Preparing a poster

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Summary
Well prepared posters are an effective means to communicate a simple message and stimulate discussion. A good poster requires considerable effort in identifying the vital ingredients and rejecting any superfluous material. The conventional structure for papers and abstracts is a suitable basis for posters on many subjects, with modification if necessary. Suitable topics include clinical trials, surveys, qualitative studies and case reports. Suggestions are made for contents that should be considered for each section. Careful planning of size, shape, flow and content will save time in preparation, and several technical graphical points are made, which may improve the attractiveness and readability of the poster.

Keywords
Poster presentation, research, scientific meetings.

Introduction
Posters can be a powerful way of getting a message across: successful poster campaigns have started revolutions! The best chance of achieving impact is with a simple message and a simple presentation. Many posters lose their readers by being too full and too indigestible. The main skills, then, of preparing a poster are in being utterly clear about what you want to say and ruthless in removing anything that distracts from your message. A poster must attract the viewer from a distance, and then hold the reader long enough to absorb the information you want to get across.

The advantage of posters compared with lectures at scientific meetings is targeting just those delegates who are really interested in your work, which allows a more relaxed and deep discussion away from the tension of the lecture theatre. But if you do not attract the reader in the first place, the discussion will never start.

You will, of course, know very much more about your subject than there is room to say. Acknowledge that to yourself right at the outset: the poster contains only a tiny fraction of what you could say. But if you try to put too much information in then you will lose the reader and end up saying nothing. You may wish to display your mastery of the literature, or your great clinical skills: you cannot do that with a poster. Stick to the facts. A poster can be a stimulus for a discussion, but is not itself the medium for it.

This paper describes what the author has learned from the experience of preparing posters, discussing the process with other researchers, and from reading one helpful text about scientific writing, and is offered in the hope that some of these suggestions may help other people avoid similar errors.

Planning the poster
The starting point for a poster can vary – you may already have written a paper, or you may have some questionnaire responses or other data that you have analysed. Be sure you have finished the analysis before you start making the poster – or you will have to change it so many times that you will never have it ready in time. You may want to take the abstract of the paper as the basis for the poster, progressively cutting it down until it is suitable for your poster. Or you can start afresh by making the briefest of summaries, as you would for a slide, for example:

Then you can add a few words of background or introduction, and a few words of comment or conclusion, keeping to the point. It is easy to write
many words, but difficult to write a few: in a poster, every word counts. Or you can start afresh by making the briefest of summaries, as you would for a slide, as shown in the Box.

Think simultaneously of the ideas and how to fit them on the poster in a balanced fashion. Most posters in the past have been constrained by having to be made up from A4 sheets, so that the poster has to be composed in little self-contained sections, each taking one or two sheets. Most sections of the poster will usually fit onto a single sheet, though Methods and Results might each take two. More recently, it has become easier and cheaper to print on A1 paper which gives the author more flexibility – though it is still wise to stick to the accepted (and expected) sections.

Requirements for shape and size should be checked with the organiser at an early stage of your preparation: you may intend to arrange your sheets in landscape, only to find that the poster boards are shaped in portrait fashion. Also check the overall size allowed.

Content
For trials, controlled or uncontrolled, the poster can be structured with the classic ‘IMRaD’ headings, representing Introduction, Methods (including Materials or Subjects), Results and Discussion (or Conclusions). Surveys will use Background, Sample, Methods, Results and Conclusions. For a case report, the section headings could be Introduction, Case history, Literature, Discussion and Conclusions/Recommendations. For qualitative studies, you may find a structured abstract too limiting, but the same principles apply – a clear message in your head and clear statements on the poster.

Title
This should be as short as possible but should give the reader a flying start in understanding your message. The reader will find it much easier to absorb the message from ‘Moxibustion for arthritis in China’ than from the full title: ‘Practitioner survey of the use of *Artemisia vulgaris* for rheumatoid arthritis in Chinese acupuncture clinics’. A heading such as ‘neck pain in medical practice’ leaves the reader still quite ignorant.

Beneath the title, all authors should be named, and their affiliations stated even if only in brief.

