PAKISTAN JOURNAL OF Cardiovascular Intervention

OPEN ACCESS

ORIGINAL ARTICLE

Heart Team: Single Tertiary Centre Real World Experience.

Muhammad Ishaq Khan, Abid Ullah, Shah Zeb, Shama Ayaz, Rafiullah Jan, Mohammad Waleed

Peshawar Institute of Cardiology, Peshawar-Pakistan.

Citation:
Khan MI, Ullah A, Zeb S, Ayaz S, Jan R, Waleed M. Heart Team: Single Tertiary Centre Real World Experience. PJCVI. 2024; 4(1): 27-34

Corresponding Author Email:
mohammad.waleed@pic.edu.pk

Funding:
This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflicts of Interests:
The authors have declared that no competing interests exist.

Received 04/02/2024
Accepted 05/03/2024
First Published 25/04/2024

Abstract

Background: The primary reasons for referral included coronary artery disease, valvular heart disease, a combination of both, and cases with structural abnormalities. Treatment decisions varied, with a significant portion undergoing percutaneous coronary intervention or coronary artery bypass grafting surgery. The study underscores the importance of a structured multidisciplinary heart team in providing optimal care to cardiac patients, emphasizing the need for local implementation of such an approach to enhance patient outcomes. The objective is to share multidisciplinary heart team experience in a tertiary care hospital and discuss its structure and function for the management of cardiac patients.

Methodology: It is a Retrospective cross-sectional observational study conducted at the Peshawar Institute of Cardiology from 1st January 2021 to 31st December 2022. Both inpatient and outpatient referred consecutive patients with cardiovascular diseases were discussed in weekly multidisciplinary heart team meetings. Data was collected retrospectively for each patient from the coordinator and hospital management information system.

Results: A total number of 389 patients were discussed in 89 multidisciplinary heart team meetings over a period of two years. The mean age of patients was 58 ± 11.8 years, with 72.5% males and 27.5% females. Coronary artery disease was the most common reason for referral, i.e., 350 patients (89.97%), 17 (4.37%) patients had valvular heart disease, 08 (2.1%) had both coronary artery disease and valvular disease, and 14 (3.4%) were cases involving structural abnormalities. One hundred and forty-two (36.5%) patients decided to undergo percutaneous coronary intervention, 147 (37.7%) had coronary artery bypass grafting surgery decision, 17 (4.3%) patients were sent for valvular surgery, 08 (2.05%) patients were referred for both CABG and valvular surgery, and 15% had individualized percutaneous procedures or were deferred further procedures following non-invasive or invasive assessments.

Conclusion: A multidisciplinary heart team approach should be at the core of managing cardiac patients at an institute. In order to provide standard care to our patients, setting up a robust, structured multidisciplinary heart team and implementing its basic principles is possible at our local level.

Keywords

Coronary Artery Disease, Coronary Artery Bypass Grafting, Percutaneous Coronary Intervention.

Published by Pakistan Society of Interventional Cardiology

Introduction

As the general population is aging, the prevalence of complex cardiovascular conditions is increasing. This makes patient management challenging for a single physician. Also, in the last two decades, there have been various advances and innovations in the diagnostic and management aspects of patient care. Due to these complexities, new approaches to patient management have been adopted worldwide, where these patients are managed by a multidisciplinary heart team.

The importance of multidisciplinary team management has been known to cancer and transplant physicians for a long[1,2]. Cardiology saw the utility of a multidisciplinary approach with Synergy between PCI with Taxus and Cardiac Surgery (SYNTAX) trial[3]. After the SYNTAX trial, the multidisciplinary heart team (MDHT) (or the heart team) took center stage in the care of cardiac patients. Since then, the idea of a heart team has been taken up by various societal guidelines. European Society of Cardiology/European Association for Cardio-thoracic Surgery revascularization guidelines in 2014 gave Class IC recommendation for MDHT assessment of patients with complex disease[4], still maintained in the newer versions of the guidelines for the management of valvular and ischemic heart disease patients[5,6].

The heart team plays a pivotal role in delivering guideline-directed management of a wide variety of cardiac patients with ischemic heart disease, valvular heart disease, cardiomyopathy, cardio-oncology, geriatric cardiac patients, cardiac failure, transplant patients, and various other cardiovascular problems.

