Demystifying Opioid Conversion Calculations: A Guide to Effective Dosing

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Customer Testimonials

"Dr. McPherson: I am almost through your opioid dosing book--I can't thank you enough!! I have been teaching opioid conversions at my hospice for 5 years now. I am so impressed with the careful and sequential approach!! You know where to begin (at the beginning, of course, but so many teachers start somewhere else). You also know how to lay the path so readers can follow sequentially. And the humor makes it all so wonderful and readable. Thank you, thank you, thank you!!! I want to buy a copy for everyone..."

Marilyn Begle, MS RN, CHPN, Staff Development Coordinator, Beaumont Hospice

“This book is a “must have” for all clinicians involved in the use of opioids for pain management. It is written in an engaging, understandable fashion. The case studies will help the clinician apply principles to practice and ensure safe and effective pain management for their patients. “

Kathleen Broglio, ANP-BC, ACHPN, CPE, Pain Management Nurse Practitioner, Bellevue Hospital Center, New York, NY

“Nothing brings fear into the hearts of healthcare professions like doing opioid conversions. What should be viewed as basic algebra (math) becomes nearly incomprehensible when changing molecules, routes of administration, and going from formulation to formulation. Dr. McPherson has introduced the missing element for success--humor! Let Dr. McPherson take the mystery out of opioid conversions and help you feel comfortable and confident. “

B. Eliot Cole, MD, MPA, CPE
Executive Director, American Society of Pain Educators

“Lynn McPherson’s book on opioids is both very practical and readable. This text is a must for those in hospice and palliative medicine.”

Mellar P Davis, MD
Professor of Medicine, Lerner College of Medicine, Case Western Reserve University, Cleveland, Ohio

From the Foreword…
"Dr. McPherson effortlessly transforms complex concepts into simple, practical solutions. Opioid conversions, routes of administration, the use of around-the-clock vs prn dosing, and definitions regarding breakthrough pain are translated for new and experienced clinicians entering the world of pain management"

Judith A. Paice, Ph.D., RN
Director, Cancer Pain Program
Division of Hematology-Oncology
Northwestern University; Feinberg School

What others are saying about …

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Official Review by Doody Review Service

Reviewer

Dennis K Constan, PharmD (Temple University Health System - Northeastern Hospital)

Description

With good tables, patient case scenarios, practice problems, and relevant pearls of practice, this book reinforces the pertinent pharmacological and mathematical knowledge necessary to effectively and safely manage patients'
pain regimens.

Purpose

It is intended as an ongoing resource for healthcare providers who need to navigate the art and science of pain management in the safest, most effective manner. Through a thorough review of the relevant literature on opioid management, it seeks to distill and present the information and controversy about a challenging subject via a simplified, accessible tool. As the book espouses, good, effective, and safe pain management is a basic human right that practitioners struggle to achieve for their patients, given its complex blend of art and science. To have a resource that brings clarity to the approach and mechanics of opioid dosing is welcome. The book succeeds and its compelling feature is its pedagogical approach to meet these objectives.

Audience

It is intended as an ongoing resource for healthcare providers who need to navigate the art and science of pain management in the safest, most effective manner. Through a thorough review of the relevant literature on opioid management, it seeks to distill and present the information and controversy about a challenging subject via a simplified, accessible tool. As the book espouses, good, effective, and safe pain management is a basic human right that practitioners struggle to achieve for their patients, given its complex blend of art and science. To have a resource that brings clarity to the approach and mechanics of opioid dosing is welcome. The book succeeds and its compelling feature is its pedagogical approach to meet these objectives.

Features

The book focuses on the important basic mathematical, pharmacokinetic, pharmacodynamic, and patient parameters that a practitioner must understand in order to safely and successfully transition patients between opioid regimens as their pain management needs change. Through tables, patient scenarios, and practice problems with explanations, the book succeeds in helping readers to not only digest and synthesize the information, but most importantly, apply what they are learning. Therapeutic pearls and pitfalls offer the basic information an additional nuance and value. Added features that make the book even more user friendly are statements of learning objectives for each chapter, a basic glossary, and an appendix of the available dosage formulations. If the book could use any enhancement, it would be its physical size. A continually accessible information resource for a practitioner is better when it is more portable, so a pocket-sized version of the book, perhaps with some abridging,
would make it an ideal resource.

Assessment

This will undoubtedly be a useful tool for healthcare providers seeking to accurately and safely achieve their patients' pain management goals. What stands out is the high caliber of the quality of the teaching. The patient cases are well conceived, and the practice problems reinforce what is being taught. Because it easily can be referenced and applied to actual patient scenarios, the book is an excellent ongoing useful resource.

