

# Patient Education Series



## LAPAROSCOPIC CHOLECYSTECTOMY Using Fluorescence Guided Surgery

### THE CONDITION

Gallstones are solid particles that form bile, cholesterol, and bilirubin in the gallbladder. The gallbladder is a small pear-shaped sac-like organ in the upper right part of the abdomen. It is located under the liver, just below the front ribcage on the right side. The gallbladder is part of the biliary system that includes the liver and pancreas. The biliary system, along with other functions, transports bile and digestive enzymes. If you have stones in your gallbladder you may require surgery to remove your gallbladder.

That procedure is called *Laparoscopic Cholecystectomy*.

#### *Common Symptoms of Gallstones*

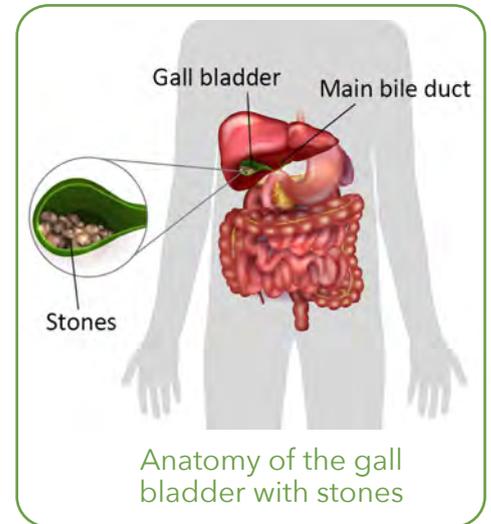
- Severe and sudden pain in the upper right abdomen, possibly extending to the upper back
- Fever and shivering
- Severe nausea and vomiting
- Jaundice (yellowing of the skin or eyes)
- Dark urine
- Jaundice associated pain (abdominal pain)

### TREATMENT OPTIONS

Laparoscopic surgery is a type of surgical procedure that allows a surgeon to access the inside of the abdomen and pelvis without making large incisions in the skin. The surgeon uses an instrument called a laparoscope, that is a small tube with a light and camera, that sends images of the inside of the abdomen to a TV monitor.

### THE PROBLEM

Although laparoscopic surgery has been shown to be very safe, complications may occur. In order to remove the gallbladder, the surgeon needs to identify a small duct (the cystic duct) that connects the gallbladder to the main bile duct. Once the duct is identified, the surgeon cuts the duct to completely remove the gallbladder. The bile duct can be wrongly identified in up to 0.4% of cases and, as a result, the main bile duct can be injured.



#### Patient Education

The information presented in the **Patient Surgical Education Series** is designed to help you be better informed about your operation and provide you with the knowledge to participate in your care and make informed decisions about your operation.

If you have stones in the gallbladder you may require surgery to remove your gallbladder. That procedure is *Laparoscopic Cholecystectomy*

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Fluorescence guided surgery helps to optimize visibility during surgery, for better accuracy and better outcomes

The dye that is in the extrahepatic bile ducts glows when it is illuminated with near infrared light, illuminating the ducts

## THE SOLUTION

### Fluorescence Guided Surgery

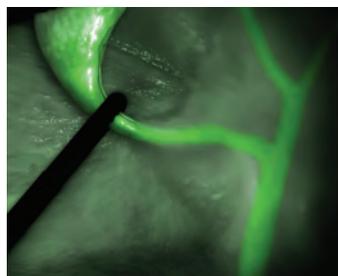
A new technology has been developed over the last few years that allows the surgeon to better visualize the ducts. It has been shown that a surgeon can see 3-times better using a technology called *near infrared (NIR) guided imaging* using a special dye called indocyanine green.

#### Indocyanine Green Dye

Indocyanine green (ICG) dye was approved by the U.S. Food and Drug Administration (FDA) in 1959 and has since been safely used in different surgical applications.



Traditional Surgery



Fluorescence Guided Surgery



Indocyanine Green (ICG) Dye



Injection of the ICG Dye

#### How it Works

In order for the surgeon to better recognize the structures while operating, ICG is intravenously administered 45 minutes before the procedure starts. This is the time required for the dye to be excreted into the bile ducts. During the procedure, the surgeon uses NIR light to illuminate the extrahepatic bile ducts.

The dye in the extrahepatic bile ducts glows when it is illuminated with near NIR light, thereby illuminating the ducts. By visualising the anatomy, it makes it easier for the surgeon to identify the anatomy and make better decisions.

## BENEFITS AND RISKS

- Fluorescence guided surgery does not make the procedure longer or change the surgical technique that your surgeon will use.
- The ICG dye contains a small amount of iodine, therefore any allergy to shellfish or iodine compound should be disclosed to your surgeon before the operation.

#### 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.

