

IS THERE A DIFFERENCE IN PAIN MANAGEMENT
OF PATIENTS WITH UPPER EXTREMITY INJURIES
IN RELATION TO AGE?

by

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Abstract

Timely and appropriate analgesia for the treatment of long bone fractures is a primary goal of Emergency Departments. Despite incentives from the Centers of Medicare and Medicaid and accreditation agencies studies have found the existence of pain management disparities. The purpose of this research study was to conduct a retrospective chart review to investigate if patients with an upper extremity long bone fracture received pain medication within 60 minutes of arrival to the ED and to identify if there was a difference in the pain management of patients, with identical injuries, by age. Katharine Kolcaba's comfort theory was used to guide the implementation of this project. Pain medication was provided within 60 minutes in 63% of the participants aged 69 and under and 56% of those aged 70 and older. A larger disparity occurred between the groups being medicated appropriately according to the World Health Organization's guidelines for pain management with 63% of participants aged 18-69 receiving the appropriate pain medication compared to 45 % of participants in the 70 and over age group. The APRN has the opportunity to educate the nurses and members of the interdisciplinary team through evidence based practice in the safe and effective methods for treating acute pain across the lifespan.

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Background/Statement of Problem

The Centers for Disease Control (CDC) estimates the number of people aged 65 and older living in the United States (U.S.) will increase from approximately 35 million in the year 2000 to 71 million in 2030. As the number of geriatric patients increases so will the number of ED visits for upper extremity injuries. In 2008 geriatric patients represented 15% of all emergency department (ED) visits annually (Cinar et al., 2012). According to the National Electronic Surveillance System's (NEISS) database upper extremity injuries accounted for 3,468,996 ED visits in 2009 (Ootes, Lambers, & Ring, 2011). A seven year national survey published in the Annals of Emergency Medicine in 2012 found that patients 75 years or older who presented to emergency departments (ED) with pain were 19% less likely to receive analgesia, and 15% less likely to get an opioid when compared to younger adults aged 35 to 54 years of age (Platts-Mills et al., 2012). This makes identifying if a disparity exists in the pain management of upper extremity fractures in relation to age an important factor in the treatment and satisfaction of the older patient population.

Prior to 2003 the Centers for Medicare and Medicaid Services (CMS) paid for the health care of its beneficiaries through a fee-for-service method. This payment system reimbursed hospitals and providers based solely on the quantity of services rendered. Since 2003 the CMS has implemented many programs in an effort to improve the quality of its beneficiaries care while lowering health care costs (Blumenthal & Jena, 2013). The latest and most aggressive program was put into law under the Patient Protection and Affordable Care Act of 2010. The program named Value Based Purchasing (VBP) offers

incentives to hospitals and providers who deliver high-value rather than high-volume healthcare (Blumenthal & Jena, 2013). Beginning in fiscal year 2014 the VBP program will tie a portion of a hospital's Medicare & Medicaid reimbursement to performance based quality measures. For emergency departments the six chart-abstracted measures are Outpatient (OP)-18; Median Time from ED Arrival to ED Departure for Discharged ED Patients, OP-19; Transition Record with Specified Elements Received by Discharged Patients, OP-20; Door to Diagnostic Evaluation by a Qualified Medical Professional, OP-21; Median Time to Pain Management for Long Bone Fractures (LBF), OP-22; Patient Left Before Being Seen and OP-23; Head CT Scan Results for Acute Ischemic Stroke or Hemorrhagic Stroke who Received Head CT Interpretation Within 45 Minutes of Arrival.

This project will focus on OP-21; Median Time to Pain Management for upper extremity Long Bone Fractures (LBF) because it is the one measure that can be improved upon exclusively by nurses in this community hospital ED and studies have revealed there is a direct relationship between patient satisfaction and pain management (Zoega et al., 2014). The ED where this study will take place has a set of Standing Orders that allows registered nurses to provide pain medication based on their assessment prior to being seen by a physician, physician assistant (PA) or a nurse practitioner (NP). Studies have revealed that utilization of Triage Protocol orders decrease time to pain medication administration and increases the number of patients that receive pain medication (Fosnocht & Swanson, 2007).

The purpose of this study is to ascertain if the older patient population with an upper extremity LBF receives less pain medication than younger patients with the same

injury. If a disparity does exist, the nurses and management team will be given the data to help support an increase of the use of triage protocol orders for pain medication administration prior to the patient being seen by a physician since studies have demonstrated that knowledge about analgesic options and adverse effects result in higher rates in patient satisfaction with pain management (Rupp & Delaney, 2004). Knowledge gained through this study will enable the triage nurses to change their practice, improve patient care and patient satisfaction by decreasing the median time to pain management and thus increasing Medicare reimbursement for patients with LBF. A literature review of pain physiology, managing acute pain, managing acute pain in elders, pain scales, pain and long bone fractures, and VBP and median time to pain management for LBS was completed.

Next the theoretical framework will be discussed.

Theoretical Framework

Katharine Kolcaba's comfort theory will be used to guide the implementation of this project. Kolcaba defines comfort as "the immediate experience of being strengthened by having needs for relief, ease, and transcendence met in four contexts (physical, psycho-spiritual, social and environmental)" (Kolcaba, 2003, p. 14).

The physical context is a complex relationship between comfort and actual pain. Kolcaba theorizes that as comfort is enhanced the level of actual pain will diminish. Comfort Care encompasses three types of comfort measures; technical comfort measure, coaching and comfort food for the soul (Kolcaba, 2003). Technical comfort measures include interventions to help patients regain comfort and to prevent complications. Examples of this type of interventions are the monitoring of vital signs and the administration of pain medication. Coaching is a measure aimed at relieving anxiety, providing reassurance and information. Comfort food for the soul are measures that target transcendence. It's a memorable connection between the nurse and patient, and can be accomplished through a simple gesture such as holding the patient's hand.

