Dynamic Chiropractic

CHIROPRACTIC (GENERAL)

A Medication Primer for Alternative Health Care Practitioners (Part 2)

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Editor's introduction: As discussed by Dr. Robinson in part 1, the purpose of this article is not to endorse medication use, but rather to arm health care practitioners with the knowledge they can use when evaluating patients, most of whom are likely taking some form of medication. As he explained in part 1: "Let's face it: Most people who seek your care are likely taking medication. These medications have distinct effects on their physical condition, as well as their mental and emotional condition, which may affect the treatment you select for them and also their response to your treatment. An important aspect of your careful evaluation is to sort through what medications your patients are taking."

Drugs for Pain Control

Morphine is arguably the greatest drug of all time, at least in the sense that it is so powerful in relieving pain. It works when nothing else will and is particularly useful for those at the end of their lives with terminal health problems such as metastatic cancer, who do not deserve to end their Earthly existence with so much suffering.

Discovered in 1804, morphine was first distributed by Merck in 1827. Merck, the first modern drug company, was then a small chemist's shop in Germany, which quickly expanded to include an adjoining small drug factory. Morphine became more popular after the invention of the hypodermic needle and syringe in 1857, which made the drug have far more powerful effects (otherwise partly inactivated by the GI tract).

Unfortunately when drugs are so powerful in their main effects, they also tend to have powerful side effects. Side effects of morphine include:

- Respiratory depression, which can be life-threatening.
- Constipation, which can be severe.
- Nausea and vomiting are not uncommon, especially with initial doses, but may go away with

repeated use.
- A curious spasm of the bile ducts may renders it unsafe to use in patients who have gallbladder disease or biliary colic from gallstones.

Because of these side effects, pharmacologists developed other opioid narcotics which are also powerful pain-killers, although not quite as strong as morphine. They also have side effects, but less so than morphine. These include levophanol (Levo-Dromoran), oxycodone (OxyContin), hydrocodone (Hycodan; many other brand names), hydromorphone (Dilaudid), methadone (Dolophine) and the popular drug meperidine (Demerol).

Methadone is less addicting than some of the other narcotics, and it does not require injections. It is used in drug-addiction clinics to help addicts withdraw from narcotics.

Another powerful narcotic that has become very popular as a preoperative medication is fentanyl (Sublimaze). It has the benefit of being less likely than morphine to cause respiratory depression.

Side effects of these other narcotic agents are similar to morphine, but less pronounced. Especially think constipation with all these drugs. All are addictive when taken for prolonged periods of time and all lead to tolerance, requiring more of the drug for the same effect. Drug withdrawal can be challenging.

There is also a group of weaker narcotic analgesics, the classic being codeine. A small percentage of codeine is converted to morphine when it is ingested by mouth (about 10 percent). Its pain-killer activity is due to the morphine. There are also other similar drugs, such as Talwin, Darvon and Nubain, which are milder in their analgesia than the strong narcotics and have the same side effects, albeit to a lesser degree (nausea, constipation are common).

Combinations of weak narcotics and NSAIDs (nonsteroidal anti-inflammatory drugs) are among the most popular medications. All require prescription and are used for severe headaches, recovery

from surgery, dental pain, muscular aches and pains – when the "big guns," with all their addiction potential, are not deemed necessary Here is a list of potential combinations some patients may be taking:

- Tylenol with codeine No.3: 30 mg of codeine and 325 mg of Tylenol
- Tylenol with codeine No. 4: 60 mg of codeine and 300 mg of Tylenol
- Vicodin: 5 mg hydrocodone and 650 mg of Tylenol
- Percocet: 5 mg oxycodone and 325 mg of Tylenol
- Percodan: 4.5 mg of hydrocodone, 0.38 mg oxycodone, 325 mg aspirin
- Fiorinal with codeine No. 3: 30 mg of codeine, 325 mg of Tylenol, 40 mg of caffeine, and 50 mg butalbital (used for migraine headaches)

So, in terms of treating pain with medication, there are three levels to be aware of. Different drugs are utilized in different settings depending on the severity of the pain:

1. *Mild to moderate pain*: Aspirin, Tylenol, Alleve, Advil, Motrin or other NSAIDs. No prescription is required.
2. *Moderately severe pain*: Tylenol with Codeine, Vicodin, Percocet or the generics of these drugs. A prescription is needed to obtain these drugs. Someone recovering from surgery, for example, is often glad to be on them for a while.
3. *Very severe pain*: A full narcotic: Morphine and Demerol are widely used in the hospital setting, and OxyContin, which is often administered as an absorbable patch, is a very popular drug in extended care facilities and with the VNA, the Visiting Nurses Association, which deals with terminal cancer patients in the home.
4. *Narcotic antagonists*: Two drugs are widely used in hospital and emergency rooms to combat narcotic overdose: naloxone (Narcan) and naltrexone (ReVia). Both block opioid receptors and reverse the effects of narcotics. They are commonly used in cases of narcotic overdose in the hospital with respiratory depression or hypotension, or with a drug addict who has suffered an overdose.

