DANGERS OF RADIATION

Radiation exposure in spine surgery is excessive, protection is underutilized, and the long-term biological effects can be deadly. Fortunately, there is a growing concern among influential spine surgeons who are calling for the reduction of radiation vulnerability in the OR.

Surgeons are highly exposed especially in MIS surgeries and scoliosis surgeries. **The annual limit dose to the eye is 20 mSv/year.**

Moreover, CT scans for diagnosis and navigational assistance during spine surgery may expose young patients to excessive radiation. **Intra-operative navigation increases the radiation exposure to patients especially in AIS and could generate about one iatrogenic malignancy for every 1,000 AIS patients treated.** Girls are at a higher risk of cancer development.

DSG Technology can minimize the amount of radiation exposure to the patient from a **25% to 54% reduction** in fluoroscopic (C-Arm) images in open surgery and **73%** in radiation time in MIS surgery.

PediGuard complies with the recommendations of the International Commission for Radiation Protection (ICRP) and the ALARA principle As Low as Reasonably Achievable

MOST RELEVANT APPLICATIONS OF DSG

Deformity

Screws at risk of impinging anatomic structures such as the aorta, esophagus, trachea or lung and screws causing neurologic deficits or injuries can be reported as an issue in deformity patients. PediGuard can significantly reduce the number of mal-positionned screws.
In anterior scoliosis surgery, PediGuard can help to decrease radiation exposure by up to **41%.**

Safe Placement in Patients with Poor Bone Quality

In patients with osteoporotic bone, PediGuard can assist in reaching high screw placement accuracy rate up to **97.3%** while decreasing radiation exposure by **54%.**

Cervical

PediGuard can improve screw placement in C1 lateral mass, in C2 and all pedicles in cervical.

PediGuard range of product

What are the latest innovations of SpineGuard?

What surgeons say about DSG technology and PediGuard devices?

DSG Technology in robotics applications

SpineGuard®
Making spine surgery safer



Evidence Based Value Technology

GPICLINIC/124E

DSG is a powerful radiation-free real time sensing technology platform to secure bone drilling

The PediGuard probes, equipped with DSG technology, are handheld devices capable of alerting surgeons in **real time** of potential vertebral cortical wall breaches.

DSG technology is based on the **local measurement** of electrical conductivity with a sensor located at the tip of the drilling instrument. Its efficacy has now been proven by more than **100,000 surgeries** and **over 30 peer-reviewed publications.**

With this mounting clinical evidence confirming its efficacy, PediGuard devices, are becoming a compelling answer to the clinical needs associated with safe and accurate pedicle screw placement.



97%
screw placement accuracy on average

73%
reduction of X-Ray in MIS

58%
breach rate reduction when used by residents

CHALLENGES OF PEDICLE SCREW PLACEMENT

Pedicle screw-based stabilization is the gold standard for treating spinal instabilities and deformities.

Up to **20%** of pedicle screws have been reported as misplaced when using conventional techniques (non-assisted techniques) and around **~5%** when using navigation or robotic-assisted.

The main risk associated with placing pedicle screws is pedicle perforation, which occurs when the screw exits the vertebrae. This can result in dural tears, vascular injury, nerve injury or, rarely, spinal cord injury. Consequences of misplaced pedicle screws are not to be underestimated and solutions exist.

DYNAMIC SURGICAL GUIDANCE SOLUTION

Based on 9 clinical studies worldwide, accuracy of pedicle screw placement, with the PediGuard device, is drastically improved with an average of **97% of good placement.**

Thanks to the real time local measurement, PediGuard device can detect and anticipate breaches. **100% successful redirection** without a breach after anticipation of an impending pedicle wall breach.

Residents can decrease their learning curve for screw placement when using the PediGuard devices. **58% reduction in breach rate** and **21% reduction of time per screw.**