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**Review Article**

# Review of Oral Medicine and Radiology Practices Across International Borders

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## ABSTRACT

Oral Medicine and Radiology (OMR) practices vary globally, influenced by healthcare infrastructure, educational systems, and technological advancements. In developed regions such as the United States and parts of Europe, OMR is well-established with structured training programs and advanced imaging technologies like cone-beam CT (CBCT) widely integrated into clinical practice. This enhances diagnostic accuracy and improves patient outcomes. Conversely, in countries like India and China, while there is increasing investment in oral healthcare, challenges include shortages of specialists and uneven access to advanced imaging in rural areas. Efforts are ongoing to expand training opportunities and improve infrastructure to meet growing demands for specialized oral health services. Across all regions, there is a growing interest in harnessing Artificial Intelligence (AI) for enhancing diagnostic capabilities and treatment planning in OMR. International collaborations and professional associations play crucial roles in setting standards, sharing knowledge, and fostering global best practices. while each region faces unique challenges, advancements in technology, interdisciplinary collaboration, and improved patient care remain universal goals in the field of Oral Medicine and Radiology.

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## INTRODUCTION

Oral medicine, as defined by various sources, is the specialized discipline within dentistry dedicated to the comprehensive oral health care of medically compromised patients. The American Academy of Oral Medicine describes it as focusing on the diagnosis and nonsurgical management of medically related disorders affecting the oral and maxillofacial region. Practitioners in oral medicine, such as those described by Thomas P Sollecito et al. , diagnose and treat a wide spectrum of conditions including oral mucosal diseases, orofacial pain, temporomandibular disorders, salivary gland disorders, xerostomia, and oral complications from cancer treatments, often providing dental care for patients with complex medical issues.[1] The British Society of Oral Medicine underscores its role in managing chronic, recurrent, and medically related disorders of the oral and maxillofacial region through diagnosis and nonsurgical interventions[2] Sir Jonathan Hutchinson, recognized as the Father of Oral Medicine, made significant contributions by describing dental manifestations of congenital syphilis and other oral conditions in the late 19th century. This progression has been vital for precise diagnosis and treatment planning across various dental specialties.[3] Internationally, the development of oral medicine and radiology has varied, with countries like India witnessing significant growth through specialized training programs and academic initiatives. The Indian Academy of Oral Medicine and Radiology, established to promote education and research, has played a pivotal role in advancing these disciplines within the Indian dental community.[4] As global healthcare landscapes continue to evolve, understanding these historical trajectories and contemporary practices in oral medicine and radiology across different regions is crucial. The Dental Council of India (DCI) has made several regulations and amendments since 2007, including the Revised BDS Course Regulations, 2007 and the DCI MDS Course Regulations, 2017 [5]This review aims to explore and compare these practices comprehensively, highlighting their impact on clinical care, education, and patient outcomes worldwide.

**Oral Medicine And Radiology Practice In India**

Oral Medicine, Diagnosis, and Radiology were introduced as a subject in the BDS curriculum in India in 1966, marking a significant milestone in dental education. The Government Dental College, Bangalore, led this initiative, becoming the first institution in India to teach these disciplines. Subsequently, in 1970, it introduced the first Master of Dental Surgery (MDS) course in Oral Medicine, Diagnosis, and Radiology, a testament to its growing recognition. The World Health Organization (WHO) played a pivotal role in this growth by providing advanced equipment like the orthopantomograph X-ray unit, installed at the Government Dental College, Bangalore, in 1970.[6] While there have been recent efforts to increase the number of postgraduate seats in Oral Medicine and Radiology, there remains a critical need to enhance the quality of education and promote broader recognition of the specialty's benefits.[7] Technological advancements, such as the adoption of cone-beam CT scans, have significantly improved diagnostic capabilities and treatment planning. The Indian Academy of Oral Medicine and Radiology (IAOMR) was established on July 4, 1993 plays a crucial role in advancing education, research, and practice standards in Oral Medicine and Radiology in India.[8] Oral Medicine Experts are uniquely positioned to play a proactive role in preventing and controlling tobacco-induced lesions. Their direct patient interactions enable early detection, counseling, and intervention strategies tailored to individuals at increased risk. By advocating for

