

## APPROPRIATENESS OF PREOPERATIVE CARDIOLOGY CONSULTATIONS IN NON-CARDIAC SURGERY- A RETROSPECTIVE OBSERVATIONAL STUDY IN A MEDICAL COLLEGE SETUP

Dilip Vijay<sup>1</sup>, S.C.Ganesh Prabhu<sup>2</sup>, Arun Shankar<sup>3</sup>

<sup>1</sup>Assistant Professor, Department of Anaesthesia, Velammal Medical College Hospital & Research Institute, Madurai, India

<sup>2</sup>Professor & Head, Department of Anaesthesia, Velammal Medical College Hospital & Research Institute, Madurai, India

<sup>3</sup>Assistant Professor, Department of Anaesthesia, Velammal Medical College Hospital & Research Institute, Madurai, India

Received : 25/02/2023  
Received in revised form : 03/04/2023  
Accepted : 17/04/2023

**Keywords:**

Cardiology, Consultation, Non-Cardiac Surgery.

**Corresponding Author:**

Dr. Dilip Vijay,  
Email: drdilipvijay@gmail.com

DOI: 10.47009/jamp.2023.5.3.94

Source of Support: Nil,  
Conflict of Interest: None declared

Int J Acad Med Pharm  
2023; 5 (3); 437-440



### Abstract

**Background:** The costs of healthcare are increased by preoperative consultations and testing. If consultations are unnecessary, it can lead to additional testing and postponement of surgery. Although guidelines are available to guide clinical practice, they are often not adhered to. Our research examined the relevance of preoperative cardiology referrals in accordance with the guidelines and the practical value of these consultations. **Materials and Methods:** In order to determine the futility of preoperative cardiology consultations, we analyzed the medical records of patients who underwent elective non-cardiac surgeries. Our evaluation included a comparison with the 2014 guidelines established by the American College of Cardiology and American Heart Association. We also took note of any recommendations given during the consultation, as well as any major adverse cardiac events or outcomes during the perioperative period. **Result:** Out of all the referrals made, only 164, which accounted for 17% of the total referrals, were deemed suitable as per the guidelines. Most of these referrals were for preoperative clearance, and the common suggestion was to avoid antiplatelet medications. However, none of the consultations had any impact on the surgery or anesthesia plans. Unfortunately, 14 patients experienced significant adverse cardiac events during the perioperative period. **Conclusion:** It appears that preoperative cardiology consultation is being excessively utilized. Surgeons tend to request consultations more frequently out of concern for potentially missing important medical issues, but this indiscriminate approach can result in unnecessary tests and reduced cost-efficiency. Additionally, the input of cardiologists in identifying clinical abnormalities has little impact on clinical decision making, which is surprising.

## INTRODUCTION

Assessing the cardiac profile of a patient before non-cardiac surgery is a complex process, and it is typically assigned to a cardiologist. Studies conducted in western countries have indicated that consulting a cardiologist before surgery is often unnecessary and lacks evidence of benefits.<sup>[1-3]</sup> However, there is limited information on the current state of affairs in India. Preoperative testing in some cases can also lead to unnecessary investigations and testing.<sup>[4]</sup> In order to fill this void, we carried out an assessment of referrals to cardiology before surgery for non-cardiac issues at our facility. Our analysis centered on determining the suitability,

discrepancies, effectiveness, and outcome of these referrals.

## MATERIALS AND METHODS

To ensure ethical standards, approval was obtained from the institutional ethics committee for a retrospective observational study conducted on patients who underwent elective non-cardiac surgery from January 2021 to September 2022. As the study was conducted retrospectively, the requirement for patient consent was waived. At our institution, all surgical patients receive a pre-anesthetic check-up, with some being seen in the underutilized anesthesia outpatient clinic days before surgery. However, the majority are seen at the bedside on the night before

or on the day of surgery. Medical records were obtained from the hospital information system, and data were collected by a single investigator. The study excluded surgeries related to obstetrics, cardiac procedures, transplants, and those that used local anesthesia. The researchers reviewed medical records to identify patients who received preoperative cardiology consultation. They used a standard form to gather patient demographics, pre-existing conditions, functional capacity, scheduled surgery, any significant cardiac events during the perioperative period, length of hospital stay, and overall outcome. The consultation request was analyzed to determine if it included a specific question or simply requested clearance for surgery. Additionally, the consultation notes were carefully examined to identify any new medical conditions, recommendations, diagnostic or therapeutic interventions, and the impact of these on patient outcomes. The primary objective was to evaluate if the consultations and tests conducted on cardiac patients for non-cardiac surgery adhered to the 2014 guidelines established by the American Heart Association (AHA) and American College of Cardiology (ACC). Additionally, we aimed to investigate any discrepancies in these referrals and examine the outcome and influence of these preoperative consultations. We analyzed the records of 5412 patients and selected 974 (18%) for the study, excluding 15 patients due to incomplete records. The Statistical Package for the Social Sciences version 21.0 was used for statistical analysis,

representing continuous data as mean (standard deviation [SD]) and categorical data as frequency with percentage.

