

EMERGENCY PAIN MANAGEMENT: TRENDS AND EFFICACY

by

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B.S.N. (*honors*), University of Central Florida, 2000

A research project submitted in partial fulfillment of the requirements for the degree of Master of Science in Nursing in the School of Nursing in the College of Health and Public Affairs at the University of Central Florida
Orlando, Florida

Fall Term

2001

ABSTRACT

More than 78% of patients who seek medical and nursing care in an Emergency Department (ED) present with pain as the primary chief complaint (Tanabe & Buschmann, 1999). Therefore, it is important that nurses working within this specialty aggressively treat pain in ED clients who present with it. Pain is multi-dimensional, affecting individuals on a physiologic, psychological, sociological, and cultural basis. There are many complex responsibilities in treating emergency patients in pain.

The purpose of this retrospective chart review is to investigate the pain management trends and efficacy within a level II Emergency Department in Orlando, Florida. All patients admitted to the Emergency Department from 6/1/00 to 6/1/01, who were 18-100 years of age with the diagnosis of long bone fracture (including fractures of the tibia, fibula, femur, radius, ulna, or humerus) with Glasgow Coma Scale (GCS) ratings of 15 were eligible for participation in the study as identified through ICD-9 coding.

A researcher-developed data collection tool was used to examine patient age, gender, ethnicity, diagnosis (bone of fracture), time of secondary assessment, chronological pain rating at time of secondary assessment, time of initial treatment through pharmacological nursing intervention, medication used for initial pain management, first reassessment chronological pain rating, and the chronological pain rating at either time of admission/transfer to the appropriate hospital unit or discharge to self-care at home.

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CHAPTER 1

INTRODUCTION

The vast majority of people will experience many different pains throughout their lives (Carroll & Bowsher, 1993). Pain from multiple etiologies and sources may develop in most parts of the body--internally in muscles, bones, joints, and viscera, as well as externally on the surface of the skin (Margoles & Weiner, 1999). Pain varies extensively in descriptive quality (aching, burning, tearing, gnawing, stinging, throbbing, sharp, or dull), intensity (weak to strong), duration (a few seconds to years), frequency (constant or episodic) and unpleasantness (a mild annoyance to an intolerable discomfort).

According to Innes (1998), the patient suffering from pain is affected both physically and mentally (both cognitively and emotionally). Adults frequently seek care in the ED for the relief of pain related to a variety of acute conditions (Selbst & Clark, 1990). Yet research to date suggests that pain in the Emergency Department is not managed well (Wilson & Pendleton, 1989; Selbst & Clark, 1990; Lewis, et. al, 1994; Ducharme & Barber, 1995; Goodacre & Roden, 1996). In addition, not many studies exist which explore pain management trends and efficacy within the emergency setting.

PURPOSE OF STUDY

The purpose of this study was to describe the trends and efficacy of the pain management techniques for patients with orthopedic fractures used by staff within the Emergency Department (ED).

RESEARCH QUESTIONS

The following research questions were considered:

1. What pharmacologic agents are used by ED staff for pain management in patients with fractures?
2. What is the mean time from secondary assessment to pharmacologic intervention?
3. What is the efficacy of emergency pain management defined by comparison of mean pain ratings at time of secondary assessment, first reassessment, and discharge home to self-care or admission to the hospital?

OPERATIONAL DEFINITION OF TERMS:

Adult- Any individual aged greater than 18 years.

Bone of Fracture- Diagnosed fractured bone (tibia, fibula, femur, radius, ulna, or humerus) as identified through ICD-9 coding.

Chronological Pain Rating- A subjective pain rating on a scale of 1-10. The patient is informed that 1 is the least amount of pain possible and 10 is the worst imaginable (Kozier, et. al, 1998).

Chronological Pain Rating at Time of Admission/

Discharge- The final chronological pain rating at the exact time of transfer to a hospital care unit or discharge to home for self-care.

Ethnicity- An individual of Caucasian, Black, Hispanic, Asian, or Other descent.

Fracture- A break in a bone (Thomas, 1997).

Pharmacological Intervention- The use of medicines to alleviate pain.

Primary Assessment- The initial assessment of a patient in a pre-hospital or triage setting.

Secondary Assessment- The second assessment performed upon admission to the ED in which the first chronological pain rating is assigned.

ASSUMPTIONS

Assumptions used in this study were:

- Adults experience pain.
- Long bone fractures are conditions that cause pain in adults.

CHAPTER 2

LITERATURE REVIEW

This review of literature will examine the topic of pain management in the Emergency Department. Studies reviewed investigated patient satisfaction with pain management, intensity upon admission/discharge, assessment and therapy, patient preferences regarding pain medication, prevalence and incidence of pain in the ED, and gender/ ethnic/age variations in care. In addition, current evidenced-based guidelines and professional medical/nursing association positions related to pain management of emergency patients will be reviewed.

SIGNIFICANCE AND MAGNITUDE OF THE PROBLEM

Many people present in the ED for treatment and pain alleviation. The medical and nursing professions are facing accountability for effectively managing pain in the emergency patient population. The Joint Commission for the Accreditation of Healthcare Organizations (JCAHO), the agency responsible for accrediting hospitals and healthcare facilities across the United States, has identified pain management as a top priority (JCAHO, 1999). Many cite pain as the fifth vital sign (Kozier, et. al, 1998).

In 2001, compliance with new JCAHO-authored standards will go into effect for re-accreditation consideration. These standards are highly applicable to the Emergency Department and consist of the following:

Table 1

JCAHO Pain Management Standards

1. Recognize the right of patients to appropriate assessment and management of their pain
 2. assess pain in all patients
 3. record the results of the assessment in a way that facilitates regular reassessment and follow-up
 4. educate relevant providers in pain assessment and management
 5. determine competency in pain assessment and management during the orientation of all new clinical staff
 6. establish policies and procedures that support appropriate prescription or ordering of pain medications
 7. ensure that pain does not interfere with participation in rehabilitation
 8. educate patients and their families about the importance of effective pain management
 9. include patients' needs for symptom management in the discharge planning process
 10. collect data to monitor the appropriateness and effectiveness of pain management
-

REVIEW OF EVIDENCED-BASED GUIDELINES

The Agency for Healthcare Research and Quality (AHRQ) has specific guidelines in place for the clinician treating patients in pain. However, guidelines generally designed for the ED are lacking. This probably relates to the fact that in the emergency setting, pain is caused from multiple etiologic sources and the guidelines in existence address the various etiologies of pain seen within the ED rather than ED pain itself.

EVIDENCE OF THE PROBLEM IN THE RESEARCH LITERATURE

An integrated research review follows regarding pain management in the Emergency Department. Tables of information identifying the main characteristics of the studies conducted and results obtained by the researchers are presented as Appendix L. Each research study examined indicated through literature review that pain was poorly treated in the Emergency Department (Beel, et. al, 2000; Chan & Verdile, 1998; Ducharme & Barber, 1995; Friedland & Kulick, 1994; Johnston, et. al, 1998; Kelly, 2000; Raftery, et. al, 1995; Selbst & Clark, 1990; Tanabe & Buschmann, 1999; Todd, et. al, 1993).

Results of the various studies were conflicted as some found ED pain management good but others poor. Chan & Vedile

(1998) used post-discharge interviews and found that 100/110 individuals interviewed believed their pain was effectively managed after discharge. However, when Ducharme & Barber (1995) used a post-discharge questionnaire to measure patient satisfaction, they discovered satisfaction was lower in comparison to other studies.

Tanabe & Buschmann (1999) conducted a study measuring efficacy by comparing mean pain ratings at time of arrival, reassessment, and discharge and concluded that pain was poorly controlled in the ED. But Kelly (2000) found that mean pain ratings obtained in the ED using the chronological pain rating scale did not correlate with patient satisfaction levels after discharge. One study found a significant number of patients reporting higher pain ratings at time of discharge compared to admission (Johnston, et. al, 1998).

Attempting to define risk factors in treating emergency patients in pain is a newer area of study. Although females are more likely to receive stronger and greater amounts of pain medications, the gender of the provider does not seem to affect his or her choice in analgesic. It was discovered that reported severity was more important than gender (Beel, et. al, 2000). However, ethnicity has been found to be an important risk factor in the under-treatment of pain.

Todd, et. al (1993) found ethnicity to be the greatest determinant of whether or not a patient was given an analgesic for long bone fracture during an ED stay. The literature review performed by this researcher found only one study investigating

the influence of ethnicity on emergency pain management practices. This is an area in need of further research augmentation.

In conclusion, this literature review found many articles supporting the hypothesis that pain management is poor in the Emergency Department. A few of the studies reviewed refuted this. Gender was not considered to have influence on ED prescribing practices while ethnicity was found to be a major risk factor for analgesic prescription. It was found that research was lacking in examining the impact ethnicity and gender have on ED prescribing practices.

CHAPTER 3

METHODOLOGY

SAMPLE

The sample consisted of individuals of both gender and any ethnicity presenting to the ED between 6/1/00 and 6/1/01 with the diagnosis of long bone fracture. Of the 60 patient medical charts randomly selected, 56 finally became part of the study as 4 patients presented with a Glasgow Coma Scale score below 15.

SAMPLE SELECTION

A sampling of 60 medical charts from June 1, 2000 through June 1, 2001 meeting inclusion criteria were obtained from the medical records department.

PROTECTION OF HUMAN SUBJECTS

This research study was exempt from review by the institutional review boards of both the hospital and the University of Central Florida (UCF) because identification of patients was solely through numeric notation. The researcher's project committee approved the research study.

The Nursing Research Committee of Florida Hospital approved the study after reviewing the research proposal and sending the data collection tool to a content expert to verify validity and reliability. This retrospective chart review posed no threat to

participants as the identity of each patient was known only to the researcher through number identification using the patient's Medical Record Identification number.

INSTRUMENT

A data collection sheet was developed by the researcher (see Appendix J). Validity and reliability were supported through a content expert on the Nursing Review Board at the hospital in which the research was conducted.

DATA COLLECTION

Retrospective data were collected from patient charts retrieved from medical records department personnel given the inclusion criteria for the study. Findings were entered into the data collection sheet electronically using Microsoft Word 2000.

TREATMENT OF THE DATA

Data were analyzed by use of descriptive statistics. Descriptive data were analyzed using measures of central tendency and frequency distributions. The Statistical Program for the Social Sciences (SPSS) 10.1 software was used to yield data results.

CHAPTER 4

RESULTS AND DATA ANALYSIS

INTRODUCTION

This chapter will review the results and data analysis of the research study. Demographic information, analysis of the data and results, and the three research questions will be examined.

DEMOGRAPHICS

Demographic characteristics were collected from the medical records and are summarized in Table 4.1. The ages of the clients varied widely. The youngest patients were age 40, the eldest, 97. 34% of participants were between the ages of 40 and 76. 66% were above the age of 76. The median age was 81 while the mode age of the population was 85 (11%).

