

RDDirect



www.rddirect.org.uk

Research Process Flowchart

This handout is an introduction to the RDDirect Research Process Flowchart. The on-line version can be accessed from our website at www.rddirect.org.uk and may be more up to date

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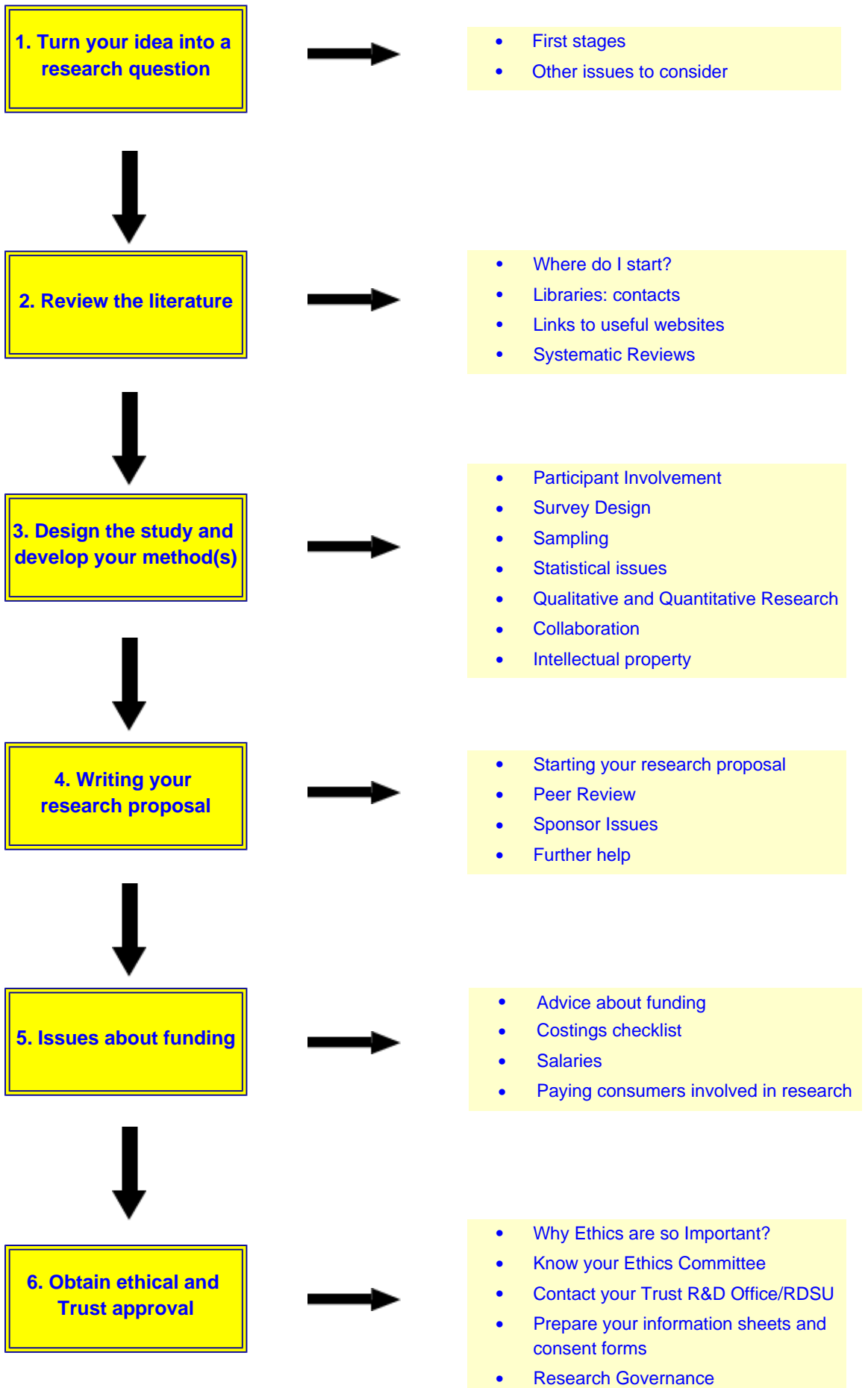
If you are experiencing problems while conducting your research remember that the RDDirect website and telephone advisory service are only a click and a call away

