



# The Complexity of Right Ventricle Measurement

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Received 2023 August 15; Accepted 2023 August 28.

## Dear Editor,

Cardiac chamber size measurement is the primary challenge in cardiac imaging. Two-dimensional Echocardiography (2D-echocardiography) is an available, noninvasive and inexpensive imaging tool commonly used as a primary modality for this purpose. Previous studies reported that cardiac chamber dimensions are affected by multiple variables such as age, height, weight, sex and body surface area (BSA). Recently published paper by Soulat-Dufour et al. mentioned the influence of sex, age, and ethnicity on right atrium size (1).

Latest Update from the American Society of Echocardiography and the European Association of Cardiovascular Imaging recommended to report echocardiographic measurement based on BSA (2).

In this article, we especially focused on the importance of right ventricle (RV) measurement normalization by BSA. Making decision based on only absolute RV size might result in incorrect diagnosis, dispensable use of imaging tools and unintended negative impacts on patients.

Although extensive research has been carried out on left heart quantification, the generalizability of published research on RV size measurement is problematic. We are unable to define RV because of its intricate anatomy caused by its crescent shape. Although the Apical 4 chamber view is commonly employed for RV size evaluation, we cannot be certain of obtaining an optimal image due to the lack of a landmark (3). Guidelines suggest RV-focused view for estimation of RV size. Right ventricle enlargement is defined as RV mid diameter higher than 35mm and RV basal diameter higher than 41 mm (2).

Right ventricle enlargement is induced by cardiac shunts, cardiomyopathy, myocardial infarction, and pulmonary hypertension. According to clinical judgment further diagnostic imaging such as TEE and CMR should be performed when RV enlargement is detected by 2D echocardiography.

We found no aberrant findings after performing

additional diagnostic imaging on several of the patients referred to our tertiary cardiovascular center and diagnosed with RV enlargement by 2D-echocardiography. One significant explanation for this could be that they were all adults. We found that although absolute RV linear dimensions were greater than upper normal limit but when echocardiographic data indexed to body surface area, they were within the reference range.

To our knowledge, 2 studies investigated about normalization of RV parameters. They exhibited the important role of BSA and gender in determining normal right ventricular dimension (4, 5). Willis et al. studied both absolute and indexed dimensions of RV in men and women. Absolute RV dimensions were larger in male, but indexed results were significantly larger in female (4). Oronzio et al. revealed that RV dimensions were significantly lower in female but after RV indexing the difference became smaller (5).

Therefore, it seems that indexed values must be considered for preventing incorrect diagnosis and dispensable use of imaging tools which leads to an increase in costs being imposed on insurance system. As a result, with respect to guidelines we emphasize that all echocardiographic parameters including RV dimension should be reported based on BSA.

## Footnotes

**Authors' Contribution:** A.Alizadeasl and F.Zolfaghari designed and drafted the manuscript. A.Alizadeasl revised the manuscript.

**Conflict of Interests:** I confirm that neither I nor any of authors have any personal or business interest in or potential for personal gain from any of the organizations or projects. authors are not editorial board members or a reviewer of this journal.

**Funding/Support:** This study received no specific grant from any funding agency.

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