comprehensive tobacco cessation programs and promoting awareness campaigns, Oral Medicine Experts can contribute significantly to reducing the burden of oral pre-cancer and cancer in India.[9,10] Oral Medicine and Radiology (OMDR) specialists focus on treating disorders related to addiction and providing counseling for oral psychosomatic disorders.[11] Employment opportunities for OMDR specialists exist in community health centers and public health facilities, where they can serve as key figures in de-addiction initiatives.[12] The postgraduate curriculum in Oral Medicine and Radiology includes forensic science, covering age estimation and related exercises, which can enhance the revenue potential for specialists in this field.[13] Historically, oral medicine faced challenges and was often undervalued by the dental profession in India. Looking forward, Indian specialists in Oral Medicine and Radiology foresee the integration of artificial intelligence (AI) as a potential enhancement to their practice.[14,15,16]

**Oral Medicine And Radiology Practices Among European Countries**

Oral Medicine and Radiology (OMR) practices vary across European countries, with notable differences in recognition and scope. In countries like Croatia and the United Kingdom, Oral Medicine is recognized as a specialty by local registering authorities, whereas in Finland, Greece, Ireland, Italy, Spain, and Sweden, it is a distinct field of study within the broader medical education framework.[17,18] There is a timely call for a standardized three-year post-graduate curriculum across European member countries to ensure consistency in training for Oral Medicine residencies and to facilitate broader recognition of the specialty. In contrast, countries like the UK require post-graduation in Oral Medicine only after obtaining an MBBS degree, resulting in a limited number of honorary practitioners as of January 2008.[19] The European Association of Oral Medicine (EAOM), founded in 1998 in London, plays a pivotal role in advocating for and supporting the field across Europe, with prominent figures from various countries involved in its establishment.[20] Challenges also exist in certain regions regarding access to advanced diagnostic tools and treatments, such as immunofluorescence, which are not widely available, necessitating referrals to other specialists.[21] The adoption of advanced imaging technologies, such as cone-beam CT (CBCT) and digital radiography, is prevalent across Europe, offering enhanced visual clarity, reduced radiation exposure, and improved diagnostic capabilities.[22] Efforts are underway to standardize protocols and training pathways for OMR throughout Europe to ensure consistent quality of care. As technological advancements continue, ensuring data security and patient privacy, in compliance with European regulations like GDPR, remains a critical focus.[23,24]

**Oral Medicine And Radiology Practice In Australia**

The Oral Medicine Academy of Australasia defines the scope of this specialty, emphasizing non-surgical management.[25, 26] Recent studies, such as Lalima Tiwari's report on orofacial pain practice among oral medicine specialists, highlight their active role in assessing and treating patients with orofacial pain, though access to these specialists across Australia may be uneven.[27] There's a recognized need for more Dentomaxillofacial Radiologists in Australia, especially outside Queensland and Western Australia, as indicated by research and projections from studies like Daniel Selim's thesis at The University of Queensland in 2018. Australian universities and research institutions are actively involved in OMR research, contributing to advancements in diagnostic tools and treatment methods.[28,29] The evolving trend in Australia emphasizes the importance of addressing specialist shortages strategically, enhancing

technological capabilities, fostering collaboration, and potentially focusing on further developing Dentomaxillofacial Radiology as a specialized field to meet future healthcare demands.

**Oral Medicine And Radiology Practice In United States Of America**

Oral Medicine and Radiology (OMR) practice in the United States has evolved significantly, overcoming historical challenges in defining its scope within dentistry. Previously, there was ambiguity around the definition of OMR until it was officially recognized as a specialty by the American Dental Association in September 2020. In the US, Oral Medicine is now defined as the specialty responsible for managing the oral health of medically complex patients and diagnosing and treating medically related conditions affecting the oral and maxillofacial region.[30] Recent studies and surveys, such as those conducted by Pinto et al., underscore the growing demand for oral medicine specialists in the US healthcare system. Findings reveal that patients often consult multiple practitioners before seeing an Oral Medicine provider, indicating a critical need for specialized care. [31] However, concerns persist regarding radiation exposure from diagnostic imaging, prompting guidelines from organizations like the American Dental Association to ensure safe practices. The cost of advanced technologies like cone-beam CT (CBCT) remains a barrier for some patients, prompting efforts to improve insurance coverage and enhance accessibility.[32] Overall, the trajectory of OMR in the US is positive, characterized by advancements in technology, enhanced patient care, and interdisciplinary collaboration.

