

Adherence to Local Preoperative, Generic Investigation Guidelines for Adult Elective Upper Gastrointestinal Surgery

ABSTRACT

Pre-operative assessment is essential in preparing patients for elective procedures as it risk-stratifies patients and optimises their conditions, reducing the rate of complications. Anaesthetists are key in this process as they are consulted about high-risk patients. They also release the guidelines for pre-operative assessments which are used in the POAC. Despite these guidelines being in place, there are still staff members who either do not use the guidelines or are unaware of their existence. This has cost implications and possibly leads to sub-standard assessments.

Keywords: Pre-operative, Guidelines, Investigations, Expenditure, Wastage.

INTRODUCTION

Pre-operative assessment is an essential aspect in preparing patients for elective procedures. It allows us to risk-stratify patients, and optimise their associated medical or surgical conditions beforehand, thereby reducing the percentage of peri- and post-operative complications.

The pre-operative algorithmic guidelines were established by the Anaesthesia Department in 2017 in order to allow for a structured preoperative approach, hereafter referred as ACC/1/Guide/2017. The latter aims to standardise investigation bookings as well as referrals according to BMI, ASA score, age, nature of surgery and comorbidities. These were created in order to avoid unnecessary tests in healthy low risk patients. Studies have shown that in normal, healthy patients [ASA I patients] undergoing minor and intermediate surgery, there is a low likelihood of abnormal results and negative surgical outcomes. Therefore, blood tests should only be performed when specifically indicated according to the local guidelines. Moreover, additional and inappropriate blood tests result in unnecessary costs.¹

The aim of this audit is to assess the adherence of preoperative generic investigations for adult elective surgery in concordance to local guidelines and the cost implications to clinical practice.

ETHICS

Prior to the commencement of this audit, the data protection committee of Mater Dei Hospital and the Faculty of Medicine and Surgery were contacted for approval. The procurement of electronic data was obtained without the use of interviews, recordings or photographic documentation of the patients in question.

METHODOLOGY

This retrospective study considered adult elective upper general intestinal surgery cases over a period of one year, from 25th January 2019 to 29th January 2020, of one Surgical firm at Mater Dei Hospital, Malta. The preoperative generic investigations were collected via iSoft. Exclusion criteria:

- Patients under 18 years of age
- Pregnant women
- Patients admitted for acute GI interventions
- Refusal to give informed consent.

The data collected included, as per ACC/1/Guide/2017:

- Age over or under 54
- BMI over or under 30
- Inability to climb two flights of steps
- ASA score
- Whether the procedure was classified as minor, intermediate or major surgery.

The investigations taken were documented, as reported on iSoft. These included:

- CBC
- Renal Profile
- HbA1C
- RBG
- INR
- APTT
- CRP
- ECG
- CXR
- Lung function test

The local preoperative guidelines as seen in Figure 1, were used to see whether the tests ordered were taken in accordance with the guidelines of Mater Dei Hospital.

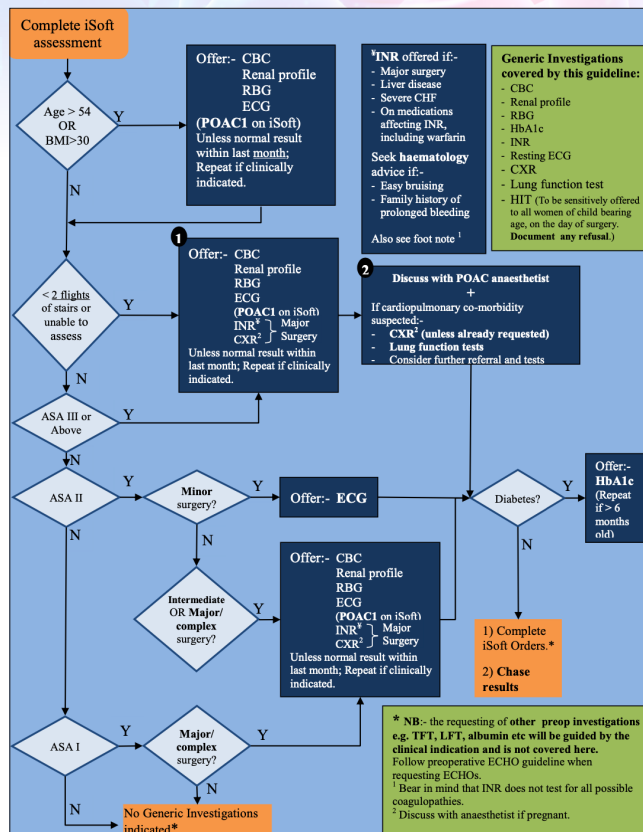


Figure 1. Preoperative, Generic Investigations for Adult Elective Surgery Guideline ACC/1/2017.2

Table 2. Total wasted cost per individual test in euros & the corresponding percentage waste.

