

Structuring paragraphs



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Abstract

Paragraphs are meant to make a text understandable and readable, and to help tell the story. Key aspects of good paragraphs include using topic sentences and story structures. Starting with an outline or a plan and using it to build to topic sentences can help. With the topic sentences and body content decided, sentences within the paragraph can be logically connected using linking words. The article also provides several exercises to help you practice making effective paragraphs.

Paragraphs are meant to make a text understandable and readable, and to help tell the story. A well-written paragraph describes only one complete idea, where the main part of the idea comes first. From there, the different parts of the idea (supporting sentences) should be organised according to a logical sequence that fits the storyline, with information placed according to its importance. This logical sequence is helped along by words link one sentence to the next.

Use topic sentences to start paragraphs

In biomedical research texts, each paragraph is usually structured with the main idea first, followed by further sentences containing supporting data, information, or examples. This makes it easy for the reader to skim read the article to obtain an overview of the whole paper before narrowing down to a specific paragraph.

This first sentence is known as a *topic sentence*. A topic sentence should be written as powerfully as possible, thus a simple sentence structure is best, with the main subject close to the verb.

Use story structures to build from topic sentences to paragraphs

Within each paragraph, information is ordered according to the storyline. Some common structures used in biomedical research are:

- Old information ► New information
- Least important ► Most important
- For ► Against
- Problem ► Solution

Start with outline or a plan and build to topic sentences

When writing, start with an outline or a plan. Then, build each paragraph from the main points in your outline or plan. Each sentence in your outline will probably be a main idea and therefore become a topic sentence. This will ensure that each paragraph only contains one idea and that you stick to your storyline.

The example below shows how you can build from an outline of an introduction or background section to topic sentences.

Outline

- Lung cancer is one of the most prevalent cancers worldwide
- Non-small cell lung cancer (NSCL) is a rare cancer
- It affects X% of the population Ref 1
- It increases with age Ref 2
- Current treatment is efficacious but is limited to younger patient groups
- Ref 3 and 4
- Some epidemiological data has indicated safety in older patients
- Ref 5
- The objective of this study is to identify toxicity of treatment B in older patients with NSCL lung cancer.

Topic sentences

- Topic sentence 1: Lung cancer represents one of the most prevalent cancers in the world.
Supporting idea: Non-small cell lung cancer (NSCLC) is the most frequent and deadly form. Example: NSCLC occurs in 85% of cases and are diagnosed 30-40% of the time at a non-operable stage
- Topic sentence 2: However, over the last 25 years, improved treatment with radiotherapy and chemotherapy has increased long-term survival.

Transition: In the 1990s, sequential radio chemotherapy became the protocol of choice. Recently, concomitant radio and chemo therapy has been shown to increase survival with minimal toxicity.

- Topic sentence 3: Concomitant radio- and chemotherapy has been shown to increase survival (mode of action and/or key clinical data here).

Hypothesis: The objective of this study is to evaluate the toxicity of a combined therapy regimen to treat NSCLC.

Link ideas between sentences

Several techniques can be used to ensure that the story flows clearly from sentence to sentence and paragraph to paragraph.

Use linking words to link sentences in a paragraph

Linking words indicate the relationship between one idea and another and guide the reader along the logical steps from one sentence to the next. In biomedical research, there are six main relationships the author would usually highlight: contrast, comparison, cause/effect, list, chronological order, and examples. Some example linking words are shown in Figure 1.

Here is an example of how a linking word can be used to link sentences:

*Traditional cell-culture methods are still used today to study cutaneous bacteria; **however**, they have been found to be relatively limited.*

Linking words may be used between sentences to connect neighbouring ideas, as in the following example.

*When mesenteric panniculitis suspected following computed tomographic scan reports, it is also important to exclude the presence of a tumour. **Although** mesenteric panniculitis and neoplastic disease occur frequently together, the association between them is still debated. **Furthermore**, non-malignant tumours cause chronic infectious or inflammatory abdominal disease such as Crohn's disease.*

Use parallel sentence structure to link sentences

Ideas are easier for the reader to follow if they are presented in a similar pattern. This means, that the same ideas should be written in the same way, that is, with the same grammatical structure. This technique is known as “parallel structure”.

