# Establishing Equipoise: Does the use of Acellular Dermal Matrices in pre-pectoral implant-based breast reconstruction improve outcomes?

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## Abbreviations

IBBR – implant-based breast reconstruction
ADM – acellular dermal matrix
UK – United Kingdom
FDA – (United States) Food and Drug Administration
CENTRAL – Cochrane Central Register of Controlled Trials
CDSR – Cochrane database of Systematic Reviews
BAPRAS – British Association of Plastic and Aesthetic Surgeons
ABS – Association of Breast Surgery
BAAPS – British Association of Aesthetic Plastic Surgeons
PLASTA – Plastic Surgery Trainees Association
ASPS – Australian Society of Plastic Surgeons
ISAPS – International Society of Aesthetic Plastic Surgery

# Abstract

## Introduction

Breast cancer is the most common malignancy among females in the United Kingdom (UK). Surgical management commonly comprises mastectomy and reconstruction, of which implant-based breast reconstruction (IBBR) are most prevalent. Acellular dermal matrices (ADM) are widely used in pre-pectoral implant-based breast reconstruction, however there is limited high-quality evidence supporting their efficacy. This study aims to establish equipoise via an expert consensus survey.

## Methods

An online survey was designed with a steering group of experts. Questions covered participant information, opinions regarding surgical outcomes with ADM use in pre-pectoral IBBR and opinions regarding available scientific evidence on the topic. The survey was advertised via national and international professional organisations. Quantitative and qualitative analyses were performed.

## Results

Thirty-two participants from the UK, Italy and Australia completed the survey. Key findings of this study include disagreement among participants regarding surgical outcomes associated with ADM use. Participants who believed that ADM reduced the risk of short-term complications and implant failure/explantation comprised a minority – 21.9%. Participants who felt that ADM use improved cosmetic outcomes and reduced long-term complications made up a relative majority – 43.8% and 40.6%, respectively. 56.3% of participants felt there was scarce scientific evidence on the topic.

## Conclusions

This study provides an insight from international surgeons; establishing a lack of consensus on surgical outcomes, efficacy and evidence-base supporting the use of ADMs in pre-pectoral IBBR. Given this clinical equipoise, alongside the growing burden of breast-cancer associated morbidity and the need for reconstruction, the implications of this study are that large-scale, prospective, randomised-controlled data are needed to establish whether ADM use in pre-pectoral breast reconstruction improves outcomes.

## Keywords

breast reconstruction; breast cancer; implant-based breast reconstruction; acellular dermal matrix; expert consensus

# Introduction

Breast cancer is the most common malignancy among females in the UK – comprising 30% of such cancers in 2019[1]. Its incidence continues to increase, however overall mortality rates have fallen by 40% since 1995[1]. The UK breast cancer screening programme has led to earlier-stage detection for many females which has contributed to improved outcomes[2].

Surgical management of breast cancer has evolved through time, from radical mastectomies to now more popular breast-conserving surgeries[3]. Reconstruction now represents an integral part of surgical care for breast cancer and has proven links to improved patient satisfaction and reduced psychosocial morbidity[4]. Immediate implant-based breast reconstruction (IBBR) is currently the most prevalent reconstructive procedure performed in the UK[5].

From the 1970s onwards, sub-pectoral implant-based breast reconstruction (IBBR) was favoured due to increased rates of skin flap necrosis, infection, implant exposure and capsular contracture associated with early pre-pectoral IBBRs[4]. However, sub-pectoral IBBR is not without its own issues and is associated with greater post-operative pain, animation deformities and functional deficit[6]. As such, pre-pectoral IBBR has again become increasingly popular, aided in part due to evolving oncoplastic surgical techniques, facilitating thicker skin flap preservation in mastectomies[7]. The use of Acellular Dermal Matrices (ADM) has also been attributed to the rise in popularity of pre-pectoral IBBR[8]. Despite being widely used by surgeons[8], there appears to be limited evidence in literature investigating the safety of ADM for use in pre-pectoral IBBR. Prior meta-analysis has been limited by included studies utilising

relatively small sample sizes and being largely retrospective in nature[9]. The United States Food and Drug Administration (FDA) published a statement in 2021 re-iterating that the organisation has not approved or cleared ADM for use in IBBR, highlighting risks associated with its use[10]. This is particularly pertinent given the recent recall of Surgimend (produced by Integra), due to concerns about post-operative fever secondary to high levels of endotoxin in the product[11].

In order to address this gap in knowledge, the authors sought to identify surgical equipoise via a web-based survey to experts in the field.

# Methods

## Study Design

### Phase 1: Preparation

Following conceptualisation, a literature review was performed to evaluate the extent of existing knowledge on this topic. Ovid Medline, Embase and Cochrane Central Register of Controlled Trials (CENTRAL) and Cochrane Database of Systematic Reviews (CDSR) were searched to determine what evidence existed on the use of ADM for pre-pectoral IBBR, its safety, complications, and outcomes. The search included the following terms in various combinations and forms:

- Acellular dermal matrix (ADM)
- Mammaplasty, breast implantation, breast reconstruction
- Mastectomy
- Breast cancer
- Post-operative complications, treatment outcomes

A total of 147 studies were identified after removal of 81 duplicates. References of included studies were also screened for inclusion suitability. Additionally, eligible papers suggested by reviewers and not included in the initial search string were included. Details of PICO criteria and exclusion criteria, alongside a PRISMA chart are included in appendix 1.