Test	Number of tests	Total cost	Wasted cost	% Waste	Taken when not indicated	Not taken even though indicated
CBC	132	415.80	81.90	20%	26	1
RP	132	110.88	21.84	20%	26	2
HbA1C	13	40.56	21.84	54%	7	11
RBG	81	27.54	5.78	21%	17	42
ECG	133	1151.78	216.50	19%	25	1
INR	132	1040.16	685.56	66%	87	2
APTT	129	1270.65	1270.65	100%	129	0
CXR	82	1910.60	1025.20	54%	44	7
CRP	48	151.20	151.20	100%	43	0
Lung function	15	284.30	25.62	9%	1	1

The data was compiled by using the investigations ordered on the same or following date of the pre-operative assessment. The date was known due to the online POAC document found on iSOFT. The cost for each individual test was obtained from the Billings department of Mater Dei Hospital and the total costs were calculated using the data in Table 1. The costs exclude manpower.

Table 1. List of individual test costings

Test	Cost (€)
CBC	3.15
Renal Profile	0.84
RBG	0.34
INR	7.88
APTT	9.85
CRP	3.15
HbA1C	3.12
ECG	8.66
CXR	23.30
Lung Function Test	25.62

RESULTS

A total of 133 patients were included in this audit. Table 2 shows that none of the patients were investigated according to the local guidelines. Figure 2 shows that 404 blood tests were taken when not indicated, while 63 blood tests were not taken, despite being indicated. Figure 3 reflects the percentage wasted cost.

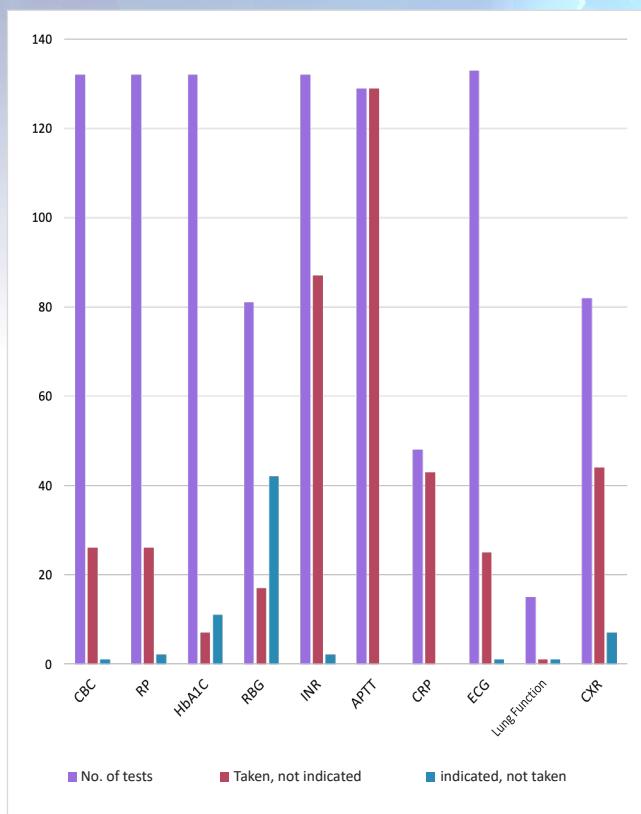


Figure 2. Preoperative Generic Investigation.

DISCUSSION

From the results extracted from this analysis, it is evident that there are a significant number of tests which are ordered without any indication or not according to guidelines. For instance, a patient having an ASA score of 1, undergoing minor or intermediate surgery does not require any generic investigations according to the guidelines, however, these were still taken. Hba1c blood tests were still repeated in diabetic patients, even though they were less than 6 months old and thus, not indicated, and HbA1C blood tests were taken in non-diabetic patients. Chest X-rays and INRs were ordered despite patients having only minor or intermediate surgeries. In addition, several CRP blood tests were ordered, even if not indicated in the ACC/1/Guide/2017. This is a nonspecific test indicating inflammation or autoimmune disease and particularly useful in post-operative patients to identify cases of infection. Therefore, their use in preoperative assessment should be questioned. APTT blood tests are not indicated in the ACC/1/Guide/2017. Despite this, it is common practice that APTT blood tests are ordered along with the INR. This highlights the lack

