Submitted: 16 June, 2026 Accepted: 25 August, 2026 Published: 12 November, 2026 DOI:10.22514/jofph.2026.075

Journal of Oral & Facial Pain and Headache

ORIGINAL RESEARCH

First-line management of post-traumatic trigeminal neuropathic pain: objective consensus analysis reveals marked heterogeneity among international expert centers

Aleksandra Zumbrunn Wojczyńska[1,*], Alexandra Lüber[1], Paulo César Conti[2], Justin Durham[3], Eli Eliav[4], Estephan Moana-Filho[5], Charly Gaul[6], Jean-Paul Goulet[7], Arne May[8], Noboru Noma[9], Maria Pigg[10], Tara Renton[11], Fréderic Van der Cruyssen[12,13], Lene Baad-Hansen[14,†], Paul Martin Putora[15,†]

[1]Clinic of Masticatory Disorders and Dental Biomaterials, Center for Dental Medicine, University of Zurich, 8032 Zurich, ZH, Switzerland
[2]Department of Prosthodontics, Bauru School of Dentistry, University of São Paulo, 17012-901 Bauru, SP, Brazil
[3]School of Dental Sciences, Faculty of Medical Sciences, Newcastle University, Newcastle, UK and Newcastle Hospitals' NHS Foundation Trust, NE7 7DN Newcastle upon Tyne, UK
[4]Eastman Institute of Oral Health, University of Rochester, Rochester, NY 14620, USA
[5]Division of TMD and Orofacial Pain, School of Dentistry, University of Minnesota, Minneapolis, MN 55455, USA
[6]Headache Center Frankfurt, 65929 Frankfurt am Main, HE, Germany
[7]School of Dental Medicine, Université Laval, Quebec City, QC G1V 0A6, Canada
[8]Department of Systems Neuroscience, University Medical Center Hamburg-Eppendorf, 20246 Hamburg, HH, Germany
[9]Department of Oral Medicine, Nihon University School of Dentistry, 101-8310 Tokyo, Japan
[10]Departments of Endodontics and Orofacial Pain and Jaw Function, Malmö University, 205 06 Malmö, Sweden
[11]Faculty of Dentistry, Oral & Craniofacial Sciences, King's College London, SE1 9RT London, UK
[12]Department of Oral and Maxillofacial Surgery, University Hospitals Leuven, 3000 Leuven, Belgium
[13]Department of Imaging and Pathology, OMFS-IMPATH Research Group, Faculty of Medicine, KU Leuven, 3000 Leuven, Belgium
[14]Section for Orofacial Pain and Jaw Function, Department of Dentistry and Oral Health, Aarhus University, 8000 Aarhus, Denmark
[15]Department of Radio-Oncology, Cantonal Hospital St. Gallen, 9007 St. Gallen, SG, Switzerland

***Correspondence:** aleksandra.zumbrunn@zzm.uzh.ch (Aleksandra Zumbrunn Wojczyńska)

† These authors contributed equally.

Abstract

Background: Post-traumatic trigeminal neuropathic pain (PTNP) lacks disease-specific treatment guidance, and how experienced clinicians select first-line management remains unclear. We aimed to quantitatively characterize real-world decision-making for first-line treatment of PTNP in patients meeting International Classification of Orofacial Pain criteria. **Methods**: Nineteen experts from dedicated secondary and tertiary care centers worldwide were invited; 13 provided detailed management strategies. Their responses were converted into anonymized decision trees and analyzed using the Objective Consensus Method, which compares recommendations across all possible combinations of predefined clinical parameters. Similar criteria and treatments were grouped into broader categories to enable cross-comparability. **Results**: Thirteen decision-criteria categories were identified. Comparison of all submitted strategies yielded 35 distinct clinical scenarios. Limited agreement (54%) was reached in only 6 scenarios, whereas no agreement was observed for the remaining scenarios. Topical treatment was favored in selected patients without imaging evidence of injury and with superficial, localized pain, whereas a slight majority of experts chose surgical intervention for selected patients after mandibular third molar surgery with imaging evidence of nerve injury and a positive diagnostic block. All experts agreed that patient education and access to psychological support are essential components of first-line care. **Conclusions**: Current first-line PTNP management shows substantial variability. Surgical evaluation is being applied in selected patients with confirmed nerve injury and positive blocks, while conservative approaches are favored in the majority of the scenarios. Patient education and psychological support should be integral to care. These findings represent expert opinion rather than outcome-validated evidence. Standardized, PTNP-specific guidelines, informed by prospective outcome data, are needed.

Keywords

Orofacial pain; Neuropathic pain; Trigeminal nerve injuries; Consensus; Decision making; Disease management

This is an open access article under the CC BY 4.0 license (https://creativecommons.org/licenses/by/4.0/).

1. Introduction

Post-traumatic trigeminal neuropathic pain (PTNP) is a chronic orofacial pain disorder arising secondary to mechanical, thermal, chemical, or radiation-induced injury to the peripheral branches of the trigeminal nerve [1]. A causal association between the nerve injury and symptom onset may be assumed when pain emerges within six months of the precipitating trauma and is localized in a neuroanatomically plausible area with somatosensory disturbances. Clinically, PTNP is most often characterized by continuous spontaneous pain of burning and/or dull quality, though evoked neuralgiform exacerbations resembling electric shocks or stabbing sensations may also occur and, in some cases, predominate [2, 3]. Associated sensory disturbances, both positive and negative, are an inherent part of PTNP diagnosis and may include hypoesthesia, hypoalgesia, hyperalgesia, and/or allodynia.

According to current diagnostic criteria, PTNP is classified as a chronic pain condition, defined by symptom persistence or recurrence for more than three months [1]. To establish a definite PTNP diagnosis, confirmatory testing is required, such as surgical or radiological evidence of nerve compression or lesion, nerve conduction studies, laser-evoked potentials, blink reflex testing, or demonstration of reduced intraepidermal nerve fiber density on skin biopsy [1]. When confirmatory testing is unavailable or does not demonstrate a somatosensory lesion, a diagnosis of probable PTNP may be made if the clinical criteria are otherwise satisfied (Table 1, Ref. [1]). Depending on the invasive procedure, the risk of PTNP following trigeminal nerve injury varies greatly, with a higher incidence reported among female patients [4, 5].

Previously termed painful post-traumatic trigeminal neuropathy (PTTN), PTNP was usually diagnosed when a trigeminal nerve injury could be clearly attributed to trauma of the nerve, for example following a surgical intervention [6]. In cases where a causal relationship was less evident, some neuropathic pain cases may have been classified as atypical odontalgia (AO) or atypical facial pain (AFP) [1, 4]. With the advent of more precise diagnostic criteria and refined diagnostic methods capable of identifying subtle sensory disturbances in patients formerly classified as having AO, the diagnosis of PTNP/PTTN has become increasingly frequent [3, 7]. Given this context, the next logical step is to understand how clinical management proceeds after diagnosis, and which factors influence subsequent therapeutic decision-making.

In a recent Delphi consensus process focused on the management of trigeminal nerve injuries, experts endorsed the application of the Neuropathic Pain Special Interest Group (NeuPSIG) of the International Association for the Study of Pain (IASP) guidelines for pharmacological treatment [8]. However, no consensus was achieved regarding the use of corticosteroids, vitamin B, opioids, or ablative surgical procedures. The updated NeuPSIG guidelines continue to recommend tricyclic antidepressants (TCAs), serotonin-norepinephrine reuptake inhibitors (SNRIs), and gabapentinoids as first-line pharmacotherapies [9]. Topical agents such as capsaicin and lidocaine (in patch or cream formulations) are suggested as second-line options, while botulinum toxin type A and opioids are reserved as third-line interventions. These recommendations are broadly directed at patients with neuropathic pain, as no PTNP-specific data are currently available to inform tailored treatment strategies or individualized therapeutic decision-making. Basically, the current consensus is based on the assumption that PTNP represents a form of peripheral neuropathic pain resulting from nerve injury, analogous to neuropathic pain occurring in other regions of the body. This assumption would suggest that existing treatment guidelines for peripheral neuropathic pain should also apply to PTNP [9]. However, the implementation of these general guidelines in the orofacial region may prove challenging in clinical practice. Anatomical, functional, and sensory particularities of the trigeminal system, as well as differences in pain mechanisms and treatment responses, may limit the direct transferability of such recommendations [4]. Also, the need for close collaboration across health care disciplines regarding patients with trigeminal nerve injuries may, at least in some countries, involve additional complexities in the diagnostic and management process due to involvement of both private dental practices and public dental

TABLE 1. Diagnostic criteria for post-traumatic trigeminal neuropathic pain and probable post-traumatic trigeminal neuropathic pain according to International Classification of Orofacial Pain, 1st edition [1].

