



The Academic Surgical Collaborative: A three-year review of a trainee research collaborative



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ABSTRACT

Introduction: The Academic Surgical Collaborative (ASC) is a trainee research collaborative (TRC) formed in the UK in October 2014. Three years on, the achievements are presented along with advice for emerging and established TRCs. **Methods:** A retrospective review of internal, member-maintained ASC records was conducted. Membership numbers, PubMed indexed publications, presentations and prizes awarded were all calculated over time. Google Scholar was used to calculate citations per ASC publication. An online survey was distributed to members to ascertain member satisfaction.

Results: With 62 active members (predominantly medical students) the ASC has published 33 PubMed indexed papers over three years, with a mean of 21 citations per paper (SD 89, range 0–491). 54 presentations have been delivered and eight prizes have been awarded for ASC research projects. 60% of ASC members believe the ASC delivers research that improves patient care. Key learning points for the ASC have been the use of a set of resources distributed to new members, the value of regular meetings, close mentoring throughout research projects to develop the skills of junior researchers, encouragement for junior members to present at conferences, and an ongoing focus on research conduct and improving evidence based medicine.

Conclusions: The ASC has fulfilled many of its goals set out at its inception. The ASCs subsequent aims are to enhance existing research training for junior members, advances in the field of core outcome development and also multi-collaborative research.

1. Introduction

The Academic Surgical Collaborative (ASC) is a trainee research collaborative (TRC), that was formed in the UK in October 2014. Its predecessor was an informal trainee research group led by one of us (RAA) since 2010. The ASC's formation was driven by the desire of trainees to be educated in research methodology. Its focus has since

been on investigating and improving research methodologies, research conduct and reporting compliance within surgical research, using meta-research, small teams with high individual autonomy, and the delivery of prompt research outcomes [1]. The following paper highlights the progress of the ASC three years on; it describes the achievements of the collaborative to date in relation to its original objectives [1], and its future aims and goals. Other such progress reports from other TRCs

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¹ <https://www.surgicalcollaborative.com/>.

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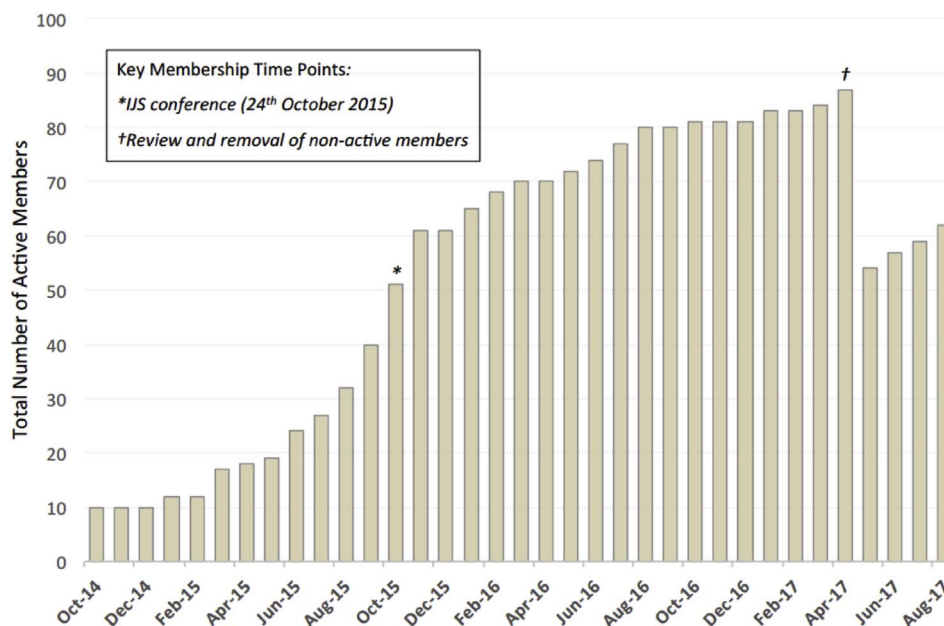


Fig. 1. Academic Surgical Collaborative membership numbers over time.

have not yet been presented in the literature, and what has been learnt by the ASC to date may inform other establishing and established research collaboratives.

