case scenario will help to illustrate the complex and interesting challenges of caring for elderly patients in the prehospital environment.

Introduction

It was a dark and stormy night. The sort of night where the cold rain pierces through your uniform, leaving you chilled to the bone, exactly the sort of night that seems to entice everyone who has had back pain for months to ascend to the highest point in their home and call 911.

Working this night is a fresh crew comprised of an inexperienced new hire "Tosca" and a well experienced, seasoned veteran "Clancie". Tosca is anxious in his new role and is hoping for some trauma drama where he can put to use all his BTLS, ITLS, PHTLS theory and save some lives. He busies himself in the vehicle checking the trauma bag and sager splints while Clancie checks the cab including the radios, portables, laptop and mappings.

As they wrap up their vehicle check, the base page goes off. "Code 3, back pain" is discernible through the static. Tosca's thought bubble: Back pain! What a waste! Seriously, take an aspirin and call me in the morning. Hopefully we can get this call over quickly so we can do some real calls.

Enroute to the call, dispatch provides an update: the patient is 75 years old and is complaining of back pain. Code 3.

The drive is uneventful, and to Tosca's disappointment, they were not re-directed to the much coveted trauma. Karma has followed Tosca on this call, as they exit the truck, the heavens open up and dump a cold deluge of a waterfall on his unsuspecting/ unprepared head. Meanwhile, Clancie pulls his rain coat hood a little forward to cover a slight smile as he watches Tosca.

Clancie and Tosca enter the bungalow, and are met by a friendly little, shaggy mutt. Tail wagging; he leads the crew to the man reclining in the overstuffed armchair in the living room. "My little buddy, Toto", the patient explains, "we take care of each other". The man in the armchair appears to be weary and pale, but is oriented. He is a heavy man, particularly thick around the middle. At his side is a table covered with pill bottles, puffers, eye glasses, and a glass of grapefruit juice.

Clancie recalls that some foods, such as grapefruit juice, may interfere with an enzyme (CYP or something like that he thinks.... school was a long time ago) which is responsible for metabolizing certain medications. This will delay the biotransformation of these medications, increasing their bioavailability and thus prolonging their effects (Brady, 2003). Clancie wonders if the patient is receiving the intended and desired benefit from the medications he has been prescribed.

Bioavailability

The fraction or percentage of the administered medication that reaches the circulation unchanged. For

example, a medication given intravenously is considered to have 100% bioavailability, whereas an orally administered medication that has to be broken down in the gut, then absorbed through the intestine will have a lesser bioavailability.

Biotransformation

A term that refers to the chemical changes made to a medication within the body in an effort to improve its elimination from the body. Enzymes facilitate these changes. Biotransformation may change a drug from an inert to an active state, or it may change a nontoxic drug to a toxic metabolite. For example, the active drug acetylsalicylic acid (ASA) undergoes biotransformation to become salicylic acid, which is also an active metabolite.

There are a number of factors that reduce the rates or amounts of biotransformation, and they include; poor nutrition, shock states, hypothermia, and *being elderly*.

Why, you ask, are we talking about this?

It may be useful for us to understand that many factors contribute to the therapeutic benefit versus harm from medications. The patient's "compliance" in taking medications is but one of those contributing factors

The pill bottles identify the man as Joe Singh.

Tosca uses that information to approach the man in the chair. "YO, JOE". Before, the patient responds, Clancie interjects, "This is Mr Singh". And in a quiet voice he directs his next comment towards Tosca. "Always be respectful. Address the patient by their last name until they indicate you may do otherwise" (BLS p7-1).

Tosca: "Right, sorry, Mr Singh it is. SO I HEAR YOU HAVE BACK PAIN, YOU MUST HAVE LIFTED SOMETHING HEAVY, EH?? WELL, WE WILL JUST THROW SOME GOOD DRUGS INTO YOU AND WHIP YOU OVER TO THE HOSPITAL."

Now, Mr Singh's internal thought process is likely quite different from that of our young Tosca. He may in fact be wondering why the paramedic is yelling at him, who will take care of his dog, and whether going to the hospital means an end to independent living. Mr Singh has likely already considered, and possibly delayed calling for help and not going to the hospital at all because of these potential considerations. Some studies suggest that the transport refusal rate ranges from 5 to 15%, and with that there may be negative outcomes such as a worsening of the clinical situation and perhaps even death (Holder et al, 2012).