Criterion	Description
Post-traumatic trigeminal neuropathic pain	
A.	Pain, in a neuroanatomically plausible area within the distribution(s) of one or both trigeminal nerve(s), persisting or recurring for >3 months and fulfilling criteria C and D
B.	Both of the following:
1.	history of a mechanical, thermal, radiation or chemical injury to the peripheral trigeminal nerve(s)
2.	diagnostic test confirmation of a lesion of the peripheral trigeminal nerve(s) explaining the pain
C.	Onset within 6 months after the injury
D.	Associated with somatosensory symptoms and/or signs in the same neuroanatomically plausible distribution
E.	Not better accounted for by another ICOP or ICHD-3 diagnosis
Probable post-traumatic trigeminal neuropathic pain	
A.	Pain fulfilling all but criterion B2 for 4.1.2.3 Post-traumatic trigeminal neuropathic pain

ICOP: International Classification of Orofacial Pain; ICHD-3: International Classification of Headache Disorders, 3rd edition.

Journal of Oral & Facial Pain and Headache

and medical health institutions, for example.

The paucity of high-quality, PTNP-specific evidence, coupled with the generalized nature of current treatment guidelines, poses significant challenges in clinical decision-making, particularly for less experienced practitioners. Hence, it is particularly beneficial to understand how experienced experts make decisions in everyday clinical practice [10]. In particular, the information on the criteria that are considered and influence decisions may not be well reflected in clinical trials with a strictly selected study population. For the acquisition and quantification of this type of information, the Objective Consensus Method has previously been shown to be appropriate [11]. In this approach, participating experts are asked a well-defined clinical question, such as treatment recommendations or patient selection for a specific therapeutic modality. The responses are translated into decision trees. An algorithm then compares all decision trees according to the applied criteria and recommendations, quantifies the level of agreement, and generates a composite decision tree that represents the shared decision-making process. The Objective Consensus Method has been applied predominantly in the fields of oncology and radiotherapy, where it has proven suitable for capturing complex clinical decision-making processes [12, 13].

Objective: The present study aimed to quantitatively characterize clinical decision-making practices in the selection of first-line treatment for patients meeting the diagnostic criteria for PTNP as defined by the International Classification of Orofacial Pain [1]. To this end, orofacial pain specialists actively managing PTNP at dedicated secondary and tertiary care centers were surveyed, and treatment approaches were synthesized using the Objective Consensus Method.

2. Materials and methods

To minimize geographical bias and ensure representation across disciplines, experts from multiple countries were invited to participate. Based on experience from previous studies using the Objective Consensus Method, a target sample size of 10–25 experts was considered appropriate [11]. The inclusion criteria for expert panel participation were: (1) authorship or substantial contribution to recent PTNP guidelines and classifications, (2) an established research record in the field of PTNP, and (3) representation within a geographically diverse panel. Experts who did not fulfill these criteria were excluded from participation. The recruitment process took place between February and August 2024. Experts who did not respond to the initial invitation were contacted with up to two follow-up emails at two-month intervals.

Initially, 19 orofacial pain experts were invited to participate, of whom 13 responded and provided details regarding their clinical decision-making process. The participants were from the following countries: Belgium, Brazil, Canada, Denmark, 2 from Germany, Japan, Sweden, Switzerland, 2 from United Kingdom and 2 from United States of America. There were 5 general dentists working in specialized orofacial pain centers, 3 oral surgeons, 2 oral medicine specialists, 2 neurologists and 1 endodontist. Five experts had received orofacial pain (OFP) training, and a further three had received formal training in pain and headache medicine, defined as completion of an accredited postgraduate specialty program or fellowship (typically $\geq$2 years). However, in many countries, OFP is not a formally recognized specialty, and dedicated postgraduate specialty training programs are therefore not available. Participants from these countries, including the general dentists practicing within specialized orofacial pain centers, had acquired their expertise through supervised clinical experience within these centers rather than through formal specialty training; the exact duration of this training was not systematically recorded for each participant. Participating experts had on average 22.1 years of experience in the management of PTNP (standard deviation (SD) = 8.74, 95% confidence interval (CI) (16.80, 27.36), range 5–40) and were currently seeing 7 (SD $\pm$ 6) new PTNP patients a month.

Each expert was contacted by AZW and AL individually via email with the following question: “Please describe your first-line management strategy for patients diagnosed with post-traumatic trigeminal neuropathic pain. Please describe all treatment options you consider and factors (patient and non-patient related) that you feel are relevant in your decision-making process. This should reflect your standard clinical practice (*e.g.*, outside of a clinical trial)”. Hence the proposed regimens reflect participants’ practical experience.

The participants were allowed to answer in any format they found most convenient (*e.g.*, free-text, Microsoft PowerPoint diagram or hand-drawing). The initial expert inputs were systematically evaluated to identify duplications, ambiguities, or incomplete responses (by AL, AZW and PMP). Similar criteria as well as treatment choices were grouped into comprehensive categories to simplify their usage and enable cross-comparability. An iterative, one-on-one process was then conducted with each expert to finalize their individual decision trees, as previously described [11]. These finalized trees were anonymized and analyzed to identify areas of agreement or disagreement, following the Objective Consensus Method, which involves a quantitative comparison of treatment choices from each expert across all possible parameter combinations [11]. Data were processed and analyzed using the proprietary software “Dodes” (v2.0, Objectify, Bratislava, Slovakia). Additional analyses were performed using custom scripts in R (R Core Team. R: A Language and Environment for Statistical Computing. Vienna, Austria: R Foundation for Statistical Computing; 2026) and GNU Emacs (Version 30.2. GNU Project; 2025). Fig. 1 (Ref. [11]) illustrates the workflow of the objective consensus methodology.

Since patient preferences should always be taken into account, criteria related to individual preferences were not explicitly depicted in the decision trees, in order to maintain clarity and usability. Similarly, criteria involving contraindications to specific pharmacological treatments were excluded from the analysis for the sake of readability. As such, the resulting algorithms are intended to guide treatment decisions for a generally healthy patient population that is willing to adhere to the proposed therapy.

