

Introduction

Trainees are required to select one of the following Research Pathways during Introduction to Orthopaedics:

- Project Pathway:
- Coursework Pathway:
- PhD Pathway:

Project Pathway

Trainees complete a full research project and present the results at the AOA ASM (or equivalent).

The AOA Research Coordinators Committee will assess whether the project has met program requirements. Trainees will be encouraged to incorporate the feedback from the Committee and submit an article for publication. Trainees will need to select a research supervisor for the duration of the project and have a research plan and supervisor approved prior to commencing the project.

Coursework Pathway

Part A: Trainees complete a Master degree, graduate diploma or graduate certificate. The course must include two of the following subjects: Clinical Epidemiology, Biostatistics, Research Methods and Evidence Based Medicine.

Part B: Trainees are required to complete a 'mini' research project, which can include a study design as per the Project Pathway, systematic review, case series/case report or clinical audit. The mini project must be presented at an AOA branch ASM, AORA ASM or the AOA ASM.

PhD pathway

Accredited research training posts will be available during Core Orthopaedics to support trainees who elect to complete a PhD during training. Trainees would need to apply directly to the training site for the post. The posts will have a reduced clinical load (0.5 FTE) to facilitate participating in research.

Trainees will have until the end of Transition To Practice to complete their chosen Research Pathway. Please refer to the [Training Program Requirements](#) for more details.

Trainees who have completed research within 5 years prior to the commencement of training may apply for recognition of prior learning via the [Research RPL form](#). Research must be directly relevant to orthopaedic surgery and meet the minimum criteria required of the project or coursework pathway.

Project Pathway

Trainees who select the Project Pathway complete a full research project and present the

results at the AOA ASM (or equivalent).

Trainees will need to select a research supervisor for the duration of the project and have a research proposal and supervisor approved prior to commencing the project.

The Research Project may be a:

- Randomised controlled trial
- Cross sectional study
- Prospective cohort study
- Retrospective cohort study
- Comparative study

Definitions of each study type are provided [here](#).

The Project will have five broad components as follows:

1. Literature Review
2. Hypothesis and Study Design
3. Data Collection and Analysis
4. Interpretation Results
5. Discussion and Conclusions

To fulfill the requirements of the Project Pathway, the research project must be directly relevant to orthopaedic surgery, and include the following:

- A clear, focused research question/hypothesis
- A comprehensive literature review, which includes key findings
- A study design that is suited to the aims of the study
- A precise depiction of design and execution of the method and recognition of any limitations of design or methods selected
- Ethics approval or a statement with regard to why ethics approval was not required.
- Details of selection criteria for research participants
- How bias was minimised
- Response rate and rate of loss to follow up, if appropriate
- Sample size calculation
- Statistical Analysis Plan
- Data analysis including study population and management of any missing data; statistical methods appropriate to the type of data; and statistical software used.
- Well-structured presentation of data with findings formulated descriptively; inclusion of all results, even those that do not attain statistical significance.
- Discussion and conclusion which includes:
 - A concise summary of the main findings
 - Clinical relevance of results
 - Results in relation to previous research
 - Due consideration to weaknesses of the study (sources of bias or error and impact on results)
 - Conflicts of interest, if any (authors, funding)

Trainees must submit their completed research project, in the form of a journal article, to the Research Coordinators' Committee for assessment. All research submitted must have the support of the research supervisor involved in the project.

The Research Coordinators Committee will either:

- a) Accept the research project as meeting the requirements of the program, and may provide suggestions to improve the work prior to submitting for publication; or
- b) Provide more extensive feedback on changes, which need to be made prior to re-assessment.

It is expected that accepted research submissions will be submitted to a peer-reviewed journal for publication.

Trainees must present the findings of their research project at the AOA ASM (or equivalent).

Trainee Collaboration

For the project pathway, there is the opportunity for up to three trainees to collaborate on each project. Trainees can contribute to a maximum of two research projects.

