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Original Article

Entry into A Cardiac Surgery Set Up: The Associated Risks and Difficulties for Inexperienced New Medical Staff

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Key Words : *Cardiac Surgery, Induction training, Occupational stress.*

Abstract:

Background: *Cardiac Surgery is one of the most sophisticated branches of medical science, which is continually being updated. With very little inclusion in medical course curriculum, medical graduates have limited orientation of this pristine subject. Capacity building is lengthy and cardiac surgery units often contain unrelated junior doctors due to scarcity of cardiac surgeons. New residents may also face similar difficulties. The objectives of this article are to describe the difficulties faces by newly posted doctors and offer some solutions.*

Methods: *This study was conducted in the Department of Cardiac Surgery, Chittagong Medical College & Hospital (CMCH) between January 2020 and December 2022. A confidential self-report system questionnaire was used to interview 30 newcomers in CMCH and other cardiac surgery set ups and their findings are compiled in the article.*

Results: *The interviewed doctors and residents have described individualities of cardiac surgery department and the difficulties they faced while working here. They also offered some solutions of the problems faced by them.*

Conclusion: *Cardiac surgery is a stressful job. The new residents and unrelated doctors face various problems while beginning here. This is more troublesome for the female doctors, but doctors trained in cardiology or other surgical disciplines suffered least. Orientation initiatives by the cardiac surgery department and publishing a complete manual handbook to provide guidelines will be helpful in this regard.*

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Introduction:

Cardiac Surgery is one of the most sophisticated branches of medical science. This high-tech subject is continually getting updated. There is very little inclusion of its topics in undergraduate medical course curriculum. Obviously medical graduates have very limited orientation of this pristine subject. Approximately one million cardiac surgeries are performed around the globe every year, in roughly 4,000 cardiac surgery centers.[1] Capacity building is a lengthy procedure in cardiac surgery. Any effort to expand the cardiothoracic surgery workforce would need to begin today because cardiothoracic surgeons undergo a longer period of training than any other specialty. In USA, the average of 8.3 years of training after medical school includes e"5 years of general surgery training and 2 to 3 years of cardiothoracic training.[2] That's why cardiac surgery units often face scarcity of doctors and contain unrelated junior doctors without any prior knowledge or experience of cardiac surgery. Cardiac surgery is a stressful job and the junior doctors are subjected to severe stress at OT and outside.[3] Surgeons in operating theaters are exposed to various risks and occupational hazards such as unfavorable

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body posture,[4] anesthetic gases and electrosurgical smoke plumes, radiation, disturbing noise and infections. In addition, surgeons complain about high psychological stress levels during working hours. In comparison to other medical disciplines, they work longer and have a lower quality of life.[5]

The unrelated new comer doctors usually carry out the routine work of the cardiac surgery ward. Whenever such a newcomer joins the department of cardiac surgery, a whole new spectrum of difficult issues embraces that person. S/He has to be acquainted with new terminology, nomenclature and abbreviations. Perfusion technology is an integral part of cardiac surgery. This is another area, where usually the newcomer has no knowledge at all. This is difficult situation both for the newcomer and other members of the department. It involves risk in terms of patient management, work environment, and teamwork. The strength of a chain is its weakest link. With the joining of the newcomer, a new weak point may appear in the strength of the team.

The objectives of this article are to describe the difficulties faces by newly posted doctors, especially from unrelated backgrounds to the cardiac surgery set ups and to identify the preventable adverse events. The new comers are asked to describe the difficulties they have faced and are encouraged to analyze the reasons and offer solutions.

Methods

The study was conducted in the Department of Cardiac Surgery, Chittagong Medical College & Hospital (CMCH) between January 2020 and December 2022. This is the first department in any public medical college hospital of Bangladesh to introduce cardiac surgery. As a public government hospital, all the junior level posts are occupied from the very beginning by the doctors of other different disciplines. They ranged from Cardiology to Gynecology. A confidential self-report system questionnaire was used to interview these Doctors to identify their problems, sufferings, adverse events, and the risks involved. The which complied the problems they have faced while working in the Cardiac Surgery department of CMCH. In the second phase, new comers working in cardiac surgery departments of some other hospitals were also interviewed and the findings were included here. A total of 30 such newcomers were interviewed and their findings are compiled in the article.