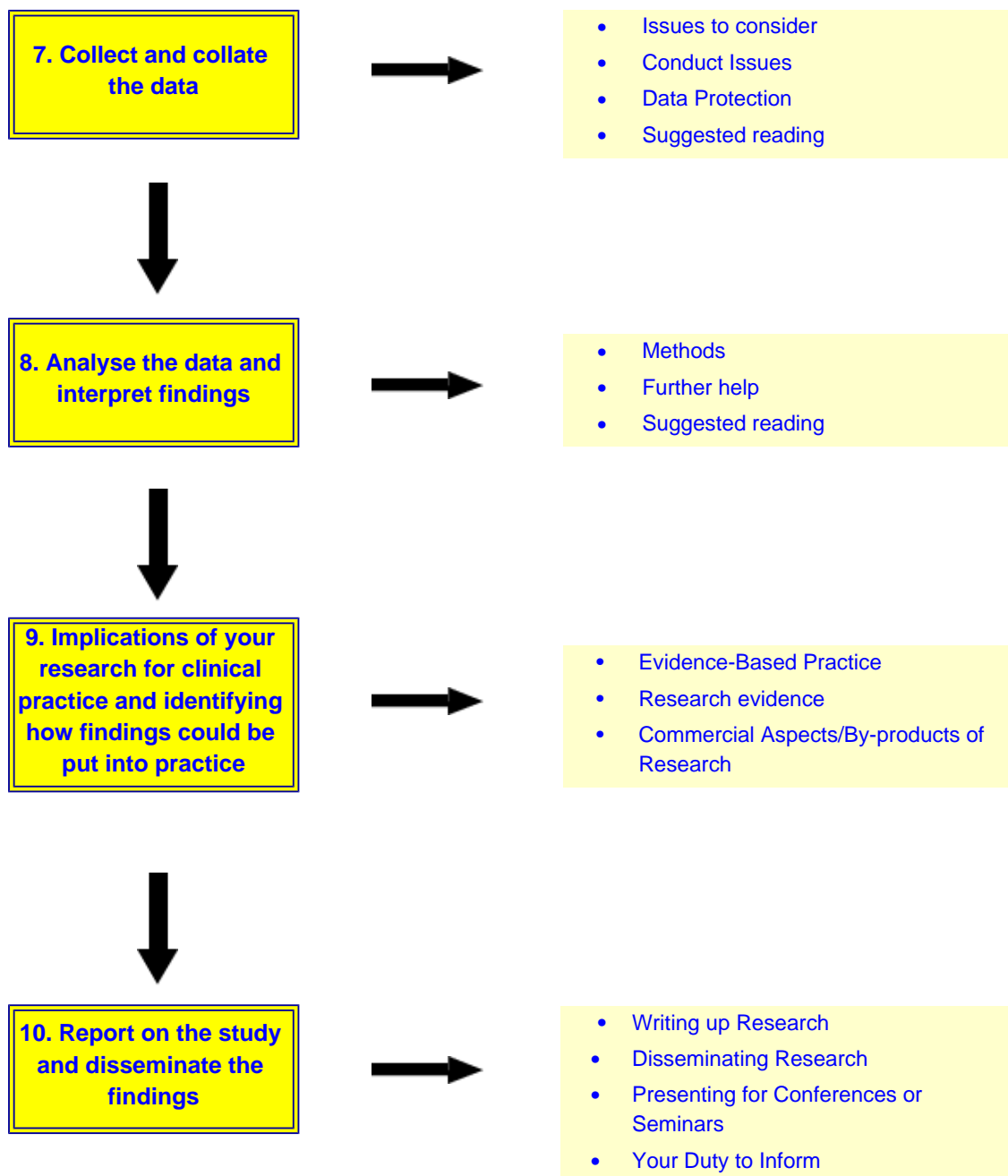
Words or phrases which are in *italics and underlined* denote where links to other recommended websites have been included in the on-line version of the flowchart.

YOUR RESEARCH PROJECT HOW & WHERE TO START?

Clicking on the coloured boxes of the flowchart accesses the next level

Any comments or
suggestions?
Email us....





1. Turn your idea into a research question

First stages

Where do you start?