Weighted Numerical Score: 91 - 4 Stars!

DEMYSTIFING OPIOID CONVERSION CALCULATIONS
A Guide for Effective Dosing
Mary Lynn McPherson

I once wrote that pain and symptom control must come first, as it is not possible to have a meaningful conversation about psychosocial or spiritual issues with a patient with unrelieved pain. This book is about optimizing pain control with opioid drugs for those with moderate or severe pain. In a very clear and practical way, it describes the use of opioids, changing to different routes of administration, changes to different opioids, the treatment of breakthrough pain, the difficulties that can be experienced with methadone, and the challenges of transdermal fentanyl and neuraxial opioids. It is written in an almost conversational manner, sometimes humorous, with lots of case anecdotes and highlighted clinical Pearls and clinical Pitfalls. Having been through the exercise, I think that these are important, for to present all this information in a dry, prescriptive manner is enough to narcotize the keenest reader. For someone with some experience with opioid therapy, I am not sure this book is concise enough for day-to-day use in the ward, but it would certainly be very useful for postgraduate courses in medical and nursing palliative care, where the finer detail of opioid therapy is sometimes overshadowed by matters related to psychosocial and spiritual concerns. I have to say that it warmed my heart to read about the author 'spending a fair amount of time banging my head on the desk wrestling with the limited, yet frequently conflicting, information published on opioid conversion calculations'. The scientific basis of what we do in the clinic is incomplete, but I think this book provides sound and common sense advice where the science is lacking.

Dr. Roger Woodruff
International Association for Hospice and Palliative Care, Australia.

Demystifying Opioid Conversion Calculations: A Guide for Effective Dosing

JOURNAL OF PALLIATIVE MEDICINE, Volume 14, Number 5, 2011

Demystifying Opioid Conversion Calculations a Guide for Effective Dosing is a thorough synopsis of opioid pharmacotherapy. The book concentrates on the important mathematical, pharmacokinetic, pharmacodynamic, and patient parameters that a pain medicine clinician needs to safely administer opioids. The regimens are logical, practical, and useful for hospice and palliative medicine consultants or for clinicians who have not been formally trained in the field. The clinical vignettes and accompanying clinical pearls are emblematic of daily practice and offer a memorable approach to learning opioid conversions. The book includes eight chapters covering opioid conversion, titration, rotation, and routes of administration. There is also a useful chapter on methadone, and another on patient controlled analgesia (PCA) and neuraxial or spinal delivery of opioids. This chapter includes a technical description of how PCAs operate and uses case examples to discuss indications for PCA use including post-operative pain, chronic pain, and advanced illness. The book relies on tables, patient vignettes, and practice problems to add interest to a topic that some clinicians hesitate to explore because the math can be intimidating. A colleague once told me, ‘‘I cannot enter this field; I have acalculia.’’ This book manages to make opioid calculations simple, meaningful, and fun.

Dr. Mary Lynn McPherson writes a comprehensive book with a light-hearted tone that makes opioid calculations approachable. The book offers a comprehensive overview of opioid prescribing and dosing with writing that is clear and succinct, and stresses solid clinical skills such as the need for clinical evaluation prior to starting, titrating, or changing opioids. It provides clinicians with accurate and safe pain medicine skills to treat anything from minor pain to refractory pain syndromes.

Lauren Shaiova, M.D.
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Demystifying Opioid Conversion Calculations: A Guide to Effective Dosing

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Oxycodone and a Useful Book

Opioids are the backbone of the management of moderate to severe pain as defined by the World Health Organization ladder. In most patients, morphine is the favored drug, however, in some the intolerable side effects and lack of efficacy dictates the use of another opioid, such as oxycodone. Oxycodone is a semisynthetic derivative of thebaine, an opium alkaloid, and can also be made by modifying morphine. It has the same structural relationship to codeine that oxymorphone has to morphine and is a potent opioid mu-receptor agonist. Oxycodone is 10 times as potent as codeine and is demethylated and conjugated in the liver. It is excreted in the urine with part of its analgesic effect mediated by active metabolites. The half-life is 2 to 3 hours and the duration of action is 4 to 5 hours.1 Oxycodone is at least half as potent orally as administered parenterally, so it is usually given orally. In a study of 20 patients, Glare and Walsh2 found single-entity oxycodone to be equianalgesic with morphine when using the oral route during chronic administration for cancer pain.

