Pre-examination Triage Management in Dental Clinics of General Hospitals During Normalized Prevention and Control of the COVID-19 Pandemic: Postprint

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Abstract

Objective: To explore the implementation effectiveness of the pre-examination and triage management protocol for the outpatient department of stomatology in general hospitals during the normalized prevention and control period of the COVID-19 epidemic. Methods: Based on relevant COVID-19 prevention and control guidance documents issued by national and municipal health commissions and the Chinese Stomatological Association, combined with the actual conditions of our department, a series of pre-examination and triage management protocols for stomatology were developed and implemented, and their effectiveness was observed. Results: From June to August 2020, 3,821 outpatient stomatology patients were received safely and in an orderly manner, with no suspected or confirmed COVID-19 patients identified, the emergency management protocol for stomatology was not activated, and no cross-infection events occurred in the clinics. Conclusion: During the COVID-19 epidemic, the implementation of the pre-examination and triage management protocol in the stomatology department, based on epidemiological investigation registration and risk classification of dental procedures, facilitates the screening of high-risk patients and, under the premise of protecting both medical staff and patients, maximally restores the order of outpatient stomatology services safely and orderly to provide dental treatment services for patients.

Full Text

Abstract

Objective: To investigate the implementation and effectiveness of pre-examination and triage management protocols for dental outpatient clinics in general hospitals during the normalized prevention and control period of the

COVID-19 epidemic. **Methods:** Based on relevant epidemic prevention and control guidelines issued by national and municipal health commissions, the Chinese Stomatological Association, and other authorities, a comprehensive series of pre-examination and triage management protocols were developed and implemented according to the specific conditions of our department. The effectiveness of these measures was subsequently observed and evaluated. **Results:** Over a three-month period, the clinic safely and orderly received 3,821 dental outpatients. No suspected or confirmed COVID-19 patients were identified, the dental department's emergency management plan was not activated, and no cross-infection events occurred in the clinic. **Conclusion:** The implementation of pre-examination and triage management protocols in dental departments during the COVID-19 epidemic, grounded in epidemiological investigation registration and risk classification of dental procedures, facilitates the screening of high-risk patients. This approach enables the maximal safe and orderly restoration of dental outpatient services while protecting both medical staff and patients.

Keywords: COVID-19; dental clinic; pre-examination and triage; fever; emergency

Introduction

COVID-19, caused by the novel coronavirus, has insidious onset, a long incubation period, strong transmissibility, diverse transmission routes, and universal population susceptibility. The National Health Commission has classified COVID-19 as a Class B infectious disease under the Law of the People's Republic of China on the Prevention and Treatment of Infectious Diseases, while managing it with Class A protocols. Dental outpatient clinics are high-risk settings for COVID-19 cross-infection due to close doctor-patient proximity, prolonged mouth-opening during procedures, and aerosol contamination from splatter-producing treatments. Within general hospitals, where large patient volumes, dense populations, and frequent inter-departmental contact among medical staff and patients create elevated risks of nosocomial cross-infection, COVID-19 prevention and control are particularly critical in metropolitan areas like Beijing with dense population mobility and frequent international exchanges.

The Department of Stomatology at the Seventh Medical Center of the Chinese PLA General Hospital established a COVID-19 Emergency Management Group to develop and coordinate comprehensive prevention and control measures according to guidelines from national and municipal health commissions, the Chinese Stomatological Association, the Beijing Stomatological Association, and the hospital's own epidemic control policies. Led by the department director and head nurse, this group strengthened the implementation of position responsibilities, zoning protocols, workflow procedures, and infection control requirements. The Pre-examination and Triage Management Subgroup, directed by the head nurse, comprises one fever screening nurse at the department en-

trance, two epidemiological investigation and triage nurses at the waiting area triage desk (one doctor and one nurse), and one guidance coordinator. This paper examines the implementation effectiveness of these pre-examination and triage management protocols for dental outpatient clinics in general hospitals during the normalized COVID-19 prevention and control period.

