

Acute Dental Conditions In Emergency Departments: Assessment, Diagnosis, And Management

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Abstract

Dental emergencies, for example traumatic injuries, infections, and post-procedural complications, demonstrate a significant clinical challenge. Dental emergencies require effective recognition and management. Traumatic dental injuries (fractures, luxations, and avulsions) may cause pulp necrosis, root resorption, and tooth loss. The prognosis closely related to the timeliness of intervention. Infectious dental emergencies (often originating from untreated caries or periodontal disease) responsible for risks of local and systemic complications, for example osteomyelitis, deep neck space infections, and rarely, intracranial involvement. Post-procedural complications, such as bleeding, and alveolar osteitis, necessitate careful evaluation of systemic factors. For example, coagulopathies and medication use to prevent morbidity. Comprehensive evaluation combining patient history, clinical examination, and judicious use of imaging, for example radiographs and advanced modalities (CT or cone-beam CT). They enable confirming diagnosis and guide effective management. Early intervention, preventive strategies, and cooperation with medical providers are important to minimize complications, preserve oral structures, and enhance optimal patient outcomes.

Keywords: Emergency department, acute dental conditions, Orofacial pain, Dental emergencies, and Dental infections.

Introduction

Acute dental conditions are the most recurrent non-traumatic complaints which presented to emergency departments. Individuals often suffer from severe pain, facial swelling, bleeding, or dental trauma, seeking immediate relief. Conventional dental care is often unavailable. As a result, most EDs are not evaluated by dental specialists. These cases can be evaluated hard and managed effectively. This review provides evidence-based generalized view of how acute dental problems are diagnosed, assessed, and treated in emergency care. Also, it is highlighted practical approaches, limitations, and opportunities to enhance interdisciplinary care (Garispe et al., 2025).

The American Dental Association (ADA) illustrated dental emergencies as conditions that can be life-threatening and need immediate care to prevent bleeding, treat infections, and eliminate severe pain. However, not all dental emergencies are considered life-threatening. A dental emergency is identified as

any problem affecting the teeth and supporting structures which need prompt attention. The aim is to prevent biological, functional, and cosmetic complications (Rodriguez et al., 2017).

Common Symptoms

Pain is the most frequent cause of patients seeking emergency dental care. Dental emergencies may arise from biological causes such as bacterial, viral, or fungal infections or mechanical causes, for example tooth fractures, dislocations, or injuries from previous dental treatment plans (Bratteberg et al., 2018).

Managing a Dental Emergency

While managing dental emergencies. The priority is identifying immediate concern, relieving pain or preventing bleeding. After the patient is being stabilized, the next steps for definitive care may be planned. Dental emergencies are grouped into three categories for evaluation and treatment. They were traumatic, infectious, and post-procedural (Ghosh et al., 2022).

1. Traumatic Dental Emergencies

Traumatic Dental Emergencies included physical injuries to the teeth and surrounding structures, such as tooth fractures, luxations (dislocations), or avulsions (complete tooth loss). Trauma is usually caused by falls, sports injuries, car accidents, and physical violence. Although the mechanism of injury might be similar. The type of trauma identifies the clinical presentation and management strategy. Untreated traumatic injuries may open the door for bacterial infections, potentially resulting in an infectious dental emergency. The risk is very high if the patient already has weakened teeth. Due to decay or previous dental issues (Patnana et al., 2025).

2. Infectious Dental Emergencies

Dental infections usually start locally and could be managed if they were detected early. If neglected, bacteria could spread to deep spaces in the neck, face, and even the brain, creating life-threatening medical conditions. Most dental infections result from dental caries. It is a common condition affecting nearly all adults. Other factors, for example, trauma or dental procedures, such as root canal treatments and wisdom tooth extractions can also trigger infections. Pulpitis and pulp necrosis included infection of the tooth pulp. Resulting in severe and persistent pain (Gasner and Schure., 2023).

