

Thorough Assessment And Treatment of Pain: A Call to Action

**A clinical discussion with Gregory B. Holm, PhD, ARNP-C;
hosted by Frances M. Sahebzamani, PhD, ARNP**



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Pain is the most common chief complaint in primary care, yet it can be confusing to work through some of the different types of pain and various treatment modalities. The subjective nature of pain alone makes it difficult to assess, so practitioners should use a variety of pain measurement indices. A vast array of pharmacologic and non-pharmacologic treatment options is available and their use calls for a thorough understanding of their mechanisms of action and their anticipated effects.

CE-TODAY: From your experience, could you discuss the prevalence of pain syndromes commonly seen in primary care settings and elaborate on the definition of persistent or chronic pain?

Dr. Holm: Pain is one of the most common complaints that we see in our practices, with anywhere from 20% to 30% of adults suffering chronic pain. After age 60, and also in females, there seems to be an increased incidence of reported pain. All persons experience acute pain at sometime or another in their life. In terms of economic impact, pain costs about \$3 billion in lost wages annually in the United States and is the third leading cause of absence from work. About \$50 million is spent annually on pain relief.

As for the second part of the question, let's first define what pain actually is. It's an unpleasant sensory and emotional experience that's sort of self-intuitive and is associated with actual or perceived tissue damage. Perceived

tissue damage can cause real pain; it's highly subjective and an individual experience. It's pathologic and has an emotional component. We have a good understanding of pain pathways and modulation, but the perception of pain remains very personal and hard to measure or grasp as a concept.

Suffering is, perhaps, the most important concept. It's important for us to control suffering, and to do that we must control pain, but let's not forget that suffering and pain are indeed different concepts. I would describe acute pain as something that has a clear-cut etiology. Usually, there is some sort of tissue insult that happens from minutes to hours before the pain occurs. It usually involves either the peripheral nociceptive receptors or neurogenic pathology.

Chronic pain, on the other hand, is generally described as pain that persists for weeks, months, or years. It's a central pain rather than a peripheral

Learning Objectives

Upon completion of this course, you should be able to:

- Identify three primary goals of chronic pain management
- Relate the psychosocial aspects of pain presentation to the overall plan of care
- Select appropriate pharmacologic and nonpharmacologic interventions in the treatment pain

For information about how to earn CE credit, see inside front cover. To view disclosure information, see page 5.

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“Physiologically, ongoing pain becomes chronic pain through sensitization. The most important thing to remember is that failure to treat the pain makes the pain become the disease.”

pain and it persists after tissue healing. Chronic pain results from central nervous system sensitization and is sensitized directly through the prostaglandins, bradykinins, adenosine, and serotonin. Indirect sensitization through the bradykinins, interleukin-6, leukotrienes, norepinephrine, nitric oxide, and tumor necrosis factor (TNF) alpha may also occur, and these lesser-known factors should also be considered when we talk about the physiology of pain.

Finally, there is persistent pain. I don't think there is a good definition of persistent pain, but I propose that it's somewhere between acute pain and chronic pain. It's an acute pain that persists beyond the expected trajectory of the injury or illness or that results in a plateau of pain relief. Some people would say persistent pain is just a synonym for chronic pain, but I think there's room for us to interject it as a sort of midpoint in the pain experience.

CE-TODAY: What are the most common causes of chronic pain?

Dr. Holm: Ongoing/underlying pathology is far and away the largest cause. If you don't fix the problem, the pain is going to continue. Sometimes the problem takes a while to fix, especially when the patient tries to be stoic and fails to report the pain. If we don't know that the patient is having pain, we may mismanage it. On the other hand, we may know the patient is having pain and yet be remiss in dealing with it through our own biases, so it's important for us to adequately treat the pain. Consistent,

persistent pain can also induce a “sick role” or a psychopathological state, or we may never know the reason for the pain.

CE-TODAY: In primary care settings in particular, evidence suggests that we are undertreating pain. What are some of the barriers and controversies related to adequate treatment of pain syndromes?

Dr. Holm: Well, it's absolutely true that we've had a history of this, although it has been getting better since 1998 when the Federation of State Medical Boards of the United States recommended pain management guidelines. However, that wasn't enough, and they're sending new guidelines to the House of Delegates for that body this year. The Federation believes we haven't gone far enough, and I agree. A substantial body of evidence suggests that both acute and chronic pain continue to be undertreated, especially in terminally ill patients who suffer needlessly. They want recognition that treatment of pain is a fundamental part of good healthcare.

Guidelines will probably be adopted on a state-by-state basis. In fact, California and Oregon already discipline practitioners, specifically physicians, for undertreatment of pain, saying that we are failing to uphold a standard of practice. Some of the barriers to adequate treatment of pain are lack of knowledge among providers about what appropriate pain management actually entails, fear of investigation by controlled substance regulators, and fear of addic-

tion and dependence, that is, fear of harming our patients. Probably the largest and least acknowledged barrier is the personal bias against sufferers of chronic pain and pain syndromes that are not necessarily pathophysiologically based or for which we cannot find a pathophysiology.

CE-TODAY: So what are the consequences of inadequate pain treatment?

