A Solution to the U.S. Parenteral Opioid Drug Shortages - The MOD® Oral PCA for Postoperative Pain Management

The Federal Drug Administration (FDA) and the American Society of Health-System Pharmacists (ASHP) have announced that the ongoing shortage of parenteral opioids for inpatient pain management may continue from some sources until 2019. Hospital pharmacies and clinicians are scrambling to conserve what they have while exploring other options for pain management in particular post-surgical pain management. (See links below to FDA and ASHP related sites):
https://www.accessdata.fda.gov/scripts/drugshortages/dsp_ActiveIngredientDetails.cfm?AI=Hydromorphone+Hydrochloride+Injection%2C+USP&st=c&tab=tabs-4&panels=1#

https://www.ashp.org/drug-shortages/current-shortages/Drug-Shortage-Detail.aspx?id=856

Intravenous (IV) Patient Controlled Analgesia (PCA) or IV as needed (PRN) parenteral opioids have been used for many years for postoperative acute pain management. However, with the advent of Expedited Recovery After Surgery (ERAS) protocols and multimodal pain management regimens, clinicians are now adopting a combination of primarily oral pain medications both opioid and nonopioid for better pain management (Golladay et al., 2017; Ladha, et al., 2016; Ljungqvist, Scott & Fearon, 2017; Parvizi & Bloomfield, 2013; Rajpal et al., 2010).

A consensus publication from Chou et al. in 2016 from the American Pain Society, the American Society of Regional Anesthesia and Pain Medicine and the American Society of Anesthesia "recommends oral over intravenous administration of opioids for postoperative analgesia in patients who can use the oral route." With new surgical and analgesia approaches, e.g. laparoscopic surgical procedures, regional nerve blocks, local surgical site injections of liposomal anesthetics and epidural analgesia, many patients can initiate oral pain medication the day of surgery or at the latest postoperative day one (Kim, Elbuluk, Yu & Iorio, 2018).

Due to parenteral opioid shortages, many hospital pharmacies are now recommending oral opioids in lieu of parenteral opioids for pain management. A common misconception is that parenteral opioids are more efficacious for pain control than oral opioids. In equianalgesic doses, oral opioids are just as effective for analgesia as intravenous opioids – the clinical difference is the onset time of analgesia (Pasero & McCaffery, 2011). Whereas parenteral opioids may have an effect in five to ten minutes, oral opioids begin to have an effect in 15 to 30 minutes. Recently many surgical groups have reported equivalent analgesia from oral opioids as compared to intravenous opioids or IV PCA (Davis, Esposito & Meyer, 2016; Pearl et al., 2001; Rajpal, et al., 2010; Rothwell, et al., 2011; Ruetzler, et al., 2014).

Oral opioids as part of multimodal pain management compared to IV PCA may reduce the risk for nausea, sedation, interference with physical activity and coughing and deep breathing as compared to IV PCA opioids (Rajpal, et al., 2010).

A problem with the use of PRN oral or parenteral opioids is the required nursing time and frequent interruptions of care causing delays in delivery when manual administration is required. A recent time study reported that 11 minutes of nursing time was required for a single delivery of a PRN oral pain medication in an orthopedic postoperative inpatient unit (Pizzi, Chelly & Marlin, 2014). This was only the measured time for the direct cumulative tasks for the process and did not take into account the frequent delays in initiating the delivery process or interruptions along the way.

A solution for the prompt delivery of PRN oral pain medication is the Medication On Demand i.e. MOD® oral PCA bedside device. Surgical patients using the oral PCA device have reported significantly better numeric pain scores and patient recovery parameters compared to the manual delivery of PRN oral pain medication (Lambert & Cata, 2014; Pizzi, Bates, Vulakovich & Chelly, 2017). MOD® adoption also saves valuable nursing time that can be focused on better patient bedside care and more time for critical thinking (Collins, Cata & Lambert, 2018). Most hospitals now using these devices for the postoperative PRN delivery of oral pain medication begin patient device use the day of surgery until discharge.

Beyond the obvious PCA delivery of oral pain medication, the MOD® is unique because it collects patient entered pain scores, reassessment pain scores and other key data to monitor pain management in any group of patients to meet Joint Commission Pain Standards for 2018. MOD® databases can further be integrated into any electronic health record and queried to monitor and improve pain management protocols for any inpatient group requiring acute pain management during their hospital stay.