To use parallel structure, keep the subject (sentence topic) the same or in the same word category from sentence to sentence. Also, when two or more items are listed in the topic sentence, the supporting sentences should follow the same order.

Discuss each data point separately, and avoid using *respectively*, which tires the reader by making them look backward. Remember to repeat key terms to remind the reader where you

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are up to in your argument.

For example, take a look at the following paragraph:

***Natriuretic peptides** (BNP, NT-proBNP and ANP) are produced by myocardial cells in the heart in response to mechanical stress due to increased pressure in the heart chambers. **These peptides** are strong, independent predictors of health following hospitalisation. However, **guiding treatment** has not been shown to be useful using natriuretic peptides.*

In this version, the last sentence is written with “guiding treatment” as the subject. This is disruptive because the reader has become accustomed to following a story where natriuretic peptides are the subject.

Now take a look at the paragraph written with parallel structure:

***Natriuretic peptides** (BNP, NT-proBNP and ANP) are produced by myocardial cells in the heart in response to mechanical stress due to increased pressure in the heart chambers. **These peptides** are strong, independent predictors of health following hospitalisation. However, whether **they** are useful for guiding treatment continues to be debated.*

Contrast

- Alternatively / but
- Although / however / while / yet
- Despite/ nevertheless

Comparison

- Alternatively / but
- Although / however / while / yet
- Despite/ nevertheless

Cause / Effect

- Since / as / because
- Consequently
- Therefore / hence /so

List

- Firstly/secondly/additionally
- Too / also
- Furthermore

Chronological order

- Afterwards
- Simultaneously
- Meanwhile
- Despite

Examples

- specifically
- such as
- particularly

Figure 1

In the revised example, the subject of each sentence matches the topic sentence, guiding the reader from one idea to the next.

Parallel structure refers not only to subjects but also to verbs, adverbs, and other parts of speech, as well as to various grammatical structures. Below is an example of parallel verb structure or tense:

*During study visits, the subjects **received** the study drug, **completed** a quality of life questionnaire, and **had** a physical examination.*

In this example, all verbs are in the same tense and, in fact, a parallel structure of past tense verb + article + noun is maintained.

The following example illustrates parallel adverb structure:

*After each dose adjustment, patients were asked to record their pain levels **hourly** during the first day, **daily** during the first week, and **weekly** thereafter.*

In this example, a parallel structure of an -ly adverb + prepositional phrase is maintained.

Consistently use terminology

Despite what you may have learned in English writing classes, employing different words (synonyms) for biomedical terms can make the text difficult to follow. For example, heart muscle contractility means the same as myocardial inotropic state. Where possible, choose the single most appropriate word or term for your reader and continue with it throughout the manuscript.

As a general rule, technical terminology and acronyms should be consistent throughout a text. Keep the repeated terms as close as possible in the paragraph. Non-native English writers should check that all technical terms are correct English words or acronyms, e.g. use WHO (World Health Organisation) instead of OMS (*Organisation Mondiale de Santé*).

In the examples below, observe how the terminology is repeated from one sentence to the next:

*The bound ligand inhibits the receptor, allowing the antagonist to activate the **signalling mechanism**. These **signals** drive specific proteins, which activate gene transcription and may thus influence cells proliferation.*

*Beta-blockers inhibit sympathetic stimulation to the heart and **reduce** heart muscle **contractility**. This **reduced contractility** reduces cardiac output, decreasing the demand for oxygen.*

Author Information

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Exercises

Example 1

Rewrite this text to make it easier to read.

After each dose adjustment, patients recorded their pain levels every hour, for the first day, then daily for the first week and finally once a week thereafter.

Example 2

Rewrite this text to make it easier to read.

