An Audit of unnecessary pre-operative Chest X-Rays in a tertiary centre in Singapore

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Background
This poster concurrently discusses an audit of pre-operative Chest X-Rays (CXR) which were taken for patients undergoing elective surgeries in Singapore General Hospital (SGH), a single tertiary centre in Singapore, and a pre-implementation survey conducted amongst clinicians in Singapore on their perspectives on unnecessary investigations that do not contribute to improved patient outcomes. The combined qualitative and quantitative data aims to establish the extent of healthcare overuse and elucidate the barriers and enablers specific to the ordering of unnecessary pre-operative CXRs, with the purpose of creating a robust implementation plan typically tailored to the local context.

Audit: Methods
A retrospective audit was conducted on pre-operative CXRs ordered for all patients planned for elective surgery who visited SGH’s pre-surgery anaesthesia evaluation clinic (PEC) from January 2022 to January 2023. The criteria used for audit is based on existing hospital guidelines¹ which were adapted from international and local guidelines²,³.

Table 1: Patients attending PEC & CXR Order

<table>
<thead>
<tr>
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<th>From Jan 2022 – Jan 2023</th>
<th>Total patients = 18,096</th>
<th>Total CXR ordered = 10,019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not ordered, not indicated</td>
<td>1082 (6.0%)</td>
<td>5547 (30.6%)</td>
<td>4472 (38.2%)</td>
</tr>
<tr>
<td>Ordered, indicated</td>
<td>7057</td>
<td>7750</td>
<td>11,467 (63.4%)</td>
</tr>
</tbody>
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Pre-implementation survey: Methods
Simultaneously, an online pre-implementation survey was conducted from April 2023 to May 2023 on junior and senior clinicians in public institutions in Singapore to explore perceptions surrounding overutilization of care.

Pre-implementation survey: Results
280 doctors responded, of which 75 (26.8%) were senior doctors (Associate Consultant and above), 61 (21.8%) were from anaesthesia, 67 (23.9%) were from surgical specialties and 152 (54.3%) were from medical specialties.

Of the 147 (52.5%) doctors who order pre-operative CXRs at least monthly, 108 (73.5%) agree that some orders are unnecessary. This proportion similar amongst junior doctors (85 of 114, 74.6%) and senior doctors (23 of 33, 69.7%).

However, there were significant differences between junior and senior doctors in the factors influencing their decision to order pre-operative CXRs (Chart 1). Junior doctors felt that instructions from senior physicians and/or the department were more influential factors than guidelines, whilst senior doctors predominantly looked at local guidelines or instructions from the department in their decision making.

Chart 2 reveals a similar difference between junior and senior doctors in the prevalent reasons for ordering more investigations than necessary. Although the top 3 reasons cited were similar in both groups (instructions from department or senior physicians, medicolegal concerns and ordering as a precaution to be clinically safe), the first reason was a particularly strong factor amongst junior doctors.

Conclusions
The number of unnecessary pre-operative CXRs ordered in SGH is significant despite established, robust clinical guidelines. In light of the barriers cited specific to the local context, this may suggest the importance of highlighting that guidelines are present to eliminate habits of ordering as a precautionary measure and to allay medicolegal concerns. Senior doctors should also set an example by ordering investigations only when medically indicated to inspire behaviour change amongst junior doctors as well. Taking these factors into consideration is pivotal in designing our subsequent implementation plans targeted to SGH.