Respiratory Drugs

Before we discuss these drugs, we need to briefly review the autonomic nervous system, which controls all the unconscious, automatic functions of our bodies, because these drugs affect this nervous system. There are two divisions – the sympathetic nervous system, which governs the fight-or-flight responses of the body and is stimulated by fear or anger; and the parasympathetic nervous system or "housekeeper" nervous system: in charge of all body processes when we are at rest and not feeling threatened.

These two divisions of the autonomic nervous system counterbalance each other, e.g., the sympathetic makes the heart beat faster; the parasympathetic makes it beat more slowly. In many ways they have a *yin / yang* balance with each other.

The neurotransmitter of the sympathetic nervous system is norepinephrine, a catecholamine. It is also stimulated by other catecholamines such as epinephrine and dopamine, and also by adrenergic drugs (we'll discuss some of them later).

The neurotransmitter of the parasympathetic nervous system is acetylcholine. It is also stimulated by other cholinergic drugs, as we'll discuss. But let's talk a little more about these two systems first.

The Sympathetic Nervous System: When activated, it promotes a "fight or flight" response. Activation thus leads to body arousal and energy generation, and inhibits digestion. It diverts blood flow away from the gastrointestinal (GI) tract and skin via vasoconstriction. Blood flow to the

skeletal muscles and the lungs is enhanced (by as much as 1,200 percent in the case of skeletal muscles). It dilates the bronchi and bronchioles of the lungs, which allows for greater alveolar oxygen exchange.

The SNS also increases heart rate and the contractility of cardiac muscle cells, thereby providing the enhanced blood flow to skeletal muscles. It provides vasodilation for the coronary vessels of the heart, enabling the heart to beat faster and stronger. It dilates the pupils of the eyes and relaxes the ciliary muscle to the lens, allowing more light to enter the eye and improving far vision.

It also constricts all the intestinal sphincters and the urinary sphincter, to keep them "quiet." It inhibits peristalsis throughout the intestinal tract. Curiously, the sympathetic nervous system also takes over from the parasympathetic at the completion of a sex act, stimulating actual orgasm. This may have a survival benefit for mammals in general, as they are most vulnerable to other predators when they are busy copulating. And, after all, we are all mammals.

There are two divisions of the sympathetic nervous system: alpha and beta. The *alpha* sympathetic nerves cause the blood vessels in the muscles to dilate and the major arteries through the rest of the body to constrict, raising blood pressure as needed to achieve maximum activity and strength while increasing flow to the muscles. The *beta* sympathetic nerves go to the heart and lungs: stimulating the heart to beat faster and stronger, and stimulating the bronchioles to dilate and the lungs to breathe faster and deeper. Drugs have been designed which stimulate, or block, one or the other of these two divisions, depending on the problem being treated.

The Parasympathetic Nervous System: When activated, the PNS promotes a "rest and digest" response, blocking the alarm responses, calming of the nerves, returning the body to regular function, and enhancing digestion. It dilates blood vessels leading to the GI tract, increasing blood flow needed for digestion. This is important following the consumption of food, due to the greater metabolic demands placed on the body by the gut.

The parasympathetic nervous system can also constrict the bronchiolar diameter when the need for oxygen has diminished. This protects the lungs and the body in general from toxic substances in the air: dusts, smoke, toxic chemicals, sand (when this becomes an overreaction, this is what leads to asthma, as we'll discuss).

Dedicated cardiac branches of the vagus nerve impart parasympathetic control of the heart, slowing the heart and diminishing the force of contraction to rest it as much as possible.

This nervous system also causes constriction of the pupil and contraction of the ciliary muscle to the lens, allowing for closer vision and quiet work: making arrow points from flint, or perhaps, at other times in our human history, repairing fine watches. It stimulates salivary gland secretion and accelerates peristalsis; thus, in keeping with the rest and digest functions, appropriate PNS activity mediates digestion of food and indirectly, the absorption of nutrients.

The parasympathetic nervous system is also involved in the erection of the male genital via the pelvic splanchnic nerves. It stimulates sexual arousal leading up to climax; then the sympathetic nervous system takes over.

Drugs that Dilate the Bronchioles (for Treatment of Asthma): Some sympathetic stimulation drugs attach to beta receptors, which preferentially affect the lung bronchioles, relaxing them and counteracting the bronchospasm of asthma. Asthma is an overreaction mediated by the inflammatory system of the body to noxious particles in the air. This bronchodilation is the same process that occurs during an alarm reaction with sympathetic nervous system stimulation. These

drugs include Alupent, Ventolin, Brethine and Maxair (their generic names are not well-known). These medications can be aerosolized in an inhaler, with dose-controlled puffs.

Other bronchodilator drugs include theophylline and aminophylline. These two drugs are xanthines, in the same class as caffeine. They are also central nervous system stimulants (caffeine has the least bronchodilation effects).

Other widely utilized drugs for treating asthma include steroids, like cortisone and prednisone, which counteract the inflammation in the bronchioles that occurs in this disease along with bronchoconstriction.

New asthma drugs: Singulair blocks the white-cell release of histamine and leukotriene that leads to bronchoconstriction. It is used to prevent an asthma attack. It does not work during an attack to stop it. This relatively new drug works well, with relatively few side effects.