One trainee could complete a research project up until the data collection phase (components 1 and 2). It would be submitted for review at this time. A second trainee could complete the data collection and analysis (component 3). A third trainee could complete the interpretation phase (components 4 and 5). In this instance, the appointed supervisor would provide the continuity. The trainees involved would co-author the paper for presentation and if published.

Each trainee must still complete all phases of the research requirement, however these may be spread across two different projects.

Applying for Approval of a Research Project

Trainees must select a research supervisor and submit a [Research Proposal form](#) for approval. The research proposal must include:

- Title of research study
- Name and position of principal research supervisor
- Aims and hypothesis of the project
- Background to the research project with brief literature review
- Research design – description and rationale for study design, data collection, statistical analysis
- Significance of the project to orthopaedics
- Timetable/plan – tasks proposed and expected stages/times for completion
- Role and involvement of the trainee in the project, including the anticipated involvement of other trainees in the project.

For new proposals, the research supervisor must sign the proposal to confirm that they are willing to supervise the project to completion.

If the trainee is intending to only complete a portion of the project, this should be included in the proposal.

Trainees who would like to contribute to a research project that has already been approved and is underway, should complete the [Contribution to Research form](#). This form must

include:

- The original approved research proposal.
- The previous role of another trainee/s in the project and the elements of the project that have been completed to date.
- Proposed role and involvement of this trainee in the project, including a broad outline of expected timeframes for completion of various elements.
- Confirmation from the research supervisor that the trainee can contribute to the nominated sections in the timeframe suggested.

The trainee responsible for each of the five elements of the project is responsible for actioning feedback on that specific element.

Trainees will be expected to maintain a log of their research activity toward completing research requirements. The log should demonstrate adequate involvement and will be reviewed together with the submission.

Coursework Pathway

Part A - Research Methodology Learning

Trainees who have selected the Coursework Pathway must complete a Master degree, graduate diploma or graduate certificate. The course must include two of the following subjects: Clinical Epidemiology, Biostatistics, Research Methods and Evidence Based Medicine.

The trainee must submit a [Coursework Proposal Form](#) for approval of the course of study and include:

- Name of degree or diploma
- Institution
- Web links to information about the course of study which confirms the degree includes successful completion of a minimum of two of the following subjects:
 - Clinical Epidemiology
 - Biostatistics
 - Research Methods
 - Evidence Based Medicine

A list of previously approved courses will be maintained for the information of trainees. Selection of a previously approved course does not preclude the need to submit an application for approval of the course of study.

Part B – Demonstration of Research Skills

Using the skills gained via completion of Part A - Research Methodology Learning, trainees are required to complete a 'mini' research project.

Trainees will need to select a research supervisor for the duration of the project and have a research proposal and supervisor approved prior to commencing the project.

The project study design may be any of the options accepted for the Project Pathway or a:

- Systematic review
- Case series/case reports
- Clinical Audit

To fulfill the requirements of the coursework pathway, the research project must be directly relevant to orthopaedic surgery and include the following detailed criteria:

- Be based on a clearly stated question/hypothesis
- Include a critical literature review
- Have an appropriate study design
- Include suitable methods of statistical analysis.

Trainees must submit the completed research project to the Research Coordinators Committee for assessment. The Research Coordinators Committee will either:
a) Accept the research project as meeting the requirements of the program; or
b) Provide more extensive feedback on changes which need to be made prior to re-assessment.

Trainees must present the findings of their research project at an AOA branch ASM, the AORA conference, AOA ASM or equivalent.

Applying for Approval of a Mini Research Project

Trainees must select a research supervisor and submit a [Research Proposal form](#) for approval. The research proposal must include:

- Title of research study
- Name and position of principal research supervisor
- Aims and hypothesis of the project
- Background to the research project with brief literature review
- Research design – description and rationale for study design, data collection, statistical analysis
- Significance of the project to orthopaedics
- Timetable/plan – tasks proposed and expected stages/times for completion

The research supervisor must sign the proposal to confirm that they are willing to supervise the project to completion.