Blood samples were taken at Visit 1, Visit 2 and Visit 3. The investigator measured O₂ saturation before inclusion. Patients were randomised to the treatment or placebo group at visit 2.

Example 3

Rewrite this text to make it easier to read.

Although there is no proof to support the hypothesis of a different pathogenesis between adolescent and adult acne, clinical evidence suggests there may be some differences. Among them, the hormonal influence on acne, indicated by the high frequency of flares before menstruation. Moreover, adult female acne relapses more frequently after treatment with systemic

antibiotics and even with isotretinoin.

Example 4

Rewrite this text to make it easier to read.

This guideline describes techniques for preparing poorly water-soluble organic compounds and introducing them into test vessels for a subsequent biodegradability test.

The subsequent tests on biodegradability are primarily methods using the analysis of the released carbon dioxide described in normative reference ISO 0000 and the determination of the oxygen described in normative references ISO 9408 and following the usual precautions for ISO 0000X.

Example 5

Reorder the sentences into one or more logically organised paragraphs and make any other changes needed to improve the logical flow of ideas.

Because the mediastinum is a common site for relapse, some chemotherapy regimens have included mediastinal radiation therapy. Mediastinal irradiation can be a useful local treatment, but

whether it improves outcome remains controversial. In addition, mediastinal irradiation delays chemotherapy and can cause cardiac damage, radiation pneumonia, thyroid dysfunction, and secondary malignancies. Because of this, mediastinal irradiation has been eliminated from paediatric treatment protocols. A retrospective study showed that mediastinal irradiation significantly decreases the risk of mediastinal recurrence in adult patients. However, in another study, around half of patients receiving mediastinal irradiation had mediastinal recurrence. Also, because of the risks of mediastinal irradiation and the equivalent or better responses observed for newer treatment protocols lacking it, mediastinal irradiation does not appear to have an added benefit in current treatment.

Example 6

Add a topic sentence to the following paragraph and make any other changes needed to improve the logical flow of ideas.

In temperate countries, the pattern of virus circulation is well established, with the main

activity during the winter. In Asia, two different patterns occur: year-round circulation with no clear peak of activity or peaks that coincide with cool or rainy seasons.

Example 7

Add a topic sentence to the following paragraph and make any other changes needed to improve the logical flow of ideas.

Pain from herpes zoster is usually acute, lasting 2 weeks, but in 17% of elderly adults, the pain can be chronic and can limit physical activity and cause emotional distress. The lifetime risk has been estimated to be around 10-30%. The risk for the illness and for severe complications significantly increases after 50 years of age.

Example 8

Add a topic sentence to the following paragraph and make any other changes needed to improve the logical flow of ideas.

Studies conducted in 2009 showed that reports of morbidity associated with the illness were several times higher in pregnant women than in

non-pregnant women. A long-term study conducted between 1990 and 2002 showed that, compared to non-pregnant women, the hospital admission rate was 1.7-fold higher for the first trimester, 2.1-fold higher for the second trimester, and 5.7-fold higher for the third trimester. The risk of complications increased from 2.5-fold higher at week 21 to 4.7-fold higher during week 37 to 42.

Example 9

Reorder the text into chronological order and add linking words to the steps in time, such as *now*, *before*, *after*, or *since*.

The treatment of metastatic pulmonary adenocarcinoma began in (1975), with the discovery of therocil, which had a median overall survival (OS) of 1.8 months. Since the 1980s chemosine was the only standard chemotherapy available for metastatic pulmonary adenocarcinoma. It is well tolerated, and the median overall survival of 6.5 months was longer than therocil. In 2011, a new chemotherapy regimen COMBINEX (a combination therapy regimen) was trialled in a pilot

study and achieved an OS of 12.2 months compared to chemosine, 7.6 months ($p < 0.001$) in the COMPARE trial. Now, a larger trial is necessary to establish this new, combination therapy regimen as standard therapy.

Example 10

Write a topic sentence and edit the text to make it easier to read. Add additional text where needed to ensure a logical argument.

