

Scientific Presentations

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Overview

- Introduction
- Applications
- Scientific manuscript
- Oral presentation
 - exercise
- Poster presentation

Begin by...

- Writing down everything you know about this area?
- Start from the beginning and keep writing until you get to the end?
- Other ideas?

Key points

- Organized
- Main message
- Who is your audience?

How to Write a Grant Application

Rubriker

- Bakgrund
- Syfte/frågeställning
- Metod
- Referenslista
- Tidsplan
- Kostnads kalkyl
- Tänkbar nytta av project

How to begin?

- Background?
- Preliminary results?
- Specific aims?

Who is your audience?

- Someone with very little time
- Do they know your field?
- Follow the instructions

Specific aims

- Decide these first
- Hypothesis driven, if possible
- Has it been done already?
- Choose specific aims that go together

Order to write?

- Background?
- Or Work plan?
- Preliminary results?

Work plan

- Specific aim 1
 - Rationale/hypothesis
 - Proposed research (include methods)
 - (Preliminary results)
- Specific aim 2
 - ...

Background

- Introduce area eg disease impact
- Background to specific aim 1
 - Open up questions
- Background to specific aim 2
 - Open up questions
- Preliminary results in background?

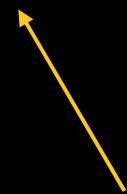
References

- A reference for every result, idea or quotation taken from another source
- Original primary study not review articles
- Literature search
- Not too many
- Cite correctly

References

- Use Endnote

1. Author, A.B. *et al.* Use a title for references in grants. *J. Biol. Chem.* 44:760–777.



Use correct
abbreviation

Importance

- A summary, include main message
- Very important
- Often at the end, but don't forget about it
- Show how your results will move the field forward
- Be realistic!

Presentation

- Professional figures
- Formatting
 - Space between paragraphs
 - Consistent style for subheadings
- Easy to read
- Attention to detail

Common errors

- Figures incorrectly numbered
- References incorrectly cited
- Background required for aims is missing
- Aims have already been done
- Abbreviations not defined
- Too long
- Too complicated

Think of your audience

- Clear message that the reviewer can easily grasp
- State message in summary, title, aims, importance



How to write a scientific article

Who is your audience?

- Co-authors
- Journal editor
- Reviewers
- Scientists in your field
- Scientists in other fields

A readable manuscript

- Good structure
- Clear message
- Simple and concise
- Attention to audience

Choose a journal

- Decide early on
- Which journals do you/your colleagues read?
- Which journals publish similar research?
- Ask your colleagues
- Be realistic

Considerations

- Open access
- Accessed by PubMed
- Cost
- Word limit
- No of figures and tables allowed

Impact factor

- A measure that reflects how often articles in a particular journal are cited
- *NEJM*: IF = 50
- *Nature*: IF = 34
- *Blood*: IF = 10.5
- *JBC*: IF = 5.3
- *Obesity*: IF = 3.3

PLoS ONE

Most journals use the peer review process to determine if an article reaches the level of 'importance' required by a given journal

PLoS ONE uses peer review to determine whether a paper is technically sound and worthy of inclusion in the published scientific record

IF = 4.3

Why you need to choose early

- Audience
- Instructions for Authors and recent issue of journal
 - word count
 - number of figures and tables
 - overall style

How to begin

- Make figures and tables
- Work out which data to use, sufficient data
- Outline results section using subheadings
- Summarize your central message in two or three sentences
- Literature search
- Don't focus too much on details

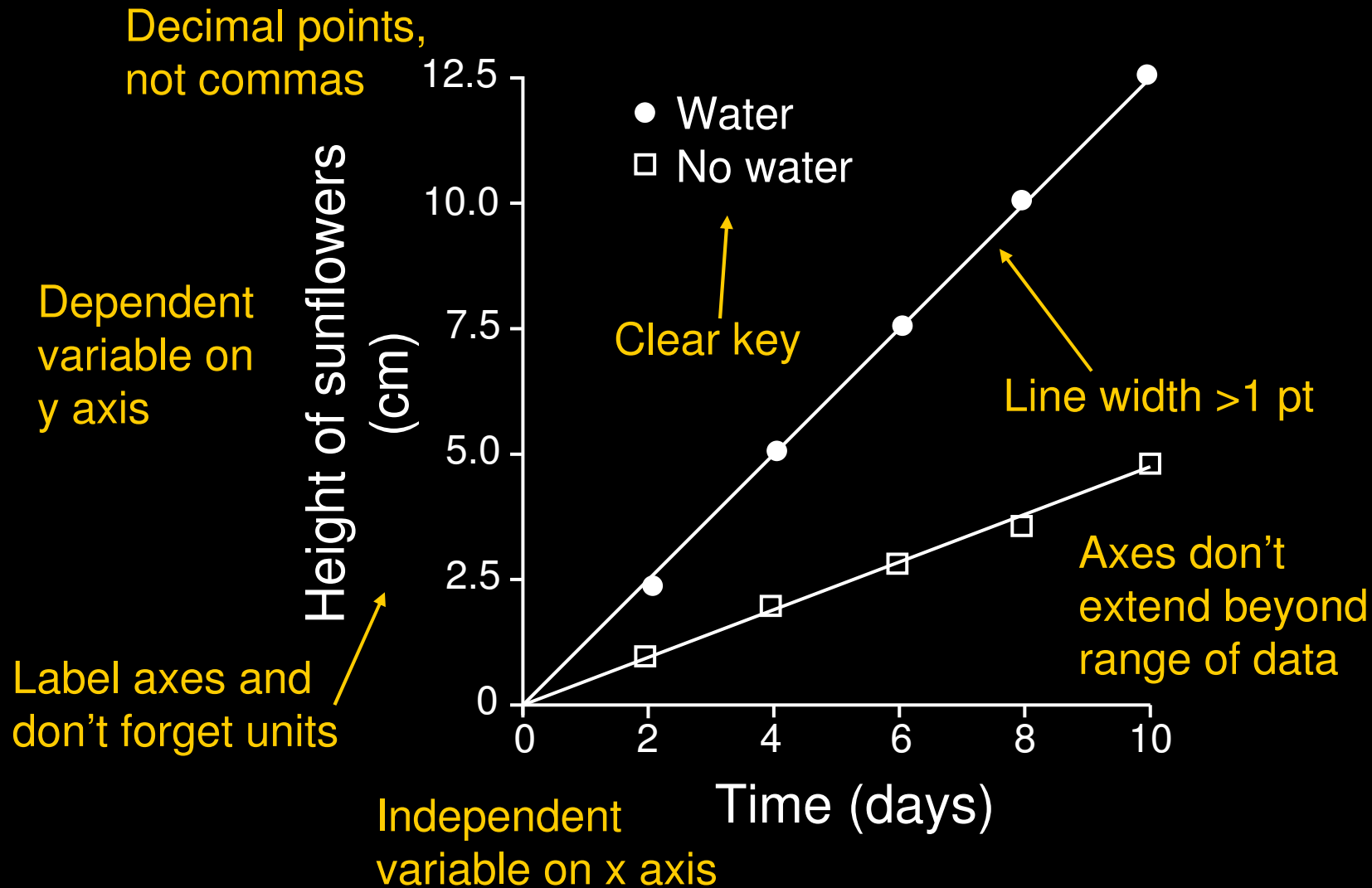
When to use your central message

- Hypothesis
- Final paragraph of introduction
- First and last paragraphs of discussion
- Title
- Abstract
- Refer to it when writing results