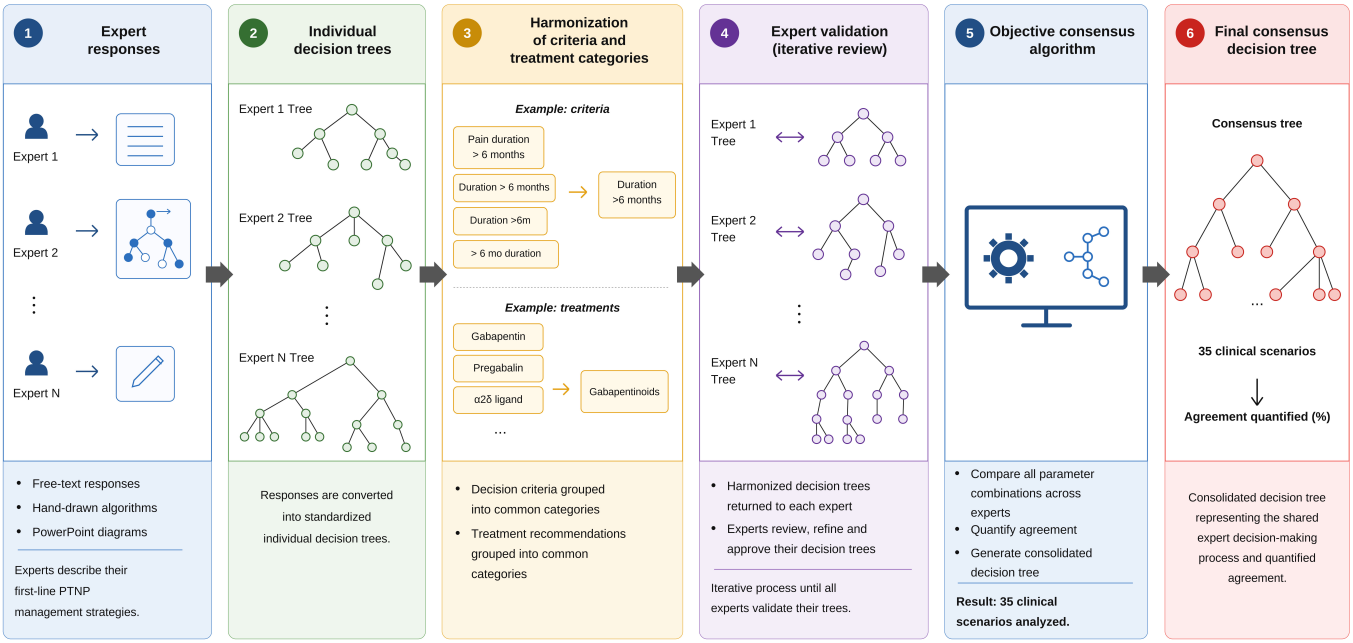


FIGURE 1. Workflow of the objective consensus method [11]. Expert responses describing first-line PTNP management were transformed into validated individual decision trees. Similar decision criteria and treatment choices were harmonized into common categories. The objective consensus algorithm compared all parameter combinations across experts, quantified agreement, and generated the consolidated decision tree used for analysis. PTNP: Post-traumatic trigeminal neuropathic pain.

3. Results

Eventually 13 categories of decision criteria were included: Indication for nerve repair surgery based on Magnetic Resonance Neurography (MRN) (Grading III–V) [14] and/or radiographic evidence of structural abnormalities affecting the nerve (Imaging: yes/no), response to anesthetic block (Block: yes/no), dominant pain quality (Quality: burning/dull/electric shock-like/mixed), pain duration (Duration: 3–6 months/>6 months), cause of nerve injury (Cause: bone fracture/dental intervention/mandibular third molar (M3M) surgery), location of pain (Location: intraoral/extraoral), localization of intraoral PTNP near tooth socket or in attached gingiva (Gingiva: yes/no), patient coping well with the pain (Coping: yes/no), size of the painful area (Size: <3 cm^2/≥ 3 cm^2), pain superficial in the oral mucosa or facial skin (Superficial: yes/no), pain modulation indicators (Modulation: low/high), pain intensity (Intensity: numeric rating scale (NRS) 0–6/NRS 7–10), qualitative (chair-side/bed-side) sensory testing (QualST: mechanical hyperesthesia/thermal hyperesthesia/sensory loss with pain). Table 2 presents information on how the initially named decision criteria were grouped into categories.

The most frequently applied decision criterion was the presence of structural abnormalities affecting the nerve, as visualized via MRN and/or other radiological evidence. This criterion was considered relevant for therapeutic decision-making by 7 out of 13 experts (Table 3).

Four experts included the response to a diagnostic anesthetic block in their clinical reasoning. Three experts differentiated between various pain qualities (burning, dull, electric shock-like, or mixed). Each of the following criteria: pain duration, causative event, anatomical localization, and coping strategies was considered relevant for treatment selection by only 2 of the 13 experts. Notably, factors such as the size of the painful area, indicators of pain modulation, pain intensity, or localization within the attached gingiva were each taken into account by only one expert.

Four experts indicated the same treatment irrespective of clinical criteria, provided the patient was generally healthy and expressed no specific treatment preferences (which was a prerequisite for inclusion in this study; see Methods section). In contrast, the most complex decision-making model included six distinct criteria, resulting in 14 different clinical scenarios. Furthermore, it was unanimously agreed by the participating experts that all patients with PTNP should receive comprehensive education regarding their condition and be offered psychological support when desired, regardless of any other accompanying therapies. These two components were considered essential elements of first-line management. Since the decision to offer education and psychological support did not vary based on the criteria choice, these aspects were not included in the final decision tree to improve its readability.

The 13 participating experts initially proposed 22 distinct first-line treatment options for PTNP patients, depending on specific combinations of clinical criteria. These treatment options were subsequently categorized into 13 groups, as shown in Table 4. **Supplementary material 1** provides a comprehensive overview of all validated decision trees.

Table 5 illustrates the variability of first-line treatment choices among participating experts. Seven experts proposed topical treatment for specific clinical presentations, while one additional expert preferred a combination of topical and systemic therapy. Notably, seven different topical agents were considered first-line treatment options.

Journal of Oral & Facial Pain and Headache

TABLE 2. Categorization of the decision criteria initially named by the participants and the possible answers based on all the named options.

Dode (diagnostic node = summary criterion)	Shortname	Initially named criteria	Possible answers for the dode
Imaging: Indication for nerve surgery based on neurographic MRI (Grading III–V) and/or radiographic evidence of structural abnormalities affecting the nerve	Imaging	Neurographic: MRN Grading III–V, radiographic: radiographic evidence of structural abnormalities affecting the nerve	Yes/no ("yes" defined by at least one of the following parameters: neurography: MRN Grading III–V; radiography: radiographic evidence of structural abnormalities affecting the nerve; intraoperative/clinical evidence)
		Radiographic evidence of damage to lingual plate, retained tooth fragments or damages IDC or MRN structural abnormalities affecting the nerve (MRC scale S0–S3)	
		MRN Grade (MRN Grade III–V/I –II)	
		Macroscopic nerve damage	
		Eligible surgical nerve repair (yes/no)	
		Clinical signs of inflammation	
Response to anesthetic block	Block	Anesthetic blockade with pain reduction (> than 50%)	Yes/no
		Anesthetic block reduces pain	
Dominant pain quality	Quality	Burning pain	Burning pain/dull pain/electric shock-like pain/mixed
		Pain quality (continuous pain/short-lasting episodic pain +/− continuous pain)	
Pain duration	Duration	Injury <6 months (yes/no)	3–6 mon/>6 mon
		Pain duration longer than 6 months	
Cause of nerve injury	Cause	Cause of injury (bony fracture/dental treatment)	Bony fracture/dental intervention/M3M surgery
		Cause of injury (LA, orthognathic, trauma, implant or endo/M3M surgery)	
Location of pain	Location	Location of Pain (extraoral pain/intraoral pain)	Extraoral/intraoral
Localization of intraoral PTNP near tooth socket or in attached gingiva	Gingiva	Localization near tooth structure and not near any vital structure	Yes/no
		Pain located in attached gingival area	
Patient coping well with the pain	Coping	Psychosocial burden (low/high)	Yes/no
		Coping Patient	
Size of the painful area	Size	Small neuropathic area <3 cm^2	<3 cm^2/≥3 cm^2
Pain superficial in the oral mucosa or facial skin	Superficial	Superficial pain (oral mucosa, facial skin)	Yes/no
		superficial pain (located in mucosa/soft-tissue)	
Pain modulation indicators (CPM or EIH)	Modulation	CPM or EIH (conditioned pain modulation)	Low/high
Pain intensity (Numeric Rating Scale (NRS))	Intensity	Pain intensity (mild-moderate (NRS 0–6)/intense pain (NRS 7–10))	Mild-moderate/intense
Qualitative sensory testing	QualST	Qualitative sensory testing (sensory loss (+ pain)/mechanical hyperesthesia/thermal hyperesthesia)	Sensory loss with pain/mechanical hyperesthesia/thermal hyperesthesia
		Mechanical hyperesthesia (yes/no)	

MRI: magnetic resonance imaging; MRN: magnetic resonance neurography; IDC: inferior dental canal; MRC: Medical Research Council sensory grading scale; M3M: mandibular third molar; LA: local anesthesia; CPM: conditioned pain modulation; EIH: exercise-induced hypoalgesia; NRS: numeric rating scale; PTNP: Post-traumatic trigeminal neuropathic pain.

