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Background:

As the practice in outpatient foot and ankle surgeries increases, more painful and invasive procedures are being performed. Charcot Marie Tooth (CMT) is a rare hereditary neuropathy characterized by distal muscle weakness and sensory deficits(1). The result can be disabling foot deformities in children or young adults that require extensive surgical correction to improve mobility. CMT reconstructive surgery, has proven to cause severe pain well beyond the 24-hour period postoperatively. Use of continuous local anesthetic-based peripheral regional analgesic techniques for patients undergoing surgical procedures is preferred where postoperative pain is likely to be more prolonged.

The University of Pittsburgh Medical Center conducted a retrospective 33-month study, evaluating the effectiveness of ambulatory continuous peripheral nerve blocks in children and adolescences. They concluded that it provided effective home postoperative analgesia.

Quality Question:

- Do postoperative pain scores improve in patients who receive ambulatory nerve infusion therapy (AMBIT) for CMT reconstructive surgery?

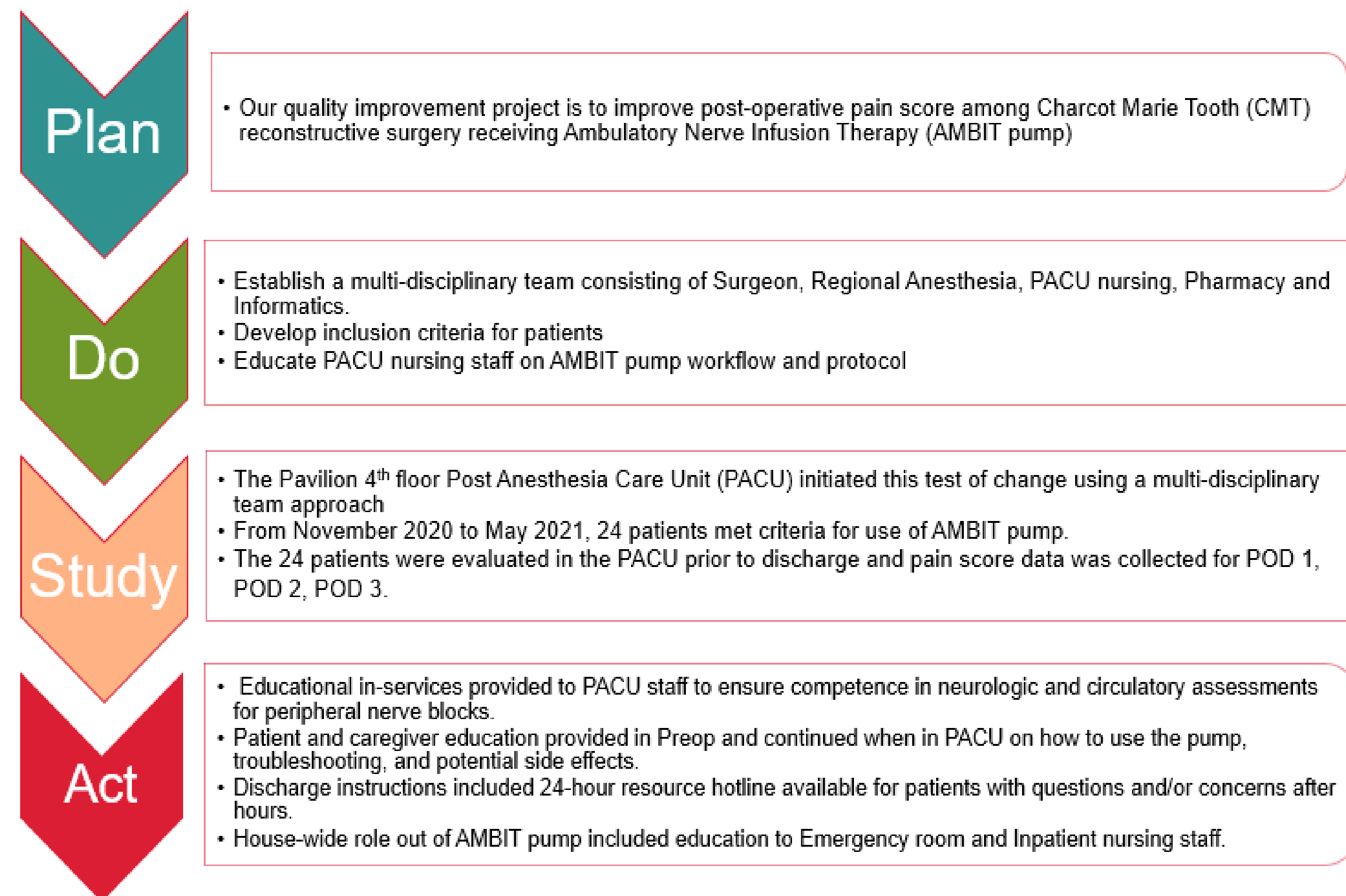
SMART Aim:

To improve postoperative pain score for CMT reconstructive surgery receiving ambulatory nerve infusion therapy for 72 hours as measured by patient reported pain score after discharge.



Figure 1 Pre-operative foot (left) and post-operative reconstruction (right)

Implementation Process:



This project was recognized and won 2nd place in Outcomes during the Nursing Research Conference at Cedars Sinai, Oct. 2021.

Results:

The implementation of the ambulatory nerve infusion therapy for CMT patients showed significant improvement in postoperative pain for 72 hours postoperatively. Pre-implementation pain scores averaged in the severe range. Post implementation pain scores averaged in the mild to moderate range.

Nursing Implications :

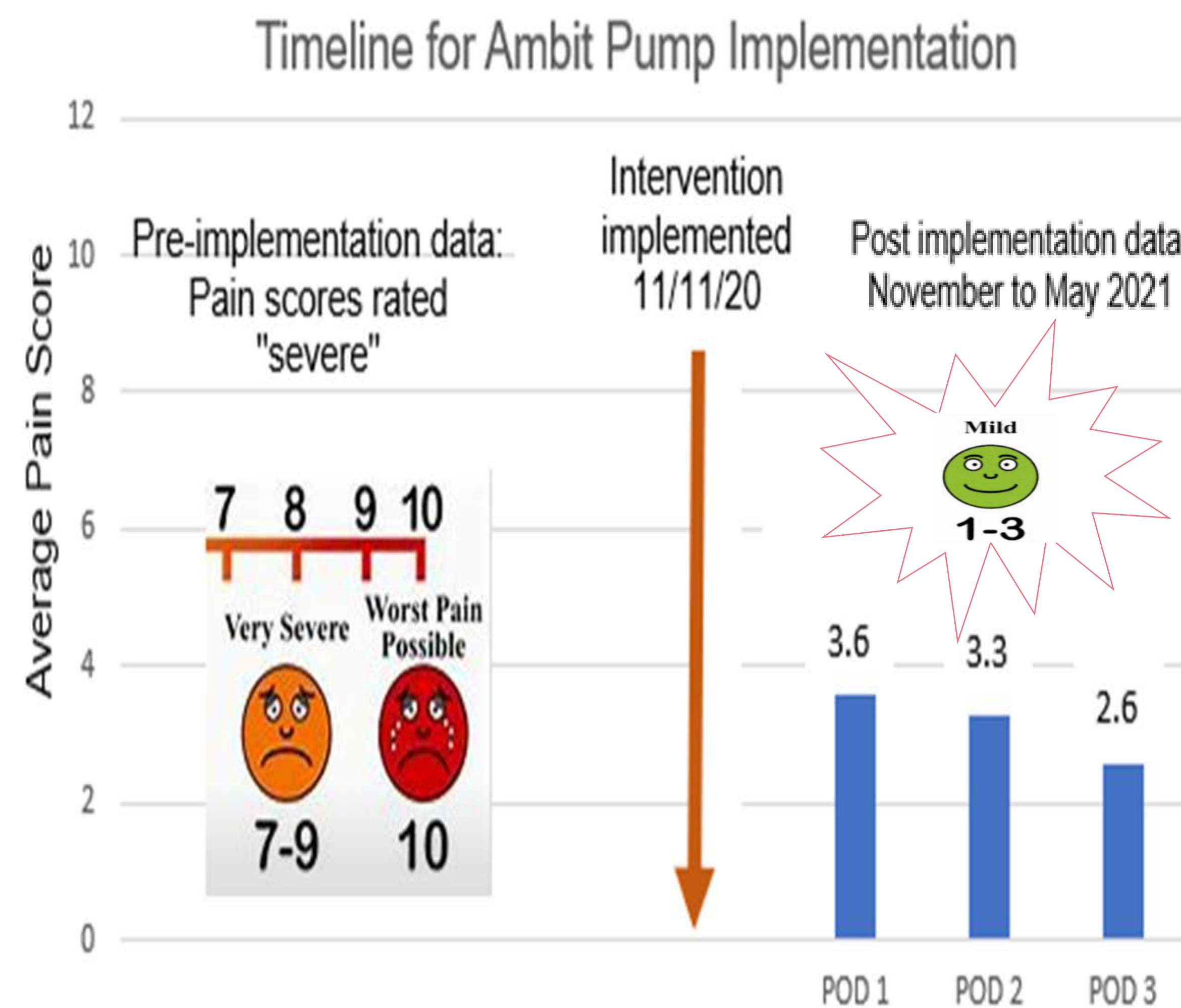
The peri-anesthesia nursing implications involves enhancing the education of the peri-anesthesia nurse. As part of the peri-anesthesia annual competency peripheral nerve block education is being incorporated through on-going education training. The educational in-services provided to PACU nurses includes proper use and handling of the ambit pump, competency in assessments of neurologic and circulatory functions of the extremity, and to anticipate complications to ensure good patient outcomes. Bedside patient teaching is provided by PACU nurse and a Regional Anesthesiologist to ensure the patient and their caregiver receives accurate postoperative education. In addition, the use of ambulatory peripheral nerve infusions in the PACU helps in reducing the use of opioids administered in the PACU and upon discharge.