1. Materials and Methods

1.1 General Information

The Department of Stomatology at the Seventh Medical Center of the Chinese PLA General Hospital has 12 doctors, 11 nurses, and 26 dental chairs, with an average monthly outpatient volume of approximately 3,500 visits. During the COVID-19 epidemic, the dental outpatient clinic adopted an on-site registration and triage system. The pre-examination and triage protocol was formulated based on local COVID-19 epidemic conditions, the risk level classification and response levels outlined in the fifth edition of the National Health Commission's COVID-19 Prevention and Control Plan, relevant notices from the Beijing Municipal Health Commission regarding standardized dental services during the epidemic, and the hospital's own COVID-19 management requirements, all adapted to the department's actual hardware and software conditions.

1.2 Pre-examination and Triage Management Protocol

1.2.1 Establishment of the COVID-19 Emergency Management Group Since the onset of the COVID-19 epidemic, all medical staff in the department have participated in relevant training covering: (1) epidemic prevention and control guidelines from national and municipal health commissions, the Chinese Stomatological Association, the Beijing Stomatological Association, and the hospital; (2) hospital-organized training videos on personal protective equipment donning and doffing procedures; and (3) emergency response drills for doctor-patient communication protocols and contingency plans under COVID-19 conditions. Based on staff characteristics and training performance, the Emergency Management Group selected principled, strong communicators to perform pre-examination and triage duties on a rotating weekly basis, ensuring strict control of the first line of defense against COVID-19 in the dental department.

1.2.2 Clinic Zoning and Layout The triage desk was repositioned forward, with the fever screening station placed in a prominent, easily identifiable, and well-ventilated location featuring clear signage, while all other entrances were closed. Staff and patient pathways were separated according to the department's spatial layout. The clinic was divided into clean, contaminated, and semi-contaminated zones: staff lounges, changing rooms, and storage areas were designated clean zones; disinfection rooms and protective equipment changing rooms were semi-contaminated zones; and dental treatment rooms were contaminated zones. According to the "COVID-19 Epidemic Period Dental Outpatient

(Emergency) Infection Prevention and Control Guidelines (Trial)" issued by the Beijing Dental Quality Control Center and Beijing Nosocomial Infection Quality Control Center, dental procedures were classified as low, medium, or high risk, with treatment provided in separate zones .

The low-risk zone contained 10 chairs in a large treatment room with 1.5-meter partitions between chairs; the medium-risk zone had 6 chairs in a large treatment room with 1.5-meter partitions and 2 chairs in a small room; the high-risk zone was an independent area with 4 separate rooms each containing 1 chair. Additionally, one treatment room was designated as an emergency clinic for necessary dental treatment of confirmed or suspected COVID-19 patients and unscreened emergency cases.

** Classification of Dental Procedure Risk Levels**

Risk Level	Procedure Characteristics	Examples
Low	No powered instruments used	Routine examination, consultation, prescription, manual scaling, tooth extraction, surgical dressing change
Medium	Low-speed powered instruments used for short procedures	Simple occlusal adjustment, denture repair
High	High-speed powered instruments (ultrasonic, high-speed handpieces) requiring substantial water cooling	Aerosol-generating procedures: pulp opening, crown preparation, ultrasonic scaling, air polishing

1.2.3 Staffing and Training Arrangements All medical staff completed training on epidemic prevention protocols and personal protective equipment procedures. The Emergency Management Group selected personnel with strong communication skills and principled judgment to staff the pre-examination and triage stations, with weekly rotations to maintain vigilance at the first line of defense.

1.2.4 Time-Slot Management of Outpatient Volume During the epidemic, stricter standards were applied to the spacing and enclosure of dental treatment units, with more rigorous post-treatment disinfection time requirements. Based on available chair numbers and average treatment/disinfection times, the maximum daily outpatient capacity was determined to be approximately 120 patients. Through WeChat public platform and telephone appointment systems, comprehensive time-slot reservations were implemented for all non-emergency visits to avoid crowding and reduce waiting times. Emergency cases such as maxillofacial trauma, space infections, or acute dental pain could access green channels through the emergency department.