Periodontitis and periodontal abscesses can affect the gums and supporting structures. It sometimes causes swelling, bleeding, or pus discharge. Pericoronitis happens around a partially erupted tooth, most commonly a wisdom tooth. It results in localized pain and swelling. Early detection and timely treatment are important to decrease complications. Maintaining good oral hygiene and identifying risk factors help to prevent the spread of infection to critical areas, for example the neck or airway (Kwon and Serra., 2022).

3. Post-Procedural Dental Emergencies

A. Post-Extraction Bleeding

Bleeding after a dental procedure. Especially extractions, which is the most identified post-procedural emergency. When minor bleeding is normal, prolonged bleeding beyond 8–12 hours could occur in patients with bleeding problems, systemic illnesses, and those on anticoagulant medications. If left untreated, severe complications such as large oral hematomas and airway compromise might develop (AlSheef et al., 2021).

B. Alveolar Osteitis (Dry Socket)

Dry sockets are a painful post-extraction complication. It is located where the blood clot in the socket is lost, then exposing the underlying bone. This condition is not an infection but a delayed healing issue. It can cause significant discomfort and often requires multiple visits for effective pain management. Factors

such as poor oral hygiene, tobacco use, difficult extractions, or certain medications elevates the risk (Ghosh et al., 2022).

Causes and Risk Factors

Trauma

Dental trauma is most popular among children and teenagers. It often results from falls or sports activities, or in young adults, because of violence. A long with the type and severity of a dental injury that depend on factors, for example the tooth location, the patient's prior dental health, and the impact force. Tooth avulsions usually identified the significant trauma. In these cases, related injuries to surrounding bone or soft tissue must also be carefully evaluated to focus on comprehensive management (Patnana et al., 2025).

Infection

Dental caries is the main cause of most dental infections. Untreated decay, trauma, or complications following dental treatments could progress. Leading to abscesses or deeper tissue infections. Certain infections which are less common, for example necrotizing periodontal disease may be severe. These primarily affect immuno-compromised individuals and need a prompt intervention to prevent serious complications (An et al., 2023).

Post-Procedural:

Post-extraction bleeding may result due to local disruption of the blood. As a result of systemic clotting issues. These systemic factors may include congenital or acquired coagulopathies, liver or kidney disease, or anticoagulant medications usage. Dry socket, and alveolar osteitis, are a multifactorial condition. It includes poor clot formation and premature breakdown of the clot. which influenced by local bacterial activity, inflammatory mediators, and patient habits, all of that can delay healing and increase pain (Rohe and Schlam., 2023).

Clinical Presentation

Traumatic Injuries

Tooth fractures can be divided into minor enamel cracks to more severe root involvement. Luxation injuries that affect the position of the tooth can be present as subluxations, extrusive, intrusive, or lateral displacements. Each demonstrates characteristic patterns of mobility and positional change. Avulsed teeth need urgent evaluation of the socket and surrounding tissues. As both the timing of replantation and proper storage of the tooth are very important for achieving a successful outcome (Patnana et al., 2025).

Infections

Common signs of dental infection such as pain, swelling, redness, pus discharge, and bad breath. In cases of pulp necrosis, the affected tooth can also become discolored. Infections which progress rapidly can pose serious risks. It is potentially spreading to deep neck structures and compromising the airway (Sanders Houck and., 2023).

Post-Procedural Complications:

Normal post-extraction bleeding typically stops within minutes. However, prolonged or excessive bleeding needs prompt intervention. Dry socket, which is a common post-extraction complication. It usually presents 1–5 days after the procedure with intense pain. It often radiates along the jaw and is not relieved by standard analgesics treatment (Wu et al., 2019).

Epidemiology and Common Presentations

Emergency departments encounter a wide range of dental problems. It includes many patients' seeking rapid pain relief, swelling, or functional difficulties. The most common presentations involve odontogenic pain, for example pulpitis or periapical periodontitis. It manifests as sharp or throbbing toothache. Dental infections, for example abscesses, cellulitis, and facial swelling are frequent. It progresses quickly if not promptly treated (Garispe et al., 2025).

