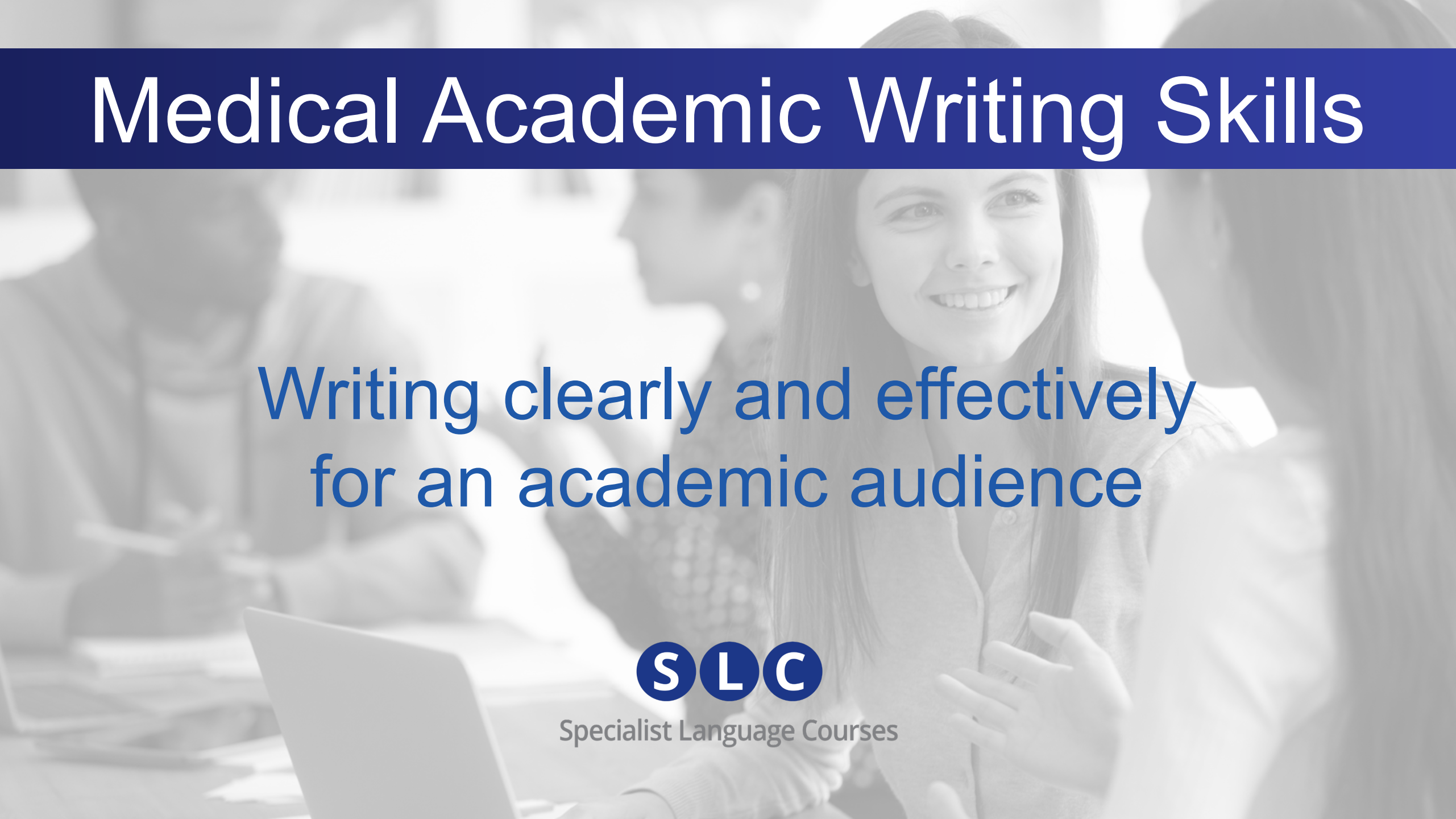
Medical Academic Writing Skills



Writing clearly and effectively for an academic audience

SLC

Specialist Language Courses

The power of words

Informal vs Formal

show →	demonstrate, indicate
find →	discover
try →	attempt
give →	donate, distribute
bad →	unacceptable, negative
good →	advantageous, positive
lots of →	significant numbers of
enough →	sufficient, adequate
look into →	investigate, analyse
go on →	continue
put off →	postpone
go up →	increase
carry out →	perform
get worse →	deteriorate
think about →	consider
take place →	occur