PhD pathway

Accredited research training posts will be available during Core Orthopaedics to support trainees who elect to complete the PhD Research Pathway.

Trainees will need to apply directly to the training site for the accredited research training post. Further information regarding the availability of Accredited research training posts will be available in 2018.

Taking up an accredited research training post does not require an Interruption to Training. Accredited research training posts will have a reduced clinical load (0.5 FTE) to facilitate participation in research.

It is expected that Trainees occupying these posts will complete a PhD relevant to orthopaedic surgery prior to the end of the Transition to Practice stage.

Trainees completing the PhD pathway will need to provide a letter of offer/acceptance of the accredited research training post, preferably by the end of Introduction to Orthopaedics.

Trainees with Prior Research Experience

Trainees who have completed research within 5 years prior to the commencement of training may apply for recognition of prior learning (RPL) via the [Research RPL form](#). Research must be directly relevant to orthopaedic surgery and meet the minimum criteria required of the project or coursework pathway. It is the responsibility of the Trainee to demonstrate that their prior research experience satisfies the research requirement.

Project pathway

Trainees who have completed a higher degree prior to commencing training (PhD or Master degree), which contains the necessary core subjects, may apply for an exemption from the project pathway by submitting a [Research RPL form](#).

The Research Coordinators Committee will determine whether the research thesis completed toward attainment of the higher degree meets the minimum criteria for the Project Pathway. If so, the trainee will only be required to present the findings of their research at the AOA ASM (or equivalent).

Coursework pathway

Trainees who have completed a Master degree, graduate diploma or graduate certificate which meets the requirements outlined for the Coursework Pathway may apply for an exemption from Part A – Research Methodology Learning. If the qualification is deemed to be equivalent, the trainee will need to complete Part B.

Trainees may also apply for exemption from the Part B – Demonstration of Research Skills. The Research Coordinators Committee will determine whether a research thesis completed toward attainment of the qualification or research that resulted in a publication in a peer-reviewed journal meets the minimum criteria. If so, the trainee will only be required to present the findings of their research at an AOA branch ASM, the AORA conference, AOA ASM or equivalent.

Other involvement in research in the five years prior to selection on to the AOA 21 training program may be considered. Trainees must clearly outline how research experience and outcome meets the learning outcomes of the curriculum and equivalence to the research requirements of the project or coursework pathway.

Research Project Type Definitions

The following project types are accepted for the Project and Coursework Pathways:

- **Randomised controlled trial**
A type of study in which participants are randomly assigned to either a treatment or control group. The treatment group receives the intervention and results are compared to those of the control group.
- **Cross sectional study**
A study of a population, or representative subset of a population, at a specific point in time.
- **Prospective cohort study**

A study of a group of individuals who are similar but differ in one key characteristic. Individuals are split into a group of interest and a comparison group based upon whether or not they display the particular characteristic or not. Both groups are followed over a defined period of time and outcomes are monitored and compared. A prospective cohort study monitors outcomes during the study period.

- **Retrospective cohort study**

A retrospective cohort is the same in structure as a prospective cohort study, but instead of prospectively monitoring the group for outcomes, the cohort is retrospectively selected and examined for exposures and other risk factors in relation to an established outcome.

- **Comparative study**

A study that examines two or more cases or events and compares each one to identify where they differ and the reasons for the differences.

The following project types are accepted for the Coursework Pathway only:

- **Systematic review**

A complete summary of current literature on a particular research question. Involves a systematic review of the literature and a narrative or quantitative synthesis of the results of all studies that meet predefined inclusion criteria.

- **Case series/case reports**

A descriptive study of a single patient (case report) or a series of patients (case series) with a particular disease or injury.

- **Clinical Audit**

An audit that is designed to assess the quality of care and/or patient outcomes against a set of defined criteria or standards.