Mr Singh may or may not have hearing loss, and if he does, yelling at him will not likely be the most helpful

method of communication. All paramedics will benefit from considering these communication tips:

(1) Face the patient and make eye contact. Do this though with the recognition that direct eye contact is not always culturally appropriate, so do permit the patient to avert their gaze if they are more comfortable doing so.
(2) Recognize that a person with some hearing loss may use lip reading to improve or augment their ability to understand your message.
(3) Slow your rate of speech down a bit. It can take an older person a bit longer to process and make meaning of your messages.
(4) Recall that when a hearing impaired person is ill or tired, they do not hear and understand as well (Nixon, 2003).
(5) If the patient has a hearing aid and is not wearing it, it may be useful to take the time required to have the patient put the hearing aid in.
(6) Reduce the ambient noise. Ask for the TV to be muted, and reduce the volume of the portable radio on your hip.
(7) If the patient continues to have difficulty understanding, consider altering the pitch of your voice. For example, lower your voice by an octave, as the hearing loss may be most prevalent at the higher pitch sounds.
(8) Select one member of the crew to talk with the patient as having multiple people asking questions can be irritating and confusing (Nixon, 2003).

Clancie gently guides Tosca towards performing an assessment.

The line of questioning reveals a vague history of back pain, that may have begun today or possible yesterday....well, it might have been a couple of days now. Mr Singh, fidgets a bit, looks embarrassed, and says that he is also experiencing some discomfort in his testicles. There was no specific moment or notable activity recalled at onset, just a growing sense of discomfort. There is no radiation of pain down the buttocks or legs. Mr Singh tells the crew that he felt quite dizzy today when he stood up, “I almost passed out.” he says.

Remember this with elderly patients: “The chief complaint may seem trivial, vague, or non-specific, obscuring the true nature of a specific illness. **Always assume the illness is serious until assessment indicates otherwise.** Be aware that the patient may minimize or deny symptoms due to fear of being hospitalized or institutionalized, thereby losing their sense of self-sufficiency” (BLS p7-3).

A set of vital signs is obtained. The radial pulse is palpated at 98 per minute, weak and regular. The manual BP is 102/60 on the left and 100/60 on the right. The finger probe is placed for the SpO_2 revealing an oxygen saturation of 97%. The respirations are counted at 20

per minute and there appears to be no respiratory distress. The pupils are equal at 4 mm, but slow to react. Tosca recalls that pupillary response to light slows with age, and this finding may be normal in an older adult (Nixon, 2003).

The past medical history includes hypertension, asthma, and diabetes. The medications on the table are a beta-blocker (Bisoprolol), an ACE inhibitor (Enalapril), a biguanide (Metformin), an inhaled corticosteroid (Flovent), and an inhaled beta agonist (Salbutamol). They all have expiry dates in 2013. There is also a bottle of over-the-counter aspirin, which Mr Singh states he uses occasionally to deal with aches and pains.

"Everything looks normal to me.", proclaims Tosca, "Do you feel up to a few steps to the stretcher out on your driveway?"

"Normal?" says Mr Singh, "Well that's great to hear!" He is genuinely pleased. The back pain had been bothersome, and he was feeling weaker than he liked to admit, and with the dizziness today, but "normal" meant no need to go to the hospital, no worry about how to take care of Toto, and no risk of losing his independence! "So, if everything is normal, I can stay home."

Hang on, thinks Clancie... let's take a closer look.

Let us begin with a brief overview of some of Mr Singh's medical challenges: Asthma, Hypertension, and Diabetes.

Asthma

When asking about Mr Singh's medical history, it may have surprised you to learn that he has asthma.

While asthma is considered a disease of childhood, it affects a significant number of adults as well. Asthma often goes undiagnosed or untreated in the older age group (Rance & O' Laughlen, 2014).

Even in the absence of reactive airway diseases there are important changes to the respiratory system that occur with aging to consider. After birth, the lungs continue to develop, reaching a stable number of alveoli by about age 8. After sexual maturity, lung function begins its decline. Age related changes include: some loss of peri-bronchial lung tissue, diminished elastic recoil, increased stiffness of the chest wall, and a weakening of the muscles associated with respiration. These changes result in an increased risk for collapse of small airways during normal tidal breathing, and with that, a risk of hypoxemia. Of course, this phenomenon is amplified in elderly patients with asthma-associated airway disease (Zein & Erzurum, 2015).

Add to this an age-related decline in immune function (also known as immunosenescence), which includes multiple important changes. There is the involution (the regressive alteration

of a body part, characteristic of the aging process) of the thymus gland (the lymphoid gland found between the sternum and the heart) leading to diminished numbers of T-cells, the cells produced by the thymus gland which play an important role in immune function.