Relief from pain can be achieved through psycho-spiritual, environmental or sociocultural means, yet each patient gets comforted in a unique and individualized way. Kolcaba defines psycho-spiritual comfort as a combination of mental, emotional and spiritual components. It is "whatever gives life meaning for an individual and entails self-esteem, self-concept, sexuality, and one's relationship to a higher order or being" (Kolcaba, 2003, p. 12). Environmental comfort is how the surroundings and conditions can be manipulated to influence a patient's comfort level. For example, elderly friendly

units that employ non-glare lighting and minimization of noise can effect a patient's perception of comfort. Sociocultural comfort relates to interpersonal, family and societal relationships. It includes acknowledgment and acceptance of an individual's customs, language and traditions.

Kolcaba's Comfort Theory can provide a framework for a holistic approach to the management of pain from a LBF in the ED setting. Relief will be accomplished through attention to the immediate concern or problem. In the ED setting this would be the nurse providing pain medication at Triage. The second need is ease from the discomfort and can be influenced by the patient's previous experiences. For example, if a patient had a previous ED visit and their pain was not addressed properly they may be fearful of having the same experience. The nurse reassuring the patient and providing emotional support can address this. The third and last need is transcendence; this includes strength and motivation and often includes the use of distraction. The nurse often meets this need unintentionally by diverting the patient through questioning about home environment, who they live with, and if anyone is available to help in there care with the goal of the patient maintaining their presence and independence. The use of Kolcaba's Comfort Care will allow for a better understanding by nurses of the many aspects of providing comfort in the ED setting.

Next is a review and critique of the literature.

Review and Critique of the Literature

A search of the MEDLINE, CINAHL Plus, PubMed, Google Scholar, Cochrane Library and Ovid databases from 2002 through 2014 was performed using the terms “pain definition and physiology”, “pain and long bone fractures”, “managing acute pain”, “managing acute pain in elders”, “pain scales”, and “VBP and median time to management for long bone fractures”.

Pain Definition and Physiology

The International Association for the Study of Pain (IASP) task force website defines pain as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage”. Acute pain has the biological purpose of providing a warning signal that an injury or illness has occurred. It is defined as pain that lasts less than three months and lessens with healing (Briggs, 2010). Acute pain can be further categorized into somatic, visceral or neuropathic pain. Somatic pain can be superficial as with an injury to the skin or deep as in an injury to bone, or muscles. It is a localized pain described as sharp, burning, dull, aching or cramping and is seen with incisional pain, orthopedic and skeletal injuries or procedures. Visceral pain comes from an injury to the organs and linings of the body cavities; it produces pain that is poorly localized, diffuse and is described as splitting, sharp or stabbing. Examples of this type of pain come from pancreatitis, appendicitis, bladder distention or intestinal injuries or illnesses. Neuropathic pain occurs with injuries to the nerve fibers, spinal cord and central nervous system. The pain is described as poorly localized, shooting, burning, fiery, shock-like, sharp and as a painful numbness. This type

of pain is seen after an amputation, mastectomy, and a spinal injury with nerve compression and with diabetic neuropathy (Helms & Barone, 2008). Regardless of the type, acute pain stimulates the body's sympathetic nervous system resulting in a "fight or flight" response (Helms & Barone, 2008). The physiological reaction from the sympathetic nervous system stimulation includes an increase in heart and respiratory rates, sweating, dilated pupils, restlessness and apprehension (Helms & Barone, 2008).

Nociception describes the processing of pain from the initial injury, transmission of electrical nerve impulses to the spinal cord and brain, conscious awareness of pain and alteration of pain signals. The stages of pain are defined as transduction, transmission, perception and modulation (Briggs, 2010). Transduction is the conversion of the painful stimulus to an electrical signal in the nerve cells. During this phase cells release a number of chemicals including prostaglandins, histamine, bradykinin and serotonin. During transmission the electrical signal is transmitted into one of the two nerve fibers. The larger A delta fibers cause sharp pain and are usually stimulated by a cut, electrical shock or physical blow. These are the fibers that are responsible for the body's reflex of withdrawal from painful stimuli and are considered the fast fibers because the body often reacts before the person even feels any pain. The second smaller and slower nerve fibers are called C fibers. These produce the more constant pain of burning or aching sensations (Helms & Barone, 2008). In the third phase, perception is characterized by the awareness of painful stimuli. This stage is influenced by emotion and previous experiences with pain (Briggs, 2010). The final stage in the processing of pain is modulation. The body produces endorphins, and opioids that inhibit the painful stimuli. These mechanisms

control the amount of stimulus that reaches the brain. Attention, distraction and sensory input can lessen the signals and perception of pain. This concept explains why pain is often described as worse during the night when there is less external stimulus (Briggs, 2010).

Pain Perception in Older Adults

Studies related to aging and pain perception are limited and conflicting. It is known that there is a decrease in the density of nerve fibers associated with aging and nerve conduction and studies point to prolonged latencies in peripheral nerve cells (Helms & Barone, 2008). These findings may affect the transduction phase of pain, increasing the time to perception of pain. The transmission of the electrical signal may be altered in elderly people because elders respond more to the C fibers than to the A fibers (Helms & Barone, 2008). This means they may describe pain differently than younger patients, but does not mean that the intensity of pain lessens with age. On the contrary, pain unlike other sensory mechanisms such as hearing and sight does not diminish with age (Helms & Barone, 2008). The perception phase can be altered because it is influenced by a person's experience with pain suggesting that experiences of pain throughout life are a vital component of one's physiological and emotional memory. Thus how a person reacts to pain is unique to each individual.