Dr. Holm: The biggest consequence is that there is an immediate lack of trust on behalf of the patient toward the caregiver, and ultimately the patient will not reach his or her optimal level of wellness. Persistent pain negates self-efficacy, which is very important. Patients need to believe they can make a difference in their pain and how it affects their lifestyle. Ongoing pain promotes anxiety, depression, and insomnia, which in turn promote ongoing pain in a vicious cycle. Fear, depression, and ongoing pain also promote inactivity, which results in muscle stiffness, muscle wasting, and weight gain. Fear of pain promotes an exaggerated and persistent pathological pain response. The patient becomes excessively self-absorbed and begins to have decreased functional activities of daily living. Physiologically, ongoing pain becomes chronic pain through sensitization. Perhaps the most important thing to remember is that failure to treat the pain makes the pain become the disease.

CE-TODAY: Can you briefly discuss the role of pain assessment and management of pain?

Dr. Holm: Neither verbal expressions by the patient nor our objective view of the patient's body language is really sufficient in assessing the pain. First of all, we need to know what type of pain it is. Is it a nociceptive-type pain? Or is it paresthesia, with a numbness and tingling so severe that it hurts or causes a feeling of burning or heaviness? Or is it simply stiffness?

We all know to look for the hallmarks of onset, severity, and location of pain. Does the pain radiate or does it stay in one place? Is it intermittent or is it con-

stant? Does it happen right after you do something (e.g., is there temporal sequencing such that you move your extremity and then you have pain) or is there also pain at rest? Does the pain have a diurnal pattern? Does it happen at work? Does it happen at night? Does it wake you up in the middle of the night? Carpal tunnel syndrome, for example, has a neuropathic type of pain that will wake the patient up at night. If it doesn't wake the patient up at night you should probably be looking for a different diagnosis.

Also, consider the duration of the pain: Is it constant or brief? Does it migrate or radiate? There is a difference. Migrating is more of a darting pain, although it may be a slow darting. In rheumatic fever and relapsing polychondritis the pain may finish in one location before it migrates to the next location in the body.

How would the patient describe the pain? Is it sharp, dull, aching, squeezing, stabbing, or burning? Is it like an electric shock? This gives us a clue as to whether it's neurogenic, neuropathic, nociceptive, chronic, or visceral. What makes it worse and what makes it better?

Visual analog scales may be helpful in trying to quantify pain. The patient may look at the scale and rate the pain from 1 to 10, with 0 being no pain at all and 10 being the worst, most horrible, excruciating pain you could ever imagine. "Just shoot me; I don't want to go on," is how I explain that type of pain to my patients. There isn't a wrong answer because the scale fits each patient. A 10 is a 10 for a given patient, even though another patient might rate that same pain as a 5.

There are also physiologic approaches for assessing pain, such as vital signs. We would expect vital signs to elevate as acute pain goes up. Electrodermal activity can be measured via electrodermogram and cortically evoked potentials, but these are not practical in a typical office setting.

CE-TODAY: Once we have the patient's perception of pain and our

objective diagnosis of chronic pain, what are the goals of managing persistent pain?

Dr. Holm: Again, the first goal is adequate assessment of the pain experience. If you don't do that correctly, then you've missed the boat from the beginning. Frustration, depression, anxiety, fear, ignorance of their conditions and its trajectory, or suicidal tendencies—all of these things need to be dealt with immediately. What we're looking for is the practitioner to exude some amount of empathy and communication with the patient and to promote patient self-efficacy.

The workhorse of all of this is patient education—listening and touching. Patients like to be touched; we all know that. Realistic expectations for pain relief are what we need to communicate to the patients and to ourselves. We cannot ameliorate all pain, but we can ameliorate suffering. We need to prevent chronic pain syndromes by interrupting the cycle early and giving patients adequate pain relief. The ultimate goal is to maximize patient function and, of course, quality of life.

Exercise 1

Which of the following is not a primary goal of pain management?

- Adequate assessment of the pain experience
- Patient education
- Complete elimination of pain
- Maximizing patient function and improving quality of life

Answer on page 16.

CE-TODAY: How likely are we to achieve successful management of persistent pain in primary care settings, and when might it be appropriate for us to refer to a pain management specialist?

Dr. Holm: In most instances, we are likely to achieve good pain control. As for the second half of the question, I think most people would say it's a last resort to send patients to pain management. When they've failed everything else you send them "into the abyss,"

and they never come out of the abyss for the rest of their lives. I've heard that many times, and I've had that bias myself, but it's really not true. Pain management specialists are not necessarily a referral of last resort. Research has shown that they generally produce better outcomes, and patients report increased self-confidence and increased self-control.

There are many different types of pain management centers, but the multidisciplinary centers are probably the best. Most are anesthesiology driven, and the anesthesiologist will do injections, narcotic treatments, and treatment of withdrawal of the narcotics. Other approaches include neurological, physical medicine, rehabilitation, and psychological—all of these are useful at any stage. In primary care, it's important to be aggressive initially with pain management. We must establish trust and involve patients in their own care. We must be clear and realistic with our expectations for them and about what they can expect, and then we must incorporate both pharmacologic and nonpharmacologic approaches in our pain care.

