Regional Anesthesia and Pain

Survey of chronic pain practice by anesthesiologists in Canada

[Enquête sur la pratique en douleur chronique des anesthésiologistes du Canada]

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Purpose: To describe the pattern of chronic pain practice (CPP) among anesthesiologists in Canada.

Methods: Following hospital Ethics Committee approval, a detailed postal questionnaire was sent to all active members of the Canadian Anesthesiologists' Society. A second mailing was conducted two months later.

Results: The overall response rate was 53%. While 38% of responding anesthesiologists were involved in CPP, in the majority of cases, this accounted for less than 20% of their clinical time. Thirty percent of those involved in CPP had previous training in pain management. The types of CPP included nerve blocks (84%) and pharmacological treatment (60%) in non-cancer pain (85%) and cancer pain (50%) patients. Ten percent and 28% of anesthesiologists were involved in research and teaching respectively while 26% were affiliated with a multidisciplinary clinic. The healthcare professions that anesthesiologists had access to or were directly working with in their practice were as follows: acupuncture (18%), nursing (36%), psychology (28%), psychiatry (35%) and physiotherapy (58%).

Epidural steroid injection was the most commonly practiced intervention (82%). This was followed by trigger point injection (70%), stellate ganglion block (61%), occipital nerve block (60%) and lumbar sympathetic block (50%). Practice of interventional procedures was highly diverse.

Seventy percent of anesthesiologists prescribed opioids as part of their CPP. However, half of them never incorporated an opioid agreement with patients. Opioids were most commonly used in the sustained release form.

Conclusion: Approximately one-third of anesthesiologists surveyed incorporate chronic pain in their practice and their pattern of practice is widely diversified.

Objectif : *Décrire le modèle de pratique en douleur chronique (PDC) des anesthésiologistes du Canada.*

Méthode : *Avec l'accord du Comité d'éthique, nous avons posté un questionnaire détaillé aux membres actifs de la Société canadienne des anesthésiologistes. Un second envoi a été fait deux mois plus tard.*

Résultats : *Le taux de réponse global a été de 53 %. Si 38 % des répondants étaient impliqués dans la PDC, dans la majorité des cas, c'était pour moins de 20 % du temps de clinique. Parmi les personnes en PDC, 30 % avaient reçu une formation en traitement de la douleur. Les modalités de PDC comprennent les blocs nerveux (84 %) et un traitement pharmacologique (60 %) pour la douleur non cancéreuse (85 %) et cancéreuse (50 %). Dix pour cent et 28 % des anesthésiologistes ont respectivement participé à la recherche et à l'enseignement, et 26 % ont été associés à une clinique multidisciplinaire. Les professions de la santé auxquelles les anesthésiologistes avaient accès ou avec lesquelles ils ont travaillé directement sont : l'acupuncture (18 %), les soins infirmiers (36 %), la psychologie (28 %), la psychiatrie (35 %) et la physiothérapie (58 %).*

L'injection péridurale de stéroïde était l'intervention la plus fréquente (82 %). C'était suivi de l'injection dans une zone réflexogène (70 %), du bloc du ganglion stellaire (61 %), du bloc du nerf occipital (60 %) et du bloc lombaire sympathique (50 %). La pratique de procédures interventionnelles était très diversifiée.

Soixante-dix pour cent des anesthésiologistes prescrivaient des opioïdes dans leur PDC. Mais la moitié d'entre eux n'ont jamais intégré d'entente pour opiacés avec leurs patients. Ces médicaments étaient utilisés le plus souvent dans leur formulation à libération lente.

Conclusion : *Environ un tiers des anesthésiologistes sondés incluent la douleur chronique dans leur pratique et leur modèle de pratique est largement diversifié.*

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ANESTHESIOLOGISTS played an important role in the early development of chronic pain medicine. This is because neural blockade was used widely for the treatment of a variety of acute and chronic pain syndromes.[1] In the 1950's, John Bonica revolutionized chronic pain management with the concept of a multidisciplinary diagnostic and therapeutic endeavour. This has generally been accepted since that time.[2] With increasing understanding of pain mechanisms and the development of new drugs and interventional techniques, the pattern of chronic pain practice (CPP) of anesthesiologists has diversified. To date, there is no information on anesthesiologists' practice of chronic pain management in Canada. Thus, we surveyed all practicing anesthesiologists in Canada with regard to their involvement and pattern of practice in chronic pain management.

