**Name of Journal:** *World Journal of Cardiology*

**Manuscript NO:** 65598

**Manuscript Type:** EDITORIAL

**Improving the heart team: An interdisciplinary team and integrated practice unit**

Veronese et *et al*. Improving the heart team

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**Author contributions:** All authors contributed to this paper; Veronese ET designed the overall concept and outline of the manuscript; Pomerantzeff PMA and Jatene FB contributed to the discussion and design of the manuscript; Veronese ET, Pomerantzeff PMA, and Jatene FB contributed to the writing and editing the manuscript, review of literature and the final approval of this paper.

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**Received:** March 17, 2021

**Revised:** September 2, 2021

**Accepted: December 7, 2021**

**Published online:**

**Abstract**

*Heart Team* emerged as an important tool in the cardiovascular care, improving the efficiency of decision-making process. In addition to the benefits in patient care, it symbolizes a new culture and mindset. However, beyond the clinical condition, in low/middle-income countries other concerns arise regarding patient's background and these demands are, usually, as challenging as the medical treatment. New models have been proposed face these demands and to assure a holistic care by Integrated Practice Units. Optimization and reorganization of already existing resources and promotion of interdisciplinary and holistic care may be an effective manner to improve outcomes despite socioeconomic barriers.

**Key Words:** Heart team; Interdisciplinary; Integrated practice units; Cardiovascular; Perioperative; Surgery

Veronese ET, Pomerantzeff PMA, Jatene FB. Improving the heart team: An interdisciplinary team and integrated practice unit. *World J Cardiol* 2021; In press

**Core Tip:** Despite emerging technologies and advanced devices, the real-world situation of low- to middle-income countries presents several socioeconomic concerns that jeopardize patients and, consequently, resources and outcomes. Our pioneer project "interdisciplinary heart team and integrated practice unit" emerged as a means by which to address these demands by prioritizing the management of existing resources.

**INTRODUCTION**

*Heart Team* (Table 1) emerged as an important tool in the cardiovascular care, improving the efficiency of decision-making process[1,2]. This multidisciplinary team-based approach has been used for decades in fields as oncology[3] and organ transplantation[4,5] to deliver the best patient care. Although is not a new concept, the term *Heart Team* was incorporated in the cardiovascular care since the publication of SINTAX Trial[6] and, more recently, the PARTNER Trial[7]. Both trials used a collaborative team-based approach to decide the better strategy to the myocardial revascularization (surgical or percutaneous) or valvular replacement (surgical or transcatheter), respectively.

Using the theory of Venn diagrams[8], this expertise’s overlap among different specialties may improve the challenging decision-making process. In addition to the benefits in patient care, the *Heart Team* also promotes continue education[1,9] through the share-of-knowledge and the built of respect, trust and lasting professional relationship between its members. Besides, the interdisciplinary rounds[10,11] and the incorporation of new devices[12] has been currently used in intensive care medicine[13], reducing miscommunication and improving the comprehension of goals by all team members and patient/family satisfaction[14].

More than a medical multi-specialty interaction, it symbolizes a new culture and mindset, and it has been adopted in many cardiology fields as cardio-obstetrics[15–17], heart failure[18], valvular disease[19–21] and coronary artery revascularization[3]. Furthermore, recently published professional societies guidelines for valvular[22–24] and coronary diseases[25] includes the *Heart Team* as pivotal to both clinical and interventional therapeutic strategies, especially in complex or high-risk patients.

Beyond the clinical condition, in low/middle-income countries other concerns arise regarding patient's background and these demands are, usually, as challenging as the medical treatment[26]. Notedly on valvular disease, the socioeconomic circumstances are crucial. Low scholarity, malnutrition, limited access to the primary care, a high prevalence of rheumatic fever, management of anticoagulation and delayed time referral to cardiac surgery are some of these concerns[27]. To face these demands, new models have been proposed[28] to assure a holistic care by *Integrated Practice Units*[29].

Our institution is the public biggest cardiovascular center in Latin America, and, beyond the traditional *Heart Team*, a pioneer interdisciplinary perioperative project coordinated and supported by the Management Executive Direction has been implemented in our Valvular Diseases Unit to optimize resources and improve outcomes. Since 2018, are part of this *Interdisciplinary Heart Team* the cardiovascular surgeon, clinical cardiologist, anesthetist, nursing, psychologist, nutritionist, physiotherapist, welfare service and pharmacists. Beyond these professional, we count on a management team responsible for the logistics to optimize further necessary exams, team re-evaluation and surgical scheduling. Before referral to surgery, all-team come together to expose and solve each patients' demands. If no concerns are pending, patient is referred to waiting surgery list.