TABLE 3. Clinical criteria among participating experts (A–M), with the number and percentage of experts endorsing each criterion (n, %).

Criteria (response options)	Experts														
	A	B	C	D	E	F	G	H	I	J	K	L	M	n	%
Imaging (YES/NO)	√			√	√	√	√		√			√		7	53.8%
Block (YES/NO)		√				√	√		√					4	30.8%
No criteria			√					√		√			√	4	30.8%
Quality (burning/dull/electric/mix)		√			√							√		3	23.1%
QualST (mech_hyper/therm_hyper/sens_loss)						√	√		√					3	23.1%
Duration (3–6 mon/>6 mon)	√						√							2	15.4%
Cause (fracture/dental intervention/M3M)				√	√									2	15.4%
Location (intraoral/extraoral)	√				√									2	15.4%
Coping (YES/NO)					√	√								2	15.4%
Superficial (YES/NO)	√											√		2	15.4%
Gingiva (YES/NO)									√					1	7.7%
Size (<3 cm^2/≥3 cm^2)					√									1	7.7%
Modulation (LOW/HIGH)											√			1	7.7%
Intensity (0–6/7–10)											√			1	7.7%

√: criterion reported by the expert; blank: criterion not reported. Imaging: Indication for nerve repair surgery based on Magnetic Resonance Neurography (MRN) (Grading III–V) and/or radiographic evidence of structural abnormalities affecting the nerve; Block: response to anesthetic block; No criteria: the same treatment was indicated irrespective of clinical criteria; Quality: dominant pain quality; QualST: qualitative sensory testing (mechanical hyperesthesia/thermal hyperesthesia/sensory loss with pain); Duration: pain duration; Cause: cause of nerve injury (M3M: mandibular third molar surgery); Location: location of pain; Coping: patient coping well with the pain; Superficial: pain superficial in the oral mucosa or facial skin; Gingiva: localization of intraoral post-traumatic trigeminal neuropathic pain near tooth socket or in attached gingiva; Size: size of the painful area; Modulation: pain modulation indicators; Intensity: pain intensity in Numeric Rating Scale.

TABLE 4. Categorization of the initially named therapeutic modalities.

Treatment category	Shortname	Included therapies
Serotonin-Norepinephrine Reuptake Inhibitors	SNRI	Duloxetine
Sodium channel blockers	Na-Bl	Carbamazepine Oxcarbazepine
Gabapentinoids	α2δ-Lig	Pregabalin Gabapentin
Tricyclic Antidepressant	TCA	Amitriptyline Nortriptyline
Combination of systemic medication	SM COMB	Gabapentin + Duloxetine Gabapentin + Amitriptyline
Systemic treatment physician's choice	SM (p)	Systemic treatment physician's choice
Topical medication	TOP	Lidocaine (topical, Patch/i.o./splint) Capsaicin topical Benzocaine Gel 20% Amitriptyline-Ketamine topical (with/without splint) Topical treatment with Gabapentin + Duloxetine + NSAID with (neuro)stent
Capsaicin-lidocaine (topical) + Nortriptyline	TCA+ Caps/Lid TOP	Capsaicin-lidocaine (topical) + Nortriptyline
Amitriptyline-Carbamazepine-Lidocaine (topical) + Nortriptyline	TCA+ TCA/Na-Bl/Lid TOP	Amitriptyline-Carbamazepine-Lidocaine (topical) + Nortriptyline
Injection	INJ	Botulinum toxin injection Corticosteroid injection
Gabapentinoid + Botulinum toxin injection	α2δ-Lig + BTX	Pregabalin + Botulinum toxin injection
Surgical/endodontic intervention	SURG	Surgical/endodontic intervention corresponding to the causal event
Education	EDU	Education only

SNRI: serotonin-norepinephrine reuptake inhibitors; Na-Bl: sodium channel blockers; α2δ-Lig: α2δ ligands (gabapentinoids); TCA: tricyclic antidepressants; SM COMB: combination of systemic medication; SM (p): systemic treatment, physician's choice; TOP: topical medication; Caps/Lid: capsaicin/lidocaine; INJ: injection; BTX: botulinum toxin; SURG: surgical/endodontic intervention; EDU: education; NSAID: non-steroidal anti-inflammatory drug; i.o.: intraoral.

Journal of Oral & Facial Pain and Headache

TABLE 5. Treatment options among participating experts (A–M), with the number and percentage of experts endorsing each treatment (n, %).

Treatments	Experts														
	A	B	C	D	E	F	G	H	I	J	K	L	M	n	%
TOP	√				√	√			√		√	√	√	7	53.8%
SURG	√			√	√	√	√		√			√		7	53.8%
α2δ-Lig				√			√			√	√	√		5	38.5%
TCA		√			√		√	√	√					5	38.5%
Na-Bl							√					√		2	15.4%
SM COMB			√								√			2	15.4%
SM (p)	√					√								2	15.4%
INJ					√				√					2	15.4%
EDU					√	√								2	15.4%
SNRI				√										1	7.7%
TCA + Caps/Lid TOP		√												1	7.7%
TCA + TCA/Na-Bl/Lid TOP		√												1	7.7%
α2δ-Lig + BTX					√									1	7.7%

√: treatment proposed by the expert; blank: treatment not proposed. TOP: Topical medication; SURG: Surgical/endodontic intervention corresponding to the causal event; α2δ-Lig: Gabapentinoids; TCA: Tricyclic antidepressant; Na-Bl: Sodium channel blockers; SM COMB: Combination of systemic medication; SM (p): Systemic treatment physician's choice; INJ: Injection; EDU: Education; SNRI: Serotonin-Norepinephrine Reuptake Inhibitors; TCA+ Caps/Lid TOP: Capsaicin-lidocaine (topical) + Nortriptyline; TCA+ TCA/Na-Bl/Lid TOP: Amitriptyline-Carbamazepine-Lidocaine (topical) + Nortriptyline; α2δ-Lig + BTX: Gabapentinoid + botulinum toxin injection.

Furthermore, seven experts, all of whom considered radiological evidence of nerve injury, recommended surgical and/or endodontic intervention for selected cases. Two experts who incorporated coping ability into their decision-making process endorsed patient education alone for individuals with high coping capacity.

Fig. 2 presents the consolidated decision tree based on input from all participating experts. A comparison of all submitted decision-making strategies resulted in 35 distinct clinical scenarios. Limited agreement (54%) was observed in only six out of the 35 scenarios. For all other combinations of clinical criteria, no agreement was reached among the participants. **Supplementary Fig. 1** in the **Supplementary material** shows the original mutual decision tree before redundant branches were removed.

Topical treatment was preferred by the slight majority of the participants for patients without radiological evidence of nerve injury, presenting with electric shock-like pain quality, thermal and/or mechanical hyperesthesia, mild to moderate pain intensity (NRS 0–6), pain localized superficially in the attached gingiva over an area larger than 3 cm^2, and low coping ability or high psychosocial burden, regardless of the causative event or pain duration.

Conversely, a slight majority of experts chose surgical intervention for patients with PTNP following mandibular third molar surgery, lasting between 3–6 months, characterized by burning, dull, electric shock-like, or mixed pain qualities, with radiological evidence of nerve injury and a positive response to diagnostic anesthetic block.