Studies have not found any evidence to support that elders experience pain any less intensely than their younger counterparts, however studies have found that elderly people tend to minimize their pain because of stoicism and hesitancy to report their pain (Layzell, 2009). Other factors that may result in elders' reluctance to report pain include

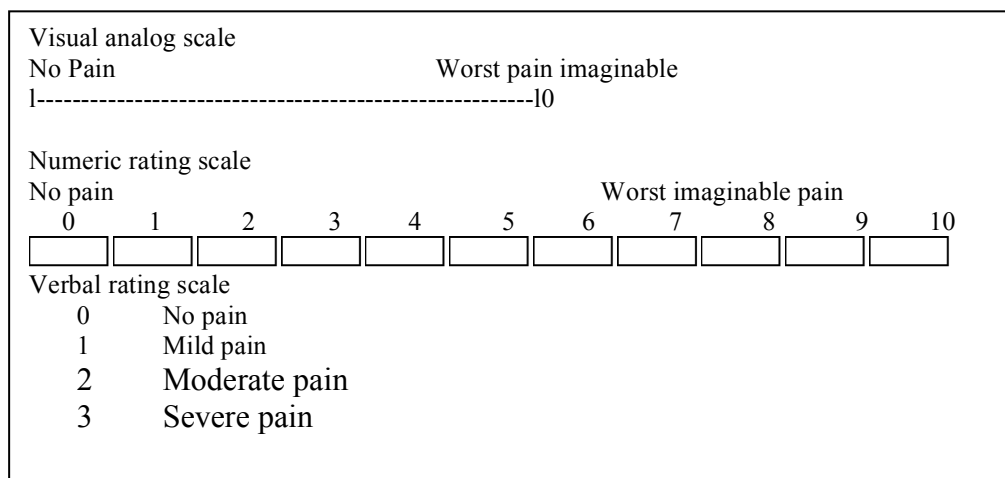
fears of addiction, the belief that pain is part of aging and concern for being labeled a bad patient (Mills, Edwards, Shofer, Holena, & Abbuhl, 2011).

Pain Scales

Assessing pain and encouraging patients to report pain is essential because unrelieved pain can lead to adverse physical and psychological consequences (van Dijk, Kappen, van Wijck, Kalkman, & Schuurmans, 2012). According to the geriatricpain.org website “Pain is always subjective. Therefore, the individual’s self-report of pain is the single most reliable indicator of pain”. Pain tolerance differs between individuals and the same stimulus may produce different responses and reporting of pain levels. Consequently, assessment tools need to be suitable for each individual.

Three common pain-rating scales for the adult population are the Visual Analog Scale (VAS), Verbal Rating Scale (VRS) and Numeric Rating Scale (NRS) (Williamson & Hoggart, 2005). The VAS is a tool that requires patients to draw along a 10-cm line that begins with no pain and ends with worst pain imaginable. This tool has been found valid in several studies but is limited because it requires the patient to draw on paper or an electronic record (Williamson & Hoggart, 2005) (figure 1). The NRS tool has the assessor ask the patient to rate his/her pain on an 11 point scale, where 0 equates to no pain and 10 is the worst pain imaginable (van Dijk, Kappen, van Wijck, Kalkman, & Schuurmans, 2012). The VRS has patients use the descriptive adjectives of no pain, mild pain, moderate pain and severe pain. The adjectives are then equated to a number scale from 0 to 3 (Williamson & Hoggart, 2005).

Figure 1: Common Rating Scales (Williamson & Hoggart, 2005, p. 799).



In the study by Williamson and Haggart all three of the afore mentioned tools were found to be reliable and valid. The VAS is the most difficult to use and had the highest failure rate. The VRS tool was the least sensitive but the easiest to use and the NRS was as sensitive as the VAS and also easy to use (Williamson & Hoggart, 2005). The study by van Dijk et al (2012) measured and compared the NRS and the VRS in patients aged 65 and older. They concluded that the NRS was an appropriate tool to assess acute post-operative pain in the older patient. In the study by Bijur et al (2003) the authors measured the validity of the NRS tool to the VAS tool in the ED setting. They found a strong correlation between the tools suggesting that the NRS can be used to evaluate acute pain in the ED setting.

Managing Acute Pain

According to the World Health Organization (WHO) Analgesic Ladder initially published in 1986, pain management should follow a three-step process. Step 1 non-

opioid medication, such as acetaminophen or ibuprofen, for mild to moderate pain. For moderate or severe pain step 1 should be skipped completely. Step 2 provides an opioid with acetaminophen, such as hydrocodone/APAP (Vicodin) for moderate to severe pain. If step 2 does not relieve the pain then progress to step 3, which is to give an opioid without acetaminophen such as morphine or hydromorphone. The acute phase following a LBF is the inflammatory stage and typically lasts for 2 to 3 weeks after the initial injury. For this reason, the Agency for Healthcare Research and Quality (AHRQ) recommends analgesics and or Non-steroidal anti-inflammatory drugs (NSAIDS) for up to two weeks after a LBF.

The Pain Management Index (PMI) is a widely utilized tool that addresses pain management adequacy. PMI integrates the WHO's recommendation for medications according to the level of pain for mild, moderate and severe pain with the pain med prescribed (Mitera et al., 2010). The PMI was originally created to assess the efficacy of pain management for metastatic bone cancer, but can also be used to evaluate acute fracture pain relief because it assesses if adequate pain management has been achieved when the type of medication prescribed was suitable for the level of pain based on existing WHO guidelines (Minick et al., 2012). PMI can be calculated by converting a Numeric Rating Scale (NRS) from 0 to 10 with zero being no pain and 10 being the worst pain imaginable into one of three categories for pain severity: mild, moderate or severe. The 3 classifications correspond to the NRS pain scale as follows; Mild= NRS from 1 to 3, Moderate= NRS from 4 to 7 and Severe= NRS from 8 to 10. Once this number is

determined it can be correlated with the WHO medication guidelines for acute pain (Mitera et al., 2010).

Standing Orders for pain relief in the ED at the study site follow the PMI tool and the WHO recommendations for analgesia management. ED nurses can initiate pain medication according to the following pain scale; patients with mild pain from 1 to 4 can be given acetaminophen or ibuprofen, and for moderate to severe pain or pain rated between 5 to 10 the patient can be given either Vicodin (hydrocodone/acetaminophen), or Morphine.