- Decide on a general area of interest
- Why does this area interest you?
- Answer the questions:
 - What is your aim? (In general terms)
 - What is your hypothesis? (In specific terms)
 - Is your idea novel? (See [Section 2](#) on reviewing the literature)
 - Why does it matter?
 - How will NHS patients or service users benefit from your research? Consult colleagues and other researchers
- Discuss your idea with your local R&D staff or your local RDSU.
- Ascertain who might be your supervisor or mentor: talk in detail with that person about your potential research project
- Short PowerPoint presentation entitled '[Turning Ideas into Research Questions](#)', by Jon Silcock, Leeds Teaching Hospitals NHS Trust
- Contact [RDDirect](#) for general advice (Helpline 0113 295 1122)
- Contact [RDLearning](#) for details of workshops and courses to give you the research skills you need

Other issues to consider

- Collaborating with experienced researchers (See [Section 3](#) of this flowchart)
- Involving users/consumers
The [INVOLVE](#) (formally Consumers in NHS Research) website has a useful short piece on why to involve consumers
- Having your research proposal peer reviewed at every stage. (See [Section 4](#) of this flowchart)

2. Review the Literature

- It is essential that existing sources of evidence, especially systematic reviews, are considered carefully prior to undertaking research.
- Research which duplicates other work unnecessarily or which is not of sufficient quality to contribute something useful to existing knowledge is in itself unethical.

Where do I start?

- How to search literature: attend a short introductory course (available at most university libraries)
- Discuss with your supervisor or mentor
- Then work out a *search strategy* to decide on your plan of action
- Start reading: use reading lists, texts, journals, abstracts, etc.
- Internet search engines may be helpful but beware of incomplete information
- Try looking at these two useful guides:
[Literature searching for research: University of Bath](#)
[Literature searching: University of York: Centre for Reviews and Dissemination](#)
- [How to develop critical appraisal skills](#) : Public Health Resource Unit

Libraries: contacts

Libraries are a very good source of information and help. You can find your local library, as well as national library resources, from the list below.

- [Electronic Library for Social Care](#)
- [Northern and Yorkshire Regional Library Advisory Service](#)
- [Directory of Health Care Libraries in Trent Region](#)
- [South West Health Care Libraries Directory](#)
- [North West Region Healthcare Libraries Unit](#)
- [NHS Scotland: eLibrary](#)
- [London Health Libraries A to Z](#)

Links to useful websites

These websites are excellent for literature searching. In some cases you will need a password which your library may be able to provide.

- [Medline](#) - Major bibliographic database for biomedical sciences
- [Cochrane Library](#) - Assess through the NELH website.
- [Embase](#) - Major bibliographic database for biomedical sciences
- [PsycINFO](#) - Major bibliographic database for psychology. Coverage: 1887 to date.
- [RDDirect](#) - for links to the above and to other databases
- [The National Electronic Library for Health](#) provides (free) access to 7 bibliographical databases and over 800 full text journals - excellent for literature searching. The databases are:
 - **AMED** - Allied and Complementary Medicine Database
 - **BNI** - The British Nursing Index (BNI) is a UK nursing database which covers British publications and other English language titles from over 220 related journals.
 - **CINAHL** - Major bibliographic database for nursing and allied health
 - **DH-DATA** - jointly produced by two services at the Department of Health (UK): The Department of Health Library and Information Service and the PH (Protection of Health) Information Unit. The core subjects covered by the Department of Health Library are health service and hospital administration, with an emphasis on the British National Health Service. The PH Information Unit specialises in medical toxicology and environmental health.
 - **EMBASE** - Major bibliographic database for biomedical sciences
 - **MEDLINE** - Major bibliographic database for biomedical sciences
 - **PSYCHINFO** - Major bibliographic database for psychology.

Access is free for NHS staff, and many University staff, but you need an Athens username/password (NHS staff [password registration](#)) to gain access, or obtain one from your library.

Systematic Reviews

The NHS Centre for Reviews and Dissemination at The University of York has published an excellent guide on systematic reviews.

- [Undertaking systematic reviews of research on effectiveness: University of York: CRD](#)

3. Design the Study and Develop Methods

Participant Involvement

The NHS R&D strategy is committed to involving participants or their representatives wherever possible in the design, conduct, analysis and reporting of research.

- [Involve](#), formerly the Consumers in NHS Research Group, advises the Central Research & Development Committee on how best to involve members of the public in the R&D process.

Survey Design

Do you know what is the most appropriate survey method for your research project? What method will give you the most useful data for the project you are working on?

