

# Patient Education Series

## Patient Education

The information presented in this leaflet will equip you with the knowledge to participate in your care and make informed decisions about your operation.

"FGS approach fundamentally changing how surgery can be performed more safely and accurately for patients."

Dr S Horgan, Director and Chief of minimally invasive surgery, San Diego Center for Fluorescence-Guided Surgery.

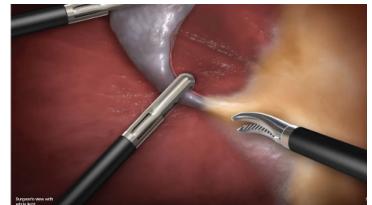


# FLUORESCENCE GUIDED SURGERY (FGS) Techniques

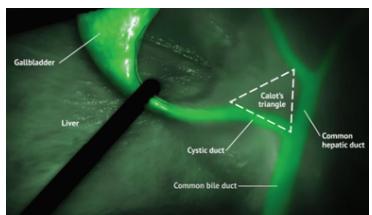
## WHY FLUORESCENCE GUIDED SURGERY (FGS)?

Many surgical procedures are considered safer today because of new technology called fluorescence guided surgery. This technology provides surgeons with critical information in real-time that was previously unavailable. Potential benefits to you, the patient, are reduced complications and better surgical outcomes.

Traditionally, surgeons were limited to what they could see under visible light. Today, using infrared light, a special dye called Indocyanine Green (ICG) and special cameras, the surgeon is able to see anatomy in a way that was previously impossible.



Surgeon's view of Gallbladder with white light



Surgeon's view of Gallbladder using fluorescence guided light

## THE PROBLEM

While there have been many advancements in preoperative medical imaging such as CT and MRI scans, surgeons still almost exclusively operate under white (visible) light during their procedures. Traditionally, surgeons rely on their ability to see and feel target tissues. However, most human tissue looks very similar under white light, and it can sometimes be challenging to distinguish one type of tissue from another, or to accurately remove diseased tissue. In addition, a surgeon can only see the topmost layer of tissue under white light, while tissues and structures underneath remain hidden.

The use of ICG along with specialized imaging equipment allows structures and vessels to be seen by the surgeon. By visualizing these structures, the surgeon can more clearly identify your anatomy and make more informed decisions during your procedure. This allows the surgeon to see beneath the top layers of tissue to areas of interest below.

FGS has the added advantage of being a real-time imaging process. Whereas traditional imaging like X-Rays, CT Scans, and MRI scans can provide excellent images, they are all limited to providing static images taken before the operation. With the additional information available through FGS techniques, the surgeon can adapt the surgery to each individual patient.

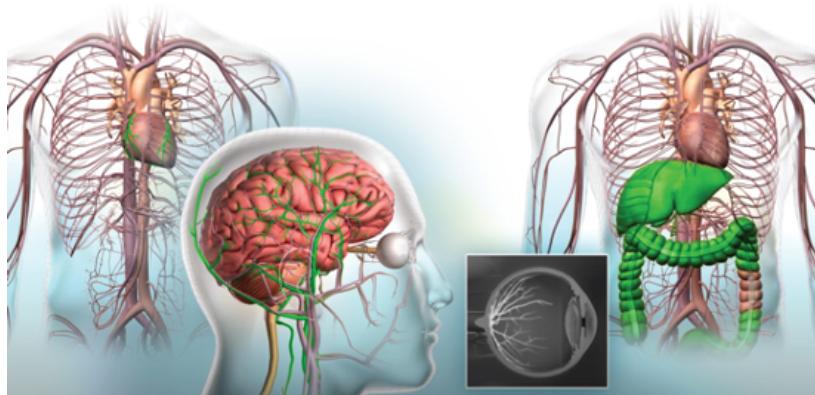
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"Improved visualization of the tissues can reduce damage to important normal structures, such as nerves, blood vessels, ureters and bile ducts." Dr Michael Bouvet, Director of Endocrine Surgery Professor of Surgery, UC San Diego Medical Center.

## Advantages of FGS Approach

There are many advantages to this type of approach including:

- It is a useful aid for surgeon to identify and visualize anatomy of the patient. Fluorescence imaging during a surgical procedure offers multiple benefits to the surgeon and ultimately you, the patient. Compared with standard unaided vision using white light imaging, real-time fluorescence imaging is helpful in identifying each patient's specific anatomy.
- It can be used in a variety of surgical procedures. Fluorescence imaging can be used across a full spectrum of surgeries from common procedures, such as gallbladder removal, colon resection, breast surgeries, as well as more complex surgeries such as liver surgery, cervical, endometrial, prostate, parathyroid, endocrine and neurosurgical procedures.
- FGS is associated with lower occurrence of surgical complications. FGS is also associated with reduced adverse events, reduction of re-interventions, and a positive impact on the post-intervention (surgical) recovery time. Studies have shown it results in a lower occurrence of surgical complications (e.g. anastomotic re-do surgeries reduced by 17%, 86% reduction in breast flap necrosis), with length of stay in hospital reduced (up to 42.86% in one study).<sup>1,2</sup>
- It can help improve surgical precision. Many surgeons have reported an increase in the ability to operate more precisely by utilizing fluorescence guided surgery techniques.



FGS used in a wide variety of procedures

### DISCLAIMER

This information is intended to educate you about your specific surgical procedure. It is not intended to take the place of a discussion with a qualified surgeon who is familiar with your situation. It is important to remember that each individual is different, and the reasons and outcomes of any operation depend upon the patient's individual condition. The International Society for Fluorescence Guided Surgery (ISFGS) has endeavored to present information for prospective surgical patients based upon current scientific information.

### References:

1. Vettoretto N, Foglia E, Ferrario L et al., Could fluorescence-guided surgery be an efficient and sustainable option? A SICE health technology assessment summary. *Surgical Endoscopy*, April 2020.
2. Harless CA, Jacobson SR. Tailoring through technology: A retrospective review of a single surgeon's experience with implant-based breast reconstruction before and after implementation of laser-assisted indocyanine green angiography. *Breast J*. 2016;22(3):274-281.



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