The majority (36) of the patients were female (64%) while 20 (36%) were male. 54 (96%) of the participants were Caucasian in ethnicity; 2 were African American (4%). Most (38) patients (68%) presented with the diagnosis of femoral fracture (ICD-9 Code 820); 16% (9) were given the diagnosis of tibia or fibula fracture (ICD-9 Code 813).

Finally, 16% (9) had fractures of the radius or ulna (ICD-9 Code 823). The times of secondary assessment are representative of a 24-hour day. The earliest secondary assessment was performed at 0025 while the latest assessment was performed at 2345. The majority (5%) was performed at 1200.

Table 2

Demographics

Gender	<u>Number</u>	<u>Percent</u>
Male	20	36%
Female	36	64%
<u>Age</u>		
40-60	6	13%
61-80	20	34%
81-97	30	53%
<u>Ethnicity</u>		
African American	2	4%
Caucasian	54	96%
<u>Fracture/ (ICD-9)</u>		
Tibia or Fibula/813	9	16%
Radius or Ulna/823	9	16%
Femur/820	38	68%
<u>Shift Presentation</u>		
0025-1100	9	16%
1105-1655	24	43%
1710-2345	23	41%

RESEARCH QUESTION #1

What pharmacologic agents are used by ED staff for pain management in patients with fractures?

The majority of the patients in this study received some type of pain medication (73%). The largest percentage (34%) received morphine sulfate. 14 of the clients were given Demerol® (25%). 2 patients were administered Toradol® (4%) while 2 patients were given Tylenol® (4%). Darvocet®, Lortab®, Percocet®, and Tylenol® #3 were administered to one patient each (2% each, 4 total patients). 15 (27%) did not receive any analgesic during their stay in the Emergency Department (see Appendix I).

Table 3

Analgesics Administered

	<u>Number</u>	<u>Percent</u>
Drug		
Morphine Sulfate	19	34%
No Intervention	15	27%
Demerol®	14	25%
Toradol®	2	4%
Tylenol®	2	4%
Darvocet®	1	2%
Lortab®	1	2%
Percocet®	1	2%
Tylenol® #3	1	2%

RESEARCH QUESTION #2

What is the mean time from secondary assessment to pharmacologic intervention?

The times from secondary assessment to pharmacologic intervention are varied. 1 (3%) chart did not have the time in which the patient received medication noted. 2 charts (5%) reviewed indicated negative values, in which notated pharmacological intervention times were earlier than the time noted for completion of the secondary assessment.

The mean time from secondary assessment to pharmacologic intervention was 3.2 hours. The fastest positive time noted for administration of analgesic was approximately 40 minutes while the longest time noted was over nine and a half hours. Table 4.3 displays the ranges and frequencies of the time of secondary assessment to administration of analgesic.

Table 4

Secondary Assessment → Rx Intervention (Actual Times in Hours)

<u>Time Range</u>	<u>Number</u>	<u>Percent</u>
.57-1.5	13	38%
1.67-3.0	10	25%
3.4-6.0	6	13%
6.3-9.6	9	20%
Negative Values	2	5%
Not Recorded	1	3%
No Rx Given	15/56	27%

RESEARCH QUESTION #3

What is the efficacy of emergency pain management defined by comparison of mean pain ratings at time of secondary assessment, first reassessment, and discharge home to self-care or admission to the hospital?

The majority (38) of the charts reviewed (68%) did not have

secondary assessment pain ratings notated and 5% utilized the Wong and Baker Scale of Pain Measurement. Of those with the chronological pain rating noted (32%), the mean rating was 5. The mode rating of those recorded was 4 (7%). Table 4.3 displays the ranges and frequencies for those pain ratings recorded.

Table 5
Secondary Pain Ratings

Rating	<u>Number</u>	<u>Percent</u>
0	3	5%
3	1	2%
4	4	7%
5	3	5%
6	1	2%
7	1	2%
8	2	4%
9	3	5%
Not Recorded	38	68%
Wong and Baker	2	5%

The majority (29) of the charts reviewed did not have a first reassessment pain rating notated (52%). Of those with the pain rating noted (48%), the mean rating was 4. The mode rating for those recorded was 0. Table 4.5 displays the first reassessment ranges and frequencies in subjective chronological pain ratings reported by study participants.

Table 6

First Reassessment Rating

Rating	<u>Number</u>	<u>Percent</u>
0	8	14%
1	1	2%
2	3	5%
4	2	4%
5	5	9%
6	1	2%
8	1	2%
9	1	2%
10	5	9%
Not Recorded	29	52%

The majority (29) of the charts reviewed did have a final assessment chronological pain rating notated (52%). The mean final reassessment rating recorded was 3. The majority of clients reported a pain rating of 0 (21%).

Table 4.6 displays the ranges and frequencies of the reported ratings of the final reassessment chronological pain rating.

Table 7

Final Reassessment Rating

Rating	<u>Number</u>	<u>Percent</u>
0	12	21%
1	1	2%
2	3	5%
3	2	4%
4	1	2%
5	4	2%
7	1	2%
8	2	4%
9	1	2%
10	2	4%

CHAPTER 5

DISCUSSION

INTRODUCTION

This study was completed to describe the pain management trends and efficacy currently employed by Emergency Department staff with patients diagnosed with a long bone fracture. Close examination of current prescribing techniques, mean time from secondary assessment to pharmacological intervention, and trends in pain ratings at three differing times of assessment were used to illustrate whether or not pain scores decreased during stay within the ED. This chapter will discuss the results of the data and clinical/educational significance. Limitations of the study and implications for further research will also be explored.

DEMOGRAPHICS

In this study, 20 (36%) of the clients were male and 36 (64%) were female. The ages of the patients ranged from 40 to 97. Only 2 (4%) participants were African American. The majority (68%) of patients presented with the diagnosis of femoral fracture. Thus, the typical patient participating in this study was a Caucasian female, age 77, with a fracture of the femur. The ED is open 24 hours per day, 7 days per week, 365 days per year and all shifts were identified through this study. The majority (84%) of patients presented between the hours of 1100 a.m. and 2400 a.m. The possible reason for this shift

presentation could be related to sleeping patterns of the general population; the majority of the population is asleep after midnight.

RESEARCH QUESTION #1

What pharmacologic agents are used by ED staff for pain management in patients with fractures?

The data from this sample indicates that the majority of participants received pain medication (73%). While a myriad of medications were used, morphine sulfate was employed most frequently at 33%. Demerol® was the second-ranked drug employed in frequency.

In a retrospective chart review performed by Tanabe and Buschman in 1999, Demerol® was the most frequently prescribed analgesic. In contrast, this study's results indicate that morphine sulfate was used most frequently as an analgesic. Demerol® was ranked second in frequency of use.

The number of participants in this study who received pain medication is about equal in comparison with other descriptive studies, which indicate that approximately 25% of patients presenting in the ER with long bone fractures do not receive medicinal intervention.

Beel, et. al (2000) examined the percentage of patients presenting to the ED with long bone fractures who were given analgesics compared to those who wanted analgesics. 77% of participants received pharmacologic intervention for pain. 73% of the participants in this study received pharmacologic intervention. However, both studies indicate that the percentage of patients who receive pain medication (77% and 73% prospectively) for long bone fracture is far less than those who actually want it (88%). In addition, the AHCPR (1992) recommends that post-traumatic pain needs to be aggressively treated.

CLINICAL SIGNIFICANCE

The appropriate management of pain is an essential component of comprehensive emergency medical care for patients of all ages not only for physicians but for nurses as well (American College of Emergency Physicians, 1998). In addition for accreditation through JCAHO, pain is taking an unprecedented saliency. Nurses must strive to make sure that patients' pain is adequately controlled. The majority (73%) of participants received pain medication in this study.

A large percentage (23%) did not receive pain medication. Previous studies indicate that only 12% of patients presenting in the ED for long bone fracture do not "want" pain medications. Therefore, an 11% difference exists in a current study of those patients not wanting medication with the percentage in this

study who did not receive it. Because of this, the importance of addressing medication needs of those in pain is strongly supported.

RESEARCH QUESTION #2

What is the mean time from secondary assessment to pharmacologic intervention?

The mean time from secondary assessment to pharmacologic intervention for those receiving it in this study is 3.2 hours (192 minutes). 38% of participants received pharmacologic intervention in 1.5 hours or less. The majority (62%) had a time of secondary assessment to analgesic administration of more than 1.5 hours. The longest time from secondary assessment to pharmacologic intervention was 9.63 hours while the shortest positive recorded time from secondary assessment to pain medication administration was .57 hours.

The mean time from secondary assessment to the administration of pharmacological intervention of 3.2 hours is much higher in this study in comparison with other studies in the literature. In separate research studies conducted by Tanabe and Buschman (1999) and Ducharme and Barber (1995), a mean time from secondary assessment to pharmacologic intervention was 1.2 hours (74 minutes), 2.6 times less than the mean time from secondary assessment to pharmacologic intervention in this study.

CLINICAL SIGNIFICANCE

Pain is a highly subjective experience and only the patient can describe the pain he or she is experiencing. Nurses usually see a patient well before the physician in an emergency setting and studies have demonstrated that the majority (69%) of patients are comfortable receiving pain medications by a Registered Nurse (RN) before being assessed by a physician (Beel, et. al, 2000). Because of this, it is important that nurses communicate with the prescriber the medication needs of the patients they are treating who are experiencing pain.

RESEARCH QUESTION #3

What is the efficacy of emergency pain management defined by comparison of mean pain ratings at time of secondary assessment, first reassessment, and discharge home to self-care or admission to the hospital?

In this study, the majority of medical charts reviewed (68%) did not have secondary assessment pain ratings noted. Charting of the chronological pain rating of the patient did increase to 48% for the first reassessment and increased to 52% for the final reassessment. For those clients in which a pain rating was recorded, the initial (secondary assessment) mean chronological pain rating was 5/10. The first reassessment mean pain rating was 4/10. And the final reassessment mean pain rating was 3/10.

Clinical Significance

The review of literature did not find other studies in which chronological pain ratings were not recorded within the charts reviewed. A 1998 research study conducted by Johnston, et. al found that a mean pain rating of 3.76 at secondary assessment had decreased to 3.0 at the time of discharge or hospital admission (.76 decline). In comparison with this study with a mean pain rating at secondary assessment of 5 and discharge/ admission mean pain rating of 3, the decline in pain rating was greater at 2.

Tanabe and Buschman (1999) found in their study a mean secondary assessment pain rating of 6. This value is greater than the mean secondary assessment pain rating of 5 this study yielded. Currently, many researchers dispute the use of the chronological pain rating scale to demonstrate pain management efficacy. Kelly (2000) found no correlation with the satisfaction level of pain management among ED patients with the chronological pain rating subjectively reported at secondary assessment, time of discharge, and any time in between.

With new emerging JCAHO pain management guidelines and an increasingly acute patient population, proper documentation of patient pain reporting is essential. This study found that the majority of charts reviewed did not have a chronological pain rating recorded for either the secondary assessment or first

reassessment. This finding has very important implications in providing care to patients in the Emergency Department because pain management evaluation is an important aspect of patient outcomes.