Introduction
The purpose of an introduction is to make it obvious why you did the study: for example, ‘conventional treatment is not particularly effective for tension headaches; previous studies have shown that acupuncture may have an effect; we decided to test it rigorously in an RCT’.

It is certainly arguable that even this brief Introduction is excessive, and that it could be pared down to the study objective ‘to test whether acupuncture is efficacious for tension-type headache’ or a summary of the research question: ‘Is acupuncture more effective than placebo for tension-type headache?’

A Background seems somehow less organised than an Introduction but its job is still to give the reader the essential information – but no more – that is needed to understand the research.

Methods
For intervention studies, this section will require up to four components:

a. Study design – although it often saves space to state this in Title or Introduction

b. Materials or Subjects, i.e. the sample of patients, giving enough information to characterise them: this will be principally demographic (age and sex) data, diagnostic criteria, and any important exclusion criteria.

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**Example of the minimal data needed as a basis for a poster.**

| Title: | Acupuncture for menopausal hot flushes: an RCT |
| Methods: | Sample of 56 women complaining of hot flushes |
| Interventions: | a) acupuncture or b) placebo over 6 weeks |
| Measure: | Frequency of flushes recorded in daily diary with 3 months’ follow-up |
| Results: | Acupuncture no different from placebo at 6 weeks, superior at 3 months. |
c. The intervention, or intervention and control; the information about that should be tailored to the expected readership – gynaecologists will probably be distracted by details of the acupuncture points and technique you used, whereas acupuncturists would expect to see that amount of information and not be distracted by it.

d. The main measure you used and the time points at which you used it: in a poster it is hardly necessary to describe the measure in detail or provide evidence that it is valid. However, you cannot assume that others know about the measure, so be sure to let the reader know, either in the Methods or when you present the Results, enough details to be able to see what aspect of the condition it was measuring.

For a questionnaire study, the above headings will be modified so that the intervention section includes some information on how you contacted your sample, and the main measure must state accurately what the wording of the questions was, at least the most important ones. This is because the wording reveals any bias that you put into the question, such as: ‘You have been fortunate in receiving acupuncture: has it helped you a) a great deal or b) somewhat?’ and obviously affects the interpretation.

Results
In a poster, more than almost anywhere, a picture speaks a thousand words. A published report usually gives the full results in a table, with actual means and standard deviations (or medians and ranges), and a graphical summary is not acceptable. However, for a poster a graphical summary precisely meets the needs – accurate information pared down to its essence and presented in a readily digestible form. The default on many computer graphics programs is for three-dimensional charts. These may look more interesting, but in some circumstances it can be difficult to see the difference between the heights of two bars. The old-fashioned two-dimensional charts still have much to recommend them. For denoting statistical significance, the asterisk system (* $p<0.05$, ** $p<0.01$ etc.) is useful.

Readers will be unlikely to worry too much about which statistical test you used so it may be safe to omit that. Generally you will have used several measures to make sure the effect was supported by other data, but the place for most of these in a poster is simply the phrase ‘supported by other data’.

Final section
Most posters need ‘rounding off’ in a way which can be tailored to your needs. There is usually little room for a Discussion with strengths, limitations, and how your work supports or contradicts other findings. But it is usual to draw some kind of conclusion, making sure that it tallies with the title and that it is genuinely supported by the data.

Any sources of support or assistance should be acknowledged, both as a courtesy and as political expedience if you ever want support again. There seems to be no consistent place for these, either beginning or end of the poster to suit your convenience and its appearance.

Which references to include is not an easy decision, as they add considerably to the ‘clutter’. Only essential citations should remain, which usually means any previous work in the same area.

Technical matters
Text
Consider carefully the use of abbreviations in a poster: they save space, but if the reader is not already familiar with them they can prolong the reading time and increase confusion. This is particularly true of the title. Naturally, those that are generally known and accepted by your target readership are fine. Thus, for example, ‘RCT’ and ‘VAS’ are likely to be accepted, ‘LFTs’ might or might not, but ‘HIAA’ would be meaningless to most. If you want to use other abbreviations, introduce them by the word in full on first mention: you may find that they actually do not save much space and, since some people find them annoying to memorise for such a short time span, they may be counterproductive.

