Chest Pain Triaging With Automated Appointment Booking

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Background

Chest pain is a common condition referred to the National Heart Centre Singapore (NHCS). However, some of these referrals may not be appropriate. Inappropriate referrals add unnecessary anxiety and cost to the patients and their caregivers and impose additional burden on our precious healthcare resources.

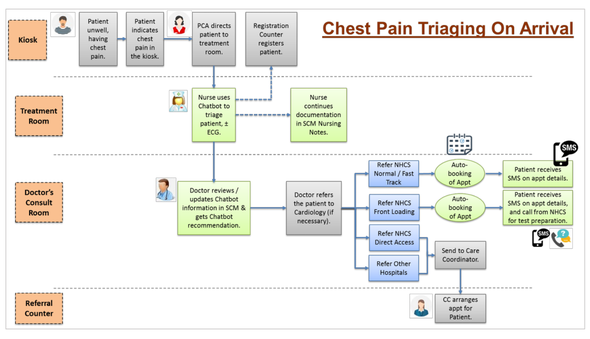
Currently, referrals to NHCS for investigations or specialist reviews are still manually done. As a result, it is manpower dependent and patients also have to wait at the polyclinic while their appointment for specialist care is being booked.

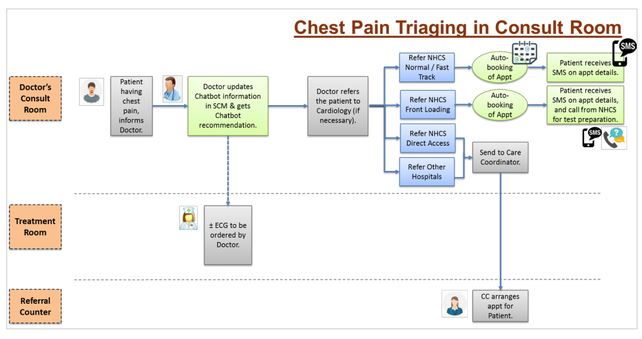
Aims

- ✓ To develop a digital Chest Pain triaging platform to assist primary care clinicians
- ✓ To automate process for referrals from SingHealth Polyclinics (SHP) to National Heart Centre Singapore (NHCS) for relevant investigations and specialist reviews.

Methodology

- ❖ Engagement of all stakeholder groups, including clinical as well as ops staff from both NHCS and SHP, to map out the operational workflows

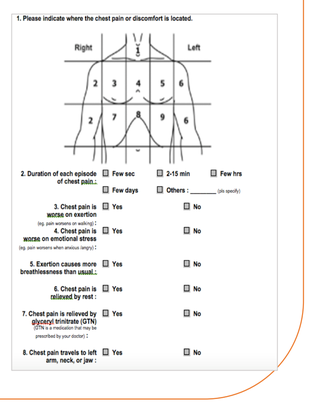




- ❖ Implemented a risk scoring matrix from the internationally recognised Coronary Artery Disease (CAD) Consortium. The risk-adjusted recommendations are as follows:

Risk Score		
<3%:	No test/referral unless patient requests. KIV direct access	
3-8%:	Direct access if clinically relevant	
8-20%: (within 2 months)	<40y	Threadmill (TMX) first choice If unable to exercise, DSE
	>40y	Myocardial perfusion scan (MIBI) first choice CTCA if available
20-50%: (within 1 month)	<40y	TMX echo first choice If unable to exercise, DSE
	>40y	MIBI first choice (Computed Tomography Coronary Angiogram) if available
>50%	Fast track (within 2 weeks). Start antiplatelet therapy, Glyceryl Trinitrate , statin, beta-blocker if no contraindications	

- ❖ Through a Call-For-Collaboration by IHiS, we worked with Key Reply vendor to implement the CAD questionnaire into an electronic platform
- ❖ Worked closely with IHiS & Ops staff to enhance our appointment system to enable automatic booking of NHCS appointments



Benefits

- Support clinical decision making and Improve referral appropriateness for Chest Pain to NHCS
- Reduce unnecessary SOC visits through frontloading tests
- Reduce time to diagnosis
- Improve productivity by reducing reliance on counter staff for appointment making
- Reduce patients' waiting time at SHP for appointment making

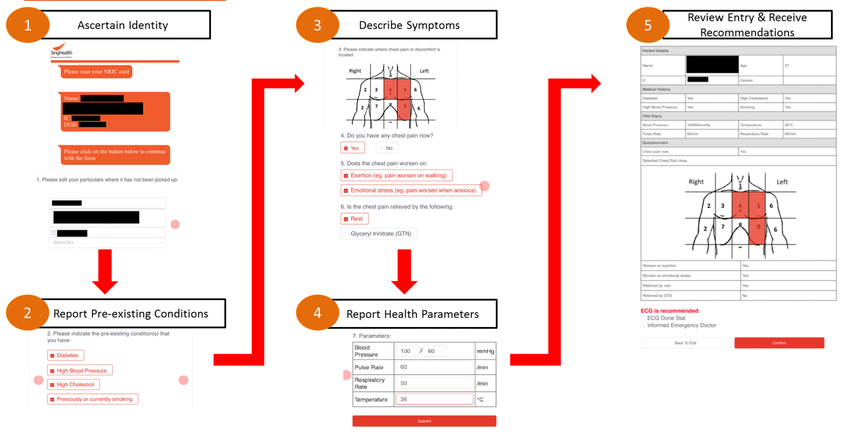
Results

Electronic Triaging Platform

Implemented since Aug-19

Chatbot Triage

Defined rules-based protocols integrated with EMR



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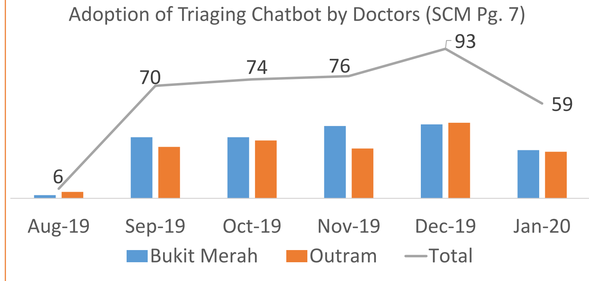
Recommendations based on risk stratification

Automatically & seamlessly get appointment for front-loading tests & NHCS consult (via SMS)

Adoption of Triaging Chatbot by Doctors (SCM Pg. 7)



SMS Sent	No.	%
Success	931	94.8%
Not Successful	51	5.2%

Auto-Booked Cases to NHCS from Aug 2019 to Jan 2020

Polyclinic	Referral to NHCS Fast Track	Referral to NHCS Normal	Referral to NHCS Front-Loading	Total
Bukit Merah	131	273	32	**436**
Outram	215	286	45	**546**
Total	**346 *(35.2%)***	**559 *(56.9%)***	**77 *(7.8%)***	**982 *(100%)***

Auto-booking	No.	%
Success	732	74.5%
Partial Success	6	0.6%
Not Successful	244	24.8%

**Partial Success refers to the frontloaded cases where either the test or consult appointment is successfully auto-booked*

Conclusion

We are the first in public healthcare in Singapore to successfully implement a specialist chest pain triaging platform at a primary care setting, coupled seamlessly with automated appointments for investigations or cardiologist referral. Through this project, we addressed process issues and worked closely with all stakeholders to test the workflow and feasibility of leveraging technology to augment clinical decision with auto-booking of appointments. Even beyond this initial pilot, the project team is also actively exploring to scale the platform beyond the pilot sites, as well as including other conditions beyond chest pain. This will enable us to deliver more seamless patient-centric care while still ensuring good care outcomes in a sustainable manner.