Dental Management in Natal and Neonatal Teeth

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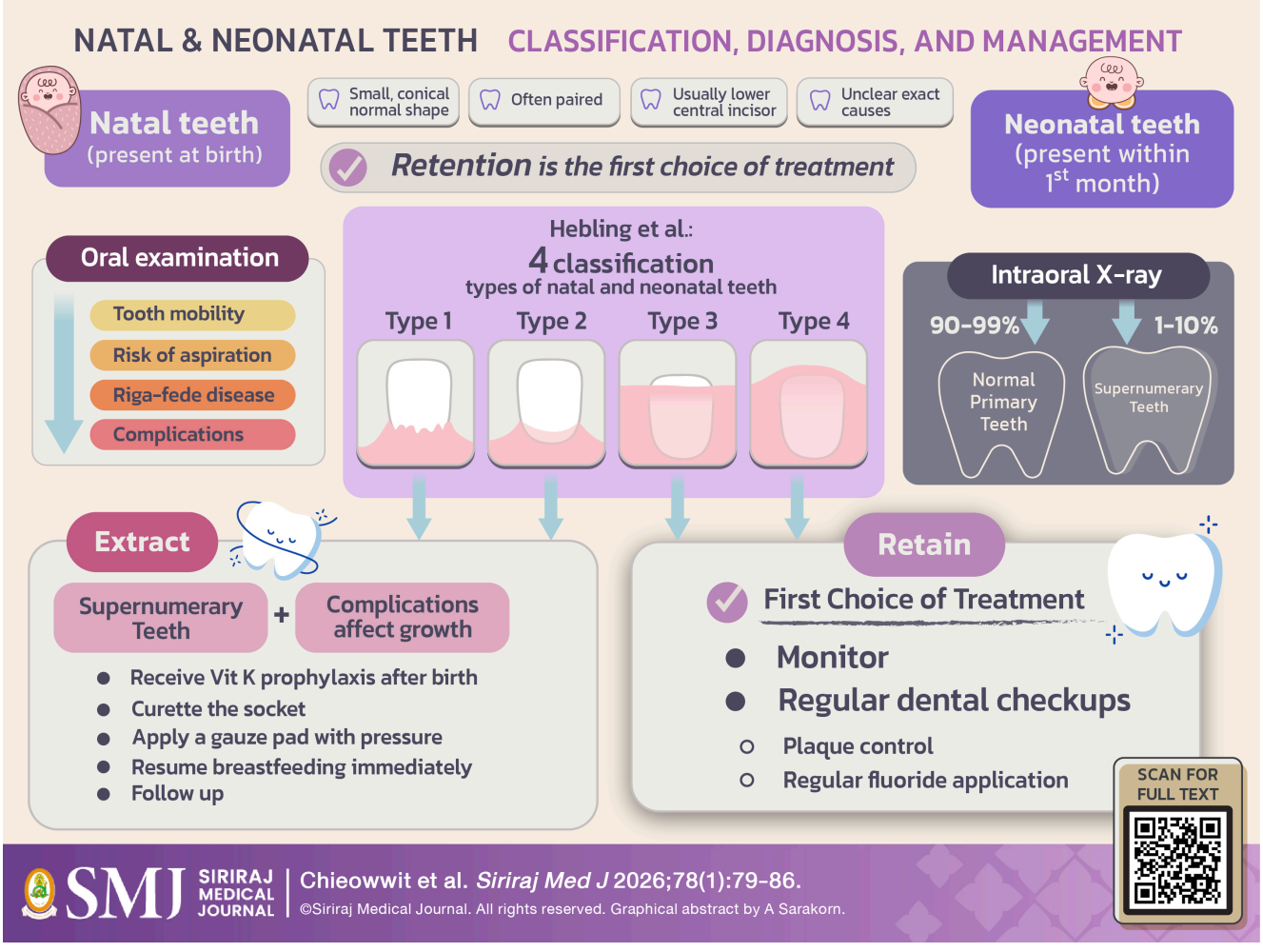