The Academic Word List

- Taken from written corpus of 3.5 million words
- Not on the General Service List (most common 2284 words and word families)
- 570 headwords and their word families
- 10 sublists

https://www.wgtn.ac.nz/lals/resources/academicwordlist

Sublist 1 of the Academic Word List

This sublist contains the most frequent words of the Academic Word List in the Academic Corpus. The most frequent members of the word families in Sublist 1 are listed below.

analysis	*established*	*occur*
approach	*estimate*	*percent*
area	*evidence*	*period*
assessment	*export*	*policy*
assume	*factors*	*principle*
authority	*financial*	*procedure*
available	*formula*	*process*
benefit	*function*	*required*
concept	*identified*	*research*
consistent	*income*	*response*
constitutional	*indicate*	*role*
context	*individual*	*section*
contract	*interpretation*	*sector*
create	*involved*	*significant*
data	*issues*	*similar*
definition	*labour*	*source*
derived	*legal*	*specific*
distribution	*legislation*	*structure*
economic	*major*	*theory*
environment	*method*	*variables*

Affixes, word families

Medical terms – univocal → clear and unambiguous

Prefixes: laparo- , cardio- , cholecyst- , brady- , tachy- , hyper- , hypo-

Suffixes: -scopy , -vascular , -itis , -pnea , -cardia , -tension , -ventilation

Academic terms and their families

(from the AWL)

analyse	assess	*estimate*	*method*
analysed	assessable	estimated	methodical
analyser	assessed	estimates	methodological
analysers	assesses	estimating	methodologies
analyses	assessing	estimation	methodology
analysing	*assessment*	estimations	methods
analysis	assessments	over-estimate	
analyst	reassess	overestimate	
analysts	reassessed	overestimated	
analytic	reassessing	overestimates	
analytical	reassessment	overestimating	
analytically	unassessed	underestimate	
analyze		underestimated	
analyzed		underestimates	
analyzes		underestimating	
analyzing			

Building compound sentences

Simple sentences - 1 clause - OK but limited → 2 or 3 clauses often better, but no more.

Compound sentences

Clauses of equal importance connected by coordinating conjunctions
FANBOYS - For And Nor But Or Yet So

The hypothalamus controls body fluid levels by causing feelings of thirst.
The hypothalamus controls body fluid levels by controlling the amount of water in the urine.

The hypothalamus controls body fluid levels by causing feelings of thirst and by controlling the amount of water in the urine.

Vaccines can be used to prevent and cure diseases, but antibiotics can only be used to cure them.
Mutations can be triggered by internal factors when cells reproduce or by external factors such as viruses.

Building complex sentences

Complex sentences

Sentences consist of one independent clause and one or more subordinate clauses.
These are linked by subordinating conjunctions, e.g. because, when, if, which, that, after…

3 types of subordinating clauses

a. Adverbial: *Water can easily enter and leave the cell, <u>because</u> the cell membrane is porous.*

b. Adjectival: *The fluid in the cell is separated by a membrane <u>which</u> is highly permeable to water.*

c. Noun: *Dr Barry Marshall discovered <u>that</u> bacteria play a role in gastric ulcers.*

Show sentence variety

(1) The polio virus enters the body through contaminated food or water and is absorbed through the gut wall. (2) From the gut, it moves to paralyse the nerves in the spinal cord which control movement. (3) In many children only the limbs were affected, but in some children the virus moved up the spine to affect the nerves controlling respiration. (4) Because the children were unable to breathe on their own, they needed to be helped to get air into their lungs.

(1) = compound
(2) = simple
(3) = compound
(4) = complex

Beware over-long sentences!

This talk describes a randomized open label, multi-arm, multi-stage, parallel group clinical trial in which four novel treatments are compared, which examines the impact of variations in drug combinations and length of treatment on the incidence of MDR-TB and which has been underway for a year.

> *This talk describes a randomized open label, multi-arm, multi-stage, parallel group clinical trial of four novel treatments for MDR-TB. The trial examines the impact of variations in drug combinations and length of treatment on the incidence of MDR-TB. It has been underway for a year.*

For the trial, 800 patients with confirmed drug-sensitive pulmonary TB were randomised to two groups, with one group receiving isoniazid and rifampicin for the standard 6 month period and the other group receiving one of four novel treatments which used varying combinations of standard anti-TB drugs for a period of two months.

