

Impact of an Intensive Cardiology Orientation Program on Confidence of New Fellows

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Objective: We implemented a four-day intensive clinical orientation program in 2004 for cardiology fellows to compare the change in self-assessed confidence of fellows before versus after the orientation.

Background: The transition from an internal medicine residency to a cardiology fellowship can be challenging. There has been limited research on the use of orientation programs to ease this transition.

Methods: New fellows in 2006 and 2007 ($N = 13$) were prospectively queried immediately before, immediately after, and six months after orientation about their confidence and their support for the orientation program. We retrospectively queried fellows who began their fellowships in 2004 and 2005 ($N = 12$) by asking them to complete the same questionnaire based on what they

recalled feeling immediately before, immediately after, and six months after orientation. Responses to each question were based on a Likert scale from 1 to 7, and a total confidence score was calculated. Retrospective and prospective data were pooled, and nonparametric paired analyses were performed.

Results: Twenty-five fellows were enrolled. Fellows' confidence scores increased after the orientation from 20 to 36 ($p < 0.01$). A significant increase was sustained after six months. In addition, at all time points, the fellows supported the orientation program.

Conclusion: An intensive clinical orientation program improved new cardiology fellows' confidence. Support for this program was high, and the findings support continuation and further development of the program.

INTRODUCTION

The transition from residency to fellowship can be challenging. Fellowship trainees need to embrace new responsibilities, learn new skills, and begin to work in a new environment. Furthermore, when clinical responsibilities begin, it can be difficult for subspecialty trainees to attend introductory lectures, potentially making their transition more difficult and conceivably deleteriously affecting patient care. Thus, condensing these introductory lectures into a focused orientation program seems ideal (Lucarelli, Lucey, & Mastronarde, 2007). Although many training programs have orientations, including 50% (Merenstein & Preisach, 2002) to 90% (Brillman, Sklar, & Viccellio, 1995) of family practice and emergency medicine residencies, their curricula vary widely and their impact is largely unknown (Lucarelli et al., 2007). Several small studies of specific orientation programs have been reported. Nielsen, Holland, and Foglia (2003) evaluated an intensive clinical orientation program on 11 obstetrics and gynecology residents (of whom four were new first-year residents), and reported an increase in all first-year resident test scores immediately after the orientation. Levy and Anwar (1979) evaluated an orientation curriculum for new emergency medicine residents by exposing six new residents from one emergency medicine program to an orientation curriculum and comparing them to nine new residents from a different yet comparable residency program who did not have exposure to the orientation curriculum. The pre-orientation test scores of the two groups were not significantly different, while the

post-orientation test scores of the exposure group were significantly higher. However, a test one year after the orientation showed no significant difference between the groups.

The transition from residency to fellowship has been even less well studied than either the transition from medical school to internship or that from internship to residency (Lucarelli et al., 2007). To the best of our knowledge, there have been no other studies on the impact of cardiology fellowship orientation programs. Montefiore Medical Center's Cardiology Fellowship program instituted an intensive four-day orientation program in 2004. We examined both the impact of that program on fellows' self-assessed confidence and their overall support for the program. Our primary outcome was the comparison of fellows' self-assessed confidence before versus immediately after the orientation.

METHODS

Study Population

We anonymously queried 25 cardiology fellows at Montefiore Medical Center, an urban teaching hospital in New York City, from the years 2004 through 2007. We prospectively surveyed all new fellows in 2006 and 2007 ($N = 13$) with a questionnaire immediately before, immediately after, and six months after the orientation. We retrospectively surveyed 12 of 14 (86%) fellows who began their fellowships in 2004 and 2005 by asking them to answer the

Table 1 | First-Year Fellows' Orientation Session Schedule.