On the procedure eve the entire preoperative routine is checked by clinician, surgeon and nursing. The intraoperative and intensive care unit, patient is under care according to the clinical, safety and handover protocols. In the ward, besides daily assessment, every patient is reviewed by the entire *Interdisciplinary Heart Team*. Forecast of hospital discharge, referral to backup hospitals and other demands are discussed. At the hospital discharge, nursing and medical team provide guidance to patients and schedule the postoperative return visit consultation.

**CONCLUSION**

Even with an unfavorable profile (high proportion of rheumatic disease, redo procedures, multivalvular disease and advanced heart failure status) preliminary results demonstrated reduction of waiting for surgery time and lowering mortality rates. As part of an upper-middle income country, optimization and reorganization of already existing resources and promotion of interdisciplinary and holistic care may be an effective manner to improve outcomes despite socioeconomic barriers. There is always a manner to the improvement.

**ACKNOWLEDGEMENTS**

We would like to express our gratitude to the motivation and dedication of the entire team of professionals committed to the success of this pioneer project.

**REFERENCES**

1 **Han JJ**, Brown CR. The Heart Team: A Powerful Paradigm for the Future Training of Cardiovascular Surgeons. *J Am Coll Cardiol* 2018; **71**: 2702-2705 [PMID: 29880131 DOI: 10.1016/j.jacc.2018.05.001]

2 **Mesana T**, Rodger N, Sherrard H. Heart Teams: A New Paradigm in Health Care. *Can J Cardiol* 2018; **34**: 815-818 [PMID: 29960610 DOI: 10.1016/j.cjca.2018.02.028]

3 **Holmes DR Jr**, Rich JB, Zoghbi WA, Mack MJ. The heart team of cardiovascular care. *J Am Coll Cardiol* 2013; **61**: 903-907 [PMID: 23449424 DOI: 10.1016/j.jacc.2012.08.1034]

4 **Junarta J**, Fernandez M, Chung I, Salha A, Klaud Francheska BD, Lowe-Jones R, Sharma R, Firoozi S, Banerjee D. Role of a cardio-renal multi-disciplinary team meeting in managing cardiovascular risk in patients on kidney transplant waitlists. *Clin Transplant* 2020; **34**: e14061 [PMID: 32780546 DOI: 10.1111/ctr.14061]

5 **Cajita MI**, Baumgartner E, Berben L, Denhaerynck K, Helmy R, Schönfeld S, Berger G, Vetter C, Dobbels F, Russell CL, De Geest S; BRIGHT Study Team. Heart transplant centers with multidisciplinary team show a higher level of chronic illness management - Findings from the International BRIGHT Study. *Heart Lung* 2017; **46**: 351-356 [PMID: 28624338 DOI: 10.1016/j.hrtlng.2017.05.006]

6 **Yang CH**, Hsieh MJ, Chen CC, Chang SH, Wang CY, Lee CH, Hsieh IC. SYNTAX score: an independent predictor of long-term cardiac mortality in patients with acute ST-elevation myocardial infarction. *Coron Artery Dis* 2012; **23**: 445-449 [PMID: 22968215 DOI: 10.1097/MCA.0b013e3283587835]

7 **Leon MB**, Smith CR, Mack M, Miller DC, Moses JW, Svensson LG, Tuzcu EM, Webb JG, Fontana GP, Makkar RR, Brown DL, Block PC, Guyton RA, Pichard AD, Bavaria JE, Herrmann HC, Douglas PS, Petersen JL, Akin JJ, Anderson WN, Wang D, Pocock S; PARTNER Trial Investigators. Transcatheter aortic-valve implantation for aortic stenosis in patients who cannot undergo surgery. *N Engl J Med* 2010; **363**: 1597-1607 [PMID: 20961243 DOI: 10.1056/NEJMoa1008232]

8 **Holmes DR Jr**, Mohr F, Hamm CW, Mack MJ. Venn diagrams in cardiovascular disease: the Heart Team concept. *Eur J Cardiothorac Surg* 2013; **43**: 255-257 [PMID: 23315961 DOI: 10.1093/ejcts/ezs656]

9 **Hahn RT**. The new paradigm for the management of valvular heart disease: the multi-disciplinary heart team. *J Am Soc Echocardiogr* 2011; **24**: A28 [PMID: 21933742 DOI: 10.1016/j.echo.2011.08.004]

