Cardiovasc Intervent Radiol (2019) 42:95–100
https://doi.org/10.1007/s00270-018-2080-3

CLINICAL INVESTIGATION OTHER

# Establishing a Platform for Interest and Education in Interventional Radiology Amongst Radiology Trainees

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Received: 22 August 2018 / Accepted: 17 September 2018 / Published online: 20 September 2018


**Abstract**
*Purpose* Over recent times, procedural Radiologists have begun to establish themselves as the distinct subspecialty of Interventional Radiology (IR). The Interventional Radiology Society of Australasia (IRSA) was established in 1982 to share collaborative ideas, encourage research, and promote education. IRSA developed a weekend registrar workshop attended by Radiology Registrars from Australia and New Zealand. In the 2018 event, we surveyed the Registrars to identify their interest in IR training before and after the workshop.
*Materials and Methods* The event was held over a weekend and consisted of both lectures and hands-on workshops. A survey was handed to all 67 registrants of the workshop and there was a 55% response rate including 78% of females in attendance.
*Results* Before the workshop, trainees rated their interest in IR training at a mean of 3.7 out of 5. After the workshop, trainees rated their interest in IR training as an average of 4.4 out of 5 ($p < 0.001$). The difference in interest between males and females before the workshop (4.0 vs. 3.1) was significant ($p = 0.003$), however after the workshop (4.5 vs. 4.1) was not significant ($p = 0.07$). The change in interest from attending the workshop was significant between genders, $p = 0.03$ (male interest increased mean 0.5, female increased mean 1.0).
*Conclusion* We show that a program of lectures and workshops designed to generate interest in IR leads to a significant increase in training interest, particularly amongst females. Other subspecialty groups should consider this type of intervention and promote ongoing education and inspiration.
*Level of Evidence* Cross-sectional study, Level IV.

**Keywords** Training · Interventional Radiology · IRSA · RANZCR · Workshop

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## Introduction

Over recent times, procedural Radiologists have begun to establish themselves as the distinct subspecialty of Interventional Radiology (IR) [1], which has been morphing into a modern form since the early days of Charles Dotter in the 1960s [2].

The Interventional Radiology Society of Australasia (IRSA) was established in 1982 as a group of

Interventional Radiologists (IRs) who share collaborative ideas, encourage research, and promote education. To date, this society has over 300 members the majority of which are practicing in Australia and New Zealand. These members are also fellows of the Royal Australian and New Zealand College of Radiologists (RANZCR), the body which governs training and credentialing for Radiologists in Australia and New Zealand [3] however IRSA and RANZCR are independent organisations. As part of credentialing of IRs, the European Board of Interventional Radiology (EBIR) diploma has been adopted into Australia as a conjoint effort of IRSA/RANZCR/CIRSE (Cardiovascular and Interventional Radiology Society of Europe). This qualification ensures that a standard of training in IR is established [4].

Trainee radiologists are in a position to direct their education along many different paths, whether that be staying general or subspecialising into a particular area. A decision on which subspecialty path to take (if any) is made by an individual taking into consideration many factors including job interest, work-life balance, academic involvement, job security, and exposure to ionising radiation, among many other reasons. Each trainee weighs these factors differently [5, 6]. Interventional Radiology is a pathway that will not be for everyone, but for those who may have interest it is a rewarding path with a bright future [1, 2].

The Radiology training program in Australia and New Zealand is a 5-year program separated into two Phases—Phase 1 is the first 3 years of training and provides for general training. Phase 2 is years 4 and 5, and encourages systems-based training which focuses on introductions to subspecialties. Those who branch into subspecialties including Interventional Radiology generally complete a further 1 or 2 years of advanced training (also known as fellowship in other jurisdictions) before practicing in Australia or New Zealand. There are both General and Interventional Radiologists across both countries who perform interventions in all regions of the body, and there are many trainees who aspire to learn these skills and subspecialise in IR after they obtain RANZCR fellowship.

As part of a continued education initiative, and with the primary intention of establishing motivation towards advanced training in IR, IRSA developed a weekend registrar workshop concept which has been supported by RANZCR. This even has been held in different institutions across Australia since 2012 and is growing in size. The first event had 38 attendees with 2 female delegates present. In 2018 the event was held in Melbourne. The 2018 workshop was attended by Radiology Registrars from both countries who are in RANZCR accredited training positions. Registrars were nominated by their Directors of Training after all training sites were invited to do so internally, and was targeted towards registrars in their first phase of training. There was no cost to participants and the event was funded by IRSA using contribution by industry education grants. The event consisted of a series of lectures given by IRs from across the region, and practical workshops allowing hands-on practical experience for trainees. Initiatives such as this have been used in the past in other Radiology settings, to encourage interest in particular subspecialty groups [7, 8].