To illustrate the clinical application of the objective consensus analysis, two exemplary clinical scenarios, described by combinations of predefined criteria, are presented as examples of the 35 scenarios generated from the consolidated decision tree. These scenarios reflect the output of the Objective Consensus Method and were not presented to the experts during the evaluation process. In scenario 1, no majority was reached, while seven different treatments were considered depending on the consulted expert (Fig. 3A). Scenario 2 is an example of a case, in which a weak majority was established, with seven out of 13 experts indicating a surgical intervention (Fig. 3B). Still, the remaining six experts suggested five different therapeutic approaches.

4. Discussion

This is the first report comparing decision-making processes for first-line treatment in PTNP patients using the Objective Consensus Method [11]. We performed a survey among thirteen orofacial pain experts actively managing PTNP patients at dedicated secondary and tertiary care centers. The analysis revealed a considerable heterogeneity in the criteria considered relevant as well as in the therapeutic preferences. After the initially named criteria and therapeutic choices were grouped into more general categories, thirty-five clinical scenarios emerged. Limited agreement (54%) was observed in only 6 out of the 35 scenarios. It is important to emphasize that the raw material underlying this analysis remains expert opinion: no patient-level outcomes were measured, and none of the resulting recommendations were validated against clinical endpoints.

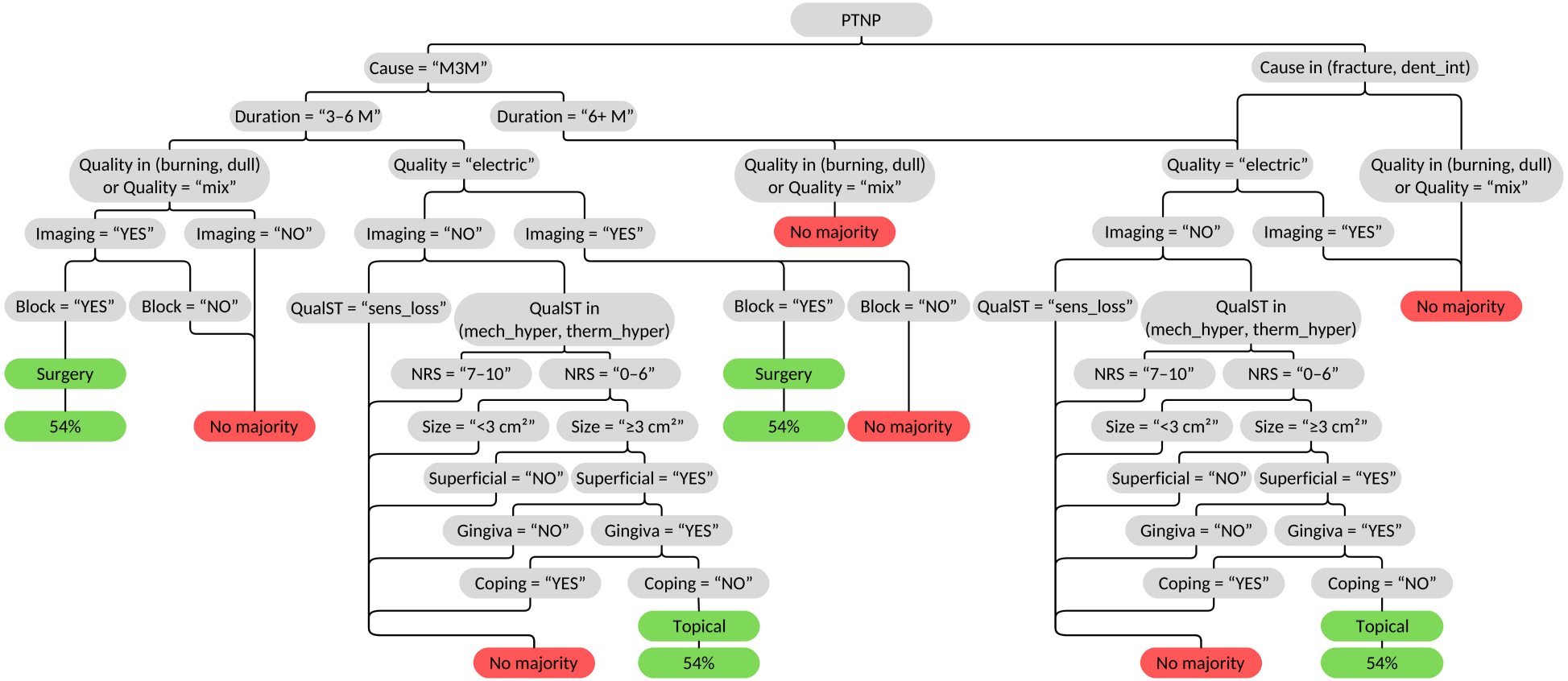


FIGURE 2. Consolidated decision tree based on input from all participating experts. PTNP: Post-Traumatic Trigeminal Neuropathic Pain as defined by ICOP 2020 diagnostic criteria; Cause: cause of nerve injury (M3M: mandibular third molar surgery; dent_int: dental intervention); Duration: pain duration (3–6 M: 3–6 months; 6+ M: >6 months); Quality: dominant pain quality; Imaging: Indication for nerve repair surgery based on Magnetic Resonance Neurography (MRN) (Grading III–V) and/or radiographic evidence of structural abnormalities affecting the nerve; Block: response to anesthetic block; QualST: qualitative sensory testing (sens_loss: sensory loss with pain; mech_hyper: mechanical hyperesthesia; therm_hyper: thermal hyperesthesia); NRS: pain intensity in Numeric Rating Scale; Size: size of the painful area (<3 cm^2; ≥ 3 cm^2); Superficial: pain superficial in the oral mucosa or facial skin; Gingiva: localization of intraoral PTNP near the tooth socket or in attached gingiva; Coping: patient coping well with the pain; Surgery: Surgical/endodontic intervention corresponding to the causal event; Topical: Topical medication. No majority: none of the treatment options was chosen by more than 50% of the experts; percentages indicate the proportion of the 13 experts recommending the treatment shown.

Journal of Oral & Facial Pain and Headache

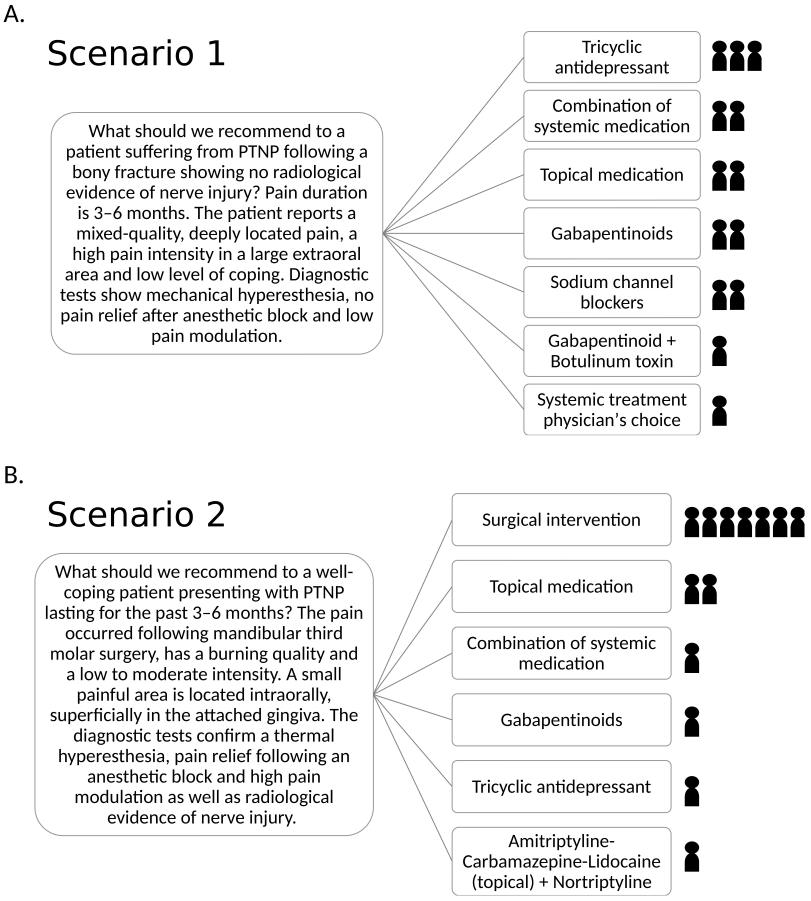


FIGURE 3. Exemplary clinical scenarios derived from the objective consensus analysis. (A) In scenario 1, no majority was reached. (B) In scenario 2, seven of 13 experts indicated surgical intervention. PTNP: Post-traumatic trigeminal neuropathic pain.

