

Tips for Writing a Research Abstract and Creating a Research Poster

Kim Siegmund
July 1, 2024

Adapted slides from
Cecilia M. Patino-Sutton MD PhD MeD
<https://profiles.sc-ctsi.org/cecilia.patinosutton>



Goals for today

- Introduce SC CTSI and why I am interested in you!
- Introduce you to some useful resources
 - Writing a scientific abstract
 - Developing a scientific poster
- Go over practical recommendations
- Discuss roadblocks to creating research abstracts and posters

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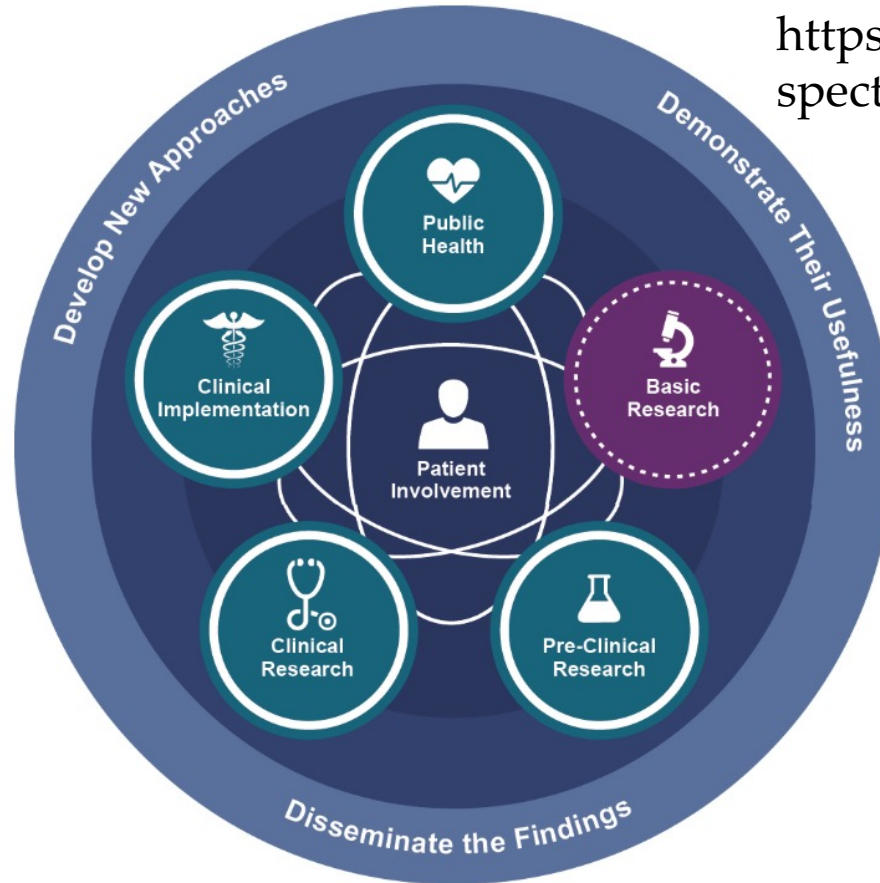
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Why I am Interested in You.....

- I am interested in improving the health of humans by training researchers to conduct high quality, rigorous and reproducible research studies
- High quality research has a better chance of improving the health of individuals
- High quality reporting of research has a better chance of getting buy-in from the health community and thus getting translated to health care decision making.

Why I am Interested in You.....

- As a researcher you will need to write research abstracts and present posters:
 - As part of a research training program
 - When presenting your research at a conference
 - When Applying for a grant
 - When Publishing
- Thus, high quality reporting of research within the context of a research abstract and a poster are of key importance
- The abstract and poster may be the only product that is read by the research community!

Research Abstract: Definition

- It is an abbreviated and structured description of a research study
- Short summary of the completed research

Have you ever written a Research Abstract?

What strategy did you use?

Association of Exercise With Mortality in Adult Survivors of Childhood Cancer

Jessica M. Scott, PhD; Nan Li, PhD; Qi Liu, MSc; Yutaka Yasui, PhD; Wendy Leisenring, ScD; Paul C. Nathan, MD, MSc; Todd Gibson, PhD; Saro H. Armenian, DO, MPH; Tormod S. Nilsen, PhD; Kevin C. Oeffinger, MD; Kirsten K. Ness, PT, PhD; Scott C. Adams, PhD; Leslie L. Robison, PhD; Gregory T. Armstrong, MD, MSc; Lee W. Jones, PhD

IMPORTANCE Adult survivors of childhood cancer are at excess risk for mortality compared with the general population. Whether exercise attenuates this risk is not known.

OBJECTIVE To examine the association between vigorous exercise and change in exercise with mortality in adult survivors of childhood cancer.

DESIGN, SETTING, AND PARTICIPANTS Multicenter cohort analysis among 15 450 adult cancer survivors diagnosed before age 21 years from pediatric tertiary hospitals in the United States and Canada between 1970 and 1999 enrolled in the Childhood Cancer Survivor Study, with follow-up through December 31, 2013.

EXPOSURES Self-reported vigorous exercise in metabolic equivalent task (MET) hours per week. The association between vigorous exercise and change in vigorous exercise and cause-specific mortality was assessed using multivariable piecewise exponential regression analysis to estimate rate ratios.