10 **Krimminger D**, Sona C, Thomas-Horton E, Schallom M. A Multidisciplinary QI Initiative to Improve OR-ICU Handovers. *Am J Nurs* 2018; **118**: 48-59 [PMID: 29369877 DOI: 10.1097/01.NAJ.0000530248.45711.60]

11 **Gonzalo JD**, Wolpaw DR, Lehman E, Chuang CH. Patient-centered interprofessional collaborative care: factors associated with bedside interprofessional rounds. *J Gen Intern Med* 2014; **29**: 1040-1047 [PMID: 24615186 DOI: 10.1007/s11606-014-2817-x]

12 **Benbenishty JS**, Bülow HH. Intensive care medicine in 2050: multidisciplinary communication in-/outside ICU. *Intensive Care Med* 2018; **44**: 636-638 [PMID: 28900688 DOI: 10.1007/s00134-017-4915-9]

13 **Collins SA**, Currie LM. Interdisciplinary communication in the ICU. *Stud Health Technol Inform* 2009; **146**: 362-366 [PMID: 19592866 DOI: 10.3233/978-1-60750-024-7-362]

14 **Justice LB**, Cooper DS, Henderson C, Brown J, Simon K, Clark L, Fleckenstein E, Benscoter A, Nelson DP. Improving Communication During Cardiac ICU Multidisciplinary Rounds Through Visual Display of Patient Daily Goals. *Pediatr Crit Care Med* 2016; **17**: 677-683 [PMID: 27176731 DOI: 10.1097/PCC.0000000000000790]

15 **Easter SR**, Valente AM, Economy KE. Creating a Multidisciplinary Pregnancy Heart Team. *Curr Treat Options Cardiovasc Med* 2020; **22**: 3 [PMID: 31989331 DOI: 10.1007/s11936-020-0800-x]

16 **Wolfe DS**. Introduction to Building the Cardio-Obstetric Team. *Clin Obstet Gynecol* 2020; **63**: 791-798 [PMID: 32740041 DOI: 10.1097/GRF.0000000000000557]

17 **Grodzinsky A**, Florio K, Spertus JA, Daming T, Lee J, Rader V, Nelson L, Gray R, White D, Swearingen K, Thomas M, Singh A, Magalski A, Schmidt L. Importance of the Cardio-Obstetrics Team. *Curr Treat Options Cardiovasc Med* 2019; **21**: 84 [PMID: 31820201 DOI: 10.1007/s11936-019-0789-1]

18 **Lau C**, Carneiro H, Baheerathan A, Moggan S, Wareham E, Pemberton S, Hull D, Daniels C, Shah J, Bethell H. Findings from an advanced heart failure multidisciplinary team meeting: a holistic pathway for improved patient care. *Future Hosp J* 2015; **2**: s17 [PMID: 31098145 DOI: 10.7861/futurehosp.2-2s-s17]

19 **Jimenez E**, Wu D, Omer S, Cornwell L, Nunez P, Rosengart TK, Coselli JS. Mitral Valve Repair Rate at a Veterans Affairs Hospital Utilizing a Multidisciplinary Heart Team. *Semin Thorac Cardiovasc Surg* 2019; **31**: 434-441 [PMID: 30849464 DOI: 10.1053/j.semtcvs.2019.02.028]

20 **Heuts S**, Olsthoorn JR, Hermans SMM, Streukens SAF, Vainer J, Cheriex EC, Segers P, Maessen JG, Sardari Nia P. Multidisciplinary decision-making in mitral valve disease: the mitral valve heart team. *Neth Heart J* 2019; **27**: 176-184 [PMID: 30742250 DOI: 10.1007/s12471-019-1238-1]

21 **Jones DR**, Chew DP, Horsfall MJ, Chuang AM, Sinhal AR, Joseph MX, Baker RA, Bennetts JS, Selvanayagam JB, Lehman SJ. Multidisciplinary transcatheter aortic valve replacement heart team programme improves mortality in aortic stenosis. *Open Heart* 2019; **6**: e000983 [PMID: 31413842 DOI: 10.1136/openhrt-2018-000983]

22 **Baumgartner H**, Falk V, Bax JJ, De Bonis M, Hamm C, Holm PJ, Iung B, Lancellotti P, Lansac E, Rodriguez Muñoz D, Rosenhek R, Sjögren J, Tornos Mas P, Vahanian A, Walther T, Wendler O, Windecker S, Zamorano JL; ESC Scientific Document Group. 2017 ESC/EACTS Guidelines for the management of valvular heart disease. *Eur Heart J* 2017; **38**: 2739-2791 [PMID: 28886619 DOI: 10.1093/eurheartj/ehx391]