The aim of the workshop was to increase awareness of IR as a career, provide education, and provide an opportunity for trainees to interact and network with established IRs. The 2018 workshop convenors surveyed the Registrars who attended to identify their interest in IR training before and after the workshop, and hypothesised that the event would lead to increased interest towards training in IR.

## Materials and Methods

Approval for this study was obtained from our Institutional Human Research and Ethics Committee.

The format of the workshop was an alternating series of didactic lectures and hands-on workshops, held over 2 weekend days.

The lecture series were separated into 4 groups: basics of IR, vascular intervention, non-vascular intervention, and other intervention. The lectures were given by IRs and were asked to target the content towards motivation and education for Phase 1 trainees. Included in the ‘basics of IR’ were also motivational lectures on the topic of women in IR, lectures from hospital senior management staff, and further information about the EBIR.

The workshops were separated into 13 different 20-min stations held in adjacent halls where IR devices (e.g. stents, IVC filters, embolisation material) were on display. The registrars were allocated into groups and they rotated through the stations so that by the end of the 2 days they had visited each station once. There was access to IRs during the workshops and registrars had the opportunity to see, feel, and deploy many of the real products.

A written one-page survey (Table 1) was handed to all 67 registrants of the workshop. Participating in the survey was voluntary, anonymous, and included consent for use of information. Trainees were asked to fill the survey and return to an empty box in the foyer at the conclusion.

Results were pooled and analysed. For statistical measurements, the Wilcoxon Signed Rank Test and the Mann–Whitney test were used to generate mean, median, standard deviation (SD), and $p$ values (real statistics add-on for Microsoft Excel, USA). Where relevant, statistical significance was defined as a $p$ value $< 0.05$.

**Table 1** Survey questions

| |
|---|
| What is your year level of radiology training? |
| What is your age? |
| What is your gender? |
| When did you first hear about Interventional Radiology |
| Why are you interested in Interventional Radiology |
| Before coming to this workshop, what was your level of interest in undertaking IR training? |
| After this workshop, what is now your level of interest in undertaking IR training? |
| What did you find most useful about the event? |
| What did you find least useful about the event? |
| Rate the following in terms of how you felt this contributed to your learning about IR at this workshop: workshops, lectures |
| Any comments? |

## Results

There were 67 participants in the course from all Australian states and territories, and also from New Zealand, of which there were 49 males and 18 females. Thirty seven of these (55%) responded to the survey. This included a mix of 23 males (47%) and 14 females (78%) (Fig. 1). Most trainees were aged between 26 and 30 (Fig. 2).