> *For the trial, 800 patients with confirmed drug-sensitive pulmonary TB were randomised to two groups. One group received isoniazid and rifampicin for the standard 6-month period. The other group received one of four novel treatments which used varying combinations of standard anti-TB drugs for a period of two months.*

Linking sentences together

The human genome project provided a map of DNA in normal human cells. In addition, it automated the process of DNA sequencing.

The use of combined vaccines make immunisation much easier. However, they can also increase the risk of side effects.

Edward Jenner's discovery of a vaccine for smallpox was based on observation. In contrast, Pasteur's discovery of a vaccine for rabies was based on theory and experiments.

In 1966 the World Health Organisation launched a global immunisation campaign against smallpox. As a result, the disease was declared eradicated in 1980.

Linking sentences together

Adding and sequencing	Illustrating and emphasising	Cause/effect and qualifying	Comparing and contrasting
Adding examples	**Illustrating examples**	**Cause/effect examples**	**Comparing examples**
And Also As well as Moreover Too Furthermore Additionally	For example Such as For instance In the case of As revealed by Illustrated by	Because So Therefore Thus Consequently Hence	Similarly Likewise As with Like Equally In the same way
Sequencing examples	**Emphasising examples**	**Qualifying examples**	**Contrasting examples**
First, second, third Finally Next Meanwhile After Then Subsequently	Above all In particular Especially Significantly Indeed Notably	But However Although Unless Except Apart from As long as If	Whereas Instead of Alternatively Otherwise Unlike On the other hand Conversely

Grammar – the passive

A team from the Roslin Institute in Edinburgh undertook one of the best-known genetic experiments in the UK.

One of the best-known genetic experiments in the UK was undertaken by a team from the Roslin Institute in Edinburgh.

Our investigators performed quality control using the 835 control probes included in the array.

Quality control was performed using the 835 control probes included in the array.

We then exported the intensity data from Genome Studio and converted them into M values using the lumi package in R software.

The intensity data was then exported from Genome Studio and was converted into M values using the lumi package in R software

Grammar – nominalisation

A large number of subjects are required for randomised controlled trials.

There is a requirement for a large number of subjects in randomised controlled trials.

When it was analysed, the genetic material contained a large amount of DNA and very little protein.

The analysis of the genetic material revealed it contained a large amount of DNA and very little protein.

Edward Jenner deduced that cowpox provided immunity to smallpox from his observations of milkmaids.

Edward Jenner's deduction that cowpox provided immunity to smallpox came from his observations of milkmaids.

Grammar – hedging

It is certain that a cure for all cancers will be found within the next ten years.

It is likely that a cure for all cancers will be found within the next ten years.

It is possible that a cure for all cancers will be found within the next ten years.

It is conceivable that a cure for all cancers will be found within the next ten years.

It is unlikely that a cure for all cancers will be found within the next ten years.

A cure for cancer could be found…

A cure for cancer may be found…

A cure for cancer might be found…

Building paragraphs

- ✓ Paragraphs provide clarity and readability to a text.
- ✓ They enable readers to understand complex ideas, arguments and information.
- ✓ Each paragraph should have one central idea and then a small number sentences which elaborate on and support that idea.
- ✓ The first sentence provides the topic and controlling idea.
- ✓ The supporting sentences then provide information, explanations and examples.
- ✓ This structure gives a paragraph unity and comprehensibility..

Building paragraphs

(1) New research on epigenetics is showing how children can genetically inherit experience from their parents. (2) Previous theories believed that inheritance happens only through the DNA which is passed from parents to children. (3) They state that although adult cells contain epigenetic information which can be altered by the environment, the reproductive cells which create new life were wiped clean of any epigenetic information. (4) This would therefore prevent the epigenetic transfer of any environmental influences. (5) However, new research from the University of Cambridge shows that in mammals around 1% of epigenetic information is not erased, but is passed on through a process called imprinting. (6) These findings help to explain the results of an experiment which examined the inheritance of fear in mice. (7) In the experiment, mice associated the smell of cherries and almonds with an electric shock. (8) The offspring of the mice and the next generation both showed fear when exposed to these smells for the first time..

(1) Topic and controlling idea
(2) Claim 1
(3) (4) Supporting information
(5) Claim 2
(6) (7) (8) Supporting information

Building texts

3 types of text

Description provides the reader with information about something. This may be introducing new concepts or providing more detail about concepts they are already familiar with.

Analysis looks at different aspects of a subject or topic and shows the reader how they fit together or interact.

Argumentation is where the writer takes a particular stance and provides evidence to support that stance.