LIMITATIONS

There are numerous limitations found within this research study. These are the following limitations acknowledged by the researcher:

1. One limitation of a retrospective chart review study is the possibility of incompletely or incorrectly recorded data before going to the medical records department.
2. Data collected was done so in only one site and in only one Emergency Department.
3. There were a great number of charts reviewed that had missing chronological pain ratings. Only 32% of charts reviewed had a secondary assessment pain rating documented.

RECOMMENDATIONS

Research about pain management in the Emergency Department is lacking (Ducharme & Barber, 1995). In addition, healthcare providers underestimate or undertreat pain significantly (Goodacre & Roden, 1996). The following are some recommendations for further research and clinical interventions.

IMPLICATIONS FOR FUTURE RESEARCH

Research is needed in many areas of emergency pain management. A review of literature found this topic to be scarce in research studies. The recommendations of several previous studies cite the need for ongoing programs that emphasize pain

management information in its curriculum (Friedland, et.al, 1997; Lewis, et. al, 1994; Wilson & Pendleton, 1989).

Ethnicity and the cultural background of patients may play a role in the perception and subjective reporting of pain, yet research in this area is scarce. Many studies (such as this one) study only one diagnosis. Future studies should attempt to correlate pain management in the ED for many painful conditions, not just one.

Research should investigate what impacts new JCAHO guidelines have had on pain management trends, efficacy, and avoidance of incomplete charting. Finally, research should be conducted to examine nursing school curriculum and possible augmentation of pain management topics through integration in general nursing studies.

IMPLICATIONS FOR CLINICAL PRACTICE AND EDUCATION

This study made several discoveries with direct implications to clinical nursing practice as well as nursing education. Documentation of pain ratings and subjective pain experiences by patients is imperative and this study found many medical records reviewed were lacking essential pain management data. Because emergency nurses usually assess patients before prescribers perform their evaluations, it is important for nurses to convey to healthcare providers the pain needs of their patients as soon as possible.

This may decrease the time of secondary assessment to intervention via pharmacologic administration. Lastly, nursing schools should strive to emphasize the importance of documentation and pain assessment in all patients encountered, not only in the Emergency Department, but in all settings where nurses have direct contact with patients in pain. These recommendations can only help to promote the care given to a nurses' primary concern: the patient.

CONCLUSION

In conclusion, the purpose of this study was to describe the trends and efficacy of the pain management techniques for patients with orthopedic fractures used by staff within the Emergency Department (ED). Data also supports the finding that the majority of patients received pain medication during their stay and that morphine sulfate was most frequently used. The mean time from secondary assessment to pharmacological intervention was 3.2 hours.

The importance of documentation was also highly supported. To improve patient outcomes and to decrease distress and suffering of patients, nurses and healthcare providers must aggressively treat pain and document interventions and assessments appropriately. Nursing and medical organizations, such as the Joint Commission for the Accreditation of Healthcare Organizations (JCAHO), has identified the management of pain in

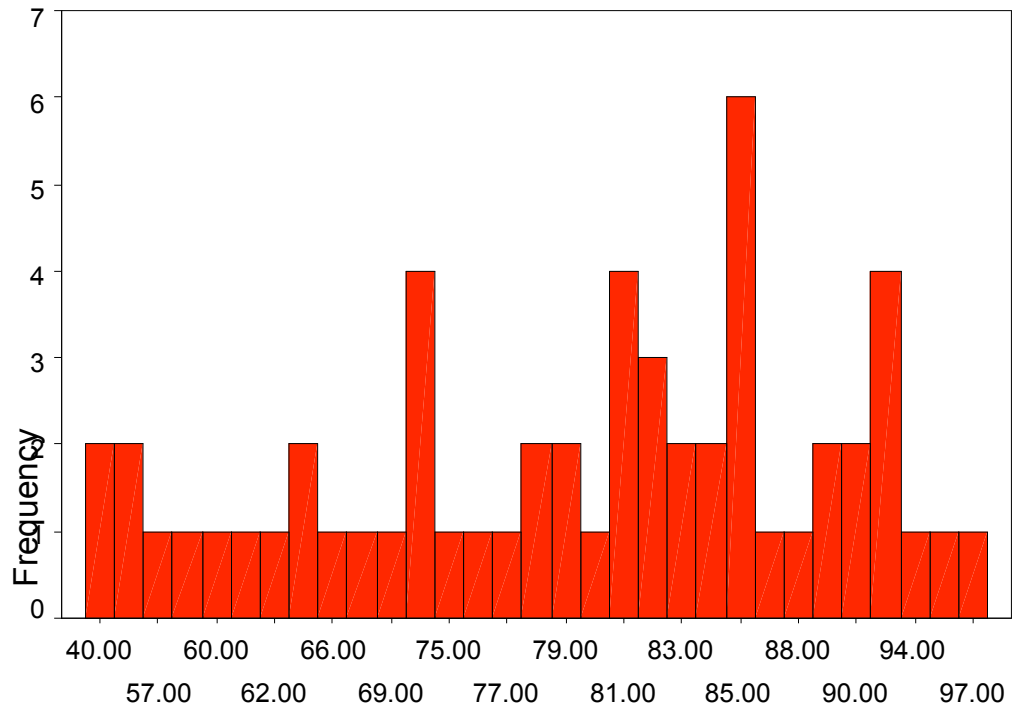
the ED as a top priority.

And healthcare research organizations have developed evidenced-based practice guidelines to help guide the Registered Nurse and Nurse Practitioner treating the emergency patient experiencing pain. Nursing's focus is singular: the patient. By improving the efficacy of pain management, the patient can only be impacted in a positive manner, which will result in a higher rate of satisfaction in the care provided by nurses.

APPENDIX A

Bar Graph Displaying the Frequency Distribution of Participant
Age

AGE

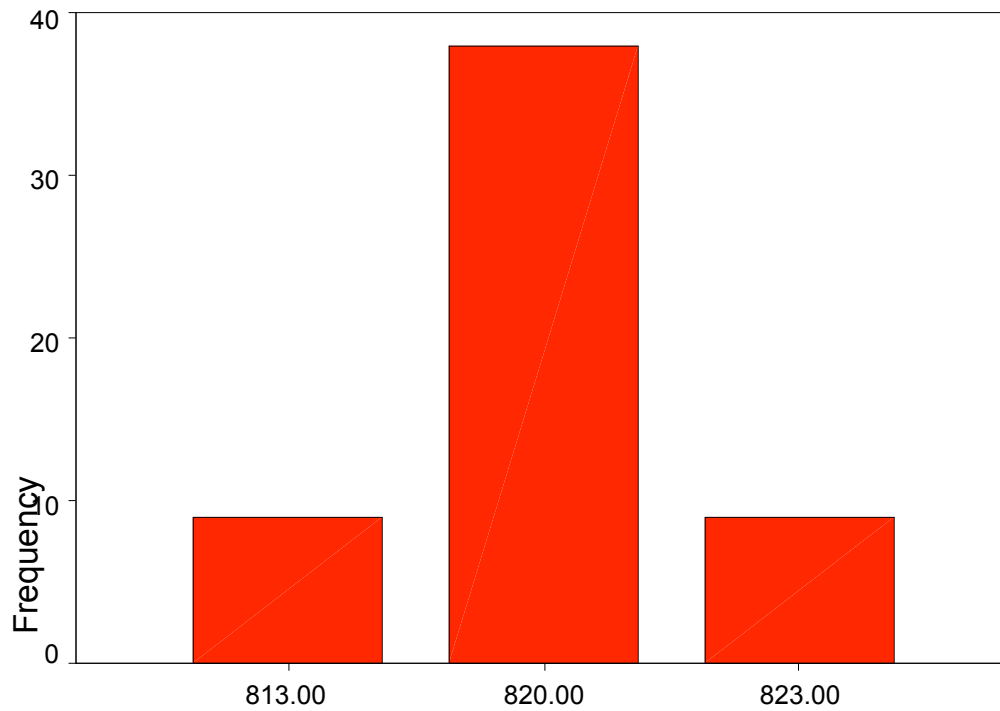


AGE

APPENDIX B

Bar Graph Displaying the Frequency Distribution of Fracture by
ICD-9 Coding

FRACTURE



FRACTURE

SPSS Software requires the insertion of numeric data to generate descriptive reports. The ICD-9 Coding is as followed:

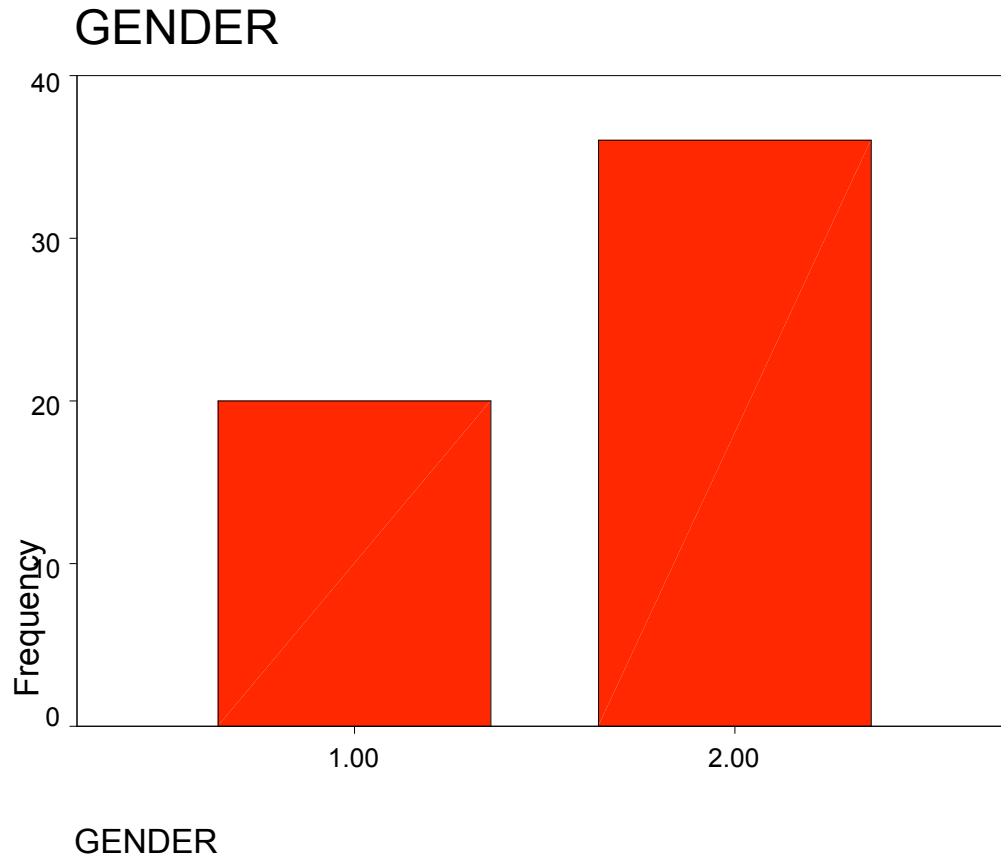
813- Fracture of the Radius or Ulna

820- Fracture of the Femur

823- Fracture of the Tibia or Fibula

APPENDIX C

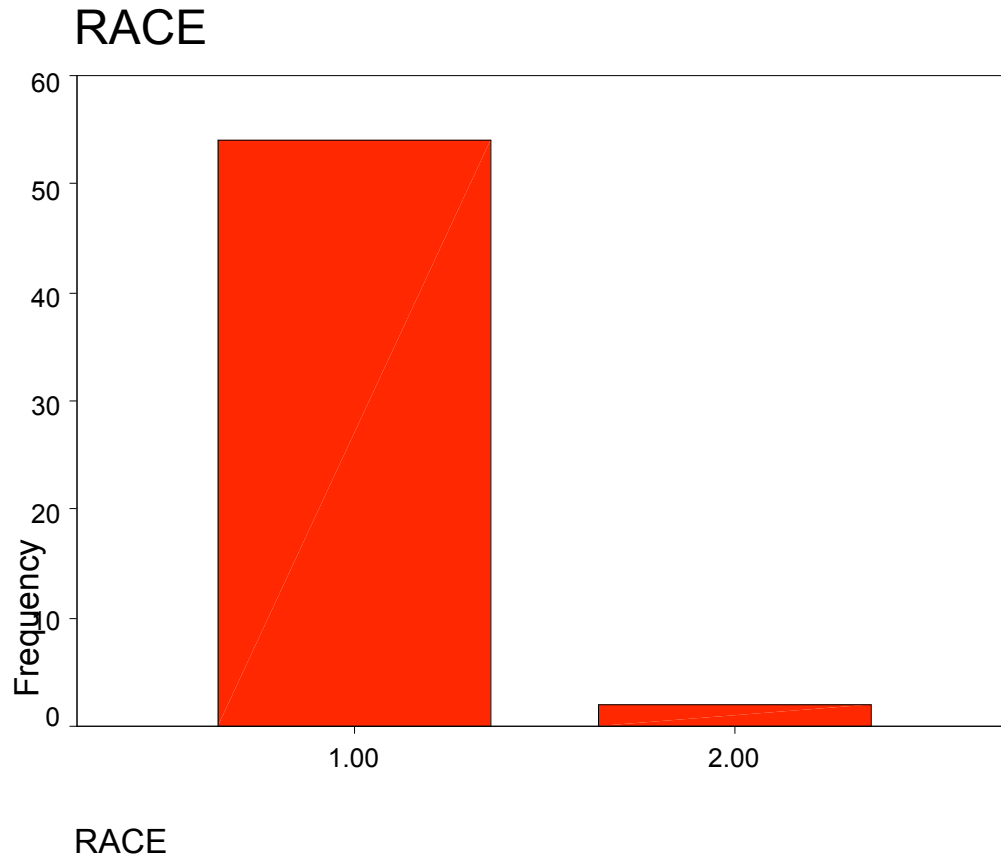
Bar Graph Displaying the Frequency Distribution of Participant
Gender



SPSS Software requires the insertion of numeric data to generate descriptive reports. Gender was inserted as the number 1 for male and number 2 for female.

APPENDIX D

Bar Graph Displaying the Frequency Distribution of Participant
Race

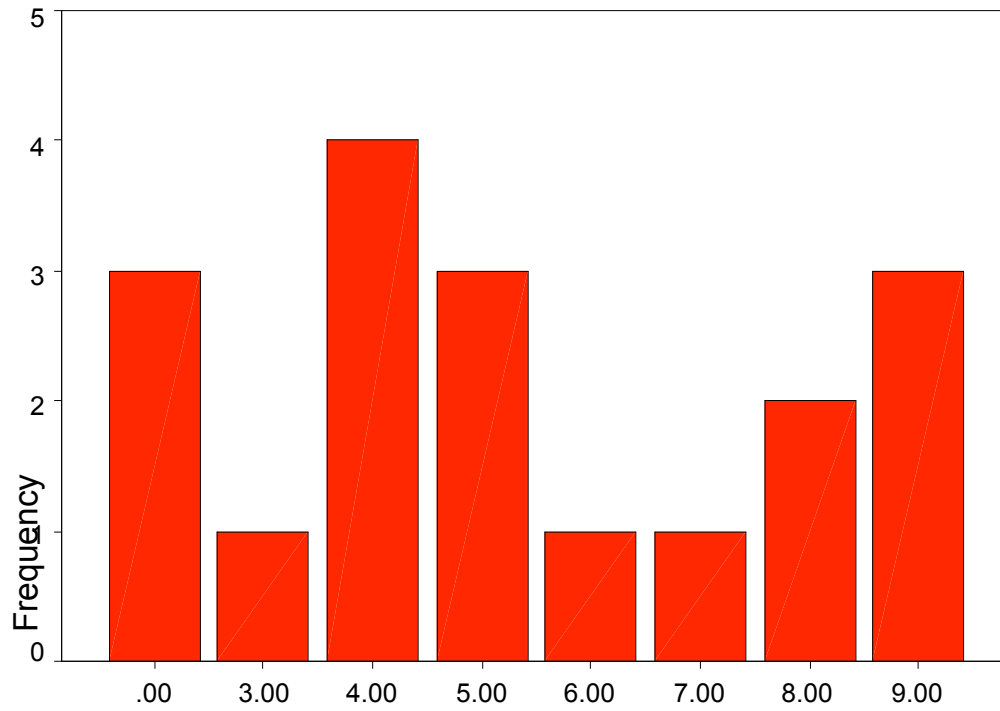


SPSS Software requires the insertion of numeric data to generate descriptive reports. Race was entered as number 1 for Caucasian and 2 for African American. Other ethnicities did not appear in the study.

APPENDIX E

Bar Graph Displaying the Frequency Distribution of Participant
Pain Rating at Time of Secondary Assessment

PAINRAT1



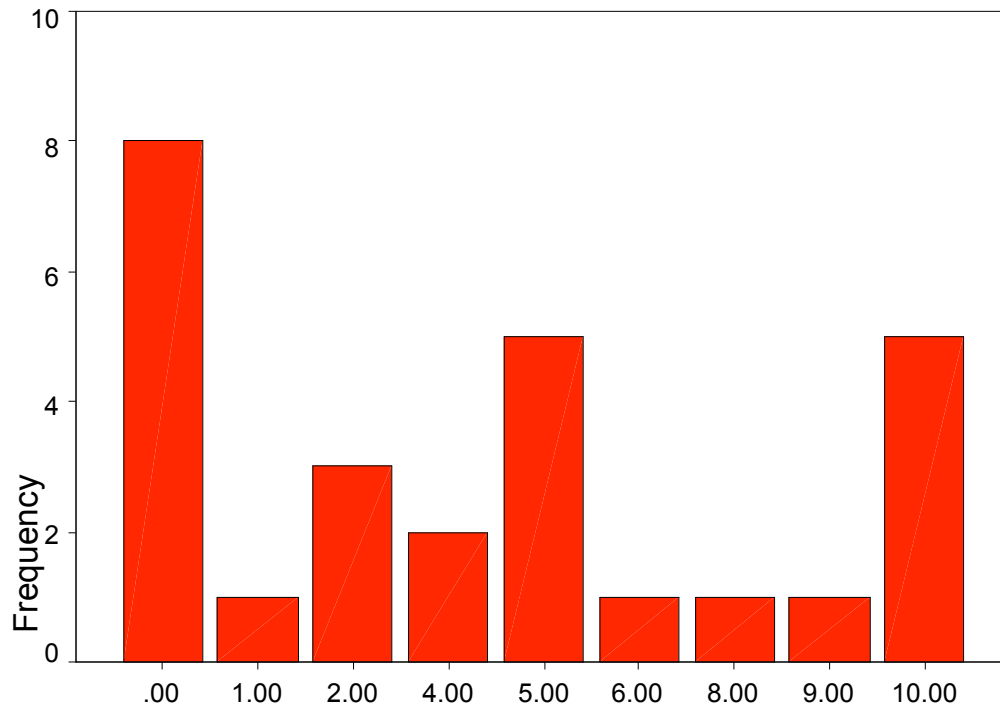
PAINRAT1

This graph was generated under the filename of PAINRAT1, corresponding with the first (secondary assessment) pain rating recorded in the medical record.

APPENDIX F

Bar Graph Displaying the Frequency Distribution of Participant
Pain Rating at Time of First Reassessment

PAINRAT2



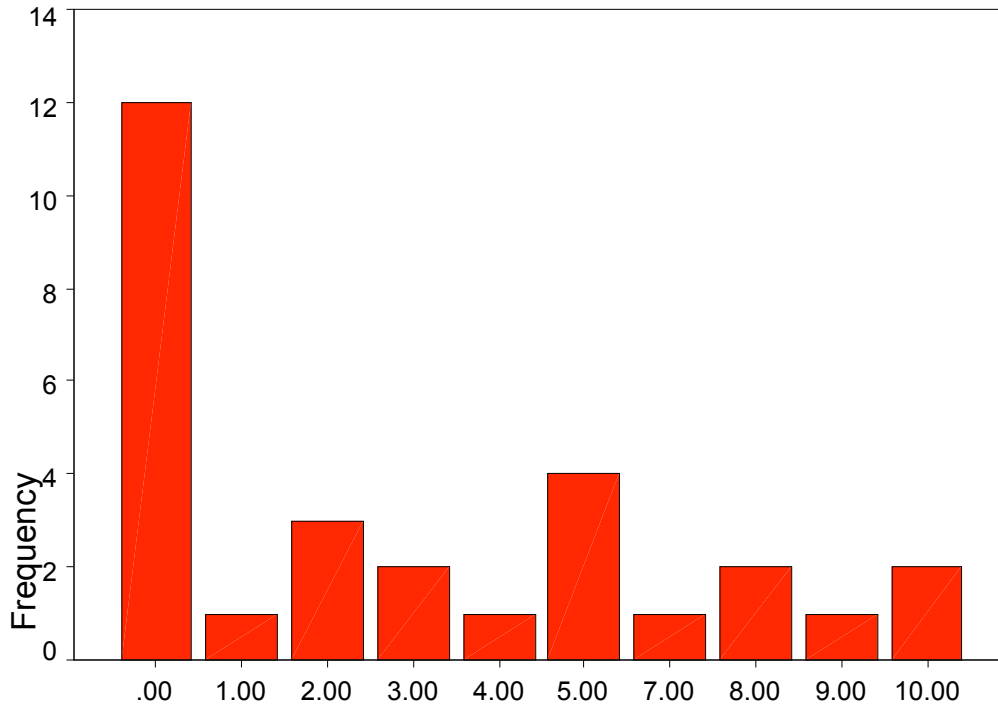
PAINRAT2

This graph was generated under the filename of PAINRAT2, corresponding with the first reassessment pain rating recorded in the medical record.