A steering committee was formed, and using evidence from the literature review, members discussed the scope of the research topic.

### Phase 2: Survey Design

An online survey form was designed and pre-tested for usability and functionality by steering committee members. To ensure survey quality, the CHERRIES checklist was used[12]. All questions included had not been previously answered in existing literature.

The survey was hosted on Google Forms whose link was accessible via a web page containing information regarding the study and participation criteria. Methods such as adaptive questioning were used to reduce question number and complexity for participants. The survey was open and commenced with a consent page explaining further study details such as purpose, length of survey, data storage and anonymisation processes, contact details for lead investigators. Following this, individuals were invited to give informed consent to participate or exit the survey.

The first section included basic demographic information such as surgical specialty and seniority level. Subsequently, specific questions pertaining to ADM use in pre-pectoral IBBR were asked in sections. The survey comprised 6 sections, each with 3-6 questions. Answer

type included Likert scale, yes/no and short free text responses (see Appendix 1). Certain questions were mandatory to promote completeness. For such questions, non-response options were included such as “not applicable” or “do not know”. Respondents were able to review and change answers through using a ‘back’ button prior to submission. In order to avoid duplication, Google Form settings were set to ‘limit to one response’.

### Phase 3: Conducting

The survey was pre-tested departmentally, following which questions were refined. The final survey was distributed and open from March 2023 – September 2023.

Target demographics were UK and international breast and plastic surgeons who undertake pre-pectoral IBBR. The survey link was disseminated via professional organisations and newsletters (British Association of Plastic and Aesthetic Surgeons (BAPRAS), Association of Breast Surgery (ABS), British Association of Aesthetic Plastic Surgeons (BAAPS), Plastic Surgery Trainees Association (PLASTA), Australian Society of Plastic Surgeons (ASPS), International Society of Aesthetic Plastic Surgery (ISAPS)), using social media and online forums and directly to clinicians. Participants were asked to participate only if they undertook pre-pectoral IBBR on a regular basis, and felt able to offer an expert opinion.

Participants were invited to leave email addresses in order participate in further research on this topic, however this was optional. Responses were extracted onto a password-protected Microsoft Excel spreadsheet and emails un-linked from answers to ensure complete anonymisation of responses.

### Phase 4: Analysis

Once extracted, data was analysed using a mixed-methods approach. Numerical analysis was performed using Microsoft Excel. Statistical correction methods such as weighting were not used as each question was considered equally significant. For quantitative data, chi-squared was used; a p value of $< .05$ was considered significant. For qualitative data, deductive thematic content analysis was used.

## Results

### Participation

The web page containing the survey link was visited 73 times. In total, 32 participants accessed and completed the survey with all participants confirming that they were happy to participate, having read the participant information – a response rate of 44%. For non-mandatory questions, the average response rate was 28 participants per question (87.5%).

### Demographics

Out of 32 respondents, 62.5% were from the UK. The breakdown of respondents by country is shown in figure 1, and by UK region in figure 2.

**Figure 1. A chart showing respondents by country of work, figure 1**

**Figure 2. A chart showing UK respondents by region of work, figure 2**

Twenty (62.5%) of respondents were plastic surgeons, the remaining twelve (37.5%) were breast surgeons. The majority of respondents were consultants (N = 23; 71.8%), with two fellows and seven registrars also participating. The breakdown of specialties based on country and seniority based on country is demonstrated in Table 1.

| | UK (%) | Italy (%) | Australia (%) | Not Disclosed (%) |
|---|---|---|---|---|
| **Speciality** | | | | |
| **Plastic Surgery** | 9 (45%) | 9 (100%) | 1 (100%) | 1 (50%) |
| **Breast Surgery** | 11 (55%) | 0 | 0 | 1 (50%) |
| **Seniority** | | | | |
| **Consultant** | 16 (80%) | 6 (66.7%) | 1 (100%) | 0 |
| **Fellow** | 1 (5%) | 1 (11.1%) | 0 | 0 |
| **Registrar** | 3 (15%) | 2 (22.2%) | 0 | 2 (100%) |

**Table 1. Frequency of respondent characteristics by country, table 1**

## ADM and Surgical Outcomes

Survey responses for surgical outcomes are shown in table 2. When asked if the use of ADM in pre-pectoral IBBR reduced short term complications, 13 respondents answered 'no' and 11 answered 'no difference than with non-use of ADM' – a combined total of 75%.

Regarding long-term complications associated with use of ADM in pre-pectoral IBBR, 13 respondents (40.6%) believed that use of ADM does reduce risk of such occurrences, however 6 (18.75%) felt it did not reduce the risk and 4 (12.5%) believed ADM use made no difference to risk.