July 1	July 2	July 3	July 5
<p>7:30–8:30 a.m. Study Questionnaire: Cardiology Fellows</p> <p>8:30–9:30 a.m. Intro and Expectations: Program Director, Attendings, AECOM Faculty</p> <p>9:30–9:40 a.m. Break</p> <p>9:40–10:15 a.m. Informed Consent: Attending</p> <p>10:15–11:00 a.m. CCU/Consults: Attending</p> <p>11:00–12:00 noon Tour of Weiler Hospital How to Be on Call @ Weiler Hospital: Cardiology Fellows</p> <p>12:00 noon Walk to Jacobi Hospital</p> <p>12:15–1:00 p.m. Lunch: Jacobi Faculty</p> <p>1:00–4:00 p.m. Orientation</p> <p>4:15–5:00 p.m. Tour of Jacobi How to Be on Call @ Jacobi: Cardiology Fellows</p> <p>5:00 p.m. Evening "on call." One to two new fellows will shadow the on-call fellow for 3–4 hours at Weiler and Montefiore. Each fellow will shadow once during orientation.</p>	<p>8:00–8:30 a.m. Intro and Expectations: Attendings, MMC Faculty, CT Surgery Staff Welcome</p> <p>8:30–9:45 a.m. Tour of MMC/NCB How to Be on Call @ Montefiore & North Central Bronx; Intro to Rotations from a Fellow's Perspective; Computer/Codes: Cardiology Fellows</p> <p>9:45–10:00 a.m. Break</p> <p>10:00–11:00 a.m. Practical Use of the "911" System; Research Studies; Chief Fellow, Various Attendings</p> <p>11:00–11:15 a.m. Break</p> <p>11:15–12:00 noon IABP: Fellows</p> <p>12:00–1:00 p.m. Lunch/Meet the New Fellows</p> <p>1:00–2:00 p.m. Arrhythmias 101: EP Attending</p> <p>2:00–2:15 p.m. Break</p> <p>2:15–3:45 p.m. Should This Patient Go to the Cath Lab? Practical Pre/Post Cath Lab Issues: Attending, Director of Catheterization Lab</p> <p>3:45–5:45 p.m. Common Consults/Practical Issues: Cardiology Fellows</p>	<p>8:00–9:00 a.m. Pressure Transducer in CCU, Catheter, Recorder System, Calibration: Attending</p> <p>9:00–10:00 a.m. Arrhythmias 201: EP Attending</p> <p>10:00–10:15 a.m. Break</p> <p>10:15–12:00 noon Pacemaker 101: EP Attending</p> <p>12:00–1:00 p.m. Lunch/Meet the New Fellows</p> <p>1:00–2:00 p.m. Practical Approach to Echo: Echo Attending and Staff</p> <p>2:00–4:00 p.m. Hands-on Echo; Teaching Cases: Echo Attending, Senior Fellow, and Sonographer</p> <p>4:00–5:00 p.m. X-Ray Techniques in CCU and Cath Lab, Practical Points: Attending, Director of Catheterization Lab</p> <p>5:00–5:45 p.m. Mandatory Written Radiation Exam: New Fellows</p>	<p>8:00–8:45 a.m. Acute CHF Assessment and Management: Attending</p> <p>8:45–11:00 a.m. SGC and Fellowship Issues: Attending</p> <p>11:00–12:00 p.m. Ongoing Clinical Studies Summary: Faculty</p> <p>12:00–1:30 p.m. New fellows: Please get lunch and return to fellows' office by 12:30 p.m. Physical Exam Review: Attending</p> <p>1:30–2:05 p.m. EKG–Urgent Issues: Cardiology Fellows</p> <p>2:05–2:15 p.m. Break</p> <p>2:15–3:30 p.m. Practical Pacemaker Points and Programming Introduction; Temporary Wires; Common Scenarios: Cardiology Fellows</p> <p>3:30–5:00 p.m. Wrap-up with Chief Cardiology Fellows; Fellows' Office; Review Key On-call Issues: Back-up, "911," Passwords, Sheaths, etc.... Study Questionnaire</p>

Abbreviations: EP=Electrophysiology, CT=Cardiothoracic, MMC=Montefiore Medical Center, NCB=North Central Bronx, CCU=Coronary Care Unit, IABP=Intra-Aortic Balloon Pump, SGC=Swan Ganz Catheter, CHF=congestive heart failure

same questionnaire recalling what they felt immediately before, immediately after, and six months after orientation. The retrospective group was surveyed on average 10 +/- 6 months after beginning their fellowships. We were unable to reach two of the 14 fellows (14%). This study was approved and exempted by the Montefiore-Einstein Institutional Review Board.