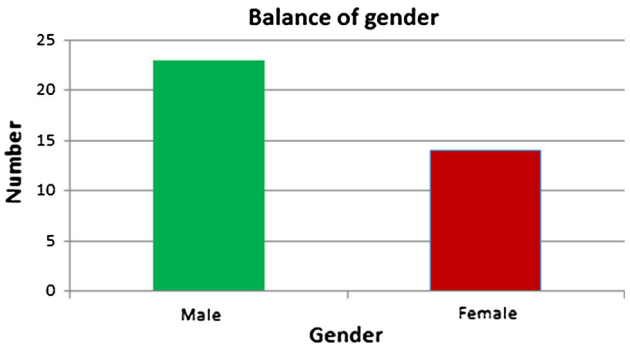


**Fig. 1** Balance of responses based on gender

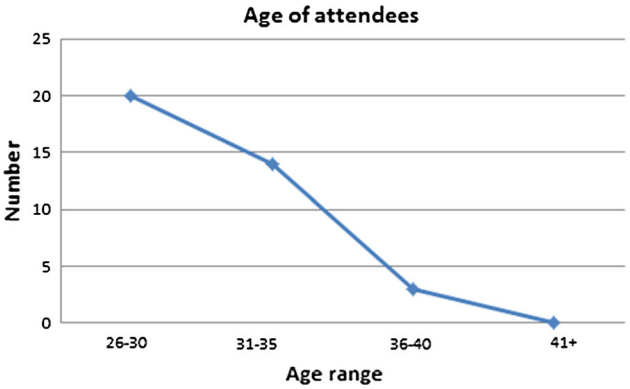


**Fig. 2** Age ranges of attendees


**Fig. 3** Year level of training

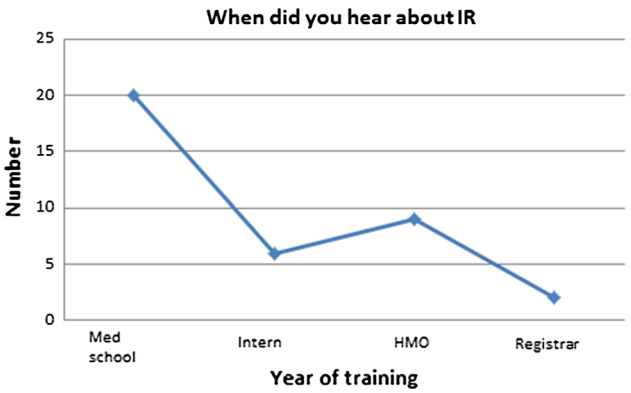


**Fig. 4** The time at which trainees first heard about IR

The spread of training experience of the attendees can be seen in Fig. 3. Thirty-three out of 37 trainees (89%) were in their first phase of training, i.e. years 1–3, with most in their second year.

Most registrars had heard about IR whilst in medical school and very few had entered registrar training before hearing about IR, as shown in Fig. 4.

Before the workshop, trainees rated their interest in IR training at a mean of 3.7 ± 0.9 out of 5. Broken down into gender, this was 4.0 ± 0.8 for males and 3.1 ± 0.9 for females.

After the workshop, trainees rated their interest in IR training as an average of 4.4 ± 0.7 out of 5 ($p < 0.001$), for males 4.5 ± 0.5 ($p < 0.001$) and for females 4.1 ± 0.9 ($p < 0.001$). These results are shown in Table 2 and Fig. 5.

The difference in interest between males and females before the workshop (4.0 vs. 3.1) was significant with $p = 0.003$, however after the workshop (4.5 vs. 4.1) was not significant ($p = 0.07$). The degree of change in interest from attending the workshop was significant between genders, $p = 0.03$; male interest increased by 0.5 points and female interest by 1.0 point.

Registrars found the lectures and workshops as the most useful items in the event (Fig. 6). The overall rating given

**Table 2** Change in interest in IR training after the workshop (numerical scale, out of 5)

| | Before the workshop | After the workshop | *p* value | Change in interest |
|---|---|---|---|---|
| Overall mean, SD | 3.7, 0.9 | 4.4, 0.7 | $p < 0.001$* | 0.7 (0.6) |
| Males mean, SD | 4.0, 0.8 | 4.5, 0.5 | $p < 0.001$* | 0.5 (0.6) |
| Females mean, SD | 3.1, 0.9 | 4.1, 0.9 | $p < 0.001$* | 1.0 (0.6) |
| Interest difference between genders mean, SD, *p* value | 0.9 (0.6, $p = 0.003$*) | 0.4 (0.6, $p = 0.07$) | $p = 0.03$* | NA |

*Statistical significance, $p < 0.05$

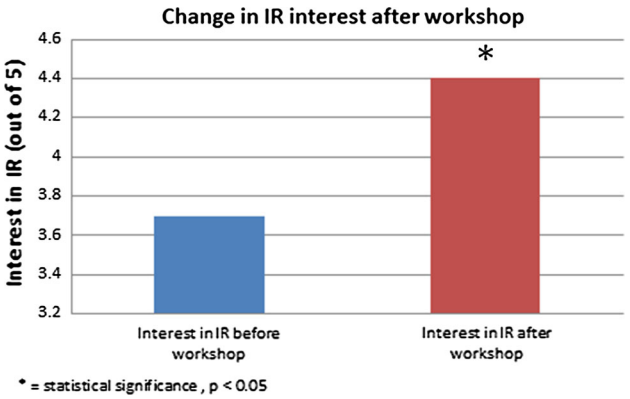


**Fig. 5** Level of interest in IR training both before and after the workshop (numerical scale, out of 5)

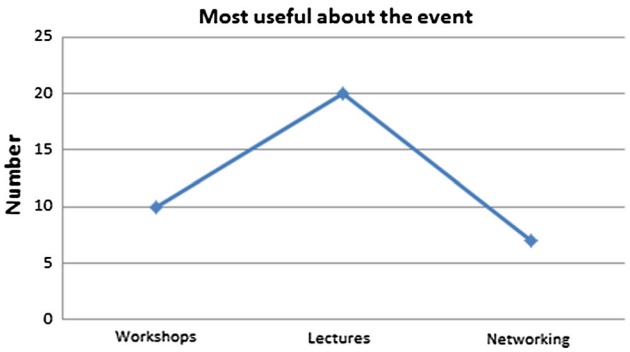


**Fig. 6** The components that trainees felt were most useful about the workshop

by the delegates for the workshops and lectures are shown in Table 3.