Descriptive	Analytical	Argumentative
Outlines relevant concepts	Outlines links between relevant concepts	Emphasises certain relevant concepts
Outlines possible options	Evaluates the reasons why some options may be better than others	Puts forward one or more options with evidence
States what actions were taken	Outlines the consequences of actions	States what actions should be taken, provides support for this

Point by point vs block by block

	Drug One	Drug Two
Length of treatment	One week	Three weeks
Effectiveness	9 cases out of ten	99 cases out of a hundred
Side effects	Mild	Mild

Block Format	Point by Point Format
Section A: Drug One • Length of treatment • Effectiveness • Side effects	**Section A: Length of treatment** • Drug One • Drug Two
Section B: Drug Two • Length of treatment • Effectiveness • Side effects	**Section B: Effectiveness** • Drug One • Drug Two
	•Section A: Side effects • Drug One • Drug Two

Texts checklist

1. Does your text answer the question you have (been) asked?

Check your topic sentences to see if they answer the question..

2. Can the readers easily follow your ideas from paragraph to paragraph?

Read through the topic sentences to check if your writing is logical, clearly formatted and makes sense..

3. Does each paragraph have a topic sentence which shows the topic of the paragraph?

If not, you should re-write your topic sentence to match the content of the paragraph.

4. Does the paragraph have unity? Are all sentences related to the topic?

If not, then you should remove any sentences which are not related to the topic.

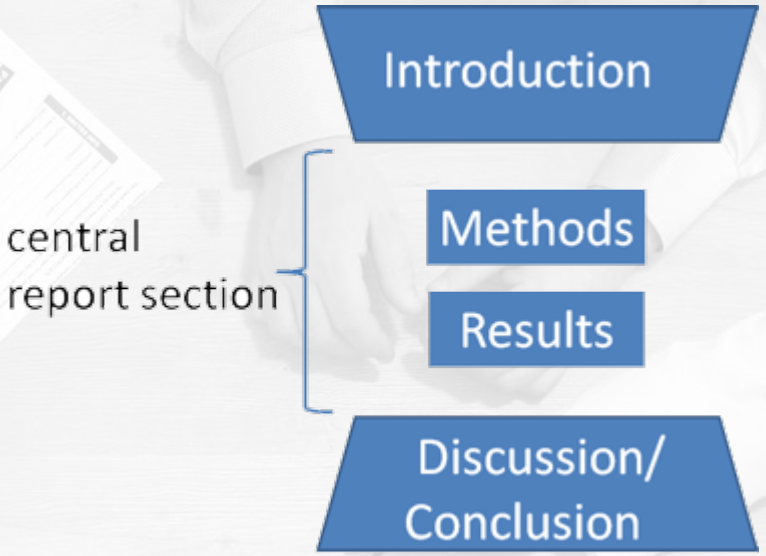
5. Does the paragraph contain enough supporting details and information?

Add supporting details and information where needed, or delete the sentence if you don't have any support.

In practice – writing an abstract

Key features

- ✓ The content follows the IMRaD format
- ✓ The abstract describes what the article has achieved and why it is important.
- ✓ The abstract can be understood without the main article.
- ✓ There are very few abbreviations.
- ✓ There are no illustrations, references or tables.



Example abstract

The Cost-effectiveness of Corticosteroids for the treatment of Community-Acquired Pneumonia.

Pliakos EE, Andreatos N, Tansarli GS, Ziakas PD, Mylonakis E.

Abstract

***BACKGROUND**: The use of corticosteroids as adjunct treatment for community-acquired pneumonia (CAP) is associated with potential clinical benefits and the aim of this study was to evaluate the cost-effectiveness of this approach.*

***METHODS**: We constructed a decision-analytic model comparing the use of corticosteroids+antibiotics to that of placebo+antibiotics for the treatment of CAP. Cost-effectiveness was determined by calculating deaths averted and incremental cost-effectiveness ratios (ICER). Uncertainty was addressed by plotting cost-effectiveness planes and acceptability curves for various willingness-to-pay thresholds.*

***RESULTS**: In the base-case analysis, corticosteroids with antibiotics resulted in savings of $142,795 per death averted (ICER: $-142,795/death averted). In the probabilistic analysis, at a willingness-to-pay of $50,000, corticosteroids with antibiotics had a 86.4% chance of being cost-effective compared to placebo with antibiotics. In cost-effectiveness acceptability curves, the corticosteroids+antibiotics strategy was cost-effective in 87.6% to 94.3% of simulations compared to the placebo with antibiotics strategy for a willingness-to-pay ranging from $0 to $50,000. In patients with severe CAP (PSI classes IV/V) the corticosteroids+antibiotics strategy resulted in savings of $70,587 and had a 82.6% chance of being cost-effective compared to the placebo+antibiotics strategy.*

