

# Writing visually for medical writers

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## Abstract

Although content is obviously important for effective documents, the look of a document is also important. If you want someone to read a document, it should be pleasant to look at, and if you want the document to be used, the information should be easy to find. This can be accomplished by following the principles of 'writing visually'. These principles include making pages open and inviting to the reader, using clear text styles, and employing lists, tables, and illustrations to explain complicated processes and relationships.

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How long does it take you to decide to bother reading a document, website, or advertisement? Probably you need just a few seconds. If you want someone to read something, you need to make it pleasing or at least easy to look at. And if you want the document to be used, you need to make the information easy to find. You might be the William Shakespeare of medical writing, but if your document is difficult to look at, it will either not be read or it will frustrate and slow your reader.

We instinctively know a visually appealing document when we see one, but we might not be able to list the common principles. In this article, we provide a set of guidelines for making visually appealing documents, a process we call writing visually.

## Make pages open and inviting

*Use white space to provide relief*

Blank space on the page, also known as white space, entices the reader to read a document because it keeps it from looking overwhelming. White space gives breathing room, that is, it separates ideas into manageable chunks and relieves the reader from trying to understand too much at one time. White space can also be used to highlight key information. Important areas of white space include:

- *Margins.* Margins should be one inch (2.5 cm) on all sides of the page. Smaller margins make the text look crowded. On the other hand, more is not better; larger margins can also distract the reader.
- *Spaces before and after paragraphs.* Although not customary in some European countries, always add space between paragraphs or at least indent the first line. This helps separate the different ideas and makes the text look less crowded.
- *Spaces before and after headings.* This makes headings easier to see.
- *Spaces between lines.* Double-spacing, at least in a draft document, makes text easier to read and allows hand-written editorial marks and comments to be inserted in a printed document. Double-spaced text is usually required for manuscripts submitted to journals.

*Break the text into sections and subsections with section headings to make information manageable and easy to find*

Breaking long documents into sections makes information more manageable. This is also a way of creating additional white space.

Indicate the content of each section with headings. Headings help the reader scan for needed information. The title and headings should be enticing and relatively short. The headings should follow a consistent format and structure throughout the document. For example, in a manuscript describing clinical trial results, you can help the reader by breaking the results into subsections on patient demographics, efficacy, and safety. In this way, the reader can immediately find the data they need.

Three heading levels are usually adequate. Change the font size and style to give the reader clues as to the heading level. The best options include ALL CAPS, **bold**, and *italics* and font sizes

between 16- and 12-point. Underlining may be useful in some cases, but be aware that underlined text might be confused with hyperlinks. This is easily done in Microsoft Word, where the format of the different heading levels can be quickly changed. For example, use Heading 1 for the title of the document, which you might make Arial 16-point bold. Heading 2 could then be used for section headings and could be Arial 14-point plain ALL CAPS (non-bold), and Heading 3 could be used for subheadings and could be Arial 12-point italics. An example is shown in Fig. 1.

#### *Use short paragraphs*

Long paragraphs make the text look intimidating and discourage the reader. Breaking up the text into short paragraphs is probably the most effective way of making the text easier to read. This creates white space and makes the content more manageable. Paragraphs should typically be no more than six to eight lines.

#### *Use a ragged right margin to keep the text from looking too crowded*

Margin formatting is often overlooked. Europeans often use proportional spacing (justified on both the right and left), but this can be distracting because the amount of space between each character and word vary to stretch the line to fit the given space. Proportional spacing also creates a monotonous block of text, which can tire the reader. As seen in Fig. 1, a ragged right margin (combined with white space and headings) makes the text easier to read.

### **Use text styles that are easy to read**

#### *Choose text styles that are easy to read on screen and on paper*

To make life easier for readers, reviewers, and editors, use Times New Roman or Arial 12-point for the main text of most documents. Smaller font sizes are difficult to read. The standard font for Microsoft Word 2010 is Calibri 11-point, which, although pleasant to view on screen, can be a bit small when printed. For tables, where space is more limited, Arial 10-point is a good font and is easy enough to read.

You may wish to highlight headings by using a different text style. For example, you might use Times New Roman 12-point for the main text, Arial 16-point bold for Heading 1, Arial 12-point bold for Heading 2, and Arial 12-point italics for Heading 3. Whatever you do, be consistent and

don't use too many different styles in a single document.

#### *For emphasis, select text styles that are clear and not annoying or confusing*

Bold, underlining, all caps, italics, or a combination of more than one of these can be used to emphasize key text in some documents. For example:

- Do NOT reuse the injection system.