Methodology

A four-page questionnaire was developed to obtain the following information: i) the proportion of anesthesiologists involved in CPP; ii) the demographics and training of anesthesiologists practicing chronic pain; iii) the clinical settings of the CPP; iv) the patterns of practice of various nerve blocks and v) the prescription practice of opioids.

Following hospital Ethics Committee approval, a four-page questionnaire was pilot tested and, subsequently, sent to all active members of the Canadian Anesthesiologists' Society. Students, residents, retired or inactive members, and those members outside of the country were excluded. A second mailing was conducted two months later. The results are presented as frequency and percentage. Background information was compared using the Chi-square test. A P value of < 0.05 was regarded as statistically significant.

Results

General information

Questionnaires were posted to a total of 1,338 anesthesiologists. The overall response rate was 53% (709 respondents) after the second mailing. Eight questionnaires were excluded because the information was incomplete or the members were not in active practice.

Chronic pain management was part of the practice of 38% of anesthesiologists surveyed. However, this practice was limited in the majority of these individuals (Figure 1). Comparison of the gender, age, training in chronic pain management and setting of practice with all anesthesiologists surveyed is shown in Table I. Only 15% of all anesthesiologists (with and without CPP) had previous training in chronic pain management (fellowship 43%; observership 57%). Of those with a practice in chronic pain management, this increased to 30% (fellowship 42%; observership 58%).

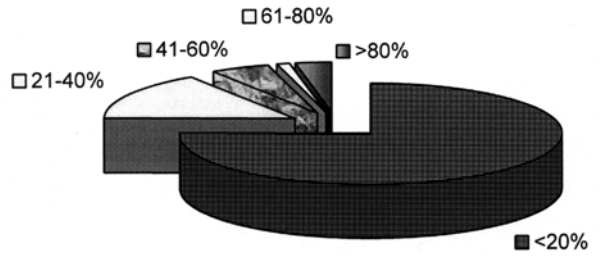

FIGURE 1 Percentage of time dedicated to chronic pain management by anesthesiologists practicing chronic pain.

TABLE I Comparison of background information

	All anesthesiologists *n (%)*	*CPP* *n (%)*
Gender M:F	2.8:1	4.3:1*
Age		
≤ 30	8 (1.1)	4 (1)
31–40	145 (21)	66 (25)
41–50	302 (43)	113 (42)
51–60	173 (25)	67 (25)
> 61	73(11)	17 (6)
Current practice		
University hospital based	339 (48)	112 (42)
Community hospital based	350 (50)	146 (55)
Private clinic	12 (1.7)	9 (3)
Previous chronic pain training	102 (15)	81 (30)*

n = number of respondents with percentages in parentheses; CPP = anesthesiologist with chronic pain practice. *$P < 0.05$.

Characteristics of CPP

The varieties of CPP included performance of nerve blocks (84%) and pharmacotherapy (60%) in non-cancer pain (85%) and cancer pain (50%) patients. This was done on an outpatient (78%) and in-patient (66%) basis. Ten percent and 28% of anesthesiologists were involved in research and teaching respectively while 26% were affiliated with a multidisciplinary clinic. The healthcare professions that anesthesiologists had access to or were directly working with in their practice included acupuncture (18%), neurology (41%), nursing (36%), psychology (28%), psychiatry (35%), physiotherapy (58%), occupation therapy (34%), rheumatology (24%), dentistry (11%) and addiction

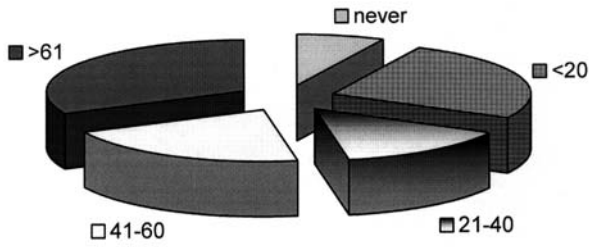

FIGURE 2 Patients requiring nerve blocks for chronic pain treatment.

