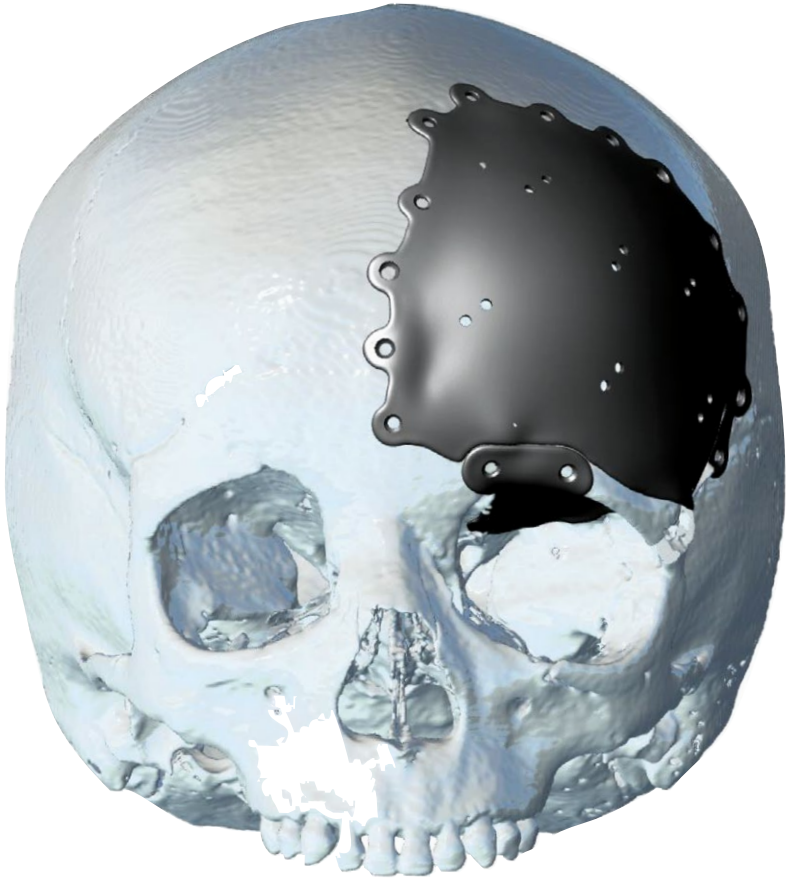
3D PRINTING SERVICES IN THE
**MEDICAL SECTOR**

# CRANIO-MAXILLO FACIAL

## 3D PLANNING, SURGICAL GUIDES AND PATIENT-SPECIFIC IMPLANTS



BROCHURE

# ABOUT US

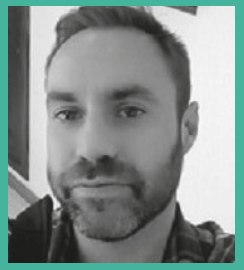
3D LifePrints is a medical 3D printing and technology organisation that uses 3D technologies to provide innovative solutions across the globe to the medical sector. Our primary focus is to supply a wide range of 3D printed medical devices, products and services at the Point of Care to medical organisations including the UK's NHS, private hospitals, research institutions & universities, medical device manufacturers and medical training centres.

We currently have a number of Embedded Medical 3D Print Hubs at the Point of Care in the UK, Including Wrightington Hospital NHS, Alder Hey Children's Hospital NHS and Oxford Hospitals NHS. These Hubs provide a wide variety of local personalised and manufactured medical products and servers to the clinical teams. Disciplines covered include Cardiothoracic, General, Neurosurgery, Oral & Maxillofacial, ENT, Plastic Surgery, Trauma & Orthopaedic, Urology and Vascular

3D LifePrints will embed experts and 3D technologies into your institution to provide a multi-disciplinary service. Working closely with your surgeons and clinicians, our team will take patient medical scan data and use in-house 3D software and hardware to design and manufacture medical solutions to meet your requirements. This includes: pre/intra surgical planning and analysis, medical devices for implantation, to aid with patient communications and for simulation and training.



3D LIFEPRINTS
## TEAM INCLUDES



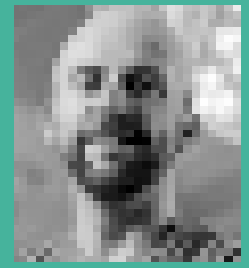
**PAUL FOTHERINGHAM**
Founder & CTO

**HENRY PINCHBECK**
Founder & CEO

**PETER EILLNGWORTH**
Chairman
CEO for the Association Of British Healthcare Industries

**JACKIE FIELDING**
Non-executive Director
Head of Medtronic UK

**TOM COSKER**
Clinical Advisor
Consultant Surgeon
Nuffield Orthopedic Centre NHS



**IAIN HENNESSEY**
Clinical Advisor
Consultant Surgeon
Alder Hey Children's NHS

**CALL US**
+44 (0) 151 528 4929 (Liverpool / Manchester office)
+44 (0) 1865 52 2767 (Oxford office)
+44 (0) 207 193 5630 (London office)