The Objective Consensus Method structures expert heuristics with greater transparency and reproducibility than a narrative survey but does not by itself constitute evidence that these choices are effective. The findings should therefore be read as a map of current expert reasoning and practice variation, rather than evidence-based guidance on which management strategy produces superior outcomes.

One possible explanation for the considerable variability in treatment choices is that the recently refined and more specific diagnostic criteria have expanded the patient population, incorporating individuals who were previously diagnosed with atypical odontalgia or atypical facial pain. Earlier clinical studies indicated that so-called "atypical facial pain" constituted a heterogeneous entity and that a neuropathic component could not be excluded without detailed neurophysiological and quantitative sensory testing [15, 16]. Consequently, the transferability of findings from earlier studies to the current PTNP population may be limited. Future studies focusing on more homogeneous patient populations, identified by the same and universally accepted criteria, are expected to generate the evidence necessary for the development of robust treatment guidelines. A further reason for the low level of consensus may be that experts from different disciplines do not evaluate the same patient populations. For example, referrals from dentists to neurologists or *vice versa* may introduce a selection bias, as these patients might present with a substantial psychosocial burden or distinct features of neuropathic pain. We consider this referral-driven difference in patient populations a substantial, rather than incidental, contributor to the observed heterogeneity. Surgical clinicians are more likely to see patients already triaged as having a structural, correctable lesion, whereas those in medical or neurology-based pain clinics more often see patients in whom surgical causes have been excluded or surgical management has failed. Over time, this differential exposure likely shapes not only the types of patients each specialist sees but also their treatment philosophies and thresholds for invasive versus conservative management, independent of underlying patient pathology—a self-reinforcing pattern that may explain part of the observed discordance and warrants consideration when interpreting cross-center variability.

Topical treatment was favored in selected patients without imaging evidence of injury and with superficial, localized pain. However, current evidence is insufficient to establish topical therapy as adequate monotherapy in all patients. A comprehensive review of intra-oral topical agents found preliminary support for efficacy but concluded the evidence—largely case reports and expert opinion—is too weak to confirm topical monotherapy as universally adequate, positioning it instead as an adjunct [17]. Consistent with this, a large retrospective PTNP cohort found that combined pharmacologic, physical, and surgical approaches were associated with better outcomes than any single modality, including topical treatment

alone [18]. Notably, the literature particularly supports topical agents for pain that is regional, superficial, and chronic, mirroring our own findings that topical treatment was favored in patients with superficial, localized presentations [19, 20]. Since our study specifically addressed first-line management, and given their favorable side-effect profile, topical agents remain a reasonable initial option in appropriately selected patients, with additional measures added later in the treatment course if the response proves insufficient.

A slight majority of experts chose surgical intervention for selected patients after mandibular third molar surgery with imaging evidence of nerve injury and a positive diagnostic block. Surgical interventions for PTNP have been controversially discussed in the literature, with several small, retrospective series reporting symptomatic improvement, particularly with earlier intervention [21–23] and direct nerve repair over grafting for larger defects [24]. However, "surgery" does not denote a single procedure but a heterogeneous group of interventions—from decompression and neurolysis to neuroma resection, microsurgical repair, or grafting—and the appropriate approach depends critically on the type and severity of the underlying nerve injury. As this evidence is exclusively retrospective and uncontrolled, it should be considered hypothesis-generating rather than definitive, and the indication for surgical intervention in selected cases must be made with great caution, in accordance with the Hippocratic principle of "primum non nocere". Neurosurgical procedures such as surgical nerve repair, surgical evaluation, removal of a causative lesion or foreign body including endodontic material should not be interpreted as interchangeable with invasive dental procedures such as endodontic treatment or tooth extractions, that bear the risk of further iatrogenic nerve damage and worsening the pain [8, 25]. Thorough patient education is crucial in this context.

Nevertheless, regardless of whether management is topical or surgical, evidence on longer-term outcomes specific to PTNP remains limited: a recent retrospective study focusing on prognostic factors and symptom evolution could not identify unequivocal associations between treatment or its absence and the persistence of neurosensory disturbances or final quality of life [26].

For methodological reasons, we focused on the decision-making process in patients without comorbidities, who were willing to accept any recommended therapy. In clinical practice, however, this idealized scenario is rarely observed. Patients with orofacial pain often present with multiple somatic and mental comorbidities, which can significantly influence therapeutic decisions [27, 28].

It has previously been shown that PTNP itself is associated with substantial patient burden and reduced quality of life [29–31]. Therefore, it was unanimously agreed by all participating experts that patients presenting with PTNP should be offered professional psychological support as a part of a multimodal approach, irrespective of the chosen somatically oriented management. Regarding the pharmacological treatment, certain analgesic or adjuvant medications may offer additional beneficial effects, such as improvement of sleep quality with tricyclic antidepressants or mood-enhancing and anxiolytic effects with duloxetine [32–35]. Conversely, potential adverse effects, including weight gain or xerostomia associated with tricyclic antidepressants, may limit their use in certain patients [36, 37].

A recently published meta-analysis on pharmacological therapies and non-invasive neuromodulation for neuropathic pain by the NeuPSIG of IASP reports strong recommendations for tricyclic antidepressants (TCAs), $\alpha 2\delta$-ligands, and serotonin–norepinephrine reuptake inhibitors (SNRIs) as first-line treatments [9]. Topical agents, including capsaicin 8% patches, capsaicin cream, and lidocaine 5% plasters, received weak recommendations as second-line options, while botulinum toxin, repetitive transcranial magnetic stimulation, and opioids were weakly recommended as third-line therapies [9]. However, several factors may limit the generalizability of these recommendations to neuropathic pain affecting the trigeminal region.

In addition to patient- and disease-related factors, multiple experts highlighted health-system limitations that interfere with clinical decision-making. In some countries, dentists are restricted in prescribing systemically active drugs, such as anti-epileptics or antidepressants, requiring orofacial pain specialists to collaborate closely with general practitioners or other specialists, including psychiatrists and neurologists, to manage pain effectively. Therapeutic choices may also be constrained by insurance coverage, which can severely limit the available treatment options.

The anatomical location of pain within the facial and oral regions presents both unique opportunities and specific challenges for topical drug administration. On one hand, dental appliances allow for targeted delivery of topical medications. On the other hand, pain may present intraorally, extraorally, or as a combination of both, necessitating a patient-centered and flexible therapeutic approach involving collaboration between dentists and medical doctors. Across participating experts, various combinations of topical agents in gel or cream formulations are currently employed, including ketamine–amitriptyline combination, lidocaine, capsaicin, and other agents.

Current PTNP criteria exclude cases with early pain onset, *i.e.*, prior to three months after the nerve injury as well as late cases developing pain later than 6 months after the causative event, which may be the case especially after radiation and/or chemotherapy [1]. Consequently, the management of these patients was not addressed in this study. Nevertheless, early diagnosis and timely intervention are critical to prevent pain chronification and its associated biopsychosocial consequences [38–40]. Several participating experts emphasized that, particularly in early-diagnosed nerve injury cases, surgical or endodontic (re-)treatment may lead to favorable outcomes. This is supported by existing evidence: a systematic review found that in cases of severe nerve injury, microsurgical neural repair should be performed within 3 months of injury occurrence to optimize outcomes [24]. Similarly, a retrospective cohort study reported that early surgical intervention is associated with substantially better prognosis, with more than 60% of patients being pain-free at 6 months when time to surgery was two hundred days or less [41].

