

Official Announcement of Physiological Diagnostic Criteria for Vascular Failure from the Japanese Society for Vascular Failure

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The Japanese Society for Vascular Failure has published a consensus statement on the physiological diagnostic criteria for vascular failure in *Hypertension*¹⁾. This was a long-desired effort of our academic society. Vascular failure was first proposed by Inoue and Node in 2006 as a highly integrated concept that includes a broad spectrum of vascular diseases, and was based on abnormalities of the vascular endothelium and medial layer components, as well as on metabolic abnormalities²⁾. Vascular failure contributes to a wide range of vascular injuries from subclinical vascular damage to atherosclerotic arterial luminal narrowing, as well as circulatory dysfunction and structural abnormalities in the systemic and local vasculature. This indicates that vascular failure potentially plays an important role in the pathophysiology of various diseases and clinical conditions. Thus, it is likely that a larger population may be unexpectedly affected by vascular failure in routine clinical practice. However, the screening and diagnosis of vascular failure has not been ap-

propriate, possibly due to its heterogeneous nature and lack of established diagnostic criteria. Based on these backgrounds, the present physiological diagnostic criteria were established as a clinical tool to systematically evaluate a subject's vascular function and/or diagnose vascular failure by the use of physiological tests.

To establish the criteria, we reviewed recent clinical evidence on the physiological tests to evaluate vascular endothelial function (flow-mediated vasodilation and reactive hyperemia-peripheral arterial tonometry) and integrated medial layer function by evaluation of arterial stiffness (pulse wave velocity and cardio-ankle vascular index). Then, we estimated two values for each test with the following goals: (i) to separate the normal and borderline zone associated with conventional cardiovascular risk factors, and (ii) to separate the borderline and abnormal zone associated with increased risk of cardiovascular events (**Figure 1**).

Hereafter, we need to disseminate these criteria widely

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Received: November 7, 2018, Accepted: November 19, 2018

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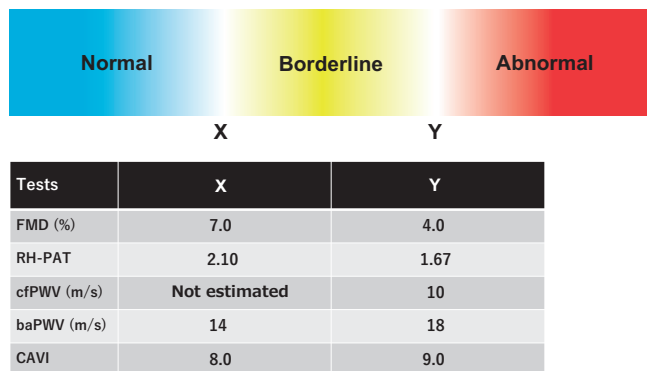


Figure 1. Diagnosis criteria for vascular failure and the cutoff values for each vascular test

A value of X indicates a cutoff value to separate the borderline from the normal range, and a value of Y indicates a cutoff value to separate the abnormal range from the borderline zone.

FMD: ≥ 7 for normal, ≥ 4.0 and <7.0 for borderline, and <4.0 for abnormal

RH-PAT: ≥ 2.10 for normal, ≥ 1.67 and <2.10 for borderline, and <1.67 for abnormal

cfPWV: ≥ 10 for abnormal

baPWV: <14 for normal, ≥ 14 and <18 for borderline, and ≥ 18 for abnormal

CAVI: <8 for normal, ≥ 8 and <9 for borderline, and ≥ 9 for abnormal

Modified from Tanaka A, et al. Hypertension 2018; 72: 1060-71.

FMD, flow-mediated vasodilation; RH-PAT, reactive hyperemia-peripheral arterial tonometry; cfPWV, carotid-femoral pulse wave velocity; baPWV, brachial-ankle pulse wave velocity; CAVI, cardio-ankle vascular index.

into clinical practice and to verify the clinical validity and efficacy of these criteria as appropriate surrogate markers for cardiovascular outcomes. In addition, we are now planning

to establish the morphological and biochemical diagnostic criteria, so that we can comprehensively diagnose the vascular failure. Lastly, we hope that these criteria may help to identify possible patients with vascular failure in clinical practice and to implement pre-emptive and preventive medicine for cardiovascular disease.

Conflicts of Interest

K.K. received research funding from Omron Healthcare and Fukuda Denshi. H.I. received donation from Fukuda Denshi. Y.H. received consulting fees from Mitsubishi Tanabe Pharma Corporation related to this study, as well as honoraria and grants from Teijin, Boehringer Ingelheim, Merck, Sanofi, AstraZeneca, Kyowa Hakko Kirin, Takeda, Astellas, Daiichi Sankyo, Mochida, Nihon Kohden, Shionogi, Nippon Sigmax, Sanwa Kagaku Kenkyusho, Unex, and Kao, and honoraria from Radiometer, Omron, Sumitomo Dainippon, Otsuka, Torii, Kowa, Fujiyakuhin, Amgen Astellas, Nippon Shinyaku, Itamar Medical, Bayer, Eli Lilly, and Ono. The other authors declare no competing interests.

Acknowledgement

The physiological diagnostic criteria for vascular failure were developed by an expert committee in the Japan Society for Vascular Failure.

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