Increasing the Evaluation of Patients with Extremely Elevated Cholesterol for Familial Hypercholesterolemia (FH) in Toa Payoh Polyclinic

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Mission Statement

To increase the percentage of patients with LDL > 4.9 mmol/L* or TC > 7.5 mmol/L** being evaluated for possible or definite Familial Hypercholesterolemia (FH) using Simon Broome Diagnostic Criteria, with Endocrine referral offered if criteria fulfilled from 12.5% to 100% over 6 months in Toa Payoh Polyclinic.

*LDL: Low-density Lipoprotein **TC: Total Cholesterol

Team Members

NAME	DESIGNATION	DEPARTMENT	ROLE
Dr Samuel Tay Rong Yao	Resident Physician	Medical	Team Leader
Dr Vittal Sunil Pawar	Senior Resident	Medical	Member
Dr Amelia Binte Ahmad Hatib	Family Physician	Medical	Member
Blessy Koottappal Mathew	Advanced Practice Nurse	Nursing	Member
Tan Poh Ching	Clinical Pharmacist	Pharmacy	Member
Won Tin Chiang	Dietitian	Dietetics	Member
Rekha Mitrina Balasubramaniam	Senior Staff Nurse	Nursing	Member
Dr Tan Khai Wei	Family Physician	Medical	Sponsor
Dr Ian Koh Jan Ming	Family Physician	Medical	Supervisor

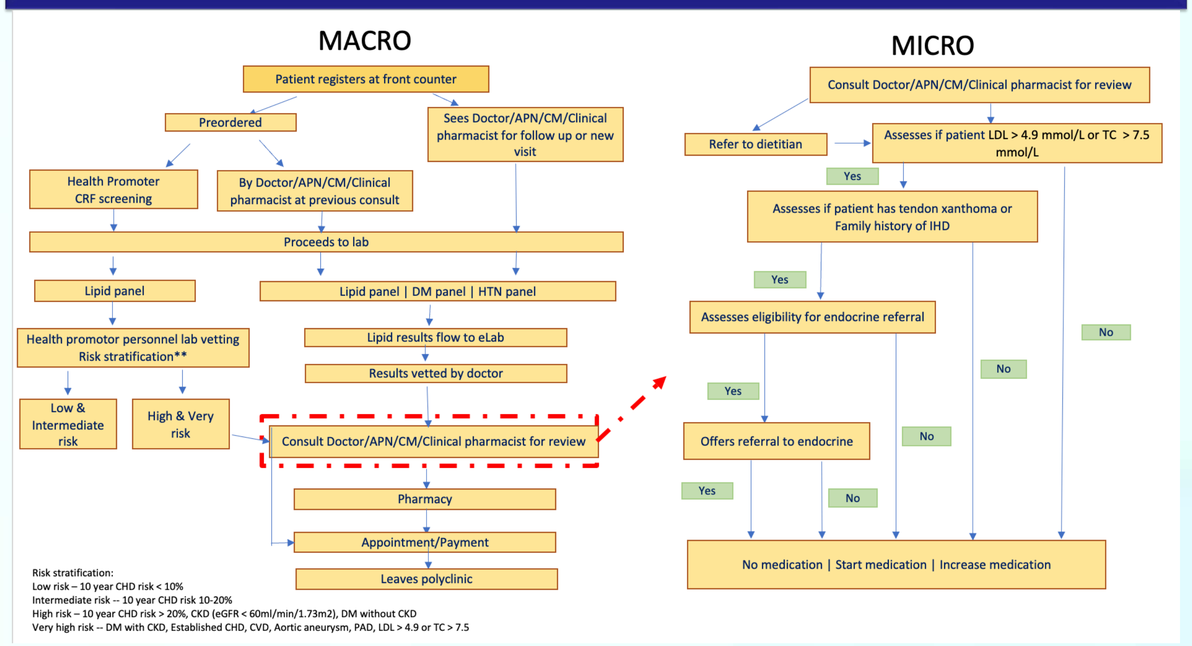
Evidence for a Problem Worth Solving

- Prevalence of Clinical FH internationally is approximately 1 in 250, translating to about 20000 cases in Singapore. However, FH is severely underdiagnosed, with < 1% being diagnosed in most countries.
- Formal diagnosis is important as the risk of premature cardiovascular disease is increased 20 fold[4]. Early identification and optimization of treatment using medications reduce this risk by more than 80%. Diagnosis also allows for cascade family screening and prompt treatment in childhood from age 8-10.
- Underdiagnosis of FH is largely due to underscreening, as reported by World Health Organization (WHO) as at most 30%. Screening is done using validated tools such as the Simon Broome Trust Diagnostic Criteria. Patients diagnosed with clinical FH based on criteria should be referred to a specialist for optimization of medical therapy, genetic testing and cascade screening.

