Doctor of Nursing Practice at The University of Texas at El Paso

NEUROPATHIC PAIN MANAGEMENT OF ADULT MALES IN A CORRECTIONAL FACILITY
9TH ANNUAL DNP SYMPOSIUM
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COHORT IX

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Neuropathic Pain Management of Adult Males A Quality Improvement Project in a Correctional Facility

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Abstract

Disease or a lesion of the somatosensory system can cause neuropathic pain, a common condition seen in most primary care settings, including my adult correctional setting. I became aware of this fact after completing a 10-day Reflective Practice Log (RPL). After a literature review, the recommended intervention, Duloxetine 30 mg daily for seven days with follow-up in seven days. In my practice, I prescribed Cymbalta 30 mg daily for 30 days. I used self-reporting as the neuropathic signs and symptoms along with pain severity. The literature recommended the use of a numeric rating scale of 0-10 for pain assessment and the Leeds Assessment of Neuropathic Symptoms and Signs with a score of twelve and greater as a screening tool for neuropathic pain. The Plan Do Study Act quality improvement method and Rosswwurm and Larrabee's Model for change to Evidence-Based Practice translational framework were used in this project.

After the approval from my correctional facility and receiving IRB approval from The University of Texas at El Paso, I began my Doctor of Nursing Practice (DNP) Quality Improvement Project. Using the Leeds scale, six patients met the criteria, and I prescribed Duloxetine 30 mg daily for 7 days. On follow-up, patients were re-evaluated with the numeric rating scale for those meeting criteria; the Duloxetine increased to 60 mg daily for 7 days with no improvement in pain control and was scheduled for follow-up in 7 seven days. The outcome was favorable for all the patients except one who switched to alternative medicine due to the Duloxetine reported adverse effects. Two patients met the outcome goal of 2-3 -point reduction on the NRS. Two other patients had a point decrease of pain and a point increase.

Keywords: Neuropathic pain, duloxetine pain management, neuropathic pain guideline
Neuropathic Pain Management of Adult Males A Quality Improvement Project in a Correctional Facility

Introduction/Background

Neuropathic pain is nerve damage caused by a lesion affecting the somatosensory system (Mammana, Cavalli, Nicoletti, Bramanti, & Mazzon, 2019). This type of pain is chronic, resulting in incidental damage to nerves that carry pain information to the brain (Nishikawa & Nomoto, 2017). With pain remaining the primary reason patients seek medical attention (Katherine, 2005), overall, its management without using addictive medications, such as opioids or narcotics in primary care, is a constant dilemma for patients and providers alike.

As a primary care provider in a correctional facility, removal from the impasses and horrors of chronic pain management reality is impossible and, somewhat more difficult due to medication formulary restrictions and availabilities. Regardless of the pharmacotherapy restrictions in the DNP student's facility, an antithesis to the abundant varieties most patients are used to outside the correctional facility's "free world," the need for pain management is still needed. During the initial intake of patients diagnosed with neuropathic pain and on Gabapentin, they are switched to Cymbalta 30mg once daily for 30 days. This change is always met with patients' resistance and is compliant with ineffective pain management. Research into the use of Duloxetine, also known as Cymbalta, in managing neuropathic pain has proven beneficial. It is also used to treat psychiatric disorders such as anxiety and depression and, used in the treatment of urinary urgency incontinence.

I completed a 10-day Reflective Practice Log (RPL), which took place during the COVID-19 pandemic that disrupted all activities. Those in correctional care were not spared from the pandemic's dilemmas on patients' wellbeing.
During this time, the DNP student's clinic patient volume reduced dramatically, leaving a handful of clients in our care. The patient volume reduction brought about quickened patient access to care and a better and efficient road map to timely care service provisions. After reviewing the 10-day RPL documenting a clinical needs assessment of my practice, I found that my patients diagnosed with neuropathic pain return every month with no relief and the same complaints. I reviewed my current prescribing of Cymbalta 30 mg daily for 30 days.

All patients complaining of neuropathic pain are assessed using the numeric rating scale (NRS) of 0-10 and the Leeds Assessment of Neuropathic Symptoms and Signs (LANSS) with a score of 12 and greater as a screening tool for neuropathic pain. Patients meeting criteria are prescribed Duloxetine 30 mg/daily for 7 days and followed up in 7 days. On follow-up, patients are re-evaluated with the NRS for those meeting criteria; the Duloxetine will be increased to 60 mg/daily/ for 7 days for those without pain improvement and rescheduled for follow-up in 7 days. The quality improvement (QI) project's significance included a pain reduction in patients experiencing neuropathic pain of 2-3 points in the numeric rating scale of 0 to 10. The project addressed a need in my practice.