Managing Acute Pain in Elders

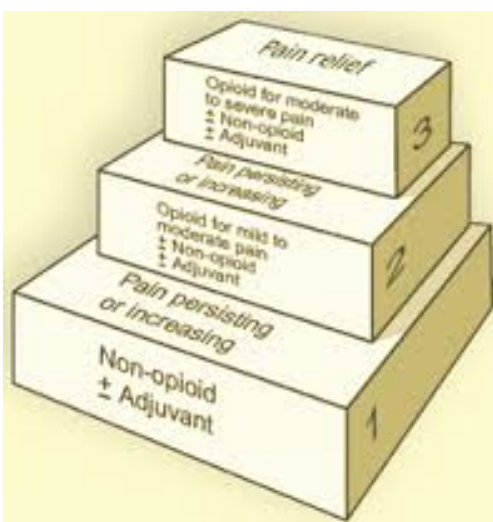
Despite the increased risk for adverse drug reactions, pharmacological interventions remain the primary modality for treating pain in the geriatric population (Cavalieri, 2002). Inadequate pain management in elderly patients can lead to complications such as delirium, atelectasis, pneumonia, functional decline and thromboembolism (Herr et al., 2004). When initiating any type of pain medication for an elderly patient the prescriber must consider age-associated changes in drug metabolism, increased risk for drug reactions, and drug to drug interactions. Elderly patients often require a lower dose of opioid medications because of age related pharmacokinetics that effect absorption, distribution and excretion of the medication. (Banicek, 2010) Therefore, prescribers should “start low and go slow” when introducing pain medications to the elderly population (Cavalieri, 2002, p. 482).

Following the WHO analgesic ladder (figure 2), the patient with mild pain, or a level between 1 and 3 on a verbal rating scale should be given a NSAID or

acetaminophen. In the geriatric population the first choice is acetaminophen (Cavalieri, 2002). According to the American geriatrics society expert panel (2012) Beers Criteria NSAIDS have a strong recommendation to be avoided unless other alternatives are not effective (p. 6). If the use of NSAIDS is necessary for short-term use then a gastro-protective agent to help reduce the risk of GI bleeding should also be prescribed. For moderate pain or a NRS from 4 to 7 an opioid containing acetaminophen should be given. Older adults are at higher risk for adverse effects from opioids because drug distribution is altered by decreased blood flow to major organs, lower plasma volume, and changes in protein binding ability. These affects are compounded in those that are opioid naïve, meaning they have had little or no exposure to opioids (Prowse, 2006).

Figure 2: World Health Organization Ladder

(<http://www.who.int/cancer/palliative/painladder/en/>)



For severe pain or a pain level of 8 to 10 Morphine is recommended. The same recommendation applies as for oral opioid dosing, begin at 20 to 50% of the normal adult dose, reassess frequently and adjust dose as necessary. Because of the potential Central Nervous System (CNS) effects of opioids, all patients, but especially elders will need close assessment prior to discharge. Cognitive function and gait should to be at baseline to ensure safe discharge from the ED setting.

Pain and Long Bone Fractures

Every year almost 2 million people seek emergency care for long bone fractures, most with moderate to severe pain yet many receive inadequate treatment (Bijur, Berard, Esses, Calderon, & Gallagher, 2008). Despite published guidelines by the Agency for Healthcare Research and Quality (AHRQ) and incentives for accreditation from certifying agencies, pain management in the ED is still inconsistent (Ware, Epps, Clark, & Chatterjee, 2012). Many studies have concluded that racial, ethnic and age disparities exist in the management of pain in LBF. According to the healthypeople.gov website one of the goals for Healthy People 2020 is the elimination of such inequalities.

Studies to determine the root causes for under treatment of pain in patients with LBF are not straightforward. Some studies have concluded that inadequate assessment and documentation of pain, long wait times, and type of provider seeing the patient all contribute to insufficient pain management (Ware et al., 2012). The study completed by Platts-Mills et al. (2012) analyzed data from the National Hospital Ambulatory Medical Care Survey (NHAMCS) over a 7-year period. They concluded that patients aged 75 and older were 19% less likely to receive adequate pain medication than were patients aged

35 to 54 years. Additional findings were that older patients were also less likely to receive an opioid or a nonsteroidal anti-inflammatory (NSAID). These authors determined that providers were less likely to prescribe analgesics because of concerns about potential side effects and older patients may be less likely to advocate for the treatment of their pain.

Ware et al. (2012) completed a 200 patient retrospective chart review on patients with LBF to investigate completion of pain assessment, pain treatment and any demographic variables including ethnicity to determine if they influenced pain treatment. In this study only 52% of patients were assessed using a pain intensity scale, 25% of all patients received no pain medication at all and only 24% were re-assessed within an hour of intervention. They did not find any disparities between ethnic groups, gender or wait times. The average patient waited 76 minutes for the first dose of analgesia.

The purpose of the study by Minick et al. (2012) was to determine the adequacy of pain medication for patient with LBF. The design of the study was an exploratory, correlational design using patient data extracted from an electronic health record of 2 major urban medical centers over a 3.5-month period. They utilized the Pain Management Index (PMI) to determine adequacy of pain medication prescribed according to the intensity of the pain. The findings of this study were similar to those previously cited, 36 % of patients with LBF received no pain medication at all despite an average pain rating of 6.9 on a 0 to 10 scale. Patients that did receive pain medication waited an average of 1.76 hours. These investigators did not appreciate any disparity in regards to age, gender or ethnicity.