1.2.5 Pre-examination and Triage Workflow The pre-examination screening station is staffed by three nurses wearing disposable surgical caps, goggles, N95 masks, face shields, and isolation gowns. Prominently displayed at the station are educational materials on dental visit procedures, Beijing Health Kit QR codes, travel history query QR codes, infrared thermometers, mercury thermometers, hand sanitizer, alcohol, and masks. An electronic registry records temperatures, travel history verification, and contact information for patients and companions to enable traceability management.

Upon arrival at the waiting area, triage nurses arrange the order of visits according to registration status, requiring patients and families to wear masks, sit at intervals, and avoid dense congregation. Temperatures exceeding 37.3°C are immediately reported, and patients are escorted to the fever clinic for evaluation. The triage desk and thermometers are cleaned and disinfected every 4 hours or when contaminated, using 75% alcohol or chlorine disinfectant (effective chlorine concentration 1000 mg/L).

Before treatment, triage desk staff conduct detailed epidemiological investigations, guiding patients to complete personal epidemiological survey forms and emphasizing the legal responsibility for providing truthful information. The survey includes: (1) presence of fever, cough, or other respiratory symptoms, or symptoms of olfactory/taste dysfunction, diarrhea, or fatigue; (2) travel history to high-risk domestic areas or overseas within 14 days; (3) contact within 14 days with individuals having overseas travel history or fever/respiratory symptoms from medium/high-risk domestic areas; and (4) cluster onset among close contacts (two or more cases with fever or respiratory symptoms in small settings like families, offices, or classrooms within two weeks).

Patients with temperatures exceeding 37.3°C and any "yes" response on the survey are considered high-risk and immediately reported to hospital emergency management, instructed to wear N95 masks, and escorted to the fever clinic. Those with temperatures exceeding 37.3°C but negative survey responses are also referred to the fever clinic. Patients with normal temperatures but positive survey responses are advised to self-isolate at home and seek care after symptoms resolve. Those with normal temperatures and completely negative surveys proceed to medical-nursing joint triage.

1.2.6 Risk-Based Triage and Zoning Through joint medical-nursing triage, staff make preliminary diagnoses based on patient complaints, history, and physical signs, estimate required treatment procedures, and determine the dental procedure risk level. According to the potential for droplet and aerosol contamination, dental procedures are classified as low, medium, or high risk, and patients are guided to the corresponding treatment zones.

1.2.7 Emergency Protocol for COVID-19 Patients with Dental Emergencies Suspected or confirmed COVID-19 patients generally defer dental treatment. However, for life-threatening emergencies such as maxillofacial trauma or space infections, the emergency protocol is immediately activated. During epidemic peaks, emergency patients with conditions like uncontrolled bleeding, severe dental trauma, or mandibular dislocation that require immediate intervention are managed under the dental emergency protocol [Figure 1: see original paper]. During normalized low-risk periods, emergency patients undergo the same risk stratification and preparation as regular outpatients.

[Figure 1: see original paper] Dental Emergency Protocol

2. Results

Triage nurses conducted non-contact forehead temperature measurements and epidemiological surveys for all outpatients. Over three months, 3,821 patients were received, including 3,798 with normal temperatures and completely negative survey responses. Two patients with normal temperatures reported cough symptoms on the survey, were instructed to wear N95 masks, and were escorted to the fever clinic; both tested negative for nucleic acid. Twenty-one patients did not receive dental treatment and were referred to the fever clinic for further investigation, all testing negative. Twenty-two patients had positive survey responses, all reporting upper respiratory symptoms, diarrhea, or fatigue without travel or contact history. Of these, 20 had normal temperatures and were advised to seek medication for symptom relief and self-isolate before returning for treatment .