The survival benefit of the multidisciplinary team approach is documented in oncology patients[7]. In cardiac patients, the causal relation is not established, and the evidence is mostly from observational data[8], although some data is coming up recently which reports mortality benefit[9]. Patients with severe comorbidities were majorly excluded from the trials using MDHT, which is still an area of equipoise in the cardiac community. Having said that, it is in this state of uncertainty that MDHT becomes more relevant and shapes the management beyond the decision of revascularization[10].

A multidisciplinary heart team is patient-centered[11] and encourages shared ownership of the heart team members' decisions and their outcomes[12].

The structure of the multidisciplinary heart team comprises an MDHT coordinator, cardiac surgeons, and Cardiologists, including interventional cardiologists, general cardiology consultants, imaging specialists, and cardiologists with further sub-specialist expertise depending on the local setup and availability. Additional attendees (residents and fellows, intensivists, and medical students) according to the nature of the heart team meeting[11]. Meetings should be at least convened weekly with ad-hoc/mini MDHT meetings called on an urgent basis for sicker patients[13]. Finally, for patients to have meaningful participation in shared decision-making, they should be appraised of the benefits and risks of all the treatment options available[14]. Figure 1 illustrates the structure of the contemporary heart team.

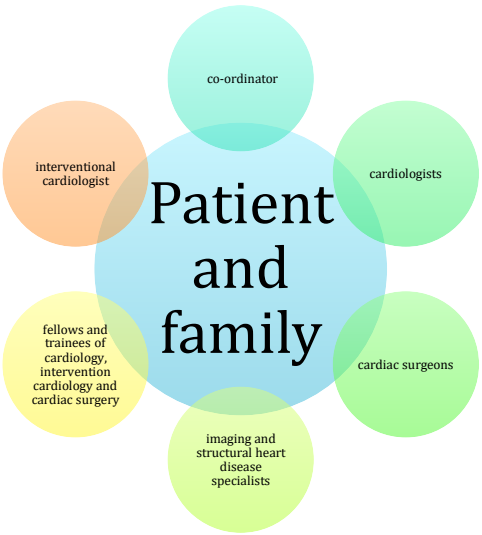

Figure 1: The contemporary heart team

The purpose of the MDHT is to provide the required expertise by its participants in accurate and timely diagnosis by adopting appropriate investigative tools and discussing different aspects of patients' anatomical, physical, and social circumstances in the light of established best medical practices and risk models aiming to achieve the best long term results of the shared decisions and treatment undertaken[15].

Patients are referred from within the same organization (inpatient and outpatient) and from other hospitals to an MDHT coordinator, who gathers the relevant data of the case and puts it up for the meeting, as shown in Figure 2. The coordinator is in liaison with the team members and the chair – a senior clinician – and ensures the meeting decisions are documented and communicated effectively to the patient[11,16].