Value Based Purchasing

Value Based Purchasing (VBP) is a Center for Medicare and Medicaid (CMS) initiative that rewards providers for delivering better patient outcomes at a lower cost. VBP rewards quality of service rather than the more traditional fee for service (Van Lare & Conway, 2012). The CMS has implemented many strategies over the past decade to incentivize hospitals to improve upon patient care at lower costs. One of these programs was the Premier Hospital Quality Incentive Demonstration (PHQID), which tracked and then rewarded hospitals on performance of 6 specific diagnoses: acute myocardial infarction, congestive heart failure, pneumonia, coronary artery bypass graft surgery, hip and knee replacement surgery and perioperative management of surgical patients (Blumenthal & Jena, 2013). In 2005 the Hospital Compare Website was introduced, this website allows patients to compare area hospital patient surveys, core measures, readmissions, complications, deaths and Medicare volume and reimbursement (Raso, 2013). Beginning in 2008, in response to the skyrocketing cost of hospitalizations, CMS stopped paying hospitals for several hospital-acquired complications, including urinary tract infections, bloodstream infections, falls, and pressure ulcers. Beginning in fiscal year 2013 (payable in 2014) VBP will be available to all acute care hospitals in the United States. Initially only 2 care domains will be included, (1) clinical processes of care (weighted 70%) and (2) patient experience of care (weighted 30%). Incentive payments to hospitals will be based not only on performance but improvement over time. This allows and encourages lower performing hospitals to improve on quality of care (Blumenthal & Jena, 2013). The 2014 VBP domains will be reviewed next.

Median Time to Pain Management for Long Bone Fractures

For fiscal year 2014 (payable 2015) the VPB focus by the Centers for Medicare and Medicaid will be (1) Clinical Process of Care (weighted 45%), (2) Patient Experience of Care Domain (weighted 30%) and (3) Outcome Domain (weighted 25%). One of the new process measures to begin in 2015 for EDs is Median Time to Pain Management for Long Bone Fractures, known as OP-21. This measure is described by CMS as the median time from ED arrival to initial oral or parental pain medication administration in patients with long bone fractures. Payment will be based on improvement as demonstrated as a decrease in the median time from year to year.

Methods will be described next.

Methods

Purpose

The purpose of this research study was to explore if patients with an upper extremity LBF received pain medication within 60 minutes of arrival to the ED and to identify if there was a difference in the pain management of patients, with identical injuries, by age in a community hospital emergency department.

Design

This study was a descriptive two-group retrospective chart comparative review from January 2013 through December 2013 of patients with upper extremity fractures.

Sample

The first group was patients over the age of 18, but under the age of 70 with an upper extremity fracture: the second group was patient's 70 and older with upper extremity fractures. Inclusion criteria included patients that were alert and oriented and able to rate their pain using a Numeral Rating Scale. Exclusions included anyone with a reported pain level of 0, patients that refused the offer of pain medication and anyone who received pain medication by EMS or took medication at home prior to arrival because they would not be eligible for further medication under the Standing Orders policy. Also excluded were any patients with a possible head injury, unstable vital signs or who had a syncopal episode. These patients required other immediate interventions that could have delayed the giving of pain medication. Similarly, patients that were not

able to communicate in English to rate their pain were excluded because of the potential time delay in obtaining a translator before pain medication could be given.

Site

The study site was a community based ED, which averages approximately 55,000 ED visits per year. The project was conducted at a computer station in the physicians consult room. This is a non-patient care area located in the ED that had several computers with the ED electronic record available on the desktops. The electronic records were accessible by password only and timed-out after one minute when not in use. The consult room was only accessible through a Lifespan badge swipe or pin pad entry code.

Procedures

After IRB approval through Lifespan and Rhode Island College was obtained this student researcher ran a report through the ED charting software, Medhost. This ED charting system was able to extract data by a chosen denominator. The Medhost data collection software was utilized to view a report from the ED electronic health record on all patients with upper extremity fractures for the stated time frame. This was done in the physician's consult room in the ED which was accessed through a Lifespan badge swipe. This report contained the patient's name, medical record number, age, gender, discharge diagnosis and disposition. Only the age and diagnosis was collected for this study. All electronic records were reviewed by this student researcher to identify any exclusions. Electronic records of included patients were surveyed for a documented assessment of the reported pain level during triage and to determine if pain medication was given within 60 minutes of arrival to the ED. The quantitative data was collected using a data collection

tool created by this researcher. Age, injury, numeric rating of pain, and if appropriate pain medication provided within 60 minutes as well as which medication was given was the only data gathered on the data collection tool. No identifiable patient data was reported on the collection tool. No electronic records were printed or stored. The data collection tool was kept in a locked box accessible to only this student researcher.

Measurement

The data from each group was placed in a table illustrating their age, injury, pain level, if pain medication was given, time to first medication and which medication was given. These data were displayed utilizing descriptive statistics to provide readers with a visual comparison of the data and if the WHO recommendations for pain management were met.

Timeframe

The time frame to review each record and tally the data was approximately 10 minutes per record. The number of records reviewed was dependent on the completeness of data in the patient record in order to obtain the necessary sample size. IRB was approved on March 12, 2015: Data collection took place on March 14, 2015: Data analysis took place from March 15, 2014 through March 29, 2014: Dissemination will be completed April 1, 2014 through April 28, 2014.

Organizational/Systems factors

A major enabling factor was the institutions interest to improve patient satisfaction and to meet accreditation organizations and payer expectations. A potential barrier identified was incomplete documentation of study elements.

Desired Outcomes

Desired outcome was to determine if an analgesic was being offered to patients with upper extremity LBF within 60 minutes of arrival and to identify any disparities in the management of pain according to age.

Ethical Concerns

Only records of discharged patients were reviewed without bias for gender or ethnicity. Therefore no ethical concerns or diversity implications were identified.

Evaluation plan

The results of the two groups were compared to determine if there were any disparities in treatment. The limitations of the study are identified.

Plan for dissemination

The ED management team was provided with a written report and a presentation of the results were disseminated to ED staff nurses and Quality departments through weekly leadership meetings, daily staff huddles and monthly quality reports.

Results of the study will be discussed next.

Results

A total of 203 records were reviewed. Sixty-six records were excluded based on the exclusion criteria and secondary to incomplete documentation of pain or events precipitating the fall. The age categories of the study subjects are illustrated in Figure 2.