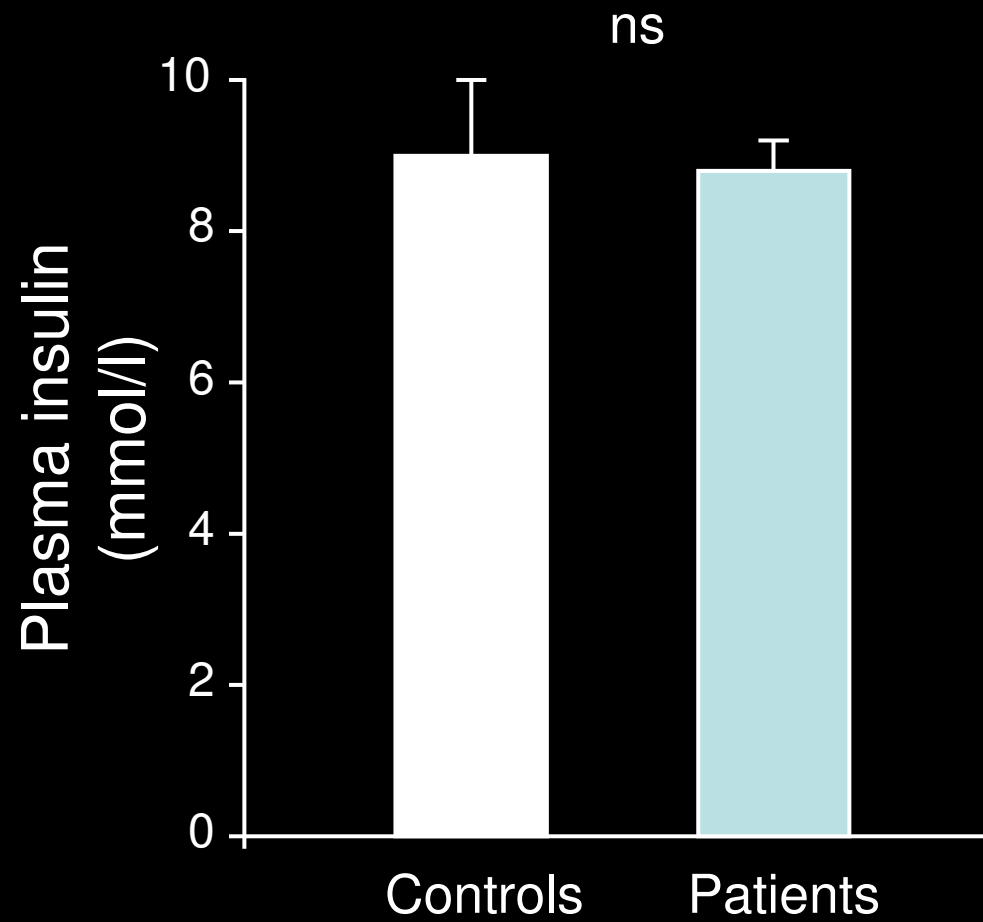
Order to write

1. Figures and tables
2. Results and methods
3. Introduction and discussion
4. Abstract
5. Title

Make clear figures



This is a boring figure



Do's and don't's

- Do use a figure if it will increase the impact of your data
- Do use the same format for all figures
- Do start with control (on left, first in key)
- Don't repeat same data in separate panels
- Don't repeat data already published

Do spend a lot of time on figures

- Create a good impression
- Increase the impact
- Improve the readability

Figure legends

- Brief title
 - Figure 1. Lack of water reduces growth of sunflowers.
- Describe all panels, clearly
- Minimize experimental detail and discussion
- Include statistical information
 - Data are mean \pm sd; n = 5; *p<0.05

Tables

- Don't include too much data
- What is required to tell your story
- Use to avoid lots of data written out in main text

Don't compare data by rows

	No.	Age, years	Body weight, kg	Height, m
Control	98	54.1±10.7	72.8±7.8	1.6±0.1
Patients	101	63.9±15.0	85.6±10.4	1.8±0.1

Table 1. Characteristics of the control and patient groups

Characteristic	Control	Patients
No. of subjects	98	101
Age, years	54.1±10.7	63.9±15.0
Body weight, kg	72.8±7.8	85.6±10.4
Height, m	1.60±0.08	1.83±0.12*

*p<0.01 versus control

define any symbols

consistent no. of digits

units

1st

Citing figures and tables

- Refer to ALL the figure panels and tables in sequential order
- Aim for one figure per subsection
- Mainly cited in results, sometimes methods, avoid in discussion
- Don't repeat data from figures and tables in the main text

Results

- Limit interpretation – save this for the discussion
- Use subheadings to summarize results
 - state key finding
 - orientate the reader
- Present most important changes first in each section