However, TOO MUCH ALL CAPS CAN BE ANNOYING. Also, underlining can be confused in some cases with hyperlinks. And, *italics can sometimes be hard to read especially when printed*. The best way to emphasize text may be **boldface**. Generally, use emphasis techniques sparingly and reserve them mostly for headings and titles.

#### *Avoid coloured text for most technical documents, but for documents where colours are desirable, choose colours that are easy to see and differentiate*

Coloured text should be avoided in most documents. Many people do not have colour printers and, even if they do, the ink is expensive, so they generally will not print a document in colour. When printed on a black and white printer, colours may appear light grey, making the text difficult to read. Also, colour in a technical document can be annoying or look out of place.

However, for electronic documents like websites or for marketing information, colours can be useful and can help highlight key information. Keep the number of colours to no more than three or four; more may confuse and annoy the reader. Also, try to use colours that show up well both on screen and when printed. Note that the appearance of colours can differ between different computer screens, projectors, or printers, so be sure to use colours that can be easily differentiated. Finally, avoid using green and red together because many people are red-green colour-blind. A list of recommended colours for different backgrounds is shown in Table 1.

### **Use visual elements for quick reference**

Lists, tables, and illustrations can cut through several pages of text. Like section headings, these visual elements allow the reader to quickly extract information and can help them remember it better.

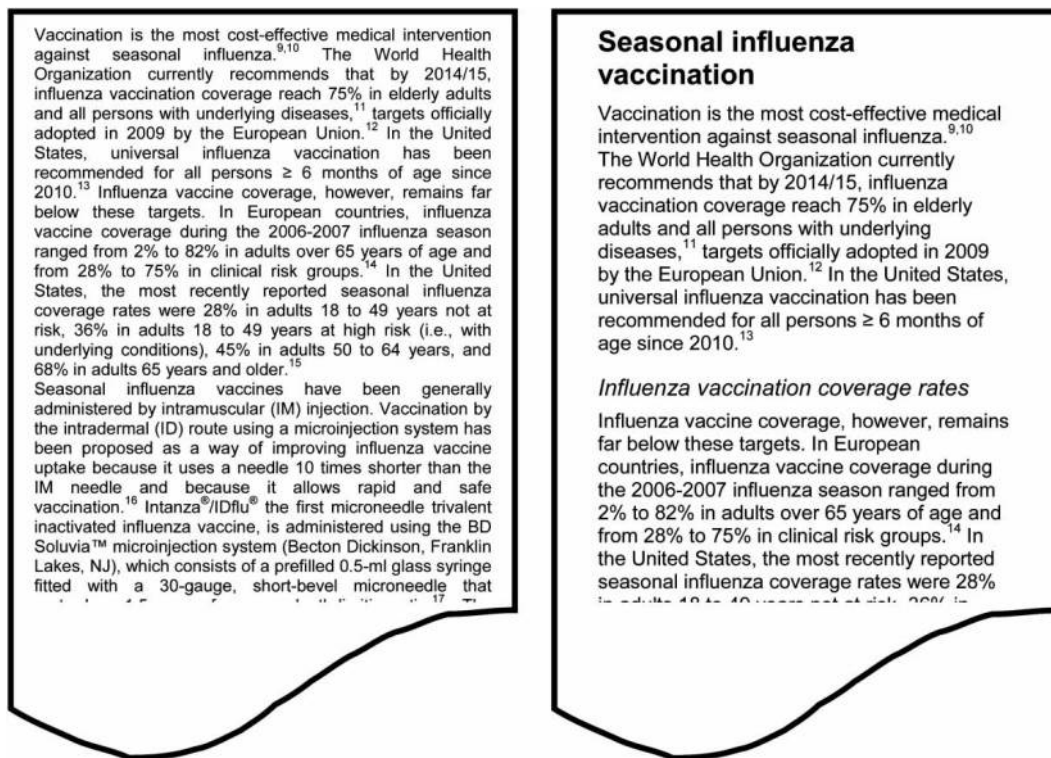


Figure 1: Comparison of a poorly formatted text and a well-formatted text. Left: the text looks crowded because of narrow margins, proportional spacing, small text, and a lack of white space. Right: the text is open, with sufficient margins, a larger text size, a ragged right margin, headings, and plenty of white space.

### Organise related items in lists

Lists help readers quickly understand a series of related items. Lists also give plenty of white space and breathing room and they provide information in easily manageable chunks.

The items in a list should have consistent format and structure, and begin with a capital letter. If using full sentences, end each with a period. Keep lists short and try to limit them to roughly nine items. For longer lists, try grouping them into several shorter lists. Generally begin each list with an introductory phrase that ends with a noun describing the items, followed by a colon.