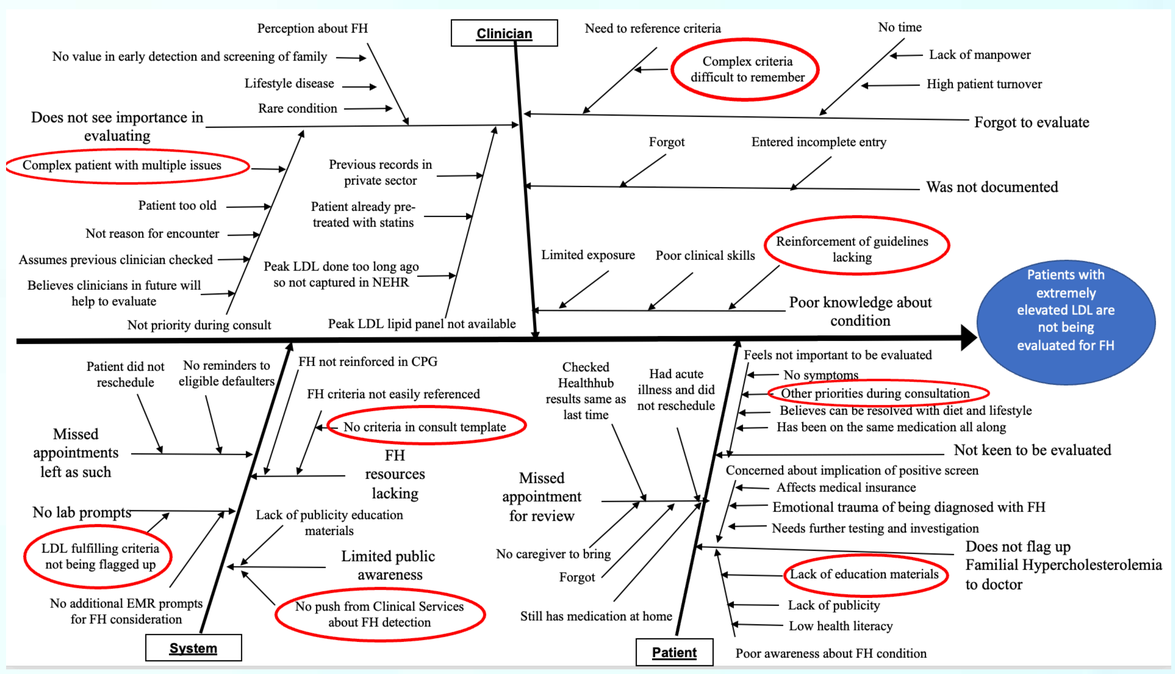
Current Performance of a Process

In Toa Payoh polyclinic, out of 177 patients with lipid panels from July - Dec 2019 fulfilling LDL > 4.9 mmol/L or TC > 7.5 mmol/L, only 12.5% were correctly evaluated for FH.

