Editorial

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Plastic and Reconstructive Surgery Using Three-Dimensional Printing

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Surgeons may now produce highly personalised patient-tailored items using increasingly cheaper three-dimensional (3D) printing technologies. Individualized artificial and biologic implants, regenerative scaffolds, and cell-specific replacement tissue and organs might all be created using this method. Accurate volumetric analysis combined with the creation of 3D printed biologic materials is emerging approaches that show tremendous potential for generating an accurate and natural-looking anthropomorphic reconstruction. This systematic review highlights the present published literature on 3D printing in the field of plastic and reconstructive surgery, as well as known continuing research (PRS).

Using PRS and industry-related search words, researchers combed through three medical databases (PubMed, Ovid MEDLINE, and Google Scholar), as well as recent news stories and university websites. Any publication, respected news, or academic article in electronic or printed media that studied or commented on the usage of 3D printing technology in relation to PRS met the inclusion criteria. Two reviewers critically examined the present literature, and the quality of selected papers was assessed and manually filtered for relevance.

From the aforementioned sources, a total of 1092 publications about 3D printing in medicine were found. In 226 publications, 3D printing was discussed in relation to biologic and surgical applications. A total of 103 articles were reviewed from this subset. Five were relevant to surgical planning, training, and patient education among those chosen. 4 pages dedicated to upper extremity and hand prosthetics; 24 pages dedicated to bone and craniomaxillofacial (CMF) reconstruction; 10 pages dedicated to breast reconstruction; 20 pages dedicated to nose, ear, and cartilage reconstruction; 20 pages dedicated to skin; and finally 20 pages dedicated to overlapping basic subjects in 3D printing and PRS. 3D printing allows for the creation of complicated, personalised implants that not only improve patient outcomes but also increase cost-effectiveness. The technology has the potential to provide a level of accessibility that is critical for distant and resource-constrained areas where health care is typically scarce. The development of facial and limb prosthetics, as well as developments in biologic and synthetic implants, will all benefit greatly from 3D printing-based technology.