After registering with the National Research Collaborative at the ASC's inception, the ASC became one of 48 registered collaboratives in the UK, 31 of which are surgically themed [2].

The ASC has grown exponentially, having achieved 33 publications (see Appendix 1), 56 national presentations and 8 National Prizes (as of September 2017). Medical students have remained at the forefront of the collaborative and comprise 58% of its 62 members.

2. Members and recruitment

The ASC is open to all trainees. A “trainee” in this context is any allied healthcare student in a training programme (i.e. university degree or academic programme) or employee in a healthcare provider post. The ASC would consider working with collaborators from other allied disciplines in the future. ASC membership numbers over time are shown in Fig. 1. In June 2015, a dedicated Membership Officer role was established to manage recruitment. An application for membership takes place via the ASC website [3]. Potential members are asked to provide a CV and when approved, are issued with an induction pack. As well as describing the logistics of how the collaborative functions and signposting volunteers toward relevant projects, links are provided to relevant educational resources [1,4,5].

Providing a brief overview of the collaborative with links for members to acquire more information on the areas they find appealing has been valuable. Signposting members to appropriate project leads allows further questions to be more relevant, giving new members a more informed start with the collaborative. This approach of inducting new members has proved simple and efficient and the ASC would recommend this structure to other TRCs.

Learning point: Issuing an educational resource pack both educates and engages new members early in the process of joining a collaborative. A brief introductory presentation so that new members can contact appropriate project leads for work they found interesting is considered a helpful feature.

mouth, networking at conferences, the original editorial published in June 2015 [1], an active Twitter account, and an affiliated conference [6] (see Fig. 1).

In May 2017, member numbers peaked, however it was felt that some had stopped contributing to the collaborative. An unresponsive group of members can create an impression of inactivity, with poor responses to collaborative communications, and perceived disengagement. Therefore, members were asked to “opt-in” to remain involved. This resulted in a fall in membership numbers from 87 to 53 members who had all actively stated they wished to remain part of the group (see Fig. 1). New member intake has driven change and improvement throughout the evolution of the ASC.

Learning point: Over time, some collaborative members had become progressively less active. A request for members to proactively chose to remain involved, updated the membership to only those still interested in participating in the ASC's work.

As of September 2017, of 62 members, 36 were medical students (58%) (30 in their clinical years of university), 11 were Foundation Doctors (18%), 4 junior trainees (6%), 4 Specialist Registrars (6%), 6 Clinical Research Fellows (10%) and an Associate Professor (2%). The ASC membership are largely UK based but the ASC has attracted active co-authors from abroad including Italy and Australia.

The areas of interest of members were predominantly in the surgical specialties, with Plastic Surgery (23, 41%), Trauma and Orthopaedics (14, 25%) and General Surgery (14, 25%) registering most frequently as a main interest for members (see Fig. 2).

The ASC conducted an online audit of its members on the 4th of May 2016 against recommendations from the UK National Research Collaborative (NRC) conference on points TRCs should aim to achieve [7]. Twenty members responded. 75% of members joined the ASC for opportunities to publish, 70% joined for research conduct training, 30% for managerial experience and 5% for networking purposes. Over 60% believed the ASC delivered research that improved patient care and provided them with the opportunities to participate in research projects, whilst 55% felt they were able to network with clinicians at different levels of training. However, only 20% of respondents felt completely confident of leading their own project. 30% felt that there was a