After reviewing the 10-day RFL, three possible opportunities were identified to improve the care that is presently provided to the patients. With careful deliberation on the identified opportunities by the DNP chairs, adult and geriatric patients' neuropathic pain management was selected for the QI project to answer the bellow PICOT question:

P: Adult males 18-99 years diagnosed with neuropathic pain with NRS greater than 4 points in a correctional facility

I: Duloxetine PO 30 mg/daily, increased by 30 mg/daily weekly as needed up to a maximum dose of 60 mg/daily
C: Cymalta 30mg daily for 30 days

O: Pain reduction of 2-3 points in the numeric rating scale (NRS) of 0 to 10

T: During 30 days

Methods

The project poses some risk to the patients, as it involves prescribed medication. The risk comprises medication side effects or adverse reactions to the patient(s). However, patient education and teaching of possible medication-associated side effects were made known to patients. Reading materials enumerating Duloxetine adverse effects and contraindications were printed and handed to the patients. Also, patients were informed and instructed to seek medical attention for any untoward effect. There was no possibility of coercion or undue influence; the chance that data collected may be compromised is minimal, and identifiable data are not made available. There were no audio or video recordings during any portion of this project.

This QI project is based on several literature reviews with the highest level of evidence validating the use of Duloxetine in the treatment of neuropathic pain (Bates et al., 2019; Finnerup et al., 2015; Mu et al., 2017; Sumitani et al., 2018) and translated for the management of adult males diagnosed with neuropathic in a correctional facility. The project took 4 weeks. Adult males 18-99 years old diagnosed with neuropathic pain with NRS greater than points and LANSS score 12 and greater in a correctional facility were the project’s inclusion criteria.

Setting

This correctional facility is an Intermediate Sanctions Facility (ISF) that houses short-term and transient inmates in Houston, Texas, with 667 male inmate capacity. These inmates are
mostly low-risk offenders from around Texas counties and are released into the community within 120 days.

The University of Texas Medical Branch (UTMB) is contracted by the Texas Department of Criminal Justice to manage and provide the inmate's medical care. This facility is a 12-hour medical facility with a medical doctor as the medical director, one nurse practitioner, a nurse manager/practice manager, two-shift registered nurses, three licensed vocational nurses include the infection control nurse, two-shift medication aids, and a unit secretary. Laboratory technicians also operate an in-house laboratory service.

Behavioral health services are offered by two in-house mental health counselors and a psychiatric health nurse practitioner who visits patients daily via telemedicine. Medically, patients are scheduled with health care providers upon their request. Clinics are run daily, and after-hours care is provided via telemedicine. Patients needing emergency care are transported to a local hospital and sent back to the facility once stable or transferred to UTMB Galveston for extended care or urgent care needs. Overall, UTMB strives to provide the highest quality and equity in care.

**Planning the Intervention**

The project intervention started with the 10-day reflective log of the clinic's practice in a male correctional facility. The reflective log took place during the COVID-19 pandemic when patient volume shrunk, leaving a handful of clients in our care. Seventy patients were seen and logged over the 10 days. All patients are adult males from 18 to 65 years of age and of different races. Each patient encounter, from chief complaint to treatment, was logged daily. After the 10 days of the reflective log, an overview of the record was necessary after a few days of relaxation.
Rest is encouraged for an insightful assessment to better assimilate the catalog of information gathered and for clearer mindful organization and data analysis.

The 10-day reflective log was sorted, reviewed, and logged by diagnosis to evaluate consistencies or inconsistencies in patient care, treatment, and possible problems in practice. With the issue now vivid, a presentation of the issues to solve was put into a clinic research question. For this QI project, three possible opportunities to change were found and presented to the DNP chairs.

The clinical research questions’ presentation was written as PICOT, a memory aid or mnemonic developed to summarize research questions to explore the effects of therapy (Riva et al., 2012). The PICOT question includes:

P: Population refers to the sample of subjects you wish to recruit for your study.

I: Intervention refers to the treatment that will be provided to subjects enrolled in your study (to be determined by literature review).

C: Current treatment, care, or therapy subjects are receiving before new intervention.

O: Outcome represents what result you plan on measuring to examine the effectiveness of your intervention.

T: Time describes the duration for your data collection.

(Riva et al., 2012, p.169).

After reviewing the 10-day RPL documenting a clinical needs assessment of the practice, the DNP student documented, reviewed, and reflected upon the findings. The DNP student identified three possible opportunities to improve the care the DNP student presently provides the patients. The DNP student met with the DNP chairs and selected one possible QI project.
Once the chairs approved, the DNP student began a literature review and collected several sources and the top three sources with the highest evidence validating the QI project.

