

Division of Dental Anesthesiology
Department of Human Biology and Pathophysiology

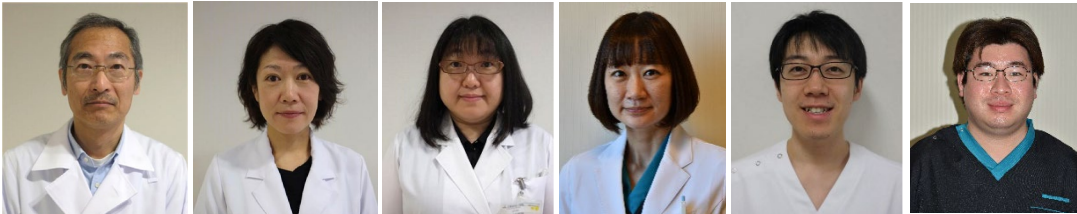
Outline

Dentist anesthesiologists offer a full spectrum of safe and comfortable anesthesia services for dental care. It is a unique feature of Japanese government policy that specialized dentists are allowed to perform general anesthesia on whomever requires oral surgery or dental treatment. In our hospital, a large variety of oral surgeries are performed, ranging from a major surgery of orofacial cancer accompanied with a reconstructive operation to minor surgeries. In addition, dental treatments of children and handicapped patients under general anesthesia are frequently performed at our hospital.

Sedation is also utilized for treatments of patients with anxiety or some circulatory diseases. Nitrous oxide inhalation and administration of benzodiazepine or intravenous anesthetic agents are used. Sedation not only provides a sedative effect for consciousness but also secures a stable circulation dynamic in patients. The aging of Hokkaido's population is advancing, therefore, the role of sedation is becoming increasingly important. Moreover, no patient should be denied access to quality dental care for lack of adequate control of anxiety and pain.

Pain control encompasses a considerable part of dentist anesthesiologists' duties. We educate students in the safe and effective administration of local anesthesia, using an intelligent local anesthetic injection simulator. Orofacial pain or abnormal sensation are sometimes difficult to diagnose and care. In our pain clinic, we apply Quantitative Sensory Testing (QST), questionnaires and Magnetic Resonance Neurography (MRN) to evaluate the disordered trigeminal nerve, and decide a course of treatment based on our advanced diagnosis.

Faculty members



Professor; Makoto TERUMITSU, D.D.S., Ph.D., Lecturer; Hiroyo YOSHIMOTO, D.D.S., Ph.D.
Assistant professor; Hanako OHKE, D.D.S., Ph.D., Assistant professor; Rie IWAMOTO, D.D.S., Ph.D., Assistant professor; Kenji GOH, D.D.S., Ph.D. , Assistant professor; Naomasa Fujiita , D.D.S., Ph.D.

Main research in progress

- 1) Magnetic Resonance Neurography (MRN) for patients with a disordered trigeminal nerve.
- 2) Macrophage imaging *in vivo* in the animal model of neuropathic pain to elucidate the mechanism of neuro-inflammation after nerve injury.
- 3) Multi-institutional joint research for treating orofacial pain in Japan.
- 4) Elucidating central nervous system sensitization in chronic pain. Investigations for functions of astrocytes *in vitro*, metabolites in the brain and functional connectivity among the cerebral cortices in patients.

- 5) Mechanisms of the parasympathetic vasodilation via trigeminal nerve to modulate the blood flow in orofacial region.
- 6) Evaluating unpleasantness experienced in a dental treatment by using fractal analysis of an electroencephalogram.
- 7) Novel and safe anesthesia regimens for handicapped patients and children.

Current publications

*Terumitsu M, Takado Y, Fukuda K, Kato E, Tanaka S. Neurometabolite Levels and Relevance to Central Sensitization in Chronic Orofacial Pain Patients: A Magnetic Resonance Spectroscopy Study. *Journal of Pain Research* 2022;15 1421–1432.

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Horie Y, Yamamoto T, Yamamoto T, Amenomori H, Yokoyama C, Shinagawa M, Maruyama T, Nakamine N, Oguma Y, Satoh I, Tsutsumi M, Terumitsu M, Ohno S, Ishida S, *Kitaichi N. Cataract Surgery under Conventional Sedation with Dexmedetomidine: Efficacy and Safety in Patients with Psychiatric or Neurological Conditions. *J Anesth Clin Res* 2018, 9:7.

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Terumitsu M, Matsuzawa H, Seo K, Watanabe M, Kurata S, Suda, A, *Nakada T, High-contrast resolution Imaging of Post Traumatic Mandibular Nerve by 3DAC-PROPELLER MRI: Correlation with the Severity of Sensory Disturbance. *Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology*, 124(1):85-94, 2017.

*Kumasaka A, Kanazawa K, Ohke H, Miura I, Miura Y. Post-ischemic Intravenous Administration of Allogeneic Dental Pulp-Derived Neurosphere Cells Ameliorated Outcomes of Severe Forebrain Ischemia in Rat. *Neurocrit Care*, 26: 133-142, 2017.

*Seo K, Terumitsu M, Inada Y, Nakamura T, Shigeno K, Tanaka Y. Prognosis after surgical treatment of trigeminal neuropathy with a PGA-c Tube: Report of 10 cases. *Pain Medicine* 17(12):2360-2368, 2016.

*Nezu A, Morita T, Tojyo Y, Nagai T, Tanimura A. Partial agonistic effects of pilocarpine on Ca²⁺ responses and salivary secretion in the submandibular glands of live animals. *Exp Physiol*, 100: 640651, 2015.

*Miura Y, Kanazawa K, Nasu I. Preischemic Administration of Sevoflurane Does not Exert Dosedependent Effects on the Outcome of Severe Forebrain Ischemia in Rats. *J Neurosurg Anesthesiol*, 27:216-221, 2015.