



Improving outcomes in surgery for Crohn's disease

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No Disclosures





Admission for surgery

Patient related factors (e.g., age, co-morbidity, performance, BMI, smoking, alcohol...etc)

Disease related factors (e.g., type of cancer, disease activity index in IBD, disease, response to medical treatment ...etc)

Pre-operative optimization (e.g. nutrition, correction of anemia, physical exercise, medications, ...etc)



Surgical team related factors (e.g., skills, coordination, performance, tools, operation theatre ...etc)

Surgery related factors (e.g., type of resection, extent of resection, blood loss, anastomosis, operation time, ...etc)

Intra-operative physiological changes (e.g., type of anesthesia, blood gas, venous pressure...etc)



Post-operative complications (e.g., anastomotic leak, pneumonia, thrombo-embolic, ileus ...etc)

Enhanced recovery after surgery (e.g., nutrition, mobilization, pain control, laxatives, thrombo-prophylaxis ...etc)

Post-operative monitoring (e.g., blood investigations, physiological function, microbial profile ...etc)

Discharge after surgery





Philosophy of marginal gains

“If you broke down everything that could impact on a cycling performance and then

you improved every little thing by **1%**, when you clump it all together, you're going to get quite a **significant increase** in performance”

Dave Brailsford

British cycling coach and performance director

Courtesy of *Richard Hooper*





Admission for surgery



Surgical team related factors (e.g., skills, coordination, performance, tools, operation theatre ...etc)

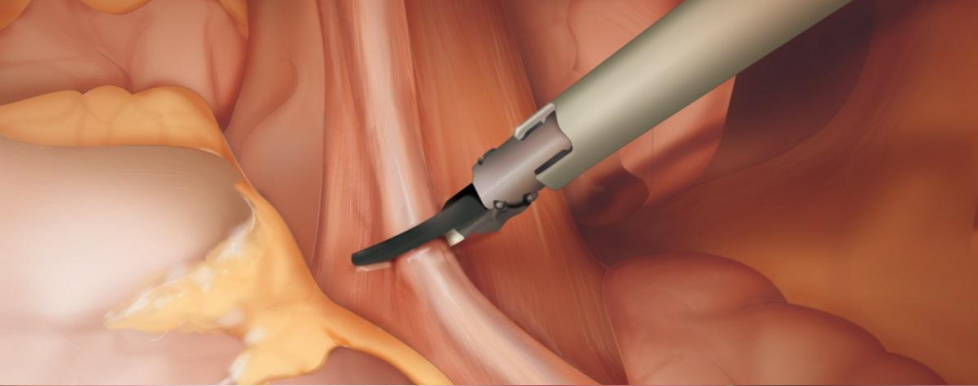
Surgery related factors (e.g., type of resection, extent of resection, blood loss, anastomosis, operation time, ...etc)

Intra-operative physiological changes (e.g., type of anesthesia, blood gas, venous pressure...etc)