The QI project approval began the QI proposal documentation to be sent and approved by the clinical site or work site. The proposal delineated the DNP QI project title, expected outcome of the project, DNP chair or co-chair, three data supporting the DNP project, and the project timeline's anticipated project start date. This documentation also included the new intervention's expected outcome, a brief explanation of the project, the project PICOT question, the translational framework, and the QI model used in the project. Lastly, a description of the effect the DNP QI project will have on the patients and practice setting was provided. The clinical site approval of the QI proposal means the DNP QI project can be carried out in that setting, pending Institutional Review Board (IRB) approval.

IRB CITIProgram courses on research ethics and compliance are mandated before completing the IRB application. The CITIProgram course is better completed on time to avoid application delay. The IRB application and approval are needed to determine that the DNP QI project is not research. The DNP QI project was submitted to the University of Texas at El Paso (UTEP) IRB, and a letter stating the "NOT RESEARCH-QI/QA PROJECT" project was received from UTEP IRB. The receipt of the "NOT RESEARCH" letter certified that the QI project could commence.

As a result of the IRB QI project approval, the DNP student's clinic prepared for the project start. All nurses in the clinic, on different rotating shifts, triage patient sick call requests. At the same time, the unit secretary scheduled patient appointments. All the staff in the clinic are informed of the project start date. In-service education was provided to staff using Leeds Assessment of Neuropathic Symptoms and Signs (LANSS) and the Numeric Rating Scale (NRS)
pain screening tool on the QI project's first day. Assessment, evaluation, diagnosis, and treatment with Duloxetine 30mg daily initial starting dose weekly for patients experiencing neuropathic pain with NRS greater than four points began the same day. Although in-service education was given to the nurses on using LANSS and NRS screening tools, the administration and use of these tools were done by the DNP student on every patient visit.

**Week 2**

In the second week, a review and re-orientation of nursing staff on the project process, screening tools (LANSS and NRS), follow-up patients from the previous week with initiated therapy. The DNP student addressed the 15-20 minutes of patient visits. The evaluation of medication effectiveness (pain level, satisfaction, and comfort), side effects, and patient concerns were also discussed and addressed by the DNP student. If needed, medication was adjusted (increased by 30mg weekly to 60mg daily maximum), and the patient was scheduled for follow-up in 1 week.

**Week 3**

A recap of the project process and progress to the clinic staff and worksite supervisor occurred in week 3 and follow-up with patients from the previous week(s). Re-evaluation of medication effectiveness (pain level, satisfaction, and comfort) and the decision to continue Duloxetine therapy (increase/not to increase or change to another first-line medication) continues.

**Week 4**

Lastly, week 3 was the final follow-up visit with patients, the last evaluation of treatment effectiveness (pain level, satisfaction, and comfort), and the project outcome assessment, with a decision to adopt, adapt, or reject practice change. The worksite supervisor and staff notified the
project end, communicated project findings, and thanked the team for their support and corporation.

To measure the intervention of Duloxetine medications on patients and its effect on pain reduction outcomes, the NRS pain screening test was administered to patients with LANSS score greater than 12 at their initial visit and weekly at the start of their follow-up visits. Furthermore, the LANSS score was also administered and evaluated weekly for the difference in score from the previous week.

The two screening tools, LANSS and NRS, are rating scales used by the medical community to analyze and classifying pain. The LANSS tool seeks to differentiate damaged nerve or neuropathic pain from acute pain. This tool is conducted in two parts: a questionnaire section completed by the patient and a clinical assessment section for the medical provider or clinician. The clinician examination section examines sensory dysfunction such as allodynia or hyperalgesia. Each questionnaire on the LANSS has an attached score with a total maximum score of 24 points. A LANSS test score of less than 12 points is considered non-neuropathic pain (Bennett, 2001). The European Federation of Neurological Societies (EFNS) recommended using LANSS to confirm neuropathic syndrome and aetiological or reason for the diagnosis (Üçeyler & Sommer, 2011). The test's simplicity in administration made it an ideal choice and a valuable tool for discriminating neuropathic pain acute or nociceptive pain.

The Numeric Rating Scale (NRS) has been widely used among medical professionals, primarily for measuring pain intensity (Hawker et al., 2011). This screening tool is also recommended by the EFNS (Üçeyler & Sommer, 2011) in assessing pain. NRS is a reliable and valid pain intensity measuring tool that could be administered verbally and in writing and very simple to score (Hawker et al., 2011). It's an 11-point numeric scale with a score of 0 representing
no pain and a score of 11 representing extreme pain (Hawker et al., 2011). Clinical trials for diabetic neuropathy, chronic low back pain, OA, and fibromyalgia with pregabalin, to analyze the ability of NRS to detect changes in pain score, demonstrated a pain reduction of 2 points (Farrar, Young, LaMoreaux, Werth, & Poole, 2001), which solidifies the NRS screening tool as a good fit for this QI project.