## Discussion

Educational activities are a key component of training for junior doctors. Workshops in the style of the IRSA registrar workshop have been performed in the past across different medical settings but exactly how they impact on future career paths is difficult to quantify. This type of information allows us to justify the cost and thus benefit of the resource allocation.

**Table 3** Overall rating of events during the program (numerical scale, out of 5)

| | Workshops | Lectures |
|---|---|---|
| Overall (mean, SD) | 4.0 (0.9) | 4.5 (0.7) |
| Males (mean, SD) | 4.0 (0.8) | 4.4 (0.7) |
| Females (mean, SD) | 4.0 (1.1) | 4.5 (0.9) |

This survey shows that the workshop resulted in an increase in the interest in IR training of the attendees who responded. There were no responding attendees who were less interested after the workshop with all showing either similar interest or increased interest.

There were more males than females in attendance (49 vs. 18) however we were encouraged by 14 female respondents to the survey which was 78% of those who attended. The overall level of interest in IR training between the genders was significantly higher in males before the workshop, but not significantly different after the workshop. Also, the relative change in interest between genders was significantly higher in females at the conclusion. This is an encouraging initiative to address the current gender imbalance in IR [6, 9, 10] and shows that the workshop has been particularly successful in engaging female interest in IR training. We acknowledge that there was a lecture specifically targeted towards training of women in IR, but this suggests that even small initiatives can have a big impact on the audience and should be encouraged for future events in both Radiology and other specialties.

Most trainees became aware of IR during Medical School, which suggests that this may be the best time to begin with education and advertisement of the different Radiology subspecialty types, including IR. This has been recommended as an ideal time to generate interest in previous literature [11–16].

We have identified that most attending the workshop are in phase 1 of training, which places them in a position with time to contemplate and evaluate their career goals before

making a decision on career path. We did position the workshop to occur after phase 2 examinations however study commitments for upcoming phase 2 candidates and on-call commitments for senior trainees may have contributed to an absence of this particular cohort. Conversely, is it possible that registrars in phase 2 of training may have already decided on their career path and it may be too late to influence their decision. This would be an interesting area of further investigation.

The 2018 IRSA workshop was attended by a large number of accredited Radiology trainees but this number was limited by resources at the venue. The rate of feedback was 55% which introduces some bias into the results. Those who did not respond may have been due to inconvenience, lack of interest in surveys, or even lack of interest in IR, among many other potential reasons. Comparing this to literature, there is no consensus on what constitutes an 'acceptable' response rate to a written survey, with a range of rates suggested from 10 to 70% [17, 18] but places our rate towards the higher end of what may be considered an acceptable rate with some papers suggesting rates of 33% or higher may be acceptable for written surveys [18]. For the purposes of our analysis, the opinion of those who responded was assumed to be the opinion of the group as a whole but we acknowledge that this may not be the case, although there is no way to prove this.

The nature of surveys such as this is that they obtain a snapshot of interest and opinion at a particular time point, which in this case is towards the end of the workshop. This allows the trainee to reflect on their experience and score the event based on their own perceived change in interest. Attempting to obtain a separate entry and exit survey would allow for a more sensitive dataset as it is separated in time, but would also likely lead to a higher attrition rate. We acknowledge the influence this will have on the results.

There is also an element of selection bias in the results, as those who participated were nominated by their relevant directors of training, and may have a predilection already towards IR training. Conversely, if there is a pre-existing interest in IR training then this workshop may have been less likely to influence such a person into IR training than for those who were undecided at the beginning.

## Conclusion

We show that a program of lectures and workshops designed to generate interest in IR subspecialty training in the early stages of accredited training, leads to a statistically significant increase in training interest particularly amongst females. We identified that another ideal time for individuals to develop specialty or subspecialty interest would be medical school as this is where IR is first contemplated.

Other IR interest groups across the world as well as other radiology subspecialty craft groups should consider this type of intervention. In addition, established IRs should continue to work with relative stakeholders to promote ongoing educational activities to future-proof our profession and inspire a potential next generation of IRs.

**Acknowledgements** The authors would like to acknowledge the efforts of previous IRSA Registrar Conference convenors, in particular Dr. Glen Schlaphoff who has been instrumental in designing the current workshop format. We would also like to acknowledge the Interventional Radiology Society of Australasia and the Royal Australian and New Zealand College of Radiologists.

**Authors' Contributions** All authors contributed to the production of this manuscript.

**Compliance with Ethical Standards**

**Conflict of interest** The authors declare that they have no relevant conflicts of interest.

**Consent for Publication** Consent for publication was obtained for every individual person's data included in the study.

**Ethics Approval and Consent to Participate** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Informed Consent** Informed consent was obtained from all individual participants included in the study.

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