- [Survey Research](#)

Sampling

What method of sampling will give you the most useful data for the project you are working on?

- [Sampling methods from the National Audit Office Sampling Guide](#)
- Discussion on the distinction between [Probability](#) and [Nonprobability](#) sampling methods

Statistical Issues

Are you familiar with the statistics you may need to use?

- [Statistics Guide for Research Grant Applicants](#)
- [Online Statistics Textbook from Statsoft.com](#)
- [Statistical Sampling Terms](#)
- [Statistics glossary](#), from The Centre for Applied Statistics, Lancaster University
- Comprehensive bibliography of medical statistics textbooks from [‘Medical Statistics at a Glance’](#) (Blackwell Publishing)

Qualitative and Quantitative Research Methods

Which research method is most appropriate to your research project? Do you know the difference between quantitative and qualitative research methods?

- [Choosing an appropriate method of research](#)
- [Developing your research idea](#)

Adapted from material by Keith Chantler, R&D Manager, Central Manchester and Manchester Children's University Hospitals
(Page 11 - Table of comparison)

Questionnaire Design

Do you know how to design a questionnaire for survey research?

- [A Guide to the Design of Questionnaires](#)
- [Questionnaire Design and Surveys Sampling](#)

Collaboration

Have you considered collaborating with other researchers?

- [Collaborative Research - points worth considering](#)

Intellectual Property

What is 'Intellectual Property' and what does it mean to a researcher?

- [Handling Inventions and other Intellectual Property](#), The NHS Executive

4. Writing your research proposal

Starting your research proposal

- First talk about your research proposal with your supervisor. Your supervisor will advise you on writing your research proposal.
- The researcher has a responsibility for developing proposals that are scientifically sound and ethical.
- No two proposals are the same, but they will all have a similar structure:
 - title
 - abstract/summary
 - background or rationale of the project
 - aims/objectives
 - experimental design and methods
 - ethical considerations
 - benefits of the study
 - resources and costs

(Adapted from material by Keith Chantler, R&D Manager, Central Manchester and Manchester Children's Hospitals)

- [Key elements in a research proposal](#) (from Hull & East Yorkshire Hospitals NHS Trust R&D Resource pack)
- Use the following to check if you have included everything you need in your research proposal:
- ['Writing a research proposal: some thoughts to consider'](#)
- Specimen [online application forms](#) for grants/awards can be viewed on RDInfo

Peer Review

- Every proposal for health and social care research must be subjected to independent peer review by experts in the relevant fields who are able to offer advice on its quality and suitability. The following web sites provide reasons why peer review is important
 - [MRC Guidance on Reviewing Research Proposals](#)
 - [AMRC Guide-lines for the Use and Practice of Peer Review](#)
 - [Parliamentary Office of Science and Technology report on Peer Review](#)
- Arrangements for peer review must be commensurate with the scale of the research.
 - Many organisations allow established research teams to determine details of the elements of an overall programme of

- research, which has been reviewed externally.
- For student research projects the university supervisor will normally provide an adequate level of review.
- Guidance from the [Research Governance Working Group of the NHS R&D Forum](#)
- The [North West Peer Review System Guide for Researchers](#) offers an outline and answers some questions about the process.
- You can also check the [United Bristol Healthcare NHS Trust Peer Review Form](#) for the assessment criteria.

Sponsor Issues

The [Research Governance Implementation Plan](#) for the NHS made clear that from April 2004 no research with human participants, their organs, tissue or data, may begin or continue in the NHS until a sponsor accepts responsibility.

- The designation 'sponsor' describes a set of functions for which one of the lead organisations agrees to take on overall responsibility. It will normally be one of the following:
 - the lead health or social care organisation,
 - the lead employer of the researchers, or
 - the main funder.
- The sponsor must be satisfied that clear agreements are reached, documented and carried out, providing for proper initiation, management, monitoring and financing.
- There is a list of "[recognised sponsors](#)" on the DH web site.

Further Help

- Speak with your supervisor or mentor
- Contact [RDLearning](#) for courses and workshops for additional skills and knowledge about writing research proposals
- Contact RDDirect for further advice: telephone 0113 295 1122 or email info@rddirect.org.uk

5. Issues About Funding

Advice About Funding

Do you need any advice concerning funding for your research project?