Promoting the collaborative to new members has been via word of

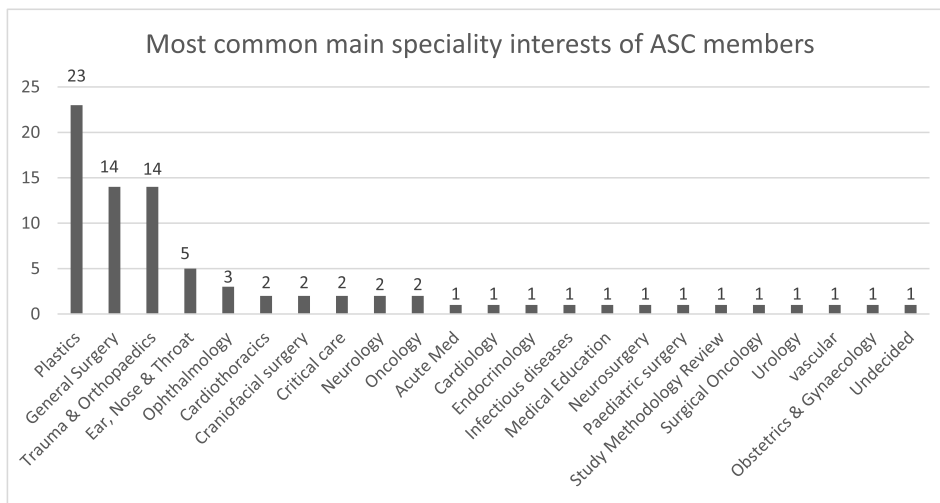


Fig. 2. Interests of Academic Surgical Collaborative Members (all those cited by two or more members included).

lack of available projects to get involved in. Many respondents commented that training workshops in areas such as methodology development, statistical analysis, and data interpretation, would equip more members with the skills necessary to lead their own projects, and therefore create a greater availability of projects for members to collaborate on.

3. Research conduct and team structure

A central tenet of the ASC has been the use of small teams to foster manageable projects [1]; with 6.3 authors per paper on average (median 6; range 2–10), with a lead author appointed to steer each project. The lead author distributes tasks (data collection, data analysis, sections of the write-up) to the junior co-authors. Crucially, junior co-authors are mentored and trained in research conduct during the research project, so that they are able to become lead authors after a number of projects. A senior author in turn advises the lead author on methodology and study conduct. This structure enables team members to be autonomous, and to retain control over their work. This focussed structure has allowed the ASC to deliver the prompt research output that members desire (33 publications over three years).

An area of weakness the ASC has encountered is when members withdraw their commitment to a project whilst it is in the process of being carried out. This delays completion and may require recruitment of a new team member. ASC members are strongly encouraged to escalate concerns regarding workload early to their lead author so that contingency plans can be made.

A noted area of improvement for the ASC is to encourage all collaborative members to act as lead authors. The expectation is that this will be the case in the future as members become educated in research

methodology and conduct.

Learning Point: The ASC advocates a need to mentor and educate junior collaborators on the conduct of the research project as it proceeds. Otherwise the educational value of the project to the co-authors is lost. Co-authors cannot simply be data collectors [8].

Much of the ASC's research (systematic reviews and meta-analyses) can be carried out remotely. Once the lead author delegates a clear plan, well-established junior co-author roles allow collaborators to work in parallel at geographically separate sites. This has allowed more flexibility in scheduling and enables long distance collaboration.

4. Achievements of the ASC

PubMed indexed publications have been used as outcome measures to compare collaboratives in the past [9,10]. The ASC have published 33 PubMed indexed papers as of September 2017; 19 are research articles, and 14 are non-research, as defined by prior work [9] (see Fig. 3).

However, the ASC prefers not to focus on numbers of publications, but on the importance of those contributions to the scientific literature. The ASC's top 5 cited papers are show in Table 1. The ASC's 33 papers have been cited a total of 711 times to date (Google Scholar citations), with a median of 3 citations per paper (IQR 1–10), and mean of 21 citations per paper (SD 89, range 0–491 citations per paper). This yields an i10 of 8. For completeness, this was also calculated purely for ASC research publications (n = 19); yielding a mean of 33 citations per