Orientation Sessions

During the orientation program (Table 1), cardiology faculty members gave didactic sessions on core cardiology topics, including arrhythmias, acute congestive heart failure assessment and management, practical cardiac catheterization lab issues, informed consent, X-ray techniques in the coronary care unit and catheterization lab, and pacer-

maker and defibrillator basics. Senior cardiology fellows presented didactic sessions on intra-aortic balloon pumps, urgent electrocardiogram issues, common consults, and practical pacemaker programming. There were also hands-on sessions on the use of echocardiography machines and pacemaker and defibrillator interrogation devices.

Study Questionnaire

The study questionnaire (Table 2) was separated into two categories of questions: confidence in medical skills and management of cardiology issues (questions 1–7), and support for the orientation program (questions 8–9). The questionnaire assessed confidence in starting the fellowship, being on call, managing congestive heart failure, interpreting arrhythmias on electrocardiograms, performing trans-thoracic echocardiograms, performing device (pacemaker and defibrillator) interrogations, and approaching ST-elevation myocardial infarction. The questionnaire assessed the fellows' support for the orientation program by asking both whether the orientation would help their fellowship experience and what their overall support for the orientation program was. The responses for each question were graded on a Likert scale of 1 through 7, with 1 representing the least agreement with the statement, 4 being neutral, and 7 representing the most agreement. For each subject, at each time point, we created a total score for each of the two categories of questions. Thus, at baseline, for the seven confidence questions, the subject's summed score should range from a low of 7, achieved by reporting a score of 1 for each question, to a high of 49, achieved by reporting a score of 7 for each question. Similarly, for the two support questions, the total score could range from 2 to 14.

Statistical Analysis

Retrospective and prospective data were pooled and analyzed together. Median scores were compared. Nonparametric paired analyses were performed with the Wilcoxon Rank Sum test.

RESULTS AND DISCUSSION

Twenty-five fellows were enrolled over four years. There was a significant increase in the median score for questions assessing confidence from before to immediately after orientation (Table 3, 22 vs. 36, $p < 0.01$), and this difference

remained significant six months after orientation (Table 4, 22 vs. 38, $p < 0.01$). There was high support, but a non-significant difference in overall support, for the program before, immediately after, and six months after the orientation, with median scores of 13 in each case. When analyzing the retrospective and prospective data separately, the findings for both confidence and support did not significantly differ.

Our findings support that an intensive four-day clinical orientation program increased new cardiology fellows' self-assessed confidence and that this increase persisted six months after the original orientation program. To the best of our knowledge, no such assessment of a cardiology fellowship orientation program had previously been reported. We also found that fellows' support for our intensive orientation program was high immediately before, immediately after, and six months after orientation. This suggests that fellows' support for the program is sustained over time, even after confidence levels have improved.

We believe the high level of support immediately before the program may have been secondary to the new fellows' desire to learn more about both cardiology and the medical system they were joining. We were encouraged that six months after settling into their fellowships, the fellows' support for the orientation program remained high, suggesting that it had utility for them.

Trainee support for an intensive, clinically focused orientation has been documented. At the University of Florida in Gainesville, a trial five-day orientation program for two groups of five first-year obstetric and gynecologic residents reviewed clinical skills and basic procedures. All participating residents strongly recommended that the orientation program be permanently incorporated into the training program (Duff, 1994). In Nielsen et al.'s 2003 study of an intensive orientation program for obstetric and gynecology residents, 64% of the residents rated the program "very helpful" even though seven of the 11 participants were second- and third-year residents. Each resident recommended that the orientation program be offered annually. Furthermore, Lucarelli et al. (2007) reported that an intensive, single-center orientation program in pulmonary and critical care focusing on didactic and procedural skills

Table 2 | Study Questionnaire.

1. I feel confident as I start my cardiology fellowship.
2. I feel confident performing a basic trans-thoracic echocardiogram.
3. I feel confident performing a basic pacemaker interrogation.
4. I feel confident about understanding how to be on call.
5. I feel confident approaching the typical patient with congestive heart failure.
6. I feel confident interpreting arrhythmias on an electrocardiogram.
7. I feel confident about coordinating care for an ST elevation myocardial infarction.
8. The orientation program will help me with my cardiology fellowship.
9. I support having an intensive orientation program.