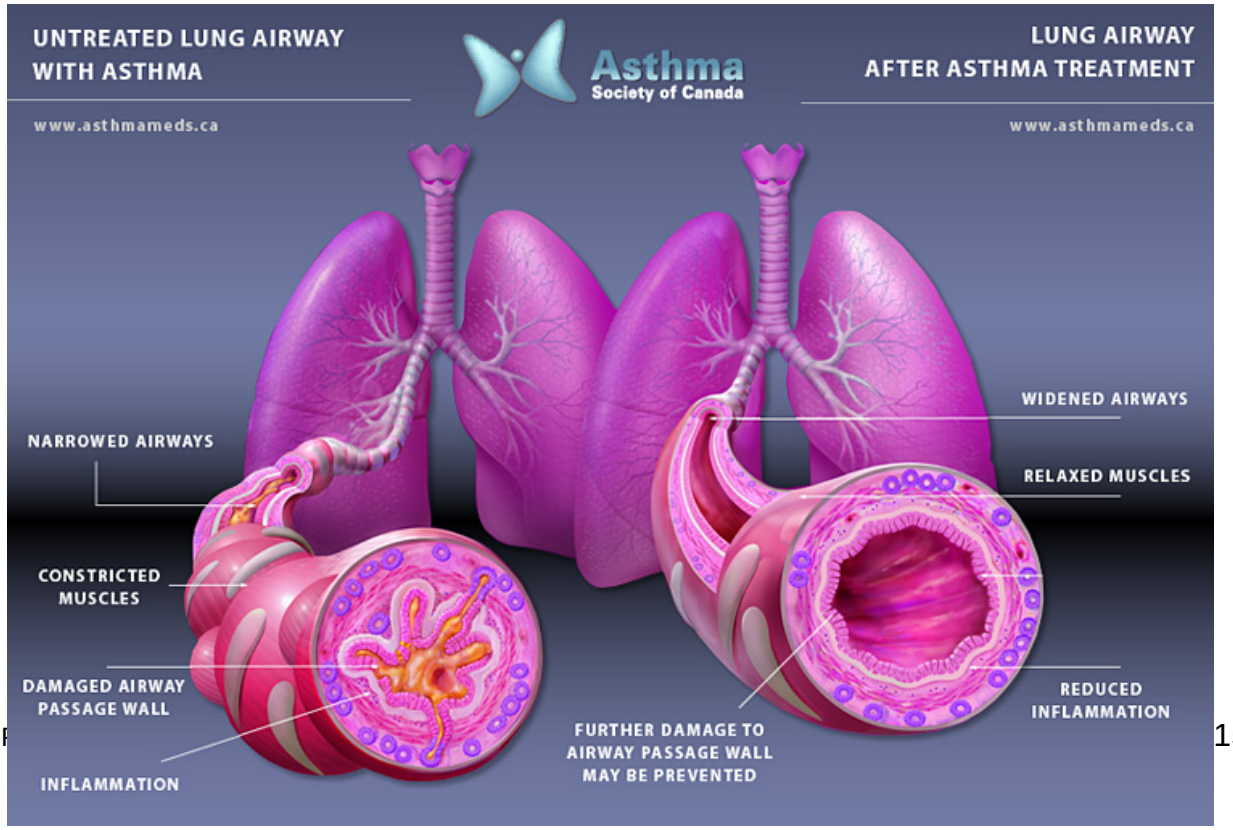
There is also a reduction in the rate at which the cilia in the airways move (the ciliary beat frequency) compromising the ability to clear mucous and foreign bodies. This in turn increases their susceptibility to allergens, air pollution, and lung infections.

The front line treatment for asthma management is corticosteroids, found in the orange puffer. Unfortunately for older asthmatics, they are more likely to experience airway inflammation and are thus generally resistant to corticosteroid therapy (Zein & Erzurum, 2015).

Further challenges exist as the older patient may have difficulty achieving the strength and dexterity required to coordinate the use of the metered dose inhaler device. It has been demonstrated that less than half of all patients, and as few as 10% of elderly patients, can properly handle metered dose inhalers. In the elderly, reasons include muscle weakness, poor dexterity, visual impairment, arthritis (in the hands), and cognitive impairment (Berbecaru-Iovan, 2014).

There are other age-related changes with links to asthma: menopause is one (this is not a concern for Mr Singh, but it is worth a mention here), and obesity is the other.