- *Numbered lists.* Use these to show sequential steps in a procedure or rankings. Use only one action per numbered step.
- *Bulleted lists.* Use these to show non-sequential items or choices. Bulleted lists help readers

quickly scan a document. Each item should be independent of the others. This may keep the reader from understanding how the items fit together, so construct them carefully and avoid overusing them. For readability, it is possible that a paragraph may be more effective than a bulleted list.

- *Checklists.* Use these to track completion of required steps.

Examples of the different kinds of lists are shown in Fig. 2.

### Organize information in tables to show how different pieces of information relate to each other

Tables are an effective way to concisely describe relationships. A well-designed table can save the reader from going through pages of text to find one fact or understand how different pieces of information relate to each other.

Tables generated by Microsoft Excel and some other software appear as grids with horizontal and vertical lines. However, vertical lines interfere with understanding relationships in the table, and too many horizontal lines can make the table difficult to look at. For manuscripts, vertical lines are generally not allowed, and horizontal lines are allowed only above and below the column headings and at

Table 1: Colour choices for text readability

Background	Use	Avoid
White	Black Blue Red	Yellow Cyan
Black	White Yellow Green	Blue Red Magenta

<p>Divide your writing project into these phases:</p> <ol style="list-style-type: none"> <li>1. Decide on the goal.</li> <li>2. Perform the research.</li> <li>3. Organize the material.</li> <li>4. Write the draft.</li> <li>5. Have the draft reviewed.</li> <li>6. Make the revisions.</li> </ol>	<p>The project team decided to develop these five deliverables:</p> <ul style="list-style-type: none"> <li>• A paper-based tutorial</li> <li>• A checklist to guide the reader through the document</li> <li>• A brochure summarizing the content</li> <li>• A reference for the product</li> <li>• A form to assist in planning.</li> </ul>	<p>Before the patient leaves, check the following points:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Nurse verbally confirms with the team</li> <li><input type="checkbox"/> The name of the procedure recorded</li> <li><input type="checkbox"/> Specimen identification, correct labeling with 2 identifiers, and management</li> <li><input type="checkbox"/> Surgeon, anesthesia professional, and nurse review any key concerns for recovery and management of the patient</li> <li><input type="checkbox"/> Could anything have been done</li> </ul>
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Figure 2: Lists. Left, a numbered list. These are used to show sequential steps or rankings or when a procedure must be completed in a fixed order. Middle, a bulleted list. These are used to show non-sequential items or choices, and they help readers quickly scan a document. Right, a checklist. These are used to track completion of required steps.

the end. However, vertical lines can be useful for grids as in a process table (Fig. 3).

Keep the table's description and the table close together. A short, informative title should be included before or after the table. Below the table, provide a legend adding any key information and describing all abbreviations and footnotes.

The top row or rows of the table should include column headings. Each column should have a heading. These should appear in bold, and the first letter of each heading should be capitalised. Horizontal lines should be added above and below the column headings.

Within the table, group related information together, and make each group consistent. Also, be sure that there is sufficient white space to differentiate columns. Different groups of information can be separated by inserting blank rows (to create white space) or by shading alternating sections or rows, although shading should not be used for manuscripts.

Stay within the 1-inch (2.5-cm) page margins. However, the page can be rotated from portrait to landscape format for a wider table. If you feel compelled to go outside these margins after rotating the page, your table is probably too complicated and should be split into multiple tables.

Use a font that can be easily read. To save a little room, you can use a san serif font, like Arial, which is made of simple lines as opposed to one with little bits on the ends of the lines like Times New Roman. Remember that the reader needs to be able to see the information in the table, so try to not go below 9-point for most

documents. For example, Arial 10-point is a good style for table text. If you feel compelled to use smaller text, your table is probably too large and should probably be broken up into multiple smaller tables.

- *Reference tables.* These show data in a grid. A reference table usually lists a category of information in the left column. Once the reader understands how the table is organised, the reader looks at the category in the left column for the item of interest and then looks for the related information across the same row. Comparisons are made between different rows. These are used for display of data, for example, in a study report or manuscript.
- *Process tables.* These show who is responsible for doing a task in a long procedure and when. These are used, for example, in clinical study protocols.
- *Decision tables.* These help readers make decisions, and they are useful when your written explanation about a procedure is filled with if's, and's, and but's. These are used, for example, in instructions given to study investigators and trial nurses.
- *Action-response tables.* These show actions and the responses to that action, especially human actions and the related machine responses. These are used infrequently by medical writers.

Examples of reference, process, and decision tables are shown in Fig. 3.

