Future Outpatient Journey: Enhanced Operations with Chest Pain Triaging & Automated Appointment Booking

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Introduction

Chest pain is a common condition referred to the National Heart Centre Singapore (NHCS). Currently, appointments made to NHCS for investigations or specialist reviews are being booked by a polyclinic staff. As a result, it is manpower dependent and patients have to wait at the polyclinic while their appointment for specialist care is being booked.

This project seeks to develop a digital Chest Pain triaging platform to assist primary care clinicians in determining the patients' Coronary Artery Disease (CAD) risk score, recommend the course of action, and to automate process for referrals from SingHealth Polyclinics (SHP) to NHCS for relevant investigations and specialist reviews.

Methodology

Engagement of all stakeholder groups, including clinical, nursing and ops staff from both NHCS and SHP, to map out the operational workflows.

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Implemented a risk scoring matrix from the internationally recognised CAD Consortium. The risk-adjusted recommendations are as follows:

Risk Score Recommendation

- **<3%:** No test/referral is recommended
- **3-7.9%:** No test/referral is recommended. Direct access treadmill (TMX) if clinically relevant
- 8-19.9%: <40y Consider referral for front loading TMX
 - ≥40y Consider referral for front loading Myocardial perfusion scan (MIBI)
- **20-49.9%:** <40y Consider referral for front loading TMX echo

≥40y Consider referral for front loading MIBI

≥50% Consider starting of antiplatelet, beta blocker, statin and GTN as appropriate and Fast Track cardiology consult

Results

Electronic Triaging Platform

Implemented since Aug '19

Chatbot Triage



Defined rules-based protocols integrated with EMR

Describe Symptoms

Do you have any chest pain now

Emotional stress (eq. pain worsen when anxio)

Report Health Parameter

6. Is the chest pain relieved by the following

Glyceryl trinitrate (GTN

Parameters

Pulse Rate Respiratory

Yes

Rest



<u>Outcomes</u>	Auto-Booked Cases to NHCS from Aug 2019 to Jun 2021
	(Includes non-chest pain referrals)

Polyclinic	Referral to	Referral to NHCS Normal	Referral to	Total	Auto-booking	No.	%
	NHCS Fast Track		NHCS Front- Loading		Success	2,912	73.4%
Bukit Merah	576	1,055	100	1,731	Partial	25	0.6%
Outram	971	1,102	164	2,237	Success*		
Total	1,547	2,157	264	3,968	Not	1,031	26.0%
	(39.0%)	(54.4%)	(6.7%)	(100%)	Successful		

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

Productivity Benefits

- Support clinical decision making and Improve referral appropriateness for Chest Pain to NHCS
- Reduce unnecessary SOC visits through frontloading tests With 264 cases frontloaded, 264 SOC visits were reduced





Recommendations based on risk stratification

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

- ✓ Reduce time to diagnosis
- Improve productivity by reducing reliance on counter staff for appointment making – With 2,912 appointments auto-booked to NHCS, 315hrs of PSA time at SHP were saved
- ✓ Reduce patients' waiting time at SHP for appointment making

Conclusion

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.