CE-TODAY: I'd like to discuss pharmacologic interventions and the role of nonsteroidal anti-inflammatory drugs (NSAIDs) in particular, in the treatment of persistent pain. Can you discuss your experiences and knowledge about that?

Dr. Holm: In terms of pharmacologic approaches, acetaminophen is still the first-line choice. It's not really a very strong, potent, or efficacious pain reliever, and it's not an anti-inflammatory, but it's very safe. That's why it remains first line in most cases. There are no antiplatelet or gastrointestinal (GI) problems, and that's probably the biggest benefit of acetaminophen; however, it can cause problems with chronic alcoholism. If a patient is drinking more than 3 drinks a day, or if they have liver problems, you need to be very careful of acetaminophen.

Next up the line of the peripherally acting analgesics are the NSAIDs, the ibuprofen and naproxen-type medications.

These are really the mainstay of the treatment of persistent peripheral pain. They're stronger than acetaminophen, but the responses are individual. Each patient may have a different response and a different response at a different time in their life. Essentially, if one class of drugs is not working, change classes. It's a peripheral pain mediator and a peripheral inflammatory inhibition drug so it can be used concomitantly with all of the other analgesics.

Exercise 2

Acetaminophen is not advised as a treatment for chronic pain in patients with which of the following conditions?

- a. Gastrointestinal problems
- b. Liver problems
- c. Platelet disorders
- d. All of the above

Answer on page 16.

CE-TODAY: What are the major differences in NSAIDs and what are the disadvantages?

Dr. Holm: There are a number of different classes in NSAID: propionic acids, salicylates, and a number of others in between. They're all nonselective cyclooxygenase (COX) inhibitors. To review, the COX-1 isomer is called a constituent enzyme, and it protects the gastric lining. I tell my patients it's your "gut slime"; that is, it keeps your gut from eating itself with the hydrochloric acid. It also maintains renal blood

flow under certain conditions and has a hemostatic role with platelets.

Then there's the COX-2 isomer, which we call the inducible enzyme because we bring it to bear when there's a peripheral tissue insult. It begins the inflammatory reaction. COX-2 inhibitors inhibit peripheral prostaglandin production in cells and leukocyte migration. Together this gives us the anti-inflammatory portion of their work. Disadvantages are GI toxicity, including gastric ulcer and perforation of gastric ulcer. Platelet disturbances can result, and bleeding times can be altered with use of NSAIDs. They can also cause renal or hepatic toxicity. Under certain circumstances, blood pressure can be elevated, especially with concomitant use of angiotensin-converting enzyme (ACE) inhibitors. Again, there's a variable response, and there can also be problems with aspirin-intolerant asthma and frank allergy.

NSAIDs are somewhat dangerous medications. In the United States, about 100,000 patients are hospitalized each year for what are thought to be adverse effects from NSAID use and about 16,000 arthritis patients die of NSAID use. The scary part is there may be no warning signs and the adverse event can happen after a couple of days of use or a couple of months of use. Risk factors include increased age and concomitant use of glucocorticoids. The higher the dose of NSAIDs, the greater the risk. Also, if a patient has a history of ulcer, I'd be more cautious about

NSAID use, and I would never use multiple NSAIDs together.

CE-TODAY: What are the major differences between prescription nonsteroidal preparations and over-the-counter nonsteroidal preparations?

Dr. Holm: There are 3 major differences: dose, dose and dose. The problem is that the over-the-counter preparations contain a minimal dose, and the efficacy is much less. Research is very clear in showing that NSAIDs are very dose dependent, and until you reach that maximum dose you are not going to reach the maximum peripheral inhibition and pain control. But there is a ceiling response to it. You can only get X amount of pain control and that's the end of it.

CE-TODAY: COX-2 inhibitors are now popular in most primary care settings. Can you discuss the pharmacotherapeutic characteristics of these medications and some of the advantages of their use?

Dr. Holm: COX-2 inhibitors are every practitioner's dream and every insurance company's nightmare because they are fairly new and somewhat expensive compared with the older-type medications. Research shows that they are just as efficacious as the old NSAIDs and about the same in terms of efficacy of pain relief and anti-inflammation. Three are on the market at this time: celecoxib (Celebrex®), rofecoxib (Vioxx®), and valdecoxib (Bextra®). They're all selective to the COX-2 isomer and vary in levels. (Figure 1) They all carry US Food and Drug Administration (FDA) warnings of GI toxicity, possible platelet disturbances, aspirin-intolerant asthma, and elevation of blood pressure in certain circumstances, but the research is beginning to point in a different direction. Until that research is significant and submitted to the FDA, however, those warnings are not going to disappear.

Newer research suggests notably reduced GI toxicity with COX-2 inhibitors. Current research also suggests that there is no platelet inhibition, and

FIGURE 1. COX-2 SELECTIVE INHIBITORS

INDICATION	CELECOXIB (Celebrex®)	ROFECOXIB (Vioxx®)	VALDECOXIB (Bextra®)
Osteoarthritis (OA)	X	X	X
Rheumatoid arthritis (RA) (adults)	X	X	X
Primary dysmenorrhea	X	X	X
Acute pain (adults)	X	X	
Familial adenomatous polyps	X		

that you can give COX-2 inhibitors right through a surgical procedure; you don't have to stop them a week ahead of time. In addition, Gyllfors et al conducted research that was published in the *Journal of Allergy and Clinical Immunology* in May 2003. They gave 33 subjects with proven aspirin-intolerant asthma increasing doses of celecoxib or placebo. Clinical observation showed no significant bronchial restrictor responses from either the placebo or the celecoxib. Additionally, no changes were noted in nasal septal scores, and there were no signs of skin rash or GI symptoms. Keep in mind that the results do not apply to NSAID-induced urticaria, angioedema, or anaphylaxis—only to the asthma portion.