TABLE II Types of nerve blocks or procedure performed by anesthesiologists with CPP

Types of procedure	*Respondents with CPP n (%)*
Epidural steroid injection	219 (82)
Trigger point injection	179 (70)
Stellate ganglion block	163 (61)
Occipital nerve block	153 (60)
Lumbar sympathetic block	134 (50)
Sacroiliac joint injection	117 (45)
Facet injection (joint/nerve)	72 (27)
Celiac plexus block injection	63 (25)
Epidural external pump implantation	45 (18)
Botox® injection	27 (11)
Spinal cord stimulator implantation	11 (4.5)
Epidural or intrathecal pump implantation	11 (4.5)
Epiduroscopy	6 (2.3)

CPP = chronic pain practice. *n* = number of respondents with percentages in parentheses.

TABLE III Clinical considerations for ESI

Indications			
Radicular pain	143 (68)		
Back/neck and radicular pain	125 (59)		
Back/neck pain alone	12 (5.5)		
Discontinuation of hemostasis altering drugs before ESI			
ASA	40 (19)	NSAID	22 (11)
Warfarin	209 (99)	Ticlopidine	154 (73)
Prophylactic LMWH	193 (91)	Clopidrogel	164 (78)
Prophylactic heparin	129 (61)		

Data presented as number of respondents with percentages in parentheses. ESI = epidural steroid injection; ASA = acetyl-salicylic acid; NSAID = non-steroidal anti-inflammatory drugs; LMWH = low molecular weight heparin.

medicine (11%). An estimate of the proportion of patients requiring nerve blocks (either neuraxial or peripheral) in their practice is shown in Figure 2. Fifty-three percent of the respondents estimated that more than 40% of their patients required a nerve block as part of their pain management.

Epidural steroid injection (ESI)

ESI was the most commonly performed interventional procedure by anesthesiologists surveyed with CPP (Table II). This procedure was most commonly performed outside the operating room (procedure room 37%; recovery room 30%). While 16% of anesthesiologists performed ESI in the operating room, 3.7% of anesthesiologists performed ESI in their office. The commonest level for performance of ESI was lumbar spine (99%). This was followed by thorax (44%), cervical (37%) and caudal (34%) ESI. The volume of injectate most commonly chosen was between 6 to 10 mL (61%). Most anesthesiologists (67%) combined local anesthetic with steroid (saline + steroid - 20%; opioids + steroid - 11%; steroid only 2.7%). None of the anesthesiologists performing ESI chose an injectate volume of more than 20 mL. Methylprednisolone was the most popular choice of steroid (78%) and the dose most commonly chosen was between 61 to 100 mg (65%). Most of the anesthesiologists performed ESI without radiological guidance (77%) while 5% routinely used *x-rays* for this procedure.

The clinical considerations for the use of ESI are listed in Table III. The maximum number of ESI that could be performed in a six-month period was considered by most anesthesiologists to be 3 (mode). In the event of an accidental dural puncture, most anesthesiologists (62%) would postpone the procedure. This compares with 36% who would try at a different level and 2% who would repeat at the same level. Hemostasis altering drugs that anesthesiologists would consider discontinuing before ESI are listed in Table III.

Sympathetic blocks

Fifty percent of the anesthesiologists practicing chronic pain management performed lumbar symp athetic block (LSB). The commonest indication was complex regional pain syndrome (CRPS; 88%), followed by vascular insufficiency (73%) and cancer pain (40%). A majority of the anesthesiologists performed the procedure in a designated facility such as the radiology suite, operating or procedure room. However, 3% of the anesthesiologists surveyed performed the procedure in a clinic. LSB was performed with an image intensifier or fluoroscopy by 75% of anesthesiologists. Single level injection was the most common injection technique and the vast majority of anesthesiologists chose local anesthetic as the medication of choice for

TABLE IV Technique of lumbar sympathetic block

Number of levels injected		*Medication used for first LSB block*	
1 level	62 (47)	Local anesthetics	130 (98)
2 levels	46 (35)	Neurolytic agent (phenol, alcohol)	15 (11)
3 levels	21 (16)	Steroid	10 (7.6)
> 3 levels	2 (1.5)		

Data presented as number of respondents with percentages in parentheses. LSB = lumbar sympathetic block.

