

An Introduction to Dental Informatics for Clinical Practitioners to be More Knowledgeable

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1. Introduction

Dental informatics is a relatively new field that combines the fields of dentistry, computer science, and information technology. The goal of dental informatics is to use technology to improve the efficiency, quality, and safety of dental care. In this article, we will explore the field of dental informatics, including its history, current state, and future potential [1]. The origins of dental informatics can be traced back to the early 1970s, when computer technology was just starting to be used in healthcare. At that time, the focus was on developing electronic medical records and other systems to manage patient information. However, dental care was not included in these early efforts, as it was not considered to be as complex as medical care.

It was not until the 1990s that dental informatics began to emerge as a distinct field. This was due in part to the growing use of electronic health records (EHRs) in healthcare, which provided a platform for dental informatics to build upon. The development of standardized dental codes, such as the Current Dental Terminology (CDT), also helped to facilitate the use of technology in dental care.

Current State of Dental Informatics

Today, dental informatics is a rapidly evolving field that is focused on using technology to improve the efficiency, quality, and safety of dental care. There are several areas of focus within dental informatics, including [2].

Electronic health records (EHRs): EHRs are digital versions of a patient's dental records that are stored electronically. EHRs can help dentists to access patient information quickly and easily, and can also help to reduce errors and improve the quality of care.

Clinical decision support systems (CDSSs): CDSSs are computer systems that provide dentists with real-time information and guidance to help them make clinical decisions. CDSSs can help to improve the accuracy of diagnoses, reduce errors, and improve patient outcomes [3].

Tele-dentistry: Tele-dentistry involves the use of technology to deliver dental care remotely. This can include virtual consultations, remote diagnosis and treatment planning, and even remote dental procedures. Tele-dentistry can help to improve access to care, particularly in rural or underserved areas.

Dental imaging: Dental imaging involves the use of technology to capture and analyze images of teeth and other oral structures. This can include x-rays, computed tomography (CT) scans, and magnetic resonance imaging (MRI). Dental imaging can help to improve the accuracy of diagnoses and treatment planning [4].

Challenges in Dental Informatics

Data quality: The quality of data is critical in dental informatics, as errors or inaccuracies can have serious consequences for patient care. Ensuring the accuracy and completeness of data is a significant challenge in this field.

Security and privacy: Patient data is sensitive information, and it is important to ensure that it is stored and transmitted securely. This requires robust security and privacy measures to be in place, which can be difficult to implement and maintain.

Standardization: Standardization is essential in dental informatics to ensure that different systems and applications can communicate with each other. However, developing and implementing standardized practices can be a time-consuming and complex process.

Future Potential of Dental Informatics

As technology continues to advance, the future potential of dental informatics is vast. The field has the potential to revolutionize the way dental care is delivered and improve the overall quality of care. In this article, we will explore some of the most promising developments in dental informatics and their potential impact on the future of dentistry.

Artificial intelligence (AI) has the potential to revolutionize dental informatics in several ways. One area where AI could have a significant impact is in the development of clinical decision

support systems (CDSSs). CDSSs could use AI algorithms to analyze patient data and provide real-time guidance to dentists, helping to improve the accuracy of diagnoses and treatment planning.

AI could also be used to improve dental imaging. For example, AI algorithms could be used to analyze x-rays and identify early signs of tooth decay or other dental issues. This could help dentists to diagnose and treat dental problems at an earlier stage, potentially reducing the need for more invasive procedures [5]. Virtual reality (VR) has the potential to revolutionize dental education and training. VR could be used to create immersive simulations of dental procedures, allowing dental students to practice in a safe and controlled environment. This could help to improve the quality of dental education and training and reduce the risk of errors during real-world procedures.

VR could also be used to improve patient education. VR could be used to provide patients with a virtual tour of their mouth, showing them areas that need attention and providing them with personalized oral hygiene instructions.

2. Conclusion

In conclusion, dental informatics is a rapidly evolving field that has the potential to revolutionize the way dental care is delivered. With advances in technology, such as artificial intelligence, IoT, 3D printing, blockchain, and virtual reality, the future of dental informatics looks bright.

One of the most significant advantages of dental informatics is the ability to improve the quality of care. By using data analytics and AI algorithms, dentists can make more accurate diagnoses and treatment plans, resulting in better outcomes for patients. With IoT-enabled devices, dentists can monitor patients' oral health remotely, identify issues early, and provide personalized oral hygiene instructions.

Another advantage of dental informatics is the potential to increase efficiency and reduce costs. With 3D printing, dentists can create custom-fitted prosthetics quickly and at a lower cost

than traditional methods. Blockchain can improve the efficiency of insurance claims processing and reduce fraud, while virtual reality can enhance dental education and training.

However, there are also challenges that need to be addressed in the field of dental informatics. Interoperability and data quality are crucial issues that need to be resolved to ensure that patient data can be easily shared and used effectively. There are also concerns around privacy and security, particularly regarding the use of patient data and the potential for data breaches.

Despite these challenges, the potential benefits of dental informatics are too great to ignore. As technology continues to advance, we can expect to see even more innovative applications of dental informatics that will improve the efficiency, quality, and safety of dental care. It is an exciting time to be a part of this field, and with collaboration between dentists, researchers, and technology experts, we can work towards a future where dental care is more accessible, affordable, and effective.

3. References

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