Opioid Conversion Tables: How Accurate Are They?

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All our currently available opioids have been around for some time and have been widely used, so you might think that by now we would have a reasonably good idea of the equianalgesic doses when switching from one of these drugs to another. Unfortunately, this isn’t so.

A recent review found just how little agreement there is on the subject. It examined the opioid conversion tables in 4 national pain management guidelines and 5 state guidelines and found a great deal of variability among the recommendations in them.

There are a number of reasons why physicians might want to switch from one opioid to another. Rotating opioids can reduce the risk of developing tolerance to the analgesic effects of any single drug and of developing hyperalgesia (where the extended use of an opioid can actually reduce the pain threshold, resulting in a worsening of the pain). Thus, changing to another opioid can be quite beneficial.

Sometimes we may want to switch drugs because of certain special characteristics of individual drugs. For example, although parenteral morphine and long-acting oral morphine are very effective, immediate-release oral morphine is much less so. Thus, when a patient on parenteral morphine during a hospital stay is discharged and requires only an oral opioid on a prn basis, a switch to an alternative, such as oxycodone, may be made. Similarly, it may be decided to switch a patient who has difficulty in tolerating oral opioids from one of these medications to a fentanyl patch.

We currently know of at least 2 factors that appear to be of special importance in complicating equianalgesic dosing: differences in how each of the medications exerts its analgesic effects and the degree of variability in how our bodies metabolize them. There may be other factors yet to be discovered that are of equal if not greater importance.

The most commonly used class of opioids is the μ-opioid receptor agonists. Although we classify these together, there are differences among them. There appear to be at least 7 subtypes of μ-opioid receptors, and there are differences as to how strongly each drug in this class binds to them. Therefore, when one opioid is switched for another, you retain some degree of the tolerance developed in response to the first drug but there also is opioid naivete similar to what would be present if opioid therapy was just being initiated.

With regard to variations between otherwise healthy patients who are not taking other medications, of most importance is the metabolism of these drugs by the hepatic cytochrome P-450 isoenzyme system. Several of the most commonly used opioids—including oxycodone, the opioid in Percocet and OxyContin; hydrocodone, the one in Vicodin and Lortab; codeine; and tramadol (Ultram)—are metabolized to their analgesic forms by the P-450 2D6 system.

How active this system is in the person taking one of these drugs can markedly affect the level of analgesia and risk of adverse events experienced by that person. Patients who have weaker 2D6 systems and thus are slower metabolizers usually receive less of an analgesic effect; those who are rapid metabolizers experience a far stronger one. In contrast, methadone is inactivated by other P-450 izoenymes so that the strength of these systems will have the opposite effect on the efficacy of and the adverse events associated with this medication.

Unfortunately, the importance of the P-450 system is overlooked, with potentially life-threatening consequences.
Although it is now possible to perform a lab test to measure the strength of the P-450 isoenzymes in patients, routine use of the test is not generally recommended to aid in choosing and dosing of opioids. Some insurance plans will pay for this testing for a limited number of reasons, most notably to determine the potential efficacy of clopidogrel (Plavix), which is activated by a P-450 2C19 system.

All these factors can potentially affect opioid dosing without adding other confounding issues that are often present. For the most part, the conversion tables are based on studies of healthy, non-geriatric adults who aren’t taking any other medications, so most tables don’t even begin to take into account many other factors that can have a substantial impact on opioid efficacy and adverse events. Age can affect metabolism. If patients have liver or kidney disease, this may also play a role in response to opioids.

Some commonly used medications are P-450 2D6 inhibitors, most notably the selective serotonin reuptake inhibitor antidepressants, especially paroxetine (Paxil) and fluoxetine (Prozac), and the serotonin–norepinephrine reuptake inhibitor duloxetine (Cymbalta), which is also FDA-approved as an analgesic for several pain conditions. If a patient is taking one of these drugs along with one of the opioids that is converted to its analgesic form by this system, the efficacy of the opioid can be significantly reduced.

So how should a clinician decide on dosing when switching from one opioid to another? Because of the multiple factors, one conversion table can’t be described as any more accurate or better than another. The best advice is to start low and go slow. Any conversion table should be taken as an advisory starting point, not an absolute.

It is generally recommended that one start the dose of the new opioid at one-half of what the conversion tables indicate. This is especially important if the switch is from a short-acting opioid to a different long-acting one.

Fortunately, unlike some medications for which failure to initially give a sufficient dose could have dire consequences, the worst that will happen if you underdose an opioid analgesic is that the pain may persist a bit longer. It is always possible to give more of the opioid if there isn’t sufficient relief from the initial dose; it is very difficult to get it out of the patient if you give too much.

References