TABLE V Technique of facet block

Nerve or joint		*Use of x-ray*		*Medications*	
MBN	14 (20)	Always	56 (78)	LA only	13 (18)
Joint	41 (57)	Sometimes	7 (10)	Steroid only	2 (3)
Both	17 (24)	Never	9 (13)	Both	56 (79)

Data presented as number of respondents with percentages in parentheses. MBN = medial branch nerve block; LA = local anesthetic.

the first injection (Table IV). The majority of anesthesiologists (84%) who performed chemical sympathectomy preferred a diagnostic local anesthetic block before neurolysis. The rest would consider neurolysis as the initial procedure for patients with cancer pain or vascular insufficiency.

Stellate ganglion block was performed by 61% of the anesthesiologists practicing chronic pain management (Table II). The majority (83%) used the classical approach with a needle insertion at the C6 level. Two percent of anesthesiologists always performed this procedure with *x-ray* guidance.

Facet blocks

Facet joint or nerve blocks were performed by 27% of anesthesiologists with CPP. The choices of techniques are summarized in Table V. Of those performing facet joint or nerve block, 29% also performed radiofrequency neurolysis. Two-thirds of this group would consider performing two diagnostic blocks before the radiofrequency procedure.

Opioid prescription practice

One-third of the anesthesiologists with CPP never prescribed opioids (Table VI). Approximately half of those who prescribed opioids never used an opioid agreement or contract (Table VI). Support from the family doctor for opioid prescription was felt to be poor or very poor in 32%. Access to an addiction specialist was readily available in 16% of anesthesiologists prescribing opioids.

TABLE VI Opioid prescription in non-cancer pain patients and the use of opioid contract

Opioids in non-cancer pain	*n (%)*	*Opioid agreement use*	*Percentage (n)*
Never	88 (33)	Never	92 (49)
< 20% of practice	120 (45)	Sometimes	72 (38)
21–40%	35 (13)	Always	24 (13)
41–60%	11 (4.2)		
61–80%	6 (2.3)		
> 80%	5 (1.9)		

n = number of respondents with percentages in parentheses.

The majority of anesthesiologists (82%) who prescribe opioids preferred sustained release preparations in the management of chronic pain patients. Twenty-three percent of the anesthesiologists with CPP prescribed methadone ($n = 43$).

Injection of botulinum toxin (Botox®)

Botox® injection was part of the practice of 11% of anesthesiologists. This therapy was used in the treatment of neck pain (89%), back pain (63%), headache (50%), craniofacial pain (37%) and fibromyalgia (19%).

Discussion

General features of CPP

The response rate of the present survey was 53%, which is comparable with other national surveys of Canadian anesthesiologists.[3,4] Compared with obstetric practice (OP), CPP is not as popular (60% *vs* 38% respectively).[4] However, additional training in the relevant field is more prevalent in anesthesiologists practicing chronic pain management (OP 8.5%, CPP 31%). The majority of anesthesiologists (75%) practicing chronic pain management in our survey have a restricted practice, spending less than 20% of their time in this area. Most of them manage chronic non-cancer pain (CNCP) patients with nerve blocks (84%). Only a minority of them (26%) are affiliated with a multidisciplinary clinic.

To date, no survey has described CPP in anesthesiologists. In the present survey, it was found that there was a wide variation in the practice of different procedures and opioid prescription practice. Only a few selected topics will be commented upon because of their potential interest or controversial nature.

ESI

ESI was the most commonly performed interventional procedure by anesthesiologists with CPP in our sur-

vey. Despite half a century of experience, there is no consensus as what is the "proper" technique.[5,6] Similar to the national survey on the practice of ESI in the U.S.,[7] a wide variation of techniques was found in the present survey.