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ABSTRACT

The premature eruption of teeth in newborns is categorized as natal teeth, which are present at birth, and neonatal teeth, which appear within the first month of life. Natal teeth are about three times more common, with 90-99% being normal primary teeth and 1-10% supernumerary. The exact causes are unclear. These teeth often appear small, conical, or similar to normal teeth. They are usually located in the lower central incisor region and often paired. This literature review aims to provide dental management for the accurate diagnosis and effective treatment of natal and neonatal teeth. Diagnosis relies on clinical examinations and may involve radiographic evaluation for supernumerary teeth. These teeth can lead to complications such as tooth mobility, raising concerns about aspiration, sublingual ulcerations (Riga-Fede disease), and nipple lacerations during breastfeeding. Since most of these teeth are normal primary teeth, they should be retained with periodic monitoring. Extraction is only indicated if a tooth is extremely mobile and poses a risk of aspiration, or if ulcerations affect the child's ability to suck effectively, particularly in conjunction with the use of a nasoalveolar molding appliance in children with cleft lip and palate.

Keywords: Newborn; premature eruption; natal teeth; neonatal teeth; retain; extract (Siriraj Med J 2026;78(1):79-86)

INTRODUCTION

Newborns typically receive an oral examination by a pediatrician immediately after birth. If any abnormalities are detected in the oral cavity, the pediatrician will refer the infant to a dentist for further diagnosis and appropriate management. Although the premature eruption of teeth in newborns is rare, it can lead to feeding difficulties and, in severe cases, pose life-threatening risks. Pediatricians may consult either general dentists or pediatric dentists for treatment. However, due to a shortage of pediatric dentists in Thailand, it is crucial for general dentists to have the knowledge and skills to accurately diagnose and manage these cases. This literature review, conducted between May and December 2024, gathered reliable information from PubMed and Google Scholar, along with insights from the author's experience with infant care. The study aims to provide a comprehensive overview of the literature and dental management techniques for dentists, ensuring accurate diagnosis and effective treatment for natal and neonatal teeth.

Premature tooth eruption in newborns includes natal and neonatal teeth. Natal teeth are present at birth, while neonatal teeth emerge within the first month.[1,2] Primary teeth that erupt between one and three months of age are classified as early-erupting primary teeth.[3] Natal teeth are more common than neonatal teeth,[4-6] and three times more prevalent.[1,2,7] The incidence of natal and neonatal teeth ranges from 1 in 2,000 to 1 in 3,500 births.[1,4-6,8,9] The worldwide prevalence of natal teeth is about 34.55 per 10,000 births (95% CI, 20.12 to 59.26). In Asia, the prevalence rate is about 11.26 per 10,000 births (95% CI, 7.58 to 16.61), while in North America, it is higher at 75.32 per 10,000 births (95% CI, 51.11 to 99.86). For neonatal teeth, the worldwide prevalence is around 4.52 per 10,000 (95% CI, 2.59 to 17.91). In Europe, the prevalence is estimated at 3.52 per 10,000 births (95% CI, 1.73 to 7.06). In South America, the prevalence is 6.01 per 10,000 births (95% CI, 2.25 to 16.60).[10] No prevalence data have been reported in Thailand.

There is no significant difference in prevalence between males and females.[1,11] However, some studies report a higher occurrence in females,[4,12,13] with a ratio of 66% for females compared to 31% for males.[4,12,14] Approximately 90-99% of natal and neonatal teeth are normal primary teeth, while 1-10% are supernumerary.[3,11] A retrospective study by *Samuel et al.* involving 33 newborns found that all 52 teeth were normal primary teeth, with no supernumerary teeth noted.[15] *Almeida* and *Gomide* highlighted a higher prevalence in infants with cleft lip and palate, with rates of 10.6% in the complete bilateral cleft group and 2.02% in the complete unilateral cleft group.[16]