**Analysis**

All analyzed data are continuous data, collected weekly after each patient's visit and plotted on the run a chart to show the QI project intervention's effects. The intervention effects were gauged against the patient's NSR score from the first visit. In other words, the patient's NRS first score was the baseline, while the aim of a 2- to 3-point pain reduction in the NRS remained the objective. The run chart was used for all five patients. The continuous use of these measures (from week 1 to week 4) allowed the DNP student to plot data using the same scale type for each patient weekly, envision data on process performance, determine if intervention tested resulted in an improvement, and allow for better data study (Chin et al., 2020).

The choice of run chart for analysis is not random; rather, it is rooted in evidence in its use in several QI projects in healthcare (Chin et al., 2020). The Institute for Healthcare Improvement (IHI) also recommended using it for QI project data analysis (IHI, 2017). Furthermore, the run chart conserved the events' order and enables the visualization of process changes (Chin et al., 2020). These characteristics made the run chart selection for data analysis in the QI project easy.
Run chart analysis

*Figure 1.* Patient #1 NRS score from week 1 to week 5. Week 5 shows a 3-point drop from week 4 with the patient continuing on Duloxetine 60mg daily.

*Figure 2.* Patient #2 NRS score from week 1-week 4. Week 4 shows a 2-point increase from week 3, with the patient continuing on Duloxetine 60mg daily.
Note. Patient #2's Duloxetine was discontinued and started on venlafaxine 75mg daily.

One of his psychiatric medication medications, Tegretol, was increased for his neuropathic pain management.

*Figure 3.* Patient #3 NRS score from week 1. The patient was started on 30mg Duloxetine daily on the initial visit after meeting QI project criteria.

*Note.* The patient self-discontinued the medication due to adverse reactions (increased anxiety and insomnia). He was started venlafaxine 75mg daily, alternative medicine for pain control. He was removed from the project.
Figure 4. Patient #4 NRS score from week 1-week 4. The patient had a 2-point decrease from week-2 – week-4. This patient met the project goal of a 2- to 3-point pain reduction on the NSR.

Figure 5. Patient #4 NRS score from week 1-week 4. Week 4 shows a 3-point decrease from week-2-week-3 and another 2-point decrease from week 3-week 4, with the patient continuing on Duloxetine 60mg daily.
Note. Patient #5 presented with a gluteal abscess in the week 2 visit that may have contributed to his NRS score increase.

![NRS Pain Score Graph](image)

*Figure 6. Patient #6 NRS score from week 1- week 3.*

Note. This patient's evaluation was not concluded at the time of this writing.

**Results**

The correctional facility is an Intermediate Sanctions Facility (ISF) that houses short-term and transient inmates in Houston, Texas, with 667 adult male inmate capacity. The facility, a fully air-conditioned building with four floors, is strategically located in the heart of downtown Houston's prime real estate. Patients are inmates, mostly low-risk offenders from around Texas counties, and are released into the community within 120 days.

Among the six patients enrolled in the QI project, the majority were Hispanics (3), followed by Whites (2), and Black (1); all are males with a mean age of 49.5 years. All patients were started on Duloxetine 30mg on initial visit after meeting inclusion criteria (Adult males 18-99 years in a correctional facility diagnosed with neuropathic pain with NRS greater than 4
points and LANSS score 12 and greater). Three out six patients had LANSS scores of 24 points, one had 23 points, another with 22 points, and the last one with a 19 point LANSS score.

All patients complaining of neuropathic pain were assessed using the numeric rating scale (NRS) of 0-10 and the Leeds Assessment of Neuropathic Symptoms and Signs (LANSS) with a score of 12 and greater as a screening tool for neuropathic pain. Patients meeting criteria were prescribed Duloxetine 30 mg/daily for 7 days and followed up in 7 days. On follow-up, patients were re-evaluated with the NRS; the Duloxetine increased to 60 mg/daily for 7 days with no pain reduction or improvement and scheduled for follow-up in 7 days.

Two out of the six patients met the pain reduction of 2-3 points in the numeric rating scale (NRS) of 0 to 10 of the QI project goal after a duloxetine dosage increase in week 2 and evaluated in week 3. One patient was switched to Effexor due to Duloxetine's adverse effects (insomnia and anxiety) in week 2. The last patient is currently on week three (3) at the time of writing this report.

Many of the patients complained about environmental coldness and its effect in possibly affecting the pain intensity. Their dormitories are constantly cooled, without the liberty to control the room temperature. Although some pain improvement occurred in some patients, the influence of the unintended conditions made data analysis difficult. However, they mentioned the ease of use and understanding of the NRS screening tool.