Similarly, in a recently published Delphi study, participants agreed that early intervention may help prevent central sensitization and pain chronification [8]. Moreover, according to 75% of the experts participating in the above-mentioned

Journal of Oral & Facial Pain and Headache

Delphi study, the most relevant factors influencing clinical decision-making included time since symptom onset, sensory profile, level of impairment, imaging findings, and psychological impact. Hence, the potential impact of the diagnostic criteria themselves on management strategies warrants consideration. Expanding the criteria to encompass both early and late presentations would facilitate inclusion of these cases and should be considered in future classification frameworks. Furthermore, several participants in this study argued that subdividing the PTNP diagnosis into distinct subcategories could enhance diagnostic precision and enable more targeted treatment recommendations. In particular, several participating experts raised the possibility of subdividing cases into acute versus chronic, or early versus late, based on the timing of diagnosis. Another suggestion focused on the mechanism of the causative event. Furthermore, a growing body of literature suggests that patient phenotyping based on sensory profile could contribute to better treatment outcomes [42–44].

Our study has limitations. The adaptation of decision trees to represent a wide range of decision-making processes requires simplification, potentially overlooking nuances in some of the clinical strategies. For example, evidence from various imaging modalities was pooled into the same category as intraoperative evidence of nerve damage; subdividing this category, however, did not change the final mutual decision tree. Similarly, "surgical/endodontic intervention" category includes interventions that may differ substantially in indication, timing, and clinical risk. This aspect should be interpreted with caution.

The limited sample size does not allow for a statistical comparison of the decision-making processes between experts' subgroups *e.g.*, based on their speciality. It may be hypothesised that surgeons and endodontists were more inclined towards surgical management of certain cases. This is a research question worth investigating in the future applying a different study design. Furthermore, the process of participant selection and the final group size achieved may be considered debatable. While our findings reflect the input of an experienced, internationally representative group of experts, we cannot rule out that a larger or differently composed cohort might have yielded a different degree of consensus.

Given the status quo for the decision-making process for PTNP management, we believe that the present study offers a valuable overview of the current approaches employed in selected specialized secondary and tertiary care centers worldwide and provides a solid foundation for the future development of guidelines. Only by thoroughly understanding the present situation and accounting for region-specific healthcare conditions can guidelines specific for PTNP be formulated that are both practical and widely accepted.

5. Conclusions

The Objective Consensus Method proved suitable for the quantitative assessment of clinical decision-making processes in patients with PTNP. Comparison of all submitted strategies resulted in the identification of 35 distinct clinical scenarios. Limited agreement was observed in only six of these 35 scenarios. The substantial heterogeneity in therapeutic approaches may contribute to patient confusion and uncertainty, particularly when patients consult multiple specialists or seek second opinions. Future clinical guidelines should incorporate criteria specific to PTNP to facilitate their routine application in everyday clinical practice.

AVAILABILITY OF DATA AND MATERIALS

The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

AUTHOR CONTRIBUTIONS

AZW, PMP and LBH—designed the research study. AZW and AL—performed the research and collected the data; managed and coordinated the research project. PCC, JD, EE, EMF, CG, JPG, AM, NN, MP, TR, FVDC, LBH and AZW—participated as members of the expert panel, provided their first-line management strategies, and reviewed and validated their individual decision trees. PMP—developed the methodology, software, validation procedures, and performed the formal analysis. AL—curated the data. AZW—wrote the original draft of the manuscript. PMP, AL and AZW—prepared the visualizations. LBH and PMP—supervised the study. All authors contributed to editorial changes in the manuscript. All authors read and approved the final manuscript.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable. As an expert consensus study not involving patient data or human subjects research as defined under Swiss law (Human Research Act, Art. 2 HRA), this study did not fall within the remit of a cantonal ethics committee and therefore did not require formal ethics approval or a waiver. All participating experts were informed of the study's purpose and consented to have their anonymized responses used and published as part of this analysis.

ACKNOWLEDGMENT

The authors thank Digital Society Initiative (DSI) of the University of Zurich for providing a platform that facilitates interdisciplinary collaborations such as this project.

The authors would like to thank Łukasz Wojczyński for his assistance in editing the manuscript, as well as the figures and tables.

FUNDING

This work was supported by the standard financial plan (institutional budget) of the University of Zurich; no grant number applies. The study received no external funding.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

SUPPLEMENTARY MATERIAL

Supplementary material associated with this article can be found, in the online version, at https://files.jofph.com/files/article/212076274346614784O/attachment/Supplementary%20material.zip.