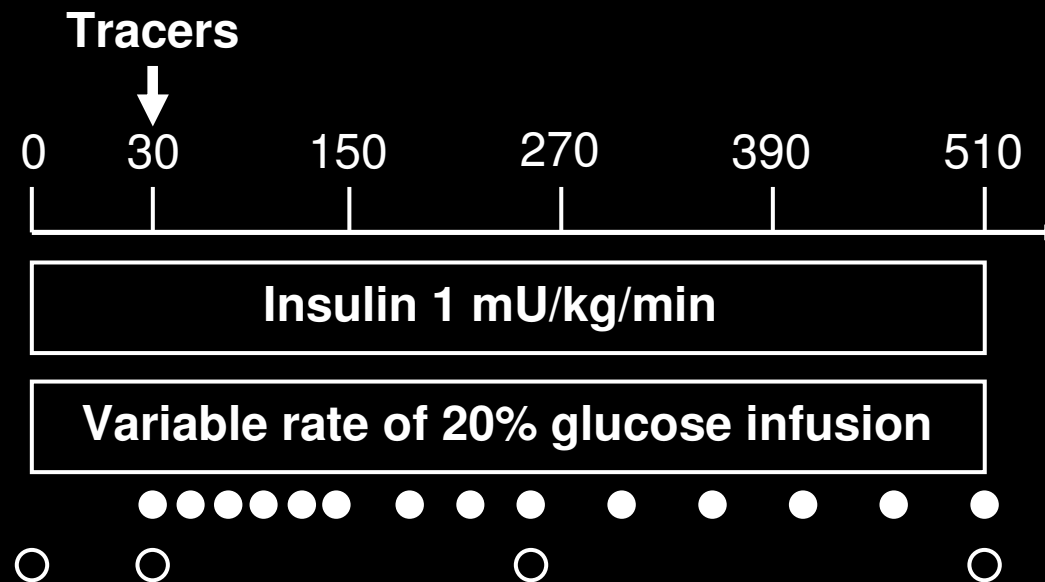
Don't overinterpret your results

- Correlations
- Non-significant changes
- Appropriate statistical tests
- Compare with control
- Reviewers will jump on overinterpretation

Methods

- Write in parallel with results
- Sufficient information to allow another scientist to repeat your experiment
- Don't need to reproduce details of a published protocol
 - as previously described (Ref. 37)

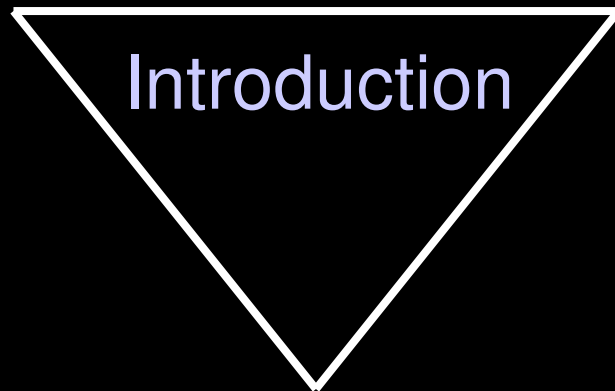
A diagram can help explain a complicated protocol



Methods

- Order logically to match order in results section
- Use subheadings
- Don't put results here - exceptions
- Include ethical considerations and statistical methods

Limit your introduction to three paragraphs

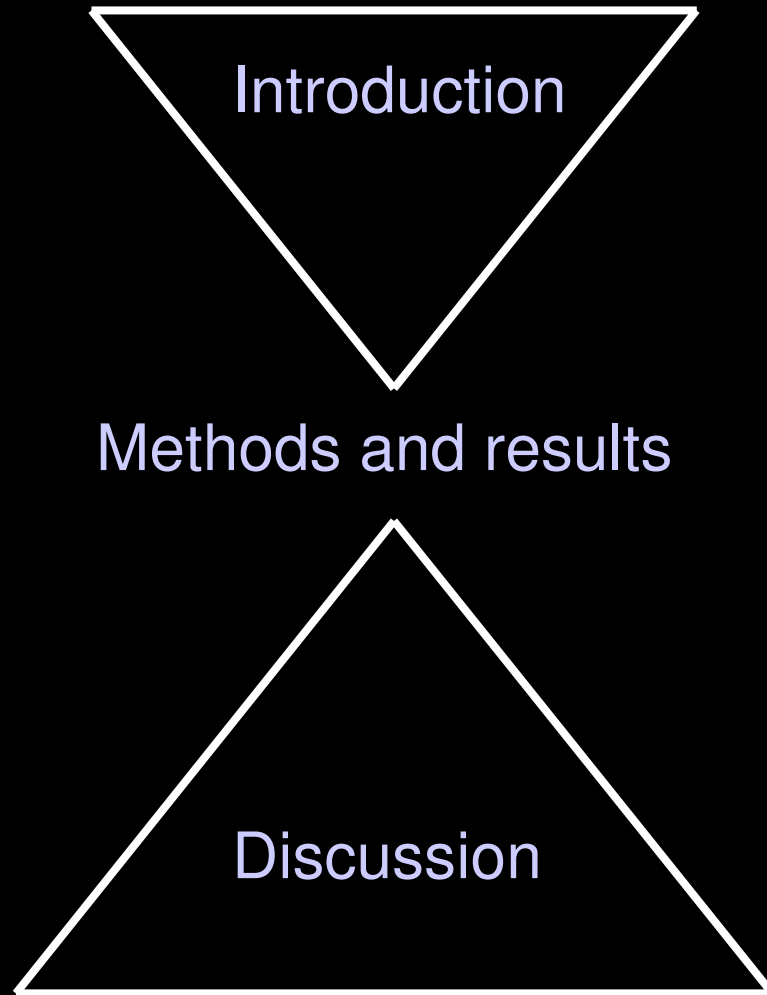


1. Background
not too general
2. Gaps in the knowledge
opens up questions
3. Aim of your study
hypothesis, objectives,
central message

Discussion

- Don't repeat introduction
- First paragraph
 - summary of key findings, central message
- One results subsection per paragraph
- Discuss ALL your results
- Final paragraph
 - implications of your results in general context

Discussion to mirror introduction



Introduction

1. Background
2. Gaps in the knowledge
3. Aim of your study

Methods and results

Discussion

1. Summarize key findings
2. Compare and contrast
3. Limitations
4. Suggestions for further work
5. Conclusion and implications

References

- A reference for every result, idea or quotation taken from another source
- Original primary study not review articles
- Avoid plagiarism: restate author's findings in your own words
- Literature search

Abstract

- A shortened version of the paper
- Write (or rewrite) when you have finished full paper
- Check word count and journal style
- Very important as it will encourage scientists to read the full text

A title should summarize the key message

- Not too technical
- Check word count
- No abbreviations
- Very important as it will encourage scientists to read the abstract
- State what you have shown

Good titles?

Investigation of the effects of low dose aspirin therapy on primary and secondary prevention of cardiovascular disease

Cyclooxygenase-2 controls energy homeostasis in mice by de novo recruitment of brown adipocytes

Metabolic syndrome

Good titles?

The Wnt/beta-catenin pathway is required for the development of leukemia stem cells in acute myelogenous leukemia

Interleukin-6 and interleukin-10 gene polymorphism, endothelial dysfunction, and postoperative prognosis in patients with peripheral arterial disease

Good titles?