APPENDIX G

Bar Graph Displaying the Frequency Distribution of Participant
Final Recorded Pain Rating

PAINRAT3

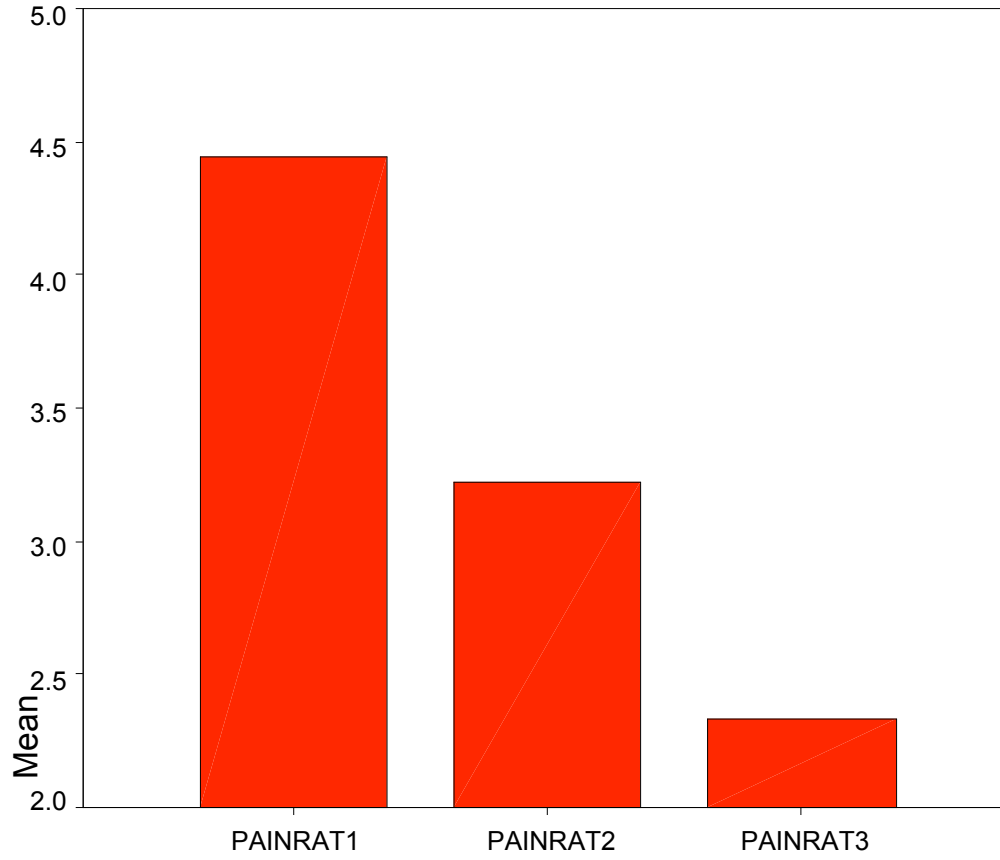


PAINRAT3

This graph was generated under the filename of PAINRAT3, corresponding with the final reassessment pain rating recorded in the medical record.

APPENDIX H

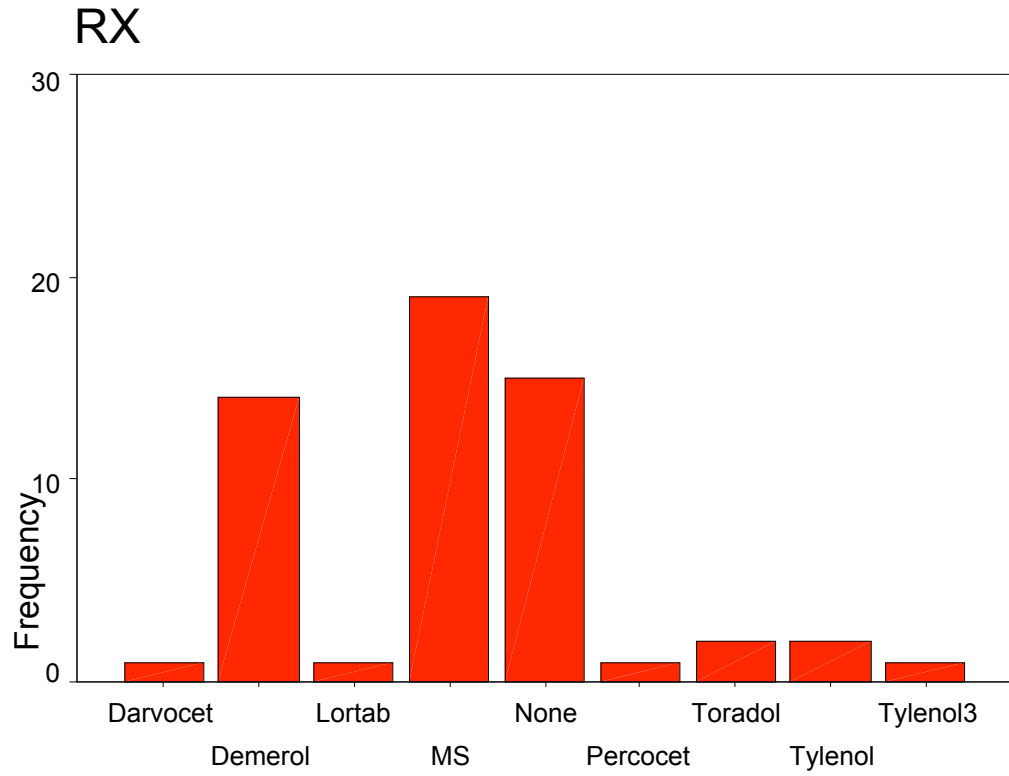
Bar Graph Comparing the Mean Pain Ratings at the Three Times of
Assessment



This graph was generated to compare the mean pain ratings at the three studied times of assessment/reassessment. PAINRAT1, PAINRAT2, and PAINRAT3 are the filenames for the secondary assessment pain rating, first reassessment pain rating, and final reassessment pain rating (prospectively) recorded in the medical record.

APPENDIX I

Bar Graph Displaying the Frequency Distribution of Analgesic
Prescribed/Administered



RX

This graph was generated under the filename Rx, the abbreviation for prescription, corresponding with the analgesic prescribed by the caregiver.

APPENDIX J

Data Collection Tool

Data Collection Tool for Research Project Entitled:

Emergency Department Pain Management: Trends and Efficacy

No: _____

MRI# _____

Age _____

Encircle Answers to the Following:

Gender: M F

Ethnicity: C B H A O

Diagnosis (Bone of Fracture-ICD-9):

Tibia and Fibula:

Fracture of the Tibia and Fibula: 823

Pathologic Fracture of the Tibia and Fibula: 733.16

Femur:

Femoral Neck Fracture: 820

Fracture of Other Parts of the Femur: 821

Pathologic Femoral Neck Fracture: 733.14

Pathologic Fracture of Other Parts of the Femur: 733.15

Supracondylar Fracture of the Femur: 821.23

Radius:

Fracture of Proximal Radius: 813.07

Fracture of Distal Radius: 813.42

Other Radial Fracture: 813.52

Ulna:

Fracture of Proximal Ulna: 813.04

Fracture of Distal Ulna: 733.12

Other Ulnar Fracture: 813.14

Humerus:

Fracture of Humerus: 812

Pathologic Fracture of Humerus: 733.11

Time of Secondary Assessment (Military Conversion) _____

Chronological Pain Rating at Secondary Assessment:

0 1 2 3 4 5 6 7 8 9 10

Time of Initial Pharmacological Intervention (Military Conversion) _____

Medication Used for Initial Intervention _____

2-hour Reassessment Chronological Pain Rating:

0 1 2 3 4 5 6 7 8 9 10

Discharge/

Admission to Hospital Unit Chronological Pain Rating:

0 1 2 3 4 5 6 7 8 9 10

APPENDIX K

Statement of IRB Exemption

Statement Regarding Exemption of Institutional Review Board of
Research Project of:

Christopher W. Blackwell, RN/BSN(hons.):

As per Institutional Review Board (IRB) document
Application for Exempt Status, this research study meets
exemption protocol category number 4, which states:

"Research involving the collection or study of existing
data, documents, records, pathological specimens or diagnostic
specimens, if these sources are publicly available or the
information is recorded by the investigator in such a manner
that subjects cannot be identified, directly or through
identifiers linked to the subjects."

This research project will not identify subjects directly
and identities of subjects will be 100% anonymous.

APPENDIX L

Literature Review Summary Tables

Table 8

Research Study 1

<u>Study</u>	<u>Study Characteristics</u>
Author, date, title, journal, volume, pages	Tanabe, P., & Buschmann, M. (1999). A prospective study of ED pain management practices and the patient's perspective. <u>Journal of Emergency Nursing</u> , 3, 171-177.
Research Problem	Pain is poorly controlled in the Emergency Department.
Study Purpose	To determine the level of efficacy that currently exists in treating ED clients in pain.
Objectives, questions, hypotheses	Identify treatment of pain in the ED including pharmacological intervention and the mean pain rating via chronological pain scales.
Literature Reviewed	22 References are cited at the end of the research article.
Theory or Conceptual Framework	None Identified.
Research Design	Descriptive Study
Type of Sample, Size, Characteristics, and Recruitment	All patients meeting the following were approached (203 participated): aged 18+; ability to read/speak English; oriented to name, date, and place; physiologically stable; absence of hallucinations, delusions, suicidal/homicidal ideation; and non-multiple trauma/ laceration. Gender and ethnicity are not discussed.
Conceptual/ Operational Definitions	The concept is pain. The operational definition is the subjectivity of the pain experience as identified through a phone interview.

Variables

Variables included:

- 1) Pain experience as described by the patient through Numeric Rating.
- 2) Time lapse between time of arrival and pharmacologic administration.
- 3) Demographics.

**Reliability/
Validity of Measures**

Validity for the instruments used for measurement was previously established in another study.

**Data Collection/
Statistical Tests
Performed**

Data were collected through interview for 7 consecutive days in 6/96 from the hours of 11a.m.-9p.m. Upon discharge, chart review was conducted examining variables. SPSS 6.1 for Windows was used for analysis (descriptive analysis and multiple logistic regression were utilized).

Study Results

391 patients were evaluated; 182 were excluded (see above criteria). 47.8% were males, 52.5% females; 10.8% elderly (65+). The average pain rating was 6.13 (moderate). 128 records were analyzed and chest pain was most often treated. Demerol® was the most frequently used opioid. The average time to pharmacological intervention was 73.8 minutes. Chest pain was the only pain treated seriously.

Research Findings

The conclusion was made that pain was poorly controlled in the Emergency Department, which is conclusive with the majority of research findings.

**Internal/External
Validity Threats**

Subjects were selected based on exclusion/inclusion criteria. External validity threats were found because the study had only a few elderly participants and the data were collected only in one site.

Ethical Conduct

Institutional Review Board (IRB) approved the study. No ethical problems existed because participants were asked to be part of the study and could refuse. Nothing seemed to affect the treatment provided.