Traumatic dental injuries, for example fractured or avulsed teeth and lacerations of the lips, tongue, or oral tissues. It frequently arises from accidents or sports-related incidents. Postoperative complications, for example dry socket or persistent bleeding. Recent dental procedures are another cause for patients seeking emergency care. Additionally, dental restorations problems such as broken crowns, dislodged fillings, or damaged prosthetic appliances can cause sudden discomfort or functional limitations. It prompted patients to visit the emergency department (Mordini et al., 2021).

These conditions frequently developed or worsen outside normal dental office hours. Leaving patients with few options and prompting them to search for help in the emergency department as a last resort. Limited access to routine dental care whether due to financial, geographic, or availability barriers also promotes many individuals to rely on the ED. It makes it an essential safety net for urgent dental needs (O'Cathain et al., 2020).

Assessment of Acute Dental Conditions in the ED

A structured assessment provides emergency clinicians to determine how serious the dental problem is. Also, it is quickly identifying any red flags which may signal a potentially dangerous condition (Garispe et al., 2025).

1. History Taking

A thorough patient history is important for evaluating acute dental problems in the emergency department. Clinicians must ask about the onset, duration, and nature of the pain. As well as any recent dental procedures or traumatic events. It is very important to note the presence of systemic or oral symptoms for example fever, trismus, or difficulty swallowing (dysphagia), and to evaluate the ability of patient to maintain an open airway. A complete medical history, such as current medications and allergies, is also important for identifying risk factors and guiding safe treatment decisions (Matsuda et al., 2022).

2. Physical Examination

A focused oral examination is important for identifying the extent and severity of acute dental problems. Clinicians must inspect the oral cavity for swelling, redness, and any signs of drainage or pus. Assessment of individual teeth for mobility, sensitivity to percussion, or fractures helps identify the pain source. The soft tissues, such as the floor of the mouth and tongue, could be carefully evaluated for abnormalities, and the clinician that always assesses for any compromise of the airway, that requires urgent attention (Chen et al., 2024).

3. Red Flag Signs

Certain clinical features can signal a rapidly spreading or potentially life-threatening infection. These identified by rapidly progressing facial or oral swelling, trismus, fever, and other signs of systemic involvement. Difficulty swallowing, drooling, changes in voice, and signs suggestive of Ludwig's angina are particularly concerning. Patients demonstrating any of these red flags need urgent diagnostic imaging, which prompting initiation of appropriate antibiotic therapy. In many cases, consultation with a surgeon or dental specialist to prevent serious complications (AL Ghabra et al., 2025).

Evaluation of Traumatic Dental Emergencies

Both intraoral and extraoral radiographs, such as CT scans, play an important role in identifying dental and periodontal fractures. Recommended imaging such as a parallel periapical view, 2 additional views with vertical and horizontal angulation, and an occlusal view. Radiographs aid in distinguishing between dental luxation and avulsion and evaluate the extent of fractures below the gingival margin. Depending on the patient's history and physical examination. Imaging may not always change the treatment plan. Dentists need weight the benefits of imaging versus the risks of radiation exposure (Soheili et al., 2024).

Evaluation of Infectious Dental Emergencies

Visual inspection and palpation are the primary methods for evaluating dental infections. Common signs such as erythema, swelling, pus discharge, tooth discoloration, and gingival necrosis. Periodontal probing may help in diagnosing periodontal disease. Radiographs, for example intraoral periapical, bitewing, and panoramic views. It provides additional information about areas not easily seen, revealing the extent of dental caries, periapical abscesses, alveolar bone loss, and third molar eruptions. The clinician could confirm all radiographic findings via physical examination to confirm accurate diagnosis. CT scans and MRIs are particularly useful for evaluating deep-space infections and osteomyelitis. While cone-beam CT is highly used for detailed visualization of oral infections (Blake et al., 2025).

