



Rethinking Care Efficiency: Insights and Opportunities



Eastern General Hospital
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INTRODUCTION

Excessive referrals and over investigations increase healthcare costs without improving patient outcomes and may be associated with negative consequences such as extended appointment waiting time and poor patient satisfaction. Understanding the extent of such practices is an important step towards developing an efficient and cost-effective health care system.

OBJECTIVE

The aim of this multi-centre study is to identify areas where there are potentially inefficient or ineffective care, focusing on the utilisation of the following services:

1. Inpatient inter-departmental referrals.
2. Radiology investigations.
3. Laboratory investigations.



METHODOLOGY

Literature review and extraction of SingHealth data with focus on the following -

1. INPATIENT REFERRALS:

Inpatient referrals to selected Singapore General Hospital (SGH) medical specialties from January to June 2023 were reviewed for appropriateness.

2. RADIOLOGICAL INVESTIGATIONS:

CT Head scan reports from Changi General Hospital (CGH) between January and December 2019 were scored from 1 to 5, where higher scores indicated greater abnormality. **Excluding trauma and stroke.*

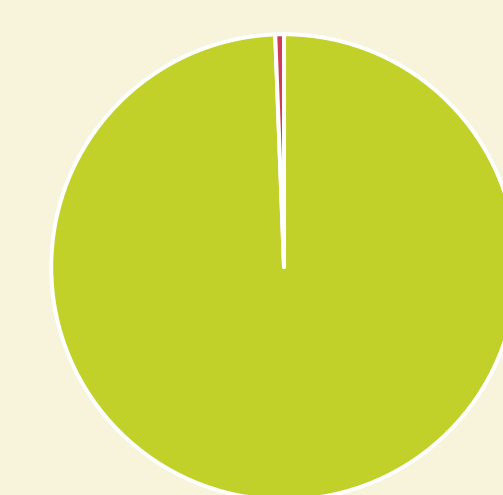
3. LABORATORY INVESTIGATIONS:

Laboratory data from SGH between January and June 2023 were reviewed to identify and analyze results of tests repeated within 3 days.

RESULTS

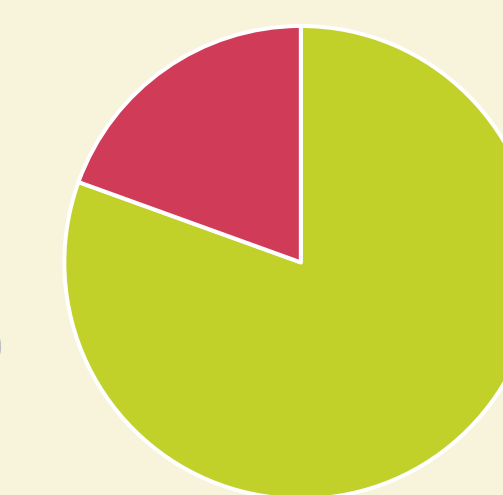
I. INPATIENT REFERRALS

There is significant variation in the rate of inappropriate referrals among medical specialties, ranging from **below 1%** to **24%**.



