

## Presentation at SMISS plenary session of SpineGuard's DSG® robotic technology confirming excellent outcomes in bone breach detection

**PARIS and BOULDER (CO), November 15<sup>th</sup>, 2021** – 08:30 am CET - SpineGuard (FR0011464452 – ALSGD), an innovative company that deploys its DSG (Dynamic Surgical Guidance) sensing technology to secure and streamline the placement of bone implants, announced today that Dr. Larry T. Khoo presented in plenary session of the congress of the Society for Minimally Invasive Spine Surgery (SMISS) the experimental results of the robotic application of its DSG technology.

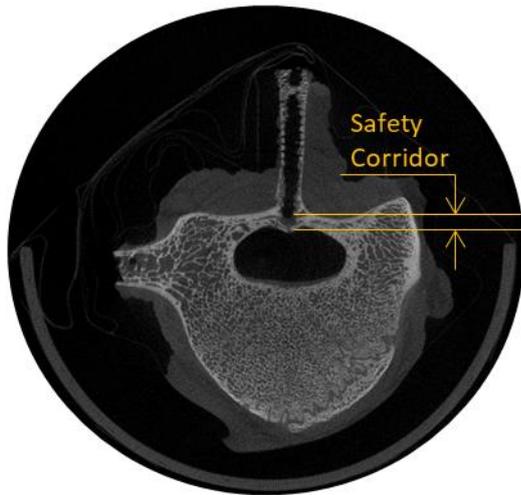


DSG is based on the local measurement of electrical conductivity of tissues in real time without X-ray imaging, with a sensor located at the tip of the drilling instrument. Its efficacy was proven by more than 85,000 surgeries across the globe and 17 scientific publications. SpineGuard has entered in 2017 a collaboration with the ISIR (Institut des Systèmes Intelligents et de Robotique) lab of Sorbonne University, CNRS and INSERM, for the application of DSG to surgical robots and the enhancement of their safety, accuracy and autonomy. The experiment results presented at SMISS consisted in the boundary detection between bone and soft tissues during vertebral drilling performed by a robot, and in automatically stopping the drilling as the tip reached this limit.

SMISS (Society for Minimally Invasive Spine Surgery) is one of the major spine surgery congresses in the world. Founded in the USA in 2007, and with international inclusion, it was the first to focus on innovation, scientific research and teaching of minimally invasive approaches to spine surgery. It is the main reference in this arena. The annual SMISS meeting was held in Las Vegas last weekend; Dr. Khoo presented in plenary session on Saturday Oct. 30<sup>th</sup> the experimental results of DSG applied to robotics.

These results are the fruit of the collaboration between the researchers of SpineGuard and Sorbonne University, J. DaSilva, E. Saghbiny, G. Morel, T. Chandanson, S. Bette with the Scientific Advisory Board of SpineGuard composed of R. Assaker (France), R. Betz (USA), C. Bolger (Ireland), M. Bourlion (France), H. Defino (Brazil), A. Kaelin (Switzerland), L. Khoo (USA), J. Williams (USA), HK. Wong (Singapore).

This presentation is a key milestone because it is a validation by the scientific community of the relevance of the results, it comes naturally as a support to SpineGuard's strategic discussions with the industry, aiming at the integration of DSG in robotic assistance surgical platforms.



*Example of the drilling accuracy, obtained via post-experiment micro-CT imaging. In 104 drillings performed robotically, the tip of the drill bit was automatically stopped at an average distance of 0.65mm from the bone limit.*

**Dr. Larry Khoo, minimally invasive Spine Surgery specialist at the *Spine Clinic of Los Angeles (USA)* and member of the Scientific Advisory Board (SAB) of SpineGuard** declares: "*Robots all give the surgeon a trajectory, but the problem is that the trajectory is not always as accurate as we would like to believe because certain basic rules of physics and engineering cannot be overcome when using long instruments, resulting in a possible +/- 2 or 3mm range of error at the tip. In contrast, DSG is designed for providing real live feedback from the tip with a very high ability to predict or prevent a breach. This opens up a great new area of research with control algorithms beyond robotic assistance towards automated placement of screws and rods.*"

The algorithms used are property of SpineGuard, Sorbonne University, INSERM and CNRS. The verification work received funding from the European Union's Horizon 2020 research and innovation program, in the context of the FAROS project (Functional Accurate RObotic Surgery) under grant agreement No 101016985.



SpineGuard is focused on the following priorities while striving to remain close to breakeven:

1. Boost commercial activities with the launch of the DSG-Connect visual interface.
2. Implement the DSG digital technology in ortho-robotics through the deployment of AI algorithms, scientific evidence, and additional patents.
3. Intensify the collaboration with ConfiDent ABC for the dental application and co-develop a new generation of products embedding the DSG technology.
4. Affirm the company's technological shift and sign strategic partnerships in particular for the use of DSG technology in the robotic field.

## About SpineGuard®

Founded in 2009 in France and the USA by Pierre Jérôme and Stéphane Bette, SpineGuard is an innovative company deploying its proprietary radiation-free real time sensing technology DSG® (Dynamic Surgical Guidance) to secure and streamline the placement of implants in the skeleton. SpineGuard designs, develops and markets medical devices that have been used in over 85,000 surgical procedures worldwide. Seventeen studies published in peer-reviewed scientific journals have demonstrated the multiple benefits DSG® offers to patients, surgeons, surgical staff and hospitals. Building on these solid fundamentals and several strategic partnerships, SpineGuard has expanded its technology platform in a disruptive innovation: the « smart » pedicle screw launched late 2017 and is broadening the scope of applications in dental implantology and surgical robotics. DSG® was co-invented by Maurice Bourlion, Ph.D., Ciaran Bolger, M.D., Ph.D., and Alain Vanquaethem, Biomedical Engineer. SpineGuard has engaged in multiple ESG initiatives.

For further information, visit [www.spineguard.com](http://www.spineguard.com)

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