

Table S1. Summary of the discussed 3D printing publications.

| Citation | Author | Year | Field | Anatomy/Pathology | Type of Intervention | Motive |
|----------|--------------------|------|-------------------------------------|--|---|--|
| 5 | Scanlan et al. | 2018 | Pediatric Cardiac Surgery | Atrioventricular valves | Valvular repair | Specialized Training |
| 6 | Valverde et al. | 2017 | Pediatric Cardiac Surgery | Congenital heart defects | Better understand unique patient pathology | Visualize Pathology |
| 7 | Deng et al. | 2021 | Pediatric Cardiac Surgery | Ventricular septal defect | Better understand unique patient pathology | Visualize Pathology, Educate Patients |
| 8 | Costello et al. | 2015 | Pediatric Cardiac Surgery | Ventricular septal defect | Better understand variations in the pathology | Specialized Training |
| 9 | Tiwari et al. | 2021 | Pediatric Cardiac Surgery | Congenital heart defects | Best route of intervention | Procedure Planning |
| 10 | Valverde et al. | 2015 | Pediatric Interventional Cardiology | Transverse aortic arch hypoplasia | Planning endovascular stenting | Procedure Simulation |
| 11 | Phillips et al. | 2016 | Pediatric Interventional Cardiology | Tetralogy of Fallot | Transcatheter pulmonary valve replacement | Procedure Planning |
| 12 | Jalal et al. | 2018 | Pediatric Interventional Cardiology | Atrioventricular septal defect with left ventricular outflow tract obstruction | Hybrid melody valve implantation | Procedure Planning, Procedure Simulation |
| 13 | Bhatla et al. | 2017 | Pediatric Interventional Cardiology | Ventricular septal defect | Right atriotomy with a tricuspid valve approach | Procedure Planning |
| 14 | Sabiniewicz et al. | 2018 | Cardiac Structural Interventions | Adults with congenital heart disease | Transcatheter Pulmonary Valve Replacement | Procedure Planning, Procedure Simulation |
| 15 | Biernacka et al. | 2018 | Cardiac Structural Interventions | Adults with congenital heart disease | | Procedure Planning |
| 16 | Schievano et al. | 2007 | Cardiac Structural Interventions | Adults with congenital heart disease | | Procedure Planning |
| 17 | Ripley et al. | 2016 | Cardiac Structural Interventions | Aortic Valve pathology | Transcatheter aortic valve replacement | Procedure Simulation |
| 18 | Zelis et al. | 2020 | Cardiac Structural Interventions | Aortic Valve pathology | Transcatheter aortic valve implantation | Procedure Simulation |
| 19 | Qian et al. | 2017 | Cardiac Structural Interventions | Aortic Valve pathology | Paravalvular leaks in transcatheter aortic valve implantation | Procedure Simulation |
| 20 | Levin et al. | 2020 | Cardiac Structural Interventions | Structural valve deteriorations | Valve in valve procedures | Procedure Planning |
| 21 | Little et al. | 2016 | Cardiac Structural Interventions | Mitral valve pathology | Percutaneous mitral interventions | Procedure Planning |
| 22 | Wang et. al. | 2016 | Cardiac Structural Interventions | Mitral valve pathology | Transcatheter mitral valve replacement procedure | Procedure Planning |
| 23 | Izzo et al. | 2016 | Cardiac Structural Interventions | Mitral Valve | Transcatheter Native Mitral Valve Replacement | Procedure Planning |
| 24 | Holmes et al. | 2014 | Cardiac Structural Interventions | Left atrial appendage | | |
| 25 | January et al. | 2019 | Cardiac Structural Interventions | Heart | Arrhythmia | |
| 26 | Wang et al. | 2016 | Cardiac Structural Interventions | Stroke with atrial fibrillation | Percutaneous left atrial appendage closure | Specialized Training |