The small number of patients in the study did not allow for a robust data sample. However, the COVID-19 pandemic led to this problem. A facility with a capacity of 667 patient inmates was two times less crowded during the time of this writing. The frequent facility COVID-19 testing with associated social distancing guidelines, isolations, and quarantines with
suspected and confirmed cases added to the low number of patients in the facility who met the QI project inclusion criteria.

On the other hand, the patient volume drop brought about quickened patient access to care, a better and efficient road map to timely care service. In-house patient care for medical assessment was made possible by providing an examination office close to client housing for the medical staff to deliver timely care.

**Discussion**

The use of screening tools was simple to administer and handle in the clinical setting. The patients found the NRS simple to understand and use. It required no reading and was visually self-explanatory. The LANSS, on the other hand, provided some challenges for the DNP student and the patients. On many occasions, the patient section was difficult to comprehend for some patients, and more time was spent explaining the questions. Fortunately, all the patients in the QI project spoke English. Otherwise, visitation time would have more than doubled, as translators would have been needed. The extent to which the DNP student's explanations affected the assessment outcomes is not known and not measured.

The constant lockdown, quarantine, and isolation in the facility made patient access somewhat tricky. Security staff shortages were rampant that delayed the patient access process until ratified by medical staff, superior ranking officers, and the warden. Could there have been more patients added to the project were patient access better initially? This question is a question posed by the QI team that was not answered.

The use of Duloxetine with weekly evaluation for medication effectiveness and dose increase for ineffective neuropathic pain control was well received and accepted by the patients. They were eager and looked forward to the next visit. All patients complimented the DNP
student for seeing them so soon and were appreciative of the DNP student's interest in their wellbeing. It elevated patient communication and trust with the provider and medical staff. Did this positive interaction and trust between the medical unit and patient correspond to the low patient grievance rate in the facility? Answering the question would require other inputs beyond the scope of this QI project but is worth exploring.

Fortunately, no cost was accrued by these patients for their visits, as the facility does not charge. The facility not charging for any medical visit may have facilitated patient's eagerness to return for their follow-up visits, which is a strength in this study. No financial commitment was made by any other patients in the QI project during their treatment. It was interesting that most of the patients were Hispanics, followed by Whites and then Blacks, contrary to most prison demographics.

**Compare and Contrast Study Results With Relevant Findings of Others**

An article on pharmacotherapy for neuropathic pain in adults, a systematic review updated by NeuPSIG recommended treatment duration of 3-12 weeks with a less than 3-week follow-up visit between therapy (Finnerup et al., 2015), slightly contracts the approach used in this QI project. However, a 30% pain reduction was recorded in pharmacotherapy for neuropathic pain in this systematic review of adults (Finnerup et al., 2015. Although Finnerup et al.'s (2015) study mildly contrasted with the current study in treatment duration, a similarity existed in that one patient in the QI reported more significant 3 points of pain reduction after 4 weeks with Duloxetine 60mg daily.

Although the NRS was used for measuring pain intensity and its use validated by the EFNS (Üçeyler & Sommer, 2011), the "use of a percent change may provide a more standardized approach to the evaluation and interpretation of clinical trials for pain therapies"
(Farrar et al., 2011). This does not negate the NRS' reliability and validity as a pain intensity measuring tool that could be administered verbally and in writing and is simple to score (Hawker et al., 2011).

According to Farrar et al. (2011), "A more standard approach may improve our ability to compare results across trials and in the evaluation of differences in the pain experiences between different populations such as the report of pain by males and females, and in different cultures" (p. 1471). Although all the patients in the QI project pain reduced, the reductions were not equal and did not meet the project goal. Using the percentage change as a measuring tool could have shown differences in an increase or decrease of pain, providing clarity on the overall project's result (Farrar et al., 2011).

The 2- to 3-point pain reduction recorded with two patients during the 4-week therapy duration of the QI project should be considered a success, according to Mu et al. (2017). Similarly, Duloxetine 30 mg daily, increase by 30 mg every week with a maximum dose of 60mg, was used for the same four weeks duration before adding or switching the patient to alternative therapy (Weinberg et al., 2017).

Limitations

Despite the relatively encouraging result of pain reduction in the QI project in comparison with other studies, the limitation of this QI project must be considered before implementing it in similar correctional facilities. This correctional facility in downtown Houston is unique. First, many correctional facilities are not airconditioned, causing increased pain as complained by most patients in this QI project. Another facility's uniqueness is the building floor plan with many stairs in patient's (inmates) housing units, which they also believed impacted their pain. Pain response in other correctional facilities from patients could be different.
The patient volume during the QI project is another limitation. First, the facility is a small unit with small medical staff and a patient population made smaller by the COVID-19 pandemic. These scenarios may not be the same as other correctional facilities. Secondly, patients are to be released into society within 120 days from their intake day, unlike other facilities. The anticipation of getting released home to their loved ones may reduce their medical encounters to avoid altercation, resulting in more extended confinement. Thirdly, being free from any financial obligation for medical service is an advantage and massive incentive for the patients in this facility. Some costs or charges are attached to medical services in most other facilities that limit patients' requests or demand for care. The absence of fees or charges for the patients at this Houston facility's medical care may have encouraged patients to return for follow-up visits. Finally, staff shortage in the pandemic is another limitation that slowed the patients' access to the clinic. As many security staff was quarantined, measures realigned to accommodate safety.