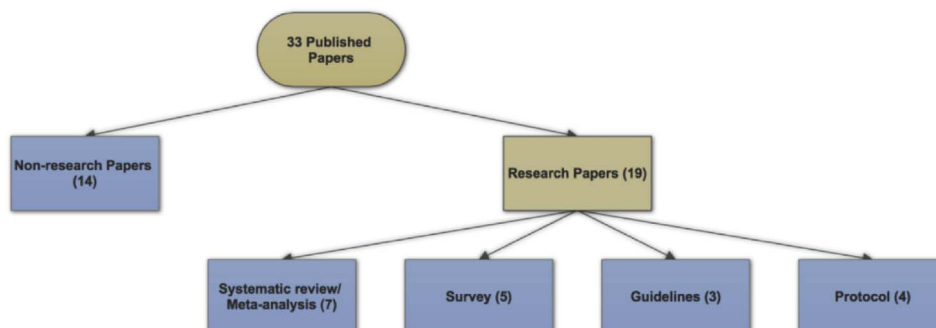


Fig. 3. Research and non-research PubMed indexed articles published by the ASC as of 26th September 2017.

Table 1

Top 5 Cited Publications by the Academic Surgical Collaborative as of 26th September 2017 (citation numbers derived from Google Scholar).

Paper title	Reference	Journal	Citations
The SCARE Statement: Consensus-based surgical case report guidelines	Agha RA et al. (2015) [11]	Int J Surg.	491
Preferred reporting of case series in surgery; the PROCESS guidelines	Agha RA et al. (2016) [12]	Int J Surg.	46
Use of autologous fat grafting for breast reconstruction: a systematic review with meta-analysis of oncological outcomes.	Agha RA et al. (2015) [13]	J Plast Reconstr Aesthet Surg.	44
A protocol for the development of reporting criteria for surgical case reports: The SCARE statement	Agha RA et al. (2016) [14]	Int J Surg.	26
Reporting Quality of Observational Studies in Plastic Surgery Needs Improvement: A Systematic Review.	Agha RA et al. (2016) [15]	Ann Plast Surg.	22

paper (SD 121), and a median of 4 citations per paper (IQR 2.75–23).

Learning point: The ASC would encourage TRCs not to measure their success by the number of publications they produce, but instead by the impact of those publications. Total number of citations, or average citations per publication, are simple metrics that could be compared across collaboratives.

56 ASC presentations have been delivered as posters or as podium presentations, nationally and internationally. These conferences are of wide scope, spanning the fields of general surgery, plastic and reconstructive surgery and of evidence based medicine. This fulfils an original goal of the ASC to deliver realistic opportunities for members to both publish and present.

Learning point: Lead and senior authors encourage junior co-authors to present at least once if they would like to do so. This serves to disseminate research, builds experience for the presenter, provides certifiable evidence of continued professional development, and encourages the engagement of new members in the collaborative.

Learning point: As part of the ASC's mentoring and training structure, we have found it helpful to keep a question bank of questions asked after presentations at conferences. This has aided subsequent future presenters in feeling more confident in delivering considered answers. Additionally, practicing presentations at our regular meetings has been beneficial. This has been reflected in the prizes awarded to presenters for their work (see Table 2).

Table 2

Prizes awarded for ASC projects.

Project/Presentation	Conference/Organisation	Prize	Date
The SCARE Statement: Consensus-based surgical case report guidelines	International Journal of Surgery Editorial Board Best Paper	Harold Ellis Prize	August 2017
Outcome measures reported in published clinical research studies of interventions for patients with craniosynostosis: A systematic review	British Burns Association Session - Society of Academic and Research Surgery Joint Meeting	Runner up for the Jackson prize	January 2017
The development of the Research Registry: A global research registry to increase compliance with the Declaration of Helsinki 2013	European Health Innovation Conference 2016	Oral presentation prize	November 2016
Systematic Review of the Methodological and Reporting Quality of Care Series in Surgery	IDEAL Collaboration Conference, UK	Poster prize	April 2016
The Use of Study Registration and Protocols in Plastic Surgery Research: A systematic review	Mammary Fold Academic and Research Day, UK	Medical Student Prize	January 2016
The Need for Core Outcome Reporting in Fat Grafting - Launching the VOGUE Study	Fat Therapy and Therapeutic Challenges, Royal Society of Medicine Section of Plastic Surgery Meeting, UK	Joint first prize	October 2015
The PROCESS Statement: Preferred Reporting of Case Series in Surgery.	British Association of Plastic, Reconstructive and Aesthetic Surgeons	Paton Masser Memorial Fund Award	February 2015
Efficacy of the Cook-Swartz Implantable Doppler in the Detection of Free Flap Compromise: A Systematic Review and Meta-Analysis	British Burns Association Session - Society of Academic and Research Surgery Joint Meeting	The Gibson prize	January 2015