- Visit [RDInfo](#) for database of funding opportunities health and social care
- Contact [RDDirect](#) for further advice on 0113 295 1122 or [email](#) them
- Contact your local R&D Department, your local RDSU or relevant research lead to discuss issues about funding
- To find out more about current research projects, and the funding they have received visit the [National Research Register](#) (NRR)
- Visit [RDDirect](#) for links to other database of research projects

Costings Checklist

Have you thoroughly assessed the potential costs of your research project?

- [Proposal preparation and costing checklist](#); provided by College of Science & Engineering, University of Edinburgh.
- General [Costings Checklist](#), adapted from material provided by The University of Leeds Research Support Unit.

Salaries

Will you need to pay for any other assistance or do you have enough staff within your research project?

- [Salaries in Public Health Medicine and Community Health](#)
- [Current Salary Scales in Research](#)
- [Current Salary Scales for Technical Staff](#)
- Other Staff Costings

Paying Consumers Involved in Research

Are you using any consumers in your research? If so, do they require paying for expenses, or do you need to acknowledge their contribution?

- [INVOLVE - Guide to Paying Consumers Actively Involved in Research](#)

6. Obtain Ethical and Trust approval?

COREC - [Central Office for Research Ethics Committees](#)

Do you know where to start and what to consider in relation to ethics in your research project?

The Central Office for Research Ethics Committees (COREC):

- co-ordinates the development of operational systems for local and multi-centre Research Ethics Committees (LRECs and MRECs), on behalf of the National Health Service in England;
- maintains an overview of the operation of the research ethics system in England, and alerts the Department of Health and other responsible authorities if the need arises for them to review policy and operational guidance relating to Research Ethics Committees (RECs);
- manages the MRECs in England;
- develops and manages a national training programme for REC members and administrators in England;
- maintains close contact with officials in the Department of Health with policy responsibility for wider issues of research ethics and with colleagues from Northern Ireland, Scotland and Wales;
- with appropriate advice, develops, implements and maintains operating procedures and standards for RECs that will be consistent across the UK;
- establishes and manages regional Offices of Research Ethics Committees (ORECs) to oversee the activity of LRECs;
- provides advice to the Department of Health on the implications and practicalities of transposing the European Clinical Trials Directive in the UK.

Know your Ethics Committee

Research Ethics Committees (RECs) have been working to standard operating procedures since 1st March 2004, and the COREC website gives people access to comprehensive and up-to-date information on the REC system in the UK including:

- [New Operational Procedures for NHS Research Ethics Committees: Guidance for Applicants to RECs](#)
- [When to apply for Ethical Approval](#)

- [How to apply](#)
- [Where to apply](#)

Contact your Trust R&D Office or RDSU

How can you contact your Trust's R&D department or your RDSU?

- [Links to RDSU and Regional sources of advice](#)
- [Local Hospital Trusts](#)
- [Local Primary Care Trusts \(PCTs\)](#)

Prepare your information sheet and consent form

How do you fill out ethical consent forms?

- [Information Sheet checklist](#)
- [Consent form](#)

Research Governance

What is research governance? How does it affect me?

- [DH Research Governance Framework](#)

7. Collect and collate the data

Issues to consider

- Beware of biases: yours and/or other researchers'
- Seek statistical advice if necessary

Conduct Issues

- Researchers bear the day-to-day responsibility for the conduct of research in terms of:
 - Ensuring that research follows the agreed protocol (or proposal).
 - Making sure that participants receive appropriate care while involved in research.
 - Protecting the integrity and confidentiality of clinical and other records and data generated by the research.
 - Reporting any failures in these respects, any adverse drug reactions and other events or suspected misconduct through the appropriate systems.
- Data collected in the course of research must be retained for an appropriate period to allow further analysis by the original or other research teams subject to consent, and to support monitoring of good research practice by regulatory and other authorities.

Data Protection

- Data Protection Act stipulates that the appropriate use and protection of patient data is paramount in the research setting.
- All those involved in research must be aware of their legal and ethical duties, particularly in terms of ensuring confidentiality of personal information about living or deceased participants.
- When collecting and storing data on human participants, the following should be considered:
 - Identities should be disguised by use of codes (do not use initials!)
 - Any details should be anonymised
 - Use of patient-identifiable information should be avoided unless absolutely necessary
 - If unavoidable, only minimum necessary patient-identifiable information should be used
 - Access to patient-identifiable information should be on a strict need to know basis.