| 27 | Pellegrino et al. | 2016 | Cardiac Structural Interventions | Left atrial appendage | Transseptal puncture site and device sizing | Procedure Planning, Specialized Training |
| 28 | Otton et al. | 2015 | Cardiac Structural Interventions | Left atrial appendage | Transseptal puncture site and device sizing | Procedure Planning, Specialized Training |
| 29 | Hell et al. | 2015 | Cardiac Structural Interventions | Left atrial appendage | Transseptal puncture site and device sizing | Procedure Planning, Specialized Training |

| | | | | | | |
|----|------------------------|------|----------------------------------|---|--|---------------------------------------|
| 30 | Li et al. | 2017 | Cardiac Structural Interventions | Left atrial appendage | | Procedure Simulation |
| 31 | Sabiniewicz et al. | 2020 | Cardiac Structural Interventions | Aortic arch aneurysm | | Procedure Planning |
| 32 | Cruz-Gonzalez et al. | 2019 | Cardiac Structural Interventions | Valve pathology | Transcatheter paravalvular leak closure | Procedure Planning |
| 33 | ElGuindy et al. | 2020 | Cardiac Structural Interventions | Valve pathology | Transcatheter paravalvular leak closure | Procedure Planning |
| 34 | Bellia-Munzon et al. | 2020 | Pediatric Surgery | Pectus excavatum | Nuss procedure | Procedure Simulation, Custom Fit |
| 35 | Huang et al. | 2019 | Pediatric Surgery | Pectus excavatum | Nuss procedure | Procedure Simulation, Custom Fit |
| 36 | Deng et al. | 2020 | Pediatric Surgery | Pectus excavatum | Vacuum bells | Custom Device |
| 37 | Villarreal et al. | 2020 | Pediatric Surgery | Conjoined twin | Conjoined twin separation | Procedure Planning |
| 38 | Prayer et al. | 2019 | Pediatric Surgery | Congenital diaphragmatic hernias | Of patch placement | Procedure Planning |
| 39 | Sánchez-Sánchez et al. | 2018 | Pediatric Surgery | Tumor | Oncological surgery | Procedure Planning |
| 40 | Beltrami et al. | 2021 | Pediatric Surgery | Musculoskeletal Tumor | Surgical resection | Procedure Planning, Custom Implant |
| 41 | Vanesa et al. | 2020 | Pediatric Surgery | Mandibular hypoplasia | Mandibular distraction | Procedure Planning, Custom Implant |
| 42 | Morrison et al. | 2015 | Pediatric Surgery | Tracheobronchomalacia | Splints | Custom Implant, Bioresorbable Splints |
| 43 | Pietrabissa et al. | 2020 | General Surgery | Abdomen | | |
| 44 | Pankaj et al. | 2019 | General Surgery | Kidney | Transplant | Procedure Planning |
| 45 | Chandak et al. | 2017 | General Surgery | Kidney | Transplant | Procedure Planning |
| 46 | Stefania et al. | 2017 | General Surgery | Kidney | Transplant | Procedure Planning |
| 47 | Rui et al. | 2018 | General Surgery | Biliary tree | Choledochoscopic Examination | Procedure Simulation, Custom Device |
| 48 | Hasan et al. | 2016 | General Surgery | Pelvis | Percutaneous Nephrolithotripsy Surgery | Specialized Training |
| 49 | Shibata et al. | 2017 | General Surgery | Visceral Aneurysm | Endovascular Embolization | Procedure Simulation |
| 51 | Marconi et al. | 2016 | General Surgery | Pancreatic cancer | | Procedure Planning |
| 52 | Vater Fang et al. | 2016 | General Surgery | Pancreatic cancer or cancer around the ampulla of Vater | Surgical resection | Procedure Planning |
| 53 | Bauermeister et al. | 2016 | General Surgery | Pathologies of the skull | Various procedures | Procedure Planning |
| 54 | Richard et al. | 2019 | General Surgery | Laryngotracheal stenosis | surgical correction | Procedure Simulation |
