

# Attitudes of Early-Career Cardiologists in Japan About Their Cardiovascular Training Programs



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Understanding the perspective of early-career cardiologists is important to design effective responses to the challenges in modern cardiovascular (CV) training programs. We conducted a web-based survey on a total of 272 early-career cardiologists (within 10 post-graduate years) who registered for the 2011 annual Japanese Circulation Society Meeting. Main outcome measures were satisfaction with their training, confidence in their clinical skills, and professional expectations, scaled from 0 to 10. The median training time was 6 years, with 2 years for internal medicine and 4 years for CV disease. Most received their training in university hospitals at some point during their career (79.5%) and were interested in a subspecialty training, such as interventional cardiology (38.6%), electrophysiology (15.1%), and advanced heart failure (10.3%); only 9.6% showed interest in general cardiology. The respondents felt comfortable in managing common CV conditions such as coronary artery disease (average score  $6.3 \pm 2.4$  on an 11-point Likert scale) but less so in peripheral arterial disease ( $3.8 \pm 2.8$ ), arrhythmias ( $3.7 \pm 2.3$ ), and congenital heart disease ( $2.9 \pm 2.2$ ). Their satisfaction rate with their CV training positively correlated with their clinical proficiency level and was associated with volume of coronary angiograms, percutaneous coronary interventions, and echocardiograms completed. In conclusion, the current young cardiologists have a positive perception of and interest in procedure-based subspecialty training, and their training satisfaction was related to volume of cardiac procedures. Additional effort is needed in enforcing the training in underappreciated subspecialty areas. © 2014 Elsevier Inc. All rights reserved. (Am J Cardiol 2014;114:629–634)

In recent years, the satisfaction of medical trainees (i.e., residents and fellows) with training and their perspective have been the subject of much research to provide reliable information for the outcome of the training system.<sup>1–9</sup> This is of no exception in cardiovascular (CV) training, and the program faces the need to identify the imbalance in volume and composition of the training system and assess its appropriateness through the perspective of the medical trainees. The CV-training programs are facing additional challenges; advances in medical treatment, intensive care, and noninvasive diagnosis in cardiology have led to an increasing demand for a complex system that provides residents with knowledge and skills required for diverse subspecialties.<sup>10</sup> However, the perspective of trainees in CV medicine and their self-assessed confidence level is unknown. There has been much research on resident perspectives and satisfaction within other specialties.<sup>1–9</sup> Factors such as operating experience, quality of the

attendant's teaching, interaction with attendants during patient care, and substantial citing of evidence-based literature were associated with residents' satisfaction in their training programs.<sup>3–5,11</sup> Our primary goal was to analyze and understand job-satisfaction levels and their factors for early-career cardiologists.

## Methods

This study is based on an analysis of data from a survey of CV trainees in Japan registered to attend the Japanese Circulation Society annual meeting scheduled in March 2011. Two hundred seventy-two trainees, who graduated all within 10 years, completed the web-based anonymous survey on registration.

The details of the survey questionnaire are provided in the [online supplement](#). The survey included questions across a wide number of variables. Questions related to current employment included hospital information, scholarly activity, satisfaction in current job environment, current annual salary, and clinical proficiency and satisfaction level in subspecialty management and imaging studies. Questions related to education and training included past training patterns regarding hospital type and specialty (general internal medicine, clinical cardiology, basic cardiology); obtaining specialist qualifications and PhD; areas of interest in CV subspecialty; experience of cardiology procedures; and length of career since graduation from medical school.

Trainees were queried regarding the number of cardiology procedures they performed as a primary operating physician. The procedures included coronary angiogram,

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See page 634 for disclosure information.

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Table 1  
Demographical information of the study participants

Type of current training facility	
University hospital	145 (53%)
Community hospital	
<200 beds	16 (6%)
200–500 beds	59 (22%)
500+beds	37 (14%)
Others	15 (6%)
Total training duration (years)	7.6 ± 2.1
Training duration, type of specialty (years)	
General internal medicine	2.1 ± 1.1
Clinical cardiology	3.9 ± 2.3
Basic cardiovascular research	2.7 ± 2.3
Training duration, type of training facility (years)	
Community hospital	3.6 ± 0.4
University hospital, clinical training	2.7 ± 2.4
University hospital, basic science	1.5 ± 1.8
Cardiology board qualification	134 (49%)
Presentation at scientific meeting	
Basic science research	90 (33%)
Clinical science research	236 (87%)
Publication of peer-reviewed article	
Basic science research	50 (18%)
Clinical science research	114 (42%)
Annual salary	
<6,000,000 JPY*	31 (11%)
6,000,000–10,000,000 JPY*	130 (48%)
10,000,000–JPY*	99 (36%)
Unanswered	12 (4%)

Note: Data are shown as the mean ± SD or number (%).