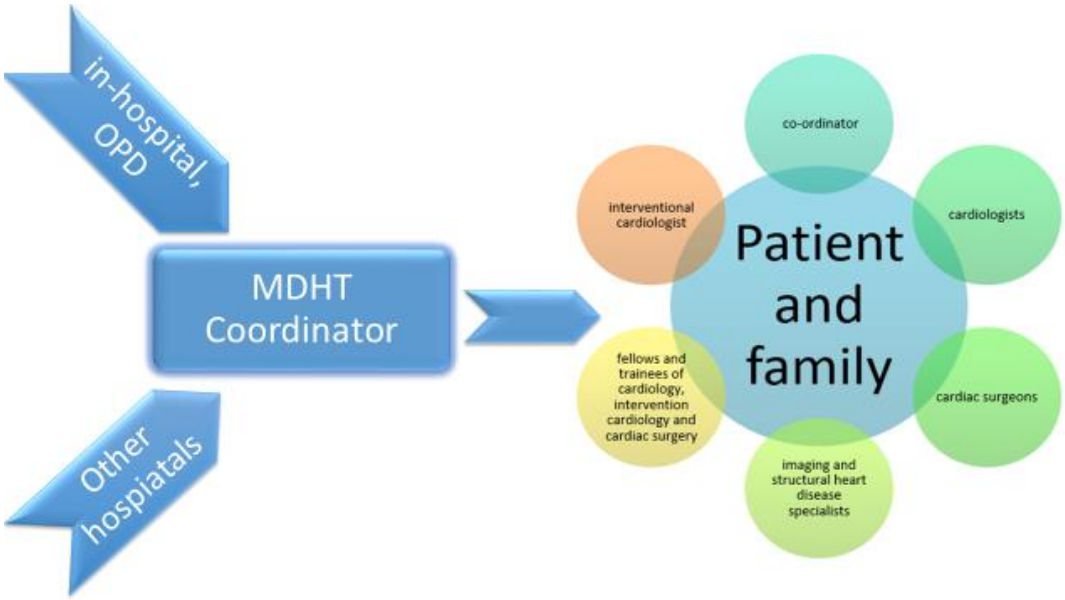

Figure 2: Referral pathway for multidisciplinary heart team

The concept of the MDHT approach is so embodied in the care of cardiac patients that integrating it into institutional practice is strongly advocated[13]. Our hospital has it rooted permanently in the academic routine, and it is mandatory for both the attending and the junior colleagues to attend these weekly meetings.

We present here our experience with the heart team over the last two years in a large cardiac tertiary care center.

Methodology

We conducted a retrospective analysis of all patients who were discussed in our weekly MDHT meeting at the Peshawar Institute of Cardiology (PIC) from 1st January 2021 till 31st December 2022. Data about the patient demographics, age, reason for referral, and MDT decision was collected from the MDHT pro forma (Appendix). Electronic Medical Records (EMR) were accessed for any deficient data. Data was collected retrospectively for each patient from the coordinator and hospital management information system.

Data was entered in SPSS version 22. (IBM Corp, Armonk, NY). Descriptive statistics was used to calculate the mean and standard deviation (Mean ±SD). Frequencies and percentages were calculated for qualitative variables.

Patients of all age groups with cardiovascular diseases referred to the MDHT via inpatient as well as outpatient departments of our hospital for discussion in weekly or ad-hoc meetings were included in the study. Patients who declined their respective case discussions in hospital MDHT or whose acute clinical conditions dictated against discussions were excluded.

Results

A total of 89 MDHT meetings were conducted over the period of two years. In these 89 meetings, a total of 389 patients were discussed with various cardiovascular problems. The mean age of patients was 58 ± 11.8 years (range: 91-16 years), with 72.5% males and 27.5% females. Table 1 illustrates the baseline characteristics.

Table 1: Baseline characteristics of the study population.

Variables		**N (%)**
Total number of patients discussed		389 (100)
Total number of MDHT meetings		89
Average number of patients discussed per MDHT		4-5
Diabetes		130 (55)
Hypertension		164 (62)
Smoking		13 (3.4)
Gender	Male	282 (72.5)
	Female	107 (27.5)
		Mean ± Stand. Dev
The mean age of patients		58.02 ± 11.75 years
Mean left ventricle ejection fraction		41.05 ± 9.9 %
MDHT frequency		Once weekly

*available data out of the total number of patients
(MDHT = multidisciplinary heart team)

Coronary artery disease was the most common reason (89.9%) for referral to MDHT, i.e., 350 patients (89.97%), followed by patients with valvular disease (4.53%), 08 patients (2.1%) had both coronary artery disease and valvular disease. The remaining 13 (3.4%) patients had other cardiac problems, summarized in Table 2.

Table 2: Reason for Referral and MDHT decision.

Reason for Referral to MDHT	Number of patients N (%)
Coronary artery disease	350 (89.97)
Valve disease	18 (4.6)
Coronary Artery Disease+ Valve Disease	8 (2.05)
Acquired / congenital Structural cases other than valvular diseases	13 (3.4)

*MDHT=Multidisciplinary Heart Team

In regards to outcome of MDHT decision, 142 (36.5%) patients were decided to undergo percutaneous coronary intervention (PCI), 147 (37.7%) coronary artery bypass graft (CABG) surgery decision, 17 (4.2%) patients were sent for valvular surgery, 08 (2.05%) patients were referred for both CABG and valvular surgery and around 15% had other procedures done (structural heart disease procedures like post MI VSR closures, post-surgical aortic aneurysm device closures, invasive assessment with intracoronary devices). Table 3 shows these details.

Table 3: MDHT decision.