| 55 | Erdogan et al. | 2021 | General Surgery | Nasal malformation | External nasal splints | Custom Implant |
| 56 | Zhu et al. | 2016 | General Surgery | Ear malformation | Ear reconstruction surgery | Procedure Planning |
| 57 | Zein et al. | 2013 | General Surgery | Liver failure | Liver transplantation | Procedure Planning |
| 58 | Burdall et al. | 2016 | General Surgery | Choledochal cyst | Choledochal cyst excision and reconstruction | Specialized Training |
| 59 | Witowski et al. | 2017 | General Surgery | Colorectal liver metastasis | Laparoscopic resection | Specialized Training |
| 60 | Pietrabissa et al. | 2016 | General Surgery | Colorectal liver metastasis | Laparoscopic resection | Specialized Training |

| | | | | | | |
|----|-------------------|------|---------------------|---|--|--|
| 61 | Huang et al. | 2020 | Orthopedic Surgery | Acetabular joint | fracture | Procedure Simulation |
| 62 | Kong et al. | 2020 | Orthopedic Surgery | Intra-Articular Distal Radius | fracture | Procedure Planning |
| 63 | Chen et al. | 2019 | Orthopedic Surgery | Radius fracture | Complex fractures of the distal radius | Procedure Planning, Educate Patients |
| 64 | Wu et al. | 2020 | Orthopedic Surgery | Chronic Lateral Ankle Instability | Lateral Ankle Ligament Reconstruction | Procedure Planning |
| 65 | Park et al. | 2021 | Orthopedic Surgery | Pelvic tumor | | Procedure Planning |
| 66 | Gu et al. | 2020 | Orthopedic Surgery | Knee | Arthroplasty | Procedure Planning, Procedure Simulation |
| 67 | Harrysson et al. | 2008 | Orthopedic Surgery | | Implant | |
| 68 | Mazzoli et al. | 2009 | Orthopedic Surgery | Cranium | Implant | |
| 69 | Kantaros et al. | 2021 | Orthopedic Surgery | | Scaffolds | |
| 70 | Cheng et al. | 2021 | Orthopedic Surgery | | Bone Substitute | |
| 71 | Larson et al. | 2020 | Orthopedic Surgery | | Bioprinting | |
| 72 | Wang et al. | 2021 | Orthopedic Surgery | | Implant | |
| 73 | Chae et al. | 2021 | Orthopedic Surgery | | Implant | Bioink |
| 74 | Freundø et al. | 2021 | Otorhinolaryngology | Hearing loss | Cochlear implant surgery | Specialized Training |
| 75 | Frithioff et al. | 2021 | Otorhinolaryngology | Temporal bone | | Specialized Training |
| 76 | Barber et al. | 2016 | Otorhinolaryngology | Temporal bone | Defect repair | Specialized Training |
| 77 | Zheng et al. | 2019 | Otorhinolaryngology | Nasal Sinus | | Procedure Planning, Specialized Training |
| 78 | Ferreira et al. | 2021 | Otorhinolaryngology | External auditory canal and the tympanic membrane | Tympanic membrane paracentesis | Specialized Training, Student Training |
| 79 | Gordon et al. | 2021 | Otorhinolaryngology | Nasal malformation | Rhinoplasty | Procedure Planning |
| 80 | Tretiakow et al. | 2020 | Otorhinolaryngology | Nasal malformation | Simulating airflow | Procedure Planning |
| 81 | Moniripiri et al. | 2021 | Otorhinolaryngology | Nasal Sinus | Endoscopic sinus surgery | Specialized Training |
| 82 | Haemmerli et al. | 2021 | Otorhinolaryngology | Nasal Sinus | Endoscopic sinus surgery | Specialized Training |
| 83 | Valtonen et al. | 2020 | Otorhinolaryngology | Nasal Sinus | Endoscopic sinus surgery | Specialized Training |
| 84 | Deonarain et al. | 2021 | Otorhinolaryngology | Larynx and trachea | Tracheostomy and reconstruction | Specialized Training |
| 85 | Sananes et al. | 2021 | Otorhinolaryngology | Nasopharynx | Taking a swab | Specialized Training, Student Training |
| 86 | Hidalgo et al. | 1989 | Head & Neck Surgery | Mandible | Reconstruction with a composite free fibula flap | |