Conclusion: The adoption of the MOD® Wi-Fi system for better pain management will not only circumvent the need for parenteral opioids, it will collect and provide needed data for ongoing pain management improvement in today's hospitals.

References

Chou, R., Gordon, D.B., de Leon-Casasola, O.A., Rosenberg, J.M., Bickler, S., Brennan, T. … Wu, C.L. (2016) Guidelines on the management of postoperative pain. Journal of Pain, 17(2), 131-157.

Collins, L., Cata, C., Lambert, T., (2018) Timing studies for the utilization of an oral patient controlled analgesia device compared to the manual delivery of oral as needed pain medication in an orthopedic inpatient unit. Poster submission to ASPMN national meeting, 2018. Manuscript in preparation for submission for publication.

Davis, K.M., Esposito, M.A. & Meyer, B.A. (2006) Oral analgesia compared with intravenous patient-controlled analgesia for pain after cesarean delivery: a randomized controlled trial. American Journal of Obstetrics and Gynecology, 184, 967-971.

Golladay, G.J., Balch, K.R., Dalury, D.F., Satpathy, J., Jiranek, W.A. (2017) Oral multimodal analgesia for total joint arthroplasty. Journal of Arthroplasty, 32(9S), S69-73.

Kim, K., Elbuluk, A., Yu, S., & Iorio, R. (2018) Cost-effective peri-operative pain management: assuring a happy patient after total knee arthroplasty. The Bone & Joint Journal, 100-B (1 Supple A) 55-61.

Ladha, K.S. Patorno, E., Huybrechts, K.F., Liu, J., Rathmell, J.P., Bateman, B.T.(2016) Variations in the use of perioperative multimodal analgesic therapy. Anesthesiology, 124(4), 837-845.

Ljungqvist, O., Scott, M., Fearon, K.C. (2017) Enhanced recovery after surgery: A review. JAMA Surgery, 152(3), 292-298.

Parvizi, J., & Bloomfield, M. (2013) Multimodal pain management in orthopedics: Implications for joint arthroplasty surgery. Orthopedics, 36(2), 7-14.

Pasero, C. & McCaffery, M. (2011) Chapter eleven, Physiology and pharmacology of opioid analgesics. In: M. McCaffery, C. Pasero, eds. Pain Assessment and Pharmacological Management (pp. 283-300). St Louis, MO: Mosby.

Pearl, M.L., McCauley, D.L., Thompson, J. Mahler, L., Valea, F.A. & Chalas, E.A. (2002) A randomized controlled trial of early oral analgesia in gynecologic oncology patients undergoing intrabdominal surgery. Obstetrics and Gynecology, 99, 704-708.

Pizzi, L.J., Bates, M., Vulakovich, K, Chelly, J.E. (2017) A prospective randomized trial of an oral patient-controlled analgesia device versus usual care for the administration of as needed (PRN) oral pain medications following total hip arthroplasty. Poster presentation American Society of Pain Management Nursing (ASPMN) national meeting, 2017, manuscript in preparation for submission for publication.

Pizzi, L., Chelly, J., & Marlin, V. (2014) Nursing time study for the administration of a PRN oral analgesic on an orthopedic postoperative unit. Pain Management Nursing, 16(3), 603-608.

Rajpal,S., Gordon, D.B, Pellino, T.A., Strayer, A.L, Brost, D., Trost, G.R., Zdeblick, T.A., Resnick, D.K. (2010) Comparison of perioperative oral multimodal analgesia versus IV PCA for spine surgery. Journal of Spinal Disorders & Technique, 23(2), 139-145.

Rothwell, M.P., Pearson, D., Hunter, J.D., Mitchell, P.A., Graham-Woollard, T., Goodwin, L., & Dunn., G. P. (2011) Oral oxycodone offers equivalent analgesia to intravenous patient-controlled analgesia after total hip replacement: a randomized, single-centre, non-blinded, non-inferiority study. British Journal of Anesthesia, 106(6), 865-872.

Ruetzler, K., Blome, C.J., Nabecker, S., Makarova, N., Fischer, H., Rinoesl, H., … Koinig, H. (2014) A randomized trial of oral versus intravenous opioids for treatment of pain after cardiac surgery. Journal of Anesthesia, 28, 580-586.

February 2018
Sharon Conley MD PhD CPE, Chief Medical Officer

Mount Pleasant, SC and Melbourne, FL
www.avancen.com 1-800-607-1230