Table 3 | Pre-orientation versus Immediate Post-orientation Scores.*

	Pre-orientation	Immediate Post-Orientation	P-value
Confidence (Q1–Q7 pooled)	22 (12,28)	36 (31,38)	<0.01
Support for Program (Q8 & 9 pooled)	13 (11,14)	13 (11,14)	NS

*Data reported as median (interquartile range). Q = questions, NS = not significant.

Table 4 | Pre-orientation versus Six-Month Post-orientation scores*

	Pre-orientation	Six months post-orientation	P-value
Confidence (Q1–Q7 pooled)	22 (12,28)	38 (35,40)	<0.01
Support for Program (Q8 & Q9 pooled)	13 (11,14)	13 (10,13)	NS

*Data reported as median (interquartile range). Q = questions, NS = not significant.

improved fellows' self-assessed readiness for clinical and procedural duties. However, the methods and data from that study were not described. Supplementing these data, our results appear to support both that study's findings and the benefits of continuing such intensive clinical orientation programs.

The optimal content of an orientation program for medical trainees, and specifically for a cardiology fellowship program, has yet to be determined. According to Bandaranayake (1985), the curriculum for an orientation program should be designed to address assessed needs and established goals. However, this is often not the case. A survey of 100 family practice residency programs reported that while program directors prioritized social events when organizing orientation programs, new residents highly desired that clinical education be part of the curriculum. Ninety-nine percent of the orientation programs provided a social event with faculty, while only 16% had organized clinical activities with knowledge testing to assess and evaluate the clinical needs of their trainees (Grover & Puczynski, 1999). In order to address the clinical needs of cardiology fellows, our orientation focused on field-specific clinical skills, while also addressing the Accreditation Council for Graduate Medical Education core competencies through both didactic and practical teaching. Although we agree that the social aspects of orientation are important, we subjectively found that there were ample opportunities for fellows and faculty to interact in an informal manner during our program.

The optimal duration of an orientation program is also unclear. Some trainees desire a longer orientation program in fields requiring both clinical and procedural training. In Nielsen et al.'s 2003 study, obstetric and gynecology residents underwent a half-day orientation consisting of multiple didactic and hands-on clinical skills stations. However,

the residents did not feel that enough time was allotted for each station and specifically commented on the need for more hands-on time. In the survey by Lucarelli et al. (2007) of 87 fellowship programs in pulmonary and critical care, 86% had formal orientation programs. These programs consisted, on average, of five to 10 hours of didactics and up to five hours of wet-lab training. In contrast, our curriculum devoted more hours to both didactics and hands-on sessions. Further study is required to optimize the duration and the content of such programs.

Studies in surgical residency programs (Pandya, Bhagwat, & Kini, 2010; Pandya, Bhagwat, & Kini, 2012; Fernandez et al., 2012) found that intensive orientation programs yielded improvement in clinical skills. Although our findings were limited to self-assessed confidence and to support for the orientation program, the studies by Pandya et al. (2010, 2012) and Fernandez et al. (2012) suggest that focused orientation programs may yield clinical benefit. Further study in a wider range of medical fields is warranted.

Strengths of our study include its relatively larger sample size as compared to previously reported studies of medical residency or fellowship orientation programs, its assessment of multiple fellowship classes, and its six-month follow-up. There are several limitations. Our measure of confidence was subjective and not previously studied, and we did not have a control group. Data from 12 subjects were collected retrospectively, which may have led to influence by recall bias. However, the subjects were instructed to answer the questions as if they were new fellows. Also, when the retrospective and prospective data were analyzed separately, the findings did not significantly differ.

CONCLUSION

In an area lacking published data, we found that an intensive orientation program for new cardiology fellows improved

self-assessed confidence in field-specific clinical skills both immediately and six months after orientation. Our findings support the continuation of such programs, the need for further study of their optimization, and further evaluation of whether they may yield patient-care benefits.

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Conflict of Interest Disclosure

The authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. No conflicts were noted.

Author Contributions

All authors had an equal role in the writing of the article.

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