More information can be found on [Data Protection in Healthcare](#)

[Research](#) and on the [DH Information Policy Unit](#).

Further help

- Take a look at material from [Section 3](#) of this flowchart -- sampling and statistical issues
- Visit RDDirect for a [database of web sites](#) containing relevant information on statistics
- Consult your supervisor

Suggested Reading

- A [reading list](#) provided by The University of Leeds' School of Medicine's Health Research course MEDR 5110 Module 3: Handling Data for Research provides information about books useful to the researcher when collecting and handling data.

8. Analyse the data and interpret findings

Quantitative Data Analysis

- Quantitative research techniques generate a mass of numbers that need to be summarised, described and analysed.
- Characteristics of the data may be described and explored by drawing graphs and charts, doing cross tabulations and calculating means and standard deviations.
- Further analysis will build on these initial findings, seeking patterns and relationships in the data by comparing means, exploring correlations, performing multiple regressions, or analyses of variance.
- Advanced modelling techniques may eventually be used to build sophisticated explanations of how the data addresses the original question.
- Although methods used can vary greatly, the following steps are common in quantitative data analysis:
 - Identifying a data entry and analysis manager (e.g., SPSS <http://www.spss.com>)
 - Reviewing data (e.g., surveys, questionnaires etc) for completeness
 - Coding data
 - Conducting Data Entry
 - Analysing Data (e.g., sample descriptives, other statistical tests).

Qualitative Data Analysis

- Qualitative data analysis describes and summarises the mass of words generated by interviews or observational data.
- It allows researchers to seek relationships between various themes that have been identified or relate behaviour or ideas to biographical characteristics of respondents.
- Implications for policy or practice may be derived from the data, or interpretation sought of puzzling findings from previous studies.
- Ultimately theory could be developed and tested using advanced analytical techniques.
- Although methods of analysis can vary greatly (e.g., [Grounded Theory](#), [Discourse Analysis](#)) the following steps are typical for qualitative data analysis:
 - Familiarisation with the data through repeated reading, listening etc.
 - Transcription of interview etc. material.

- Organisation and indexing of data for easy retrieval and identification (e.g. by hand or computerized programmes such as NUD*IST, Nvivo)
- Anonymising of sensitive data.
- Coding (may be called indexing).
- Identification of themes.
- Development of provisional categories.
- Exploration of relationships between categories.
- Refinement of themes and categories.
- Development of theory and incorporation of pre-existing knowledge.
- For more information see '[Qualitative Data Analysis](#)' by Trent Focus.

Interpreting Data

- The last step of data analysis consists of interpreting the findings to see whether they support your initial study hypotheses, theory or research questions.
- Data interpretation methods vary greatly depending on the theoretical focus (i.e., Qualitative or Quantitative research) and methods (e.g., Multiple Regression, Grounded Theory).
- You should seek further advice for this step from:
 - Your supervisor/Other experts within your organization
 - Computer Package Manuals (e.g., SPSS, NUD*IST) and methodology books
 - [An Introduction to Using Statistics in Research](#)
 - The material in [Section 3](#) of this flowchart on statistics and sampling issues
 - The panel of advisors at RDDirect tel. 0113 295 11 22 ([e-mail](#)).
- Visit RDDirect for a [list of websites](#) containing relevant information on statistics

Suggested Reading

- Books on data analysis and interpretation from [the reading list](#) from the University of Leeds' School of Medicine's Health Research course MEDR 5120 Module 5: Analytic Research.

9. Implications of your research for clinical practice and identifying how findings could be put into practice

Evidence-Based Practice

- *Evidence-Based Medicine; How to Practice and Teach EBM* – David L. Sackett, Sharon E. Straus, W. Scott Richardson, William Rosenberg, R. Brian Haynes

This book is a very useful resource, and will be available in most university and hospital libraries. An accompanying CD provides clinical examples from other disciplines, and information about resources to support evidence-based decisions.