There are a few interesting findings in our survey. Slightly less than 4% of anesthesiologists chose to perform ESI in their office. Although ESI is considered to be a very safe procedure, life-threatening complications can occur[8] and ESI was the major cause of malpractice claims in chronic pain management both in Canada and the United States.[9,10] It should be performed in a location where resuscitation equipment and personnel are immediately available, particularly when a local anesthestic is used. The only widely accepted indication for ESI is pain associated with radiculopathy.[6] However, 5.5% of anesthesiologists in our survey considered back pain alone an indication. Ten percent of the surveyed anesthesiologists would add an opioid to the steroid for injection. This is rarely practiced in the United States, where less than 2% of institutions, exclusively academic, would add an opioid to the injectate.[7] While there is no evidence to support the benefit of adding an opioid to ESI injection, a recent closed claim study showed that death or brain death was observed only in the cases where an opioid or local anesthetic was injected concomitantly with the epidural steroid.[10] Although a cause and effect relationship cannot be established in a closed claim study, clinicians performing ESI should judge the benefit against the risk when adding an opioid to the injection.

While there is no literature to suggest the maximum number of ESI per year, Cushing's syndrome and adrenal suppression have been reported after paraspinal injections of 150 to 290 mg triamcinolone over a three-month period.[11] Weekly epidural injections of 80 mg triamcinolone for three weeks also resulted in acute suppression of plasma adrenocorticotrophin (ACTH) and cortisol levels for a month following the last injection.[12] The cortisol response to synthetic ACTH (cosyntropin) was also blunted in 36% of the same group of patients in the month following the last injection. This returned to normal in all patients three months after the last injection. In our survey, most anesthesiologists would perform three injections in a six-month period (range 1 to 6). Interestingly, the maximum number of injections in a year ranged from 0 to 40 among anesthesiologists in the United States.[7]

There is no consensus on the optimal volume, dose and type of medication used for injection. Since the target epidural space is on the ventral aspect of the dura (such as inflammation from a herniated disc), a higher volume of injectate will promote spread of medication from the site of injection on the dorsal aspect of dura. However, injectate volumes of 10 to 20 mL have been shown to increase intrathecal pressure for ten minutes[13] and a larger volume (> 40 mL) may lead to retinal hemorrhage or visual disturbance.[14] An injection volume of up to 10 mL has been recommended.[5]

Sympathetic blocks

Sympathetic blocks are commonly performed by anesthesiologists for the management of patients with CRPS, circulatory insufficiency and cancer pain.[15,16] The sympathetic chain and its ganglia for the lumbar region lie close to the anterolateral aspect of the vertebral bodies, separated from somatic nerves by the psoas fascia and muscle.[16] Although the locations of the ganglia are quite variable, ganglia are more likely to be present at the L3 level.[17] Various approaches of LSB have been described, from a single level injection with a high volume of local anesthetic (e.g., 20 mL) to multilevel injections with smaller volumes of injectate.[18] No study to date has demonstrated the superiority of one approach over the other. In our survey, the most popular technique is a single level injection.

Confirmation of needle position with an *x-ray* is necessary when performing neurolytic blocks of the lumbar sympathetic ganglia.[16] However, opinions on the role of fluoroscopy when only local anesthetic is used vary. One quarter of the anesthesiologists surveyed did not use fluoroscopy for LSB in their practice. A 'loss of air resistance' technique can also be used to locate the 'correct' position of needle tip.[16] The safety of this 'blind' technique was examined in a cadaver study.[19] Three of out 80 needle attempts resulted in the needles embedded in grossly osteoporotic vertebral bodies or hilum of the kidney. All incorrect placements would have been prevented by the use of fluoroscopy.

