

Original Research

A Nerve Block Team in the Emergency Department

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Objectives

To improve pain management in the emergency department (ED), emergency physicians are performing an increasing number of ultrasound-guided regional anesthesia procedures (nerve blocks). We aimed to examine the effect of a dedicated emergency department (ED) nerve block team (NBT) on the number and types of ultrasound-guided nerve blocks administered in the ED.

Methods

We performed a retrospective chart review comparing the nine-month period before and after the creation of a dedicated NBT. This was performed at a tertiary care urban hospital that is a level 1 trauma center. We assessed and compared the number and types of nerve blocks performed, level of learners who performed nerve blocks, and time of ED arrival to disposition, before and after implementation of the NBT.

Results

The utilization of nerve blocks rose from 79 prior to the establishment of the NBT to 108 following its creation, representing a 36.7% increase. The average duration of stay in the emergency department decreased by 51 minutes, though this change did not demonstrate statistical significance ($P=0.1237$). There was an increased variety in the types of nerve blocks performed.

Conclusion

The introduction of a NBT led to a rise in both the quantity and diversity of nerve blocks conducted in the ED.

INTRODUCTION

Effective pain management for patients within the emergency department (ED) has consistently presented a challenge for emergency physicians (EPs). With the risk of adverse outcomes, most notably respiratory depression and long-term addiction potential, there is increasing incentive to limit the use of opioid pain medications in the ED. To that end, EPs and other nonanesthesiology physicians are performing an increasing number of ultrasound-guided regional anesthesia (UGRA) procedures.¹ Trials assessing the effectiveness of UGRA performed by EPs have found success.^{2,3} Yet, a survey of emergency ultrasound (US) directors and US fellowship directors found that only 48% of academic institutions with an emergency medicine (EM) residency offer any supervised practice on real patients.⁴ This results in many emergency medicine (EM) trained providers being unfamiliar and uncomfortable with performing these procedures. This likely explains why the number of nerve blocks performed is still lower than the an-

ticipated number of patients that could benefit from such a procedure. One of the barriers in teaching nerve blocks to EM residents is a reported lack of procedural opportunities.⁵ To address these barriers, we created a dedicated nerve block team (NBT) in our ED. The primary objective of this study is to assess the effect of a dedicated NBT on the number and types of nerve blocks performed in the ED.

METHODS

This is a single-center, retrospective chart review study comparing a nine-month period before and after the creation of a dedicated on-call NBT. The NBT consisted of ultrasound fellowship-trained emergency medicine attendings. They were available for consultation between the hours of 9am-5pm on weekdays to come and either supervise or perform any needed nerve blocks.

Patients who received ultrasound-guided nerve blocks during their ED visit in the nine months before and after the creation of a dedicated on-call NBT in February 2019

Table 1. Demographics and nerve block data. Abbreviations: NBT = Nerve block team. ED = Emergency department.

	Pre-NBT creation	Post NBT creation	
Age	60 ± 26.45	64 ± 22.6989	P=0.102367
Gender	37 females, 42 males	54 females, 54 males	
Number of blocks	79	108	
Time from arrival to block	309 minutes	319 minutes	
ED length of stay	424 minutes	373 minutes	P=0.1237
Time to NBT consult		212 minutes	
How often NBT was consulted		34/108 blocks or 31.48%	

were included. Procedure notes are documented for point of care ultrasounds performed in the ED. Eligible Cases were identified by querying the EMR database for all nerve block procedures performed during the two time periods. The overall number and type of nerve blocks were recorded. The time to NBT consult and the time to disposition was noted. In addition, we looked at the percentage of all performed nerve blocks that had a NBT consult after its creation. Lastly, we assessed the level of learners involved in the performance of the nerve block. Our hospital's Institutional Review Board approved this study prior to the initiation of this study, approval number 2020-10-13 on November 24, 2020. This research did not receive any grant funding.

RESULTS

There were 79 blocks performed during the nine months prior to creation of the NBT, and 108 blocks performed after its creation (Table 1). We also found that the ED length of stay had a trend towards a decreased length of stay with an average decrease of 51 minutes, although this was not statistically significant ($P=.1237$).

Blocks not previously performed in the ED including cervical sympathetic ganglion block, dorsal penile nerve block and the erector spinae block, were performed after the initiation of the nerve block team (table 2).

There were 55 blocks in which the resident performed the procedure before the NBT and 72 after its implementation, or a 31% increase (table 3). In addition, there was a significant increase in the number of interns involved in the procedure, from 3 to 17.

DISCUSSION

The creation of a dedicated NBT resulted in a significant increase in the number of and variety of nerve blocks performed in the ED. Many EM trained providers may not be familiar or comfortable with performing nerve blocks due to scarcity in opportunities to practice on real patients during training.⁴ For example, the fascia iliaca and superficial cervical plexus blocks were found to be performed in only 33% and 5% of academic emergency departments respectively.⁴

Table 2. Level of training of provider performing the block.

	Pre-NBT creation	Post NBT creation
PGY1	3	17
PGY2	32	31
PGY3	20	24
EM attending with no ultrasound training	7	3
US fellow	3	3
US faculty	6	30
No entry (unable to discern from chart)	8	0

Abbreviations: NBT = Nerve block team. PGY = Post graduate year. EM = Emergency medicine. US = Ultrasound.

Table 3. Types of nerve blocks performed

Types of nerve blocks performed	Pre-NBT creation	Post NBT creation
Cervical Sympathetic Ganglion	0	1
Superficial Cervical Plexus	7	4
Dorsal Penile Block	0	1
Erector Spinae	0	1
Fascia Iliaca	11	30
Femoral Nerve	4	12
Interscalene Brachial Plexus	17	20
Posterior Tibial	1	1
Serratus Anterior	23	24
Supraclavicular Brachial Plexus	1	2
Transabdominal Plane (TAP)	1	2
Forearm Blocks	14	10

The nerve block team at our institution is comprised of ultrasound-fellowship trained faculty. Having faculty who are adept at performing nerve blocks available for consult to perform these procedures is likely what resulted in this increase in the number and types of Nerve blocks performed.

Having a dedicated team of physicians for performing Nerve blocks, who are not simultaneously taking care of other patients clinically, allows for greater teaching opportunities and closer supervision of the novice trainees. This is possibly why interns got more opportunities to perform nerve blocks. Furthermore, we observed a trend towards a decrease in length of stay by 51 minutes for patients in the post-NBT group who underwent a NB in the ED. This is possibly due to having a dedicated team, who can focus on gathering the equipment and performing the procedure more quickly without any distractions typical during a clinical shift.

Although ultrasound-guided regional anesthesia-trained physicians already exist, they often lack the resources to routinely provide regional anesthesia for non-surgical patients on a 24-hour basis that is needed in the ED.⁵ Going forward, having a dedicated NBT may potentially allow for collaboration with these existing services to make best use of equipment and expertise and provide expedited and high-quality pain control to the patients in the ED.

Future studies could see if less opioids are given as a result of implementation of a NBT, and if having a NBT improves the success rate of the Nerve blocks performed.

LIMITATIONS

Being a retrospective chart review, it is possible that some of the documentation was incomplete. Nerve blocks could have been performed without any corresponding documentation in the EMR. In addition, we were not able to tell the level of the provider performing the block in 8 cases before the implementation of the NBT, although there were no cases after the creation of the NBT possibly indicating more accurate documentation with a dedicated team.

CONCLUSION

Implementation of a NBT resulted in an increased number and variety of nerve blocks performed in the ED. It also provided further opportunities for EM residents to perform nerve blocks and gain experience in this important skill.

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