MDHT decision	N (%)
PCI	142 (36.5)
CABG	147 (37.7)
Valvular surgery	17 (4.3)
CABG + Valvular surgery	08 (2.05)
Medical management	32 (8.22)
Further non-invasive assessment needed	21 (5.39)
IVUS / FFR, DFR assessment needed	15 (3.85)
Percutaneous VSR closure	02 (0.5)
CABG + ASD closure	02 (0.5)
Aortic aneurysm percutaneous closure	02 (0.5)
Balloon aortic valvuloplasty (BAV)	01 (0.25)

*Abbreviations: (ASD = atrial septal defect, CABG= Coronary Artery bypass grafting, DFR Diastolic hyperemia-free ratio, FFR = fractional flow reserve, IVUS = intravascular ultrasound, MDHT = multidisciplinary heart team, PCI=Percutaneous Coronary Intervention, VSR = ventricular septal rupture)

Discussion

The multidisciplinary heart team approach has been at the center of the care of cardiac patients for the last two decades. Our observational study presents a unique experience of MDHT meetings at our tertiary care cardiac hospital. Out of the total available data for all the patients, 55% were diabetic, mostly with multivessel disease, pointing to the fact that most patients had complex coronary disease. Most of them got the recommendation for coronary artery bypass graft (CABG) surgery, reflecting the general practice in light of the contemporary trial evidence[17]. While around 35% of patients were sent for PCI, 8.2% of patients initially referred for possible intervention were left on medical therapy.

Setting up a functional MDHT seemed an uphill task in a newly established cardiac center. Due to the lack of a structured MDHT proforma and

stringent documentation on EMR in the first few weeks of starting the MDHT at our new center, a few patient data about comorbidities were missing, which is one of the limitations of our data.

Left ventricular ejection fraction used as a measure of left ventricular function in routine practice seems to have dictated the MDHT decision sway towards percutaneous treatment. A paradox as it may seem in the light of existing literature[18,19], but it reflects the guarded decision of the team members due to the poor outcomes in this patient population[20] and also the ground reality of our limited resources for supportive peri-procedural care and the lack of advanced mechanical assist devices to support such patients. Local variations in enforcing MDHT principles and in decisions regarding management plans for different disease conditions are an acceptable norm[14]. While some guidelines are based on evidence from multiple trials for the management of a particular condition, others accommodate multiple factors, including economic implications relevant to particular regions, resulting in different recommendations for the same condition[21,22].

Among the patients who presented with high-risk ACS who warrant multidisciplinary discussion with regards to revascularization, a mini/ad-hoc MDHT meeting was convened while the patient was still in the catheterization laboratory, a practice routinely exercised at our center and endorsed by the British societies recommendations(11). These meetings are added to the patient's records on the hospital management information system (HMIS).

Administrative support for conducting MDHT meetings in terms of space, logistics, staffing, and resources should be offered by every organization. In this regard, the hospital management information system is instrumental, and we encourage organizations to keep their records electronic in order to be easily retrievable and auditable and to enable meaningful research.

Expensive gadgets like pressure wire studying equipment (FFR/iFR), intravascular ultrasound (IVUS), and atherectomy devices (Rotablator / Rotapro) cannot be made available in many centers. With a robust referral network in the health care system, patients with complex diseases can be streamlined and referred to tertiary care centers MDHTs, and these resources can be utilized judiciously for the benefit of the patients. Based on the MDHT decisions of some referred patients to our center, they were subjected to anatomical (IVUS) and physiological studies (FFR/iFR), and in light of the results of these advanced modalities, these patients were left on medical treatment and referred back, to their primary physicians, thus avoiding unnecessary intervention. A good referral system in health care enables treating physicians to refer patients to centers where appropriate treatment for their patients is available with the required expertise.

Two cases where device closure of post-myocardial infarction ventricular septal rupture was performed by our structural heart disease team, and another two cases where the aortic pseudo aneurysm was closed by atrial septal defect closure devices were those where multiple MDHT meetings were convened in quick succession pinned largely on structural and imaging specialists. Although the complication rates are high in such cases[23], the procedural success achieved owes to the fact of exemplary MDT approach and collective responsibility of shared decision makers.

Due to the lack of a proper referral system and medical network among local or national centers, outpatient referral patients were at a disadvantage in the absence of their primary referring physician/cardiologist. Using virtual technology has been advocated[24], but more importantly, educating our medical fraternity about a multidisciplinary approach to patient management and taking responsibility for the shared decision thereof seems the need of the day.