**EMAIL US**
info@3dlifeprints.com

3D LIFEPRINTS UK LTD
**CASE STUDY**

**PROCEDURE:** MANDIBLE RECONSTRUCTION
**DEVICE:** 3D PRINTED PATIENT-SPECIFIC ANATOMICAL MODEL

# PAEDIATRIC CRANIO-MAXILLOFACIAL PRE-SURGICAL PLANNING

## OUTCOME / BENEFITS

Giuseppe Pelella stated that the model was of great use in explaining the rare condition to nurses, cardiologists and to the patient's parents in a way that couldn't be achieved using only the CT scan. This allowed his team to have a more accurate planning of the surgery. The model slaso helped in reducing the time taken to plan the surgery.





## CASE SUMMARY

Faced with a paediatric patient in need of urgent cranio-maxillofacial surgery to reconstruct the mandible bone, the cranio-maxillofacial surgical team at Alder Hey Children's Hospital, Liverpool, sought out assistance in understanding the true extent of the surgery required and pre-planning the procedure for a better patient outcome. A model of the patient's craniofacial complex with pre-existing metalwork was commissioned.

## DESCRIPTION

3D LifePrints segmented the CT scan of the patient's craniofacial complex and printed the model in polywood, a bone-like material, for skeletal tissue, and PLA in an alternative colour, to highlight areas of pre-existing metalwork.

The surgeon used the replica model to understand the complex anatomy, as a reference during surgery, and also as a tool to pre-bend the new plates for the patient which were to be used in surgery.

3D LIFEPRINTS UK LTD
**CASE STUDY**

**PROCEDURE:** NASAL SPRAY PATHWAY INVESTIGATION
**DEVICE:** 3D PRINTED PATIENT-SPECIFIC ANATOMICAL MODEL

# PAEDIATRIC ENT RESEARCH

## OUTCOME / BENEFITS

While 3D printing's core value has been more commonly found in treating complex individual patient cases, hospitals and researchers are increasingly finding the technology useful in broadening their understanding of pathologies and experimenting with treatments. Traditional techniques can be refined, or entirely new approaches devised, using anatomically accurate replicas.



## CASE SUMMARY

ENT researchers at Alder Hey Children's Hospital, Liverpool, conducting an investigation into child sinus treatment, requested an anatomically correct model for testing the flow and coverage of nasal spray solutions as part of their research.

## DESCRIPTION

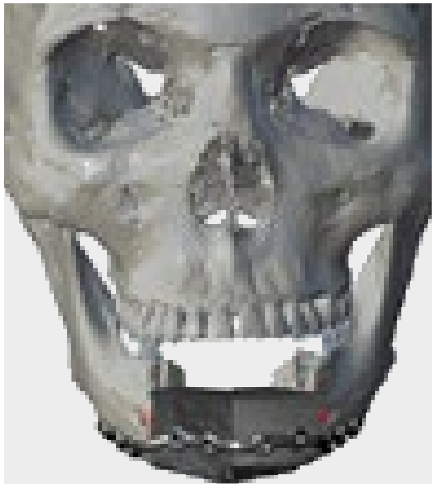
3D LifePrints segmented the test subject's CT scan data and provided a model of their bony facial structures with accompanying voids and sinuses. Bony structures were printed in a rigid PLA, while the voids & sinuses were lined with a layer of flexible silicon to represent the soft tissue properties found in these locations. The model also had strategically placed holes drilled into it, to allow for the insertion of a camera into the internal cavities while sinuses were being flushed.

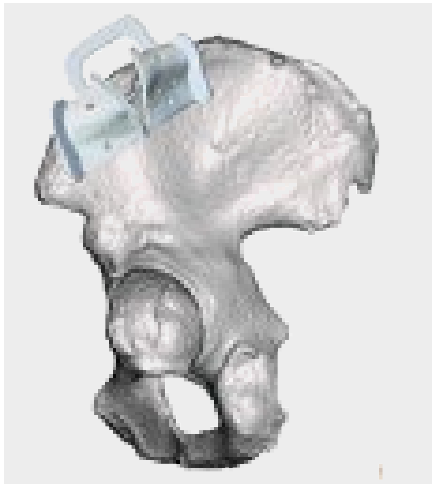
The investigators sprayed their nasal solution into the model, tracking the flow of the spray through the structural voids, gaining a better understanding of where it was distributing within paediatric patients.

3D LIFEPRINTS UK LTD
**CASE STUDY**

**PROCEDURE:** ANTERIOR MANDIBLE RESECTION AND MICROVASCULAR RECONSTRUCTION
**DEVICES:** 3D PRINTED PATIENT-SPECIFIC ANATOMICAL MODELS, SURGICAL GUIDES AND IMPLANT

# CRANIO-MAXILLOFACIAL PRE-SURGICAL PLANNING, SURGICAL GUIDES AND IMPLANT





## OUTCOME / BENEFITS

Pre-determining the ideal cutting locations in virtual surgery meant that the surgical guides provided the same level of accuracy in theatre. Both infra alveolar nerves were kept intact, and the surgeon was able to successfully reconstruct the patient's mandible. At a later date, the patient will have implants and a fixed dental prosthesis fitted as part of her treatment.