The peri-menopausal time is associated with, relatively speaking, a hyper-secretion of estrogen and with



that comes a worsening of asthma symptoms, but when the menopause transition is complete there tends to be an improvement in asthma symptoms (Zein & Erzurum, 2015). This age-related protective effect for women can be undermined by the use of hormone replacement therapy, which has deleterious effects on asthma control.

What is the relationship between obesity, specifically abdominal obesity and asthma? Patients who have abdominal obesity and *metabolic syndrome** experience higher levels of insulin resistance at the cellular level and consequently have higher serum levels of insulin. This higher level of circulating insulin promotes contractility of the airway smooth muscle and hyper-responsiveness of the airway (Zein & Erzurum, 2015).

Metabolic Syndrome

With a prevalence of approximately 20-25% in the adult population, metabolic syndrome is a serious health condition. People with metabolic syndrome have an increased risk of diseases related to a fatty build up in the walls of arteries. This increases the likelihood of heart attacks, strokes, and peripheral vascular disease. As well, a person with metabolic syndrome is more likely to develop type 2 diabetes.

The criteria that a physician uses to diagnose metabolic syndrome include central obesity (measured as waist circumference), dyslipidemia (high triglycerides and low HDL cholesterol), elevated blood pressure, and high fasting blood sugar (American Heart Association, www.heart.org).

Add to this, the very real possibility that Mr Singh also experiences obstructive sleep apnea, a disorder that increases in prevalence with age and may be linked to asthma. The related research suggests that the link between obstructive sleep apnea and poor asthma control occurs due to airway inflammation and obesity (Rance & O'Laughlen, 2014).

So let's piece this together as it applies to Mr Singh. He has asthma and consequently will have challenges managing activities that require exertion. His puffers are hard for him to manage and so he is "non-compliant" with their use. Even if he was able to manage the puffers, the effectiveness of the inhaled corticosteroid is likely less than it would be if he was younger. As a result, he is increasingly sedentary, furthering his obesity, thus worsening his asthma. His airway inflammation and diminished ciliary function compromise his body's ability to clear mucus, leading to an increased risk of infection. Immunosenescence, with the involution of the thymus gland and reduction in T-cell production, means his immune system is less effective at fighting infection.

Hypertension

Blood pressure is the force, measured as a pressure, of circulating blood against the walls of the blood vessels. It is necessary to have blood pressure to deliver oxygen and nutrients to all cells. However, too much pressure will damage blood vessels. How much pressure is too much? The current thinking is that blood pressure should be less than 140/90 mmHg for most people, including those with kidney disease. For people over the age of 80 years, the guideline changes to a blood pressure less than 150/90 mmHg. For most diabetics a blood pressure less than 130/80 mmHg is the target (Hypertension Canada, 2015).

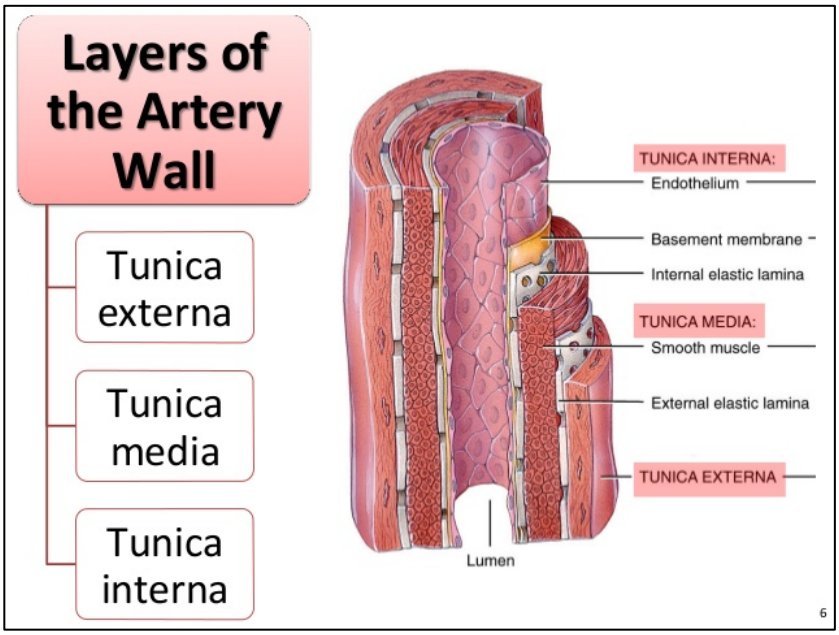
Let's segue for a minute to review some of the important points related to obtaining an accurate measurement of blood pressure.