Facet blocks

The prevalence of lumbar facet or zygapophysial joint pain in chronic low back pain patients ranges from 15 to 52%.[20] Management of lumbar facet joint pain has included intra-articular injections of steroid, percutaneous denervation using radiofrequency electrodes, chemical or cryogenic techniques, pharmacotherapy, physical therapy and manipulation.[21] Before the treatment, identification of the lumbar facet joints as sources of low back pain can be made with diagnostic facet blocks. For the purpose of diagnosis, medial branch block and intra-articular facet joint injection

are believed to have equal diagnostic sensitivity.[21,22] The lumbar medial branch block has been shown to be highly target specific.[23] Dual blocks (a series of two diagnostic blocks) of the facet joints or the medial branch are recommended for a more secure diagnosis, especially before the patients are considered for medial branch neurotomy. This is because of an unacceptable false-positive or placebo rate associated with single nerve blocks.[21] The false positive rate of single injection is 38% using a dual block protocol.[24] Dual medial branch blocks using lidocaine and bupivacaine can substantially reduce the likelihood of a false-positive or placebo response.[21] Either intra-articular injection or medial branch block should be performed under fluoroscopic guidance.[21] A slight (few mm) misplacement of the needle off the target point can result in a higher incidence of aberrant spread such as spread to the intervertebral neural foramen and epidural space,[23] which will result in a falsely positive result.

Opioid prescription practice

One-third of the anesthesiologists with CPP never prescribe opioids. This may be attributed to the fact that interventional procedures are an important component of practice of the anesthesiologists surveyed (84% anesthesiologists included nerve blocks in their practice). Although 60% included pharmacotherapy in their practice, only a few of them obtained nursing support (36%) or worked in a multidisciplinary clinic (26%). This may explain the low utilization of opioids in their practice. Other possibilities include physicians' concern about the risk of addiction and the fear of disciplinary action from regulatory agencies.[25]

Opioid therapy is well established as an invaluable treatment for acute pain and cancer-related pain. However, the opinion regarding the appropriate use of opioid therapy in CNCP is not as clear.[26] In the past decade, research has shown that opioid therapy can relieve pain and improve mood and functioning in many patients with CNCP.[27,28] The recognition of this led to the consensus statements published by the American Pain Society, American Academy of Pain Medicine and Canadian Pain Society.[26,29] Despite this recognition from the medical societies, opioid therapy is still underutilized for the treatment of CNCP. A recent survey on chronic pain in Canada showed that 80% of patients with chronic pain taking prescription analgesics suffered from moderate to severe pain. However, only one-fifth of them were managed with an opioid analgesic.[25]

Opioid contract or agreement is frequently used in the opioid management of CNCP.[30] This is an agreement, either verbal or written, between the prescribing physicians and the patients in how the opioid medications can be prescribed safely. However, only half of the opioid-prescribing anesthesiologists in the present survey used an opioid agreement. A recent consensus statement and guidelines published by the Canadian Pain Society on the use of opioid analgesics for the treatment of CNCP suggests a documented verbal consent in most practice settings.[26] This includes a discussion of the risks and benefits of opioid therapy, as well as the conditions under which opioids will be prescribed. However, they recommend a written therapeutic agreement for patients assessed to be at higher risk of noncompliance with the verbally agreed treatment plan.[26]

The majority of anesthesiologists prefer the use of sustained release preparations (e.g., MS Contin®, Purdue Pharma, Pickering, ON, Canada) or long-acting (e.g., methadone) opioids for managing chronic pain patients. These two forms of opioid preparations have many advantages in treating chronic pain. It can improve the pain control and patient compliance with a round-the-clock and time-contingent dosing schedule. With a more consistent blood level of opioid, the tolerance to side effects such as cognitive impairment improves. It also may reduce the risk of addiction by avoiding the reinforcement seen in *prn* dosing regimens.[26]

Limitations of the study

The overall response rate was 53%, similar to other national surveys of Canadian anesthesiologists.[3,4] However, only 38% of respondents practice chronic pain management. Thus, information on CPP was obtained from approximately 20% of practicing anesthesiologist in Canada (n = 267).

It is possible that the survey overestimates the proportion of anesthesiologists with CPP, as the respondents were more likely to have a CPP. To minimize the bias of response, the questionnaire was designed in such a way that those who have no CPP were encouraged to return their questionnaires after completion of a few questions on background information. A copy of the four-page questionnaire is available as Additional Material at www.cja-jca.org.

Conclusion

In summary, the present national survey showed that approximately one-third of anesthesiologists surveyed incorporated chronic pain in their practice and their pattern of practice was widely diversified.

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