The KARL STORZ Solution

4 mm Endoscopic NIR/ICG Fluorescence Imaging for Neurosurgery

The ONLY 4 mm ICG Neuro Telescope on the market.

STORZ
KARL STORZ — ENDOSKOPE

Current Status

The trend is toward minimally invasive endoscopic neurosurgery and away from the microscope; in fact, studies show more tumor can be readily seen with an endoscope[1]. Microscopic neurosurgeons started using the drug IndoCyanine Green (ICG) in 2003 in neuro vascular surgery. ICG technology has revolutionized aneurysm surgery and it is now the gold standard.

During the last 15 years, ICG has been widely used for other types of microscopic brain procedures. These learnings are now being applied to traditional endoscopic neuro surgery. KARL STORZ has the only 4 mm endoscopic enhanced visualization system on the market that includes ICG and allows surgeons to deliver safe and cost effective patient care.

NIR/ICG Imaging Technology

NIR/ICG imaging delivers a roadmap of neurovascular structures deep below the surface which clearly shows where the surgeon should and, more importantly, should not cut.

NIR/ICG allows the surgeon to see whether tissue is receiving sufficient blood supply. With NIR/ICG it's possible to:

Increase surgeon's confidence by providing better intraoperative understanding

- Identify critical neuro vascular structures below tissue surface[2]
- Differentiate tissue planes between lesions and adjacent structures[3, 4]

Improve outcomes by

- Significantly reducing errors[2, 3]
- Reducing the chance of incomplete aneurysm clipping[2, 5, 6]
- Evaluating tissue perfusion intraoperatively and accurately predicting flap viability for the prevention of reconstructive complications[7]

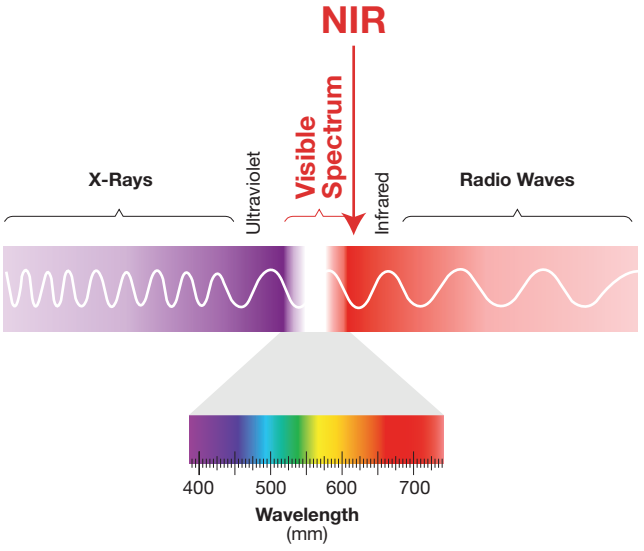

Fig. 1: NIR is outside the visible white light spectrum and provides additional information during surgery.

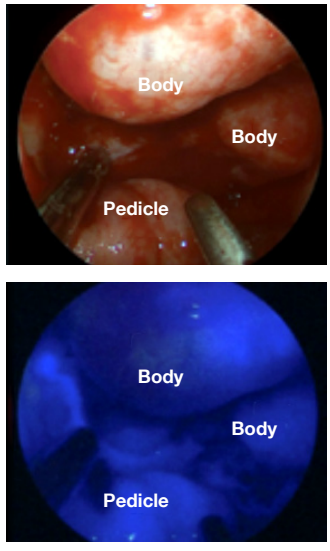

Fig. 2: NIR/ICG can assist with identifying whether the septal nasal flap is properly perfused. The blue color indicates adequate perfusion, which is essential to prevent complications that would require a return to the operating room.

Profitability

Using endoscopic ICG fluorescence angiography has the potential to reduce errors and lower cost if it prevents complications including meningitis and CSF leaks requiring a return to the operating room. By reducing associated morbidity and mortality and subsequent cost savings, NIR/ICG fluorescence imaging could increase patient satisfaction allowing you to deliver more cost effective patient care.

Reimbursement

CPT code 92240[8] can be added to your endoscopic neuro ICG procedures. Medicare's allowable is approximately $232 for 2018. This amount will vary depending on geographic region.

Why KARL STORZ?

Reduction of Equipment Redundancy
(Improve Operational Efficiency while Reducing Capital Acquisition Costs)

- ***Provide your surgical team telescopes in their preferred size - 4 mm - that can be used in white light or NIR***
- Reduce unnecessary care and equipment variation – with the IMAGE1 S™, only a single video tower is necessary for mutilspecility use of NIR/ICG and white light imaging
- Avoid costly unnecessary purchases – ICG endoscopes and camera heads are designed to be used in every endoscopic case whether ICG is used or not

Fig. 1: IMAGE1 S™ is a modular camera architecture with 2D, 3D, 4K, and NIR capabilities. It is adaptable and scalable to fit your needs and provides the best return on your endoscopic investments.