Evaluation of Post-Procedural Dental Emergencies

Post-Procedural Bleeding

In the absence of traumatic injury, radiographs and CT scans have limited utility in post-extraction or postoperative bleeding managing. Detailed medical history is important to illustrate congenital coagulopathies, systemic illnesses, or anticoagulant use which can increase bleeding risk. Family history can also reveal undiagnosed inherited bleeding disorders. In coordination with hematologists or primary care physicians it is recommended for individuals with known coagulopathies or systemic conditions to decrease postoperative complications (Dawoud et al., 2021).

Although some sources identify temporarily discontinuing anticoagulants, current evidence that emphasizes the high efficacy of local hemostatic measures and thromboembolism risk if anticoagulants are stopped. Preoperative or postoperative laboratory tests. When indicated, can evaluate hemoglobin and platelet levels, INR values for patients on warfarin, and clotting factor levels in hemophilia patients (Campana et al., 2023).

Alveolar Osteitis

Alveolar osteitis, or dry socket, is identified as a clinical diagnosis which typically does not require laboratory or radiographic studies. A thorough history and physical examination are sufficient for diagnosis. Panoramic radiographs can be indicated if there is concern about retained tooth fragments in the alveolar socket (Rohe and Schlam., 2025).

Diagnostic Approaches

1. Imaging

Diagnostic imaging plays a key role in demonstrating acute dental conditions in the emergency department. Panoramic radiographs are useful for examining dental abscesses, fractures, or other structural abnormalities. Computed tomography scans are usually used in cases of significant facial swelling. It suspected deep-space infections, or complex trauma. They provide detailed visualization of both bone and soft tissues. Ultrasounds detect fluid collections, especially in superficial or accessible areas. It can guide timely management decisions (Shuaib et al., 2015).

2. Laboratory Tests

Laboratory investigations are especially important when a systemic infection is suspected. A complete blood count (CBC) can identify leukocytosis. It indicates an active infection. Inflammatory markers, for example C-reactive protein (CRP) and erythrocyte sedimentation rate (ESR) help confirm the severity of inflammation. In cases of severe sepsis or suspected bacteremia, blood cultures are important for identifying the causative organism and guiding targeted antibiotic therapy (Fulton et al., 2025).

Management Strategies in the Emergency Department

The main aim in the emergency department is to relieve pain. Also to manage or contain any infection. It maintains patient safety. While arranging or awaiting definitive dental treatment (Okunseri et al., 2012).

1. Pain Management

Effective pain control is a important of emergency dental care. Nonsteroidal anti-inflammatory drugs (NSAIDs) are the first-line drug treatment for most acute dental pain. Acetaminophen could be prescribed in combination with NSAIDs to increase analgesic effects in needed. Opioids reserved for severe or uncontrolled pain and administered cautiously. Considering the patient's medical history and potential for adverse effects (Green et al., 2024).

2. Infection Control

Controlling infection is an important factor in emergency dental care. Localized abscesses need incision and drainage. When clinically feasible to relieve pressure and stop the spread. Antibiotic therapy is prescribed for systemic involvement. Also, in case of cellulitis, and rapidly spreading infections. Commonly prescribed antibiotics for example amoxicillin, amoxicillin–clavulanic acid, or clindamycin. They were selected depending on the severity of the infection, patient allergies, and local resistance patterns (Sanders et al., 2025).

3. Management of Dental Trauma

Prompt and appropriate management of dental trauma is critical to preserve function and prevent complications. Avulsed permanent teeth replanted immediately whenever possible. Ideally after proper cleaning and handling. Fractured teeth need stabilization and adequate pain control to decrease discomfort and further damage. Soft tissue injuries, for example lacerations of the lips, tongue, or oral mucosa, could be thoroughly cleaned, sutured if necessary, and carefully evaluated for any foreign bodies. The aim to reduce the risk of infection and enhance healing (Alotaibi et al., 2025).