The aforementioned problem is at the core of the patient group who failed to follow up at our center and instead proceeded with further management at other centers without regard to the MDHT consensus decision about a particular patient, as apparent from our follow-up phone conversations.

The disparity of decisions among different heart teams can be there, but deciding a treatment strategy independently for a patient sans coordination with the parent MDHT calls for ethical and professional consideration, especially when there is up to 30% documented disparity in the decision-making of an individual physician vs. that of MDHT[25]. This makes the importance of establishing MDHTs across our fragmented healthcare system even more obvious. The overarching need for the application of MDHT is realized when patients for whom treatment decisions are made by a single physician rather than a heart team land with complications to tertiary care centers, whose management plans would be very different in the first place had an MDHT been conducted.

The fact that participation in these meetings is mandatory on a weekly basis and is a part of the annual assessment makes it a robust and flourishing platform for comprehensive patient care in line with the British society's guidelines and consensus statement released recently[11]. We recommend our national training bodies incorporate MDHT meetings in their regular student / fellow evaluation.

Recording short-term outcomes of the patients discussed in our MDHT meetings with follow-ups is being processed and will be published soon with further patient details.

Audit and feedback are an integral part of comprehensive MDHT programs. Apart from an external audit by the hospital financier, an internal audit will be initiated in light of the current study at our center, and further recommendations will be made for improvement.

Multidisciplinary heart teams should be made part of our local healthcare system and national training programs to benefit our patients. Moreover, a local health network should be developed to appropriately refer patients. Based on these medical records, national registries should be developed in the future to benefit patients and academicians alike.

Our study had some limitations: a single center observational data, no objective risk scoring was done, communication between out-of-hospital referring physicians was limited, and referring cardiologists were not part of heart team discussions. The local referral system is not in place, and many patients who potentially could benefit from a multidisciplinary approach might not have had a chance to discuss or participate in the MDHT meeting.

Conclusion

A multidisciplinary heart team approach should be at the core of managing cardiac patients at an institute. In order to provide standard care to our patients, setting up a robust, structured multidisciplinary heart team and implementing its basic principles is possible at our local level.

Acknowledgment

Authors would like to thanks the administration and management staff of Peshawar Institute of Cardiology.

References

1) Taberna M, Gil Moncayo F, Jané-Salas E, Antonio M, Arribas L, Vilajosana E, et al. The multidisciplinary team (MDT) approach and quality of care. Frontiers in oncology. 2020;10:85.
2) Kowalczyk A, Jassem J. Multidisciplinary team care in advanced lung cancer. Translational Lung Cancer Research. 2020;9(4):1690.
3) Serruys PW, Morice M-C, Kappetein AP, Colombo A, Holmes DR, Mack MJ, et al. Percutaneous coronary intervention versus coronary-artery bypass grafting for severe coronary artery disease. New England journal of medicine. 2009;360(10):961-72.
4) Members ATF, Kolh P, Windecker S, Alfonso F, Collet J-P, Cremer J, et al. 2014 ESC/EACTS guidelines on myocardial revascularization: the task force on myocardial revascularization of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS) developed with the special contribution of the European Association of Percutaneous Cardiovascular Interventions (EAPCI). European journal of cardio-thoracic surgery. 2014;46(4):517-92.
5) Members WC, Lawton JS, Tamis-Holland JE, Bangalore S, Bates ER, Beckie TM, et al. 2021 ACC/AHA/SCAI guideline for coronary artery

revascularization: a report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. Journal of the American College of Cardiology. 2022;79(2):e21-e129.