In terms of the effects of COX-2 inhibitors on blood pressure, White et al published a study in the April 2002 issue of *Hypertension* that suggests that there was absolutely no effect on blood pressure with concomitant use of ACE inhibitors. These are interesting pieces of research—they are not the last word, but they are encouraging.

Exercise 3

Which of the following statements is false?

- COX-2 inhibitors can be safely prescribed in patients with a history of ulcer disease
- COX-2 inhibitors are dose dependent
- COX-2 inhibitors are similar to non-selective NSAIDs in terms of efficacy
- COX-2 inhibitors carry FDA warnings for GI toxicity, platelet disturbances, aspirin-intolerant asthma, and blood pressure elevation

Answer on page 16.

CE-TODAY: Talk a little bit about cost issues. I know that plays a big role in my practice setting in regard to whether or not patients can afford certain drugs or whether they covered. What role does cost play in NSAID selection and use?

Dr. Holm: Obviously, the oldest NSAIDs are the cheapest. The ones that have been around a long time, such as

naproxen, aspirin, and ibuprofen, are generally the cheapest. Generic versions are available, and they are on almost all formularies; unfortunately, they tend to have higher side-effect profiles, although they are very efficacious. COX-2 inhibitors, on the other hand, are the most expensive because we are still paying for the research. But if you adjust the cost of the NSAID by the amount of times a day you have to dose the patient, and if you incorporate the price of adding proton pump inhibitors or a gastroprotective agent such as misoprostol in order to protect the stomach, there may be little difference in cost in the long run. The difference is really formulary. Is the insurance company going to pay for it or not? As always, clinical judgment is called for in terms of what we're going to use and what we're not going to use. Additionally, rofecoxib carries a warning of short-term use only, less than 5 days, and there is an additional FDA warning about ischemic heart disease, cardiovascular disease, and thromboembolic disease in caution with cytochrome P450 inducing medications.

CE-TODAY: If you were trying to determine which NSAID is appropriate for a particular patient, which patient characteristics may predict successful selection of an NSAID?

Dr. Holm: It's trial and error, and generally speaking, one will work just as well as another. It's a case-by-case clinical judgment, and one should switch classes if one NSAID doesn't work. In a young healthy individual with acute pain who is probably use an NSAID short term, and who is fairly resistant to GI upset such as heartburn, you might want to start with naproxen or ibuprofen or something like that first. However, gastroenterologists will almost always point you to the COX-2 inhibitors first, and indeed they may be correct clinically speaking in the long run. For longer-term use, if there were any question about GI history, impending surgery, anticoagulant use, or intolerance to NSAIDs because of potential side effects related to NSAIDs I would start immediately with COX-2 inhibitors.

CE-TODAY: What is the role of narcotic analgesics in managing persistent pain?

Dr. Holm: By convention, narcotics are left more for moderately severe to severe pain syndromes. That's what's necessary to ameliorate the pain, because narcotics are centrally acting at the mu receptors, whereas the NSAIDs tend to be peripherally acting and have a ceiling of pain relief. What is interesting, and probably not well known by most practitioners, is that morphine also affects the calcium and potassium channels, which are responsible for hyperpolarization; this leads to a reduction in excitability of the neurons. The use of morphine is appropriate for both chronic and acute pain; morphine is not just an acute pain medication. It's typically reserved for those patients who are not responding well to the peripherally acting analgesics.

It is important to note that morphine and the other opiates are not effective for neurogenic pain, that is, the burning type pain. We don't use morphine as much in an outpatient setting as we once did. Now we have better analogs, such as oxycodone and hydrocodone, which have fewer side effects and are readily available for oral use. There's also the fentanyl patch. Propoxyphene is used less with the onset of tramadol, because tramadol is probably more effective than propoxyphene and has minimal or no narcotic-type side effects and addictive properties. Finally, there is a new product called Darvocet A 500 in which the amount of acetaminophen has been reduced from the 650 mg in Darvocet N 100 to 500 mg, which is helpful for those patients who don't tolerate acetaminophen or who are already taking other products containing acetaminophen.

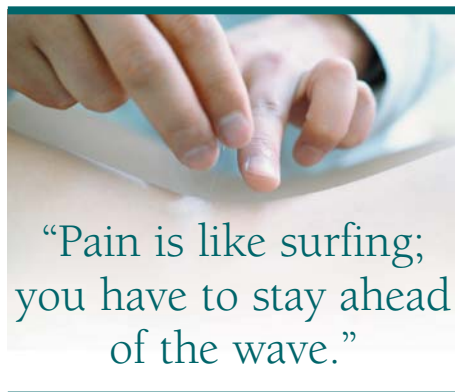
CE-TODAY: Many of my patients, particularly the older patients, are afraid of developing a tolerance to their medication and are afraid it will no longer provide relief for them. Can you talk about this issue a little bit?