Causes and factors

The exact causes of natal and neonatal teeth are still unknown.[1,4,11] However, several factors have been proposed, with the most widely accepted theory suggesting that a superficial position of the tooth germ, possibly influenced by hereditary factors.[11] These factors include abnormalities in the position of tooth germs during alveolar development.[4,17,18] For example, the tooth germ might be positioned too superficially.[2,11] Another hypothesis proposes that excessive resorption of the overlying bone accelerates premature eruption.[1] For hereditary factors, no definitive evidence confirms a link between early

eruption of teeth and family history.[11] However, a study by *Zhu* and *King* reported familial association in 8% to 62% of cases,[9] while *Bondenhoff* and *Gorlin* reported a 14.5% prevalence of family history.[5] Similarly, *Kates et al.* identified a positive family history in 7 out of 38 cases of natal and neonatal teeth.[12] Some evidence suggests an autosomal dominant inheritance pattern.[4,5,19,20] Natal and neonatal teeth have also been linked to various syndromes and developmental disturbances, including Ellis-Van Creveld syndrome, Hallerman-Streiff syndrome, Rubinstein-Taybi syndrome, Pierre-Robin syndrome, Sotos syndrome, Pallister-Hall syndrome, Pfeiffer syndrome, short rib-polydactyly type II, cleft lip and palate, craniofacial dysostosis, cyclopia, ectodermal dysplasia and epidermolysis bullosa simplex.[1,4,11,13,20] Hormonal imbalances during pregnancy, such as excessive secretion from the pituitary gland, thyroid, or gonads, can influence premature eruption.[1,2,4,6] Additionally, maternal illness during pregnancy such as fever and exanthemata may lead to premature eruption.[4] Also, congenital syphilis has been associated with this condition.[1,2,4] Maternal malnutrition or hypovitaminosis can adversely affect tooth development,[1,2,4] while exposure to environmental toxins may also play a role in the eruption of neonatal teeth. There have also been reports that prenatal exposure to harmful substances such as polychlorinated biphenyls (PCBs), polychlorinated dibenzo-p-dioxins (PCDDs), and dibenzofurans (PCDFs) may contribute to neonatal tooth eruption.[1,21,22] However, a study by *Alaluusua et al.* found no correlation between the presence of natal teeth and PCB or PCDF levels in breast milk.[23]

Clinical characteristics

Natal and neonatal teeth vary in shape and size, often appearing conical or resembling normal teeth but typically smaller.[3,4,11,13] These teeth frequently show enamel and dentin hypoplasia, with poor or absent root development. Due to their premature eruption and lack of roots, they are typically mobile and attached only by soft tissue,[9,13,24] posing a risk of swallowing or aspiration. In some cases, mobility leads to degeneration of Hertwig's epithelial root sheath, resulting in further root development and stability, and changes in the radicular structures.[1] The color of these teeth is often abnormal, ranging from white to yellow. Early eruption is associated with hypomineralization of enamel, known as dysplasia, which disrupts the calcium-rich enamel matrix, leading to smaller teeth with a yellowish-brown appearance. Furthermore, there is a decrease in the mineral content of the enamel layer, contributing to enamel hypoplasia, with the thinner enamel layer covering only about two-thirds of the crown.[4]

Natal and neonatal teeth most commonly occur in the mandibular central incisors,[7] which are the first to erupt.[5,15] Approximately 85% of natal teeth are mandibular incisors, 11% maxillary incisors, 3% mandibular canines and molars, and only 1% maxillary canines or molars.[5] Natal teeth in the maxillary molar region are scarce.[24] However, *Varriano et al.* and *Roberts et al.* reported a rare case of two primary maxillary molars.[18,25] In newborns with cleft conditions, teeth frequently erupt in the maxilla within the area of the cleft.[26] These natal and neonatal teeth usually present alone or in pairs,[11] while multiple natal or neonatal teeth are uncommon.[4] Rare cases include 14 natal teeth reported by *Masatomi et al.*,[27] 12 natal teeth by *Gonçalves et al.*,[28] and 11 natal teeth by *Portela et al.*[29]

Hebling et al. classified natal and neonatal teeth into four classification types.[1] (Fig 1)

Type 1: A shell-like crown structure loosely attached to the gum, with no root.

Type 2: A solid crown with little or no root, loosely attached to the gum.

Type 3: The cutting edge of the tooth has erupted through the gum.

Type 4: The gum appears swollen, with an unerupted tooth within the gum.

Fig 1. Hebling's classification of natal and neonatal teeth. (1A) Hebling's classification type 1 (1B) Hebling's classification type 2 (1C) Hebling's classification type 3 (1D) Hebling's classification type 4

Note: Fig 1A from "Management of an infant having natal teeth", by V. Khandelwal, U.A. Nayak, P.A. Nayak, and Y. Bafna, 2013, BMJ Case Report, p. 1. Copyright 2013 by BMJ Publishing Group Ltd. Adapted with permission of the author.