The position of the arm can have a major impact on the pressure observed. This is due to hydrostatic pressure. The pressure can change by 1 to 2 mmHg for each 2.5 cm above or below the level of the heart. For example, if the upper arm is positioned above the level of the right atrium, the reading will be lower than the actual value (Frese et al, 2011).

With elderly patients, beware of the ausculatory gap. This is the period during which the sounds of systole fade away and then reappear at a lower pressure, resulting in an underestimation of systolic blood pressure. It occurs predominantly in the elderly as a result of vascular disease.

7.5 million Canadians live with hypertension (www.hypertension.ca) making it one of the most problematic health challenges in our nation. Much of the age-related increase in blood pressure can be attributed to changes in the structure of the arteries. Large vessels, like the aorta, become less distensible. There are structural changes such as calcification of both the intima and media, fatigue fracture of the elastin in the tunica media, and deposits of collagen in the tunica media.

Wait a minute, anatomy 101 is but a distant memory. Let's review the structure of an artery (see image below).



When the elastic fibers become damaged over time, the mechanical load is transferred to collagen fibers, which

are 100 to 1000 times stiffer than elastic fibers. Overall, this results in an increase to systemic vascular resistance. Along with changes to the distensibility of blood vessels, there may be calcium deposits in the large vessels. Calcification within the aorta is positively correlated to diabetes.

These 'age-related changes' are not inevitable however, there is a growing body of evidence to suggest that a combination of high calorie diets, obesity, low physical activity levels, and high dietary sodium contribute to arterial stiffness.

Diabetes

Over 9 million Canadians are living with diabetes or prediabetes (Canadian Diabetes Association, 2015). Older adults, particularly adults with central obesity, are at risk of diabetes. Type 2, or adult onset diabetes is typically present for several years prior to the diagnosis, therefore it is not unusual to see complications of diabetes present even in newly diagnosed patients (Kirkman et al, 2012). As paramedics, we are aware of the cardiovascular and microvascular diseases associated with diabetes. These diseases include heart disease, peripheral vascular disease, blindness and kidney failure. In addition to these vascular changes, the older adult may experience a group of conditions termed "geriatric syndromes".

The geriatric syndromes occur at a higher frequency in older adults with diabetes and may affect self-care abilities and health outcomes including quality of life (Kirkman et al, 2012).

Let us take a brief look at what is meant by geriatric syndromes:

(1) Cognitive impairment:
Dementias such as Alzheimer's-type and multi-infarct are about twice as likely to occur with diabetics. Cognitive impairment can make self-care more challenging, and it may be more difficult to perform complex tasks such as glucose monitoring (Kirkman et al, 2012).

(2) Functional impairment:
People with diabetes are typically less physically active than those without diabetes. Why is that? Problems with peripheral neuropathy (present in 50-70% of older patients with diabetes) and the resultant postural instability and balance problems account for much of this. Associated with these functional impairments is an increased probability of falls

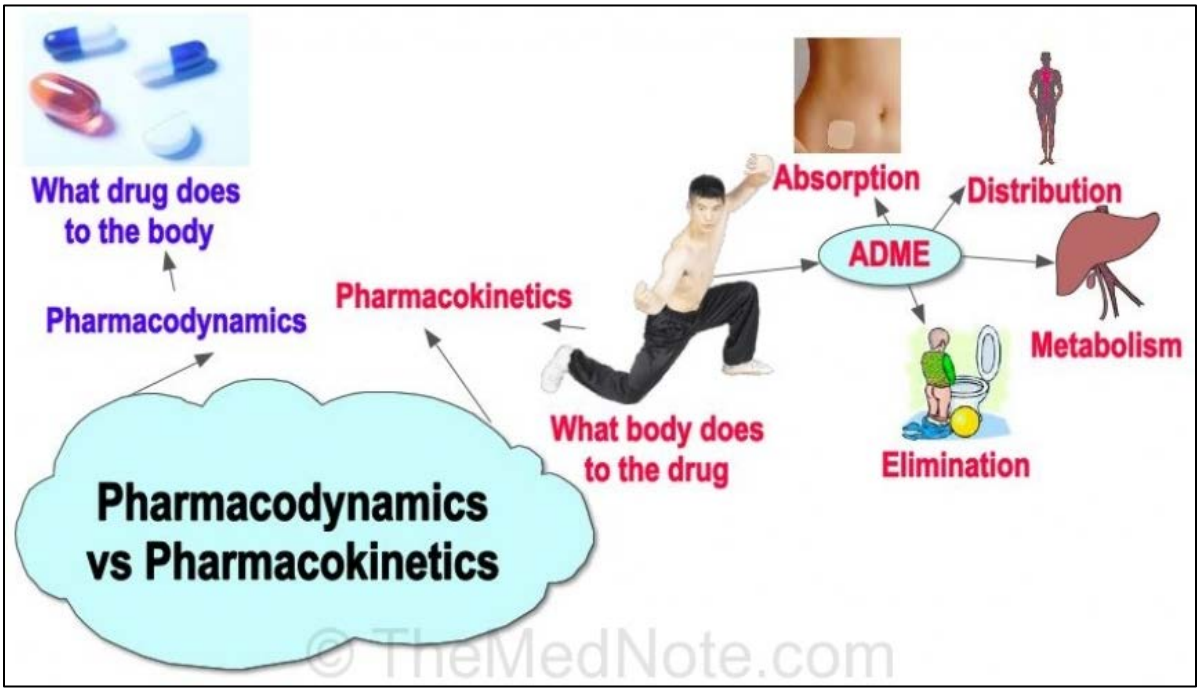
(3) Falls and fractures:
Functional impairment, with the loss of stability and balance, predispose the diabetic adult to falls. Hypoglycemia and hyperglycemia also contribute to fall frequency. Fractures are also more likely with diabetes, as one study describes "women with diabetes have a higher risk of hip and proximal humerus fractures" (Schwartz et al, 2002).