Patient Characteristic	Group 1 N=38	Group 2 N=73
Age (y)		
Mean ± SD	65.0 ± 9.0	65.1 ± 8.7
Range	50 – 84	51 – 90
Sex, n (%)		
Female	22 (57.9)	40 (54.8)
Male	16 (42.1)	33 (45.2)
Ethnicity, n (%)		
African-American	0 (0.0)	1 (1.4)
Native American	0 (0.0)	0 (0.0)
Arabic/North African	0 (0.0)	0 (0.0)
White/Caucasian	38 (100.0)	72 (98.6)

Task	Visit	1	2	3
	Week	0	4	8
Collect informed consent		X		
Confirm that patient conforms to entry criteria		X		
Assign subject identification number		X		
Patient provides demographic information		X		
Physical examination		X	X	X
Collect medical history		X		
Collect available clinical data		X	X	X
Collect concomitant medication data		X	X	X

IF the patient's score is...	Option 1	Option 2	Option 3
Under 60	YES		
60		YES	
Over 60			YES
<b>THEN...</b>			
Complete form 2	X	X	
Call the physician		X	X

Figure 3: Reference, process, and decision tables. Top left, a reference table. These are used to show results, for example, in a study report or manuscript. Top right, a process table. These are used to show who is responsible for each task and when, for example, in a study protocol. Bottom left, a decision table. These help readers make decisions and are used, for example, in instructions given to study investigators and trial nurses.

*Use illustrations to describe complex processes*

Illustrations are line drawings meant to describe complex processes. Carefully thought-out illustrations show the reader what they need to know without making them wade through pages of written text.

However, be sure that the illustration is needed; simple illustrations sometimes are better left as text. For example, a flow chart describing a long process with no decision points might be better presented as a numbered list.

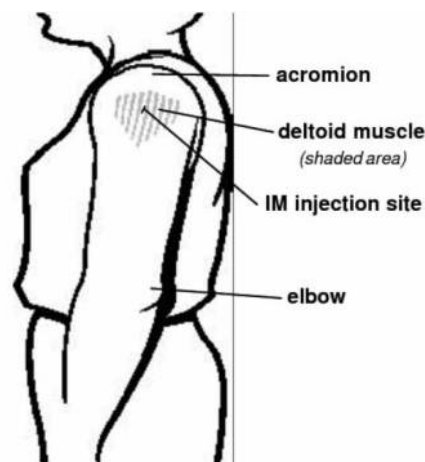
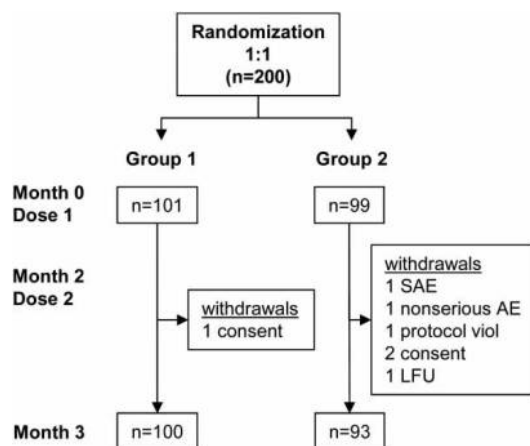


Figure 4: Flowcharts and diagrams. Left, an example of a CONSORT flow diagram, which is a type of flow chart. Flow charts describe workflow in complicated processes and procedures and may be used in place of or in addition to process tables. Right, an example of a simple diagram (public domain image). Diagrams are effective for helping the reader rapidly comprehend complicated equipment or procedures.

Illustrations should be clear and big enough to be easily read on screen and when printed. If you are providing illustrations for a journal, magazine, or flier, check the proofs to ensure that the copy editor did not make them too small or too big.

The illustration should include an explanation so that the reader does not have to refer back to the text. Keep the explanation and the illustration close together except in manuscripts where figure legends are generally listed on a separate page at the end of the text.

- *Flowcharts*. These are used to describe workflow in complicated processes and procedures and may be used in place of or in addition to process tables. Flowcharts allow readers to grasp essential steps quickly and easily, especially when the process involves decision-making. The flowchart should present the workflow from top to bottom, then from left to right, using arrows and lines to connect different steps. For long procedures, present one concept per flowchart, then continue to the next flowchart. To tie several flowcharts together, you can use an overview flowchart.
- *Diagrams*. These are effective for helping the reader rapidly comprehend complicated equipment or procedures.
- *Report or form samples*. Inserting a sample can help the reader understand how to complete a report or form. Be sure to replace actual data, such as names, addresses, social security numbers with fictitious information.

Examples of a flowchart and a diagram are shown in Fig. 4.

## Conclusion

Although content is obviously important for effective documents, the look of a document is also important. If you want someone to read and use a document, it should follow the principles of writing visually, including making pages open and inviting to the reader, using clear text styles, and employing lists, tables, and illustrations to explain complicated processes and relationships.

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