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Recent advances in smart materials and its applications in pediatric dentistry

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The recent technologies for life time efficiency and improved reliability include the use of smart materials and structures. Smart materials are materials that are able to be altered by stimuli and transform back into the original state after removing the stimuli. Smart materials are being used, and are continually being developed, for medical, defensive and industrial purposes. The recent advances in the design of smart materials have created novel opportunities for their applications in bio-medical fields. One of the important applications is dental restoratives. Smart materials support the remaining tooth structure to the extent that more conservative cavity preparation can be carried out. These dental materials may be altered in a controlled fashion by stimulus such as stress, temperature, moisture, pH, electric or magnetic field. Some of these are biomimetic in nature as their properties mimic natural tooth substance such as enamel or dentin. Such smart materials include smart composite, smart ceramics, compomers, resin modified glass ionomer, pit and fissure sealants etc. This presentation attempts to highlight the use of smart materials in pediatric dentistry to get maximum advantage by restorations in dentistry. The benefit for the patient and the quality of dental therapy will undergo a significant improvement if such materials are developed and introduced.

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