(4) Polypharmacy:
Pharmacotherapy, the therapeutic use of medications, becomes more challenging with the older adult. "Older patients are at increased risk for adverse drug events from most medications due to age-related changes in pharmacokinetics (in particular reduced renal elimination) and pharmacodynamics (increased sensitivity to certain medications) affecting drug disposition (Kirkman et al, 2012).

Older adults with diabetes are more likely to be involved in polypharmacy, defined as the use of 6 or more prescription medications. With type 2 diabetes, this polypharmacy is often intentional as diabetes complications and to treat related comorbidities. However, with polypharmacy there is an increased risk of drug side effects and drug-to-drug interactions. Polypharmacy is also correlated with an increased risk of falling in older people (Huang et al, 2010).

Pharmacodynamics and Pharmacokinetics:
These concepts help us to better understand the relationship between a drug and the human body. For example, remember Mr Singh's glass of grapefruit juice? Well that beverage can have an impact on the metabolism of some medications, affecting the pharmacokinetics.

People often find it easier to



(image from www.themednote.com)

it is necessary to reduce the risk of remember that Pharmacodynamics

(PD) is what the drug does to the body and Pharmacokinetics (PK) is what the body does to the drug.

(5) Depression:
There is an increased prevalence of depression in the diabetic population (Nouwen et al in Kirkman et al, 2012). In the older adult, depression often goes undiagnosed, leading to difficulty with self care and challenges with implementing a healthy lifestyle.

(6) Vision and hearing impairment:
Vision impairment occurs in about 20% of older diabetics, and this is directly related to the aforementioned challenges with self-care, and fall risks. Hearing impairment has approximately double the prevalence in the diabetic population than it does in the non-diabetic population. The many impacts of vision and hearing impairment can include decreased socialization, isolation, and depression.

(7) Pain:
Inadequate treatment for persistent pain from neuropathy, or other causes, is correlated to functional impairment, falls, depression, decreases socialization, and disturbances to sleep.

Let us recall Mr Singh's vital signs: Pulse was 98, and BP was 102/60. These findings were thought to be "normal", but are they? Mr Singh has hypertension, and he is not routinely taking medication for it. Should a resting heart rate of 98 and an untreated blood pressure of 102/60 not rouse our suspicion?

"*Maintain a high level of suspicion for shock; elderly patients may not have a physiologic response to shock due to the presence of underlying hypertension, cardiovascular or renal disease in addition to the concurrent use of cardioactive medications. For example, a systolic BP of 110 in a patient with a history of hypertension, or a heart rate of 70 bpm in an individual taking beta blockers should not be interpreted as normal*" (BLS p7-3).

Mr Singh's vital signs are deeply troubling, and ought to prompt the paramedic to assess carefully and handle gently.

Tosca describes a GCS of 15, clear speech quality, flat neck veins, and xanthelasma (a deposition of yellowish cholesterol-rich material on the eyelids, usually a sign of dyslipidemia).

Image from www.dermnet.com

Tosca then auscultates, and hears clear air entry throughout.