The effect of dimerumic acid on LPS-induced downregulation of Mrp2 in the rat

Creation of a bacterial cell controlled by a chemically synthesized genome

First draft

- Plan first
- Write without worrying about grammar
- Remember the central message
- Write the paper in parts
- Leave the first draft for a few days



First draft

- Plan first
- Write without worrying about grammar
- Remember the central message
- Write the paper in parts
- Leave the first draft for a few days
- Read it through

A readable manuscript

- Good structure
- Clear message
- Simple and concise
- Attention to audience

Writing good English

- Clarity
 - essential to get your message across
- Simplicity
 - avoid complicated words
- Brevity
 - female individuals = women
 - in order to =

Use simple terms

Instead of

- Utilize
- Prior to
- Demonstrate
- Due to the fact that
- Sacrifice
- It has long been known that

Write

- Use
- Before
- Show
- Because
- Kill
- I'm too lazy to find the correct reference

Use simple terms

- Prior to sacrifice, the mice were starved overnight
- The mice were killed after an overnight fast

How to keep it short

- Ten patients, six male and four female individuals, with [the disease] were included in the study during acute relapse, and repeated blood sampling was performed after a further 3 months
- Blood samples were taken from six men and four women with [the disease] at acute relapse and 3 months later

Don't ramble

- One thought per sentence
- Avoid sentences with >2 subclauses
- Logical order
 - sentence B follows sentence A...
 - don't assume that the reader knows the missing parts

Paragraphs

- Collect related thoughts into a paragraph
 - not too long
- Don't end a paragraph with first sentence of next paragraph
- Logical order
 - paragraph B follows paragraph A...

Use active verbs

- Active is easier to read
 - he cut the grass
- Passive is very formal
 - the grass was cut by him

Use active verbs

- Food was consumed by the obese mice at a higher rate than their wild-type littermates
- The obese mice ate more than their wild-type littermates

Tense

- Use past tense for results described in your paper
- Use present tense for results from published papers

US vs UK spelling

US spelling

- Color
- Organize
- Characterize
- Analyze
- Advertise

UK spelling

- Colour
- Organise, -ize
- Characterise, -ize
- Analyse
- Advertise

US vs UK spelling

US spelling

- Modeling
- Labeling
- Enrollment
- Anemia
- Fetus
- Feces
- Program

UK spelling

- Modelling
- Labelling
- Enrolment
- Anaemia
- Foetus
- Faeces
- Program(me)

Abbreviations

- Limit abbreviations
- Don't define standard abbreviations
 - DNA, h, min
- Define all others at first mention
- Check abbreviation is used again
- Space between number and unit
 - 36 h, 35 nmol/l
 - exceptions: 53%, 34 °C

Common word errors

- Data are plural
- Compare with: to examine differences and similarities
 - almost always what you should use in scientific writing
- Compare to: to liken to without analysis
 - 'shall I compare thee to a summer's day'

Spelling

- Misspellings reflect careless attitude
- Spellcheckers will not spot all your mistakes
 - treating the mouse as a hole
 - were or where
 - pier review
 - witch or which
 - personal or personnel



Human studies

- Don't use man (unless you mean man), use human
- Be sensitive
 - avoid use of diabetics, asthmatics
- Use who/whom not that/which when referring to people
 - ...in ten subjects from which we had sufficient amounts of RNA...

Style for references

- Follow journal style
- Use Endnote, but check in journal

1. Author, A.B. *et al.* *J. Biol. Chem.*
44:760–777.

Is volume
no. bold?

En dash or hyphen
for page range?

How many authors
before *et al.* is used?

Use correct
abbreviation

Before you submit

- Check Instructions to Authors
- Check figures and tables cited
- Optimal use of subheadings
- Check facts
- Check references, no., accuracy, style
- Check language and spelling (US or UK?)
- Ask someone else to read through

Summary

- Tell a story
- Good structure
- Central message
- Clear, concise and consistent
- Think about your audience
- Revision is essential
- It takes a lot more time than you think



How to Prepare an Oral Presentation

Overview

- How to get your message across
 - Group exercise
- Use of PowerPoint
 - Can your audience read every slide?
 - Can your audience understand every slide?

How to get your
message across

How to get your message across

- A talk is not a paper
- Avoid linear argument that builds towards conclusion
- Be repetitive, adding layers as you go

How to get your message across

- Say what you are going to say
- Say it
- Summarize what you said

Say what you are going to say

- Descriptive title
- Overview of the whole talk
- Background, key questions
- Conclusion

Say it

- Brief methods, highlight novel parts
- Results
- Conclusions
- Repeat for each topic

Summarize what you said

- Overall summary
- Repeat important ideas throughout the talk
- What does it all mean?

How to get your message across

- One powerful take-home message
- Aim level to suit audience
- "Röd tråd"
- Engage your audience

Group exercise: oral presentation

- Prepare a short presentation
- Topic of your choice
- Audience of your choice
- One person present
- Length max 5 min



Overview

- How to get your message across
 - Say, what you are going to say, say it, summarize what you said
 - One take-home message
- Use of PowerPoint
 - Can your audience read every slide?
 - Can your audience understand every slide?

Using PowerPoint to help get your message across

- Limit number of slides <1 per minute
- 7-by-7 rule
- Avoid small fonts and many figure panels
- Use as a support

Summary cartoon

- Useful if audience unfamiliar with complex concepts
- Keep returning to same basic figure with additions
- Introduce hypothesis
- Explain intermediate stages
- Summarize findings

Can your audience
read your slides?

Gradients can make it hard to read
some of the text

Text at the bottom is easy to read

Background/colours

- Light text on dark background easy to read
- Dark text on light background can be used
- Use contrasting colours

yellow

white

yellow

pink

violet

blue

Avoid red and green

- Over 10% Scandinavian males red/green colourblind
- Certain ranges hard to distinguish
- Can't interpret micrographs presented in green and red
- Red on black does not contrast well

Avoid red and green



non colour blind



red cone cells
defective



green cone cells
defective

Source: Okabe and Ito

Fonts

- Use sans serif fonts: cleaner, modern
- Don't mix fonts randomly
- Ideally 30 pt text, 40 pt title
- Don't go below 24 pt
 - 12 pt is too small to read
- **AVOID CAPITAL LETTERS:** hard to read and proofread
- Avoid underlining for emphasis

7-by-7 rule

- Don't use too many words - bullet points not complete sentences
- Maximum 7 words per line
- Maximum 7 lines

If there is too much text in the title or on the slide, then it is hard to read and understand

- If I write down everything I want to say on the slide, some of the audience will try to read what is on the slide
- To give them time to read, I will have to read out everything that I have written, as otherwise they will miss a key point that I may be trying to make somewhere in this slide
- Others will be deterred from reading anything on the slide
- I will also have to use too small a font, and the people sitting at the back will not be able to read it
- This font size is 18 pt. Don't go below 24 pt unless absolutely necessary. If you want to say this much, use more slides
- A slide with this much text on is an indication of the author not preparing their slides properly. It is always possible to go back to the text and take out unnecessary words
- If you try to make too many points on one slide, you won't get your message across
- If you've read this far, then you probably haven't heard a word that I'm saying

Should I use animations?

