

Annual Conference on

# 3D PRINTING & BIO-PRINTING IN HEALTHCARE

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## How 3DP assists surgeons in surgical pre-planning and improves their capabilities

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The following presentation demonstrates how 3D-Printing and digital imaging is used to enhance surgeon's capabilities. Generally, this can be done in two main aspects: First, creation of anatomical models based on CT and MRI scans of actual patients, which then presented to the surgeon in advance, thus, allowing him to prepare and familiarize himself with the exact anatomy he will find in the future surgery. The second aspect is the creation of custom-made surgical tools (or PSI – Patient Specific Instrument) that improves the surgeon's accuracy and cut down the overall surgery duration. In addition, the presentation will elaborate on several specific cases in which using the above techniques led to impressive surgical performance and outcomes:

- Resection of a tumor from the distal femur of a 11 years old girl. Thanks to an extreme level of accuracy of the custom made cutting guide, the need for total knee

replacement was prevented.

- Cryoablation of a sub-sacrum tumor, using trajectory guiding tool. This technique was used in order to avoid removal that required larger opening, which would have necessarily caused paralysis from pelvis downward.
- Mandibular reconstruction using fibula free flap. Using a custom-made tool, the surgery was significantly shorter, and the surgeon was able to achieve higher degree of accuracy, thus fulfilling the design objectives.
- Removal of a tumor from the ischium and replacement with a custom-made 3D-printed implant. The use of a custom-made implant allowed minimizing the portion of healthy bone being removed while implementing a new joint.

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