Histological characteristics

The crowns of natal and neonatal teeth are primarily covered with varying degrees of hypoplastic enamel.[11] Research by Jasmin and *Clergeau-Guerithault*, using scanning electron microscopy, showed that the enamel surface of these teeth exhibited hypoplasia, with no enamel layer present at the incisal edge.[30,31] *Masatomi et al.* found that while some enamel exhibited a normal prism structure and mineralization, others lacked this prism structure in the cervical part of the enamel. They observed that cervical and apical dentin were tubular but changed into an irregular osteodentin containing enclosed cells.[29] *Uzamis et al.* reported that natal and neonatal teeth had an enamel thickness of about 280 µm, significantly less than the 1200 µm typical for primary teeth, indicating incomplete mineralization at birth.[31] The dentino-enamel junction was irregular and not scalloped, with no predentin or odontoblast layers in the tubular dentin. Vascular inclusions were present in the osteodentin-like structure, but endothelial cells were absent. The cementum was hypertrophied, featuring numerous lacunae and a layer of acellular cementum.[27] Developing teeth showed thinner acellular cementum, wider pulp canals and chambers, and few inflammatory cells within the vascularized pulps.[27,32]

Differential diagnosis

Inclusion cysts are often mistaken for natal and neonatal teeth. These benign oral mucosal lesions can be categorized into three types.[4] Epstein's pearls are small, white, grayish nodules or papules that range from 0.5 to 3 mm in size. They can be found singly or in clusters along the mid-palatal raphe, particularly at the junction of the hard and soft palates. These nodules originate from remnants of ectodermal tissue that occur during palatal development.[33] Bohn's nodules are clusters of nodules located on the buccal and lingual aspects of the alveolar ridges.[13,34] They arise from remnants of minor salivary glands.[35-37] Dental lamina cysts appear in white or cream-colored nodules, which can be found singularly or in multiples. They are typically located on the alveolar ridges of the lower incisors[34,35] and jaws.[34,38] They originate from remnants of the dental lamina after tooth formation.[39]

Other differentiating conditions include eruption cysts and congenital epulis. An eruption cyst is a fluid-filled cyst around an erupting tooth, often appearing as clear, dome-shaped swellings, but may take on a blue or purple due to blood accumulation, known as an eruption hematoma.[41,42] They originate from remnants of the dental lamina during the eruption,[38,40] and can sometimes contain natal or neonatal teeth.[40] Congenital epulis is a rare benign tumor appearing as a smooth, raised mass on the upper or lower jaw or tongue, typically matching the color of the gum tissue.[35] It is most commonly found on the anterior alveolar ridge of the upper jaw[33,43] and can vary in size from millimeters to centimeters.[35] About 10% of cases involve multiple lesions, making a thorough examination essential.[43] It is believed that estrogen and progesterone play a role in the development of this lesion.[44] (Fig 2)

Treatment planning

Treatment planning of natal and neonatal teeth relies on clinical examination and intraoral radiography. A thorough examination is essential for accurate diagnosis and appropriate treatment to prevent complications.[3] Key factors to consider include the tooth's classification, appearance, position, degree of mobility, and risk of aspiration, which can lead to choking and asphyxia.[45] To assess tooth mobility, Miller's classification is commonly used. If mobility exceeds level 2 (i.e., movement from cheek to tongue greater than 2 mm.), there is a risk of aspiration during feeding.[1] The natal and neonatal teeth may cause lesions under the tongue, known as Riga-Fede disease. (Fig 3) This condition occurs in about 6-10% of cases,[9,46] caused by repeated trauma from the sharp edges of the teeth as the tongue moves.[1] Severe lesions can

Fig. 2 The differential diagnosis of natal and neonatal teeth. (2A) Bohn's nodules. (2B) Dental lamina cysts. (2C) Eruption cyst. (2D) Congenital epulis.