- Do they help?
- Or are they just a distraction?
- Is my message clearer if I spin it around?
- Is this the last bullet?
- Or was it this one?
- Oh no it wasn't!

Avoid overdoing anything

- Background/colours
- Animations
- Fonts
- Text
- Use slide master

Can your audience
understand your slides?

Can your audience understand your slides?

- Aim for simplicity
- Less detail can be presented orally than in written form
- Avoid making slides with tables and figures taken directly from your manuscript

Can your audience understand your slides?

- Every slide should have a title
- Limit abbreviations
- Avoid showing data that you are not going to talk about

Tables

- Useful for a small amount of data
- Not useful if impossible to read
- Don't use if you need to say, I know you can't read this but...

Table 2. Results of studied variables and its changes among the time-window from 1995 to 2007

Year	Number of Surgeries	Number of surgeries/1,000 inhabitants	Total in-hospital expenses (U\$)	Blood transfusion cost (U\$)	Length of stay (days)	Mortality
1995	2,374,785	14.95	430,863,966.29	4,854,739.24	4.36	1.35%
1996	2,240,815	13.89	437,971,979.33	4,770,430.97	4.46	1.46%
1997	2,152,741	13.14	434,812,544.63	5,153,020.23	4.37	1.53%
1998	2,205,637	13.27	520,001,042.93	6,263,305.91	4.34	1.54%
1999	2,359,313	13.98	674,983,936.25	7,274,983.84	4.31	1.57%
2000	2,505,951	14.63	698,072,190.81	7,591,026.47	4.07	1.53%
2001	2,412,859	13.88	731,001,821.51	7,805,656.50	4.16	1.61%
2002	2,578,830	14.63	824,119,175.40	7,809,363.30	4.12	1.58%
2003	2,672,604	14.95	936,352,419.05	7,743,472.55	4.06	1.65%
2004	2,748,461	15.18	1,063,584,652.73	9,036,363.77	3.99	1.68%
2005	2,750,971	15.00	1,140,509,016.19	10,375,029.49	3.91	1.78%
2006	2,796,745	15.07	1,158,672,620.45	9,953,549.40	3.82	1.74%
2007	2,859,801	15.24	1,273,316,507.84	10,140,843.08	3.83	1.77%
Total	32,659,513		10,324,261,873.41	98,771,784.73		

doi:10.1371/journal.pone.0010607.t002

Yu *et al.* Non-Cardiac Surgery in Developing Countries: Epidemiological Aspects and Economical Opportunities – The Case of Brazil *PLoS ONE* 5(5): e10607. doi:10.1371/journal.pone.0010607

Tables

- Tables can be confusing or even too interesting: highlight key point
- Title should summarize result you want to show
- Remember units for all parameters
- Cite reference with minimal information
 - Gordon P et al. JBC 2005
- Copyright?

Height is increased in patients

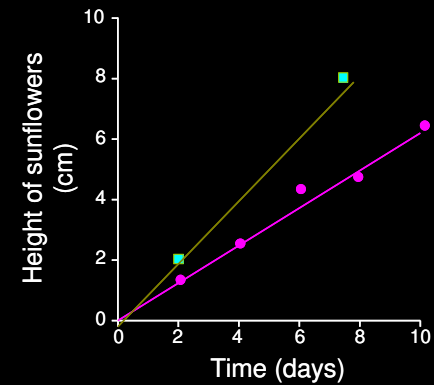
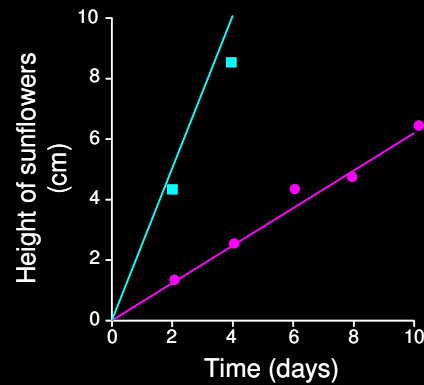
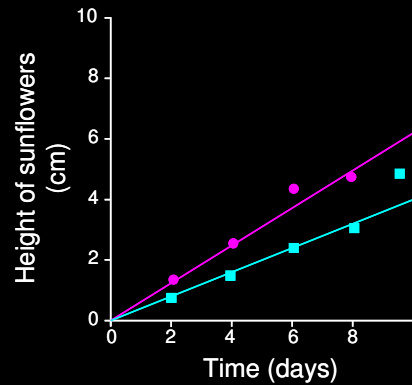
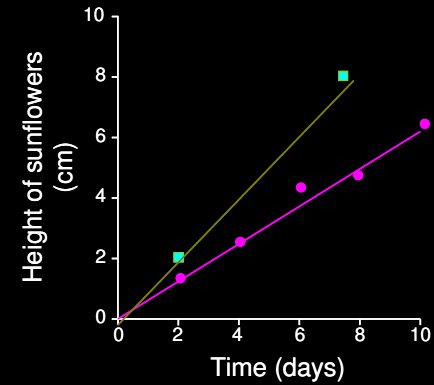
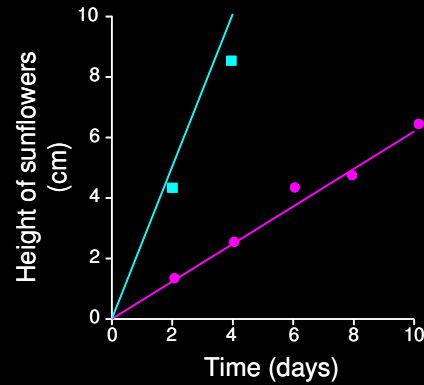
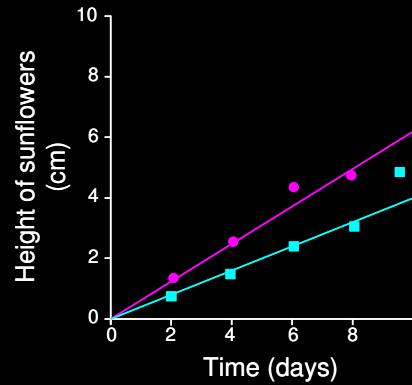
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No. of subjects	98	101
Age, years	54.1±10.7	63.9±15.0
Body weight, kg	72.8±7.8	85.6±10.4
Height, m	1.60±0.08	1.83±0.12*

*p<0.01 versus control

Figures

- Keep simple, max. two panels per slide
- Axes: tickmarks, labels, units
- Use colour, be consistent
- Fill the space effectively
- Cite reference with minimal information
 - Edwards et al. NEJM 2007
- Copyright?

