

## Capstone for Impact Submission | GY2019

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**Project Title:** Intraoperative fluorescent angiography predicts pharyngocutaneous fistula after salvage laryngectomy

**Student Name(s):** Brennan, Julia

**Advisor Names(s):** Matt Spector

**Branch:** Diagnostics & Therapeutics

**Path of Excellence:** N/A

**Handover/Transition:**

If this project can be continued by another UMMS student, you may contact them at the following email address/phone number (N/A if project cannot be handed over): **n/a**

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**Summary:**

My goal for my capstone project was to see through a research project from start to finish in which I was primarily responsible for the design, data collection, analysis, and manuscript writing. Projects of interest in particular were those relating to the field of otolaryngology that took advantage of diagnostic technology to further tailor clinical courses for patients.

My mentor, Matt Spector and I worked together to find something that fit my needs, and the study I ended up pursuing utilized intraoperative perfusion angiography to predict fistula formation in salvage laryngectomy patients. The project took place from 2017-2018 and will culminate in a first-author publication (currently accepted) in the Annals of Surgical Oncology.

The following excerpts are taken from the manuscript abstract:

Hoesli R\*, Brennan JR\*, Rosko AR, Birkeland AC, Malloy KM, Moyer JS, Prince MEE, Shuman AG, Chinn SB, Stucken CL, Casper KA, Spector ME. Intraoperative fluorescent angiography predicts pharyngocutaneous fistula after salvage laryngectomy. Annals of Surgical Oncology. Accepted for publication December 11, 2018.

"Introduction: Technology to assess tissue perfusion is exciting with translational potential, although data supporting its clinical applications have been lagging. Patients who have undergone radiation are at particular risk of poor tissue perfusion, and would benefit from this expanding technology. We designed a prospective clinical trial using intraoperative indocyanine green angiography to evaluate for wound healing complications in patients undergoing salvage laryngectomy after radiation failure."

**Methodology:**

"Methods: This prospective trial included patients undergoing salvage laryngectomy at an NCI-designated tertiary cancer center between 2016 and 2018. After tumor extirpation and prior to reconstruction, 10mg of indocyanine green dye was infused and the fluorescence (FHYPO) and ingress rate of the pharyngeal mucosa was recorded. The primary outcome measure was the formation of a pharyngocutaneous fistula (PCF)."

**Results/Conclusion:**

"Results: Patients who developed a PCF had significantly lower FHYPO (87 vs 172,  $p < .001$ ) and ingress rates (6.7 vs 15.8,  $p = .043$ ) compared to those who did not develop a fistula. There were no fistulas in patients with FHYPO  $> 150$  ( $n=21$ ) or ingress  $> 15$  ( $n=15$ ). There was a 50% fistula rate in patients with FHYPO  $\leq 103$  ( $n=10$ ) and ingress rate  $\leq 6$  ( $n=6$ ).

Conclusion: Intraoperative indocyanine green angiography can assess hypoperfusion in patients and predict risk of PCFs after salvage laryngectomy, and can thus intraoperatively risk-stratify patients for post-operative wound healing complications."

**Reflection/Lessons Learned:**

This project has been the most meaningful research work I have done to date. It gave me the opportunity to partake in several parts of the process and to work with many different members of the Department of Otolaryngology. I have a great appreciation for what goes into this research, and it has set the stage for future research endeavors in residency and beyond. I'm particularly thankful for my mentor, Matt Spector, whose guidance and support have allowed me to explore these research interests over the past year.