Look in particular at Chapter 1: 'Asking Answerable Clinical Questions', and Chapter 2: 'How to Find Current Best Evidence'

Also visit their website at:

<http://www.cebm.utoronto.ca/>

- University of Sheffield: the ScHARR Core Library for evidence-based practice is a [virtual library of links](#) to full text documents on all aspects of evidence-based practice

Research evidence

- Strategies for searching for reviews of research evidence
From The [University of Birmingham](#)

Commercial Aspects/By-products of Research

- Some advances in health and social care need to be developed commercially if they are to be made widely available, such as:
 - Drugs,
 - Medical devices and
 - Aids for disabled people
- Successful commercial development often depends upon the protection of intellectual property or commercial confidentiality at critical points in the innovation process.
- The [Policy Framework for the Management of Intellectual Property](#)

[within the NHS](#) arising from Research & Development Circular and the [Salford Royal Hospitals site](#) provide guidance on Intellectual Property.

10. Report on the Study and Disseminate Findings

What's the next step after the data has been collected, analysed and interpreted?

Writing up Research

What do you need to consider when writing up your research? In what style will you write up research?

- A research report is a carefully structured piece that clearly states the purpose, findings and relevance of research activity.
- A report may be written for a range of reasons and for a variety of audiences, therefore its length, style and detail tend to vary greatly.
- Research reports are usually produced for such groups as service users, multi-disciplinary colleagues, and fellow professionals and as a result of commissioned research.
- The publication [Presenting and Disseminating Research](#) by Jane Schober and Andy Farrington for Trent Focus, contains comprehensive information on the following topics:
 - First section: "Writing up a Research Project" includes:
 - The research report
 - The research dissertation
 - Common features of research reports and dissertations
 - Second section: "Contents of a written report" includes:
 - Layout
 - Specific guidelines on dissertations by literature review
 - Producing a short report or executive summary from a main study
- For those completing a thesis, [Writing Research Theses or Dissertations](#) by the University of Newcastle Upon Tyne, Department of Chemical Engineering and Advanced Materials covers important aspects of academic writing. (NOTE: Please check with your own institution for specific requirements.)
- For more general tips on writing academic papers, we recommend the following:
 - [Effective Writing](#) taken from a PowerPoint presentation on Writing for Publication produced by the University of Loughborough.
 - [Writing Academic Papers](#) by Rob Newell, Professor of Nursing

Disseminating Research

Are you writing up your research for publication? Have you chosen how and where to publish your results?

- A [PowerPoint presentation](#) written by Theo Raynor and Jonathan Silcock, School of Healthcare Studies, University of Leeds. This presentation is excellent and a very comprehensive guide.
- Further extracts taken from the publication [Presenting and Disseminating Research](#) by Jane Schober and Andy Farrington for Trent Focus, provide information in the section 'Dissemination research outcomes' on the following topics:
 - Strategies for local, national and international dissemination of research
 - Publication
 - Tips on getting published
- The [Writing/Publishing Research](#) section of the RDDirect website also offers links to further information on aspects of submitting articles for publication in medical journals.

Presentation for Conferences or Seminars

Are you presenting your research findings to an audience? If so, what kind of audience?

- [RDLearning](#) has a list of potentially relevant conferences and seminars
- [Reporting Scientific Data](#) contains information on producing posters and making oral presentations
- Section "Dissemination research outcomes" in [Presenting and Disseminating Research](#) by Jane Schober and Andy Farrington for Trent Focus, provide information on the following topics:
 - Types of presentation
 - Tips on presenting at a conference
 - The abstract and usual abstract guidelines
- For more general tips on presentation skills we recommend A PowerPoint show on [Presentation skills](#): material extracted from presentation prepared by Adrian Turrell, ScHaRR, University of Sheffield
 - [Presentation Skills](#)
 - [Human Nature and Dynamics \(1\)](#)

- [Human Nature and Dynamics \(2\)](#)
- [Poor Presentations](#)
- [Coping with Nerves](#)
- [Verbals and Non-verbals](#)
- [Preparing the Presentation](#)
- [Planning the Presentation](#)
- [Why Rehearse?](#)
- [The Opening](#)
- [The Intro](#)
- [The Close](#)
- [The End](#)
- [Responding to Questions](#)

Your Duty to Inform

- Health and social care research is conducted for the benefit of patients, users, care professionals, and the public in general.
- There should be free access to information both on the research being conducted and on the findings of the research, once these have been subjected to appropriate scientific review through the accepted scientific and professional channels:
 - Findings must be made available to the research participants (including the relatives of deceased patients who have consented to the use of organs or tissue in the research) at the end of the study AND
 - Results must also be made available to all those who could benefit from them (e.g., patients, care professionals, the general public), through publication and/or other appropriate means.