| 87 | Mavrogenis et al. | 2019 | Head & Neck Surgery | Segmental mandibular defects | Reconstruction with a composite free fibula flap | Procedure Planning |
| 88 | Pellini et al. | 2012 | Head & Neck Surgery | Mandibular pathology | Conventional free-hand mandible reconstruction | Procedure Planning, Specialized Training |
| 89 | Hirsch et al. | 2009 | Head & Neck Surgery | Mandibular pathology | Computer-aided mandible reconstruction | Procedure Planning |
| 90 | Succo et al. | 2015 | Head & Neck Surgery | Mandibular pathology | Computer-aided mandible reconstruction | Procedure Planning |
| 91 | Toto et al. | 2015 | Head & Neck Surgery | Mandibular pathology | Conventional free-hand mandible reconstruction, computer-aided mandible reconstruction | Procedure Planning, Procedure Simulation |

| | | | | | | |
|-----|-------------------|------|---------------------|--|--|--|
| 92 | Culié et al. | 2016 | Head & Neck Surgery | Mandibular pathology | Conventional free-hand mandible reconstruction, computer-aided mandible reconstruction | Procedure Planning, Procedure Simulation |
| 93 | Blanc et al. | 2019 | Head & Neck Surgery | Mandibular pathology | Conventional free-hand mandible reconstruction, computer-aided mandible reconstruction | Procedure Planning, Procedure Simulation |
| 94 | Powcharoen et al. | 2019 | Head & Neck Surgery | Mandibular pathology | Conventional free-hand mandible reconstruction, computer-aided mandible reconstruction | Procedure Planning, Procedure Simulation |
| 95 | Monaco et al. | 2016 | Head & Neck Surgery | Mandibular pathology | Conventional free-hand mandible reconstruction, computer-aided mandible reconstruction | Procedure Planning, Procedure Simulation |
| 96 | Wu et al. | 2021 | Head & Neck Surgery | Mandibular pathology | Conventional free-hand mandible reconstruction, computer-aided mandible reconstruction | Procedure Planning, Procedure Simulation |
| 97 | Tarsitano et al. | 2018 | Head & Neck Surgery | Mandibular pathology | Conventional free-hand mandible reconstruction, computer-aided mandible reconstruction | Procedure Planning, Procedure Simulation |
| 98 | Zweifel et al. | 2015 | Head & Neck Surgery | Mandibular pathology | Conventional free-hand mandible reconstruction, computer-aided mandible reconstruction | Procedure Planning, Procedure Simulation |
| 99 | Cogswell et al. | 2020 | Neurosurgery | Intracranial vasculature | | |
| 100 | Nagassa et al. | 2019 | Neurosurgery | Cerebral artery aneurysm | | Procedure Simulation |
| 101 | Weinstock et al. | 2015 | Neurosurgery | Arteriovenous malformations and vein of Galen malformation | | Procedure Planning |
| 102 | Weinstock et al. | 2017 | Neurosurgery | Noncommunicating hydrocephalus | Endoscopic third ventriculostomy | Specialized Training |
| 103 | Randazzo et al. | 2016 | Neurosurgery | Brain tumor | Resection | Procedure Planning |
| 104 | Kosterhon et al. | 2020 | Neurosurgery | Skull base tumors | Resection | Procedure Planning |
| 105 | Cecchinato et al. | 2019 | Neurosurgery | Spine deformity | Spine deformity correction | Procedure Planning |
| 106 | Chen et al. | 2019 | Neurosurgery | Spine deformity | Spine deformity correction | Procedure Planning |
| 107 | Clifton et al. | 2020 | Neurosurgery | Spine deformity | Spine deformity correction | Procedure Planning |
| 108 | Weiss et al. | 2019 | Neurosurgery | Spine fractures | Cervical laminectomy | Specialized Training |
| 109 | Waran et al. | 2015 | Neurosurgery | Ventricles of the brain | Ventriculostomy or transsphenoidal endoscopic pituitary surgeries | Specialized Training |