When asked if the use of ADM reduced the risk of explantation and failure, 13 (40.6%) respondents answered 'no' and 7 (21.9%) answered 'no difference than with non-use of ADM' – a total of 62.5%.

| | Frequency | Percentage |
|---|---|---|
| **In your opinion, does the use of ADM for pre-pectoral implant-based breast reconstruction reduce the risk of short-term complications such as haematoma, seroma, wound infection?** | | |
| **Yes** | 7 | 21.9% |
| **No** | 13 | 40.6% |
| **No Difference** | 7 | 21.9% |
| **Don't Know** | 5 | 15.6% |
| **In your opinion, does the use of ADM for pre-pectoral implant-based breast reconstruction reduce the risk of long-term complications such as capsular contracture?** | | |
| **Yes** | 13 | 40.6% |
| **No** | 6 | 18.8% |
| **No Difference** | 4 | 12.5% |
| **Don't Know** | 9 | 28.2% |
| **In your opinion, does the use of ADM for pre-pectoral implant-based breast reconstruction reduce the risk of significant complications requiring explantation or implant failure?** | | |
| **Yes** | 7 | 21.9% |
| **No** | 13 | 40.6% |
| **No Difference** | 7 | 21.9% |
| **Don't Know** | 5 | 15.6% |

**Table 2. Participant responses - surgical outcomes associated with ADM use, table 2**

## ADM and Cosmetic Outcomes

Less than half of the participants (N = 14) answered 'yes' when asked whether ADM use improved cosmetic outcomes in patients undergoing pre-pectoral IBBR; with 9 (28.1%)

answering ‘no’, 7 (21.9%) answering ‘no difference than with non-ADM use’ and 2 (6.25%) answering ‘do not know’.

## ADM and Patient Reported Outcomes

When asked if satisfaction and quality of life was higher among patients undergoing pre-pectoral IBBR with ADM, 11 (34.4%) participants answered ‘yes’, whilst an almost equal number of participants (31.3%) answered ‘no’ (N=4) or ‘no difference than with non-ADM use’ (N=6).

## Evidence Used to Inform Practice

An absolute majority of respondents (N = 18, 56.3%) felt that inadequate or scarce evidence was available for surgeons in literature regarding ADM use in pre-pectoral IBBR. 11 (34.4%) respondents believed there was adequate evidence, whilst 9 (9.4%) did not know if evidence was available.

When asked to specify what evidence was available, participants were invited to give multiple responses, totalling 16. The majority (N = 8, 50%) of examples given were level 5 evidence. The distribution of responses is shown in figure 3.

**Figure 3. A graph showing respondent-stated levels of evidence for ADM use in pre-pectoral IBBR. figure 3**

## Subgroup Analysis

Subgroup analysis was performed, dividing participants into specialty (plastic surgery or breast surgery) and seniority (consultant, fellow or registrar). No significant difference was observed among survey responses between subgroups.

## Qualitative Analysis

Themes were extracted from survey questions regarding outcomes associated with ADM use – these are demonstrated in table 3.

| Factors associated with ADM use | Frequency |
|---|---|
| **Less seroma** | 1 |
| **Less haematoma** | 1 |
| **Less implant movement** | 4 |
| **Less capsular contracture** | 7 |
| **Less rippling** | 8 |
| **Less implant rotation** | 7 |
| **Less flap necrosis** | 1 |
| **Less contour deformities/asymmetry** | 3 |
| **Better cosmetic outcomes** | 7 |
| **Less pain** | 4 |
| **Faster recovery** | 3 |

**Table 3. Factors associated with ADM use in pre-pectoral IBBR, table 3**

Another theme that emerged among participants was the impression that factors other than ADM use affected surgical outcomes. Specific quotes were “outcomes are affected more by patient selection than ADM use”; “many factors are involved in failure and success therefore it is difficult to link to ADM”; “the historical outcomes of subcutaneous implants have been poor. Whether this was technique, training or ADM is hard to know”.

Regarding availability and quality of evidence, seven participants felt that they used their personal experience along to inform practice, with one stating “evidence is only anecdotal”. For participants who did feel that some evidence was available, level one to three evidence was only mentioned by three participants, with one stating “literature is abundant in retrospective studies but evidence from high quality trials is still needed”.

Specific studies mentioned by participants were a literature review by Cuomo et al.[13] and two cohort studies – one multicentre by Masia et al.[14] and one single-centre by di Pompeo et al.[15]. These will be explored further in the discussion.

## Discussion

In this analysis of opinions of 32 surgeons who regularly undertake pre-pectoral IBBR, there is a clear lack of consensus regarding the role of ADM. Participants who believed that ADM reduced the risk of short-term complications and implant failure/explantation in pre-pectoral IBBR comprised a minority of the sample. Although participants who felt that ADM use improved cosmetic outcomes and reduced long-term complications made up a relative majority of the sample, there was still substantial disagreement. This is further reinforced by an absolute majority (56.3%) of participants believing that adequate evidence on the topic is scarce, with the most common type of evidence use cited by participants as individual practice and clinical experience.

When examining studies cited by participants, Cuomo et al.’s 2020 literature review investigated pre-pectoral and sub-muscular IBBR using ADM and concluded that whilst some positive reports have been published by authors, there are still concerns over material costs

and high complication rates associated with ADM in other studies[13]. Masia et al.'s multi-centre retrospective audit collected data on a large number of patients undergoing pre-pectoral IBBR with Braxon ADM (porcine) and demonstrated acceptable complication rates, however, did not have a control group and concluded itself that further prospective randomised data is required[14]. The study also did not cover patient reported outcome measures. Lastly Di Pompeo et al.'s prospective study, again investigating Braxon ADM use for pre-pectoral IBBR, demonstrated acceptable complication rates not associated with patient or surgical factors. Analysis compared factors such as mastectomy versus reconstructive complications and implant wrapping was specified in surgical technique. Despite comparison with other literature in the discussion, as a single arm study without a control group, external validity and reliability of results is not maximised[15].