Fig 3. Ulcer of Riga-Fede disease on the ventral surface of the tongue.

also lead to insufficient nutrient intake, affecting growth and development.[46] Additionally, some mothers also report pain or nipple lesions during breastfeeding. While *Moura et al*. found that 2 out of 23 mothers experienced nipple lesions due to natal teeth, leading to breastfeeding difficulties,[47] *Zhu* and *King* found no association between neonatal teeth and nipple lesions during breastfeeding. The tongue usually protects the nipple from the teeth.[9] During breastfeeding, the nipple is positioned deep in the infant's mouth, with the tongue covering the lower gums and the lip contacting the maternal areola, reducing the likelihood of biting injuries.[48]

Intraoral radiographs are essential for assessing whether the teeth are normal primary or supernumerary,[11,13] as well as evaluating root development and surrounding tissues.[4] An X-ray of a normal primary tooth shows a developing permanent tooth bud beneath an erupted natal or neonatal tooth. Conversely, an X-ray of a supernumerary tooth reveals the natal or neonatal tooth alongside the properly positioned permanent tooth bud, indicating an extra tooth beyond the typical 20 primary teeth. Since infants are more sensitive to radiation, dentists must weigh the benefits and risks before taking an X-ray. Extracting a very mobile tooth is crucial to prevent choking during breastfeeding. Radiographs may not change the treatment plan or be necessary before the extraction. When radiographs are necessary, appropriate radiation protection equipment should be used for infants, as their cells are more sensitive to radiation.

The decision to retain or extract an infant's tooth should be considered individually, based on the outlined treatment plan, and dentists must inform parents to weigh the benefits and risks. Parents must be involved in the decision-making process regarding treatment, with the primary goal being to ensure that an infant can continue breastfeeding and to prevent potential complications.

Typically, natal and neonatal teeth are usually normal primary teeth, so retention is the first choice of treatment.[20] Teeth with minimal mobility (less than Miller's classification level 2) pose a low aspiration risk and can be retained, as root development and stabilization occur over time. If these teeth cause discomfort or lesions on the mother's nipple during breastfeeding, they may still be retained. Reports show that nipple lesions are not related to eruption of natal or neonatal teeth, and most lesions caused by these teeth typically occur only on the baby's tongue.[9,11] Riga-Fede disease does not require tooth extraction. Instead, the sharp edges of the affected tooth can be smoothed using a finishing bur or sandpaper disk.[49] Alternatively, the tooth can be filled or covered with composite resin or glass ionomer cement.[1,46,49,50] Parents can adjust feeding methods to reduce tongue trauma by using bottles with larger nipple holes, sippy cups, or feeding with a spoon.[51] The lesions can heal in 7 to 10 days once the source of trauma is eliminated, even without specific treatment. However, if a faster healing process and pain relief are needed, the dentist may recommend applying Solcoseryl dental adhesive paste to the lesion 3–5 times daily.[52] This paste contains 5% protein-free haemodialysate, which increases tissue repair and regeneration and improves the healing of lesions, along with 1% polidocanol to relieve pain.[53]

When the natal or neonatal teeth are Hebling's category type 4 and the teeth have some mobility, dentists need to follow up periodically. When these teeth emerge from the gum, they should reassess the level of tooth mobility to determine whether it poses a risk of aspiration. If the tooth is not very mobile, it may be retained, but if it is highly mobile and at risk of aspiration, extraction can be considered.

Additionally, tooth extraction should be considered in specific cases, such as supernumerary teeth confirmed through radiographs, if the tooth is extremely mobile, particularly in Hebling's type 1 and type 2 teeth, and Riga-Fede disease under the tongue if it impacts feeding, leading to failure to thrive. If the child has a cleft lip and palate with teeth positioned in a way that interferes with fitting a nasoalveolar molding (NAM) device, tooth extraction may be necessary. (Fig 4)

Treatment care approach for extraction

In the past, natal and neonatal tooth extractions were recommended only after 10 days of age to allow the infant's intestinal flora to produce enough vitamin K for proper blood clotting.[7,11] If extraction cannot be delayed, a pediatrician should assess if vitamin K supplementation is needed, particularly if the infant did not receive vitamin K after birth. However, current guidelines have changed, and standard care now recommends a single intramuscular (IM) dose of 0.5 to 1.0 mg of vitamin K injection[54] or two oral doses of 2 mg vitamin K on day 1 and day 4.[55] If