The more syllables a word has, the more difficult it is to read: this holds true even for readers with a high level of education. So resist the temptation to demonstrate your intimate knowledge of specialist language and use simple words, as long as that is possible without
distorting the accuracy of what you are saying or losing relevant detail. For example, don’t state that you ‘enquired about chest pain’, rather that you ‘asked them to report the frequency of attacks of chest pain’.

Make sure the language of the poster is consistent within itself: if your Methods stated you asked patients their ‘headache duration’, don’t give results on number of ‘attacks per day’. If your title states you are investigating ‘efficacy’, then do not draw your conclusion about ‘effectiveness’.

Preparing any kind of report about your work exposes it to scrutiny first by yourself and then by others. Inevitably, at some stage there will be that sudden awful realisation that you forgot to record something really basic like the participants’ ages. Worry not, as the researcher does not exist who has not gone through the same experience. This is a good reason for having collaborators on the study – they should help avoid such problems and will certainly have to share the responsibility. Report what you did faithfully, ‘warts and all’ and point it out in the limitations!

Punctuation can be used rather sparingly. It is usually best not to place a full-stop at the end of each line of bulleted text, though you will need one between sentences of a paragraph.

I am constantly amazed at how I can miss my own spelling mistakes time after time in preparing posters and slides. I have learned always to have the poster checked thoroughly by one colleague, or preferably several, before finally assembling it. They will pick up not only spelling errors, but any errors in the logic and flow which may have arisen when you made revisions earlier.

Layout and graphics
Make sure there is a clear hierarchy to the different levels of information being presented. Type size, colour and its position on the page are the most common ways of giving an ‘order’ to the poster. However, try not to use too many different levels of information otherwise it will start to look confusing: three to five should be enough.

For longer amounts of text try to keep line length to no more than 10-16 words. It is hard for the reader to find the next line if he has to scan back a long way across the poster.

Colour preference can be very subjective, so it is safer to keep your use of colours simple. Contrasting colours are often attractive. Be careful when placing text over a coloured background, and especially over images. If you are placing text over a very strong colour consider using white text.

White space around text is very important. Stay clear of the edges and leave ample space between different levels or parts of information.

Fonts: it is generally accepted that dense copy, as in newspapers and novels, is easier to read in a serif typeface. Larger headings and titles often work better in a sans serif font - they have the effect of being punchier (particularly in a bold weight).

Try not to use more than two fonts, as this is likely to make the design untidy. A strong sans serif font for titles and headings, contrasted with a serif font for longer prose, often works well. Lower case is easier to read, particularly with longer text.

Directing the eye
Think constantly about how the reader is to be lead obligingly in the right sequence. Each section should have a clear heading that tells the reader what to expect (the standard section headings, such as Methods, are usually best). In addition, numbering the sheets in order can be useful though is surprisingly rarely used. One clear number in the corner of each sheet adds very little to the ‘clutter’ of the poster and is a simple and surprisingly unobtrusive way of guiding the eye.

Final touches
Handout
It is a good principle to prepare some hand-outs where you can give more detail about references to relevant previous studies, and to validation of the outcome measure, or you may want to add the secondary measures, details of analysis and other publications. Include your address if you wish readers to contact you.

Poster presentation
It is quick and cheap to laminate individual sheets, and this not only protects them from dirt but makes them much more attractive. Conference organisers usually provide the means to attach the
poster to the board, often with hook-and-eye tape, but it is a good plan to take drawing-pins.

When you first contact the organiser about submitting your poster, find out whether there will be a poster session (when you have to stand by your poster to invite discussion) or even a formal poster round (when you have a very short time to state the essence of your poster to the assembled audience – a considerable skill, but a useful one). If neither of these has been planned, suggest to the organisers that they do it, for they may have simply not thought of it. It certainly increases the sense of satisfaction from all the hard work you have undertaken. Remember to add your poster presentation to your CV!

Poster presentations have great potential for encouraging useful contact and discussion; but the potential is not often fully realised either by the presenters or by the delegates. Some effort on both parties makes the whole experience much more rewarding.

**Reference list**

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