## CASE SUMMARY

A patient diagnosed with an odontogenic myxoma, a rare and locally aggressive tumour needed a
resection of their mandible followed by a microvascular reconstruction with DCIA.
In this case, the entire part of the mandible was rebuilt using a bone from their hip with microvascular anastomosis.

To ensure that the inferior alveolar nerve on both sides of the patient's mandible were not damaged during the resection, and that the choice of bone from the iliac crest was a custom fit, the clinic reached out to 3D LifePrints for assistance in the creation of several patient-specific devices that would help ensure the best possible outcome for the patient.

.

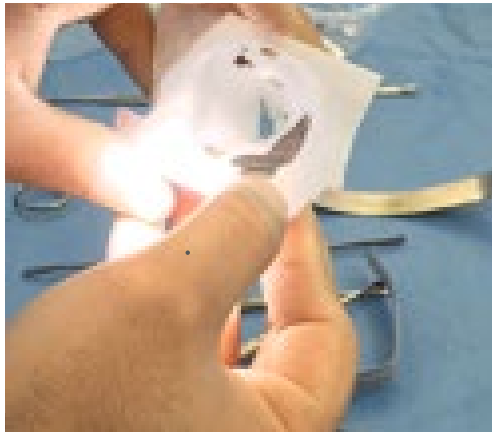
## DESCRIPTION

To ensure that the inferior alveolar nerve on both sides of the patient's mandible were not damaged during the resection and the hip bone fitted well, several patient-specific devices were made to help ensure the best possible outcome for the patient.

3D LIFEPRINTS UK LTD
**CASE STUDY**

**PROCEDURE:** COMPLEX ORBITAL FLOOR & MEDIAL WALL RECONSTRUCTION
**DEVICE:** 3D PRINTED PATIENT-SPECIFIC IMPLANT

# CRANIO-MAXILLOFACIAL SURGICAL IMPLANT



## OUTCOME / BENEFITS

Mr Amini was able to reconstruct the orbital floor and part of the medial wall to provide a base for the globe. Furthermore, buccal fat pad graft was harvested and placed inferior to the globe to restore the volume with excellent preliminary results..



## CASE SUMMARY

This patient had been allegedly assaulted, suffering complex orbital fractures along with globe injury leading to severe visual deficit and atrophy of the eye. Additionally, the patient suffered with severe social anxiety due to the appearance of the enophthalmos/ atrophied globe.

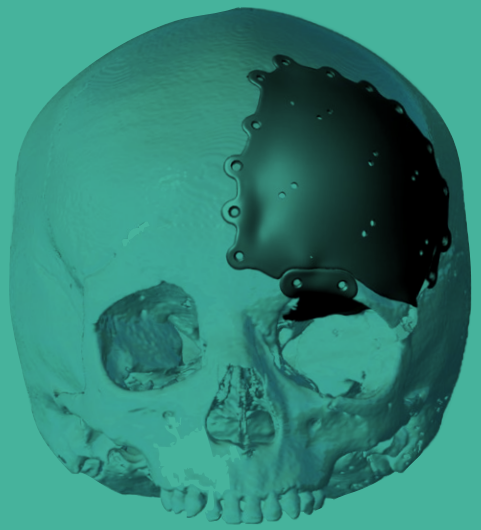
Mr. Ali Amini, Consultant Oral and Maxillofacial Surgeon, of Chase Farm Hospital, was required to perform a complex orbital floor and medial wall reconstruction. 3D LifePrints was commissioned to provide two patient-specific devices to support both planning and actual reconstruction.

.

## DESCRIPTION

3D LifePrints provided a replica of the patient's orbital floor and the patient-specific implant used in the reconstructive surgery. The orbital model was printed in PA 12 and sterilized for reference use during the operation to help position the titanium 3D printed implant which had been custom designed for the patient.

# CRANIO-MAXILLO FACIAL



3dlifeprints.com

WE PRIDE OURSELVES ON PROVIDING OUTSTANDING CLIENT SERVICE, AND ARE ALWAYS AVAILABLE FOR A DISCUSSION


**EMAIL US**
info@3dlifeprints.com

**CALL US**
+44 (0) 151 528 4929 (Liverpool / Manchester office)
+44 (0) 1865 52 2767 (Oxford office)
+44 (0) 207 193 5630 (London office)

**FIND US**
**Alder Hey Children's Hospital**
Eaton Road, Liverpool, L12 2AP, UK
**Nuffield Orthopaedic Centre**
Windmill Rd, Oxford OX3 7LD, UK
**Wrightington Hospital**
Hall Lane, Appley Bridge, Wigan, WN6 9EP, UK
**Health Foundry**
Canterbury House, 1 Royal St, London SE1 7LL, UK