When exploring other literature, varying conclusions are found. In Urban et al.'s[8] 2022 multi-centre cohort study investigating pre-pectoral IBBR, complication rates were reported to be similar to those experienced with ADM. The authors acknowledge that these data are preliminary and further prospective studies should be performed. Onesti et al.[16] report a single-institution retrospective review, demonstrating a reduced risk of long-term complications such as capsular contracture in patients undergoing pre-pectoral IBBR with ADM. Conversely, a recent single-centre, retrospective study by Bushong et al.[17] demonstrated an increased likelihood of ecchymoses, mastectomy flap necrosis and nipple necrosis with the use of ADM. A systematic review and meta-analysis by Mangialardi et al. provided insight into complication rates associated with pre-pectoral IBBR using ADM, however the researchers noted that the power of statistical analysis was limited by a relative

small sample size, studies being mainly retrospective analyses, and a lack of correction of the confounding factors[9].

Current issues appear to be that despite ADM being increasingly adopted and attributed to improved patient aesthetic and functional outcomes[18,19], there is a lack of high-quality scientific evidence to corroborate its use. The majority of studies present single-arm, retrospective data with a range of conclusions, making it difficult for surgeons to make decisions in the patient's best interest. Surgical factors such as degree of implant wrapping and ADM type alongside patient factors such as radiotherapy and smoking are covered in some studies but not compared against control groups in randomised trials. Furthermore, incomplete or unrepresentative information as a result of lower quality evidence could lead to poor patient selection and subsequent complications.

This study is limited by sample size. Surgeons were asked to participate only if they regularly performed IBBR and felt able to provide an expert opinion; placing trust in their probity and self-assessment of clinical expertise. Nevertheless, annual procedure numbers per surgeon and participants' relationship to industry were not established, and these factors introduce a potential bias. However, a need for further research (and thus lack of consensus) was also concluded by authors of many of the papers included in the literature review which strengthens the conclusions of this study.

Key findings of this study relate to a lack of consensus as to the outcomes associated with ADM for pre-pectoral IBBR. Participants who believed that ADM reduced the risk of short-term complications and implant failure/explantation comprised a minority – 21.9%.

Participants who felt that ADM use improved cosmetic outcomes and reduced long-term complications made up a relative majority – 43.8% and 40.6%, respectively. 56.3% of participants felt there was scarce scientific evidence on the topic. Qualitiative themes that emerged focused on other factors affecting surgical outcomes more than ADM use and an inadequate evidence base.

The clinical implications of this study include the need for further and more robust research, given the lack of randomised and comparative data. Surgeons may wish to employ a personalised approach based on individual patient factors and surgical history until more definitive evidence is available. It is crucial for surgeons to engage in shared decision-making with patients, discussing the potential benefits, risks, and uncertainties associated with ADM use when deciding operative management.

This study highlights the need for large-scale, prospective, randomised-controlled trials to generate high-quality evidence to establish whether ADM affects surgical outcomes in pre-pectoral IBBR, in order to improve patient outcomes.

Appendix 1. a) PICO and exclusion criteria; b) PRISMA chart

Appendix 2. Survey Questions

Appendix 3. a) Survey Distribution Email; b) Survey Announcement

## Declarations

Ethical Approval - Not required

Funding – none

Conflict of Interest Statement - The authors declare they have no competing interests