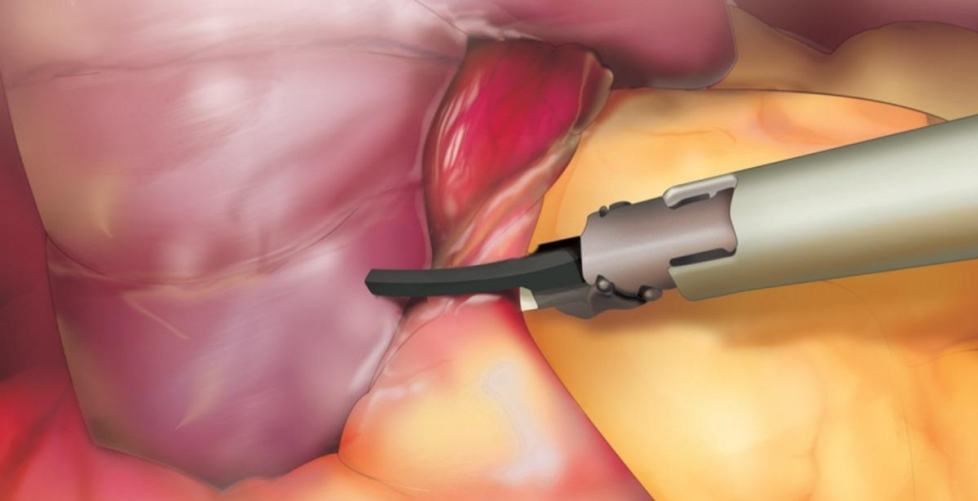
Discharge after surgery





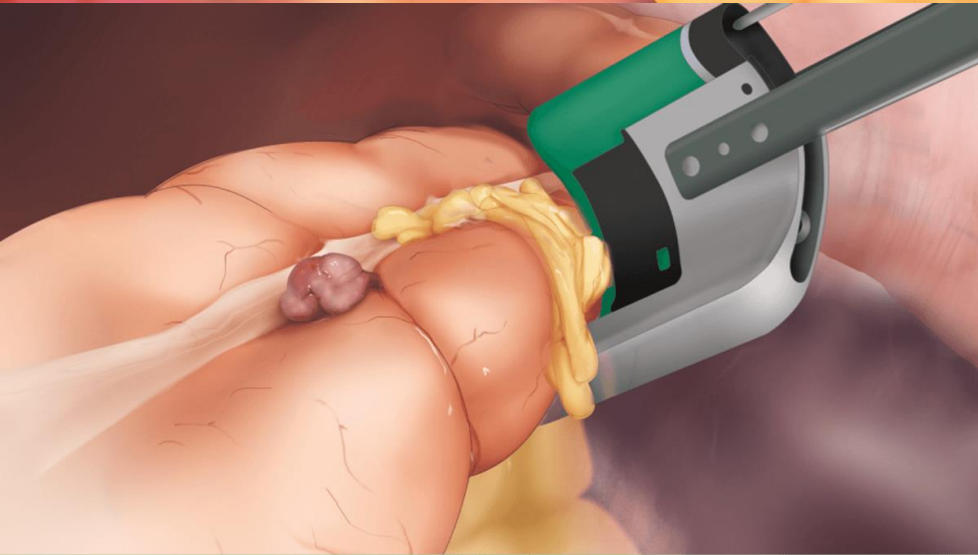
IBD surgeon why?

ESCP Collaborating Group 2018 The impact of stapling technique and surgeon specialism on anastomotic failure after right-sided colorectal resection. Colorectal Dis.



Elective surgery why?

Udholm 2021 A systemic review and metaanalysis of postoperative outcomes in urgent and elective bowel resection in patients with Crohn's disease. Int J Colorectal Dis.



Anesthesiologist is part of the team how?

Hallet 2023 Association Between Familiarity of the Surgeon-Anesthesiologist Dyad and Postoperative Patient Outcomes for Complex Gastrointestinal Cancer Surgery. JAMA Surg.





Crohn's disease pathogenesis?

CD is “thought” to result from an inappropriate **inflammatory response** to the **gut microbial flora** in **genetically predisposed individuals**





Mesentery poor evidence

Alshantti 2021 The role of Kono-S anastomosis and mesenteric resection in reducing recurrence after surgery for Crohn's disease: a systematic review. Colorectal Dis.

Anastomosis technique poor evidence

Alshantti 2021 The role of Kono-S anastomosis and mesenteric resection in reducing recurrence after surgery for Crohn's disease: a systematic review. Colorectal Dis.

Feng 2018 Stapled side-to-side anastomosis might be benefit in intestinal resection for Crohn's disease: A systematic review and network meta-analysis. Medicine (Baltimore).

He 2014 Stapled side-to-side anastomosis might be better than handsewn end-to-end anastomosis in ileocolic resection for Crohn's disease: a meta-analysis. Dig Dis Sci.





Resection margin controversial. Why?

Yzet 2023 Positive margins and plexitis increase the risk of recurrence after ileocecal resection. Dig Liver Dis.

Tandon 2021 Active Margins, Plexitis, and Granulomas Increase Postoperative Crohn's Recurrence. Clin Gastroenterol Hepatol.

Stricture-plasty in selected patients

Butt 2020 Strictureplasty versus bowel resection for the surgical management of fibrostenotic Crohn's disease: a systematic review and meta-analysis. Int J Colorectal Dis.

Bemelman 2018 ECCO-ESCP Consensus on Surgery for Crohn's Disease. J Crohns Colitis.



ATTENTION
PLEASE!





Extraction site/incision to be considered

Calini 2023 Incisional hernia rates between intracorporeal and extracorporeal anastomosis in minimally invasive ileocolic resection for Crohn's disease. Langenbecks Arch Surg.

Laparoscopic versus open important

Bemelman 2018 ECCO-ESCP Consensus on Surgery for Crohn's Disease. J Crohns Colitis.

