

## Research Article

# Critically Appraising Mentorship: Fostering the Next Generations in Cardiothoracic Surgery in the UK

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## Abstract

**Objectives:** Mentorship is critical to the professional development of junior colleagues in cardiothoracic surgery. Despite its presumed importance and frequent discussion, its impact within cardiothoracic surgery training remains uncharacterized within the UK. We aimed to evaluate mentorship experience and identify gaps in the system of mentorship education. The differences between men and women's views on mentorship are also considered.

**Methods:** We prospectively collected a total 92 responses [50M:42F] over 18 weeks. 'SCTS Critically Appraising mentorship' survey was formulated by means of SurveyMonkey (Portland, Ore.) and emailed to health professionals and medical students by using SCTS membership directory. Chi-squared test (with Yates' correction for 2 × 2 tables) was used to statistically analyse, and significance level for all statistical tests was set to 0.05.

**Results:** 48.5% (40/92) had less than 5 years of experience in practice, but in general men were more experienced than female with over 15 years of practice (40% vs. 9.52%) (p=0.01). More female changed their practice mostly for favourable work-life balance (40%, 4/10) or due to financial incentives (40%, 4/10), whereas career specialization (38.1%, 8/21) was the main reason for transition in men (p=0.014). 48.91% (45/92) have a system of mentorship in the current practice, but 66.67% (30/92) did not have formal evaluations. All male participants did not think gender of mentor/mentee was important, but 21.43% (9/42) of female did (p=0.002).

**Conclusion:** The need for mentorship scheme is widely recognized and is imperative to achieve maximum career potential, both professionally and personally. The key will be to establish more structured mentoring program, finding apposite mentor-mentee and having predefined needs, and to recognize individual mentee's unique needs of in mentorship. Women face unique challenges as a minority, and this must be considered when forming mentorship relationship.

**Keywords:** Cardiothoracic surgery; Mentorship; Surgical education; Teaching

## Abbreviations

AATS: American Association for Thoracic Surgery; AHP: Allied Health Professional; NHS: National Health Service; NTN: National Training Number; SCTS: Society of Cardiothoracic Surgeons of Great Britain and Ireland; WICTS: Women in Cardiothoracic Surgery

## Introduction

Medicine and Surgery are unique art forms. We all spend time in our career development striving to flourish, not just to survive, as a measure of our personal success. What halts our paths in this

pursuit of 'ultimate' success is the question we all want to answer? As a cardiothoracic society, we aim to improve the care and safety of all patients who encounter our services, and it is essential that our practicing members are allowed the space to flourish and succeed.

The term "mentorship" derives from Homer's Odyssey, in which Mentor, a friend of Odysseus, was entrusted with the care of Odysseus' son while Odysseus was away fighting the Trojan war. Within this parental-like relationship between Mentor and Odysseus' son, guidance and life lessons were imparted to the young son, and during this time the son developed into a fine young man [1]. Mentorship has been commonly discussed of late as key to success in Cardiothoracic Surgery (CTS). It was the topic of Dr. Kron's [2], 2011 American Association for Thoracic Surgery (AATS) presidential address. Dr. Kron [2] referred to a Buddhist proverb, "If you save a life, you are responsible for that life forever" and suggested the same connectedness should be applied between cardiothoracic surgeons and their trainees.

Mentorship is not only vital for professional development of junior colleagues, but also improves personal development, and can rekindle our passion while reducing the risk of compassion fatigue [3]. The latest survey suggests that NHS staff were 50% more likely to experience high levels of work-related stress compared with the

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general working population, resulting in burnout [4]. A recent systematic review showed that burnout was associated with a doubling in the risk of patient safety incidents [5]. Compromised psychological wellbeing of medical professionals can lead to detrimental effects, such as iatrogenic harms. Mazer et al. [6] estimate approximately 62% of all hospital deaths are due to medical error and 3.6% of hospital deaths are preventable [7]. Many of us will be pleased to take on outside interests and passions to give us fulfilment and some of us see our identity in the work we perform and want to take the risk that a great career can offer. But what risks should we accept and how best to mitigate them.