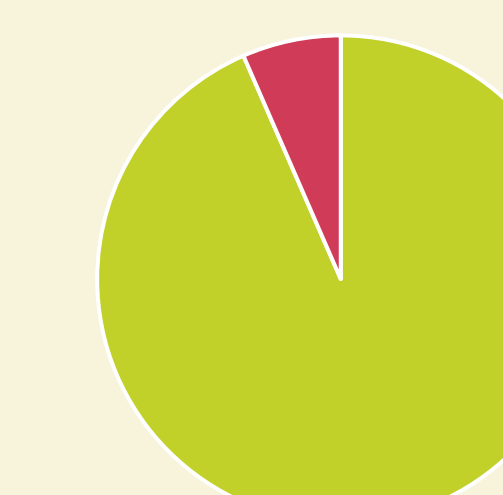
RCCM
0.6%

Inappropriate



NEPHRO
24.2%

Inappropriate

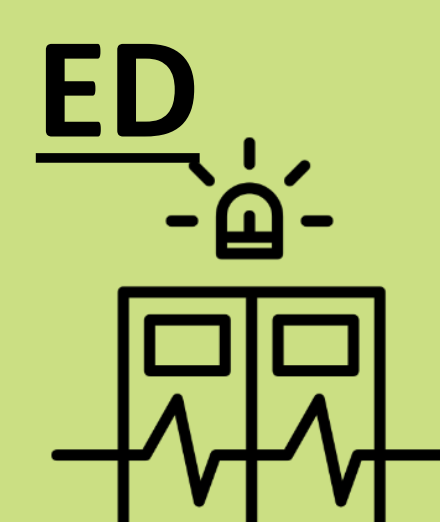


GASTRO
7%

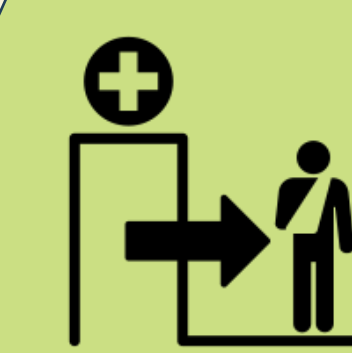
Inappropriate

II. RADIOLOGICAL INVESTIGATIONS

Common indications for CT head scans included **VERTIGO, DIZZINESS, and HEADACHE**. A high proportion of these scans had **insignificant findings** (scores of 1 and 2).



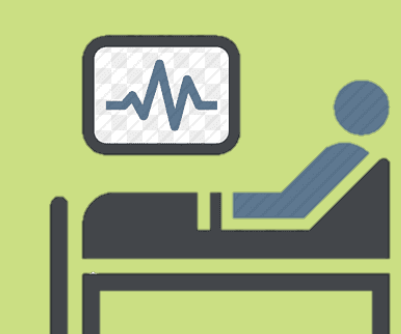
70% of total
91%
insignificant



13% of total
87%
insignificant

Outpatient

Inpatient

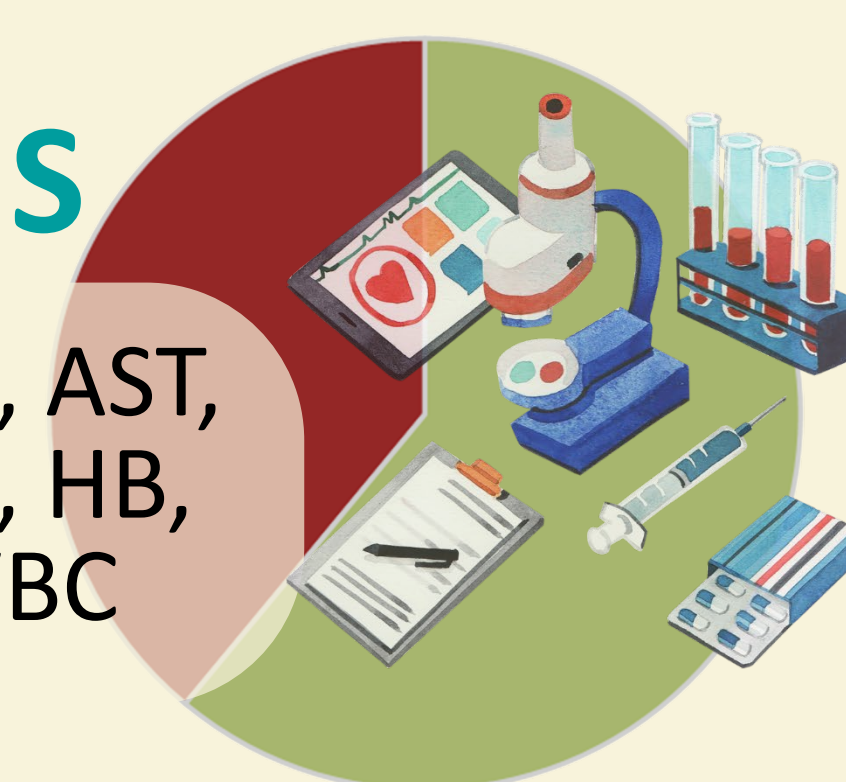


17% of total
87% insignificant

III. LABORATORY INVESTIGATIONS

On average **39%** of tests repeated within three days were **NORMAL**. **21%** of **these tests** comprised both initial and second tests with **normal results**.

ALT, TBIL, AST,
CRE, UR, HB,
PLT, WBC



750K of 1.9M tests
(**39%**): **NORMAL**
158K (21%) of them
from: 1st and 2nd TESTS

CONCLUSION

Our findings underscore the need for evidence-based practice changes to **enhance clinical reasoning behind referral and test ordering**.

By addressing these inefficiencies, we can **improve system efficiency and sustainability** of care.

These insights pave the way for **further studies and the implementation of practice changes** across EGH Campus, SingHealth, and beyond.