| | | | | | | |
|-----|------------------------|------|---------------------------------------|---|---|--|
| 110 | Miller et al. | 2018 | Gynecology and Obstetrics | Congenital heart disease | Fetoscopic surgery | Procedure Planning |
| 111 | Flaxman et al. | 2021 | Gynecology and Obstetrics | Symptomatic uterine fibroids, endometriosis | Resection | Procedure Planning |
| 112 | Sandrini et al. | 2020 | Gynecology and Obstetrics | Congenital heart disease | | Procedure Planning |
| 113 | Biglino et al. | 2019 | Gynecology and Obstetrics | Congenital heart disease | | Procedure Planning |
| 114 | Ruedinger et al. | 2018 | Gynecology and Obstetrics | Congenital heart disease | | Procedure Planning |
| 115 | Huang et al. | 2021 | Gynecology and Obstetrics | Congenital heart disease | | Procedure Planning |
| 116 | Abudayyeh et al. | 2018 | Cardiac Structural Interventions | Heart | | |
| 117 | Mitsouras et al. | 2015 | Radiotherapy | | | |
| 118 | Otton et al. | 2017 | Cardiac Structural Interventions | Heart | | |
| 119 | Mackey et al. | 2019 | Gynecology and Obstetrics | Delivery | Cesarean delivery | Specialized Training |
| 120 | Baek et al. | 2016 | Gynecology and Obstetrics | Cervical Cancer | | Procedure Planning |
| 121 | Barsky et al. | 2018 | Gynecology and Obstetrics | Pelvis | Pessary | |
| 122 | Punyaratabandhu et al. | 2018 | Orthopedic Surgery | Cancer | | Procedure Planning, Procedure Simulation |
| 123 | Corona et al. | 2018 | Orthopedic Surgery | Tibia | Post-traumatic correction | Procedure Planning, Procedure Simulation |
| 124 | Maddox et al. | 2018 | Urology | Renal cancer | Robot-assisted partial nephrectomies | Procedure Simulation |
| 125 | Komai et al. | 2016 | Urology | Renal cancer | Resection | Procedure Simulation |
| 126 | Porpiglia et al. | 2018 | Urology | Prostate cancer | Robot-assisted radical prostatectomy | Procedure Simulation |
| 127 | Shin et al. | 2016 | Urology | Prostate cancer | Robot-assisted radical prostatectomy | Procedure Simulation |
| 128 | Silberstein et al. | 2014 | Urology | Prostate cancer | Robot-assisted radical prostatectomy | Procedure Simulation |
| 129 | Jomoto et al. | 2018 | Urology | Prostate cancer | Robot-assisted radical prostatectomy | Procedure Simulation |
| 130 | Li et al. | 2013 | Urology | Renal stones | Percutaneous nephrolithotomy | Procedure Planning |
| 131 | von Rundstedt et al. | 2017 | Urology | Renal cancer | Robot-assisted laparoscopic partial nephrectomy | Procedure Simulation, Specialized Training |
| 132 | Wang et al. | 2015 | Urology | Prostate cancer | Biopsy | Procedure Simulation |
| 133 | Blankstein et al. | 2015 | Urology | Bladder and kidney | Flexible ureteroscopy | Specialized Training |
| 134 | Park et al. | 2015 | Urology | Ureteral reflux | Ureteral stents | Custom Implant |
| 135 | Canvasser et al. | 2017 | Urology | | Surgical clips | Custom Implant |
| 136 | Junco et al. | 2015 | Urology | | Trocars | Custom Device |
| 137 | Ali et al. | 2019 | Urology | Kidney | | Bioprinting |
| 138 | de Kemp et al. | 2015 | Urology | Urethra | Reconstruction | |
| 139 | Chen et al. | 2020 | Urology | | | |
| 140 | Cacciamani et al. | 2019 | Urology | | | |
| 141 | Atalay et al. | 2017 | Urology | Pelvis | | |
| 142 | Pang et al. | 2020 | Emergency Medicine and Anesthesiology | Pelvis | | Specialized Training, Student Training |

| | | | | | | |
|-----|--------------------|------|---------------------------------------|----------------------------|--|---|