Dr. Holm: That would be my fear as a patient, and I'm sure most patients do have that fear. Pain is something we try

to avoid. We seek pleasure; we avoid pain. The population in the United States is educated to the point that they know about narcotic use. They know that you build a tolerance to them and that eventually the medication may not work—and they're afraid of that. Again, it's not an issue of peripherally acting medications. They have their own ceiling, and that ceiling is present throughout the time the patient is with you.

It's important up front to reassure the patient, if appropriate, that they will be better, that the tissue damage will resolve itself, and that the pain will go away before they develop a tolerance. Now it's clear that tissue swelling and initial pain reaches its maximum point at 48 hours after insult, whether it's an operative insult or a traumatic insult. So I tell my patients the first 2 days are going to be the worst, so we may apply ice or some other types of things or give them some analgesics to keep the swelling down to reduce the pain. I try to encourage them by showing them a trajectory of pain relief that gives them something to look forward to and reassure them that by day 3 or day 4 they will start getting a little bit of relief. Thus, they don't panic as much for the first 2 days. If they panic in the first 2 days they may buy into that "sick role"—the fear, the anxiety, and so on that may discourage them.

I also give them pain medications by the clock initially and not just p.r.n. I explain to them that pain is like surfing; you have to stay ahead of the wave. As long as your pain is ahead of that wave, you're okay. We get their blood levels up with our initial dosing and then we keep that up by doing



around-the-clock dosing. If they miss a dose, the wave may crash over them, and it's going to be difficult for them to get back on top of their pain control again. If it doesn't work we can adjust their pain medications either in dose, by mixing them, or by changing them altogether.

Exercise 4

Which of the following may occur as a result of consistent, unrelieved pain?

- a. Assumption of a “sick role”
- b. Ulcers
- c. Comorbid depression
- d. All of the above

Answer on page 16.

CE-TODAY: When is it appropriate to use nonanalgesic pharmacologic interventions?

Dr. Holm: There are many, many different types of nonanalgesic drugs that we should be using. We've discussed some of them already. A controversial group, especially in musculoskeletal pain, is the glucocorticoids—methylprednisolone (Medrol Dosepak) and prednisone, for example. These drugs do have a rheumatology and collagen indication from the FDA.

In my practice, I frequently use methylprednisolone or prednisone in a decreasing dose over a short time and get rather remarkable results. With low back pain or certain other types of musculoskeletal pain, even herniated disks, I have found that sometimes you can avoid surgery by use of these medications. They do not mask the pain, but they actually get at the source of the pain and promote anti-inflammation and even reduce swelling. If you have a herniated disk that's pushing on a nerve, sometimes you can reduce the swelling just enough to relieve the pressure and relieve the pain.

Glucocorticoids are obviously very potent, and the trade-off for that potency is that they also have a lot of side effects. If a patient has a history of peptic ulcer disease or gastric ulcer disease, I tend to shy away from glucocorticoids because they knock off the anti-inflammatory prostaglandin chain a step higher than even the nonsteroidals do, and they have a more potent effect. If a patient has an infection, we might give them an antibiotic to go with the glucocorticoid for their bacterial infection.

As far as muscle relaxants go, the take away message is that they don't relax muscles. They have absolutely no effects on the motor end plates whatsoever; research is very clear on that. So why do we use them and how do they work?

For one, they have sedating factors, and if you relax your posture because you are more sedated, then you are going to have less muscle spasm and reaction. Secondly, there seems to be some additive or potentiating effect with the analgesic medications that may be centrally acting in terms of the emotive portion, or it may actually be physiologic in terms of the nociceptive portion. Muscle relaxers do work in terms of reducing the patient's pain and suffering.

Botulinum toxin type A injections are used as a neurotoxin for cervical dystonia, seventh cranial nerve disorders, and those sorts of things, but its use is fairly limited for pain management.

In terms of rheumatoid arthritis, the disease-modifying antirheumatic drugs are very effective, but also very toxic. I tend to leave those for the specialists because it's an area of toxicity and responsibility that I choose not to get into. Research has shown quite clearly that the antirheumatic drugs decrease inflammation and retard dysfunction brought on by rheumatoid arthritis. It's important to use them early in the diagnosis of rheumatoid arthritis to try and prolong the patient's wellness as long as possible.

The antimalarial drug hydroxychloroquine, which is a dihydrofolic acid reductase inhibitor, is one of a number of drugs indicated for rheumatoid arthritis. You don't want to use it with other NSAIDs, especially high-dose NSAIDs, however. You also need to avoid alcohol and sulfonamide use, and

FIGURE 2. PAIN MANAGEMENT



you have to be careful about bone marrow suppression.

Gold can be given either orally or parentally, and research shows that good long-term functional outcomes can be achieved with these. Probably one of the most popular drugs for use with rheumatoid arthritis is methotrexate, which is used primarily for the more severe cases. The antibiotic minocycline is also used along with the TNF antagonists which seem to be effective, but the long-term effects are still under study. Mixing the disease-modifying agents is very, very efficacious. Randomized clinical trials have indicated that this increases the effectiveness, although the long-term safety again remains unclear.