**Oral Medicine And Radiology Practice In China**

Oral Medicine and Radiology (OMR) practice in China is experiencing significant developments amidst its expanding healthcare landscape. With China's growing middle class having greater disposable income, there is an increasing investment in oral healthcare, including consultations with OMR specialists. The Chinese medical imaging market is forecasted to expand to $2.7 billion by 2030, highlighting substantial growth in advanced imaging technologies like cone-beam CT (CBCT) and digital radiography.[33] Despite these advancements, China faces challenges similar to other countries, such as a shortage of qualified OMR specialists, particularly in rural and under-developed areas where advanced medical imaging technologies may not be readily accessible. To address these disparities, the Chinese government is actively implementing initiatives to enhance oral health awareness and improve access to dental care.[34]

**Oral Medicine And Radiology Practice In Middle East Countries**

The practice of Oral Medicine and Radiology (OMR) in Middle Eastern countries, particularly in the Arab Middle East, faces significant challenges and opportunities. Unlike the well-established frameworks in Western countries, the Arab Middle East shows limited development in these specialties. Oral Medicine (OM)) is critical for comprehensive healthcare, yet there is a notable scarcity of specialists, educators, and training programs across most Arab Middle Eastern nations. Currently, only a few countries in the region have recognized OM as distinct specialties with established training programs. For instance, Saudi Arabia leads with a modest number of trained practitioners, followed by Jordan and Kuwait, which have minimal presence and limited training opportunities.[35] Studies indicate a significant prevalence of smoking among young Kuwaitis, compounded by widespread exposure to secondhand smoke. Despite these health challenges, the number of oral medicine specialists in Kuwait remains limited, with only 5 specialists allocated across the country's seven dental specialty centers. The absence of formal specialty

recognition poses critical consequences for both oral medicine specialists and their patients in Kuwait. This lack of recognition hinders effective medical-dental cooperation in providing comprehensive care, particularly in managing oral manifestations of systemic diseases. Establishing a dedicated oral medicine department is therefore considered essential to streamline administrative and clinical protocols.[36,37] Such initiatives are crucial given that clinical services provided by oral medicine specialists can profoundly impact patients' overall health and quality of life.

**Need For Global Collabration**

In the post-COVID-19 era, addressing global oral health issues requires collaboration among Oral Medicine practitioners worldwide. This collaboration is essential for tackling rare diseases and conditions that require extensive data collection. By sharing knowledge, experiences, and data, researchers and practitioners can accelerate advancements in the field, ultimately improving patient care globally. However, barriers such as insufficient funding and time constraints currently limit participation in international collaborations. Despite these challenges, there is strong support for enhancing global collaboration through initiatives such as joint meetings between Oral Medicine associations and participation in international research projects. Further research is needed to better understand and strengthen existing networks of collaboration in Oral Medicine on a global scale.[38,39,40]

## CONCLUSION

Overall, Oral Medicine and Radiology (OMR) practices across different countries, including India, the United States, China, and various European nations, demonstrate both similarities and distinct characteristics shaped by local healthcare systems, educational frameworks, and technological advancements. In countries like the United States and some European nations, OMR is well-recognized as a specialty with structured training programs and significant integration into healthcare settings. These regions emphasize advanced imaging technologies like cone-beam CT (CBCT) and digital radiography, enhancing diagnostic capabilities and patient care. Conversely, in countries such as India and China, while there is growing recognition and investment in oral healthcare, challenges persist, including shortages of specialists and uneven accessibility to advanced imaging technologies, particularly in rural areas. Efforts are underway in these regions to expand training programs and improve infrastructure to meet increasing demands for specialized oral health services. Across the board, there is a universal trend towards integrating Artificial Intelligence (AI) into OMR practices, promising to further enhance diagnostic accuracy and treatment planning. Moreover, international collaborations and professional associations play a crucial role in advancing standards, sharing knowledge, and promoting best practices in Oral Medicine and Radiology globally.

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