Despite its presumed importance and frequent discussion, mentorship within CTS training remains uncharacterized and its impact on doctors, Allied Health Professionals (AHPs) and students in CTS within the UK is unknown. Who are mentors to trainees? What traits do these mentors bring and how do they specifically affect successful completion of training? What characteristics are mentees looking for in mentors, what do they find, and what gaps in mentorship remain? Answering these questions was the goal of this study. To accomplish this, a series of questions within the 2022 Society of Cardiothoracic Surgeons in Great Britain and Ireland (SCTS) 'Critically Appraising mentorship' survey were formulated.

## Materials and Methods

### Data collection

Between 1<sup>st</sup> June and 31<sup>st</sup> October 2022, a survey assessing demographics, mentorship, and career pathways was designed by means of SurveyMonkey (Portland, Ore.) and e-mailed to various health care professionals working in CTS or to medical students using the SCTS membership directory. Data were collected with three rounds of email invitations. Survey participation was voluntary, non-incentivized, and all responses remained anonymous.

### Survey design

The survey domains explore respondents' demographics, current or previous academic appointments, leadership roles, experience of mentorship, and opinions regarding ideal implementation of mentorship model, including the views on necessity for racial and gender concordance between mentor and mentee.

### Statistical method

R Core Team (R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria 2022) was used for all statistical analysis. Chi-squared test (with Yates' correction for 2 × 2 tables) was used to compare answers among groups. Significance level for all statistical tests was set to 0.05. Microsoft Word (Microsoft Corp., USA 2022) was used to create flow diagrams.

## Results

### Participant demographics and practice details

A total 92 responses were received from 50 male (54%) and 42 female (46%) participants. Approximately half of the respondents (48.5%, 40/92) had less than 5 years of experience in practice, but in general men were more experienced than female with over 15 years of practice (40% vs. 9.52%) ( $p=0.01$ ). Among male respondents, the majority (76%, 38/92) were consultant surgeons, compared to 21.43% (9/92) of the female participants ( $p<0.01$ ). 52.17% (48/92) of the respondents were Caucasians (female 50%, male 54%) and Asians were relatively prevalent (29.35%, 27/92). No difference emerged

between men and women ( $p=0.898$ ). 58.7% (54/92) of the participants' pursued fellowship or external training, but more commonly in men (68% vs. 47.62%) ( $p=0.078$ ). The majority (78.26%, 72/92) did not hold academic appointments in both men and women ( $p=0.749$ ). Men were more likely to hold leadership positions on a local (42% vs. 30.95%) or a national level (13.05% vs. 7.14%) ( $p=0.089$ ) (Table 1).

77.17% (71/92) did not change their career and the difference between men and female is insignificant ( $p=0.245$ ). More female changed their practice mostly for favourable work-life balance (40%, 4/10) or due to financial incentives (40%, 4/10), whereas career specialization (38.1%, 8/21) was the main reason for transition in men ( $p=0.014$ ) (Table 2) (Figure 1).

### Current mentorship practice

Almost half of the respondents (48.91%, 45/92) have a system of mentorship in the current practice, but 66.67% (30/92) did not have formal evaluations. Male participants were more likely to have a mentorship system (54% vs. 42.86%) ( $p=0.392$ ), but with infrequent evaluations. 55.56% (10/18) of female participants reported a system of a formal evaluation, but only 18.52% (5/27) in male ( $p=0.024$ ) (Table 3) (Figure 2).

### Ideal implementation of mentorship model

The majority (89.13%, 82/92) "strongly agrees" or "agree" that mentorship should be a critical tool for development in a person's career, and no difference is emerged between men (86%) or women (92.86%) ( $p=0.117$ ). It is uncertain whether the relationship should be chosen by the mentee or a mentor. 68.48% (63/92) of the participants "strongly agree" or "agree" that mentors should be chosen by the mentees ( $p=0.979$ ), but also 42.39% (39/92) believe that mentees should be chosen by the mentors ( $p=0.716$ ). No statistical difference was seen in both genders. Furthermore, 66.31% (62/92) "strongly agree" or "agree" that mentorship is the responsibility of seniors ( $p=0.35$ ) and 65.22% (60/92) believe that it should be mandated by an employing organization ( $p=0.254$ ) (Table 4). We further explored the necessity to have a mentor of the same gender or race/ethnicity. All male participants did not think gender of mentor/mentee was important, but 21.43% (9/42) of female did ( $p=0.002$ ). The majority (95.65%, 88/92) did not think race/ethnicity was an important issue in mentorship and no statistical significance was found between genders. In addition, 75% (69/92) felt mentors should be from the same specialty ( $p=0.307$ ), but more supported by men than women (80% vs. 69.05%) (Table 5).