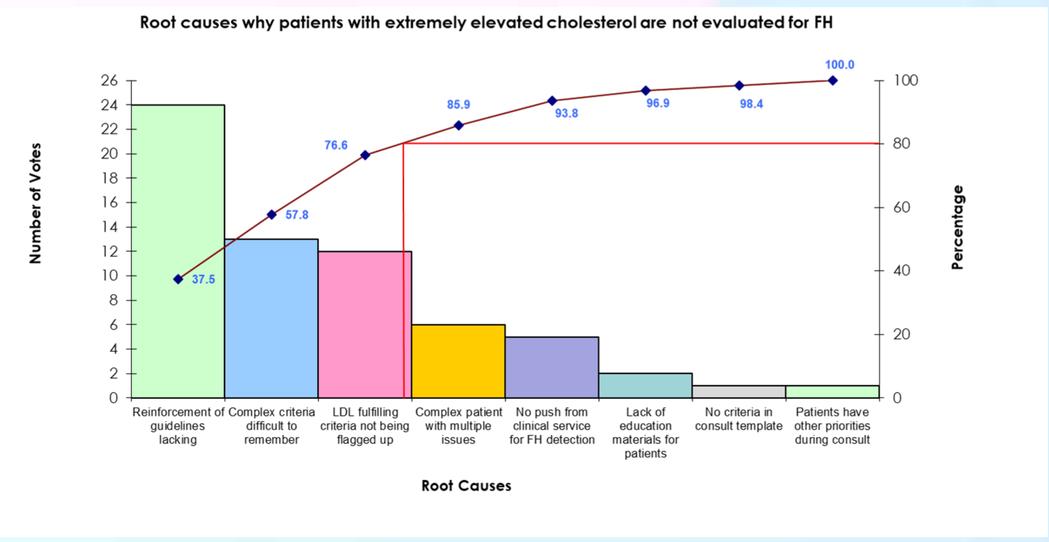
Flow Chart of Process



Cause and Effect Diagram

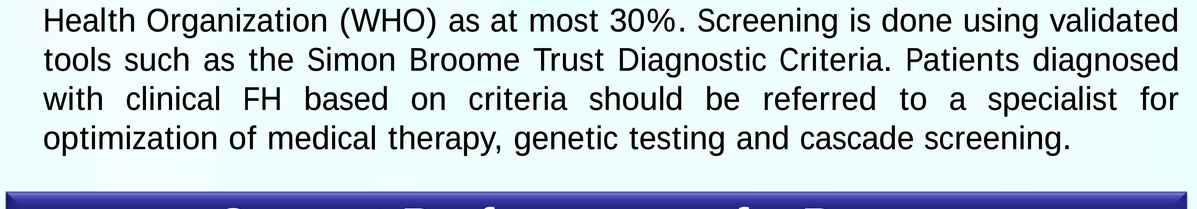


Pareto Chart

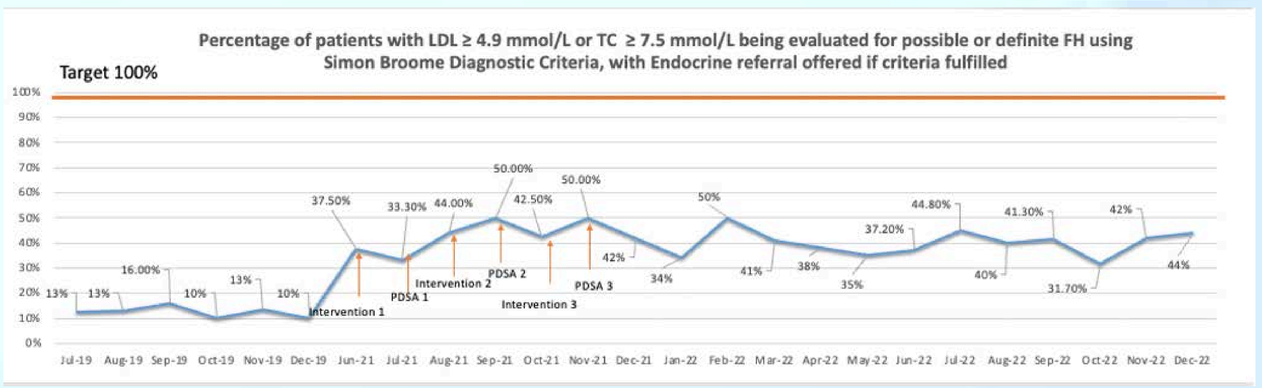


Implementation

CAUSE	INTERVENTION	DATE
1)Reinforcement of guidelines lacking	**Clinic-based lunchtime Continuing Medical Education:** Internal CME to healthcare professionals (HCP) in polyclinic to educate them about FH	1st Jun 2021
	1st PDSA: 1-page summary information sheet and CME slides were sent to those who did not attend while the former was sent to those who attended but did not evaluate FH	1st Jul 2021
2) Complex criteria difficult to remember	**Development of acronym:** Acronym developed to aid with evaluating FH during consult and printed out on A5 visual cards	1st Aug 2021
	2nd PDSA • Visual card was then blown up to A4 size and included age for family history of AMI and bolded lipid cut off values.	1st Sep 2021
3) LDL fulfilling criteria not being flagged up	**Smartphrase creation for results vetting -** Created a smartphrase ".samuelFH" to flag lipid cut off values by result vetting doctor, sent daily reminders to import smartphrase into result note for reviewing doctor to apply evaluation in consult.	1st Oct 2021
	3rd PDSA: Conducted briefing during zoom roll call to import smartphrase and flag up abnormal lipid panels when vetting own results.	1st Nov 2021
Sustained interventions post project	NHG Healthier SG primer for General practice: Asynchronous e-learning chronic care 101 with coverage on FH and 1 CME point for each module completed, team-based skills workshop	Nov 2022
	Projected was selected for presentation at NHG SMM (Senior management meeting) and NHG Board meeting.	Feb 2023



Results



The 6 month data from the project saw a consistent improvement and maintenance in the percentage of the patients being evaluated for FH during consult from baseline of 12.5% to 33-50% in Toa Payoh Polyclinic.

The 12 month data post project saw a maintenance in the percentage of the patients being evaluated for FH during consult from 31.7-50% in Toa Payoh Polyclinic.

Cost Savings

Cost effectiveness for FH screening (both opportunistic and cascade) and treatment in terms of the money saved from avoidance of CVS events if all relatives of index cases were identified and treated optimally.

Problems Encountered

The outcome of our interventions may have been underestimated as in reality, as supported by findings from our patient survey, most, if not all would not know the lipid values of their relatives or if they have tendon xanthomas.

Strategies to Sustain

- Revision to current FH section in NHGP clinical practice guidelines (CPG) to emphasize identification of FH in primary care
- NHGP wide CME in collaboration with FH care and Endocrine SAG
- Converting 1 page information sheet and HEART acronym into QR code for easy access by other polyclinics