Length of resected/remained bowel very important

Hendel 2017 Systematic review of pre, peri and postoperative factors and their implications for the lengths of resected bowel segments in patients with Crohn's disease. International Journal of Surgery Open



PRE-OPERATIVE DATA

Parameter	Result	Reference range	Flag
Hemoglobin	4.9 g/dL	12-16 g/dL	Low
Total white cell count	4.4 x 10 ⁹ /L	4.0-10 x 10 ⁹ /L	Normal
Platelet count	152 x 10 ⁹ /L	150-400 x 10 ⁹ /L	Normal
Mean corpuscular volume	117.4 fL	77-101 fL	High
Mean corpuscular hemoglobin	103.2 pg	115-145 pg	Low
Mean corpuscular hemoglobin concentration	88.1 g/dL	115-145 g/dL	Low
Red cell distribution width	15.1 %	11.5-14.8 %	High
Reticulocyte count	0.0 %	0.0-1.0 %	Normal
Prothrombin time (PT)	13.0 sec	11.5-14.5 sec	Normal
International normalized ratio (INR)	1.0	0.8-1.1	Normal
Fibrinogen	375 mg/dL	200-500 mg/dL	Normal
D-dimer	0.15 µg/mL	<0.5 µg/mL	Normal
Ferritin	100 µg/L	<200 µg/L	Normal
Iron	110 µg/L	50-150 µg/L	Normal
Total iron binding capacity	443 µg/L	450-600 µg/L	High
Transferrin saturation (TSAT)	24.8 %	20-50 %	Normal
Alkaline phosphatase (ALP)	108 U/L	30-100 U/L	High