Can you interpret this slide?



Keep text horizontal

It is hard to read
vertical text

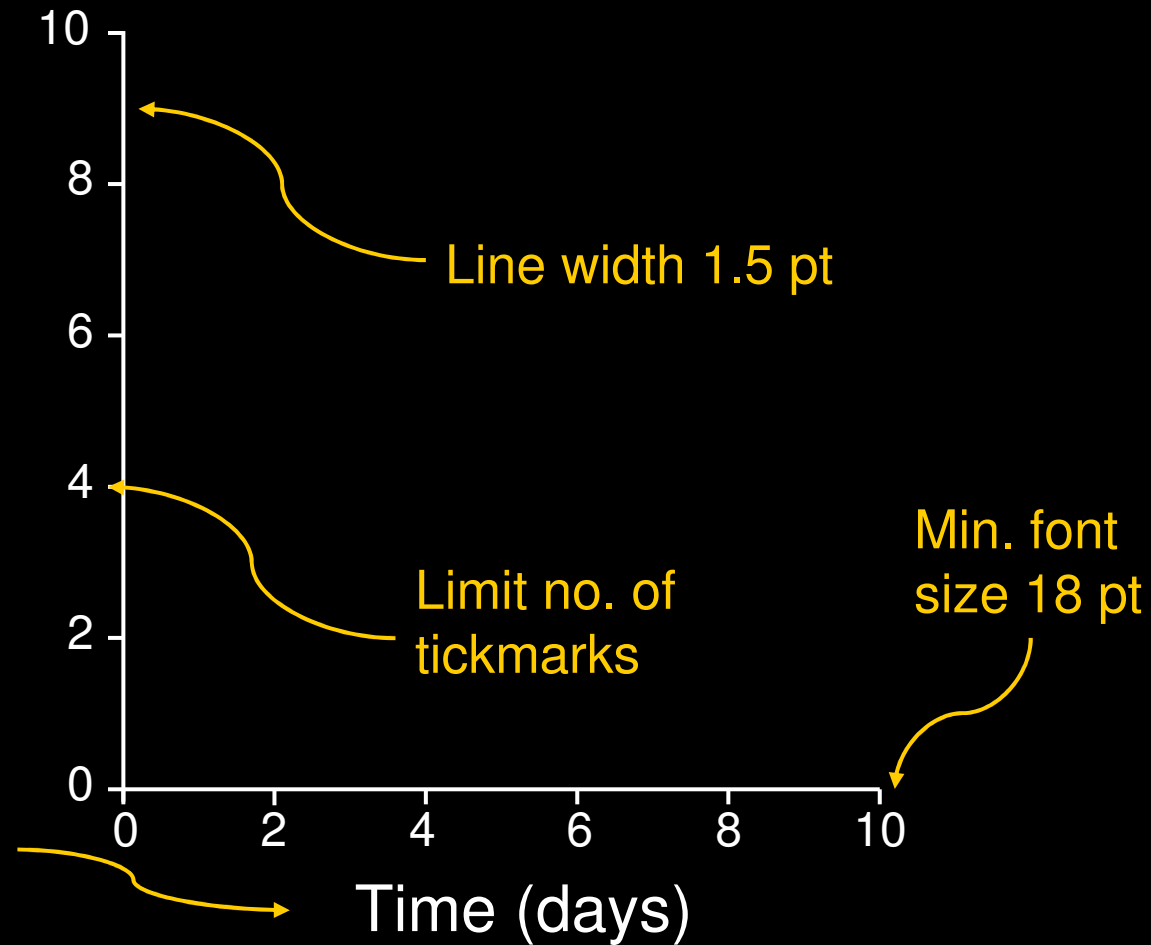
Or text at other
strange angles

Figure axes

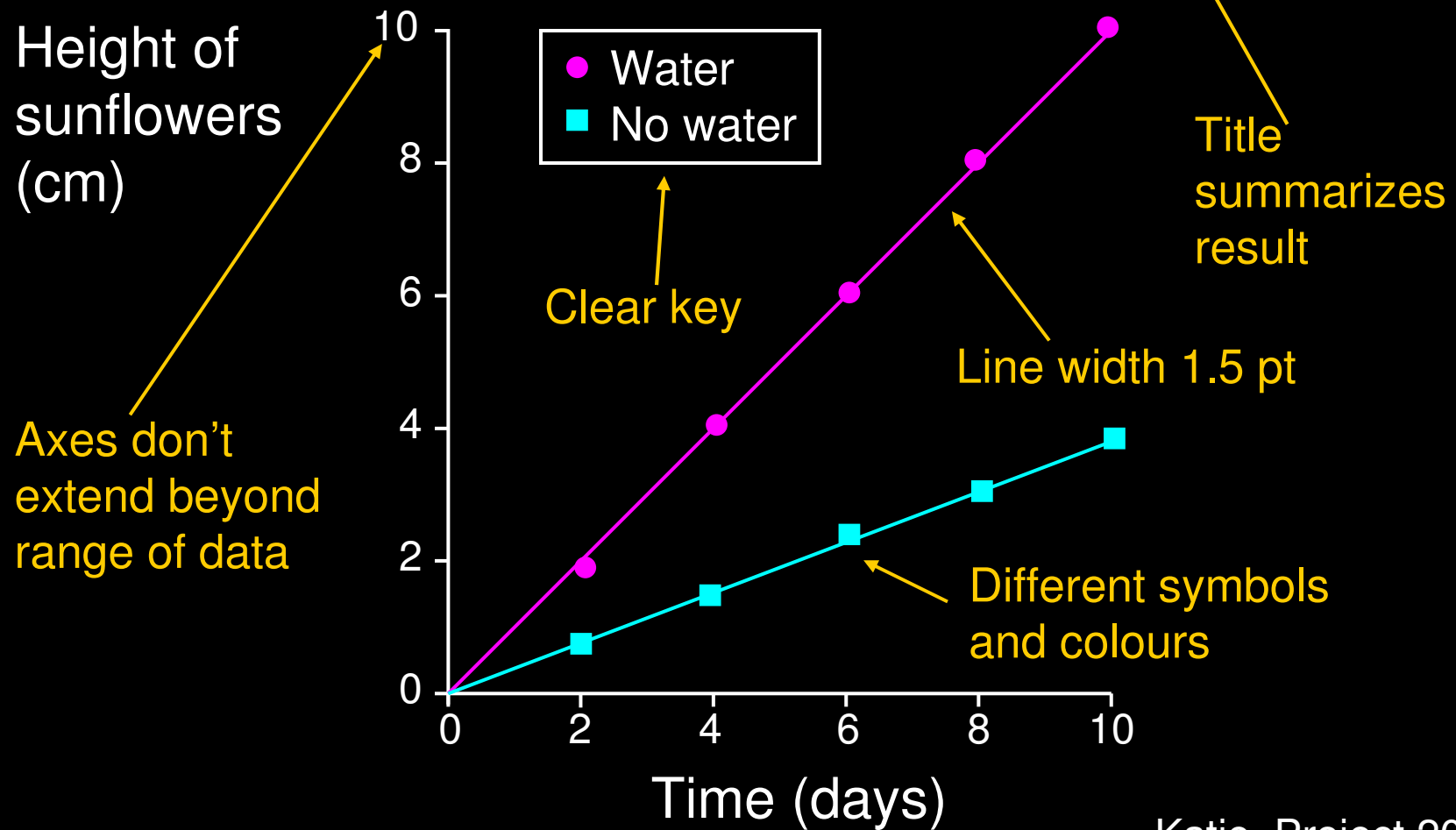
Height of
sunflowers
(cm)