### WICTS 'Lift as you climb' mentorship scheme from 2021-2022

Out of 42 female respondents, 52.38% (22/42) used the mentorship scheme developed by the Women in the Cardiothoracic Surgery (WICTS) network within SCTS between 2021 and 2022. 68.18% were (15/22) mentees and 80% (12/15) of them stated that goals, they identified with the mentors, were met. The most common mode of communications was virtual platforms, 63.64% (14/22). Approximately half, 54.55% (12/22) had 2-5 meetings and 90.91% (20/42) said they would recommend participation to colleagues (Table 6).

## Discussion

The ratio of male to female consultant surgeons in the UK is approximately 8:1 and women remain a minority [8]. Furthermore, CTS is one of the most unevenly gender distributed specialties with

**Table 1:** Demographics of respondents. NTN indicates national training number.

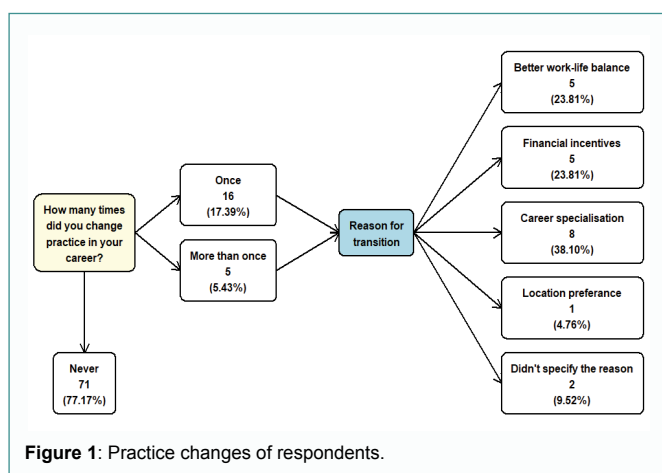
	Parameter	Female	Male	Total	p
Time in practice	<5 years	25 (59.52%)	15 (30.00%)	40 (43.48%)	p=0.01*
	5-10 years	8 (19.05%)	11 (22.00%)	19 (20.65%)	
	11-15 years	5 (11.90%)	4 (8.00%)	9 (9.78%)	
	16-20 years	3 (7.14%)	6 (12.00%)	9 (9.78%)	
	21-25 years	1 (2.38%)	7 (14.00%)	8 (8.70%)	
	>25 years	0 (0.00%)	7 (14.00%)	7 (7.61%)	
Current title/position	Consultant Surgeon	9 (21.43%)	38 (76.00%)	47 (51.09%)	p<0.001*
	Doctor (NTN/Non-NTN)	15 (35.71%)	9 (18.00%)	24 (26.09%)	
	Allied Health Professional (Nursing, Pharmacy)	11 (26.19%)	3 (6.00%)	14 (15.22%)	
	Medical Student	7 (16.67%)	0 (0.00%)	7 (7.61%)	
Race/ethnicity	Caucasian	21 (50.00%)	27 (54.00%)	48 (52.17%)	p=0.898
	Black/African	3 (7.14%)	2 (4.00%)	5 (5.43%)	
	Asian	12 (28.57%)	15 (30.00%)	27 (29.35%)	
	Other	6 (14.29%)	6 (12.00%)	12 (13.04%)	
Fellowship or external training	Yes	20 (47.62%)	34 (68.00%)	54 (58.70%)	p=0.078
	No	22 (52.38%)	16 (32.00%)	38 (41.30%)	
Academic appointment	Yes	8 (19.05%)	12 (24.00%)	20 (21.74%)	p=0.749
	No	34 (80.95%)	38 (76.00%)	72 (78.26%)	
Local leadership positions	0-1	29 (69.05%)	29 (58.00%)	58 (63.04%)	p=0.469
	45353	12 (28.57%)	18 (36.00%)	30 (32.61%)	
	>4	1 (2.38%)	3 (6.00%)	4 (4.35%)	
National leadership positions	0-1	39 (92.86%)	41 (82.00%)	80 (86.96%)	p=0.089
	45353	2 (4.76%)	9 (18.00%)	11 (11.96%)	
	>4	1 (2.38%)	0 (0.00%)	1 (1.09%)	