6) Otto CM, Nishimura RA, Bonow RO, Carabello BA, Erwin III JP, Gentile F, et al. 2020 ACC/AHA guideline for the management of patients with valvular heart disease: executive summary: a report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. Journal of the American College of Cardiology. 2021;77(4):450-500.
7) Bilfinger TV, Albano D, Perwaiz M, Keresztes R, Nemesure B. Survival outcomes among lung cancer patients treated using a multidisciplinary team approach. Clinical lung cancer. 2018;19(4):346-51.
8) Coylewright M, Mack MJ, Holmes DR, O'Gara PT. A call for an evidence-based approach to the heart team for patients with severe aortic stenosis. Journal of the American College of Cardiology. 2015;65(14):1472-80.
9) Jones DR, Chew DP, Horsfall MJ, Chuang AM-Y, Sinhal AR, Joseph MX, et al. Multidisciplinary transcatheter aortic valve replacement heart team programme improves mortality in aortic stenosis. Open Heart. 2019;6(2):e000983.
10) Metkus TS, Beckie TM, Cohen MG, Fremes SE, Mehran R, Sellke FW, et al. The heart team for coronary revascularization decisions: 2 illustrative cases. Case Reports. 2022;4(3):115-20.
11) Archbold A, Akowuah E, Banning AP, Baumbach A, Braidley P, Cooper G, et al. Getting the best from the Heart Team: guidance for cardiac multidisciplinary meetings. Heart. 2022;108(11):e2-e.
12) Yeoh J, MacCarthy P. Is it time to refresh the heart team? New paradigms for shared decision making. Heart. 2021;107(8):674-81.
13) Young MN, Kolte D, Cadigan ME, Laikhter E, Sinclair K, Pomerantsev E, et al. Multidisciplinary heart team approach for complex coronary artery disease: single center clinical presentation. Journal of the American Heart Association. 2020;9(8):e014738.
14) Lindman BR, Goel K. British Societies' recommendations for Heart Team multidisciplinary meetings: broadly relevant principles with anticipated regional differences in process. BMJ Publishing Group Ltd and British Cardiovascular Society; 2022. p. 824-6.
15) Lancellotti P, Ancion A, Davin L, Dulgheru R, Gach O, Lempereur M, et al. [The heart team : definition and organization. Point of view of the cardiologist]. Revue medicale de Liege. 2019 Sup;74(S1):S5-S9. PubMed PMID: 31070309. Epub 2019/05/10. Le «Heart Team» : définition et organisation. Point de Vue du Cardiologue. fre.
16) Batchelor WB, Anwaruddin S, Wang DD, Perpetua EM, Krishnaswami A, Velagapudi P, et al. The multidisciplinary heart team in cardiovascular medicine: current role and future challenges. JACC: Advances. 2023;2(1):100160.
17) Mohr FW, Morice M-C, Kappetein AP, Feldman TE, Ståhle E, Colombo A, et al. Coronary artery bypass graft surgery versus percutaneous coronary intervention in patients with three-vessel disease and left main coronary disease: 5-year follow-up of the randomised, clinical SYNTAX trial. The lancet. 2013;381(9867):629-38.
18) Petrie MC, Jhund PS, She L, Adlbrecht C, Doenst T, Panza JA, et al. Ten-year outcomes after coronary artery bypass grafting according to age in patients with heart failure and left ventricular systolic dysfunction: an analysis of the extended follow-up of the STICH trial (Surgical Treatment for Ischemic Heart Failure). Circulation. 2016;134(18):1314-24.
19) Velazquez EJ, Lee KL, Jones RH, Al-Khalidi HR, Hill JA, Panza JA, et al. Coronary-artery bypass surgery in patients with ischemic cardiomyopathy. New England Journal of Medicine. 2016;374(16):1511-20.
20) Pieri M, Belletti A, Monaco F, Pisano A, Musu M, Dalessandro V, et al. Outcome of cardiac surgery in patients with low preoperative ejection fraction. BMC anesthesiology. 2016;16(1):1-10.
21) guideline NG208 N. Heart valve disease presenting in adults: investigation and management. 2021.
22) Members WC, Otto CM, Nishimura RA, Bonow RO, Carabello BA, Erwin III JP, et al. 2020 ACC/AHA guideline for the management of patients with valvular heart disease: a report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. Journal of the American College of Cardiology. 2021;77(4):e25-e197.
23) Schlotter F, de Waha S, Eitel I, Desch S, Fuernau G, Thiele H. Interventional post-myocardial infarction ventricular septal defect closure: a systematic review of current evidence. EuroIntervention. 2016;12(1):94-102.
24) Schultz WM, Kelli HM, Lisko JC, Varghese T, Shen J, Sandesara P, et al. Socioeconomic status and cardiovascular outcomes: challenges and interventions. Circulation. 2018;137(20):2166-78.
25) Tsang MB, Schwalm JD, Gandhi S, Sibbald MG, Gafni A, Mercuri M, et al. Comparison of Heart Team vs Interventional Cardiologist Recommendations for the Treatment of Patients With Multivessel Coronary Artery Disease. JAMA Network Open. 2020;3(8):e2012749-e.