Conclusion:

A multi-disciplinary test of change created an effective workflow for implementing peripheral nerve catheters for a novel and invasive procedure. Furthermore, preliminary results proved this ambulatory nerve infusion therapy improves postoperative pain for CMT reconstructive surgery well beyond the 24-hr period after discharge. Future studies should examine the effectiveness of postoperative pain management using AMBIT pump therapy for other procedures, as well as compared to other conventional treatments.

References:

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- Polshin, V., Petro, J., Wachtendorf, L. J., Hammer, M., Simopoulos, T., Eikermann, M., & Santer, P. (2021). Effect of peripheral nerve blocks on postanesthesia care unit length of stay in patients undergoing ambulatory surgery: a retrospective cohort study. *Regional Anesthesia & Pain Medicine*, 46(3), 233–239. <https://doi.org/10.1136/rapm-2020-102231>.
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- Schmitt, H. J., Huberth, S., Huber, H., & Münster, T. (2014). Catheter-based distal sciatic nerve block in patients with Charcot-Marie-Tooth disease. *BMC Anesthesiology*, 14(1). <https://doi.org/10.1186/1471-2253-14-8>



This graph shows that pre-implementation pain scores averaged in the severe range and post implementation pain score from POD 1 decreased from 3.6 to 2.6 on POD 3.



Education TipSheet: AMBIT PAIN PUMP

Professional Development Committee (PDC)

Date: 7/14/21

What is changing and why?

- The Ambit Pain Pump is a pain management system that delivers local anesthetic medication continuously into a peripheral nerve catheter to relieve pain after surgery.
- Patients with the Ambit Pump are typically discharged to home from PACU. In rare cases they may be admitted to the hospital and end up in the inpatient setting.
- The purpose of this TipSheet is to educate inpatient nurses on what to do if they have a patient with an Ambit Pain Pump.

What do I need to do?

- Target audience: Inpatient and Emergency Department nurses
- Assess and document the peripheral nerve catheter and site, per unit documentation guidelines.
- Immediately call** the number labeled on the Ambit Pump: (310) 384-4270. An anesthesiologist or Regional Pain Team will respond.
- The responding MD will disconnect the pump and place new orders to convert the peripheral nerve catheter to an epidural pump.
- Do not touch the settings or disconnect the Ambit Pump.
- Do not connect to a peripheral IV site.
- Prior to discharge home, the provider may want to come back to reconnect the Ambit Pump. Discuss the plan of care with the provider. Discharge instructions can be found in EPIC under dotphrase: **painpumpdischarge**.



Figure 2: Education Tip Sheet