\* USD = 79.71 JPY (2011 average).

Table 2  
Interest of area in cardiology subspecialty among the study participants

Interest of Area	
Ischemic heart disease (including interventional cardiology)	105 (38.6%)
Arrhythmia (including electrophysiological study and catheter ablation)	41 (15.1%)
Advanced heart disease (including management of left ventricular assistant device and heart transplantation)	28 (10.3%)
General cardiology	26 (9.6%)
Imaging study; echocardiogram	25 (9.2%)
Basic research	18 (6.6%)
Imaging study; computed tomography/magnetic resonance imaging	9 (3.3%)
Valvular heart disease	4 (1.5%)
Imaging study; nuclear study	3 (1.1%)
Congenital heart disease	2 (0.7%)
Other	11(4.0%)

percutaneous coronary intervention, percutaneous peripheral intervention, electrophysiological study, catheter ablation, transthoracic echocardiogram, transesophageal echocardiogram, implantation of pacemaker, implantable cardioverter defibrillator, and cardiac resynchronization therapy (-defibrillator). Each item had 9 categorical choices for procedure volume.

Clinical proficiency level was assessed with 9 items based on an 11-point Likert scale (i.e., 0 = “never done before” to 10 = “able to handle all by myself through the

end”). Items evaluated were management of ischemic heart disease, arrhythmia, severe heart failure, peripheral artery disease, valvular heart disease, congenital heart disease, and imaging studies (echocardiogram, nuclear studies, and computed tomography/magnetic resonance imaging). Trainees were asked to rate their satisfaction level with their training in same 9 items by using an 11-point Likert scale (i.e., 0 = “dissatisfied, complete lack of experience” to 10 = “satisfied, gained enough experience”).

Participants were asked to rate the most important factors in their program choice. On a 0 to 10 scale (i.e., 0 = “not important at all” to 10 = “most important”), important cardiology training facility variables included hospital location, volume of patients and procedures, faculty and facility quality/reputation, and clinical and basic experimental research quality.

Continuous data were summarized as mean values ± SD and discrete data as absolute values and percentages. Data were analyzed using SPSS statistical software (SPSS Inc., Chicago, Illinois). Overall satisfaction score was calculated as the sum of satisfaction levels in each subspecialty. This reflected satisfaction with career training in the management of 6 CV fields (ischemic heart disease, valvular heart disease, advanced heart failure, arrhythmia, peripheral artery diseases, congenital heart diseases) and 3 noninvasive imaging studies (echocardiogram, nuclear studies, and computed tomography/magnetic resonance imaging). Logistic regression analysis was used to assess the association (reported as odds ratios and 95% confidence intervals) of trainee satisfaction with various factors, including clinical proficiency, procedure volume, scholarly activity, and obtaining cardiology board qualification or MD/PhD dual physician-scientist degree.

## Results

Baseline characteristics of the 272 responding participants are shown in Table 1. One hundred forty-five participants (53%) identified themselves as currently working in university hospitals and 112 (41%) in community hospitals. Most received their training in academic university hospitals at some point during their career (79.5%). The 3 most selected areas of interest in CV medicine were management of ischemic heart disease, arrhythmia, and advanced heart failure. Only 9.6% selected general cardiology as their area of interest (Table 2).

In terms of current job environment, 55 residents (20%) were “satisfied,” 107 (39%) were “somewhat satisfied,” and 20 (7%) were “dissatisfied.” The response of “satisfied” or “somewhat satisfied” was significantly greater among the participants in nonuniversity hospitals than those in university hospitals (73% vs 53%,  $p = 0.003$ ). Notably, the participants who responded “satisfied” or “somewhat satisfied” had similar training periods compared with their counterparts (CV medicine training;  $4.2 \pm 2.3$  vs  $3.8 \pm 2.2$  years [ $p = 0.21$ ]).

Figure 1 presents the volume of procedures performed by participants as a primary operating physician. The volume of coronary angiogram and transthoracic echocardiogram varied greatly. Nearly half of trainees had experienced less than 50 cases of percutaneous coronary intervention, and

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