Project Title

Optimal Care Index (OCI): A novel healthcare index showing holistic outcomes improvement for Acute Cholecystitis by an Acute Surgical Care Model

Project Lead and Members

Project lead: Chia Luck Khng Clement

Project members: Lee Jin Keat Daniel, Rao Anil Dinkar, Tan Ming Yuan, Gunasekaran Sivaraj, Tan Enjiu Pauleon, Ong Weijie Marc, Kang Min Li

Organisation(s) Involved

Khoo Teck Puat Hospital

Healthcare Family Group(s) Involved in this Project

Medical

Applicable Specialty or Discipline

General Surgery

Project Period

Start date: Not Available

Completed date: Not Available

Aims

Aim to evaluate the impact of an Acute Surgical Care Model (ASCM) using Optimal Care Index (OCI), a novel holistic index that incorporates patient's function, cost and experience into the traditional clinical model.

Project Attachment

See poster attached/below

Background

See poster attached/below

Methods

See poster attached/below

Results

See poster attached/below

Conclusion

See poster attached/below

Additional Information

Accorded the NHG Quality Day 2021 (Category A: Improving and Sustaining Quality & Safety) Merit Award

Project Category

Technology

Product Evaluation, Evaluation Criteria

Care & Process Redesign

Quality Improvement, Job Effectiveness

Keywords

Acute cholecystitis, laparoscopic cholecystectomy, Optimal Care Index

Name and Email of Project Contact Person(s)

Name: Dr Chia Luck Khng Clement

Email: chia.clement.lk@ktph.com.sg

Optimal Care Index (OCI): A novel healthcare index showing holistic outcomes improvement for Acute Cholecystitis by an Acute Surgical Care Model

Chia CLK[1], Lim W.W.[1], Liu N.Y.[2], Ng Y.F.[2], Tang T[3], Tan KY[1], Goo T.T.[1]

[1]General Surgery, [2]Corporate Development, [3]Office of Clinical Informatics

Khoo Teck Puat Hospital

Mission Statement

- Acute cholecystitis (AC) is one of the most common surgical emergencies.
- Index admission early laparoscopic cholecystectomy (ELC) improves outcomes compared to delayed laparoscopic cholecystectomy (DLC) performed 6 weeks later but is often constrained by logistical limitations.
- We **aim** to evaluate the impact of an Acute Surgical Care Model (ASCM) using Optimal Care Index (OCI), a novel holistic index that incorporates patient's **function**, **cost** and **experience** into the traditional clinical model.

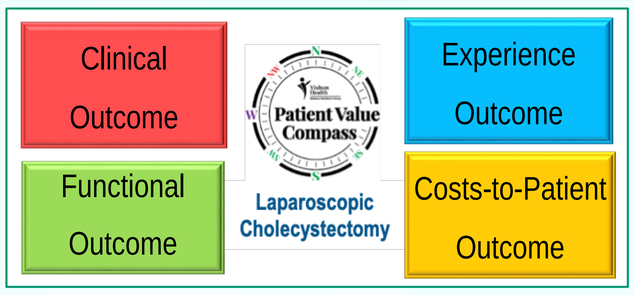
Team Members

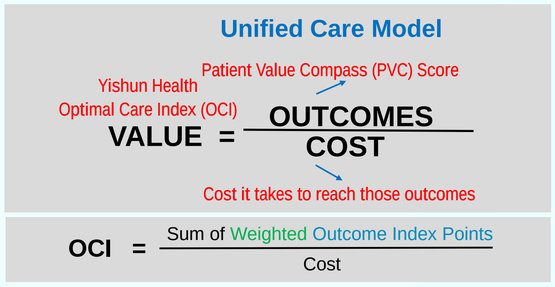
	Name	Designation	Department
Team Leader	Chia Luck Khng Clement	Consultant	General Surgery
Team Members	Lee Jin Keat Daniel	Consultant	General Surgery
	Rao Anil Dinkar	Consultant	General Surgery
	Tan Ming Yuan	Consultant	General Surgery
	Gunasekaran Sivaraj	Consultant	General Surgery
	Tan Enjiu Pauleon	Consultant	General Surgery
	Ong Weijie Marc	Consultant	General Surgery
	Kang Min Li	Snr Staff Physician	General Surgery

Evidence for a Problem Worth Solving

- DLC predisposes to unplanned readmissions, high dependency stay and invasive interventions with downstream effect on function, cost and perceived value to patients.
- The traditional 24-hour on-call team model has competing requirements from both emergency and elective work and ability to perform ELC during the index admission is limited.
- Beyond 72hours of symptoms onset during index admission, surgery is also considered more treacherous, further limiting suitability of ELC.[1]