** Survey and Temperature Registration of Outpatients**

Category	Number	Percentage
All survey items negative	3,798	99.4%
One or more survey items positive	22	0.6%

Monthly outpatient volumes were 1,020, 1,245, and 1,556 for June, July, and August respectively, showing gradual recovery. High-risk procedures numbered 45, 52, and 68 cases respectively, accounting for 4.4%, 4.2%, and 4.4% of total procedures. This demonstrates that during the epidemic, medical staff strictly controlled and selectively performed high-risk procedures to reduce cross-infection

risk, while patients also avoided high-risk procedures when possible [Figure 2: see original paper].

[Figure 2: see original paper] Three-Month Outpatient Volume and Risk Classification

No suspected or confirmed COVID-19 patients visited the dental department during the three-month period, and neither the COVID-19 dental emergency protocol nor the general dental emergency protocol was activated. One patient with a history of elevated temperature but no epidemiological risk factors was diagnosed with pericoronitis with space infection, managed with anti-inflammatory medication and nucleic acid testing, then underwent incision and drainage as a regular outpatient after negative results.

3. Discussion

3.1 Comprehensive Pre-examination and Triage Management as the Foundation for Safe Dental Practice

The characteristics of tertiary general hospital dental departments make them high-risk settings for COVID-19 cross-infection. With rapidly evolving epidemic conditions and continuously updated prevention and control guidelines, establishing a dental department COVID-19 Emergency Management Group to develop various contingency plans in advance and adjust them according to epidemic changes is essential. The pre-examination and triage management group serves as the first line of defense and the prerequisite for orderly outpatient services. Through established protocols and advance drills, standardized yet flexible responses enable efficient and safe patient flow management and emergency responses.

3.2 Risk Stratification Enables Precise Prevention and Control

The principle of "normalized prevention with precise control" requires strict management of the first line of defense through detailed pre-examination and triage plans that reduce cross-infection risk and improve treatment efficiency. Classifying dental procedures into low, medium, and high risk represents concrete precise control. Different zones have distinct spatial configurations and infection control requirements, optimizing medical resource allocation while reducing cross-infection risk and improving efficiency. Different epidemic response levels require different triage standards and protection levels; measures that are too lax or too strict both impede safe and orderly dental practice, necessitating scientific, precise implementation.

3.3 Traceability Management During Epidemic Periods

Enhanced doctor-patient communication and education during pre-examination and triage prevent conflicts caused by cumbersome procedures while ensuring

traceability management through detailed registration of patient information and attending medical staff for future tracking.

3.4 Emergency Preparedness and Response

Although no emergency protocols were activated during the observation period, establishing clear emergency response pathways for confirmed or suspected COVID-19 patients with life-threatening dental emergencies remains critical for preparedness.

References

[1] WANG C, HORBY P W, HAYDEN F G, et al. A novel coronavirus outbreak of global health concern[J]. Lancet, 2020.

[2] HUANG C L, et al. Clinical features of patients infected with novel coronavirus in Wuhan, China[J]. Lancet, 2020.

[3] CHEN L L, ZHAO J J, PENG J F, et al. Detection of SARS-CoV-2 in saliva and characterization of oral symptoms in COVID-19 patients[J]. Cell Prolif, 2020.

[4] HUI X L, SUN J L, WANG K N, et al. Preliminary exploration of management measures for dental emergency and outpatient services during the COVID-19 epidemic[J]. People's Military Medical Journal, 2020.

[5] LI Z Y, MENG L Y. Prevention and control of novel coronavirus infection in dental practice[J]. Chinese Journal of Stomatology, 2020.

[6] MENG L, HUA F, BIAN Z. Coronavirus disease 2019 (COVID-19): emerging and future challenges for dental and oral medicine[J]. J Dent Res, 2020.

[7] MING Q, LIU L. Nursing management practice in dental outpatient clinics during the COVID-19 epidemic[J]. Laboratory Medicine and Clinic, 2020.