INTRA-OPERATIVE DATA

Arterial Blood Gas Analysis

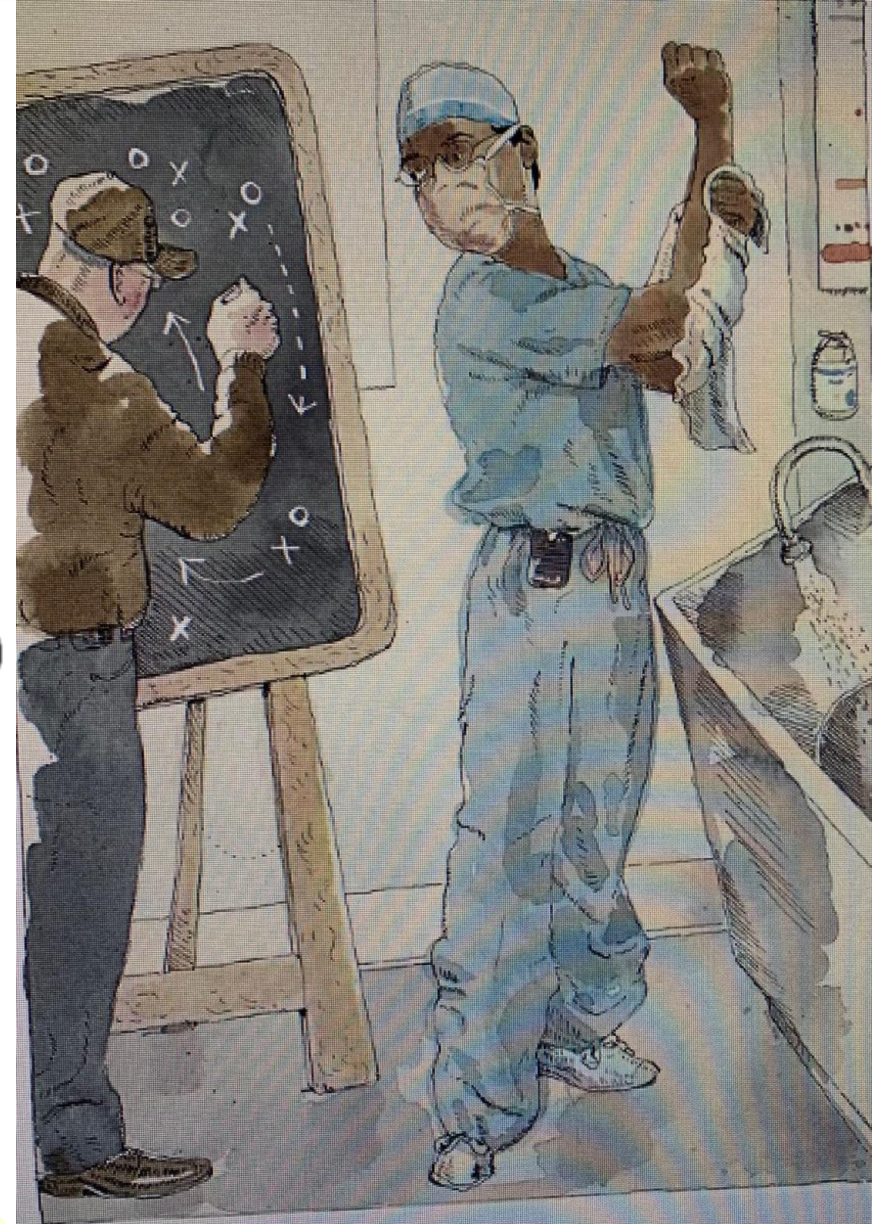
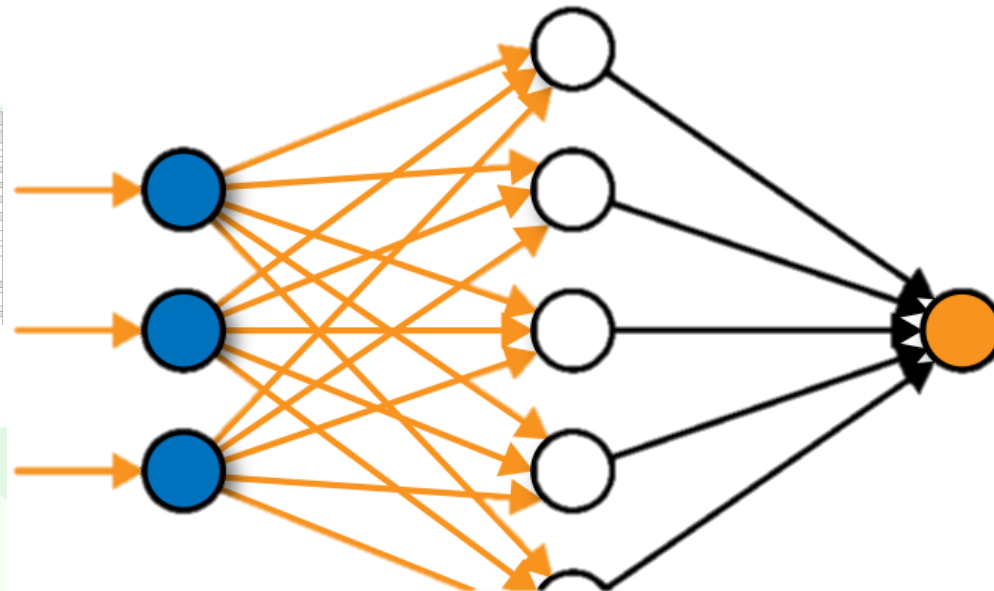
Parameter	Result	Reference range	Flag
pH	7.38	7.35-7.45	Normal
PO ₂	100	75-100	Normal
PCO ₂	35	35-45	Normal
HCO ₃ ⁻	22	22-28	Normal
Base excess	-1	-2 to +2	Normal
Base deficit	1	0-2	Normal
Lactate	1.5	<2	Normal
Glucose	100	70-100	Normal
Urea nitrogen	10	8-20	Normal
Creatinine	1.0	0.7-1.3	Normal
Bilirubin	1.2	<1.2	Normal
Aspartate aminotransferase (AST)	15	0-37	Normal
Alanine aminotransferase (ALT)	15	0-40	Normal
Gamma-glutamyl transferase (GGT)	15	0-40	Normal
Alkaline phosphatase (ALP)	108	30-100	High

POST-OPERATIVE DATA

Identifying movements in laparoscopic surgery

- Time spent
- Direction of movement
- Success achieving the aim
- Results accomplished
- Control of bleeding
- Cutting through adhesences

Artificial intelligence to improve surgeon's performance



See AIS channel for details about AI in surgical research and innovation

More about Innovation in **Surgery?**



OSRC. network



Website: <https://osrc.network>
Email: contact@osrc.network
LinkedIn: <https://www.linkedin.com/company/osrc>
Twitter: <https://twitter.com/opsore>



Breeding innovators through workshops, courses and research



OpenSourceResearch 2022

Implementing information technologies in medical research

Vang Le
Senior data scientist
Denmark

Nir Horesh
Surgeon, entrepreneur
Israel & USA

Lalit Al Hachkar
Chairman
Germany

Jasbir Waraich
Member
UK

Ara Mirzaei
Member
Spain

Elyan Samir
Member
Australia

All Youkhana
Chairman
Turkey

Wahid Kamel
Member
Egypt

Paul Sergio Ribeiro
Member
Brazil

Auf Rahim
Member
India

Wael Sleem
Member
Egypt

Marwa Elmal
Member
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Wahid Kamel
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