**Interpretation**

Although the QI intervention was carried out as planned with partial attainment to the anticipated goal of 2- to 3-point pain reduction on NRS for some patients, the clinic gained significantly in winning patients' trust. Notwithstanding the hard times from the pandemic with frequent quarantines, the scheduling process was approached methodically. Missed patient visits were promptly rescheduled, which resulted in the successful continuation of care for our patients, both for those in the QI project and the other patients who needed follow-up care.

Without a doubt, the sample size for the QI was small; however, the positive impact on the clinic from few patients cared for during this pandemic provides an opening for future improvement. This pattern of improvement opportunity is supported by Berlinski, Chambers, Willis, Homa, and Com (2014), who posited that regular patient s follow-up visits in clinics were
associated with improved outcomes. Furthermore, patients' input into their care in the use of NRS and LANSS tools was invaluable. At the same time, patients being the ones with the pain burden, eager to follow up routinely, afforded the DNP the privilege to adjust or replace their medication therapy.

Undoubtedly, the QI sample size was hindered by the COVID-19 pandemic, possibly making it difficult to replicate this QI process. The pandemic afforded some opportunities that quickened patient care access, removing some barriers to a medical visit, including waiting for a patient security escort to medical for a clinical visit. Instead, patients enjoyed in-house or dormitory (cell side) visits from the DNP and the medical staff.

**Conclusion**

Generally, the outcome was favorable for all the patients except one who switched to alternative medicine due to the Duloxetine reported advise effect. Two patients met the outcome goal of 2-3-point reduction on the NRS. Two other patients had a point decrease of pain and a point increase that may be related to activities or other unknown, unrelated issues. Furthermore, the care and trust from patients to the medical staff is encouraging. The sustainability of a timely patient follow-up is very viable, giving the uniqueness of the facility and its small associated medical clinical staff. In the future, a combination of NRS, a "percent change" (Farrar et al., 2011), and satisfaction score measurement tools should be explored to quantify patients' pain treatment outcomes. Keeping the patients on 60mg beyond 4 weeks should remain and warrants more investigation in this population. A 2 point pain reduction on the NRS was noted in this QI Project after 4 weeks with Duloxetine. A broader study of neuropathic pain management with Duloxetine with more patients in the correctional facility needs to be explored.

**Funding**
A grant was received from the Paso Del Norte Community Foundation through the University of Texas at El Paso for this project. They had no role in the study proposal, the conduct of the QI project, the collection, management, analysis, or interpretation of the data, review, or approval of this QI project (Dhalla et al., 2014).
References


Farrar, J. T., Polomano, R. C., Jesse, B. A., & Strom, B. L. (2011). A comparison of change in the 0-10 numeric rating scale to a pain relief scale and global medication performance


Neuropathic Pain Management of Adult Males in a Correctional Facility

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Disclosures

Funding

- I received an award from the Paso Del Norte Community Foundation (PDNHF) through the University of Texas at El Paso for this project. PDNHF had no role in the Quality Improvement (QI) proposal, the conduct of the QI project, the collection, management, analysis, or interpretation of the data, review, or approval of this QI project.

- Personal

- Family and Friends

(Dhalla et al., 2014)
Overview

- Reflective practice and practice setting discussion
- Neuropathic pain Introduction and discussion
- PICOT questions and discussion
- Literature review discussion and findings
- Discussion on Method and Model for quality improvement (QI)
- QI project result and analysis
- Conclusion
Practice Setting Discussion

Practice site

[Image of a building behind a fence]

https://en.wikipedia.org

Patients

[Image of people in orange uniforms]

This Photo by Unknown Author is licensed under CC BY-SA
Reflective Practice Discussion

**REFLECTION**
- Ten days
- COVID-19 and patient census
- Seventy patients

**DIAGNOSIS**
- Obesity
- Tinea pedis
- Chronic pain
Reflective Practice Discussion Cont.

Chronic pain

Medication therapy

Ibuprofen
Tylenol
Venlafaxine (Effexor)
Duloxetine (Cymbalta)

Neuropathic Pain
Neuropathic Pain Introduction and Discussion

- A type of chronic pain, resulting in incidental damage to nerves that carry pain information to the brain (Nishikawa & Nomoto, 2017).
- A common condition seen in most primary care settings