4. Postoperative Complications

Patients presented to the emergency department with complications after recent dental procedures. Dry sockets are a important cause of severe postoperative pain. It was managed with thorough irrigation of the extraction site and placement of medicated dressing. Persistent or excessive bleeding controlled by local pressure, hemostatic agents. Ensuring patient safety while preventing any future complications (Khalifah., 2021).

Gaps and Challenges in Dental Care

Emergency clinicians often have significant limitations. When managing dental patients. Many lack formal dental training and cannot have access to specialized equipment or appropriate radiographic tools. It required for accurate diagnosis. High patient volumes and time constraints after complicate care and arranging timely follow-up with a dental specialist could be challenging. These barriers result in incomplete treatment. Repeated visits to the emergency department, and persistence of underlying dental conditions. It highlighted the need for enhanced resources and interdisciplinary support (Di Spirito et al., 2025).

Improving Interdisciplinary Collaboration

Strengthening the collaboration between dental practitioners and emergency physicians can significantly improve patient outcomes. Effective strategies such as developing clear clinical pathways for common dental emergencies. Providing emergency department staff with basic dental training and establishing formal hospital–dental referral networks to make sure timely specialist care. Additionally, enhancing public awareness about preventive dental care could help in reducing the frequency and severity of dental emergencies. It ultimately easing the burden on emergency services (Bethesda., 2021).

Complications of Traumatic Dental Emergencies

Complications resulting from traumatic dental injuries differ depending on the type and severity of trauma. Common sequelae involve pulp necrosis, pulpal obliteration, tooth discoloration, dental or periodontal abscesses, fistula formation, and root resorption. Avulsed teeth are vulnerable. As the risk of pulp necrosis elevates, the duration of the tooth remains outside the alveolar socket. Prompt management is important to preserve pulp vitality and prevent long-term tooth loss (Garispe et al., 2025).

Complications of Infectious Dental Emergencies

Tooth loss is the most important complication of untreated dental infections. Infections can spread contiguously or hematogenously. It potentially causes severe systemic complications. Contiguous spread could result in osteomyelitis of the mandible or maxilla, deep neck space infections for example Ludwig's angina or retropharyngeal abscess, mediastinitis. In rare cases, intracranial infections include cavernous sinus thrombosis, meningitis, and subdural empyema. Hematogenous spread can result in endocarditis in susceptible patients (Neal and Schlieve., 2022).

Ludwig's angina and retropharyngeal abscesses cause immediate risks to the airway. Ludwig's angina is typically identified as soft tissue edema of the face, oral cavity, and neck. It is causing trismus, respiratory distress, voice changes, and difficulty managing oral secretions. Stridor is an alarming sign, and early airway management identified by advanced techniques for example video laryngoscopy or fiber optics can be required. Retropharyngeal abscesses presented the neck stiffness rather than facial or neck edema. Pain is increased with cervical extension. Both conditions carry high morbidity and mortality. Highlighting the need for healthcare providers to maintain a high index of suspicion in disease-appearing patients with dental infections (Costain et al., 2010).

Complications of Post-Procedural Dental Emergencies

The most common complication following dental extractions or procedures is recurrent bleeding. It may cause patients to return to their dentist or visit the emergency department. Rarely, large intraoral hematomas may develop. It is posing a risk to the airway. In cases where bleeding is difficult to control. Hospitalization or blood transfusions may be necessary. Alveolar osteitis (dry socket) is generally self-limiting. It is not related to an increased risk of additional dental complications (Alotaibi et al., 2023).

Conclusion

Dental emergencies encompass traumatic injuries, infections, and post-procedural complications. Each with distinct causes, presentations, and risks. Timely and accurate diagnosis involving thorough history, physical examination, and appropriate imaging remains important for diagnosis and effective management. Traumatic dental injuries may lead to pulp necrosis, root resorption, or tooth loss if not promptly treated. While untreated dental infections increase the risk of local and systemic spread, potentially compromising the airway. It can cause life-threatening conditions, for example Ludwig's angina or endocarditis. Post-procedural complications, such as bleeding and alveolar osteitis. It requires careful monitoring and coordination with the patient's medical history to decrease risks.