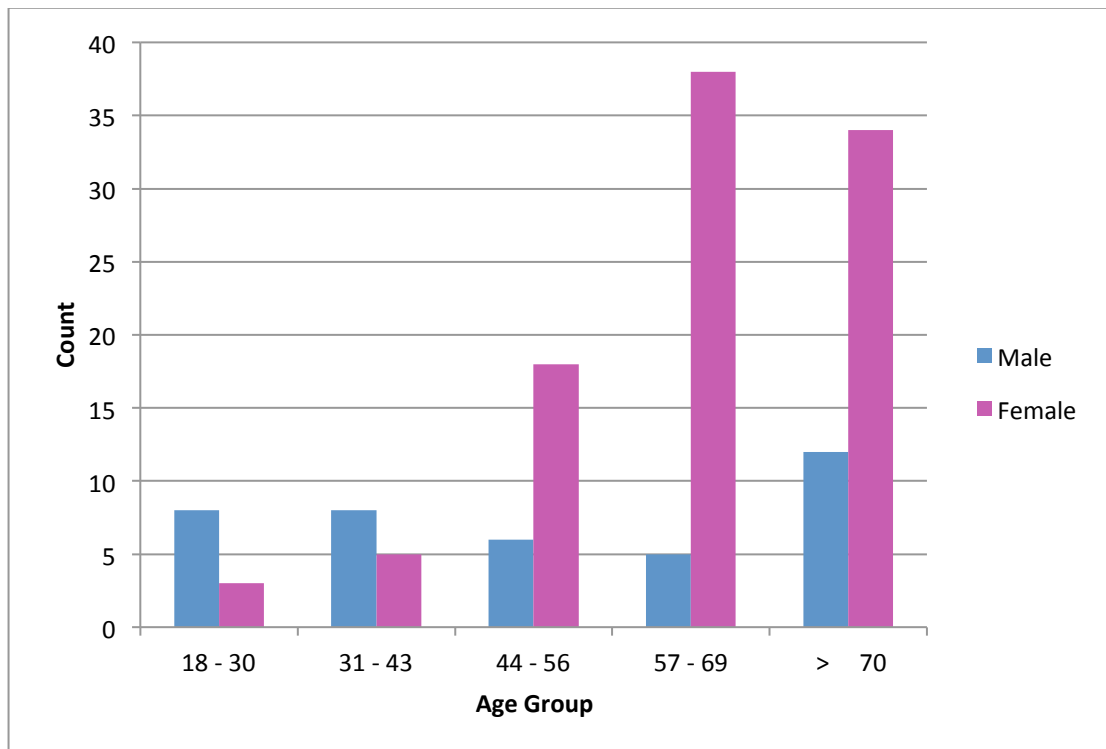


Figure 2. Age of study participants by gender

Of the total number of study subjects (N= 137), 71.5 % (n=98) were female and 28.4% (n= 39) were male. For purposes of this study, age categories were further analyzed into those 69 years and under and those aged 70 and over. Ninety-one

participants (n= 66.4%) were in the 69 or younger group, with 46 (n= 33.5) being 70 years of age or older.

The number of participants medicated and not medicated within 60 minutes of arrival to the ED by age is illustrated in figure 3.

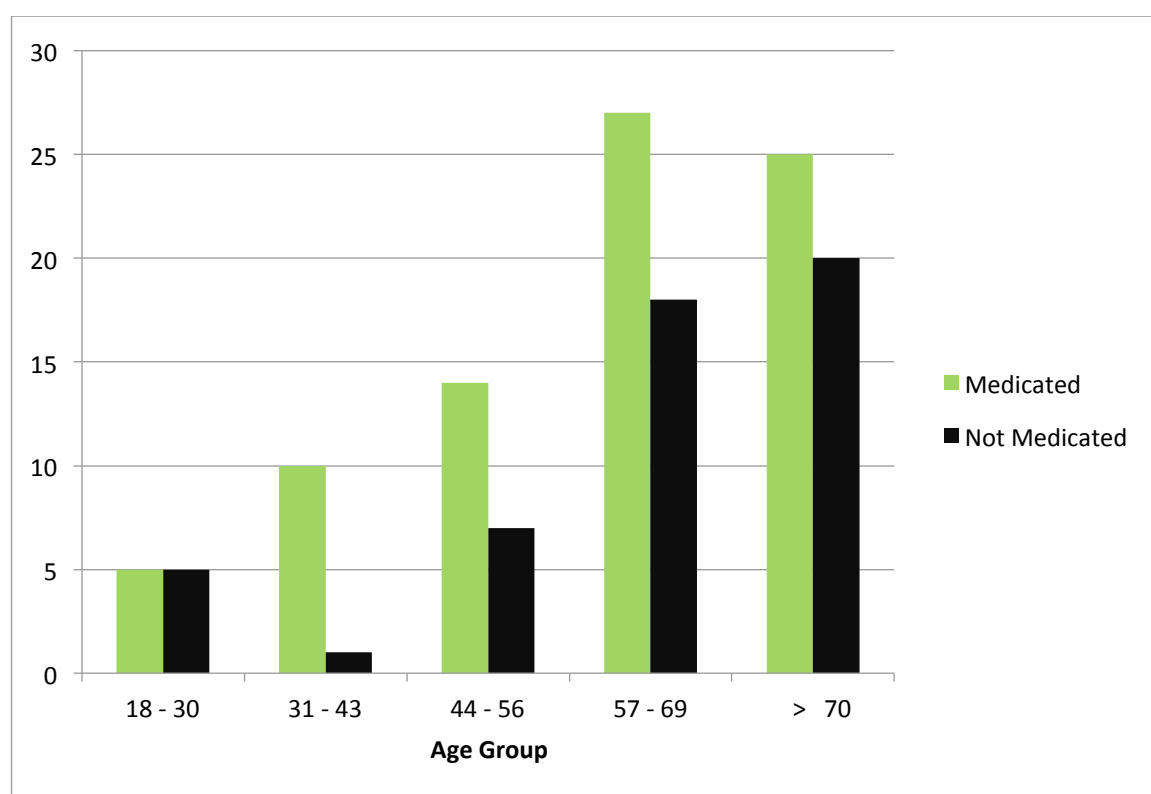


Figure 3. Number of participants medicated and not medicated within 60 minutes of arrival to ED by age.