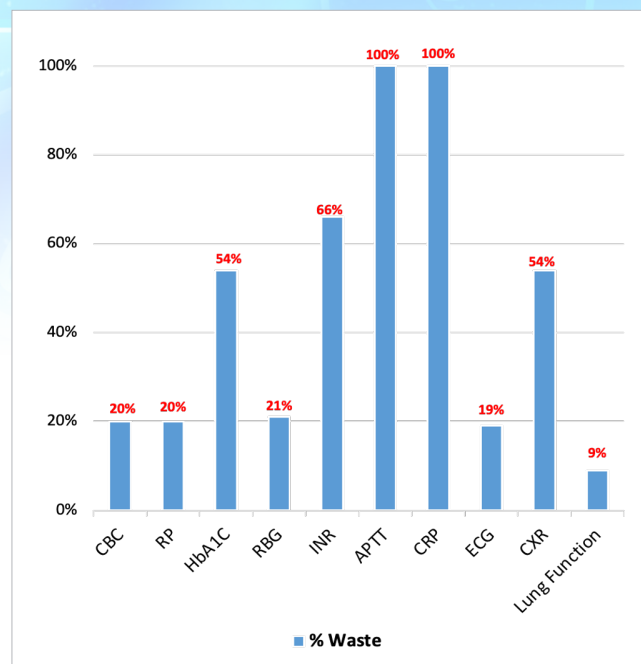


Figure 3. Percentage Wasted Cost.

of awareness of its omission in the guideline present amongst doctors. APTT blood tests are only indicated if patients have coagulopathy comorbidities.

Inappropriate testing leads to a significant amount of financial waste and misuse of resources. Notably, there are a number of tests which have a greater percentage of waste than others. Tests with a percentage waste of more than 50% included HbA1C, INR, APTT, CXR and CRP. APTT and CRP had a 100% total waste. However, given that each test price is different, the test that imposed the greatest unnecessary financial burden was that of the APTT blood test. This cost an additional 1270.65 euro which could have been invested into other medical resources. Overall, the total cost spent was €6,403.47 and the total wasted cost amounted to €3,506.09.

Also of concern is the fact that, with the exception of APTT and CRP, all the tests were not taken even when indicated for specific patients. This can directly impact the surgical outcome and the ensuing QoL of patients and their carers. More importantly such omission may lead to longer hospitalisation delays and complications for patients which would drastically increase the cost of patient care.

Of note here is that this audit relates solely to one surgical firm only.

CONCLUSION

Out of all the 133 subjects, none of the investigations were carried out according to the guidelines. This evidently shows that the guidelines are not being followed during the preoperative assessment. This results in an unnecessary financial burden³ on the healthcare system and, more importantly, creates an increased workload on health care professionals and lab technicians.

It is important to note that blood testing performed unnecessarily can cause both physical and psychological discomfort to patients, as well as increase occupational hazards to healthcare workers.

A qualitative study done by Brown et. al,⁴ explored factors affecting conformity to available local guidelines. These included medico-legal concerns, a lack of awareness of guidelines, concerns about surgical delays or cancellations and lastly, the belief that other caring doctors might need the blood results taken.

This audit reinforces the requirement for frequent liaison of both anaesthetists and surgeons to ensure regular updates and increased awareness of current preoperative guidelines.¹

RECOMMENDATIONS

It is recommended that a similar audit is carried out across all surgical firms to obtain a more comprehensive view of the economics involved. Both over-investigations and under-investigations contribute to varying degrees of additional costs to our healthcare system. They may also lead to suboptimal surgical outcomes. It would also be beneficial if the guidelines and investigative costs³ were made available in all allocated rooms in the POAC department. Moreover,

it may be beneficial for the guidelines to be reviewed and updated accordingly given that they have last been published in 2017. An educational program could be included during the induction meetings of surgical placements where the appropriate preoperative investigations are explained to foundation year doctors. It would be also vital to inform the anaesthetists regarding such guidelines.

References:

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ABBREVIATIONS

ASA - American Society of Anaesthesiologist
BMI - Body Mass Index
CBC - Complete Blood Count
HbA1C - Glycated haemoglobin
RBG - Random Blood Glucose
INR - International normalised ratio
APTT - Activated partial thromboplastin time
CRP - C-reactive protein
ECG - Electrocardiogram
CXR - Chest X-ray
POAC - Pre-operative Assessment Clinic
RP - Renal profile

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