

CASE STUDY

PRESIDENT'S
DESIGN AWARD
SINGAPORE

Complex Spinal Surgical Device

Industry Sector

- Healthcare

Solutions

- Plastics
- Metal
- Microelectronics
- Design Engineering
- Mold Fabrication
- Ultrasonic Welding
- Lapping
- Assembly
- Hybrid Manufacturing



The Challenge

Back pain is very common - about three in four adults experience back pain during their lifetime - and this may be caused by deformities, lumbar degenerative disc diseases, cervical disorders, trauma and tumors, some cases requiring surgery. Spine surgery is performed to stop the scoliosis from progressing, restore the spine to a more normal alignment and appearance, and to address any back pain, heart or lung function problems caused by the scoliosis.

Spinal fusion is the most common surgical procedure (about 1,6 million performed worldwide annually). Implants such as screws and rods are used to help the spine fuse. Placement of screws in the vertebra is challenging: surgeons must carefully prepare a pilot hole using a perforation instrument to ensure that the screw is placed within the pedicle. Perforating the vertebral pedicle wall is a common complication related to pedicle screw insertion, and may result in very serious clinical consequences.

PediGuard® is the first patented, wireless, electronic handheld instrument capable of accurately detecting changes in tissue type, and providing audio and visual feedback to surgeons as to whether the tip is in contact with cortical bone, cancellous bone, soft tissues or blood, allowing safe navigation throughout the drilling process.

The innovative design allows the surgeon to remain in control at all times during drilling and unlike traditional scanning methods there is no requirement for scanning the patient before or during the operation, which reduces exposure of the patient and medical staff to X-rays.

Beyonics Solution

Efficient Vertically Integrated Solutions

Beyonics supplies precision medical devices and high value product solutions to the world's leading healthcare companies. Our in-house tooling, manufacturing, automation, knowledge of special materials and R&D Lab, enable Beyonics to create a vertically integrated solution to optimize efficiency.

Working as a One Team

Beyonics engineering team work very closely with our customer to collaborate on development and commercialization of the device.

Some specific tool / process have been developed solely by Beyonics to fulfil customer's requirement and design expectations.

Product Accomplishments

- Development of specific tool / process to achieve specific design of the product.
- Validate the entire assembly process carefully and repeatedly including plastics injection molding process, components sub assembly process which required detailed process mapping.
- Perform final assembly and functional testing and lastly sterile packaging in clean room of the finished product.
- Manage and design in-house mechanical test, molding tool and printed circuit board control tool.
- Manage the manufacturing and quality of printed circuit board from Beyonics' Malaysian flagship factory.



For more information, visit www.beyonics.com

© 2021 Beyonics Pte LTD. All rights reserved.

Beyonics
Precision. Driven.