Early recognition, intervention, and patient education along with preventive measures, for example proper oral hygiene and management of systemic risk factors are important to reduce morbidity, preserving dental

structures, and preventing serious systemic consequences. A structured, evidence-based approach confirms both patient safety and optimal clinical outcomes among all categories of dental emergencies.

References

1. AL Ghabra Y, Brizuela M, Winters R, et al. Ludwig Angina. [Updated 2025 Jun 22]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK482354/>
2. Alotaibi S, Haftel A, Wagner ND. Avulsed Tooth. [Updated 2023 Mar 6]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/sites/books/NBK539876/>
3. AlSheef M, Gray J, AlShammari A. Risk of postoperative bleeding following dental extractions in patients on antithrombotic treatment. *Saudi Dent J*. 2021 Nov;33(7):511-517.
4. An J, AL Ghabra Y, Singhal M. StatPearls [Internet]. StatPearls Publishing; Treasure Island (FL): May 24, 2023. Ludwig Angina
5. Blake A, Tuttle T, McKinney R. Apical Periodontitis. [Updated 2023 Jul 17]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK589656/>
6. Bratteberg M, Thelen DS, Klock KS, Bårdsen A. Traumatic dental injuries-Prevalence and severity among 16-year-old pupils in western Norway. *Dent Traumatol*. 2018 Jun;34(3):144-150.
7. Campana, Maria Domenica & Aliberti, Angelo & Acerra, Alfonso & Sammartino, Pasquale & Dolce, Pasquale & Sammartino, Gilberto & Gasparro, Roberta. (2023). The Effectiveness and Safety of Autologous Platelet Concentrates as Hemostatic Agents after Tooth Extraction in Patients on Anticoagulant Therapy: A Systematic Review of Randomized, Controlled Trials. *Journal of Clinical Medicine*. 12. 5342. 10.3390/jcm12165342.
8. Chen, B., Zhu, Y., Lin, M. et al. Expert consensus on the diagnosis and therapy of endo-periodontal lesions. *Int J Oral Sci* 16, 55 (2024). <https://doi.org/10.1038/s41368-024-00320-0>
9. Costain, Nicholas & Marrie, Thomas. (2010). Ludwig's Angina. *The American journal of medicine*. 124. 115-7. 10.1016/j.amjmed.2010.08.004.
10. Dawoud BES, Kent S, Tabbenor O, George P, Dhanda J. Dental implants and risk of bleeding in patients on oral anticoagulants: a systematic review and meta-analysis. *Int J Implant Dent*. 2021 Aug 25;7(1):82.
11. Di Spirito, F., Giordano, F., Di Palo, M. P., De Benedetto, G., Aulisio, L., & Boccia, G. (2025). Sustainable Dental and Periodontal Practice: A Narrative Review on the 4R-Framework—Reduce, Reuse, Rethink, Recycle—And Waste Management Rationalization. *Dentistry Journal*, 13(9), 392. <https://doi.org/10.3390/dj13090392>
12. Fulton II MR, Zubair M, Taghavi S. Laboratory Evaluation of Sepsis. [Updated 2023 Aug 27]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK594258/>
13. Garispe A, Sorensen C, Sorensen JR. Dental Emergencies. [Updated 2022 Dec 7]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK589664/>
14. Gasner NS, Schure RS. StatPearls [Internet]. StatPearls Publishing; Treasure Island (FL): May 8, 2023. Necrotizing Periodontal Diseases
15. Ghosh A, Aggarwal VR, Moore R. Aetiology, Prevention and Management of Alveolar Osteitis-A Scoping Review. *J Oral Rehabil*. 2022 Jan;49(1):103-113
16. Green VG, Polk DE, Turturro MA, Moore PA, Carrasco-Labra A. Evidence-based clinical practice guidelines for the management of acute dental pain. *Am J Emerg Med*. 2025 Mar;89:247-253. doi: 10.1016/j.ajem.2024.12.054. Epub 2024 Dec 22. PMID: 39764906.
17. Khalifah, M. A. A. (2021). Curettage versus zinc oxide eugenol in the treatment of dry socket. *Egyptian Dental Journal*, 67, 235–239. <https://doi.org/10.21608/edj.2020.48499.1322>

