Authors have nothing to disclose with regard to commercial support.

ON THE DEFINITION OF GEOMETRIC ORIFICE AREA

To the Editor:

We read with great interest the Position Statement about labeling of heart valve prostheses recently published in the *Journal*.¹ The effort to achieve more clarity about the issue should be commended. The authors stated that the geometric orifice area (GOA) of a mechanical prosthesis is the area created by open spaces between the valve ring and the leaflets, and it should not be mistaken for the internal orifice area, which is the area calculated from the internal diameter of the prosthesis. To avoid confusion, it should be emphasized that such definition was different in the past. In fact, there are several published articles that define GOA as the area determined from the internal orifice diameter, including inside the GOA space occupied by the leaflets of the mechanical prosthesis.²⁻⁵ However, the GOA definition from the Position Statement¹ is similar to the previously reported concept of “valve clear area”^{2,3} or “clear orifice area.”⁵ More importantly, manufacturers usually report the GOA according to the past definition^{2,3} and do not state on the “Instructions for Use” how the GOA has been measured or calculated.⁶ In our opinion, it would be advisable that manufacturers report in an explicit way the adopted definition of GOA and the way to measure or calculate the GOA.

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References

1. Durko AP, Head SJ, Pibarot P, Atluri P, Bapat V, Cameron DE, et al; EACTS–STS–AATS Valve Labelling Task Force. Characteristics of surgical prosthetic heart valves and problems around labeling: A document from the European Association for Cardio-Thoracic Surgery (EACTS)-The Society of Thoracic Surgeons

The Editor welcomes submissions for possible publication in the Letters to the Editor section that consist of commentary on an article published in the *Journal* or other relevant issues. Authors should: • Include no more than 500 words of text, three authors, and five references. • Type with double-spacing. • See <http://jtcvs.ctsnetjournals.org/misc/fora.shtml> for detailed submission instructions. • Submit the letter electronically via jtcvs.editorialmanager.com. Letters commenting on an article published in the JTCVS will be considered if they are received within 6 weeks of the time the article was published. Authors of the article being commented on will be given an opportunity to offer a timely response (2 weeks) to the letter. Authors of letters will be notified that the letter has been received. Unpublished letters cannot be returned.

- (STS)-American Association for Thoracic Surgery (AATS) Valve Labelling Task Force. *J Thorac Cardiovasc Surg*. 2019;158:1041-54.
2. Walker DK, Brendzel AM, Scotten LN. The new St. Jude Medical regent mechanical heart valve: laboratory measurements of hydrodynamic performance. *J Heart Valve Dis*. 1999;8:687-96.
3. Bottio T, Caprili L, Casarotto D, Gerosa G. Small aortic annulus: the hydrodynamic performances of 5 commercially available bileaflet mechanical valves. *J Thorac Cardiovasc Surg*. 2004;128:457-62.
4. Daneshvar SA, Rahimtoola SH. Valve prosthesis-patient mismatch (VP-PM): a long-term perspective. *J Am Coll Cardiol*. 2012;60:1123-35.
5. Dominik J, Zacek P. Overview of the heart replacement devices. In: Dominik J, Zacek P, eds. *Heart Valve Surgery. An Illustrated Guide*. Berlin Heidelberg: Springer-Verlag; 2010:44-7.
6. Instructions For Use. St Jude Medical™ Mechanical Heart Valve. 09/30/2014.

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REPLY: THE DEVIL IS IN THE DETAILS (OF DEFINITIONS)

Reply to the Editor:

We thank Drs Cannata and Russo for their letter¹ discussing the definition of geometric orifice area (GOA) of prosthetic heart valves provided in the recently published Position Statement of the European Association for Cardio-Thoracic Surgery–Society of Thoracic Surgeons–American Association for Thoracic Surgery (EACTS–STS–AATS) Valve Labelling Task Force.²

Clear definitions are of uttermost importance when reporting technical parameters. Summarizing, clarifying, or providing these definitions in terms of prosthetic valve characteristics was one of the main goals of the EACTS–STS–AATS Valve Labelling Task Force.

The concept of defining the area theoretically available for flow within a prosthetic heart valve orifice (GOA) was introduced with the intention to find a parameter that can characterize prosthetic heart valve performance, is easy to measure, and is not dependent from patient-related factors like in vivo effective orifice area.

Although the direct clinical usefulness of this dimension is questionable,³ numerous, occasionally overlapping, or conflicting definitions have been introduced to define this parameter, leading to inconsistency between reports and publications. Among others, “clear orifice area,” “internal geometric area,”⁴ “planimetric GOA,” or “theoretical GOA”³ have been used, while the applicable International Organization for Standardization standard does not provide a definition for this parameter.⁵

Considering that the area within a prosthetic heart valve orifice occupied by valve leaflets or occluders is not “available for flow,” the EACTS–STS–AATS Valve Labelling Task Force defined GOA as “the area between the free edges of the open leaflets of a bioprosthetic valve, or the area created by the open spaces between the valve ring and leaflet(s) for a mechanical surgical heart valve.” This is in line with previous definitions for GOA in case of native valves⁶ and implies that GOA should be

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determined using planimetry techniques rather than simply being calculated from the internal orifice diameter of the prosthesis.

We thank again Cannata and Russo for underlining this important point, and we cannot agree more that in the forest of terminology, the uniform use of clear and commonly accepted definitions is necessary when reporting prosthetic valve characteristics.

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References

1. Russo CF, Cannata A. On the definition of geometric orifice area. *J Thorac Cardiovasc Surg.* 2020;159:e303.
2. Durko AP, Head SJ, Pibarot P, Atluri P, Bapat V, Cameron DE, et al. Characteristics of surgical prosthetic heart valves and problems around labeling: A document from the European Association for Cardio-Thoracic Surgery (EACTS)–The Society of Thoracic Surgeons (STS)–American Association for Thoracic Surgery (AATS) Valve Labelling Task Force. *J Thorac Cardiovasc Surg.* 2019;158:1041-54.
3. Lancellotti P, Pibarot P, Chambers J, Edvardsen T, Delgado V, Dulgheru R, et al. Recommendations for the imaging assessment of prosthetic heart valves: A report from the European Association of Cardiovascular Imaging endorsed by the Chinese Society of Echocardiography, the Interamerican Society of Echocardiography and the Brazilian Department of Cardiovascular Imaging. *Eur Heart J Cardiovasc Imaging.* 2016;17:589-90.
4. Pibarot P, Dumesnil JG. Prosthesis–patient mismatch: definition, clinical impact, and prevention. *Heart.* 2006;92:1022-9.
5. International Organization for Standardization (ISO). *International Standard, ISO 5840:2015, Cardiovascular implants—cardiac valve prostheses.* Geneva: ISO; 2015.
6. Garcia D, Kadem L. What do you mean by aortic valve area: geometric orifice area, effective orifice area, or gorlin area? *J Heart Valve Dis.* 2006;15:601-8.

<https://doi.org/10.1016/j.jtcvs.2019.12.090>