Usually, side effects appear early and although mostly mild at onset, can become severe, impairing quality of life. These skin reactions may lead to dose reductions or treatment discontinuations, potentially detrimental to the treatment outcome. Although cutaneous reactions may differ between treatments, protecting the skin barrier function before and during therapy has been shown to prevent these reactions from appearing. Patients should be advised to apply an emollient to their skin before and during each cycle of chemotherapy.

Answer key

Example 1

Suggested revision:

After each dose adjustment, patients were asked to record their pain levels hourly for the first day, daily for the first week, and weekly thereafter.

Reason:

By using parallel structure and describing the dosage routine with adverbs, the sentence is easier to read.

Example 2

Suggested revision:

At visit 1 oxygen saturation was measured and recorded. At visit 2, eligible patients were included into the study and randomised to either the treatment or placebo group. Blood samples and oxygen saturation were measured at each study visit.

Reason:

Following a logical order is easier to read. Information like *the investigator measured* is probably not the reality and not essential information.

Example 3

Suggested revision:

Although there is no evidence in the literature that the pathogenesis differs between adolescent and adult acne, clinical evidence suggests there may be some differences. One difference is the hormonal influence on acne, indicated by the high frequency of flares before menstruation. Another difference is adult female acne, which relapses frequently following antibiotic or isotretinoin treatment.

Reason:

Firstly, the opening sentence has been simplified by shortening *there is no proof to support the hypothesis* to *there is no evidence in the literature* to make it more powerful and precise. Then, the structure was made parallel by repeating the word *differences*. This links the first sentence to the second and the second to the third.

Example 4

Suggested revision:

This guideline describes techniques to prepare water-soluble organic compounds and introduce them into test vessels for subsequent bio-

degradability testing. These biodegradability tests measure carbon dioxide release as described in ISO reference ISO0000, and determine oxygen levels as described in ISO reference ISO 0000. All tests are performed to standards described in ISO 0000X.

Explanation:

To improve this text, start by putting the verbs in the same tense form. So, keeping with the present tense *it describes*, change *introducing* to *introduces*. Next join sentence 1 with 2 and repeat the subject of the sentence, *these biodegradability tests*. Lastly, use *methods that analyse carbon dioxide release* can be simplified to *measure carbon dioxide*.

Example 5

Suggested revision:

Mediastinal irradiation can be a useful local treatment *to prevent relapse*, but whether it improves outcome remains controversial. A retrospective study showed that mediastinal irradiation significantly decreases the risk of mediastinal recurrence in adult patients. However, in another study, around half of

patients receiving mediastinal irradiation had mediastinal recurrence.

In addition, mediastinal irradiation delays chemotherapy and can cause cardiac damage, radiation pneumonia, thyroid dysfunction, and secondary malignancies. Because of this, mediastinal irradiation has been eliminated from paediatric treatment protocols. Also, because of the risks of mediastinal irradiation and the equivalent or better responses observed for newer treatment protocols lacking it, mediastinal irradiation does not appear to have an added benefit in current treatment.

Explanation:

The main topic of the paragraph is not clear – there seems to be more than one idea: (1) mediastinal irradiation can be a useful local treatment, but whether it improves outcome remains controversial; and (2) mediastinal irradiation delays chemotherapy and can be toxic. Each thought should therefore be in its own paragraph, each with its own topic sentence. In the first paragraph, the topic sentence (sentence 2) is followed by the information related to the different outcomes (sentences 4 and 5). In the second paragraph, the topic sentence (sentence 3) is followed by information related to the problem (sentences 4 and 7). Finally, sentence 1 is not needed anymore and the relevant information can be combined with the topic sentence of the first paragraph (sentence 2) by adding the phrase to *prevent relapse*.

Example 6

Suggested revision:

Temperate countries and Asia have different patterns of virus circulation. In temperate countries, the pattern of virus circulation is well established, with the main activity during the winter. *In contrast*, in Asia, two different patterns occur: year-round circulation with no clear peak of activity or peaks that coincide with cool or rainy seasons.