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**FIGURE 1**

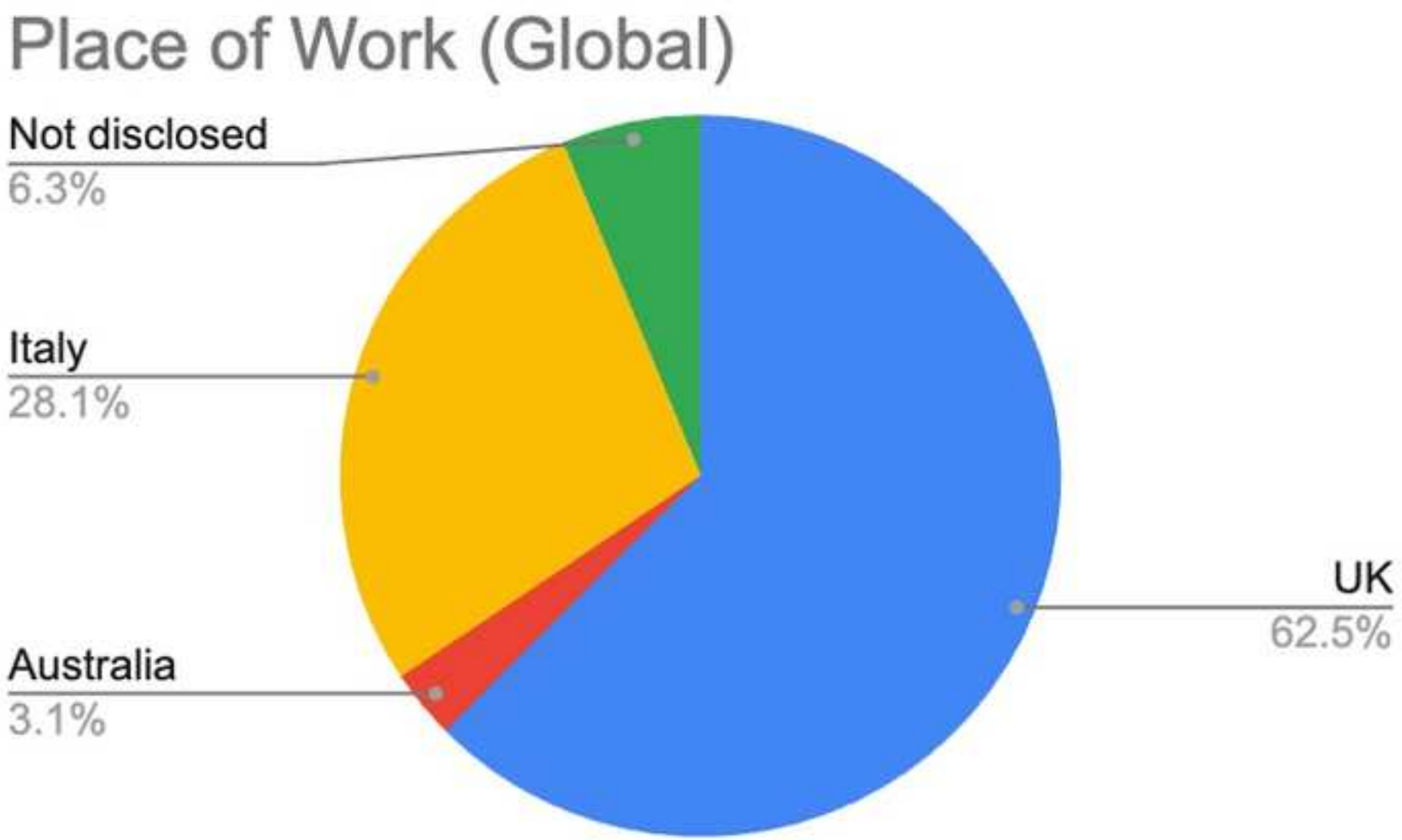