Individualities of Cardiac Surgery

Cardiac surgery is a highly specialized, sophisticated subject, and different from other surgeries. It involves stopping the heart completely while operation and shifting its action to the heart lung machine. This is a unique scenario unheard of any other parts of medicine. This makes cardiac surgery even more fearsome

Table-I

A list of individualities as expressed by the newcomers in cardiac surgery

Expressed Individualities (n=30)	Number of Respondents
Invasive monitoring lines (CVP line, Arterial line, Temperature probe)	13
Median sternotomy by electric or pneumatic saw.	12
Purse string in great vessels for cannulation.	9
Cardiopulmonary bypass by heart lung machine.	17
Heparinization, ACT reading, Protamine	8
Arrest of heart by cardioplegia, hypothermia, direct application of ice to the heart	12
Postoperative prolong mechanical ventilation and ABG reading	9
Sensitive equipment	11
Minute dose of drug	13

for a newcomer. The newcomers have enlisted several issues, which made their entry to the department uncomfortable related to these individualities of the subject. A list of individualities is enumerated in Table I as observed and expressed by the newcomers in cardiac surgery. This is the reflection of the perception of the new comers about cardiac surgery. Their observations show what they actually feel about this new subject for them.

Difficulties faced by the new comers

In addition to expressing the individualities or eccentricities observed with cardiac surgery, the respondents were also asked to mention the practical difficulties they actually faced as a new comer. They have identified a series of problems while joining the department. Their observations have been enlisted in Table II. Some of the issues mentioned by the new comers are real are difficulties, whereas others are silly excuses. Some of these issues are easy to solve and may be solved locally, where as some others are beyond the scope of correction by the local administration. Although some of these doctors were simple medical graduates, some of them represented various other disciplines as well. The cardiologists and doctors trained in other surgical disciplines suffered less than the others. This is easy to explain as the cardiologists are well acquainted with the terminologies used in the department of cardiac surgery. Junior doctors with work or training exposure in some other surgical department usually have some degree of basic surgical knowledge, which make them feel better for

Table-II

The difficulties actually faced as a new comer

1.	No knowledge of terminology and procedures as undergraduate medical (MBBS) curriculum and internship rotation doesn't contain any cardiac surgery content.
2.	Lack of basic surgical skills, basic life support, CPR etc.
3.	Complexity of outpatient and pre-operative management of cardiac surgery patients.
4.	Difficulty to understand the post-operative patient's emergency situation.
5.	Uncomfortable and uncommon attire used in cardiac surgery ICU.
6.	Difficulty in operating sophisticated equipment (such as mechanical ventilator ABG analyzer, i-Stat, ACT machine, etc.) used in CARDIAC ICU.
7.	Long working hours as well as extra-long operation hours.
8.	Difficulties in documentations.
9.	Authoritarian administration.
10.	Little or no orientation about the medicines used including inotropes and anti-arrhythmic medications.
11.	No idea about the costing of different cardiac surgery operation.
12.	Very little knowledge about ECG and Echocardiogram.
13.	Unable to manage the complications regarding massive blood transfusion.
14.	Gynecologists facing difficulties to handle male patients due to lack of exposure.
15.	Less academic environment due to huge workload.
16.	Non-cooperation or less cooperation from the fellow colleagues for not having a degree or training on respective subject.
17.	Lack of proper supervision by the supervisor.
18.	Almost no knowledge about the national and international guidelines.
19.	Less research opportunity.

handling at least the surgical, anesthetic and sterility issues. This finding should be taken into consideration while recruiting unrelated new comer doctors for any cardiac surgery set up.

Gender equity is poorly represented in absolute male dominated world of cardiac surgery. Despite the fact that women outnumbered men in enrollment in American medical schools for the first time in 2017,[6] men still dominate cardiac surgery. Women surgeons, remain under-represented in cardiac surgery. In 2019, across all specialties in the US, women represented 36% of active physicians.[7] In contrast, only 11% of practicing cardiac surgeons in Canada were women in 2015, and merely 6% of practicing adult cardiac surgeons in the US were women in 2019.[8] Although women are a minority in other surgical specialties, such as 20% of the current workforce in general surgery, cardiothoracic surgery remains one of the most unevenly–gender distributed specialties. This makes cardiac surgery even more hostile terrain for a female new comer as compared to her male counterparts. The cardiac OT and ICU complexes are often designed as unisex set up. The female new comer may face difficulties even finding a changing area or restroom.