Horizontal
y-axis label

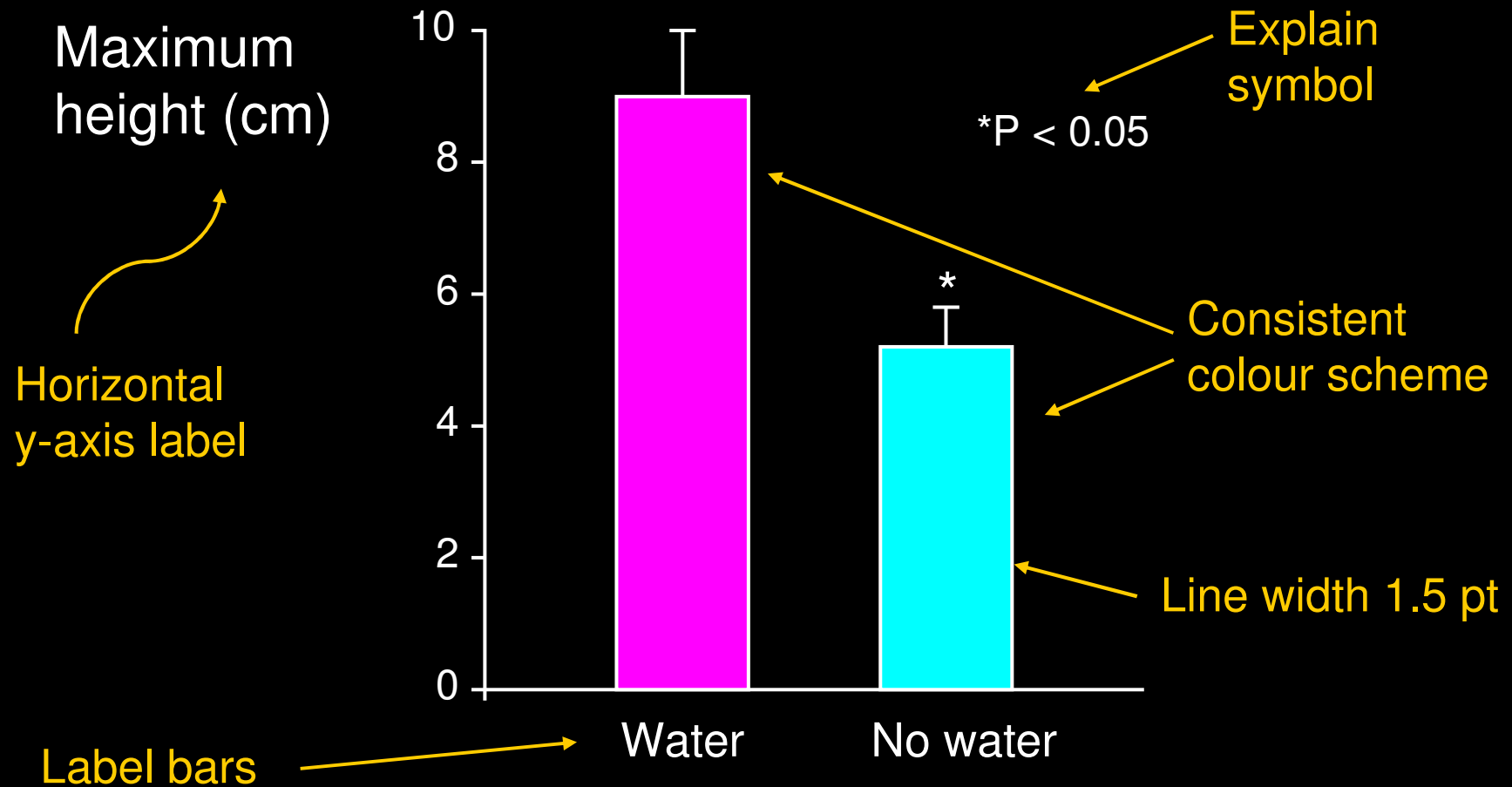
Label axes and
include units



Lack of water reduces growth of sunflowers



Lack of water reduces maximum height of sunflowers



Using figures and tables

- First explain axes on graphs or columns and rows in tables
- Then point out trends or differences
- Interpret meaning after each figure or table
- Remember, a talk is not a paper

Summary of PowerPoint

- Arial, Times New Roman, other fonts?
- CAPITAL LETTERS?
- Smallest font size?
- Underlining?
- How many rows, words per row?
 - Right justify text?