Table 9

Research Study 2

<u>Study</u>	<u>Study Characteristics</u>
Author, date, title, journal, volume, pages	Ducharme, J., & Barber, C. (1995). A prospective blinded study on emergency pain assessment and therapy. <u>Journal of Emergency Medicine, 4</u> , 571-575.
Research Problem	Pain is poorly controlled in the Emergency Department.
Study Purpose	To prospectively evaluate how acute pain is assessed/managed in the ED and determine the level of patient satisfaction with pain management upon discharge.
Objectives, questions, hypotheses	The objective of the study was to determine current assessment/management trends and overall satisfaction with ED pain management by patients.
Literature Reviewed	12 References are cited at the end of the research article.
Theory or Conceptual Framework	None Identified.
Research Design	Prospective blinded observational study
Type of Sample, Size, Characteristics, and Recruitment	The sample was obtained through exclusion/inclusion criteria (pain > 72 hours, inability to understand the protocol, presence of principal investigator, life-threatening/unstable conditions, unwillingness to keep study blinded). 355 patients were assessed; 42 entered the study. A weakness of the study was that gender and ethnicity of participants were not discussed.
Conceptual/Operational Definitions	The concept is pain and the operational definition is the subjective analysis of the pain management experience as identified by the patient.

Variables

The Variables include:

- 1) The subjective reporting of pain by patients.
- 2) Origin of Pain.
- 3) Demographics.
- 4) Satisfaction rating of pain management as reported by the patient

**Reliability/
Validity of Measures**

Validity for the instruments used for measurement was previously established in other studies.

**Data Collection/
Statistical Tests
Performed**

Patients were assessed after triage, prior to being seen by a provider. A research Registered Nurse (RN) was available 16 hours per day on weekdays and 8 hours per day on weekends. Pain severity was defined using a numerical rating scale (NRS) and visual analog scale (VAS). The patient was given a satisfaction questionnaire upon discharge. Means of the pain level and waiting times were computed.

Study Results

Patients with severe pain waited more than an hour to be seen by a physician. 4/11 of these patients received no medicinal intervention. Those receiving medications waited an average of 74 min. 1/18 of moderate pain reporters received intervention. 31% of the patients felt the waiting time to see a physician was too long (>1h). However, the majority of patients were satisfied with the pain management rendered to them during their ED visit.

Research Findings

The findings were that pain management and assessment was even poorer than originally suggested by the researchers and that despite this, overall patient satisfaction with pain relief was high. The first finding is consistent with current literature. The second finding is in direct contrast with the majority of results obtained in other ED pain research studies.

**Internal/External
Validity Threats
Ethical Conduct**

Threats were minimized effectively.
However, exclusion criteria existed.
IRB approval was deemed unnecessary by
the researcher and patient
representative because the study was
solely observational and did not alter
patient care.

Table 10

Research Study 3

<u>Study</u>	<u>Study Characteristics</u>
Author, date, title, journal, volume, pages	Chan, L., & Verdile, V. (1998). Do patients receive adequate pain control after discharge from the ED? <u>American Journal of Emergency Medicine, 7, 705-707.</u>
Research Problem	A lack of data exists about the effectiveness of pain management after discharge from the ED.
Study Purpose	To determine the effectiveness of bedside education as performed by the physician prior to ED discharge in increasing patient satisfaction of pain management after ED treatment.
Objectives, questions, hypotheses	The Objective was to compare patient satisfaction with pain management in the ED after being educated at the bedside by the physician prior to discharge with overall satisfaction rates within the literature. The hypothesis is that satisfaction would be higher than currently reported in the majority of existing literature.
Literature Reviewed	19 References are cited within the research article.
Theory or Conceptual Framework	None Identified.
Research Design	Prospective study

Type of Sample, Size, Characteristics, and Recruitment

Any pt. aged 18+ presenting with the complaint of fracture (29%), burn (8%), corneal abrasion (29%), ankle sprain with swelling (9%), otitis media (5%), urolithiasis (16%), or cholelithiasis (4%) were eligible for the study. 110 patients enrolled and were approached after DC instructions were given by a provider who did not deliver any aspect of care to the patient for consent.

Conceptual/Operational Definitions

The concept is pain and the operational definition is the subjective experience of satisfaction of pain management after receiving pre-discharge instructions from the physician.

Variables

The Variables include:

- 1) The subjective reporting of pain by pts.
- 2) Origin of Pain.
- 3) Demographics.
- 4) Satisfaction rating of pain management as reported by the patient.

Reliability/Validity of Measures

Previous studies have shown the reliability and validity of the instruments of measurement.

Data Collection/Statistical Tests Performed

The study took place over 4 months and patients were called 48 hours after discharge and were asked a series of questions requiring only a "Yes" or "No" reply. The data were reported as percentages and confidence intervals were calculated. Outcomes were compared with those found in the medical literature.

Study Results

62% of respondents were male and 38% female. The majority of patients suffered from corneal abrasion or fracture while cholelithiasis made up the smallest sample. 100/110 of the patients felt their pain was well managed after discharge. 10 felt their pain was not adequately managed after discharge. 104 received an analgesic prescription.

Research Findings

This study found much higher rates of patient satisfaction with pain management and pain medication use than in previous reports. The authors contribute this finding to the extensive pain education program this institution has in place to educate ED nurses and physicians.

Internal/External Validity Threats

Threats to internal and external validity were well controlled. However, external validity could be a concern because the majority of participants were male and only certain conditions were included in the study. Exclusion criteria also existed.

Ethical Conduct

No ethical misconduct noted.

Table 11

Research Study 4

<u>Study</u>	<u>Study Characteristics</u>
Author, date, title, journal, volume, pages	Raftery, K., Smith-Coggins, R., & Chen, A. (1995). Gender-associated differences in emergency department pain management. <u>Annals of Emergency Medicine, 4</u> , 414-421.
Research Problem	Insufficient data exists about the relationship between effective pain management and the gender of provider/patient in the ED.
Study Purpose	To determine gender-associated differences in emergency department pain management.
Objectives, questions, hypotheses	The objective of the study was to determine if a relationship exists between pharmacologic administration and the gender of the provider/patient.
Literature Reviewed	15 references appear throughout the research article.
Theory or Conceptual Framework	None Identified.

**Research Design
Type of Sample, Size,
Characteristics, and
Recruitment**

Prospective cohort study
Patients 18 years and older who arrived at the Emergency Department with a chief complaint of neck pain, headache, or back pain between 2/1/93 and 9/30/93 were included in the study (190 total). Provider participants included medical students, interns, residents, nurse practitioners, and attending physicians. Education amongst the participants regarding the study was identical. The mean age for male patient participant was 38.4, that of female participant 41.9. 60% of the male patient participants were white, 44% of females. The mean age for male provider participant was 29.4, that of female provider 30.5. .9% of ARNP providers were male, 16.9% female. The concept is pain and the operational definition is the level of pharmacologic intervention by patient/provider gender.

**Conceptual/
Operational Definitions**

Variables

The Variables include:
1) The subjective reporting of pain by patients.
2) Origin of Pain.
3) Demographics.
4) Medication Administered.

**Reliability/
Validity of Measures**

Previous studies have shown the reliability and validity of the instruments of measurement.

**Data Collection/
Statistical Tests
Performed**

Triage personnel were responsible for the initial determination of eligibility and a questionnaire was stapled to each eligible chart. The questionnaire was administered by the providers, who were informed the study concerned solely with neck pain, headache, and back pain in the ED. Patient charts were then reviewed and demographic data and prescription after discharge information were gathered. All statistical analyses were performed with SAS, version 5. Preliminary characteristics of female and male patients were performed with two-sample *t*-tests and chi-square tests.

Study Results

Female patients were more likely to present with headache and male patients were more likely to have back pain. 60% of female patients were non-white and the females reported more pain than the males. No significant differences were noted between female and male patients with regards to the other characteristics measured. Provider assessment of pain was consistently less than the provider's assessment of the patient's perception of pain, regardless of gender. The difference between the two ratings did not change significantly with provider gender or patient or provider race. Female patients were more likely to receive pain medication and were more likely to receive those medications in the stronger strength category.

Research Findings

According to the authors of this study, research has not been conducted to examine patient/provider gender influences on ED pain management. Therefore, comparison with existing literature is an impossibility.

**Internal/External
Validity Threats**

Internal and external validity threat: *selection*. This study only examined those patients who presented to the ED with a chief complaint of back pain, neck pain, or headache. The study was also limited to those above the age of 18 and therefore, application to the pediatric population cannot be assumed. Exclusion criteria also existed.

Ethical Conduct

No ethical misconduct noted.

Table 12

Research Study 5

<u>Study</u>	<u>Study Characteristics</u>
Author, date, title, journal, volume, pages	Beel, T., Mitchiner, J., Frederiksen, S., & McCormick, J. (2000). Patient preferences regarding pain medication in the ED. <u>American Journal of Emergency Medicine, 4, 376-380.</u>
Research Problem	Studies have shown that pain management in the ED is poor.
Study Purpose	To determine the percentage of study participants with pain from long bone fractures who wanted pain medication administration in the ED.
Objectives, questions, hypotheses	The objective was to estimate the proportion of patients with acute long-bone fracture who actually want pain medication in the ED.
Literature Reviewed	8 references noted throughout the research article.
Theory or Conceptual Framework	None Identified.
Research Design	Descriptive Study Design
Type of Sample, Size, Characteristics, and Recruitment	A convenience sample was taken from all patients with long-bone fractures presenting to the ED of St. Joseph Mercy Hospital. Patients >18 years with isolated acute fractures of the radius or ulna, humerus, hip, distal fibula, distal femur, tibia or fibula were eligible. 107 patients participated in the study. The mean age was 57 years. 65% of the subjects were females. 85% were Caucasian while 14% were African American.
Conceptual/Operational Definitions	The concept is pain and the operational definition is the subjective reporting of patient satisfaction of pain management by ED nurses and physicians.

Variables

The Variables include:

- 1) The subjective reporting of pain by patients.
- 2) Type of fracture.
- 3) Demographics.
- 4) Medication Administered.
- 5) Patient's desire to receive medications for pain by an RN before being evaluated by a physician.

**Reliability/
Validity of Measures**

Previous studies have proven the reliability and validity of the instruments of measurement.

**Data Collection/
Statistical Tests
Performed**

Those patients who agreed to be part of the study read a 2-page questionnaire about the study, which generally took 1-2 minutes to complete. The values for the VAS levels and the answers to all but the last question were tabulated and analyzed using SPSS 6.1.4 for Windows. Differences in characteristics between the group that wanted pain medication in the ED and the group who declined pain medication were determined by chi-square analysis and by two-tailed t-tests for differences between means. A significance level of .05 was used for all tests.

Study Results

69% of all subjects were agreeable to receiving pain medication by an RN before seeing a physician. 70% wanted sufficient medication to alleviate the pain but without being sedated. 25% wanted complete pain relief, even if it resulted in heavy sedation, and 5% were uncertain. Those that wanted pain medication had a mean VAS score of 69.1 mm whereas those that declined had an avg. VAS score of 28.8 mm. 77% of all patients received medication in the ED (all but one who received wanted it).