\*Statistically significant (p<0.05)

**Table 2:** Practice details of respondents.

	Parameter	Female	Male	Total	p
How many times did you change practice in your career?	Never	32 (76.19%)	39 (78.00%)	71 (77.17%)	p=0.245
	Once	6 (14.29%)	10 (20.00%)	16 (17.39%)	
	More than once	4 (9.52%)	1 (2.00%)	5 (5.43%)	
Reason for transition	Better work-life balance	4 (40.00%)	1 (9.09%)	5 (23.81%)	p=0.014*
	Financial incentives	4 (40.00%)	1 (9.09%)	5 (23.81%)	
	Career specialization	0 (0.00%)	8 (72.73%)	8 (38.10%)	
	Location preference	1 (10.00%)	0 (0.00%)	1 (4.76%)	
	Didn't specify the reason	1 (10.00%)	1 (9.09%)	2 (9.52%)	

\*Statistically significant (p<0.05)



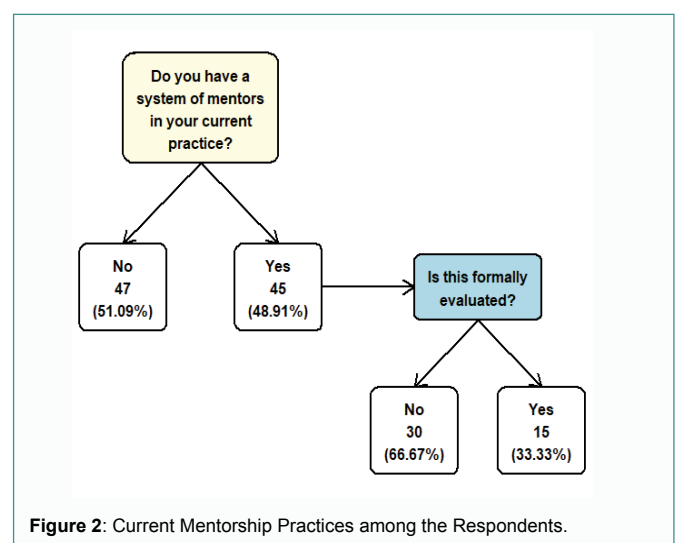
**Figure 1:** Practice changes of respondents.

female cardiothoracic surgeons constituting less than 10% of the workforce [9]. This is also reflected in our survey, in which there were more male respondents (54%, 50/92) than the female participants (46%, 42/92) (Table 1). Pompili et al. [10] suggest that a total of 67% of female respondents in CTS experienced gender discrimination in the workplace and 35% considered leaving surgery, but this was only a consideration of 13% in men. In addition, 31% of men reported that they were “very satisfied” with their career, compared to only 17% of women (p<0.0001). This is also reflected in our study that more

**Table 3:** Current Mentorship Practices among the Respondents.

	Parameter	Female	Male	Total	p
Do you have a system of mentorship in your current practice?	Yes	18 (42.86%)	27 (54.00%)	45 (48.91%)	p=0.392
	No	24 (57.14%)	23 (46.00%)	47 (51.09%)	
Is this formally evaluated?	Yes	10 (55.56%)	5 (18.52%)	15 (33.33%)	p=0.024*
	No	8 (44.44%)	22 (81.48%)	30 (66.67%)	

\*Statistically significant (p<0.05)