Of the total number of study subjects medicated within 60 minutes of arrival (n= 81) 76% were in the 69 and younger age group. Almost 31 % (N=25) of all patients

medicated within 60 minutes of arrival were 70 years of age or older. Of those not medicated within 60 minutes of arrival (N= 51), 60 % were in the 69 years of age or younger. Approximately 39% (N=20) of patients not medicated within 60 minutes were 70 years of age or older.

The WHO guidelines state that pain management should follow a three-step process. Step 1 should start with a non-opioid, such as acetaminophen or ibuprofen, for mild to moderate pain. If the patient is having moderate or severe pain step 1 should be skipped completely. Step 2 is to provide an opioid with acetaminophen, such as hydrocodone/APAP or Vicodin for moderate to severe pain. If step 1 is skipped and step 2 does not relieve the pain then progress to step 3, which is to give an opioid without acetaminophen such as morphine or hydromorphone. The number of patients medicated appropriately and inappropriately according to the WHO guidelines is illustrated in figure 4 by age.

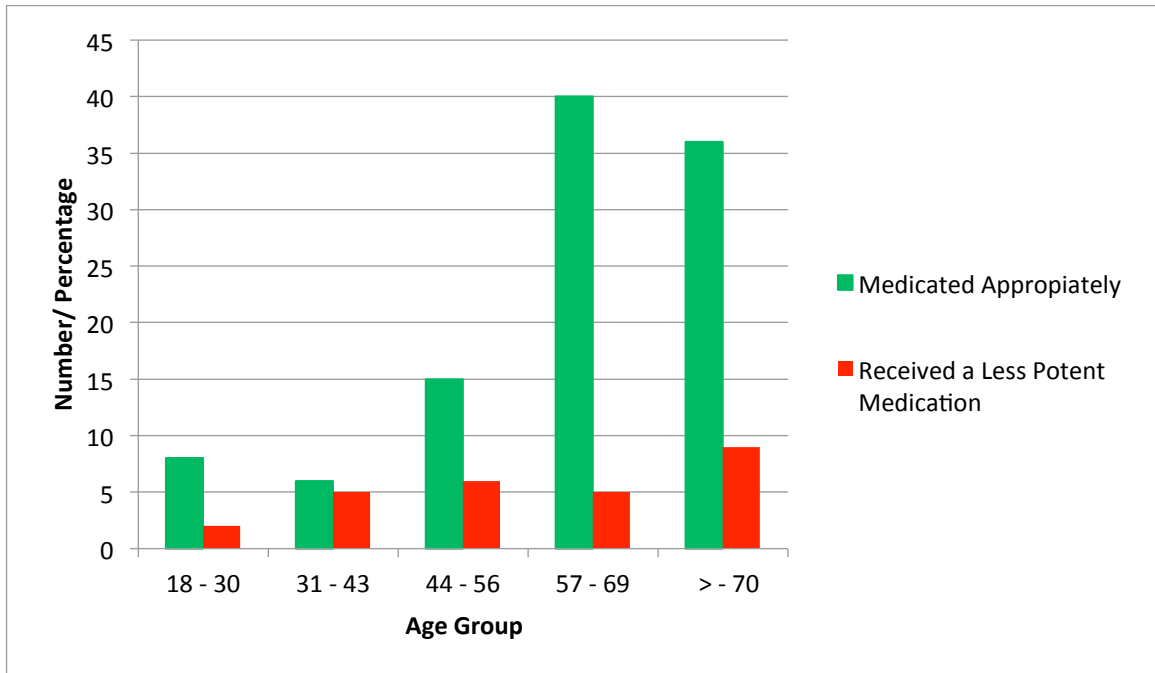


Figure 4. Participants who received appropriate and inappropriate medication according to WHO guidelines by age.

Of the total number of patients medicated according to the WHO guidelines (N=105), 65.7 % were in the 69 years of age or younger. Approximately 34% (N=36) of all patients medicated according to WHO recommend guidelines were 70 years of age or older.

Summary and Conclusions

Every year almost 2 million people seek emergency care for long bone fractures (LBF), most with moderate to severe pain yet many receive inadequate pain management (Bijur, Berard, Esses, Calderon, & Gallagher, 2008). Studies have concluded that inadequate assessment and documentation of pain, long wait times and type of provider seeing the patient all contribute to insufficient pain management (Ware et al., 2012). Effective pain management of emergency department (ED) patients with bone fractures is not only a crucial element in patient satisfaction, but it is also a priority for providers and nurses because unrelieved pain can lead to adverse physical and psychological consequences (van Dijk, Kappen, van Wijck, Kalkman & Schuurmans, 2012). A seven year national survey published in the *Annals of Emergency Medicine* in 2012 concluded that patients 75 years or older who presented to EDs with a complaint of pain were 19% less likely to receive pain medication when compared to younger adults with similar injuries (Platts-Mills et al., 2012). Studies have not found any evidence that elders experience pain any less than their younger counterparts (Layzell, 2009), but they have established that not adequately treating acute pain in elderly patients can lead to complications such as atelectasis, dementia, pneumonia, functional decline and thromboembolism (Herr et al., 2004).

Pharmacological interventions remain the primary modality for treating pain in both the young adult and geriatric population. WHO has established a three-step process for pain management. Step 1 starts with a non-opioid and is for mild to moderate pain,

rated from 1-3 on a 1-10 pain scale. Step 2 for moderate pain or pain rated 4-7 on a 1-10 pain scale includes an opioid containing acetaminophen. For severe pain or a pain level 8-10 on a 1-10 pain scale morphine is recommended. The purpose of this study was to determine if patients with an upper extremity LBF receive pain medication within 60 minutes of arrival to the ED and to identify if there is a difference in the pain management of patients, with identical injuries, by age in a community hospital ED.