The newest, most powerful drug is Xolair (omalizumab). It is a monoclonal antibody to IgE (immunoglobulin E, released during asthma attacks) and it works wonders in severe asthma (selectively blocks IgE release by the white cells in the lung tissue). However, Xolair must be given by subcutaneous injection, usually every two weeks. It is also very expensive ($30,000-$40,000/year), and can cause anaphylactic reactions in some patients. Yet it often works better than anything else in severe cases of asthma, which can otherwise lead to *status asthmaticus*, a very intense attack of asthma that requires hospitalization and may be life-threatening.

Drugs for Gastrointestinal Problems

Not everyone has asthma or heart disease, but *everyone* has GI problems at one time or another. Dyspepsia is extremely common: stomach pain, cramping and fullness. Fifteen percent of American adults have or will have a stomach or duodenal ulcer! Twenty percent of American adults have GERD (gastroesophageal reflux), with burning substernal pain radiating into the throat. Virtually everyone gets constipation or diarrhea at some time.

Drugs for dyspepsia, ulcers and GERD: The relatively new wonder drugs for severe dyspepsia, ulcers and GERD are the proton-pump inhibitors. These powerful drugs inhibit the formation of hydrochloric acid in the parietal cells of the stomach. It is the hydrogen ion that makes it acid (H+, a single proton), which is formed in the stomach parietal cells in a pump-like mechanism

The most popular proton pump inhibitors are omeprazole (Prilose), esomperasole (Nexium) and a popular, relatively new combination of omeprazole and sodium bicarbonate known as Zegerid. Prilosec and Zegrid are over-the-counter drugs, but Nexium still requires a prescription.

Other widely used drugs for these GI disturbances are the histamine 2 receptor antagonists (sometimes called H2 receptor blockers). Histamine 2, produced by the body, is required for the formation of stomach acid (HCL). Cimetadine (Tagamet), developed in the 1970s, was the first blockbuster drug, earning more than $1 billion a year for its developers. Another very popular drug of this type is ranitidine (Zantac).

H2 receptor blockers or proton-pump inhibitors can be given IV to patients who are critically ill in the ICU to prevent stress ulcers. Hospital patients with serious conditions of all sorts are often placed on Tagamet or Prilosec. Both work well under these conditions to prevent GI bleeding in highly stressed patients who are in shock, have a severe infection or may be recovering from a severe automobile accident.

H. pylori (a bacteria) is present in virtually all peptic ulcers and is treated pharmaceutically with

antibiotics, usually a combination of two of them: metronidazole (Flagyl) and doxycycline (Vibramycin).

Antidiarrheal agents: Diarrhea (*dia* = through, *rhea* =flow) is a common experience for most humans. Causes include toxic substances in the diet (food poisoning), drug reactions, viral infections (Norwalk virus), and, of greatest concern, bacterial infections (*Staph, E. coli, Salmonella*).

Treatment: Suspicious drugs should be stopped,and substituted for some other drug if continuing treatment is necessary. Most other cases of diarrhea are self-limiting over 1-2 days and respond to the BRAT diet (bananas, rice, apple sauce, and tea, to calm the intestinal tract and replace lost electrolytes such as potassium and sodium).

If necessary (for example, some cases of Norwalk virus diarrhea), antidiarrheal drugs, such as bismuth (Pepto-Bismol) or loperamide (Imodium) are used. Bacterial infectious diarrhea is more serious, presenting with fever, abdominal pain, and bloody diarrhea. Stool samples show white cells and cultures are often positive for *Salmonella, Shigella, Camplylobacter,* or *Staphlococcus*. Appropriate antibiotics are needed (often ciprofloxacin or doxycycline). Giardia diarrhea is caused by a parasite that shows up in the stool of campers. It responds to metronidazole (Flagyl).

Laxatives: Most episodes of constipation are transient. Many are related to travel, a change in activities or diet, or prolonged immobilization after surgery or accidents. More severe forms can be due to certain drug reactions (iron replacement, narcotics, anticholinergics). Constipation is common in the elderly.

Conservative treatment is best, if possible, with increased fiber in the diet and, if needed, bulk-forming agents such as psyllium fiber (Metamucil) or konsyl fiber (Mitrolan), which have no side effects. In severe constipation, drug treatments are often prescribed by physicians. These include stimulant laxatives such as bisacodyl (Dulcolax), cascara or senna (Senakot). Chronic use of these agents can cause dependency. Chronic senna use may actually damage the nerves to the colon, leading to intractable constipation, which often requires manual disimpaction by a nurse!

Milder drugs for constipation are much preferred. Those that draw water into the colon include milk of magnesia or polyethylene glycol (Miralax). Colace improves the penetration of water into the feces and causes increased bulk. Mineral oil lubricates the feces if the stools are especially compacted and dry, and helps with elimination.

I hope this brief summary has been helpful. In my final installment of this series, I will discuss drugs for cardiovascular disease, antibiotics (along with antiviral and antifungal agents), and anti-inflammatory and immune-suppressant drugs.

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