**Figure 2:** Current Mentorship Practices among the Respondents.

**Table 4:** Mentorship Is/Should be.

Parameter		Female	Male	Total	p
Mentorship should be a critical tool for development in a person's career	Strongly agree	29 (69.05%)	23 (46.00%)	52 (56.52%)	p=0.117
	Agree	10 (23.81%)	20 (40.00%)	30 (32.61%)	
	Neither agree nor disagree	1 (2.38%)	5 (10.00%)	6 (6.52%)	
	Disagree	1 (2.38%)	2 (4.00%)	3 (3.26%)	
	Strongly disagree	1 (2.38%)	0 (0.00%)	1 (1.09%)	
Mentees should be chosen by the mentor	Strongly agree	5 (11.90%)	6 (12.00%)	11 (11.96%)	p=0.716
	Agree	13 (30.95%)	15 (30.00%)	28 (30.43%)	
	Neither agree nor disagree	14 (33.33%)	18 (36.00%)	32 (34.78%)	
	Disagree	10 (23.81%)	9 (18.00%)	19 (20.65%)	
	Strongly disagree	0 (0.00%)	2 (4.00%)	2 (2.17%)	
Mentors should be chosen by the mentee	Strongly agree	8 (19.05%)	10 (20.00%)	18 (19.57%)	p=0.979
	Agree	21 (50.00%)	24 (48.00%)	45 (48.91%)	
	Neither agree nor disagree	10 (23.81%)	11 (22.00%)	21 (22.83%)	
	Disagree	2 (4.76%)	4 (8.00%)	6 (6.52%)	
	Strongly disagree	1 (2.38%)	1 (2.00%)	2 (2.17%)	
Mentorship is/should be the responsibility of seniors	Strongly agree	12 (28.57%)	15 (30.00%)	27 (29.35%)	p=0.35
	Agree	14 (33.33%)	20 (40.00%)	34 (36.96%)	
	Neither agree nor disagree	7 (16.67%)	11 (22.00%)	18 (19.57%)	
	Disagree	7 (16.67%)	4 (8.00%)	11 (11.96%)	
	Strongly disagree	2 (4.76%)	0 (0.00%)	2 (2.17%)	
Mentorship is/should be mandated by an employing organisation	Strongly agree	11 (26.19%)	19 (38.00%)	30 (32.61%)	p=0.254
	Agree	13 (30.95%)	17 (34.00%)	30 (32.61%)	
	Neither agree nor disagree	9 (21.43%)	7 (14.00%)	16 (17.39%)	
	Disagree	6 (14.29%)	7 (14.00%)	13 (14.13%)	
	Strongly disagree	3 (7.14%)	0 (0.00%)	3 (3.26%)	

\*Statistically significant (p&lt;0.05)

**Table 5:** Ideal Implementation of Mentorship Model from Respondents.

Parameter		Female	Male	Total	p
It is important for a mentor/mentee to be of the same gender	Yes	9 (21.43%)	0 (0.00%)	9 (9.78%)	p=0.002*
	No	33 (78.57%)	50 (100.00%)	83 (90.22%)	
Mentor/mentee should be of the same race/ethnicity	Yes	3 (7.14%)	1 (2.00%)	4 (4.35%)	p=0.489
	No	39 (92.86%)	49 (98.00%)	88 (95.65%)	
Mentors should be from the same specialty or within the medical community	Same specialty	29 (69.05%)	40 (80.00%)	69 (75.00%)	p=0.307
	Not the same specialty but within the medical community	8 (19.05%)	8 (16.00%)	16 (17.39%)	
	Does not have to come from within the medical community	5 (11.90%)	2 (4.00%)	7 (7.61%)	
Being happy to participate in a mentorship scheme in the future	Yes	36 (87.80%)	47 (94.00%)	83 (91.21%)	p=0.505
	No	5 (12.20%)	3 (6.00%)	8 (8.79%)	

\*Statistically significant (p&lt;0.05)

female respondents changed their practice mostly for favourable working conditions (40%, 4/10), whereas the main reason for men was career specialization (38.1%, 8/21) (p=0.014) (Table 2) (Figure 1). Sarsons [11] state that female surgeons encounter unique biases related to referrals from physicians, who view patients' clinical outcomes differently depending on the performing surgeon's gender. Moreover, women are getting fewer leadership or academic opportunities [12]. Gender discrimination continues, originating from conscious and unconscious bias and, therefore, women in surgery face unique challenges that men do not perceive [13]. This may be related to the finding from our study that 21.43% (9/42) of females felt it was important for a mentor/mentee to be of the same gender, whereas no male respondents saw this as a significant issue (p=0.002) (Table 5). This emphasizes that it is vital to recognize the unique needs of mentees in mentorship. In addition, to promote and foster an environment that supports women in the specialty, the WICTS network within the SCTS was established in 2021 under Miss Karen Booth, consultant cardiac surgeon [9]. The WICTS is dedicated

to encouraging, enabling, and inspiring women to fulfill their surgical career ambitions, as well as improving awareness of gender discordance among men.

