

AIM

ADVANCED IMAGING MODALITY



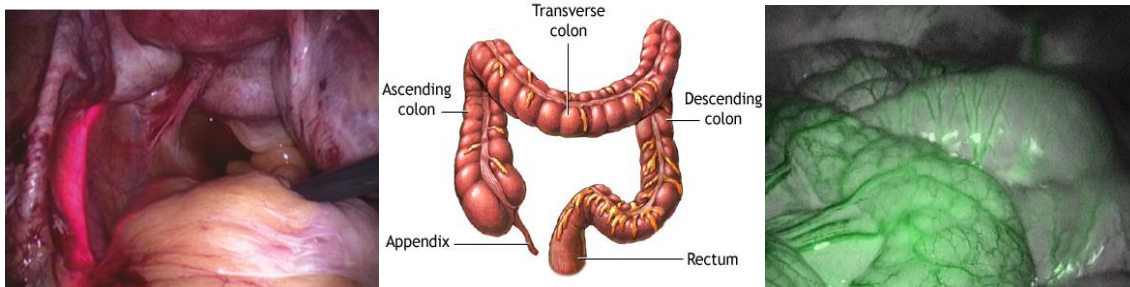
AIM in Laparoscopic Colorectal Procedures

Key Colorectal Procedures on an OR Board:

- Lap Colectomy (Right, Left)
- Low Anterior Resection (Colon resection)

Complication Stats:

- Over a 250,000 colon and rectal resections are performed annually in the United States ⁱ
 - Anastomotic leaks are a relatively frequent complication of colorectal surgery, occurring in 1.2–19.2 % of all operations, with rates reaching 39 % for rectal cancer cases requiring low or ultra-low anastomosis ⁱⁱ
 - Anastomotic leaks require reoperation in 95 % of cases and result in significant mortality ⁱⁱ
 - Besides technical aspects, **adequate bowel perfusion is the main factor in ensuring the integrity of an anastomosis** ⁱⁱ
 - Ureteral injury accounted for **4.3% to 7%** of the total laparoscopy complications ⁱⁱⁱ
 - Litigation costs from ureteral injuries are wide ranging, from **\$600,000 to several million dollars** ^{iv}



WHY use AIM in Colorectal procedures?

- The AIM platform is designed to help surgeons see and do more. Colorectal surgeons are often worried about blood flow to the staple lines, as well as, avoiding injuring the ureters.
 - IRIS:
 - Infrared Ureteral Stents are designed to transilluminate the ureters to assist with visualization of the ureters during the surgical procedures.
 - Additionally, the IRIS U-kits may help surgeons save time in having to do extensive dissections to locate the ureters.
 - ENV:
 - The Stryker Near-Infrared visualization system is indicated for visual assessment of vessels and blood flow.
 - Surgeons can inject AIM IC-Green after anastomosis, and **within seconds** visualize the blood flow to the staple line.
 - Blood flow visualization is one more line of defense to assist doctors in trying to prevent leaks, strictures, or ulcers.
 - CLARITY:
 - Clarity offers real-time video enhancement when surgeons are operating with extensive smoke, or are in need of looking at the fine detail of their dissections and staple lines.

HOW does ENV work?

- AIM IC-GREEN (ICG) is a drug that binds to the protein in blood immediately, and travels throughout the circulatory system.
- When the surgeon toggles on the ENV mode from the camera head, the L10 ENV laser excites the AIM IC-Green to emit 835nm wavelength and , the scope, coupler, and camera then cut out all other wavelengths other than the 835nm showing the fluorescence.
- The surgeon can toggle back to white light mode from ENV mode.

WHY use ENV?

- Safety
 - AIM is designed to help surgeons see more. Being able to see blood flow may assist surgeons in visualization of vessels and related tissue perfusion to help reduce complications such as leaks, ulcers, and strictures.
 - It's radiation-free with very small risk of adverse reaction related to administration of ICG
- Efficacy
 - AIM IC-Green is an injection that shows up immediately when viewing blood perfusion
 - This doesn't interrupt the surgery to bring in additional equipment since the AIM technology is incorporated in the L10 and 1588 camera
- Convenience
 - AIM IC-Green can be administered by the anesthesiologist
 - Surgeons can view the fluorescence with a toggle of a camera button

Key Definitions:

- **Perfusion**- the process of a body delivering blood to a capillary bed in its biological tissue
- **Anastomosis**- a surgical connection between two structures. It usually means a connection that is created between tubular structures, such as blood vessels or loops of intestine. For example, when part of an intestine is surgically removed, the two remaining ends are sewn or stapled together (anastomosed).
- **Leak**- breakdown along an anastomosis which causes fluids to leak
- **Colon Stricture**- a narrowing of part of the colon
- **Ulcer**- A lesion that is eroding away the skin or mucous membrane
- **Colon Polyp**- a small clump of cells that forms on the lining of the colon
- **Colon Cancer**- a class of diseases characterized by out-of-control cell growth, and colon cancer forms when this uncontrolled cell growth initiates with cells in the large intestine
- **ICG (AIM-IC Green)**- a drug; cyanine dye that binds to blood proteins and is used as an indicator substance
- **LAR Procedure (Low Anterior Resection)**- a common surgery for rectal cancer and occasionally is performed to remove a diseased or ruptured portion of the intestine in cases of diverticulitis

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Literature Number: 1000901798, Rev A

ⁱ <http://www.ncbi.nlm.nih.gov/pubmed/19734778>

ⁱⁱ http://www.charlestoncolorectal.com/resources/Practice/49/Lagares_paper.pdf

ⁱⁱⁱ Saidi MH, Vancaillie TG, White AJ, et al. Complications and cost of multipuncture laparoscopy: a review of 264 cases. *Gynecol. Endosc.* 1994;3:85-90. Härkki-Siren P, Sjoberg J, Kurki T. Major complications of laparoscopy: A follow-up Finnish study. *Obstet Gynecol.* 1999;94:94-98.

^{iv} <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3015941/>