23 **Otto CM**, Nishimura RA, Bonow RO, Carabello BA, Erwin JP 3rd, Gentile F, Jneid H, Krieger EV, Mack M, McLeod C, O'Gara PT, Rigolin VH, Sundt TM 3rd, Thompson A, Toly C. 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. *Circulation* 2021; **143**: e72-e227 [PMID: 33332150 DOI: 10.1161/CIR.0000000000000923]

24 **Tarasoutchi F**, Montera MW, Ramos AIO, Sampaio RO, Rosa VEE, Accorsi TAD, Santis A, Fernandes JRC, Pires LJT, Spina GS, Vieira MLC, Lavitola PL, Ávila WS, Paixão MR, Bignoto T, Togna DJD, Mesquita ET, Esteves WAM, Atik F, Colafranceschi AS, Moises VA, Kiyose AT, Pomerantzeff PMA, Lemos PA, Brito Junior FS, Weksler C, Brandão CMA, Poffo R, Simões R, Rassi S, Leães PE, Mourilhe-Rocha R, Pena JLB, Jatene FB, Barbosa MM, Abizaid A, Ribeiro HB, Bacal F, Rochitte CE, Fonseca JHAPD, Ghorayeb SKN, Lopes MACQ, Spina SV, Pignatelli RH, Saraiva JFK. Update of the Brazilian Guidelines for Valvular Heart Disease - 2020. *Arq Bras Cardiol* 2020; **115**: 720-775 [PMID: 33111877 DOI: 10.36660/abc.20201047]

25 **Neumann FJ**, Sousa-Uva M, Ahlsson A, Alfonso F, Banning AP, Benedetto U, Byrne RA, Collet JP, Falk V, Head SJ, Jüni P, Kastrati A, Koller A, Kristensen SD, Niebauer J, Richter DJ, Seferovic PM, Sibbing D, Stefanini GG, Windecker S, Yadav R, Zembala MO; ESC Scientific Document Group. 2018 ESC/EACTS Guidelines on myocardial revascularization. *Eur Heart J* 2019; **40**: 87-165 [PMID: 30165437 DOI: 10.1093/eurheartj/ehy394]

26 **Zilla P**, Bolman RM 3rd, Boateng P, Sliwa K. A glimpse of hope: cardiac surgery in low- and middle-income countries (LMICs). *Cardiovasc Diagn Ther* 2020; **10**: 336-349 [PMID: 32420116 DOI: 10.21037/cdt.2019.11.03]

27 **Curry C**, Zuhlke L, Mocumbi A, Kennedy N. Acquired heart disease in low-income and middle-income countries. *Arch Dis Child* 2018; **103**: 73-77 [PMID: 28838969 DOI: 10.1136/archdischild-2016-312521]

28 **Vervoort D**, Swain JD, Pezzella AT, Kpodonu J. Cardiac Surgery in Low- and Middle-Income Countries: A State-of-the-Art Review. *Ann Thorac Surg* 2021; **111**: 1394-1400 [PMID: 32771467 DOI: 10.1016/j.athoracsur.2020.05.181]

29 **van Harten WH**. Turning teams and pathways into integrated practice units: Appearance characteristics and added value. *Int J Care Coord* 2018; **21**: 113-116 [PMID: 30595841 DOI: 10.1177/2053434518816529]

**Footnotes**

**Conflict-of-interest statement:** The authors declare no conflicts of interest

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**Provenance and peer review:** Invited article; Externally peer reviewed.

**Peer-review model**: Single blind

**Corresponding Author's Membership in Professional Societies:** Brazilian Society of Cardiovascular Surgery.

**Peer-review started:** March 17, 2021

**First decision:** July 18, 2021

**Article in press:**

**Specialty type:** Health care sciences and services

**Country/Territory of origin:** Brazil

**Peer-review report’s scientific quality classification**

Grade A (Excellent): 0

Grade B (Very good): B, B

Grade C (Good): C

Grade D (Fair): 0

Grade E (Poor): 0

**P-Reviewer:** Chisthi MM, Dabla PK, Spartalis M **S-Editor:** Ma YJ **L-Editor:** A **P-Editor:** Ma YJ

**Table 1 Members of the interdisciplinary heart team responsible to solve patient's demands before they are referred to waiting surgery list**

|  |  |
| --- | --- |
| **interdisciplinary heart team members** | |
| Clinical cardiologist | Cardiovascular surgeon |
| Anesthetic | Nursing |
| Management team | Welfare service |
| Psychologist | Physioterapist |
| Nutritionist | Pharmacist |