Tricyclic antidepressants, selective serotonin reuptake inhibitors, and anticonvulsants, can be used for neuropathic pain as well as tramadol. Narcotics again are not effective for neuropathic pain. Also, we shouldn't forget the topical medications. I tend to use methyl salicylate as a topical analgesic. Research has shown use of a topical analgesic will result in a 60% higher dose of anti-inflammatory regionally than taking oral NSAID alone, and it won't have adverse effects on the rest of the body.

Capsaicin, which wipes out substance P locally, is also very effective; it's actually a pepper preparation. The problem with capsaicin is that although it wipes out substance P initially, if you use it too long there's a paradoxical flooding of substance P into the area eventually, and the pain becomes much worse

then it was initially. Antihistamines also potentiate narcotics and allow us to use narcotics at a lower dose, just as tranquilizers and caffeine increase the analgesic effect of aspirin, acetaminophen, and ibuprofen.

CE-TODAY: Wonderful overview of the pharmacologic interventions for pain management. Dr. Holm, can you discuss the nonpharmacologic interventions that we might use in our patients for chronic pain management?

Dr. Holm: Unfortunately, we don't use the nonpharmacologic interventions enough (Table 1). They are a bit time consuming for us in our busy practices. They are not a very good time return for the money, if you will. However, they are extremely important in pain management and patient self-efficacy. Especially for musculoskeletal and some neuromuscular disorders, they might include the domains of physical medicine: heat, cold, ultrasound, electrostimulation, refrigerant sprays, manipulation, physical therapy, exercise, aerobic exercise (which helps to pump the body full of some endorphins), stretching casts, splints, braces, corrective shoes. They're all very important.

In terms of heat and cold, I get asked all the time which is better and when do I use them. The answer is that we don't really know; it's more religion than science. Tissue reaches its maximum swelling in 48 hours, so theoretically it makes sense to apply ice for at least the first 48 hours. This results in some analgesia and reduction of swelling, which means reduction of pain and there is less to come back in the rehabilitative phase. I tend to use ice 20 minutes at a time or

less to prevent any problems with skin burning, and for the first 2 days I recommend applying the ice least 3 times a day and as often as 20 minutes on followed by 20 minutes off the ice and elevation. I tell the patient that after the first 2 days heat will work better. Research shows that moist heat works better than dry heat, although the reasons are not clear. So hot bath or hot shower are ideal.

I might suggest at this point that soft cervical collars promote the sick role and do nothing to alleviate muscular pain or any other pain in the neck. If a patient needs a cervical collar for a neck strain, the patient needs a semi-rigid cervical collar like an aspen collar or Philadelphia collar, and it should only be used short term. If they have a herniated disk, perhaps you want them to wear it when they are in a moving vehicle to avoid a potential whiplash-type injury, but other than that, avoid cervical collars altogether in stable situations.

Psychosocial needs must be addressed as well. (Figure 2) Every patient expects to get some form or amount of counseling from their primary care provider and that's an expectation we need to meet and starts with communication. There was an interesting study published in 1992 where they did periodic telephone calls to patients who had knee osteoarthritis. Just that fact calling and saying, "I'm concerned about you. How's it going? Are things working out for you? Are you getting better?, etc. had a great response. Compared to placebo, there was much less pain in the group that received the telephone calls than in the control group. Patients need

TABLE 1: NONPHARMACOLOGIC INTERVENTIONS FOR PAIN MANAGEMENT

Acupuncture/acupressure	Nerve blocks
Attention diversion	Physical therapy
Behavior modification	Positive Imagery
Cognitive structuring	Prayer
Electrostimulation	Refrigerant sprays
Exercise	Relaxation techniques
Heat and cold	Stretching casts, splints, braces, and corrective shoes
Hypnosis	Stress management
Manipulation	Ultrasound

reassurance and reasonable expectations. Remember that the placebo effect is a powerful analgesic; take advantage of it.

All persistent and chronic pain has features of anxiety, fear, depression, demoralization, frustration, and so on. In addition, pain varies according to the individual person. Persistent pain for you may be weeks, but for me it may be hours. If I come in expecting that my pain will be gone by the time I leave your office, and I'm hurting almost as much when I leave, then to me that's persistent pain. So remember to look at this from the patient's viewpoint and not only from your own.

Be reassuring. Listen. Patients like to be listened to. I recently heard of a study that said primary care providers tend to interrupt their patients in the first 20 seconds! It's very difficult to feel like you're being listened to when you can't even get out a complete sentence without being interrupted. Touch the patient. Communicate with the patient. Again, communication is 2/3 listening and 1/3 speaking. I teach that communication is complete when you say something to me, I repeat it back to you as I heard it, and you confirm that I heard it correctly. That's the only time that you really have complete communication.

Promote stress management, behavior modification, and self-efficacy. Remember that avoidance behavior gives you

decreased muscle tone and range of motion and promotes weight gain. Stress management is important because the cycle of the pain pushes stress; life events creep in, and this increases the pain. Stress can actually initiate spasms and enhance or perpetuate existing pain. This will lead to decreased tolerance and decreased coping with the existing pain.