**FIGURE 2**

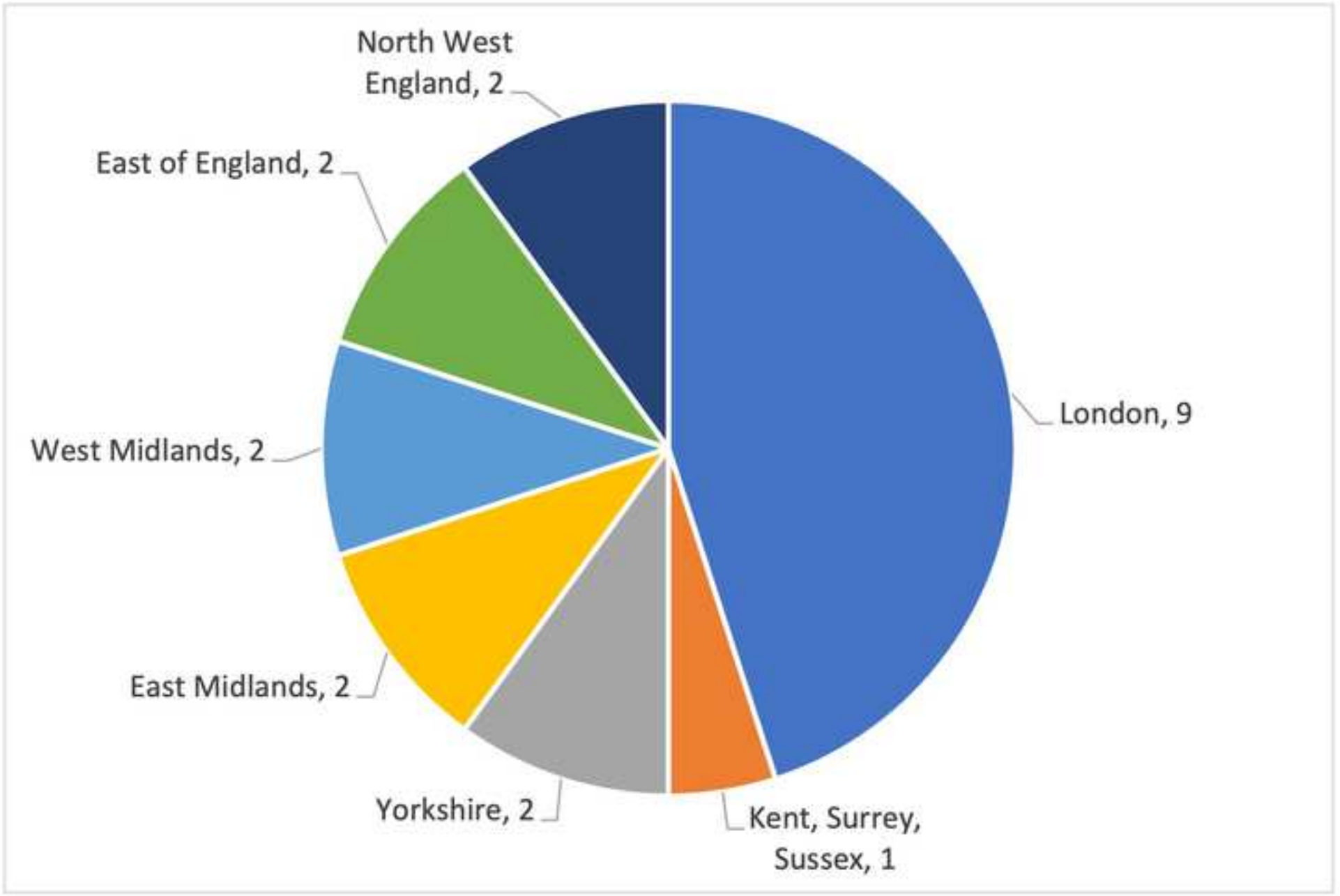
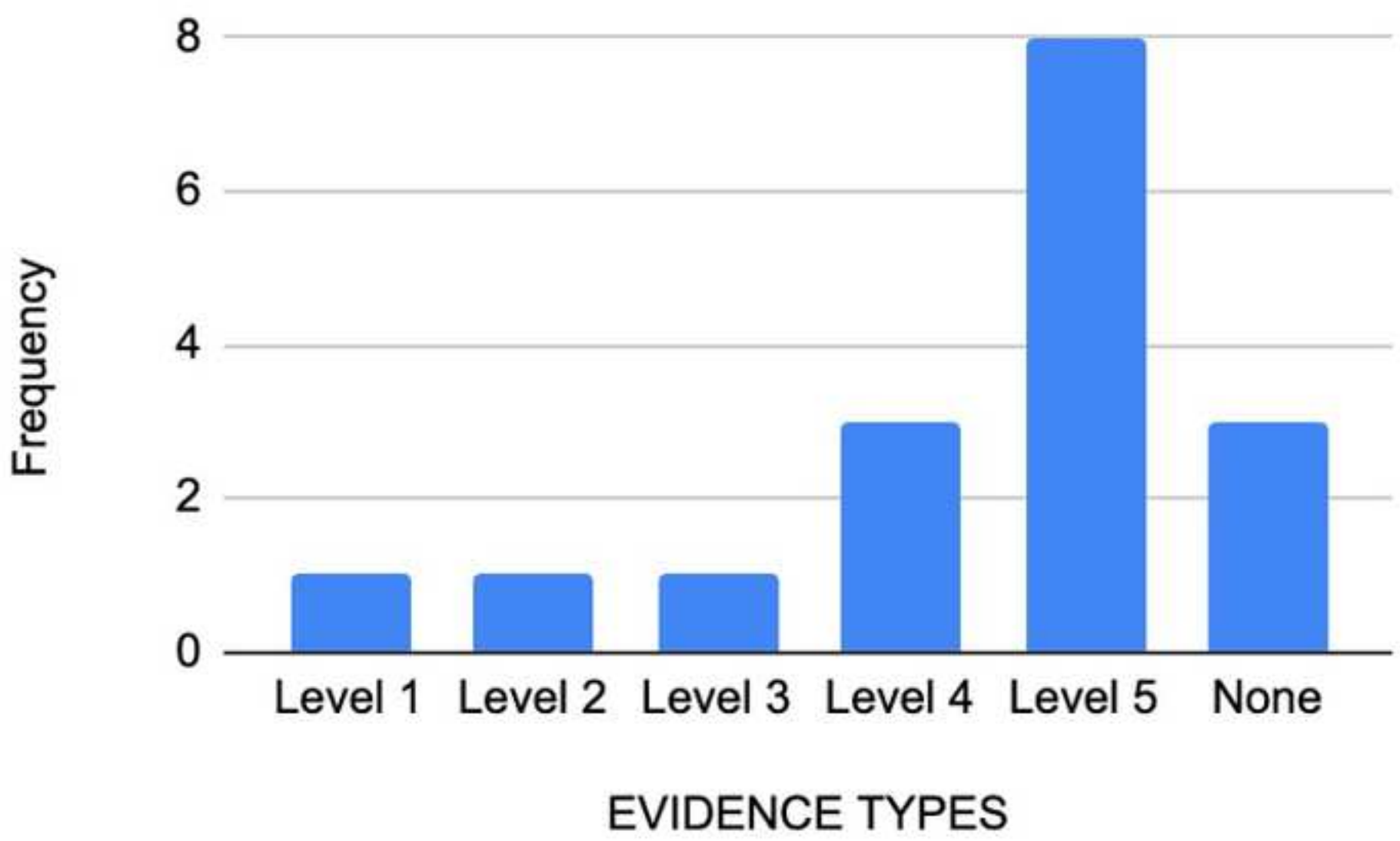