[8] LI X X, LU H Y, LI Y R, et al. Prevention and control strategies for outpatient and emergency departments in primary non-designated hospitals responding to COVID-19[J]. Nursing Management Journal, 2020.

[9] ZHOU J, WANG S L. Oral health care during the COVID-19 prevention and control period[J]. Journal of Capital Medical University, 2020.

[10] PENG X, XU X, LI Y Q, et al. Transmission routes of 2019-nCoV and controls in dental practice[J]. Int J Oral Sci, 2020.

[11] CHAI G J, SUO J J, LIU Y X, et al. Preliminary investigation of epidemiological survey experience during the COVID-19 outbreak[J]. Chinese Journal of Nosocomiology, 2020.

[12] FENG X K, HAN J, TAO Y, et al. Emergency management of orthodontic patients under the COVID-19 epidemic[J]. Journal of Clinical Stomatology, 2020.

[13] HU Z P, HUANG R Z, DAI Q, et al. Application and effectiveness evaluation of electronic pre-examination and triage system for COVID-19 in specialized stomatology hospitals[J]. Journal of Nurses Training, 2020.

[14] ZENG J. Prevention and control measures for dental outpatient clinics during the COVID-19 epidemic[J]. Chinese Journal of Nursing, 2020.

[15] DAI Y H, WANG B C, HAN S Q, et al. Analysis and reflection on online dental diagnosis and treatment during the COVID-19 epidemic[J]. Chinese Journal of Geriatric Stomatology, 2020.

[16] ZHOU J F, SHEN M Y, CHEN X, et al. Nursing management practice in high-risk wards for nosocomial infection based on three-dimensional quality management theory during the COVID-19 epidemic[J]. Nursing Management Journal, 2020.

[17] PENG J L, LUO L, TIAN Y, et al. Prevention and control strategies for dental emergency during the COVID-19 epidemic[J]. Journal of Clinical Stomatology, 2020.

[18] LU Z, LIU F, YAN W, et al. Construction of emergency nursing management system for dental outpatient clinics based on COVID-19 epidemic prevention and control[J]. Chinese Nursing Management, 2020.

[19] TAO B, HUANG D, YANG Y, et al. Prevention and control strategies for restoring normalized outpatient services in general hospitals under the COVID-19 epidemic[J]. Modern Medicine and Health, 2020.

[20] ZHANG X H, ZHONG F, XIANG Y Y, et al. Management and infection prevention and control countermeasures for dental outpatient clinics during the COVID-19 epidemic[J]. Chinese Journal of Stomatological Research (Electronic Edition), 2020.

[21] YU Q M, ZHENG D H. Research on normalized prevention and control of COVID-19[J]. China Public Security (Academic Edition), 2020.

[22] YANG W Z. Reflections on transitioning from emergency response to combined emergency and normalized prevention and control of COVID-19[J]. Chinese Journal of Epidemiology, 2020.

[23] XIA J, DUAN X, CAO C X, et al. Observation on preventing nasal and facial pressure injuries in nursing staff during COVID-19 prevention and control[J]. Nursing Management Journal, 2020.

[24] CHEN H, CHEN J C. Experience in nursing management of fever clinics during the COVID-19 epidemic[J]. Nursing of Integrated Traditional Chinese and Western Medicine (Chinese and English), 2020.

[25] WANG J J, ZHANG M, CHEN Y J, et al. Protection standards for stomatology hospitals during the COVID-19 epidemic (Part 11): Emergency management of dental emergencies[J]. Journal of Practical Stomatology, 2020.

[26] JIANG S, XIA J, CHEN H H, et al. Investigation analysis and protection strategies for novel coronavirus infection among emergency medical staff[J]. Chinese Journal of Emergency Medicine, 2020.

[27] CAO Y, LI Q, CHEN J, et al. Hospital emergency management plan during the COVID-19 epidemic[J]. Acad Emerg Med, 2020.

Note: Figure translations are in progress. See original paper for figures.