Explanation:

This paragraph needs a topic sentence to express the main idea and lead to the body of the paragraph. The topic is that there are differences in virus circulation between temperate countries and Asia. The two sentences logically follow this, although the second sentence could benefit from the addition of *In contrast* or *However* to highlight that the sentences are showing different things.

Example 7

Suggested revision:

Herpes zoster is a common, painful viral infection mostly affecting elderly adults. Pain from herpes zoster is usually acute, lasting two weeks, but in 17% of elderly adults, the pain can be chronic and can limit physical activity and cause emotional distress. The lifetime risk has been estimated to be around 10-30%, *although* the risk for the illness and for severe complications is highest after 50 years of age.

Explanation:

As in the previous example, this paragraph needs a topic sentence to express the main idea and lead to the body of the paragraph. The topic is that herpes zoster is (a) common, (b) painful, and (c) mostly affects adults over 50 years of age. In addition, the paragraph can benefit from a logical link between the last two sentences. In this case, *although* is a good linking word because it makes the distinction that the 10-30% is not evenly distributed by age.

Example 8

Suggested revision:

Pregnancy increases the rate of complications from the illness. Studies conducted in 2009 showed that reports of morbidity associated with the illness were several times higher in pregnant women than in non-pregnant women. *Also*, a long-term study conducted between 1990 and 2002 showed that, compared to non-pregnant women, the hospital admission rate was 1.7-fold higher for the first trimester, 2.1-fold higher for the second trimester, and 5.7-fold higher for the third trimester. *The study further showed* that risk of complications increased from 2.5-fold higher at week 21 to 4.7-fold higher during week 37 to 42.

Explanation:

The topic is that complications from the illness are increased by pregnancy, as expressed in the added topic sentence. In addition, the paragraph can benefit from a logical links between the sentences. Between the second and third sentences of the revised version, *Also* was added to show that this is additional information. Similarly, between the third and fourth sentences, *further* was added to show that this is additional information, and *The study ... showed* was added to indicate that this was from the same study as in the previous sentence.

Example 9

Suggested revision:

The treatment of metastatic pulmonary adenocarcinoma began in 1975, with the discovery of therocil, leading to a median overall survival (OS) of 1.8 months. Since the 1980s chemosine was the only standard chemotherapy available for metastatic pulmonary adenocarcinoma. It is well tolerated, and the median overall survival of 5.6 months was longer than with therocil. In 2011, a new chemotherapy regimen COMBINEX (a combination therapy regimen) was investigated in the COMPARE trial and achieved a longer OS (12.2 months) than chemosine (7.6 months; $p < 0.001$) in the COMPARE trial. Now, a larger trial is necessary to establish this new, combination therapy regimen as standard therapy.

Explanation:

This paragraph has been edited to describe how chemotherapy has improved over time. The text has been rearranged in chronological order and specific dates have been added (*over X years ago* would have been an acceptable alternative). Note that the introductory words and dates (*began*, *since*, *in 2011*, and *now*) lead the reader through the story.

Example 10

Suggested revision:

Cutaneous reactions are a side effect of chemotherapy that usually appear early in the treatment phase and differ from one chemotherapy agent to another. They are mild at onset and with continued treatment can become severe and impair quality of life. These reactions may lead patients to reduce their dose or discontinue their treatment, which could be detrimental to the treatment outcome.

Skin barrier function has been shown to play an essential role in the development of cutaneous reactions related to chemotherapy.

Explanation:

The text refers to side effects, skin reactions and cutaneous reactions. Creating a topic sentence with cutaneous reactions defines the topic for the sentence and explains that they are a side effect. The phrase *These reactions lead to dose reductions* has been made more direct by adding a subject, who make the reductions. *Although cutaneous reactions may differ between treatments* has been moved to the topic sentence. A second paragraph has been created to address the topic of skin barrier function.