You need to treat stress with support systems. Look around and see what's available to them. Family members may be very helpful. Get the patient to be realistic about unloading daily tasks. Today, everybody does 10% to 20% more than they reasonably should be doing in any given day or week. Teach the patient coping mechanisms, and promote self-efficacy. Get the patient in touch with reality. Do this early before negative belief systems become too entrenched.

You can also teach patients attention diversion. For instance, research has shown that the time from injury to wellness is 30% longer for worker's compensation patients who may be sitting at home thinking about their pain than for other insured patients with the same diagnosis. Teaching patients cognitive structuring techniques is also helpful. Encourage them to say things like, "I'm not going to let this beat me; I'm going to beat it; I have a good caregiver, a strong body, and the ability to get over this." And most patients will get over it: 90% all back pain patients get better in 90 days, and more than half of

those get better in the first 2 weeks. Let your patient know that you expect them to get better. If patients know where they're going to go and they know what's expected of them, most of them will do that.

Teach your patients relaxation techniques. Positive imagery is very, very helpful. I can sit here and think about horrible excruciating pain that I've had in my life and start to hurt, or I can think about wonderful pleasure that I've had in my life and start to not hurt, and so it does have very positive effects. The 17th-century French philosopher René Descartes was absolutely wrong he said there was a mind-body dualism. There is no mind-body dualism. In fact, there's a very big connection between the mind and the body and it works both ways. For many patients, sincere corporate prayer can be very, very helpful. It's not something you should fake, but if you can go there, it may be helpful.

Getting back into the realm of more physiologically based techniques, electrical stimulation, either pulsed or transcutaneous electrical stimulation, have been shown to be helpful, especially for neuropathic pain. Sometimes electrical stimulation is applied topically with the electrodes, and sometimes it's actually implanted. Sometimes vibratory stimulation can accomplish the same results. It can also be used for persistent, nociceptive, and neuropathic pain. The more localized the pain, however, the better it's going to work. Research shows positive effects compared to placebo; 30% of those with chronic pain reported feeling better, as did 60% of those with acute pain 60%. Unfortunately, we tend to use these techniques for the more chronic, persistent pain, and we don't use them early when they are probably more effective.

Does acupuncture work? Yes, acupuncture has been shown to be better than placebo. Acupuncture techniques range from mechanical stimulation to electrical mechanical stimulation, needles with electrodes, just needles, or acupressure. Many years ago, I learned an effective acupressure technique for coping with sinus headache and pressure from an article in *The New England Journal of*

Medicine. Pushing for 30 seconds 3 times each in succession on the supraorbital nerve, the mandibular nerve between the nose and the upper lip, and the supraorbital nerve on the chin changes the vasculature in the sinus and actually opens things up and breaks sinus headaches. My wife has frequent headaches of this type, and I have never failed to break her headache with this technique.

Other, invasive pain management techniques are done more often by specialists. These include nerve blocks in the spine; epidural steroids, which work not for isolated back pain, but only for the radicular leg pain; and surgery to relieve stenosis caused by bone spurs or perhaps herniated disk. These types of techniques relieve pain by getting rid of the mechanical pressure. Trigger point injections, joint injections, and arthrocentesis would also fall into this category.

Arthrocentesis involves removing large amounts of fluid and blood from a joint where there's pressure and effusion. When the fluid is removed, the pain relief is immediately apparent and the patient walks out very thankful for what you've done.

In terms of arthritis of the larger joints (e.g., knees), intraarticular injections of sodium hyaluronate are under investigation. Early research shows that it's very effective, even beyond the time that we would theoretically believe it to be effective. Sodium hyaluronate is really a highly viscous polymer of cartilage that prevents bone-on-bone erosion. Even more invasive is rhizotomy, which is an ablation of a nerve through chemical or radio frequency means, and neurolysis, which is surgical ablation. This technique is used when the patient has intolerable chronic pain and there's nothing left but to destroy the nerve to stop the pain.

There are also spinal opiate pumps, which pump the opiate medications directly into the intrathecal sac. This technique is useful in nonmalignant chronic pain. The benefits are still questionable; we don't have the answer in terms of research. And, finally, there are nutraceuticals, or functional foods, which many consider to be medications. Preliminary research on chondroitin and

glucosamine sulfate is somewhat equivocal, but tends to indicate that they work in the larger joints, hips and knees, for example, but may not be as effective for fingers and smaller joints.

Exercise 5

List and briefly describe 3 nonpharmacologic interventions you might initiate in a patient with a chronic pain syndrome such as rheumatoid arthritis:

Answer on page 16.

CE-TODAY: You have given us a wonderful overview of both the pharmacologic and the nonpharmacologic interventions. I feel a renewed passion to go out there and tackle chronic pain. Before we finish, can you share any final caveats on the management of pain in primary care settings?

Dr. Holm: I can sum it all up by saying that number one you need to evaluate your own prejudices about pain and pain management before you go out and try and evaluate your next patient's pain. That may be very difficult to do. I still have a lot of prejudices, bias, and maybe even ignorance that I'm wrestling with. If you have dealt with your own prejudices, then when the patient walks in you're ready, you're prepared, you're psyched, you're going to do the right thing, and you're going to try something new this time.