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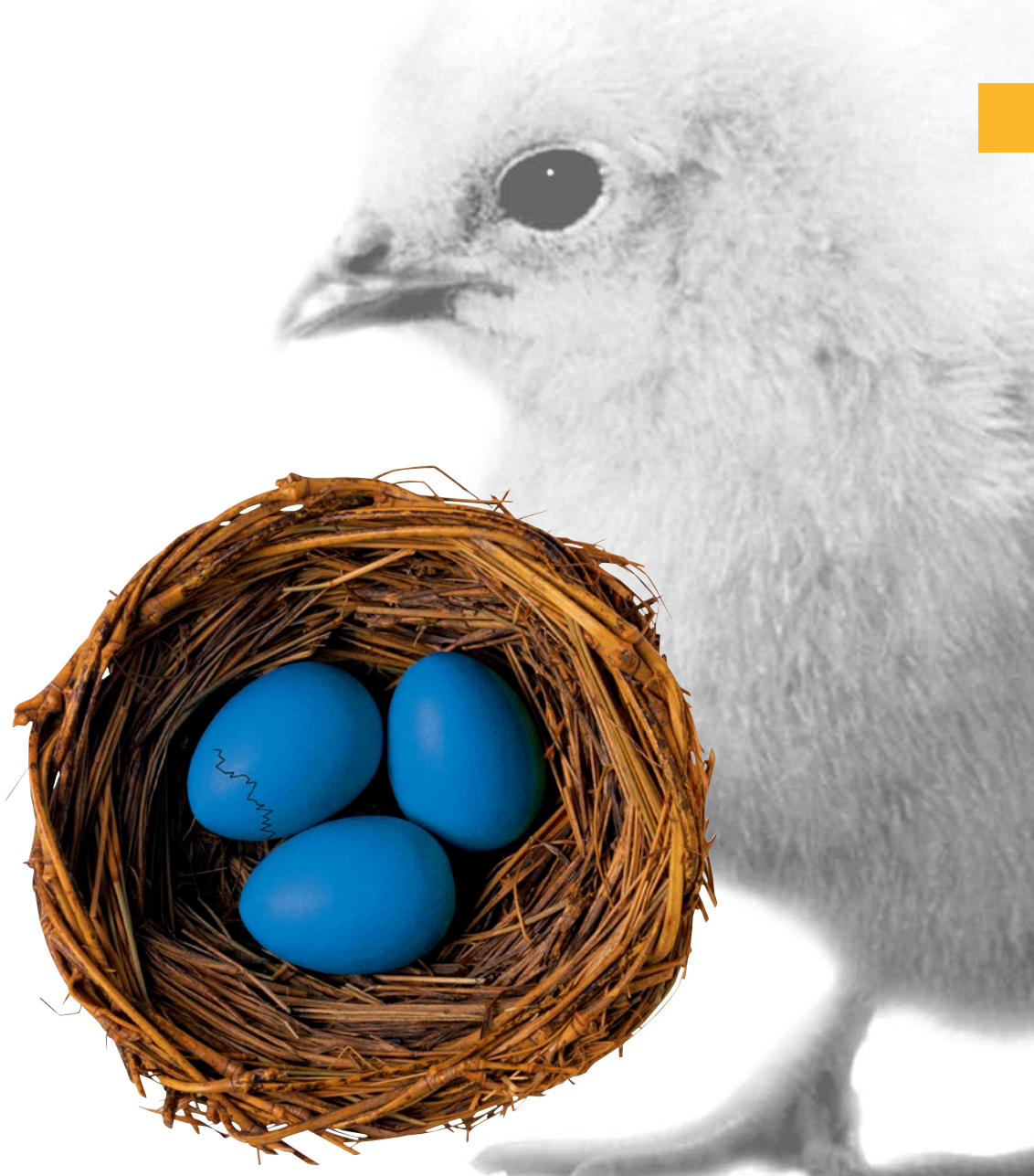
2. Catapano, G., Sgulò, F.G., Laleva, L.N., Columbano, L., Dallan, I., & Notaris, M.D. (2017). Multimodal use of indocyanine green endoscopy in neurosurgery: a single-center experience and review of the literature. Neurosurgical Review, 1-14.
3. A. Igami Nakassa, P. Gardner, et al; Usefulness of Indocyanine Green Fluorescence Endoscopy for Intraoperative Differentiation of Intracranial Tumors and Adjacent Structures; J Neurol Surg B 2017; 78(S 01): S1-S156
4. Inoue, T. Ohnishi, et al; Usefulness of an Image Fusion Model Using Three-Dimensional CT and MRI with Indocyanine Green Fluorescence
5. Y. H, KINOUCHI H. The Roles of Endoscope in Aneurysmal Surgery. Neurologia medico-chirurgica. 2015;55(6):469-478. doi:10.2176/nmc.ra.2014-0428.
6. Mielke D, Malinova V, Rohde V.; Comparison of intraoperative microscopic and endoscopic ICG angiography in aneurysm surgery; Neurosurgery. 2014 Sep;10 Suppl 3:418-25
7. M. Geltzeiler, A. C. Igami Nakassa, P. Gardner et al; Evaluation of Intranasal Flap Perfusion by Intraoperative Indocyanine Green Fluorescence Angiography, Operative Neurosurgery, , opy002,
8. CPT code 92240: Indocyanine-green angiography (includes multiframe imaging) with interpretation and report, unilateral or bilateral



...evolution continues

STORZ
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THE DIAMOND STANDARD

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