**FIGURE 3**



**Appendix 1**

| | |
|---|---|
| **Patient** | 1) Females undergoing pre-pectoral implant-based breast reconstruction with or without ADM<br>2) women undergoing reconstruction for cancer treatment or prophylaxis<br>3) immediate or delayed reconstruction<br>4) unilateral or bilateral reconstruction |
| **Intervention** | use of acellular dermal matrices (ADM) during breast reconstruction procedures |
| **Comparison** | non-use of ADM during breast reconstruction procedures |
| **Outcome** | operative success, defined by:<br>1) complications<br>2) failure (loss of implant)<br>3) patient quality of life |

**Appendix 1a: Study Population, Intervention, Comparison and Outcomes (PICO)**

| | |
|---|---|
| **Exclusion Criteria** | - secondary reconstructive procedures such as reconstruction revision<br>- aesthetic or cosmetic procedures<br>- sub-pectoral implant placement<br>- non-implant-based reconstruction, for example, autologous free flaps<br>- non-English language<br>- animal or cadaveric studies<br>- systematic review including papers already present in results |

**Appendix 1b: Exclusion Criteria**

**Appendix 1**

| | |
|---|---|
| **Patient** | 1) Females undergoing pre-pectoral implant-based breast reconstruction with or without ADM<br>2) women undergoing reconstruction for cancer treatment or prophylaxis<br>3) immediate or delayed reconstruction<br>4) unilateral or bilateral reconstruction |
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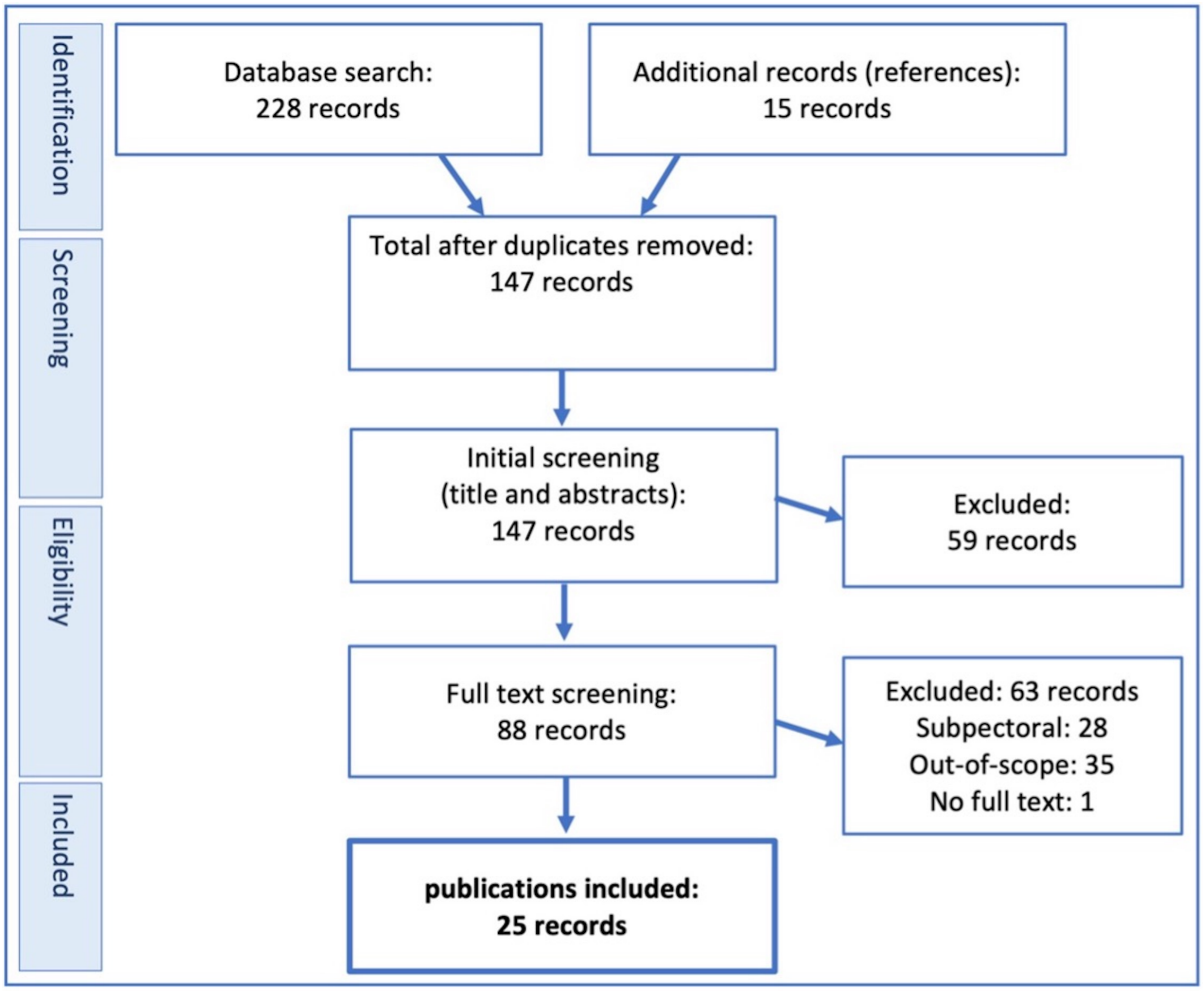


**Appendix 1c. PRISMA Diagram**

## APPENDIX 2. SURVEY QUESTIONS

# ADM vs no ADM for Breast Reconstruction - Surgical Equipoise?

A team at the Royal Free Hospital are seeking to answer the above question. In order to understand current practice we are seeking information from surgeons regarding their current practice and what evidence base they feel is available on this subject.

* Indicates required question

1. Many thanks for taking the time to consider participating in this study. This questionnaire will ask for your expert opinion, as a surgeon, on the effect of ADM on various outcome measures for operative success in pre-pectoral implant-based breast reconstruction. We are also interested to know what evidence you use or are aware of that has informed your clinical decision making. * 
   To reflect your contribution to our research, we have established the ADMIRE research collaborative and if you wish to be part of this you will be credited as part of this in any subsequent publications.
   If you wish to withdraw at any point during the questionnaire, simply terminate your browser page. If you would like to withdraw your answers following the questionnaire or if you have any questions please get in touch via email: admirecollaborative@outlook.com

   *Mark only one oval.*

   - ◯ Yes I am happy to participate
   - ◯ No I am not happy to participate

## General Questions

2. Within which hospital or NHS trust are you currently working?

   _____

3. Which specialty are you specialised or training in?

   *Mark only one oval.*

   - ◯ Plastic Surgery
   - ◯ Breast Surgery

4. What is your seniority level?

   *Mark only one oval.*

   - ◯ Consultant
   - ◯ Fellow
   - ◯ Specialist Registrar
   - ◯ Trust-grade Registrar

## ADM vs no ADM: Operative Complications and Failure

5. In your opinion, does the use of ADM for pre-pectoral implant-based breast reconstruction reduce the risk of short term complications such as haematoma, seroma, wound infection? *