Begin with a thorough history, which is 90% of the process, perhaps, and then do a thorough physical examination to back up your history. Establish a good rapport with your patient and try to be empathetic. Educate and partner with the patient. I am a big believer in getting my patient to "buy in" to the treatment and understand what we're doing. Compliance is important, too. Although it may not be a politically correct term, it's a concept we can all get our arms around. Patient outcomes are better when the patient buys in to the process and

believes, "This my body, and I can have a big effect on it."

Use all of the tools at your disposal to minimize or eliminate the pain. If you can't eliminate the pain, at least eliminate the suffering. Your approach may vary from mechanical to psychological, pharmaceutical, pain management, or maybe early referral to a pain specialist if you think that this is not going to be a quick, easy type of pain-management situation.

If you don't feel comfortable with managing the pain, refer it, just like you would any other condition. Pain is a true pathological condition, and it deserves referral just as much as an orthopedic, surgical, or cardiac condition.

Finally, be certain that you have the correct diagnosis. If you fail to correct the underlying pathology the pain isn't going to go away, and it's going to become persistent and/or chronic pain. Make sure your treatment plan is good. You don't want the patient to move beyond acute pain. You want them to suffer as little pain as possible for as long as possible, and it takes a concerted effort on the part of the practitioner and all of the people in the office to accomplish this.

CE-TODAY: Thank you so much Dr. Holm. ■

Dr. Gregory Holm, NP-C is an assistant professor at the University of South Florida in Tampa, holding dual appointments in the College of Nursing and the College of Medicine. He maintains a clinical practice at Lakeside Occupational Medicine Centers, P.A. Dr. Holm is active in the American Academy of Nurse Practitioners where he has participated in item writing and test construction for the national certification exams for six years, as well as being a charter member of the Practice Based Research Network. His program of research involves macromolecules and neuro-muscular disorders. Dr. Holm is a published author and nationally known speaker.

Answers

Exercise 1

Which of the following is not a primary goal of pain management?

- a. Adequate assessment of the pain experience
- b. Patient education
- c. Complete elimination of pain
- d. Maximizing patient function and improving quality of life

Answer: c. For a variety of reasons, complete elimination of pain may not always be possible. Therefore, providers should focus on the amelioration of suffering by utilizing appropriate tools to properly assess and diagnose the cause of pain, communicating realistic pain relief expectations to the patient, and ultimately strive towards restoring patient function and quality of life.

Exercise 2

Acetaminophen is not advised as a treatment for chronic pain in patients with which of the following conditions?

- a. Gastrointestinal problems
- b. Liver problems
- c. Platelet disorders
- d. All of the above

Answer: b. If a patient consumes moderate to heavy alcohol on a daily basis or if they have a comorbidity of the liver, acetaminophen therapy should be avoided.

Exercise 3

Which of the following statements is false?

- a. COX-2 inhibitors can be safely prescribed in patients with a history of ulcer disease
- b. COX-2 inhibitors are dose dependent
- c. COX-2 inhibitors are similar to non-selective NSAIDs in terms of efficacy
- d. COX-2 inhibitors carry FDA warnings for GI toxicity, platelet disturbances, aspirin-intolerant asthma, and blood pressure elevation

Answer: a. All NSAIDs, including COX-2 inhibitors, should be prescribed with extreme caution in patients with a prior history of ulcer disease or GI bleeding. The

risk of GI-related adverse events associated with the use of COX-2 inhibitors (coxibs) is considerably less than that associated with the use of nonselective NSAIDs, but the same warnings and precautions regarding adverse GI effects should be considered since the prescribing information states that serious GI toxicity can occur at any time with or without warning.

Exercise 4

Which of the following may occur as a result of consistent, unrelieved pain?

- a. Assumption of a "sick role"
- b. Ulcers
- c. Comorbid expression
- d. All of the above

Answer: d. Ulcers, sick role, depression, somatization, and even suicidal tendencies all tend to appear with chronic pain. The longer the pain persists, the more likely the patient may succumb to one or more of these complications of unrelieved pain. Therefore, in addition to physiologic treatment, stress management, behavior modification, and promotion of self-efficacy are all essential elements of an overall plan of effective pain management.

Exercise 5

List and briefly describe 3 nonpharmacologic interventions you might initiate in a patient with a chronic pain syndrome such as rheumatoid arthritis:

Answer: The most effective pain management strategies utilize a biopsychosocial approach that combines both pharmacologic and nonpharmacologic therapies and a consistent emphasis on patient education. A variety of nonpharmacologic interventions are recommended for persistent and chronic pain conditions. See pages 13 to 15 for a description of some practical and useful techniques.

Further Reading

Gyllfors P, Bochenek G, Overholt J, et al. Biochemical and clinical evidence that aspirin-intolerant asthmatic subjects tolerate the cyclooxygenase 2-selective analgetic drug celecoxib. *J Allergy Clin Immunol.* 2003;111:1116-1121.

White WB, Kent J, Taylor A, Verburg KM, Lefkowitz JB, Whelton A. Effects of celecoxib on ambulatory blood pressure in hypertensive patients on ACE inhibitors. *Hypertension.* 2002; 39:929-934.



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