To overcome gender discordance, but also to fulfill individual mentee's unique needs, having multiple mentors can be beneficial. Stephens et al. address that 77.8% (288/370) of cardiac surgery trainees viewed mentorship as "critical to success", but is also beneficial beyond the training years [14]. This has resulted in 84% of trainees having multiple mentors throughout their careers [14]. Having different mentors can be useful depending on each mentor's expertise or type of support that mentees require. In our study, 75% (69/92) felt mentors should be from the same specialty (p=0.307), but this view had more support from men than women (80% vs. 69.05%) (Table 5).

The research suggests that as long as mentees have a clear goal they want to achieve, gender, race/ethnicity, geographical location or even the specialty should not be a barrier to successful mentorship.

**Table 6:** WICTS 'Lift as you climb' Mentorship Scheme from 2021-2022. WICTS indicates Women in Cardiothoracic Surgery network at Society of Cardiothoracic Surgeons of Great Britain and Ireland.

WICTS 'Lift as you climb' mentorship scheme from 2021-2022		Total
Did you use it?	Yes	22 (52.38%)
	No	20 (47.62%)
Your role	Mentor	7 (31.82%)
	Mentee	15 (68.18%)
Did you meet your goals you identified with your mentor? (n=15)	Yes, all goals met	7 (46.67%)
	Yes, some goals met	5 (33.33%)
	No, I was unable to meet effectively with my mentor	3 (20.00%)
Mode of communications	Face to Face	3 (13.64%)
	Telephone	2 (9.09%)
	Microsoft Teams or another virtual platform	14 (63.64%)
	We were unable to meet effectively	3 (13.64%)
Number of meetings	0-1	6 (27.27%)
	4-5	12 (54.55%)
	>5	4 (18.18%)
Would you recommend participation to colleagues?	Yes	20 (90.91%)
	No	2 (9.09%)

\*Statistically significant ( $p < 0.05$ )

Kashiwagi et al. [15] recommend formulating clear objectives or goals between mentors and mentees can lead to an effective mentorship. Cooke et al. [16] suggest that mentees should set their own goals, and "strive to actively seek feedback, ask questions, and keep an accurate record of progress". So, self-motivation of the mentee is of paramount importance. This finding is consistent with our survey, in which more participants felt mentors should be chosen by the mentees (68.48%, 63/92) than the inverse (42.39%, 39/92) (Table 6). Although the onus is on the mentee to reach out, mentorship has bidirectional efforts from both mentors and mentees. A successful mentor/mentee relationship requires investment of time and effort from both the mentee and mentor. Ultimately, this will be mutually beneficial to help with work-life balance and reduce rates of physical stress and burnout.

## Limitation

The low survey rate ( $n=97$ ) may limit the statistical validity of our findings. Type I or II errors may occur and the generalizability of our findings to the entire cohort of health professionals working in CTS may be limited. This may also be related to potential selection bias. Furthermore, due to the nature of self-reported data on the survey, recall bias may not be avoidable.

## Conclusion

Between 2021 and 2022, the WICTS network within the SCTS has introduced the 'Lift as you climb' mentorship scheme, which was successful. 80% (12/15) of the mentees stated that goals they identified with the mentors were met and 90.91% (20/22) said they would recommend participation to colleagues. This was the first time in the history of CTS in the UK that a mentorship scheme was initiated. Our survey demonstrates that the need for a mentorship scheme is recognized and is imperative to achieve maximum career potential, both professionally and personally. Although challenges persist with widespread implementation in the UK, it is vital to recognize individual mentee's unique needs in mentorship. Women face specific challenges as a minority, and this must be considered when forming a mentorship relationship. These efforts to support women, empowering them to optimally contribute or to be recognized will ultimately benefit organizations, the community, future generations, and most importantly, positively affect the quality of patient care.

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