5. Notable work

In October 2016, the ASC published the SCARE (Surgical Case REport) guidelines, a 14-item checklist that was designed to improve the reporting quality of case reports that are surgically focused [11]. The guidelines were an adaptation of the existing CARE (Case REport) guidelines, and were formulated due to the specific reporting requirements that surgical case reports need. The guidelines were developed by using standard DELPHI methodology, where a group of experts on case reports participated in the development of the guidelines, something that no other collaborative has ever done before. The SCARE guidelines article is the ASC's most cited piece of work, with 491 citations to date.

In December 2016, the PROCESS (Preferred Reporting Of Case Series in Surgery) Guidelines were published [12]. The work employed DELPHI consensus methodology to establish an eight-item checklist for the adequate and complete reporting of surgical case series and has since been cited 46 times.

6. Other activity of the ASC

Apart from embarking on research projects, the ASC has widened its remit within other initiatives and organisations, most notably with the Research Registry (www.researchregistry.com) [16]. Research Registry was launched in February 2015 by the ASC founder (RAA) and allows retrospective registration of all studies with human participants, whether they are trials or observational studies, for free. The Registry reached 500 registrations in October 2015 [17] and has had a mean growth in number of registrations of 6% per month. Now with over 2500 registrations, including over 8 million patients enrolled and registrations from more than 80 countries, it continues to grow. It has received endorsement from the IDEAL Collaboration [18] and is a member of the Health Research Authority's Research Transparency Forum [19].

Members of the ASC are given the opportunity to volunteer as

curators for the registry, which involves reviewing new registrations against the curation policy and flagging up inconsistencies. In addition, those involved from the ASC have taken steps aimed to improve this process: developing educational material and training aids for curators to ensure the quality of the curation process and to uphold the integrity and reputation of the Research Registry.

The ASC is known to be associated with scientific journals such as *Annals of Medicine and Surgery* (AMS) and the *International Journal of Surgery* (IJS). ASC members are provided with the opportunity to train as peer-reviewers, enhancing their skills in critical appraisal. Some ASC members have joined the Editorial Board of AMS, after acquiring adequate experience.

The *International Journal of Surgery Careers* website [20] was set up by ASC members in 2015. Its aim was to act as a database of career resources for training doctors and medical students. The website holds an extensive list of fellowships, courses, conferences, prizes and higher degrees. The website includes ‘how to’ articles; ranging from how to organise a medical elective; to peer-reviewing a research paper and publishing a medical book. This resource is constantly being expanded and revised to cater to the needs of the training doctor.

In conjunction with the *International Journal of Surgery Careers*, the collaborative held its first national conference in October 2015 [6]. This one-day conference of workshops, seminars and lectures aimed to help delegates develop their research, leadership and entrepreneurship skills for a future surgical career. Of 50 delegates that provided feedback, 90% rated the conference content as good or excellent, and 94% rated the overall conference as good or excellent. The seminar with the highest score for content was that covering “Leadership and Management”, rated as excellent by 69% of delegates. A further opportunity for the ASC to engage in teaching came in January 2016, when it collaborated with the Association of Surgeons in Training (ASiT) to deliver a one-day course on Systematic Reviews and Meta-analyses [21].

7. Future goals of the ASC

The future research work of the ASC includes building on previous projects including our work on fat grafting [22]. A DELPHI consensus exercise has been completed for the VOGUE (Validated Outcomes in the Grafting of Autologous Fat to the breast) Study [23] to develop a core outcome set for fat grafting in breast reconstruction, and has been accepted for publication.