Research Findings

88% of patients with acute long-bone fractures want pain medication to be given while in the ED. These patients had higher VAS scores than those who declined medication. This is in direct contrast to earlier studies which showed analgesic administration in the ED is poor.

**Internal/External
Validity Threats**

Internal/external validity threat: *selection*. Only patients presenting in the ED with a chief complaint of pain related to long bone fractures were participants in the study. Exclusion criteria also existed.

Ethical Conduct

No ethical misconduct noted.

Table 13

Research Study 6

<u>Study</u>	<u>Study Characteristics</u>
Author, date, title, journal, volume, pages	Kelly, A. (2000). Patient satisfaction with pain management does not correlate with initial or discharge VAS pain score, verbal pain rating at discharge, or change in VAS score in the emergency department. <u>The Journal of Emergency Medicine, 19(2)</u> , 113-116.
Research Problem	Research to date suggests that pain in Emergency Department (ED) patients is not managed well.
Study Purpose	To correlate patient satisfaction with pain management in the Emergency Department (ED) with initial VAS pain score, verbal pain rating at discharge, and change in VAS pain score between presentation and discharge.
Objectives, questions, hypotheses	The main objective of this study was to determine if satisfaction with pain management in the ED was related to 2 pain rating scales conducted upon presentation to and discharge from the ED. A hypothesis insinuated by the researcher is that patient satisfaction with pain management is higher than current literature. A great research question the researcher started with was, "Is there a relationship between the 2 pain rating scores and patient satisfaction with pain management?"
Literature Reviewed	17 References appear throughout the research article.
Theory or Conceptual Framework	None Identified.

**Research Design
Type of Sample, Size,
Characteristics, and
Recruitment**

Prospective observational study
For the week beginning 12/1/97, all patients with acute pain between 8:00 a.m. and 12 a.m. were eligible for entry into the study. Exclusion criteria consisted of age under 16, inability to understand English, inability to give informed consent, inability to mark a VAS, and altered LOC. 54 patients completed the study. Ethnicity and gender of participants not disclosed.

**Conceptual/
Operational Definitions**

The concept is pain and the operational definition is the subjective reporting of patient satisfaction of pain management by ED nurses and physicians.

Variables

The variables included:

- 1) The subjective reporting of pain by patients.
- 2) Satisfaction rating of pain management as reported by the patient.

**Reliability/
Validity of Measures**

Previous studies have proven the reliability and validity of the instruments of measurement.

**Data Collection/
Statistical Tests
Performed**

Research assistants collected initial and interval VAS scores as part of the study. Patients received analgesia at the discretion of the treating physician. For those patients who were discharged from the ED (the sample for this study), a discharge VAS score was also obtained along with a verbal rating of pain at discharge (none, mild, moderate, or severe) and a rating of the patient's satisfaction with pain management in the ED (poor, so-so, good, very good).

Study Results

41% of all patients rated their satisfaction with pain management as "very good;" 30% as "good;" 22% as "so-so;" and 7% as "poor." No correlation was demonstrated between initial or discharge VAS pain scores compared to the rating of pain satisfaction with pain management. In addition, no correlation was found between verbal rating of pain at discharge and the degree of satisfaction with pain management.

Research Findings

Research to date suggests that pain is not managed as well as it actually might be. Part of the problem is that few EDs collect data on the timeliness and effectiveness of analgesia, so there is a lack of specific, objective data upon which to judge performance.

**Internal/External
Validity Threats**

External validity threat: *selection*. Exclusion criteria existed. In addition, the researcher made no attempts to correlate her findings with gender or ethnicity of study participants.

Ethical Conduct

No ethical misconduct noted.

Table 14

Research Study 7

<u>Study</u>	<u>Study Characteristics</u>
Author, date, title, journal, volume, pages	Johnston, C., Gagnon, A., Fullerton, L., Common, C., Ladores, M., & Forlini, S. (1998). One-week survey of pain intensity on admission to and discharge from the emergency department: a pilot study. <u>The Journal of Emergency Medicine</u> , 16(3), 377-382.
Research Problem	There have been no studies that explicitly quantify the incidence and prevalence of pain in the general emergency population.
Study Purpose	To determine the incidence and severity of pain intensity in patients 4 years of age and older presenting to the non-critical ward of the ED.
Objectives, questions, hypotheses	The objective of the study was to define the prevalence and incidence of pain in the ED patient population. This could be re-termed in a question, "What is the incidence and prevalence of pain in the ED?"
Literature Reviewed	12 References appear throughout the research article.
Theory or Conceptual Framework	None Identified.
Research Design	Prospective survey design
Type of Sample, Size, Characteristics, and Recruitment	All admissions to the ED between 10:00 a.m. and 10:00 p.m. were considered for eligibility. 42 patients participated. Selection criteria included: 1) knowledge of English or French. 2) arrived by means other than ambulance, and 3) admitted to non-critical, non-psychiatric ward of the ED

**Conceptual/
Operational Definitions**

The concept is pain and the operational definition is the prevalence and intensity of pain in the ED.

Variables

Variables included:

- 1) The subjective reporting of pain by patients.
- 2) Origin of pain.
- 3) Demographics.

**Reliability/
Validity of Measures**

The Chromatic Analogue Scale was used for assessment of pain in all patients. This is a plasticized colored scale that ranges from white, representing no pain, to a deep red, representing the most pain anyone could have. Although this scale was developed for use with children, it was easily used by adults. The 0-10 Scale was also used and its reliability and validity has previously been determined through other studies.

**Data Collection/
Statistical Tests
Performed**

Pain levels were obtained via the 2 scales upon admission and discharge from the department. In addition, age and etiologic source of the pain was also recorded. All data were entered and analyzed on SPSS-PC (Version 7.0). Descriptive statistics were used to describe characteristics and intensities. Differences in pain intensity between groups of patients were tested using ANOVA, when assumptions of skewness and homogeneity of variance allowed parametric statistics, and Kruskal-Wallis test, when nonparametric were required.

Study Results

Adults: The mean score on admission for all patients was 3.76 and that on discharge was 3.0, with 29% having no pain on admission, 52% reporting pain scores >4/10, 18% reporting scores >8/10. Upon discharge, 11% said their pain had worsened; 24% reported improvement. 2 of the patients who did not report pain on admission did so upon discharge. Those presenting with musculoskeletal, GI, and immunologic etiologies had the most pain.

Research Findings

_ of all patients of all ages have pain that is clinically important (4/10 or >). While the proportion experiencing this degree of pain at the time of discharge decreases, there remains an important proportion whom report more pain on discharge than admission. In summary, this pilot study did support the concern of clinicians that pain is a frequent and significant problem for the majority of ED patients.

**Internal/External
Validity Threats**

The study does have several limitations (which are openly discussed in the article). A threat to external validity is *selection* as exclusion and inclusion criteria existed. The researchers reported nothing about gender or ethnicity of patients. Finally, the sample of pediatric patients was much smaller than that for adults.

Ethical Conduct

No ethical misconduct noted.

Table 15

Research Study 8

<u>Study</u>	<u>Study Characteristics</u>
Author, date, title, journal, volume, pages	Friedland, L., & Kulick, R. (1994). Emergency department analgesic use in pediatric trauma victims with fractures. <u>Annals of Emergency Medicine</u> , 23(4), 203-207.
Research Problem	Previous reports have documented that fracture-related pain in the ED is commonly under-treated in both children and adults. Research is largely lacking in this area, which may be why this review found only research dating back to 1994.
Study Purpose	Demonstrate the level of adequacy in the treatment of this population.
Objectives, questions, hypotheses	To investigate the frequency of ED analgesic use in children with fractures. A study question could be, "Is pain management via analgesics adequate in children who present to the ED with fractures?" A hypothesis could be that it is adequate.
Literature Reviewed	15 references appear throughout the research essay.
Theory or Conceptual Framework	None Identified.
Research Design	Descriptive, retrospective review of a computerized trauma registry
Type of Sample, Size, Characteristics, and Recruitment	99 children participated. All pediatric patients in the trauma registry who met trauma team activation criteria with fractures of the pelvis, long bones, ankle, wrist, or clavicle were selected initially. Patients who underwent endotracheal intubation were excluded. 70% were male and the mean age of participants (.25-17 years) was 9. 75% were non-Hispanic white.

**Conceptual/
Operational Definitions
Variables**

Pain is the concept. The prevalence of pain is the operational definition. Variables included:

- 1) The subjective reporting of pain by patients.
- 2) Origin of pain.
- 3) Demographics.
- 4) Administration of analgesics to patients.

**Reliability/
Validity of Measures**

Reliability and validity are not discussed in this article. However, only 2 real variables are being measured (presence of pain, occurrence of analgesic administration) and no real tools are being used to measure this.

**Data Collection/
Statistical Tests
Performed**

Data were collected retrospectively from the registry for age, sex, race, mechanism of injury, fracture location, associated injuries to the head, chest, or abdomen, pre-hospital administered drugs, GCS, Pediatric Trauma Scale (PTS), vital signs (VS), time elapsed from time of injury to ED arrival, alcohol (ETOH)/drug ingestion, vehicle speed, height of fall, transport method, prior medical history, Injury Severity Score, and whether or not total outcome was mortality. Continuous normally distributed data were analyzed by two-tailed Student's *t*-test, non-normally distributed continuous data and ordinal data were analyzed by Wilcoxon rank-sum test, and categorical data by chi-square. $P < .05$ was considered significant. Odds ratios and 95% confidence intervals were calculated. Age trends were evaluated by logistic regression.

Study Results

53% received analgesics while in the ED. All analgesics were narcotics. The analgesic and no-analgesic group were mildly to moderately injured based on their initial ED VS and PTS. No statistical differences were found for age, sex, race, mechanism of injury, GCS, PTS, VS, time elapsed from time of injury to ED arrival, vehicle speed, height of fall, transport method, or Injury Severity Score. No relationship was found between age and narcotic administration. 72% of multiple fracture patients compared to 60% of isolated fracture patients received analgesia. 59% of those with associated internal injuries of the chest or abdomen were given analgesia. Those with head injury were less likely to receive analgesia than those with isolated fractures. Mean GCS of head injured patients receiving analgesia was 14 while that of head injured patients not receiving analgesia was 15.

Research Findings

Results suggest that ED analgesic use was low in these 99 mildly to moderately injured children, a finding that is reflective of the majority of current literature on the subject (although a large body of research on this area is non-existent).

**Internal/External
Validity Threats**

Selection is an issue with this group because exclusion/inclusion criteria existed. In addition, the researchers were acting under the assumption that these conditions are in fact painful. Lastly, 70% of participants were male, which is not representative of the population as a whole.

Ethical Conduct

No ethical misconduct noted.