*Mark only one oval.*

- Yes
- No
- No difference than with non-use of ADM
- Don't Know

6. If you answered 'Yes' to the above question, please state which complications you feel are reduced and why?

7. In your opinion, does the use of ADM for pre-pectoral implant-based breast reconstruction reduce the risk of long term complications such as capsular contracture? *

*Mark only one oval.*

- Yes
- No
- No difference than with non-use of ADM
- Don't Know

8. If you answered 'Yes' to the above question, please state which complications you feel are reduced and why?

9. In your opinion, does the use of ADM for pre-pectoral implant-based breast reconstruction reduce the risk of significant complications requiring explantation or implant failure? *

*Mark only one oval.*

- Yes
- No
- No difference than with non-use of ADM
- Don't Know

10. If you answered 'Yes' to the above question, please state which scenarios leading to implant failure are reduced and why?

## ADM vs no ADM: Cosmetic Outcomes

11. In your opinion, does the use of ADM for pre-pectoral implant-based breast reconstruction reduce cosmetic issues such as rippling, implant rotation, asymmetry? *

*Mark only one oval.*

- ◯ Yes
- ◯ No
- ◯ No difference than with non-use of ADM
- ◯ Don't Know

12. If you answered 'Yes' to the above question, please state which cosmetic issues are reduced and why?

## ADM vs no ADM: Patient Satisfaction

13. In your opinion, does the use of ADM for pre-pectoral implant-based breast reconstruction improve patient satisfaction and quality of life? *

*Mark only one oval.*

- ◯ Yes
- ◯ No
- ◯ No difference than with non-use of ADM
- ◯ Don't Know

14. If you answered 'Yes' to the above question, please explain how patient satisfaction is improved and why?

## ADM vs no ADM: evidence

15. What evidence are you aware of in literature regarding the use of ADM in pre-pectoral implant-based breast reconstruction?

16. What evidence has informed your own practice in this area?

17. How much evidence in literature do you feel is available in this area?

*Mark only one oval.*

- ◯ there is plentiful evidence available on this topic
- ◯ there is adequate evidence available on this topic
- ◯ there is scare evidence available on this topic
- ◯ there is no evidence available on this topic
- ◯ I do not know how much evidence is available on this topic

## Many thanks for participating in this study

If you would like to withdraw your answers following the questionnaire or if you have any questions please get in touch via email: admirecollaborative@outlook.com

# APPENDIX 3a. SURVEY DISTRIBUTION AND INVITATION EMAIL

**From:** [redacted]
**Sent:** 03 July 2023 13:46
**To:** [redacted]
**Subject:** Research Collaboration Opportunity

Good morning,

I hope that this email finds you well.

We are a team based in the plastic surgery department at the [redacted] who have established a research collaborative network to drive research into the use of ADM for pre-pectoral implant-based breast reconstruction.

We are interested in ascertaining current practice among breast and plastic surgeons in the UK and evidence used by clinicians for operative decision making. [redacted]

We would be most grateful if you could distribute the link to our webpage which contains information for participants to your members.

We have included an introductory paragraph below.

Please let us know if you have any questions,
Kind regards

[redacted]

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Good morning,

We are a team based in the plastic surgery department at the [redacted] who have established a research collaborative network to drive research into the use of ADM for pre-pectoral implant-based breast reconstruction.

We are interested in ascertaining current practice and decision-making among breast and plastic surgeons and registrars in the UK and overseas. [redacted]

If you have clinical experience in pre-pectoral implant based breast reconstruction with and without ADM and feel able to offer your expert opinion, we would be delighted if you could take part. The consensus survey itself takes less than 10 minutes to complete. For more information and to participate, please see our webpage: https://admirecollaborativ.wixsite.com/admire-research-coll

Many thanks in advance for your contribution,

Kind regards

The ADMIRE research collaborative

**APPENDIX 3b. SURVEY INVITATION LINK**

# ADMIRE RESEARCH COLLABORATIVE

## The ADMIRE Research Collaborative is led by trainee and plastic surgeons based in London, UK.
## We aim to drive international, multi-centre collaboration into breast reconstruction using acellular dermal matrices (ADM)

We are currently undertaking an expert consensus among surgeons on the effect of ADM on various outcome measures for operative success in pre-pectoral implant-based breast reconstruction.

Our consensus survey asks for surgeons' own experience in outcomes when using ADM alongside what evidence is used to inform clinical decision making.

If you wish to participate in the research, please click on the below link to take part in our consensus survey.

If you have further questions, please get in touch via admirecollaborative@outlook.com.

Link to Expert Consensus Survey

ADMIRE Research Collaborative

Contact email:

admirecollaborative@outlook.com

18. Would you like to be a part of the ADMIRE research collaborative? *

*Mark only one oval.*

- ◯ Yes
- ◯ No

19. If you answered 'yes', what is the best way to contact you e.g. email address?

_____

20. We are considering a clinical trial on this topic - would you be interested in participating? *

*Mark only one oval.*

- ◯ Yes
- ◯ No

21. If you answered 'yes', what is the best way to contact you e.g. email address?

_____

22. Any further comments or questions?

_____

_____

_____

_____

_____

Acellular dermal matrix (ADM) is a material used alongside implants for breast reconstruction. There is limited scientific evidence for its efficacy. This study sought the opinion of surgeons who regularly use ADM – more than half feel there is inadequate evidence and opinions differ as to its efficacy and complication rates.