The ASC welcomes the opportunity to collaborate with other collaboratives in national multi-centre research and indeed other organisations performing meta-research, such as Stanford University’s Meta-Research Innovation Centre (METRICS).

We will continue to inspire, motivate and train medical students and junior doctors in research, providing knowledge, skills and mentoring together with real opportunities to get involved with the activity of the collaborative.

8. Conclusions

In three years the ASC has established itself as a productive TRC and fulfilled the aims set out at its inception. The above article highlights learning points that may guide other collaboratives. We welcome their input in turn to further cultivate a community of ongoing collaborative research in the future.

Ethical approval

Not applicable.

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Author contribution

TEP: Concept and study design, revisions, drafting of final manuscript, approval of final manuscript.

CC: Concept and study design, drafting of manuscript, approval of final manuscript.

YAO: Data collection and analysis, editing of manuscript, approval of final manuscript.

CL: Data collection and analysis, editing of manuscript, approval of final manuscript.

RT: Data collection and analysis, editing of manuscript, approval of final manuscript.

BG: Data collection and analysis, editing of manuscript, approval of final manuscript.

KK: Data collection and analysis, editing of manuscript, approval of final manuscript.

AW: Data collection and analysis, editing of manuscript, approval of final manuscript.

AF: Concept and study design, approval of final manuscript.

RAA: Concept and study design, approval of final manuscript.

Conflicts of interest

RAA established The Research Registry and the journals *International Journal of Surgery* and *Annals of Medicine and Surgery*. This article was externally peer-reviewed independently of the authors.

Guarantor

Thomas Pidgeon.

Financial interests

None of the authors has a financial interest in any content of the manuscript.

Prior presentations

Nil.

Collaborator contributions

TEP: Concept and study design, revisions, drafting of final manuscript, approval of final manuscript.

CC: Concept and study design, drafting of manuscript, approval of final manuscript.

YAO: Data collection and analysis, editing of manuscript, approval of final manuscript.

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KK: Data collection and analysis, editing of manuscript, approval of final manuscript.

AW: Data collection and analysis, editing of manuscript, approval of final manuscript.

AF: Concept and study design, approval of final manuscript.

RAA: Concept and study design, approval of final manuscript.

Appendix 1. All ASC PubMed indexed publications as of September 2017

1. Agha, R. A., Fowler, A. J., Herlin, C., Goodacre, T. E. E. & Orgill, D. P. Use of autologous fat grafting for breast reconstruction: A

- systematic review with meta-analysis of oncological outcomes. *J. Plast. Reconstr. Aesthetic Surg.* **68**, 143–61 (2014).
2. Agha, R. A., Fowler, A. J. & Sevdalis, N. The role of non-technical skills in surgery. *Ann. Med. Surg.* **4**, 422–427 (2015).
 3. Agha, R. A., Altman, D. G. & Rosin, D. The SPIRIT 2013 statement – Defining standard protocol items for trials. *Int. J. Surg.* **13**, 288–291 (2015).
 4. Agha, R. A. & Fowler, A. J. Celebrating 350 years of academic journals. *Int. J. Surg.* **19**, 146–7 (2015).
 5. Agha, R. A. & Fowler, A. J. The Role and Validity of Surgical Simulation. *Int. Surg.* **100**, 350–357 (2015).
 6. Agha, R. et al. A systematic review protocol for reporting deficiencies within surgical case series. *BMJ Open* **5**, e008007 (2015).
 7. Agha, R. & Rosin, D. The Research Registry – answering the call to register every research study involving human participants. *Int. J. Surg.* **16**, 113–5 (2015).
 8. Pidgeon, T. E. et al. The Academic Surgical Collaborative: Launching a New Trainee Research Collaborative. *Ann. Med. Surg.* **4**, 133–5 (2015).
 9. Agha, R., Fowler, A. & Orgill, D. P. Tissue-Engineered Breast Reconstruction with Brava-Assisted Fat Grafting: A 7-Year, 488-Patient, Multicenter Experience. *Plast. Reconstr. Surg.* **136**, 556e–7e (2015).
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