***CONCLUSIONS**: The use of corticosteroids with antibiotics is a cost-effective strategy and results in considerable health care cost-savings, especially among patients with severe CAP (PSI classes IV/V).*

 PMID: 30448195 DOI: 10.1016/j.chest.2018.11.001

Source: https://www.ncbi.nlm.nih.gov/pubmed/30448195

In practice – writing a research article

INTRODUCTION

1. States what the reader should expect in the article.
2. Sets out the broader context of the research by discussing (using citations) other articles which have been written on the topic.
3. Begins more broadly and then narrows to become more specific to our topic.
4. Shows how research will advance knowledge in this area.

'Use of Physician Concerns and Patient Complaints as Quality Assurance Markers in Emergency Medicine'

Medical error is a correctable cause of morbidity and mortality. In 1991, the Harvard Medical Practice Study found that nearly 3.7% of admitted patients suffered complications from treatment, two-thirds of which were due to errors in care, and a significant portion of these were preventable (Brennan et al, 1991; Leape et al, 1991). This landmark study prompted intense national scrutiny of medical errors, which remain a significant burden (Kohn et al, 2000; National Academies Press, 2001). Recent data indicate that the incidence of adverse events attributable to medical error among hospitalized patients may be increasing. Existing evidence supports a compelling argument for emergency departments (ED) to have systems in place to perform root cause analysis of potential errors, and to implement systemic corrections to improve care when such errors are found (Public Health Council, 2014).

Although it is clearly worthwhile to uncover medical error within the ED, an ideal marker for efficient error correction has yet to be uncovered. Twice each month, the ED quality assurance (QA) team screens all cases that meet certain empirically selected criteria, such as death within 24 hours, transfer from initial floor bed to ICU within 24 hours, physician self-reported concerns, nursing incident reports or cases that generate physician or patient complaints. These surrogates are often used as routine metrics in emergency medicine QA and although they are often perceived as the gold standard, they remain largely unvalidated expert opinion (Klasko et al, 2015).

A quantitative analysis evaluating the utilization of physician and patient complaints has not been studied. The presence of an integrated, readily accessible electronic error reporting system has facilitated the study of such measures in one urban tertiary care ED. **The objective of this study was to determine whether systematic screening and evaluation of documented patient and physician QA concerns is a useful tool for identifying physician errors resulting in either an adverse or near-miss event.**

See https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5102603/ and download here.

In practice – writing a research article

METHODS

- ✓ Describe the settings
- ✓ Describe the methodology used
- ✓ Describe how the methodology was implemented
- ✓ Describe the equipment and its suppliers (where appropriate)
- ✓ Describe the problems or possible problems in data collection
- ✓ Use sub-headings to aid clarity

In practice – writing a research article

RESULTS

- ✓ Show the data and the initial analysis of that data
- ✓ Link back to methods and then forwards to discussion
- ✓ Include the relevant data, not all the data
- ✓ Data must be clearly captioned and described
- ✓ Clarity is key

In practice – writing a research article

DISCUSSION

- ✓ Moves from the specific to the more general
- ✓ Shows readers to what extent you have solved the problem or answered the question you set out
- ✓ Shows how the research findings link to the broader literature
- ✓ Make recommendations for future research
- ✓ It is essential to show the reader a clear link between the issues raised in your introduction and your discussion. You may need to re-draft your introduction to make them both fit.

And finally, proofread!

WHAT TO LOOK FOR

- ✓ Choice of vocabulary
- ✓ Spelling
- ✓ Punctuation
- ✓ Sentence structure
- ✓ Paragraph structure
- ✓ Paragraph flow
- ✓ Linking ideas
- ✓ Clarity
- ✓ Impact on the reader

Want to know more?

This material is drawn from our course English for Medical Academic Purposes

On this course, you

- ✓ develop the skills and strategies you need to listen effectively to academic talks, give presentations or read academic texts
- ✓ learn the key features of academic writing, so you can write abstracts, articles and research papers clearly and effectively
- ✓ expand your academic vocabulary
- ✓ deepen your knowledge of grammar and structure
- ✓ improve your study skills so you develop as an independent learner and researcher

https://specialistlanguagecourses.com/medical-english-courses/online-english-for-medical-academic-purposes/

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