Symptoms:
- Pricking
- Tingling, pins and needles
- Electric shocks
- Hot or burning sensations
- Pain evoked by light touching
- Allodynia
- Altered pinprick sensation

(Bennett, 2001)
Neuropathic Pain Introduction and Discussion

Neuroanatomical distribution of pain symptoms and sensory signs in neuropathic pain conditions

(Colloca et al., 2017 P.38)
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<th>Level of Research Evidence</th>
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- Treatment includes multidisciplinary care (psychology, physiotherapy, exercise, and massage).  
- Duloxetine 30 mg/d increase by 30 mg/d every wk. 60-120 mg/d (doses higher than 60 mg daily have not consistently shown benefit in clinical trials).  
- A reduction in pain of 20% to 30% should be considered a success.  
- A change in a patient’s function, sleep pattern, or ability to be social is critical in evaluation  
- A change in a patient’s function, sleep pattern, or ability to be social is critical in evaluation. |
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- Recommendation to evaluate the following six items: the intensity of pain, physical functions, mental functions, patient satisfaction, signs of adverse reactions, and adherence to the treatments.
- Duloxetine initial dose of 20mg/d/QAM after breakfast x 4 weeks-maximum dose 60mg/day.
- A stepwise approach to pharmacotherapy is recommended |
PICOT Questions and Discussion

**P**: Adult males 18-99 years diagnosed with neuropathic pain with NRS greater than 4 points in a correctional facility

**I**: Duloxetine PO 30 mg/daily, increase by 30 mg/daily weekly as needed up to a maximum dose of 60 mg/daily.

**C**: Cymbalta 30 mg daily for 30 days

**O**: Pain reduction of 2-3 points in the numeric rating scale (NRS) of zero to 10.

**T**: During 30 days
PICOT Questions and Discussion Cont.
Discussion on Method and Model For Quality Improvement (QI)

1. Assess need for Change in Practice
   - Include stakeholders
   - Collect internal data about current practice
   - Compare internal and external data
   - Identify problem

2. Link Problem with Interventions and Outcomes
   - Use standardized classification system & language
   - Identify potential interventions and activities
   - Select outcomes indicators

3. Synthesize best evidence
   - Search research literature related to major variables
   - Critique & weigh evidence
   - Synthesize best evidence
   - Assess feasibility, benefits, & risk

4. Design practice change
   - Define proposed change
   - Identify needed resources
   - Plan implementation process
   - Define outcomes

5. Implement & evaluate change in practice
   - Pilot study demonstration
   - Evaluate process & outcome
   - Decide to adapt, adopt or reject practice change

6. Integrate & maintain change in practice
   - Communicate recommended changes to stakeholders
   - Present in-service education on change in practice
   - Integrate into standards of practice
   - Monitor process & outcomes

Rosswurm & Larrabee Model for change

(Rosswurm & Larrabee, 1999)
Discussion on Method and Model For Quality Improvement (QI) Cont.

- Awareness stimulation / personal interest importance
- Link problem/ Targeted
- Stakeholders Involvement / Ownership
- Pilot / Tortoise = PDSA
- Continue education / Incentive = Sustainability

Rosswurm & Larrabee Model for change

(White, Dudley-Brown, & Terhaar, 2015; Rosswurm & Larrabee, 1999)
Discussion on Method and Model For Quality Improvement (QI) Cont.

**Rosswurm & Larrabee Model for change**

**Model for change overview**

1. **Evaluate Practice**
   - Assessing need for practice change
   - Ask answerable research?

2. **Synthesis best literatures**
   - Design change/pre-pilot
   - Stimulate awareness

3. **Implement change in practice/ pilot**
   - Cymbalta 30mg/d x 30 days to Cymbalta 30mg/d x Wk.
   - Evaluation (LANSS, NRS)
   - Implement slow
   - 2-3 pain

(Rosswurm & Larrabee, 1999)
Model for Improvement

- Developed by a group called Associates in Process Improvement.

The model begins with Three root questions

What are we trying to accomplish?
- Establish
- Aim

How will we know a change is an improvement?
- Establish
- Measures

What change can we make that will result in improvement?
- Determine
- Changes

(Institute for Healthcare Improvement, n.d., QI 102)
Discussion on Method and Model For Quality Improvement (QI) Cont.

How to use Model for Improvement

1. Set an Aim
   - Specific. Short Goal. Measurable Practical

2. Establish Measures
   - A. Outcome Measure. B. Process Measures

3. Identify Changes
   - Find ideas to Implement

4. Test Changes
   - Test your Ideas

5. Implement Changes
   - Analyze changes, Then implement

(Institute for Healthcare Improvement, n.d., QI 102)
Discussion on Method and Model For Quality Improvement (QI) Cont.