| 143 | Baribeau et al. | 2020 | Emergency Medicine and Anesthesiology | Thorax | Perioperative transthoracic echocardiography | Specialized Training |
| 144 | Lord et al. | 2021 | Emergency Medicine and Anesthesiology | Thorax | Pericardiocentesis | Specialized Training |
| 145 | Tan et al. | 2021 | Emergency Medicine and Anesthesiology | | Ultrasound-guided peripheral intravenous catheterization | Specialized Training |
| 146 | Engelbrecht et al. | 2020 | Emergency Medicine and Anesthesiology | | Intraosseous technique | Specialized Training, Student Training |
| 147 | Maier et al. | 2021 | Emergency Medicine and Anesthesiology | Airway | Bronchoscopy | Specialized Training |
| 148 | Leong et al. | 2021 | Emergency Medicine and Anesthesiology | Airway | Bronchoalveolar lavage and clearing of secretions | Specialized Training |
| 149 | Ho et al. | 2019 | Emergency Medicine and Anesthesiology | Airway | Bronchoscopy in the setting of airway pathology | Specialized Training |
| 150 | Kei et al. | 2019 | Emergency Medicine and Anesthesiology | Airway | Cricothyrotomy | Specialized Training, Student Training |
| 151 | Dziedzic et al. | 2020 | Emergency Medicine and Anesthesiology | Tracheobronchomalacia | Mesh and ring | Procedure Planning, Procedure Simulation |
| 152 | Han et al. | 2020 | Emergency Medicine and Anesthesiology | Lumbar spine | Epidural analgesia | Specialized Training, Student Training |
| 153 | Odom et al. | 2019 | Emergency Medicine and Anesthesiology | Lumbar spine | Palpate and ultrasound-guided lumbar punctures | Specialized Training, Student Training |
| 154 | Park et al. | 2021 | Emergency Medicine and Anesthesiology | Airway | Endotracheal intubation | Procedure Planning |
| 155 | Shaylor et al. | 2020 | Emergency Medicine and Anesthesiology | Airway | Ventilation | Procedure Planning |
| 156 | Olomu et al. | 2020 | Emergency Medicine and Anesthesiology | Airway | Ventilation | Procedure Planning |
| 157 | Han et al. | 2016 | Emergency Medicine and Anesthesiology | Airway | Ventilation | Procedure Planning |
| 158 | Atun et al. | 2015 | Emergency Medicine and Anesthesiology | Airway | Evaluation | Procedure Planning |
| 159 | Rooney et al. | 2020 | Radiotherapy | Cancer | | |
| 160 | Dyer et al. | 2020 | Radiotherapy | Head and neck cancer | Bolus for radiotherapy | Procedure Planning, Custom Device |
| 161 | Lee et al. | 2018 | Radiotherapy | Prostate cancer | | |
| 162 | Biltekin et al. | 2021 | Radiotherapy | | Bolus for radiotherapy | Procedure Planning, Custom Device |
| 163 | Craft et al. | 2018 | Radiotherapy | | Bolus for radiotherapy | Procedure Planning, Custom Device |
| 164 | Hazelaar et al. | 2018 | Radiotherapy | Thorax | Bolus for radiotherapy | Procedure Planning, Custom Device |
| 165 | Biltekin et al. | 2020 | Radiotherapy | Vagina | Brachytherapy | |
| 166 | Logar et al. | 2019 | Radiotherapy | Female reproductive cancer | Brachytherapy gynecological applicators | Procedure Planning, Specialized Training, Custom Device |
| 167 | Semeniuk et al. | 2021 | Radiotherapy | | Brachytherapy | |
| 168 | Arenas et al. | 2017 | Radiotherapy | Skin | Skin cancer applicators | Procedure Planning, Specialized Training, Custom Device |
| 169 | Chen et al. | 2021 | Radiotherapy | | | |
| 170 | Chiu et al. | 2020 | Radiotherapy | Prostate | Interstitial brachytherapy | Specialized Training, Custom Device |
| 171 | Doyle et al. | 2021 | Radiotherapy | Prostate | Brachytherapy | Specialized Training |
| 172 | Campelo et al. | 2020 | Radiotherapy | Pelvis | Gynecological phantom | Specialized Training, Custom Device |