This study included a two-group design and retrospective chart review to gather data. Inclusion criteria included all male and female study subjects who were discharged from the ED with a LBF of the upper extremity in 2013 that were 18 years of age or older. Group 1 included patients between the ages of 18 and 69 years of age. Group 2 included patients aged 70 years and older. A total of 203 charts were reviewed, 137 met inclusion criteria. A total of 91 subjects were 69 years of age or younger and a total of 46 were 70 years of age or older. Data collected included age, injury, numeric rating of pain, and if appropriate pain medication was provided within 60 minutes.

Over 71% of all upper extremity fractures occurred in females. Males had higher incidences in the 18-30 and 31-43 age groups. Females aged 57-69 accounted for 86.3% of upper extremity fractures. Females accounted for 74 % of fractures in the 70 and older age group. There was a slight difference in the number of participants medicated within 60 minutes of arrival with Group 1 receiving pain medication 63% (N=56) of the time and Group 2 receiving pain medication 56 % (N=25) of the time. A larger disparity existed between the groups being medicated appropriately according to the WHO guidelines with 63% (N=55) of the subjects aged 18-69 receiving the appropriate pain

medication compared to 45 % (N=36) of the subjects in the 70 and over age group. This study did not demonstrate a significant difference on pain medication according to age. It is likely the smaller sample size in Group 2 lacked the amount needed to demonstrate a significant difference.

Limitations of this project included restricting the data collection to only upper extremity fractures, the uneven sample sizes in each group and the exclusion of many records in Group 2 due to the unclear nature of the mechanism of injury (syncope vs. fall) or that the patient had been medicated prior to arrival by EMS.

Based on the findings of this study, it can be concluded that 59.5 % of all patients with upper extremity fractures are being medicated within 60 minutes of arrival to this ED and 54% are receiving the appropriate medication based on the WHO guidelines. Though type of upper extremity fracture was collected no attempt was made to analyze data by the type of fracture.

Next implications and recommendations will be discussed.

Recommendations and Implications

Recommendations for the treatment of acute moderate to severe pain are well established through WHO, and hospital accrediting agencies, yet many studies have demonstrated the under-treatment of pain in patients presenting with LBF. Furthermore, many studies have found that the elderly population are even less likely to receive an appropriate pain medication.

The utilization of Triage Protocol Orders have been found to be effective in the early recognition and treatment of acute pain. The ED nurse must be knowledgeable and skilled in the assessment and management of acute pain to be able to appropriately treat acute pain from LBF while staying within their scope of practice. One of the limitations of “Standing Orders” at this hospital is the wording of the “Standing Orders”. For example, if a patient presents with a pain rating of 7/10 per the “Standing Orders” they should be offered hydrocodone/APAP unless contradicted. However, if the patient requests a NSAID rather than the medication contained in the “Standing Order the nurse cannot administer the patient’s choice since this would be outside of the “standing order” and the nurses scope of practice. Limitations such as these may be a contributing to patients not receiving appropriate pain medication or none at all. The Advanced Practice Nurse (APRN) as a member of the interdisciplinary team can advocate and influence change to improve patient quality measures including those for the appropriate treatment of acute pain from LBF.

Older adults are especially vulnerable to side effects from analgesics, however if the medication is given in appropriate doses and patients are appropriately monitored they can be safely medicated for pain. The APRN has an opportunity to educate nurses and members of the interdisciplinary team through dissemination of and education about evidence based practice guidelines for the safe and effective methods for treating acute pain across the lifespan.

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Appendix A

**The Miriam Hospital
Emergency Department**

Subject:
Standing Orders

File Under: S.3

Issuing Department:
Emergency Department

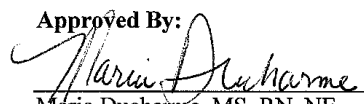
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1/05, 5/08, 1/09, 5/10, 7/12, 4/13

Original Procedure Date:

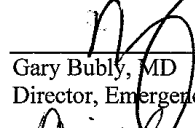
Page 1 of 5

Approved By:

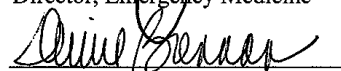
Reviewed Date:
5/90, 2/92, 11/98, 9/02,
9/05, 5/08, 9/08



Maria Ducharme, MS, RN, NE-
BC
SVP Patient Care Services &
Chief Nursing Officer



Gary Bubby, MD
Director, Emergency Medicine



Denise Brenman, RN, MSN, CNL
Director, Emergency Nursing

I. POLICY:

It shall be the policy of The Miriam Hospital Emergency Department that the Emergency Department registered nurses will order initial laboratory tests, x-rays and other interventions according to approved standing order protocols (attached) to expedite the treatment of patients.

II. PROCEDURE:

The nurse will obtain pertinent information regarding the chief complaint, e.g., past medical history, vital signs and allergies, to determine which standing order set is appropriate. The approved standing orders are intended for several common and well-defined chief complaints and should not be applied in other circumstances.

Medication (after medication allergies assessed)

1. One dose of Motrin 800mg PO
Indication: Pain scale of 4 (four) or less or Fever (Temperature 101 degrees F or greater)
Contraindication: Patients with Aspirin allergy, Renal Disease, Ulcers, Headache, Abdominal pain, Chest pain, or Pregnancy
(Has not taken Motrin within the last 6 hours)

- or -
2. One dose of Tylenol 975 mg PO
Indication: Pain scale of 4 (four) or less or Fever (Temperature 101 degrees F or greater)

Contraindication: (patient has taken Tylenol within the last 4 hours)
3. One dose of Vicodin, 1 tablet PO
Indication: Pain scale of 5 or greater

Contraindication: Patient unable to take PO medication
4. One dose of Morphine 4mg IV or SC
Indication: Pain scale of 5 or greater and inability to take PO medication and/or presumed NPO status exists
5. One dose of Zofran (Ondansetron) 4mg IM, PO or IV
Indication: Nausea

(Patients will be instructed to remain for a full examination by an LIP. Any patient who receives medication for pain and leaves prior to being evaluated by an LIP will be contacted for follow-up care.)