Table 16

Research Study 9

<u>Study</u>	<u>Study Characteristics</u>
Author, date, title, journal, volume, pages	Todd, K., Samaroo, N., & Hoffman, J. (1993). Ethnicity as a risk factor for inadequate emergency department analgesia. <u>The Journal of the American Medical Association</u> , 269(12), 1537-1539.
Research Problem	Oligoanalgesia has been reported to occur in a large portion of ED patients. Research attempting to correlate this with ethnicity variation is lacking (possibly responsible for the older date of the research obtained through literature review).
Study Purpose	Examine ethnic influences on pain management in the ED.
Objectives, questions, hypotheses	The objective was to determine whether or not Hispanics were less likely than whites to receive pain medication for long bone fracture pain. Questioned, this could be, "Do Hispanic ED patients receive less pain medication than whites?" The hypothesis was that Hispanics do receive less medication for pain in the ED than whites.
Literature Reviewed	10 references appear throughout the research article.
Theory or Conceptual Framework	None Identified.
Research Design	Prospective cohort study

Type of Sample, Size, Characteristics, and Recruitment

139 patients participated. All Hispanic and non-Hispanic white ED patients aged 15-55 years, seen between 1/1/90 and 12/31/91, with isolated long bone fractures were eligible for inclusion. Exclusion criteria included injury more than 6 hours prior to arrival, "possible" or chip fractures only, altered mentation, or ETOH intoxication. 31 participants were Hispanic and 108 were non-Hispanic white. 58.3% of non-Hispanic whites were male; 71% of Hispanic participants were male.

Conceptual/Operational Definitions

The concept is pain and the operational definition is the prevalence in administration of analgesics to Hispanics vs. non-Hispanic patients presenting with fractures.

Variables

Variables included:

- 1) The subjective reporting of pain by patients.
- 2) Origin of pain.
- 3) Demographics.
- 4) Administration of analgesics to patients.

Reliability/Validity of Measures

Reliability and validity are not discussed in this article. However, only 3 real variables are being measured (presence of pain, race, occurrence of analgesic administration) and no real tools are being used to measure this.

**Data Collection/
Statistical Tests
Performed**

ED records were reviewed for the 2-year study period at the UCLA Emergency Medical Center to find participants eligible for study. From chart review, race was determined along with fracture type, demographic data, and analgesic administration status. A source outside the study reviewed the data. Data were input and stratified analyses were performed using Epi Info, version 5.2, t-tests and chi-square tests were used for comparison of baseline characteristics. Crude and summary relative risks (RRs) for no analgesic, comparing Hispanics with non-Hispanic whites, were calculated. Multiple logistics regression analysis was performed using Stata, version 3.0 to evaluate the independent influence of different variables on the probability of analgesic administration.

Study Results

Non-Hispanic whites were significantly more likely to speak English, be insured, and suffer non-occupational injuries. Hispanics were twice as likely as non-Hispanic whites to receive no ED pain medication. The RR for ethnicity was similarly significant. Ethnicity remained the strongest predictor of ED analgesic administration after controlling by stratification for covariates related to patient, injury, or physician characteristics.

Research Findings

Research on ethnic influence on pain management practices in the ED is sparse. However, the study results are consistent with other study results showing that non-whites are less likely to receive pain medications while in the ED than their white counterparts. Selection is a concern, as exclusionary and inclusionary parameters existed. Also, the compared populations were not equal; more non-Hispanic whites comprised the study population than Hispanics themselves, which might account for the differences found

**Internal/External
Validity Threats**

(internal and external validity threats). In addition, the majority of participants in both samples were male. No ethical misconduct noted.

Ethical Conduct

Table 17

Research Study 10

<u>Study</u>	<u>Study Characteristics</u>
Author, date, title, journal, volume, pages	Selbst, S., & Clark, . M. (1990). Analgesic use in the emergency department. <u>Annals of Emergency Medicine, 19(9), 1010-1013.</u>
Research Problem	Current research shows that pain management in both children and adults is poor in the ED. Not enough research exists comparing narcotic administration in children versus adults (a possible reason for the older date for this research article obtained through literature review).
Study Purpose	Compare pain management via narcotics for adults and children.
Objectives, questions, hypotheses	The study objective was to determine whether or not pain was managed in children via narcotics similarly to adults in the ED. A research question was, "Is pain management efficacy through narcotic administration in children similar to that of adults in the ED?" Hypotheses could be that is was/ wasn't.
Literature Reviewed	17 references appear throughout the research article.
Theory or Conceptual Framework	None Identified.
Research Design	Retrospective chart review

Type of Sample, Size, Characteristics, and Recruitment

112 pediatric charts were reviewed from the Children's Hospital of Philadelphia (CHOP) ED and 156 patients from the Medical College of Pennsylvania (MCP) ED were reviewed. All patients had acute sickle cell crises (20%), lower extremity fractures (31%), or 2nd or 3rd degree burns (49%); hospitalization was required for 15% of the patients. 49% were male and 83% were black. Ages ranged from a few months to 97 years. The concept is pain and the operational definition concerns the prevalence in administration of analgesics to children presenting with various etiologic sources for pain.

Conceptual/

Operational Definitions Variables

Variables included:

- 1) The subjective reporting of pain by patients.
- 2) Origin of pain.
- 3) Administration of analgesics to patients.
- 4) Patient age.

**Reliability/
Validity of Measures**

Reliability and validity are not discussed in this article. However, only 3 real variables are being measured (presence of pain, occurrence of analgesic administration, age of patient) and no real tools are being used to measure this.

**Data Collection/
Statistical Tests Performed**

Records were reviewed for all pts. who presented to the ED of the CHOP during a 5 month period with a diagnosis of painful crises from sickle cell disease, lower extremity fracture, or second or third degree burn. The same diagnostic criteria were used for chart review at the MCP. These ED charts were assessed retrospectively for patient diagnosis, disposition, and use of narcotic and non-narcotic analgesics while in the ED as well as upon discharge from the ED. Specific data analyses methods were not discussed.

Study Results

In the ED, only 40% of patients with these painful conditions received analgesic medications. Children were much less likely than adults to receive analgesics, and senior citizens received these medications as often as young adults. Children less than 2 years old were much less likely than older children to receive pain medications. 87% of sickle cell crisis patients received medication (74% in children). 37% of lower extremity fracture patients received analgesics (approximately equal in adults, seniors and children). <25% of 2nd or 3rd degree-burn patients received analgesics and children were far less likely to receive medication for this than adults. 39% of pediatric patients treated by ED physicians compared to pediatricians (23%) were administered analgesics. 55% of all patients had no pain medication prescribed at discharge and children were less likely than adults to receive discharge pain medications.

Research Findings

Consistent with most similar studies, Data suggest that pediatricians and emergency physicians are reluctant to use analgesics for children in pain. Suggested by these researchers is the possible need for further education about pain management for emergency physicians and pediatricians. A search for more current similar studies was conducted to no avail. This indicates the need for research perpetuation on the topic.

**Internal/External
Validity Threats**

The majority of the study participants were black, which could lead to external validity threats. In addition, selection is an issue because of exclusionary criteria.

Ethical Conduct

No ethical misconduct noted.

References

- Acute Pain Management Guideline Panel, Acute Pain Management: Operative or Medical Procedures and Trauma, Clinical Practice Guideline. AHCPR Pub. No. 92-0032. Rockville, MD: Agency for Health Service, US Department of Health and Human Services, Feb., 1992.
- Agency for Healthcare Research and Quality (1992). Evidenced-Based Practice Centers. Retrieved December 5, 2000 from the World Wide Web: <http://www.ahrq.gov/clinic/epc/>
- American College of Emergency Physicians (1998). Clinical policy for procedural sedation and analgesia in the emergency department. Annals of Emergency Medicine, 31, (5), 663-667.
- Beel, T., Mitchiner, J., Frederiksen, S., & McCormick, J. (2000). Patient preferences regarding pain medication in the ED. American Journal of Emergency Medicine, 4, 376-380.
- Carroll, D., & Bowsher, D. (1993). Care of the dying. In C. Pearce (Eds.), Pain Management and the Nursing Care(68-89). Oxford: Butterworth-Heinemann, Ltd.
- Chan, L., & Verdile, V. (1998). Do patients receive adequate pain control after discharge from the ED? American Journal of Emergency Medicine, 7, 705-707.

Ducharme, J., & Barber, C. (1995). A prospective blinded study on emergency pain assessment and therapy. Journal of Emergency Medicine, 4, 571-575.

Friedland, L., & Kulick, R. (1994). Emergency department analgesic use in pediatric trauma victims with fractures. Annals of Emergency Medicine, 23(4), 203-207.

Goodacre, S., & Roden, R. (1996). A protocol to improve analgesia use in the accident and emergency department. Journal of Accident and Emergency Medicine, 13, 571-575.

Innes, L. (1998). Complimentary Treatment Modalities to Pain Management in the Patient with Cancer. Orlando: UCF.

Johnston, C., Gagnon, A., Fullerton, L., Common, C., Ladores, M., & Forlini, S. (1998). One-week survey of pain intensity on admission to and discharge from the emergency department: A pilot study. The Journal of Emergency Medicine, 16(3), 377-382.

Joint Commission for the Accreditation of Healthcare Organizations (1999). Revised JCAHO Pain Management Standards. Retrieved December 5, 2000 from the World Wide Web: http://www.jcaho.org/search_frm.html

Kelly, A. (2000). Patient satisfaction with pain management does not correlate with initial or discharge VAS pain score, verbal pain rating at discharge, or change in VAS score in the emergency department. The Journal of Emergency Medicine, 19(2), 113-116.

Kozier, B., Blais, K., Erb, G., & Wilkinson, J. (1998). Comfort and pain, Fundamentals of Nursing Concepts, Process, and Practice(974-1013). California: Addison Wesley Longman.

Lewis, L., Lasater, L., & Brooks, C. (1994). Are emergency physicians too stingy with analgesics? Southern Medical Journal, 87(1), 7-9.

Margoles, M., & Weiner, R. (1999). Psychological and behavioral management approaches to chronic pain. In D. Devine (Eds.), Chronic Pain: Assessment, Diagnosis and Management(195-208). Boca Raton: CRC Press.

Raftery, K., Smith-Coggins, R., & Chen, A. (1995). Gender-associated differences in emergency department pain management. Annals of Emergency Medicine, 4, 414-421.

Selbst, S., & Clark, . M. (1990). Analgesic use in the emergency department. Annals of Emergency Medicine, 19(9), 1010-1013.

Tanabe, P., & Buschmann, M. (1999). A prospective study of ED pain management practices and the patient's perspective. The Journal of Emergency Nursing, 3, 171-177.

Thomas, C. (Ed) (1997). Tabers cyclopedic medical dictionary (18th ed.). Philadelphia, PA: Davis.

Todd, K., Samaroo, N., & Hoffman, J. (1993). Ethnicity as a risk factor for inadequate emergency department analgesia. The Journal of the American Medical Association, 269(12), 1537-1539.

Wilson, J., & Pendleton, J. (1989). Oligoanalgesia in the emergency department. American Journal of Emergency Medicine, (6), 620-623.