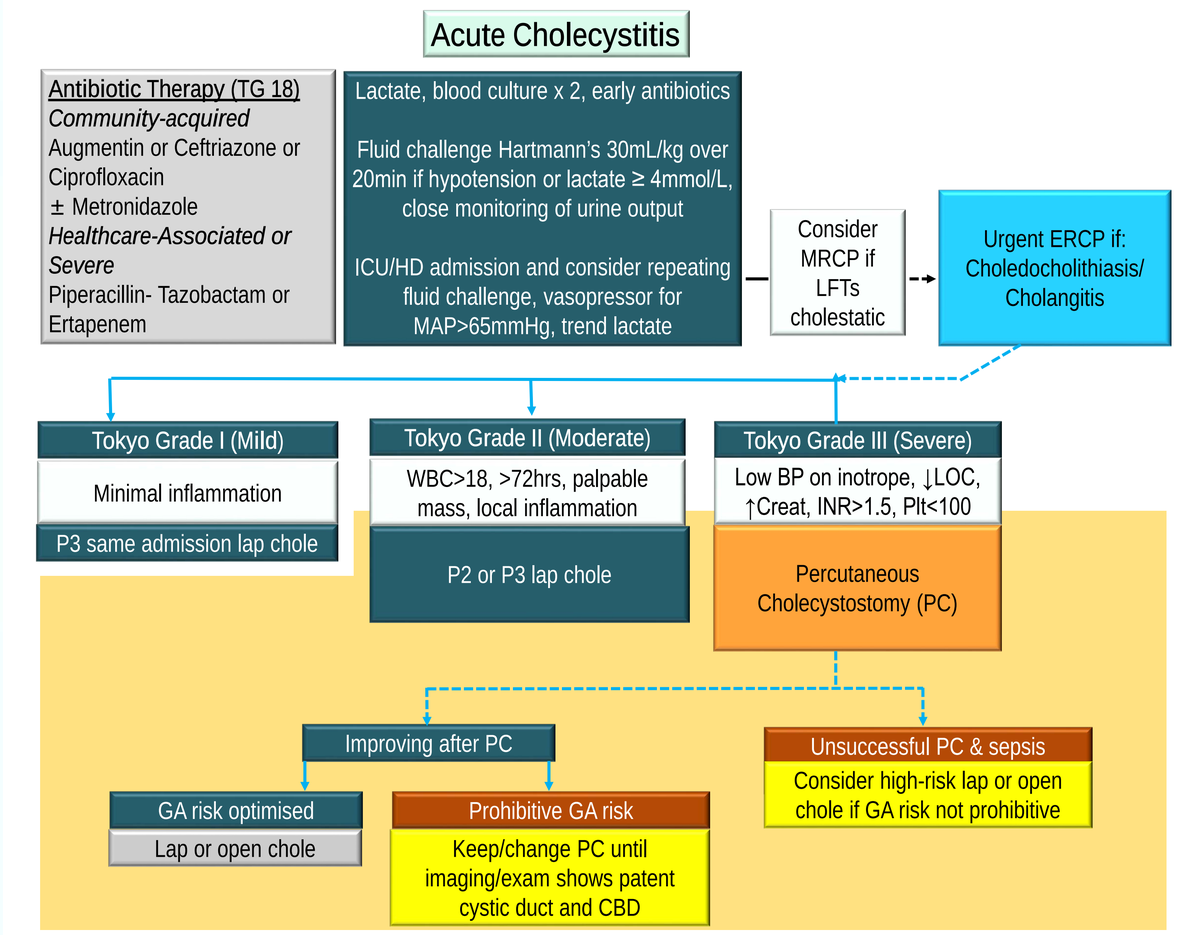
Process Care Redesign & Implementation



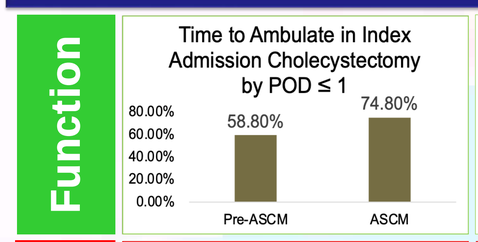


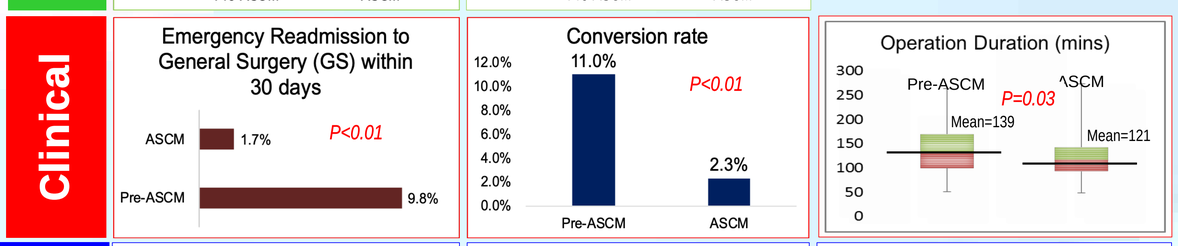
- We introduced a dedicated ASCM in our department, which is helmed by the Emergency Surgery and Trauma (ESAT) team.
- ESAT functions by separating acute and elective work streams and manages all emergency case referrals.
- The team set out to compare the outcomes of cholecystectomies before (August 2013-2014) and after (August 2017-2018) the implementation of ASCM and OCI.