Declining interest in the field of cardiothoracic surgery by new doctors due to long learning curve and development of new minimally invasive techniques favorable for treating patients compared to the open procedure by cardiologists and cardiac surgeons. Many years of schooling and training are required to become a cardiothoracic surgeon. So, doctors belong to less solvent family consider their economic instability while choosing the subject. Reported difficulty in finding job after completion of postgraduation and training. A recent Indian report showed that a big portion of the seats available for cardiovascular surgery remained vacant, probably indicating a lack of interest among the new generation of surgeons.[9] A nationwide survey covering 145 Indian cardiothoracic residents, 128 males and 17 females showed that 47% of the residents were satisfied with their training and 23% were dissatisfied, while 34% chose to remain neutral. 81% of the respondents claimed that they barely get leisure time while the remaining 19% claimed they get adequate leisure time. 75% of the respondents had a negative outlook to their future, 87% agreed that they are not confident of independent practice at the end of their training, and regrettably 41% were unhappy with their decision of taking up cardiac surgery[10]. The findings of this survey appear quite alarming for the future of Cardiac Surgery in India. Similar trends are observed elsewhere as well. This makes the future of cardiac surgery a little gloomy. The prevailing problems with recruiting junior doctors in cardiac surgery are likely to persist for long.

Risks

Stepping into an unknown territory of cardiac surgery by underprepared new comers involves various risks for the patients, for the other members of the surgical team and for self as well. Several risk issues have been identified by the newcomer doctors themselves participating in this research interviews. Surgical inexperience, lack of knowledge about critical care carries risk of making mistake in patient management. Lack of basic surgical training and inexperience may also cause serious accidental harm for the new joiner as well as for the doctors and nurses around. New comers' ignorance of the special clinical terminology and the abbreviations incur risk of miscommunication with the team members and consequent adverse events. Interruption, distraction and miscommunication reduce the clinician's ability to remain focused and maintain situational awareness. Inadequate skill, knowledge, training and poor planning may cause misdiagnosis, failure to diagnose and delayed diagnosis which are some of the most common types of medical errors. This brings about overall assessment failure.

Solutions

Once the problems are identified, finding suitable solutions becomes important. The new comers have identified the difficulties and risks. Various solutions of the problems identified have been proposed by the interviewed newcomers. Some of the solutions are already in place, whereas others are just thoughts of them.

Table-III

Solutions recommended by the interviewed new comers

1.	Whenever a new comer joins a cardiac surgery set up, an orientation program should be held to help assimilate the candidate to the existing system.
2.	Weekly, monthly workshop should be arranged on equipment, ECG, Inotropes etc.
3.	The senior team members should uphold their duties of motivation and supervision.
4.	Team building and shared responsibilities should be promoted.
5.	Preparing a freshman's training manual by senior cardiac surgeons and anesthetists will be of great help.
6.	Selection of better candidates for positions of cardiac surgery should be encouraged.

The following is a quote from one of the pioneers in the field of cardiothoracic surgery. Nicholas T. Kouchoukos, M.D. "If you are a student or resident with intelligence, drive, and stamina, who loves challenges, hard work and positive outcomes, who is results-oriented, loves working with your hands as well as your brain, and enjoys caring for others and interacting with highly competent physicians and other health care professionals, you should strongly consider becoming a cardiothoracic surgeon".

Conclusion

Cardiac surgery is a stressful job and more so for unrelated new comer junior doctors. The new doctors face various problems while working in cardiac surgery set up. This is even more troublesome for female doctors. Doctors of cardiology or other surgical discipline suffered least as the subjects are partly related. These difficulties incur risk for the patients, other team members and the new comers themselves as well. Academic and training initiatives by the cardiac surgeons might help to ease these difficulties. Publishing a complete manual handbook to provide guidelines will be helpful for noncardiac surgeon practitioners or surgical residents to cope up with cardiac surgery department jobs.

Conflict of Interest - None.

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