Now at the abdomen, he recalls that the order of assessment is important: first inspect, then auscultate, followed by palpation (Jarvis, 2009). He recalls that if he palpates before he auscultates, the bowel sounds may be altered because of the palpation itself.

With Mr Singh's consent, Tosca gently raises his shirt. This is what his inspection reveals:

(images from CMAJ.ca

What you are seeing in image "A" around the umbilicus is a peri-umbilical ecchymosis, also known as Cullen's sign. In image "B", around the flank, there is also ecchymosis, referred to as Grey Turner's sign. Each of these signs can signify retroperitoneal bleeding. As well, there may be a finding of testicular ecchymosis, referred to as the blue scrotum sign of Bryant. This also signifies retroperitoneal bleeding.

Let's stop and put what we know together. Mr Singh is an older patient with a history that includes diabetes and hypertension. The presence of

(images from CMAJ.ca)

xanthelasma suggests that dyslipidemia is likely present as well. The patient does not routinely take his medication, yet despite this, his blood pressure is low and his heart rate is elevated. You ought to be thinking about shock with these vital signs. You further anticipate a blunted pain response as Mr Singh is a diabetic. You remember that "the textbook presentations" are less likely to be seen in elderly diabetics. You see signs of a retroperitoneal bleed, potentially explaining the vital signs consistent with shock (in this case due to relative hypovolemia). You expect that the bleeding is perhaps being tamponaded in the retroperitoneal space, but where could the bleeding be coming from?

Here is a useful mnemonic to remember which structures are retroperitoneal: **SAD PUCKER**

S is suprarenal glands (also known as the adrenal glands)

A is aorta. The inferior vena cava is here as well

D is the duodenum (some but not all of the duodenum is retroperitoneal)

P is pancreas (the head, neck and body are retroperitoneal)

U is for the ureters

C is the colon, specifically the ascending and descending portions

K is the kidneys

E is esophagus

R is rectum

Tosca decides that he will definitely not be palpating this abdomen, but with direction he gently auscultates a few centimetres above the umbilicus. He positions his stethoscope here, to best hear any abnormal sounds from the retroperitoneal space. He hears something, a rhythmic whooshing? A swishing or whooshing sound is the sound of turbulence which is very likely the sound of a bleed.

Shock Index (SI)

The shock index is a comparison of the heart rate or pulse to that of the systolic blood pressure.

SI = HR / SBP

0.5 to 0.7 is believed to be a "normal" shock index. Higher values are more sensitive indicators of occult bleeding and shock states than vital signs alone. A SI of ≥ 0.9 is considered critical.

Remember earlier the vital signs obtained? HR 98 bpm and BP 102/60.

The SI for Mr. Singh is 98 / 102 = 0.96. A significant finding.

The beads of sweat collect on Tosca's forehead. He realizes that he just came way too close to dismissing this patient as 'not sick', and risked worsening his condition. "Lesson learned," he thinks, "never again".

Essentials of Clinical Geriatrics

But does it all add up? After all, if this is a ruptured abdominal aortic aneurysm (AAA) then where is the "classic" triad we learned about in school: a pulsatile abdominal mass, a tearing or ripping abdominal pain, and hypotension? Why does this patient have back pain? And where is the pulsatile abdominal mass? While classic, that presentation is found in less than half of all cases (Banerjee, 1993). So don't count on finding this classic

triad, as the odds are you are more likely to find other clues. Additionally, obesity can mask an existing pulsatile mass.

A rupture of an aortic aneurysm can present with isolated back pain, and hypotension may be transient if the bleeding is retroperitoneal and is temporarily tamponaded (Spangler et al, 2014).

So, the bottom line is we cannot rule out AAA just because the classic triad is not found. The signs can be more subtle, and require careful assessment.

You are quite likely to encounter AAA's in your career. According to the American Heart Association, the prevalence of AAA is 12.5% among men 75-84 years of age. And the most common complication of AAA is rupture (Stanford.edu, Post graduate medical journal). Your careful and deliberate assessment is critical.

The risk factors for an asymptomatic abdominal aortic aneurysm are:

- Increased age
- Male
- Smoker
- Hypertension
- Diabetes
- Family history of AAA
- Peripheral arterial disease

(American Heart Association, 2015)

"***Extreme caution*** *must be taken before diagnosing an elderly individual with new renal colic, musculoskeletal back pain, or even syncope without considering ruptured AAA"* (Marston in Spangler et all, 2014).