## RESULTS

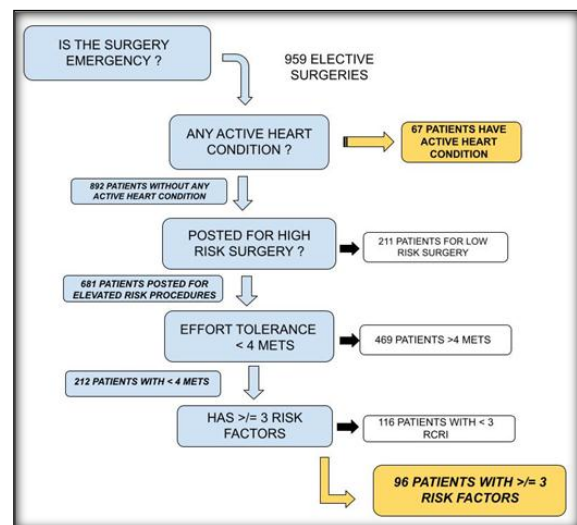


Figure 1:

We included 959 patients for the final analysis. Of all the consultations reviewed, only 164(17%) were appropriate in accordance to the 2014 AHA/ACC Algorithm. The demographics are shown in the following table. [Table 1]

Table 1:

Characteristic	n(%)
Mean (SD) age	61.3(10.52)
Age distribution	
<40	38(3.96)
40-65	489(50.99)
>65	431(44.95)
SEX	
MALE	576(60)
FEMALE	383(40)
COMORBIDITIES	
CAD/PREVIOUS PCI OR CABG	245(25.5)
HYPERTENSION	557(58)
DIABETES	499(52)
CHRONIC KIDNEY DISEASE	44(4.5)
FUNCTIONAL CAPACITY	
>4 METS	212(22.2)
<4 METS	747(77.8)
ASA CLASS	
ASA I	75(7.8)
ASA II	821(85.6)
ASA III	38(4.0)
ASA IV	25(2.6)
REVISED CARDIAC RISK INDEX	
0	307(32)
1	526(55)
2	81(8.4)
3	34(3.5)
4	11(1.1)
RISK PROPOSED BY CARDIOLOGY	
MILD	662(69)
MODERATE	240(25)
HIGH	57(5.9)

According to the analysis, the surgeon was responsible for 92.3% of patient referrals. Upon reviewing consultation notes further, it was found that only 15.8 % of patients had specific requests for abnormality evaluation or management. The majority (84.2%) of referrals were for preoperative clearance. Cardiologists made recommendations on drug modification in 28% of cases, with the common suggestion being to stop antiplatelet medication five days prior to surgery followed by change in dose of beta-blockers. Out of the patients who underwent further evaluation and interventions, only 5 patients were found to have any abnormalities. Postponement of surgery and further evaluation was suggested for 11 patients. Echocardiograms were conducted for all patients who consulted with a cardiologist, with 45% of them showing normal results. In the remaining patients, 8% had regional wall motion abnormality, 35% had age-related diastolic dysfunction, 11% had concentric left ventricular hypertrophy, and 0.8% had valvular anomalies [Figure 2]. 3 patients were found to have a clot in the LA appendage.

During the perioperative period, 11 patients experienced significant cardiac issues, such as acute coronary syndrome, atrial fibrillation, and cardiac arrest. Unfortunately, three of these patients died after the operation. The hospital stay duration had a median of 5 days (ranging from 4 to 7 days).

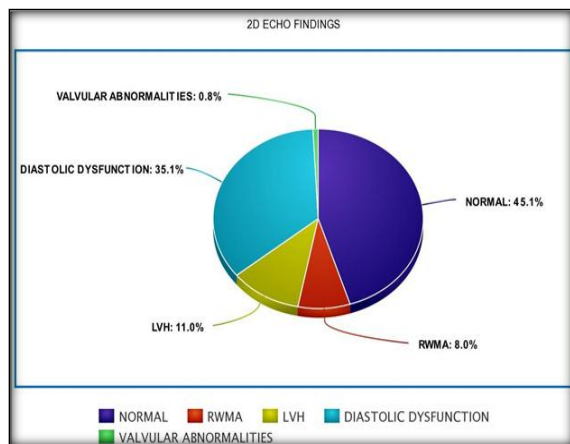


Figure 2:

## DISCUSSION

As per our research, most preoperative cardiology consultations were unnecessary, even for patients undergoing low-risk surgery without any risk factors. These consultations did not offer any additional guidance that would change the surgical or anesthetic plan, indicating that they were not useful. The ACC/AHA guidelines suggest that a person who does not require a cardiology evaluation otherwise should not have one solely because they are undergoing surgery.<sup>[5]</sup> The three main reasons for a preoperative consult are the presence of risk factors, the risk associated with the surgery, and the functional status

of the patient.<sup>[6]</sup> Apart from managing an active cardiac condition, there is little a cardiologist can do that an anesthesiologist cannot, according to Kleinman.<sup>[7]</sup>