REFERENCES

[1] International Classification of Orofacial Pain, 1st edition (ICOP). Cephalalgia. 2020; 40: 129–221.
[2] Peñarrocha MA, Peñarrocha D, Bagán JV, Peñarrocha M. Post-traumatic trigeminal neuropathy. A study of 63 cases. Medicina Oral, Patología Oral y Cirugía Bucal. 2012; 17: e297–e300.
[3] Benoliel R, Zadik Y, Eliav E, Sharav Y. Peripheral painful traumatic trigeminal neuropathy: clinical features in 91 cases and proposal of novel diagnostic criteria. Journal of Orofacial Pain. 2012; 26: 49–58.
[4] Baad-Hansen L, Benoliel R. Neuropathic orofacial pain: facts and fiction. Cephalalgia. 2017; 37: 670–679.
[5] Vázquez-Delgado E, Viaplana-Gutiérrez M, Figueiredo R, Renton T, Gay-Escoda C, Valmaseda-Castellón E. Prevalence of neuropathic pain and sensory alterations after dental implant placement in a university-based oral surgery department: a retrospective cohort study. Gerodontology. 2018; 35: 117–122.
[6] Headache Classification Committee of the International Headache Society (IHS) The International Classification of Headache Disorders, 3rd edition. Cephalalgia. 2018; 38: 1–211.
[7] Baad-Hansen L, Pigg M, Ivanovic SE, Faris H, List T, Drangsholt M, *et al*. Intraoral somatosensory abnormalities in patients with atypical odontalgia—a controlled multicenter quantitative sensory testing study. Pain. 2013; 154: 1287–1294.
[8] Van der Cruyssen F, Palla B, Jacobs R, Politis C, Zuniga J, Renton T. Consensus guidelines on training, diagnosis, treatment and follow-up care of trigeminal nerve injuries. International Journal of Oral and Maxillofacial Surgery. 2024; 53: 68–77.
[9] Soliman N, Moisset X, Ferraro MC, de Andrade DC, Baron R, Belton J, *et al*.; NeuPSIG Review Update Study Group. Pharmacotherapy and non-invasive neuromodulation for neuropathic pain: a systematic review and meta-analysis. The Lancet Neurology. 2025; 24: 413–428. Erratum in: The Lancet Neurology. 2026; 25: e1.
[10] Putora PM, Oldenburg J. Swarm-based medicine. Journal of Medical Internet Research. 2013; 15: e207.
[11] Putora PM, Panje CM, Papachristofilou A, Dal Pra A, Hundsberger T, Plasswilm L. Objective consensus from decision trees. Radiation Oncology. 2014; 9: 270.
[12] Putora PM, Glatzer M, De Ruysscher D, Faivre-Finn C, Belderbos J, Besse B, *et al*. Consolidative thoracic radiotherapy in stage IV small cell lung cancer: selection of patients amongst European IASLC and ESTRO experts. Radiotherapy and Oncology. 2019; 135: 74–77. Erratum in: Radiotherapy and Oncology. 2019; 141: 332.
[13] Naimi A, Putora PM, Rothermundt C, Digklia A, Asencio JM, Bonvalot S, *et al*. Diagnostic work-up of lipomatous tumors: a decision-making analysis among European sarcoma centers. Insights into Imaging. 2025; 16: 123.
[14] Zuniga JR, Mistry C, Tikhonov I, Dessouky R, Chhabra A. Magnetic resonance neurography of traumatic and nontraumatic peripheral trigeminal neuropathies. Journal of Oral and Maxillofacial Surgery. 2018; 76: 725–736.
[15] Forssell H, Tenovuo O, Silvoniemi P, Jääskeläinen SK. Differences and similarities between atypical facial pain and trigeminal neuropathic pain. Neurology. 2007; 69: 1451–1459.
[16] Jääskeläinen SK, Forssell H, Tenovuo O. Electrophysiological testing of the trigeminofacial system: aid in the diagnosis of atypical facial pain. Pain. 1999; 80: 191–200.
[17] Sharav Y, Heiliczer S, Benoliel R, Haviv Y. Pharmacological topical therapy for intra-oral post traumatic trigeminal neuropathic pain: a comprehensive review. Pharmaceuticals. 2024; 17: 264.
[18] Park HJ, Ahn JM, Yang YJ, Ryu JW. Multimodal management and prognostic factors in post-traumatic trigeminal neuropathic pain following dental procedures: a retrospective study. Applied Sciences. 2025; 15: 8480.
[19] Padilla M, Clark GT, Merrill RL. Topical medications for orofacial neuropathic pain: a review. The Journal of the American Dental Association. 2000; 131: 184–195.
[20] Kocot-Kępska M, Zajączkowska R, Mika J, Kopsky DJ, Wordliczek J, Dobrogowski J, *et al*. Topical treatments and their molecular/cellular mechanisms in patients with peripheral neuropathic pain—narrative review. Pharmaceutics. 2021; 13: 450.
[21] Zuniga JR, Neal TW. New perspectives in peripheral nerve surgery for neuropathic pain. Medical Research Archives. 2023; 11: 1–15.
[22] De Poortere A, Van der Cruyssen F, Politis C. The benefit of surgical management in post-traumatic trigeminal neuropathy: a retrospective analysis. International Journal of Oral and Maxillofacial Surgery. 2021; 50: 132–138.
[23] Rosson GD, Rodriguez ED, George P, Dellon AL. Surgical algorithm for treatment of post-traumatic trigeminal nerve pain. Microsurgery. 2010; 30: 614–621.
[24] Kushnerev E, Yates JM. Evidence-based outcomes following inferior alveolar and lingual nerve injury and repair: a systematic review. Journal of Oral Rehabilitation. 2015; 42: 786–802.
[25] Renton T, van der Cruyssen F. Diagnosis, pathophysiology, management and future issues of trigeminal surgical nerve injuries. Oral Surgery. 2020; 13: 389–403.
[26] Van der Cruyssen F, Peeters F, De Laat A, Jacobs R, Politis C, Renton T. Prognostic factors, symptom evolution, and quality of life of posttraumatic trigeminal neuropathy. Pain. 2022; 163: e557–e571.
[27] Kleykamp BA, Ferguson MC, McNicol E, Bixho I, Arnold LM, Edwards RR, *et al*. The prevalence of comorbid chronic pain conditions among patients with temporomandibular disorders: a systematic review. The Journal of the American Dental Association. 2022; 153: 241–250.e10.
[28] Baad-Hansen L, Leijon G, Svensson P, List T. Comparison of clinical findings and psychosocial factors in patients with atypical odontalgia and temporomandibular disorders. Journal of Orofacial Pain. 2008; 22: 7–14.
[29] Smith JG, Elias LA, Yilmaz Z, Barker S, Shah K, Shah S, *et al*. The psychosocial and affective burden of posttraumatic neuropathy following injuries to the trigeminal nerve. Journal of Orofacial Pain. 2013; 27: 293–303.
[30] Melek LN, Smith JG, Karamat A, Renton T. Comparison of the neuropathic pain symptoms and psychosocial impacts of trigeminal neuralgia and painful posttraumatic trigeminal neuropathy. Journal of Oral & Facial Pain and Headache. 2019; 33: 77–88.
[31] Pillai RS, Pigg M, List T, Karlsson P, Mladenović Ž, Vase L, *et al*. Assessment of somatosensory and psychosocial function of patients with trigeminal nerve damage. The Clinical Journal of Pain. 2020; 36: 321–335.
[32] Everitt H, Baldwin DS, Stuart B, Lipinska G, Mayers A, Malizia AL, *et al*. Antidepressants for insomnia in adults. Cochrane Database of Systematic Reviews. 2018; 5: CD010753.
[33] Liu Y, Xu X, Dong M, Jia S, Wei Y. Treatment of insomnia with tricyclic antidepressants: a meta-analysis of polysomnographic randomized controlled trials. Sleep Medicine. 2017; 34: 126–133.
[34] Shelton RC, Andorn AC, Mallinckrodt CH, Wohlreich MM, Raskin J, Watkin JG, *et al*. Evidence for the efficacy of duloxetine in treating mild, moderate, and severe depression. International Clinical Psychopharmacology. 2007; 22: 348–355.
[35] Li X, Zhu L, Zhou C, Liu J, Du H, Wang C, *et al*. Efficacy and tolerability of short-term duloxetine treatment in adults with generalized anxiety disorder: a meta-analysis. PLOS ONE. 2018; 13: e0194501.
[36] Kamp CB, Petersen JJ, Faltermeier P, Juul S, Siddiqui F, Barbateskovic M, *et al*. Beneficial and harmful effects of tricyclic antidepressants for adults with major depressive disorder: a systematic review with meta-analysis and trial sequential analysis. BMJ Mental Health. 2024; 27: e300730.
[37] Uher R, Farmer A, Henigsberg N, Rietschel M, Mors O, Maier W, *et al*. Adverse reactions to antidepressants. The British Journal of Psychiatry. 2009; 195: 202–210. Erratum in: The British Journal of Psychiatry. 2010; 196: 417.
[38] Benoliel R, Teich S, Eliav E. Painful traumatic trigeminal neuropathy. Oral and Maxillofacial Surgery Clinics of North America. 2016; 28: 371–380. Erratum in: Oral and Maxillofacial Surgery Clinics of North

America. 2016; 28: xi.

[39] Van der Cruyssen F, Peeters F, Gill T, De Laat A, Jacobs R, Politis C, *et al*. Signs and symptoms, quality of life and psychosocial data in 1331 post-traumatic trigeminal neuropathy patients seen in two tertiary referral centres in two countries. Journal of Oral Rehabilitation. 2020; 47: 1212–1221.

[40] Suhaym O, Miloro M. Does early repair of trigeminal nerve injuries influence neurosensory recovery? A systematic review and meta-analysis. International Journal of Oral and Maxillofacial Surgery. 2021; 50: 820–829.

[41] Neal TW, Zuniga JR. Post-traumatic trigeminal neuropathic pain: factors affecting surgical treatment outcomes. Frontiers in Oral Health. 2022; 3: 904785.

[42] Forstenpointner J, Otto J, Baron R. Individualized neuropathic pain therapy based on phenotyping: are we there yet? Pain. 2018; 159: 569–575.

[43] Bouhassira D, Attal N. Translational neuropathic pain research: a clinical perspective. Neuroscience. 2016; 338: 27–35.

[44] Demant DT, Lund K, Vollert J, Maier C, Segerdahl M, Finnerup NB, *et al*. The effect of oxcarbazepine in peripheral neuropathic pain depends on pain phenotype: a randomised, double-blind, placebo-controlled phenotype-stratified study. Pain. 2014; 155: 2263–2273.

How to cite this article: Aleksandra Zumbrunn Wojczyńska, Alexandra Lüber, Paulo César Conti, Justin Durham, Eli Eliav, Estephan Moana-Filho, Charly Gaul, Jean-Paul Goulet, Arne May, Noboru Noma, Maria Pigg, Tara Renton, Fréderic Van der Cruyssen, Lene Baad-Hansen, Paul Martin Putora. First-line management of post-traumatic trigeminal neuropathic pain: objective consensus analysis reveals marked heterogeneity among international expert centers. Journal of Oral & Facial Pain and Headache. 2026; 40(6): 112-124. doi: 10.22514/jofph.2026.075.