Here are some other fascinating assessment findings that are correlated to AAA. These signs of AAA were found in a textbook about Geriatric Prehospital Care:

While listening to the chest, a double heartbeat is heard (Robertson's sign)

The patient's head shows a rhythmic jerking motion (Musset's sign). The nodding is an indication that the systolic pulse is being felt by the patient because of the increased pulse pressure resulting from the aortic insufficiency.

A friction sound is heard over the sternum when the patient raises then drops his arms (Perez's sign).

A rhythmic murmur is heard when a stethoscope is applied to the patient's lips (Sansom's sign) (Nixon, 2003, p58).

The crew proceeds gently, supplies supplemental oxygen, continuous cardiac monitoring, and starts a peripheral IV. Other important secondary assessments, such as checking circulation to Mr Singh's legs, are deferred for now, and accomplished during transport. The crew recognizes that this patient's best chance of survival lies in the hands of a vascular surgeon. They recognize too that sometimes the

most advanced and useful interventions that a paramedic ought to do are excellent patient-focused communication and a thorough physical assessment.

Advocating for the patient, the crew radios ahead to the hospital, and shares their findings with the receiving hospital. Instead of a long wait on off-load, this patient is seen quickly by the ER physician and promptly referred to surgery.

References

Banerjee, A., (1993). Atypical manifestations of ruptured abdominal aortic aneurysm. Postgrad Med J. 69:6-11.

Berbecaru-Iovan, S., Popescu, F., and Berbecaru-Iovan, A. (2014) Considerations on the bronchodilator therapy in elderly patients with obstructive bronchial syndrome. Current Health Sciences Journal 40(3)

BIOL 121 Chp 21: The Cardiovascular System - Blood Vessels and Hemody... (n.d.). Retrieved August 13, 2015, from http://www.slideshare.net/robswatski/biol-121-chp-21-the-cardiovascular-system-blood-vessels-and-hemodynamics-lecture-presentation

BLS, basic life support patient care standards. (2007). Toronto: Emergency Health Services Branch.

Frese, E., Fick, A., and Sadowsky, H. (2011). Blood Pressure Measurement Guidelines for Physical Therapists. Cardiopulmonary Physical Therapy Journal 22(2): 5-12.

Gee, E. (2002). Misconceptions and misapprehensions about population ageing. International Journal of Epidemiology, 750-753.

Holder, P, Arthur, A, Thiems, G, Redmon, T, Thomas, M, Goodloe, J, Reginald, T, & Thomas, S. (2012). Patients refusing prehospital transport are increasingly likely to be geriatric. Emergency Medicine International.

Huang, E., Karter, A., Danielson, K. Et al. (2010) The association between the number of prescription medications and incident falls in a multi-ethnic population of adult type-2 diabetic patients: The diabetes and aging study. J Gen Intern Med. 25:141-146.

Inouye, S, Westendorp, R, Saczynski, J. (2014) Delirium in elderly people. The Lancet. 911-22.

Jarvis, C. (2009). Chapter 21: The Abdomen. In Physical Examination & Health Assessment (1st ed., pp. 565-580). Toronto, Ontario: Elsevier Canada.

Kirkman, M., Briscoe, V., Clark, N., Florez, H., Haas, L., Halter, J., . Swift, C. (2012). Diabetes in Older Adults: A Consensus Report. Journal of the American Geriatrics Society J Am Geriatr Soc, (60), 2342-2356. doi:10.1111/jgs.12035

Nixon, R. (2003). Geriatric prehospital care. Upper Saddle River, N.J.: Prentice Hall.

Peterson, L, Fairbanks, R, Hettinger, A, & Shah, M. (2009). Emergency medical service attitudes toward geriatric prehospital care and continuing medical education in geriatrics. The American Geriatrics Society, 57:530-535.

Rance, K., & O'Laughlen, M. (2014). Managing Asthma in Older Adults. The Journal for Nurse Practitioners, 10(1), 1-9.

Schwartz, A., Hillier, T., Sellmeyer, D., et al (2002). Older women with diabetes have a higher risk of falls : a prospective study. Diabetes care, 25:1749-1754.

Spangler, R., Pham, T., Khoujah, D., & Martinez, J. (2014). Abdominal emergencies in the geriatric patient. Int J Emerg Med International Journal of Emergency Medicine, 7(43).

Xanthomas Photo - Skin Disease Pictures. (n.d.). Retrieved August 17, 2015, from http://www.dermnet.com/images/Xanthomas/picture/23812

Zein, J, Erzurum, S. (2015). Asthma in the Elderly. Pulmonology and Respiratory Care, 4:174-182.