Summary of oral presentation

- Clear take-home message
- Repetition is important
- Revise and simplify your talk
- Allow time for preparation and practice

Allow time for preparation

”It usually takes more than three weeks to prepare a good impromptu speech”

Mark Twain (1835-1910)



How to Write a Poster

Attract people's interest

- Advertisement for your research
- A clear title/message
- Use colourful pictures
- Bullet points rather than blocks of text
- Less detail than in a paper

Attention to audience

- Logical structure
- Clear, concise and consistent message
- Two types of reader
 - browser - brief look from a distance
 - ingestor - reads every word

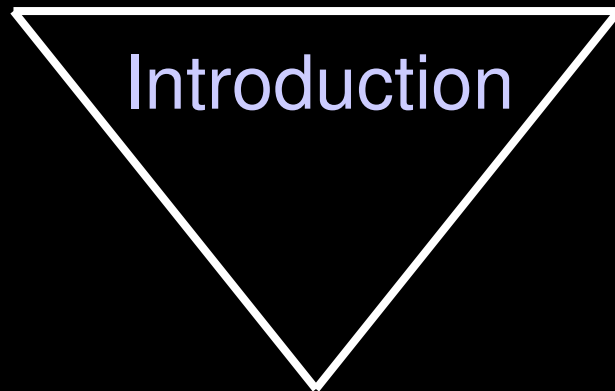
Planning

- Key points/main message
- Outline
- Follow the given instructions
- Take your time

Tell a story

- Why did you do these experiments?
- How did you do the experiments?
- What did you find out?
- What is the significance of the results?

Limit your introduction to three bullet points



1. Background
2. Gaps in the knowledge
3. Aim of your study

Keep methods short

- Be brief, and use diagrams
- Remember, you want people to ask you questions
- Could use paragraph text, not bullets, to save space
- Include methods in figure legends

Present your results in the most attractive way

- Use mostly figures
- Not too complex and use colours
- Brief text to guide the reader through the figures
- Separate figures with lots of white space

Tables and graphs

- 3D?
- Line width
- Colours
- Show all your data?

Figures should be clear

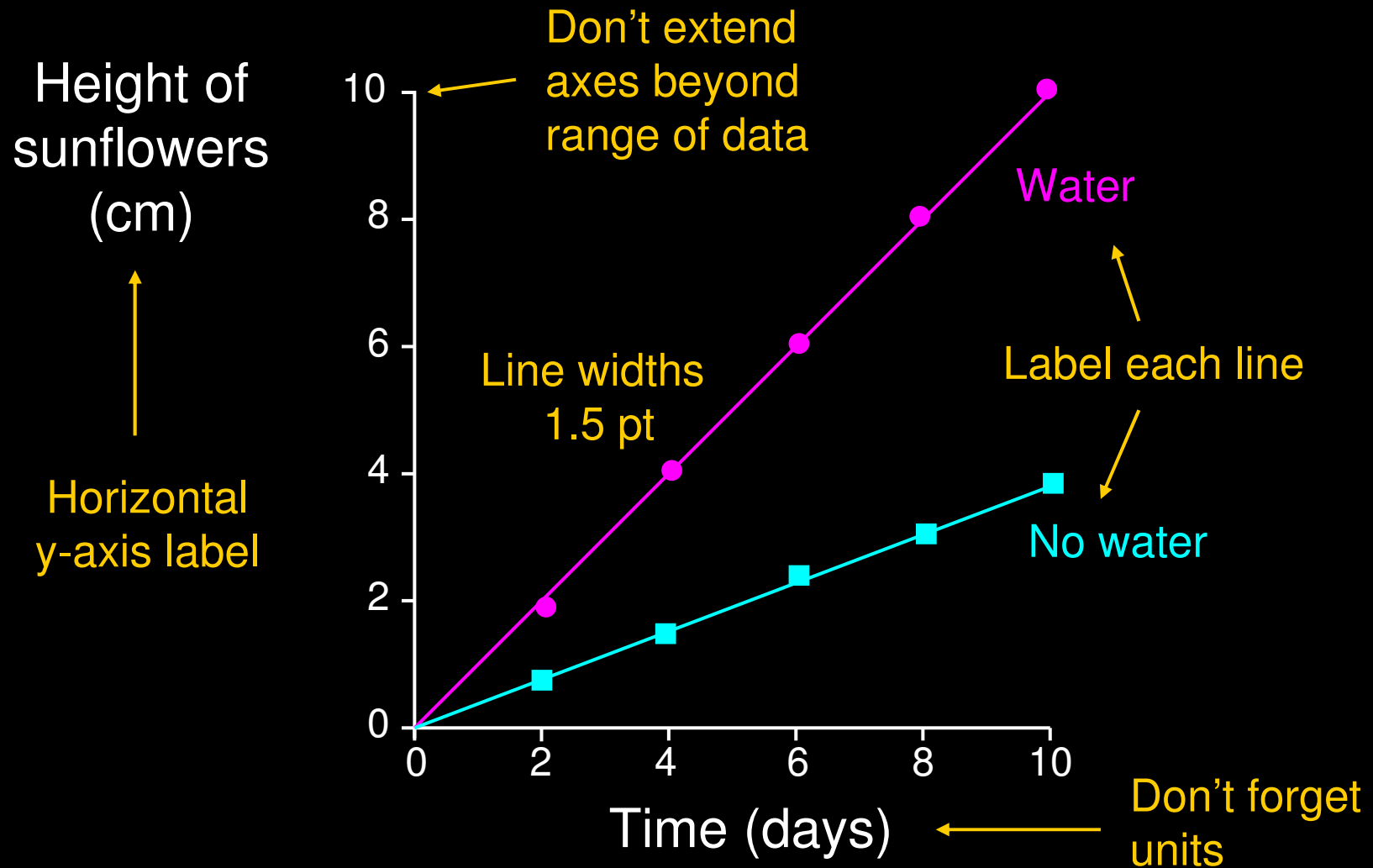


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Characteristic	Control	Patients
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Age, years	54.1±10.7	63.9±15.0
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Height, m	1.60±0.08	1.83±0.12*

*p<0.01 versus control

Conclusions are important

- Position them in a prominent place
- Logical position, not in the middle of results
- What have you *concluded* from your results?
- Refer back to the aim of your study

References

- Limit number of references
- Use a smaller font size
- Choose a style and stick to it

1. Author, X.Y. et al. *Nature* **45**:33–63.
2. Another, A.B. and Someone E.L. *J. Biol. Chem.* **55**:666–700.

Should I include...?

- Abstract
- Materials
- Discussion

Design hints

Dark text on a pale background
easiest to read for posters

- Don't justify text. This is justified and spaces between words can become too large
- Remember, white space makes it easier to read your poster

Fonts to use

- Use two fonts
 - sans serif font and colour for headings
 - serif font for body text
- Font sizes
 - 72 pt title
 - 36 pt name and address
 - 18 pt body text
 - 16 pt figure legends

Summary

- Advertisement for your research
- Tell a story, but in bullet form
- Be clear, concise and consistent
- Think about your audience
- Revision is essential

Overall summary

- Be organized
- Plan first
- Central message
- Think of your audience

Any questions?
Further thoughts?