18. Kwon G, Serra M. StatPearls [Internet]. StatPearls Publishing; Treasure Island (FL): Nov 21, 2022. Pericoronitis.
19. Matsuda S, Itoi H, Ryoke T, Yoshimura H. How should clinicians assess acute dental pain?: A review. *Medicine (Baltimore)*. 2022 Nov 11;101(45):e31727. doi: 10.1097/MD.00000000000031727. PMID: 36397373; PMCID: PMC10662864.
20. Mordini, Lorenzo & Lee, Po & Lazaro, Ricardo & Biagi, Roberto & Giannetti, Luca. (2021). Sport and Dental Traumatology: Surgical Solutions and Prevention. *Dentistry Journal*. 9. 33. 10.3390/dj9030033.
21. Neal TW, Schlieve T. Complications of Severe Odontogenic Infections: A Review. *Biology (Basel)*. 2022 Dec 8;11(12):1784. doi: 10.3390/biology11121784. PMID: 36552293; PMCID: PMC9775288.
22. O'Cathain A, Connell J, Long J, Coster J. 'Clinically unnecessary' use of emergency and urgent care: A realist review of patients' decision making. *Health Expect*. 2020; 23: 19–40. <https://doi.org/10.1111/hex.12995>
23. Okunseri, Christopher & Okunseri, Elaye & Thorpe, Joshua & Xiang, Qun & Szabo, Aniko. (2012). Medications Prescribed in Emergency Departments for Nontraumatic Dental Condition Visits in the United States. *Medical care*. 50. 508-12. 10.1097/MLR.0b013e318245a575.
24. Oral Health in America: Advances and Challenges [Internet]. Bethesda (MD): National Institute of Dental and Craniofacial Research(US); 2021 Dec. Section 4, Oral Health Workforce, Education, Practice and Integration. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK578298/>
25. Patnana AK, Brizuela M, Kanchan T. StatPearls [Internet]. StatPearls Publishing; Treasure Island (FL): Feb 17, 2025. Tooth Fracture
26. Rodriguez JM, Kalsi H, Bavisha K, Darbar U. The Emergency Dental Appointment: Restorative Emergencies Part 1 - Tooth Related Problems. *Prim Dent J*. 2017 May 01;6(2):52-61.
27. Rohe C, Schlam M. Alveolar Osteitis. [Updated 2023 May 29]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK582137/>
28. Sanders JL, Houck RC. Dental Abscess. [Updated 2023 Feb 20]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK493149/>
29. Shuaib W, Hashmi M, Vijayasarithi A, Arunkumar J, Tiwana S, Khosa F. The Use of Facial CT for the Evaluation of a Suspected Simple Dentoalveolar Abscess in the Emergency Department. *Clin Med Res*. 2015 Dec;13(3-4):112-6. doi: 10.3121/cmr.2014.1249. Epub 2014 Dec 8. PMID: 25487236; PMCID: PMC4720511.
30. Soheili, F., Delfan, N., Masoudifar, N., Ebrahimni, S., Moshiri, B., Glogauer, M., & Ghafar-Zadeh, E. (2024). Toward Digital Periodontal Health: Recent Advances and Future Perspectives. *Bioengineering*, 11(9), 937. <https://doi.org/10.3390/bioengineering11090937>
31. Wu S, Lew HP, Chen NN. Incidence of Pulpal Complications after Diagnosis of Vital Cracked Teeth. *J Endod*. 2019 May;45(5):521-525.