

3D Printing- a new tool for diagnosis and treatment in Dentistry

Three-dimensional (3D) printing is a rapidly developing technology that has gained extensive acceptance and application in dentistry (1). It is also known as additive manufacturing (AM), rapid prototyping or layered manufacturing (2). The term 3D printing is generally used to describe a manufacturing approach that builds an object by laying down one layer at a time, adding multiple layers (3). The main idea behind this innovation is that the 3D model is sliced into many thin layers and the manufacturing or assembling equipment uses geometric data to build each layer sequentially until the final desired product is completed. All of this begins with making a virtual model that is near enough to the desired item(4). Scanners might be used to examine and record the anatomy that has to be delivered to the 3D model. The 3D model is cut after which, it is prepared to be taken into the 3D printer of the appropriate type. This is done possibly by the means of USB, Wi-Fi or SD. The record is transferred to a 3D printer and then the model or item is prepared to be 3D printed in layers. The 3D printer uses each 2D picture to make a three-dimensional object. Objects with geometry ranging from simple to complex can be made. This procedure is known as a slicing(5). It is more often and correctly described as additive manufacturing, and also as rapid prototyping (6).

3D imaging plays an important role in the diagnosis and treatment planning of dental diseases. To transform digital images into a real object that can be felt and touched will provide new opportunities to practitioners regarding operative skills, patient communication, treatment planning and could also serve as teaching models in providing skill training for dental students (7). 3D modelling and printing technologies are developing due to the increased popularity of 3D printers (8). With the advancement of 3D imaging and modelling technologies such as intraoral scanning, CBCT and CAD/CAM, 3D printing has acquired great interest and has become a subject of more importance in dentistry (9).

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