According to research, over 66% of pre-surgery tests and referrals are deemed unnecessary. While anaesthesiologists are shown to be more reasonable in their ordering of pre-surgery tests, there is still room to improve and streamline the practice in order to decrease healthcare expenses.<sup>[8]</sup> The majority of referrals are requested by surgeons, although it is ideal for patients to be evaluated in an outpatient clinic by anesthesiologists weeks to days before surgery to assess risk and optimize care. Preoperative anesthesia clinics have been shown to improve patient care and reduce costs. However, surgeons may request referrals due to fear of legal action, although blanket consultations do not provide protection. Studies show that unnecessary preoperative testing and consults contribute significantly to healthcare costs, with random preoperative consults and testing having no positive impact on perioperative outcomes.<sup>[8]</sup> Cardiology is the most sought-after specialty, and a lack of robust audit data means we are unaware of deficiencies in perioperative care. Studies have shown pre-op cardiac referrals increase patient's length of stay in the hospital with no effect on choice of anesthesia.<sup>[9]</sup> The ACC/AHA algorithm for preoperative evaluation consists of five steps: (1) determination of urgency, (2) a search for active cardiac conditions, (3) a clarification of whether the operation is a low-risk procedure, (4) estimation of functional capacity and (5) investigation of symptoms and the presence of clinical risk factors. According to our proposal, the first four steps of the algorithm can be executed by surgeons with ease. Our research indicates that if all five steps are followed during routine preoperative consultations, as performed by the surgeons themselves, then majority of non-specific consultations could have been avoided. It is important to note that the algorithm comprises of five steps and none of them can be omitted for effective results.<sup>[10]</sup>

## CONCLUSION

According to our research, preoperative cardiology consultations are frequently carried out in instances where they are not needed. This type of unnecessary testing and referrals is found to be unproductive. To optimize the outcome of the perioperative period, it is recommended to establish outpatient anesthesia clinics and adhere to the relevant guidelines. As opposed to being solely responsible for the surgery itself, anesthesiologists should play a more significant role in the overall perioperative period.

## REFERENCES

1. Dogan, Volkan, et al. "Impact of preoperative cardiology consultation prior to intermediate- risk surgical procedures." *European Journal of Clinical Investigation* 48.9 (2018): e12794.
2. Monahan, Thomas S., et al. "Preoperative cardiac evaluation does not improve or predict perioperative or late survival in asymptomatic diabetic patients undergoing elective infrainguinal arterial reconstruction." *Journal of vascular surgery* 41.1 (2005): 38-45.
3. Groot, M. W., et al. "The preoperative cardiology consultation: indications and risk modification." *Netherlands Heart Journal* 25 (2017): 629-633.
4. Hoehmann, Christopher L., et al. "Unnecessary preoperative cardiology evaluation and transthoracic echocardiogram delays time to surgery for geriatric hip fractures." *Journal of Orthopaedic Trauma* 35.4 (2021): 205-210.
5. Fleisher, Lee A., et al. "2014 ACC/AHA guideline on perioperative cardiovascular evaluation and management of patients undergoing noncardiac surgery: a report of the American College of Cardiology/American Heart Association Task Force on practice guidelines." *Journal of the American College of Cardiology* 64.22 (2014): e77-e137.
6. Park, Kyung W., and David C. Warltier. "Preoperative cardiology consultation." *The Journal of the American Society of Anesthesiologists* 98.3 (2003): 754-762.
7. Kleinman, Bruce. "Preoperative cardiology consultation: How helpful is it?." *The Journal of the American Society of Anesthesiologists* 99.5 (2003): 1240-1240.
8. Karim, H. M. R., Yunus, M., & Bhattacharyya, P. (2016). An observational cohort study on pre-operative investigations and referrals: How far are we following recommendations?. *Indian journal of anaesthesia*, 60(8), 552.
9. Pavithran, Priyanka, and Binesh Arayullathil. "Preoperative cardiology referral practices at a tertiary care centre: A retrospective observational study." *The National Medical Journal of India* 35.1 (2022): 11-13.
10. Ciecchanowicz, D., Wójtowicz, M., Ufnalska, B., Głodek, P., Ruskowska, H., & Kołodziej, Ł. (2022). The impact of preoperative cardiology consultation on the surgical treatment of patients with proximal femur fractures. *Chir. narzadow Ruchu ortop. Pol.* 87(3), 99-104.
11. Aslanger, E., Altun, I., Guz, G., Kiraslan, O., Polat, N., Golcuk, E., & Oflaz, H. (2011). The preoperative cardiology consultation: goal settings and great expectations. *Acta Cardiologica*, 66(4), 447-452.