Model for Improvement into PDSA Cycle

- Test Changes
- Implement Changes
- Test your Ideas

PDSA Cycle
- PLAN
- DO
- STUDY
- ACT

- Change to test
- Predictions
- Plan to Collect date
- Record findings
- Implement
- What else?
- Any change to improvement?
QI Project Result and Analysis

Demographics

Race Variance

Age Variance

- Black
- White
- Hispanic
Patient #4 NRS score from week 1-week 4. The patient had a 2-point decrease from week-2 – week-4. This patient met the project goal of a 2- to 3-point pain reduction on the NSR.
Patient #1 NRS score from week 1 to week 5. Week 5 shows a 3-point drop from week 4 with the patient continuing on Duloxetine 60mg daily.

Patient #3 NRS score from week 1. The patient was started on 30mg Duloxetine daily on the initial visit after meeting QI project criteria. Note. The patient self-discontinued the medication due to adverse reactions (increased anxiety and insomnia). He was started venlafaxine 75mg daily, alternative medicine for pain control. He was removed from the project.
Results and Analysis

Patient #2 NRS score from week 1-week 4. Week 4 shows a 2-point increase from week 3, with the patient continuing on Duloxetine 60mg daily.

Patient #6 NRS score from week 1-week 3.

Note. This patient's evaluation was not concluded at the time of this writing.
Two patients met the outcome goal of 2-3-point reduction on the NRS.

Two other patients had a point decrease of pain and a point increase.

Sustainability of a timely patient follow-up is very viable.

I will continue using this practice change.


Neuropathic Pain Management of Adult Males in a Correctional Facility

George O Egesi, MSN, APRN, AGNP-C

INTRODUCTION
- Nerve damage caused by a lesion affecting the somatosensory system results in Neuropathic pain.
- A type of chronic pain that arises with incidental damage to nerves that carries pain information to the brain.
- Pain remains the most reason patients seek medical attention.
- As a primary care provider in a correctional facility, removal from the naps and horrors of chronic pain management reality is impossible, somewhat more difficult due to medication formulary restrictions and availabilities.
- A 10-day Reflective Practice Log (RPL) was completed. I found that patients diagnosed with neuropathic pain return every month with no relief. At the time, my prescribing practice, Cymbalta 30 mg daily for 30 days.
- I completed the Quality Improvement (QI) project at my practice, a correctional care facility, during four weeks with the goal to reduce pain in six adult males 18 to 99 years.

METHODS
- This QI project is based on several literature reviews with the highest level of evidence validating the use of Duloxetine in the treatment of neuropathic pain.
- The Model for Improvement, Plan Do Study Act (PDSA) quality improvement method and Russell and Larrabee’s Model for change to Evidence-Based Practice translational framework were used in this project.
- Six patients complaining of neuropathic pain were assessed using the NRS of 0-10 and the LANSS with a score of twelve and greater as a screening tool for neuropathic pain.

PROJECT GOALS
- Pain reduction of 2-3 points in the numeric rating scale (NRS) of zero to 10
- To create available time slots to see new patients.
- At the time, I did not use a scale to measure pain

INCLUSION CRITERIA
- Adult males 18-99 years diagnosed with neuropathic pain with numeric rating scale (NRS) greater than 4 points and 3-Leads Assessment of Neuropathic Symptoms and Signs (LANSS) score 12 and greater in a correctional facility.
- At the time, I did not use a scale to Assess Neuropathic Symptoms and Signs.

RESULTS
- Two (2) out of the six (6) patients met the Pain reduction of 2-3 points in NRS of zero to 10 of the QI project goal after a duloxetine dosage increase in week 2 and evaluated in week 3.
- One patient was switched to Effexor due to Duloxetine’s adverse effects (Neomine and anxiety) in week 2. The last patient is currently on week three (3) at the time of writing this report.
- Overall, each patient’s pain decreased. Although two patients did not meet my QI project goal of 2-3-point pain reduction on the NRS, their subsided by only 1 point pain drop.

CONCLUSION
- Overall, the outcome was favorable for all the patients except one who switched to alternative medicine due to the Duloxetine reported adverse effects.
- Two other patients had a point decrease of pain and a point increase that may be related to activities or other unknown, unrelated issues.
- The sustainability of the achieved goal in the clinical practice is very viable, giving the facility’s uniqueness and its small associated medical staff.
- I will continue the change in practice as it was effective in decreasing Chronic Neuropathic Pain in comparison to my previous practice.
- The addition of the Numeric Rating Scale (NRS) and the LANSS Assessment of Neuropathic Symptoms and Signs (LANSS) Scale will greatly improve my patient’s outcomes.

REFERENCES
George O Egesi, MSN, APRN, AGNP-C