Oxycodone has been used clinically since 1917, with varying patterns of use worldwide. The annual use of oxycodone has increased 42-fold in the United Kingdom and 3-fold in the United States from 1999 to 2003.3 It is widely used in the United States in a low dose combined with a nonopioid analgesic drug. The formulation is usually given as a tablet containing 5 mg oxycodone in a fixed combination with a nonopioid analgesic such as acetaminophen (Percocet, Endocet, Tylox) or aspirin (Percodan, Endodan) to name a few examples. It is considered a weak opioid analgesic because the dose cannot be increased above 10 mg every 4 hours due to the risk of liver damage from acetaminophen or gastrointestinal distress from aspirin. However, based on their study, Glare and Walsh have advocated that single-entity oxycodone be reclassified as a
strong opioid analgesic.2

In a follow up to the initial study,2 Glare and Walsh1 studied 24 patients with advanced cancer and chronic pain who were treated with oxycodone every 4 hours. Of the 24 patients, 20 completed the study. The median starting dose was 15 mg (range of 5 to 30 mg) and of the 20 patients who completed the study, the median stable dose was 20 mg (range of 15 to 60 mg). Although not statistically significant, patients less than 65 years had a higher median stable dose, that is, 45 mg versus 20 mg for the older patients. Side effects were mild, commonly being sedation, constipation, and nausea/vomiting. Pain relief was achieved with doses up to 60 mg every 4 hours and was the preferred analgesic in the vast majority of the patients.

Several interesting observations were made by the authors from this study. First, the effective doses of oxycodone were similar to oral morphine with most patients experiencing pain relief at a dose of 30 mg every 4 hours or less. Second, patients older than 65 years required less oxycodone, which is like the pharmacokinetics of morphine where patients older

than 50 years have significantly higher plasma levels than those younger than 50 years given the same single doses. Third, the side effects of oxycodone did not differ from other opioids. Finally, the authors concluded that oral oxycodone was versatile, flexible, and provided durable analgesia in patients with advanced cancer and chronic pain much like oral morphine.

In a more recent study, Reid et al3 reported the results of a meta-analysis of randomized controlled trials on the use of oxycodone for cancer-related pain. Four studies comparing oral oxycodone to either oral morphine or oral hydromorphone were ultimately identified and analyzed. The study found no differences between analgesic efficacy or the adverse side effect profile of oxycodone compared to morphine, again, confirming the use of oxycodone for cancer-related pain.

In this issue of the Journal, Mercadante et al4 report the results of their study of the use of high dose oxycodone in an acute palliative care unit. The reader is encouraged to read the entire article, but this study confirms the previous findings that oxycodone, including the controlled release formulation, is safe and as effective as morphine in the treatment of chronic pain and that doses were significantly lower in older patients.

So, after the above review of the use of oxycodone rather than morphine for the treatment of chronic pain, what is the equianalgesic ratio of the 2 drugs? Cannot remember? Do not know where to look? Well, a good source for this answer is the just published book entitled Demystifying Opioid Conversion Calculations. A Guide for Effective Dosing5 by Mary Lynn McPherson. Dr McPherson is Professor and Vice Chair, Department of Pharmacy Practice and Science, University of Maryland School of Pharmacy and longtime member of the Editorial Board of this journal. Turning to page 7, we find the answer to our question:

Because of the variations in bioavailability between morphine (15-64%) and oxycodone (60% or more), the equianalgesic ratio for oral morphine: oxycodone ranges from 1:1 to 2:1, partially dependent on the patient's ability to absorb the opioid. A ratio of 1.5:1 is used clinically as a compromise.

Furthermore, we find in Table 1-1, Equianalgesic Opioid Dosing, that parenteral oxycodone is not available in the United States. So, having the right resource gives us the answer quickly and this book is the right resource! Dr. McPherson details opioid conversion in 7

Chapters:
Chapter 1—Introduction to Opioid Conversion Calculations
Chapter 2—Converting Among Routes and Formulations of the Same Opioid
Chapter 3—Converting Among Routes and Formulations of Different Opioids
Chapter 4—Titrating Opioid Regimens: Around the Clock and to the Rescue!
Chapter 5—Transdermal and Parenteral Fentanyl Dosage Calculations and Conversions
Chapter 6—Methadone: A Complex and Challenging Analgesic, But It's Worth It!
Chapter 7—Patient-Controlled Analgesia and Neuraxial Opioid Therapy
Chapter 8—Calculating Doses from Oral Solutions and Suspensions

The book is liberally sprinkled with cases, fast facts, pearls, pitfalls, and more. For example, the Pitfall on page 95:

‘‘‘Set and Forget’ Method Akin to ‘You Snooze, Your Patient May Lose’’’

This is a light-hearted reminder that just prescribing a fentanyl patch is not enough and that careful observation is in order. And that approach is what makes this book so useful and all the more clinically relevant at the bedside. Take a careful look at
this colorfully designed book and add it to your library and everyone benefits.

Robert E. Enck, East Tennessee State University College of Medicine