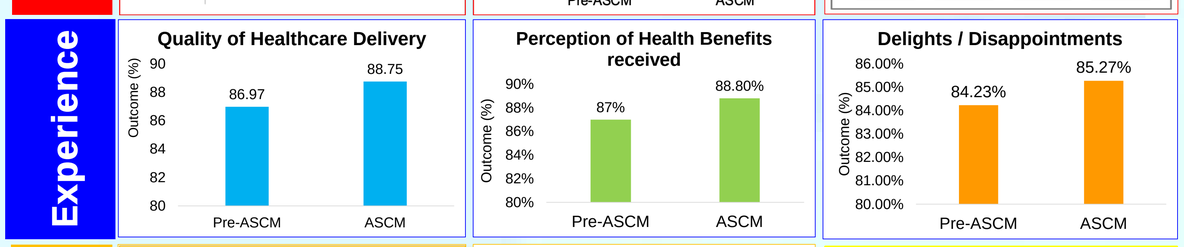
Protocol for Management of Acute Cholecystitis during ASCM Period[2]

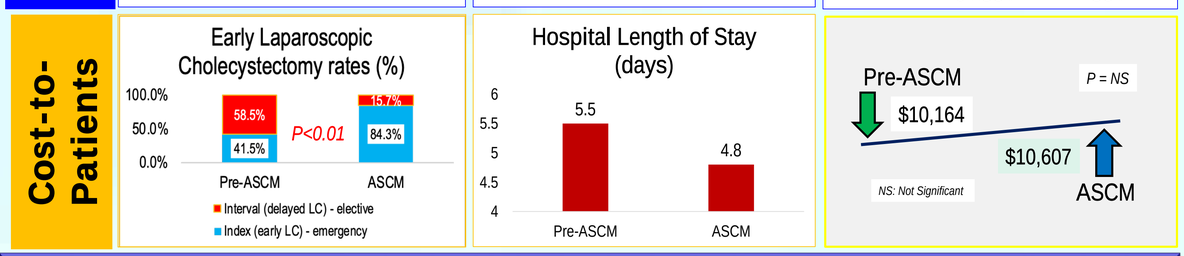


Results









Value Gain

OCI/$1,000			PVC Score			Total Cost For Providing Care (SGD$)		
PVC Score Gain per $1,000 Spent			Total Weighted PVC Score					
Pre-ASCM	ASCM	%Change	Pre-ASCM	ASCM	%Change	Pre-ASCM	ASCM	%Change
4.2	8.1	**+ 92.5**	42.6	85.6	**+ 101%**	$10,164	$10,607	**+ 4%**

Project Impact

- Via **care redesign,** ASCM has made significant **holistic** impact on patients with AC.
- We achieved **excellent clinical outcomes** with ASCM and our work has been peer reviewed and achieved **international recognition** through our publications in Australia/New Zealand[1] and Europe[2].
- Our novel in-house 'Modified Strasberg' operative technique for ELC has secured a prestigious oral presentation at World Congress of Surgery, Poland 2019 and represents **surgical innovation**.
- We also led a **national** study[3] on the impact of COVID-19 on the management of AC and paved the way for future multicenter **collaboration**.
- Despite an increase in operation Table code from 4a to 4c during ASCM era to recognize the greater technical difficulty of ELC, we were able to keep overall costs similar and increase **value** gained by patients.
- ASCM made care **safer, more efficient,** increase **earlier return to function, increase satisfaction rates** and **value** delivered to patients.
- The implementation of OCI represents the successful **union of clinical and administrative arms of the hospital** in creating a holistic healthcare model to elevate us to the next pedestal of the patient care journey.

Strategies to Sustain

- The ASCM has a weekly rotating consultant roster to ensure sustainability and avoid burnout.
- Auditing results of new surgeons rotated to ASCM through the application of **CUSUM analysis methodology** to ensure **safety** and **quality** of surgery is maintained.
- We also further audited our results from Sept 2018 – Sept 2019 which showed **sustenance, consistency** and improvement of clinical results from pre-ASCM.
- We are in the midst of publishing the OCI which is **uniquely KTPH, YH, NHG** to document and enable **reproducibility** in other healthcare settings.

Conclusion

- The ASCM has increased ELC rates and shown **holistic** improvements in outcomes of patients with AC.
- The OCI is a **patient centric** novel healthcare index that provides a holistic measurement of surgical outcomes.

REFERENCES

1.CLK Chia, J Lu, S Goh, D JK Lee, Anil D Rao, WW Lim, TT Goo. Early laparoscopic cholecystectomy by a dedicated Emergency Surgical Unit confers excellent outcomes in acute cholecystitis presenting beyond 72 hours. 4 Sept 2019 ANZ Journal of Surgery.

2.Goh, S., Chia, CLK., Ong, J. W., Quek, J., Lim, W. W., Tan, K.Y, Goo, TT. Improved outcomes for index cholecystectomy for acute cholecystitis following a dedicated emergency surgery and trauma service (ESAT). Feb 4 2020 European Journal of Trauma and Emergency Surgery.

3.Chia CLK, Oh HB, Tousif K et al. Impact of COVID-19 Pandemic on Management of Acute Cholecystitis in Singapore. Ann Acad Med Singap 2020;49:817-24