Fig 4. Management of natal teeth in cleft lip and palate newborn. (4A) Natal tooth in the region of cleft area. (4B) Extracted natal tooth with no root development. (4C) Postoperative hemostasis achieved. (4D) Nasoalveolar molding appliance in the region of cleft area.

vitamin K is not given at birth, it should be administered before and possibly after extraction to prevent bleeding complications. *Shivpuri et al.* reported that 6 out of 12 infants below 10 days of age who were administered a vitamin K injection before extraction successfully controlled bleeding, as they had not been administered the same at birth.[54]

Before tooth extraction, the dentist should securely swaddle the baby in a blanket to keep them calm. If the tooth is lightly attached, the dentist should dry the gums and apply a topical anesthetic while using a sterile gauze to prevent ingestion. For more firmly attached teeth, a few drops of local anesthetic with a vasoconstrictor, like 2% lidocaine with 1:100,000 epinephrine, should be injected around the gums to enhance the effect and to control bleeding. The amount of anesthetic should not exceed 4.4 mg/kg.[56] The tooth can be extracted with forceps. Post-extraction curettage of the socket is crucial to reduce the risk of ongoing development of the dental papilla cells.[3] *Anton et al.* reported a case in which a residual tooth-like structure developed in place of the extracted lower left primary central incisor, likely due to ongoing dental papilla development.[3] After the extraction, apply a gauze pad with pressure to the site for 5 to 10 minutes to control bleeding. Once the bleeding has stopped, the infant can resume breastfeeding immediately for comfort. The immunoglobulins present in breast milk can help promote wound healing.[2]

Complications after treatment

Long-term follow-up care is vital for individuals with retained or extracted natal and neonatal teeth. Follow-up is recommended throughout the eruption of permanent teeth.[57] For those who retain these teeth, consistent dental check-ups become essential. These visits help monitor stability and root development while preventing complications such as Riga-Fede disease. Retained teeth may have hypoplastic enamel and dentin, along with poor root formation, which increases their risk of early loss, fracture, or wear. The potential complications of retaining these teeth include dental caries, pulp polyps, and early eruption of permanent teeth.[1] The poor development of enamel and rapid eruption can heighten the risk of caries, highlighting the importance of preventive dental care, including plaque control and regular fluoride application. If a supernumerary tooth is retained, it may interfere with the eruption of the underlying primary or permanent tooth. These teeth are often recommended for extraction, even if they are asymptomatic. However, if they remain, careful long-term radiographic and clinical monitoring is essential.

For those who have extracted these teeth, follow-up assessments confirm successful healing, resolution of any ulcers, and a return to normal feeding habits and weight gain. Complications that may arise from these extractions include loss of space in the jaw, tilting of adjacent primary teeth, and reduced bone growth at the extraction site.[13,58] These issues can potentially lead to malocclusion and contribute to crowding in the permanent dentition.[11,58] Early orthodontic intervention can prevent further complications.[57] However, no significant space loss was reported in 56 out of 72 natal teeth.[59] Other complications reported include the eruption of a residual natal tooth[60], accidental displacement of primary teeth[61], neonatal osteomyelitis[62], the development of gingival growth from a residual dental papilla, and peripheral ossifying fibroma, resulting from low-grade irritation.[63]

CONCLUSION

Dental management of natal and neonatal teeth requires a case-by-case approach. Parents should be involved in the decision-making process. A radiographic examination is used to determine if the tooth is supernumerary or part of the normal primary dentition. Whether the tooth is supernumerary or primary dentition, if the mobility of the erupted teeth exceeds Miller's classification level 2, as in the case of Hebling's category type 1 and type 2, we recommend extraction due to the higher risk of aspiration. Before tooth extraction, a consultation with a pediatrician is recommended to ensure that the

infant has received vitamin K prophylaxis after birth. If the teeth are primary, they should be retained with close monitoring to prevent them from becoming an aspiration risk or affecting feeding. In case of discomfort during suckling or sublingual ulceration, the incisal edges can be smoothed or covered with composite resin. Parents should be informed of the need for adequate dental hygiene and the use of fluoride. Regular dental check-ups are important.

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Conflicts of Interest

There are no conflicts of interest.

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None.

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Use of Artificial Intelligence

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