MAIN OUTCOMES AND MEASURES The primary outcome was all-cause mortality. Secondary end points were cause-specific mortality (recurrence/progression of primary malignant neoplasm and health-related mortality). Outcomes were assessed via the National Death Index.

RESULTS The 15 450 survivors had a median age at interview of 25.9 years (interquartile range [IQR], 9.5 years) and were 52.8% male. During a median follow-up of 9.6 years (IQR, 15.5 years), 1063 deaths (811 health-related, 120 recurrence/progression of primary cancer, 132 external/unknown causes) were documented. At 15 years, the cumulative incidence of all-cause mortality was 11.7% (95% CI, 10.6%-12.8%) for those who exercised 0 MET-h/wk, 8.6% (95% CI, 7.4%-9.7%) for 3 to 6 MET-h/wk, 7.4% (95% CI, 6.2%-8.6%) for 9 to 12 MET-h/wk, and 8.0% (95% CI, 6.5%-9.5%) for 15 to 21 MET-h/wk ($P < .001$). There was a significant inverse association across quartiles of exercise and all-cause mortality after adjusting for chronic health conditions and treatment exposures ($P = .02$ for trend). Among a subset of 5689 survivors, increased exercise (mean [SD], 7.9 [4.4] MET-h/wk) over an 8-year period was associated with a 40% reduction in all-cause mortality rate compared with maintenance of low exercise (rate ratio, 0.60; 95% CI, 0.44-0.82; $P = .001$).

CONCLUSIONS AND RELEVANCE Vigorous exercise in early adulthood and increased exercise over 8 years was associated with lower risk of mortality in adult survivors of childhood cancer.

This is a study about association between and exposure and an outcome.

What other types of studies are there?

The sections of the abstract can vary based on the type of study it is about.

Development and Validation of a Clinical Risk Score to Predict the Occurrence of Critical Illness in Hospitalized Patients With COVID-19

Wenhua Liang, MD; Hengrui Liang, MD; Limin Ou, MD; Binfeng Chen, MD; Allan Chen, MD; Caichen Li, MD; Yimin Li, MD; Weijie Guan, MD; Ling Sang, MD; Jiatao Lu, MD; Yuanda Xu, MD; Guoqiang Chen, MD; Haiyan Guo, MD; Jun Guo, MD; Zisheng Chen, MD; Yi Zhao, MD; Shiyue Li, MD; Nuofu Zhang, MD; Nanshan Zhong, MD; Jianxing He, MD; for the China Medical Treatment Expert Group for COVID-19

IMPORTANCE Early identification of patients with novel coronavirus disease 2019 (COVID-19) who may develop critical illness is of great importance and may aid in delivering proper treatment and optimizing use of resources.

OBJECTIVE To develop and validate a clinical score at hospital admission for predicting which patients with COVID-19 will develop critical illness based on a nationwide cohort in China.

DESIGN, SETTING, AND PARTICIPANTS Collaborating with the National Health Commission of China, we established a retrospective cohort of patients with COVID-19 from 575 hospitals in 31 provincial administrative regions as of January 31, 2020. Epidemiological, clinical, laboratory, and imaging variables ascertained at hospital admission were screened using Least Absolute Shrinkage and Selection Operator (LASSO) and logistic regression to construct a predictive risk score (COVID-GRAM). The score provides an estimate of the risk that a hospitalized patient with COVID-19 will develop critical illness. Accuracy of the score was measured by the area under the receiver operating characteristic curve (AUC). Data from 4 additional cohorts in China hospitalized with COVID-19 were used to validate the score. Data were analyzed between February 20, 2020 and March 17, 2020.

MAIN OUTCOMES AND MEASURES Among patients with COVID-19 admitted to the hospital, critical illness was defined as the composite measure of admission to the intensive care unit, invasive ventilation, or death.

RESULTS The development cohort included 1590 patients; the mean (SD) age of patients in the cohort was 48.9 (15.7) years; 904 (57.3%) were men. The validation cohort included 710 patients with a mean (SD) age of 48.2 (15.2) years, and 382 (53.8%) were men and 172 (24.2%). From 72 potential predictors, 10 variables were independent predictive factors and were included in the risk score: chest radiographic abnormality (OR, 3.39; 95% CI, 2.14-5.38), age (OR, 1.03; 95% CI, 1.01-1.05), hemoptysis (OR, 4.53; 95% CI, 1.36-15.15), dyspnea (OR, 1.88; 95% CI, 1.18-3.01), unconsciousness (OR, 4.71; 95% CI, 1.39-15.98), number of comorbidities (OR, 1.60; 95% CI, 1.27-2.00), cancer history (OR, 4.07; 95% CI, 1.23-13.43), neutrophil-to-lymphocyte ratio (OR, 1.06; 95% CI, 1.02-1.10), lactate dehydrogenase (OR, 1.002; 95% CI, 1.001-1.004) and direct bilirubin (OR, 1.15; 95% CI, 1.06-1.24). The mean AUC in the development cohort was 0.88 (95% CI, 0.85-0.91) and the AUC in the validation cohort was 0.88 (95% CI, 0.84-0.93). The score has been translated into an online risk calculator that is freely available to the public (<http://118.126.104.170/>)

CONCLUSIONS AND RELEVANCE In this study, a risk score based on characteristics of COVID-19 patients at the time of admission to the hospital was developed that may help predict a patient's risk of developing critical illness.

 Supplemental content

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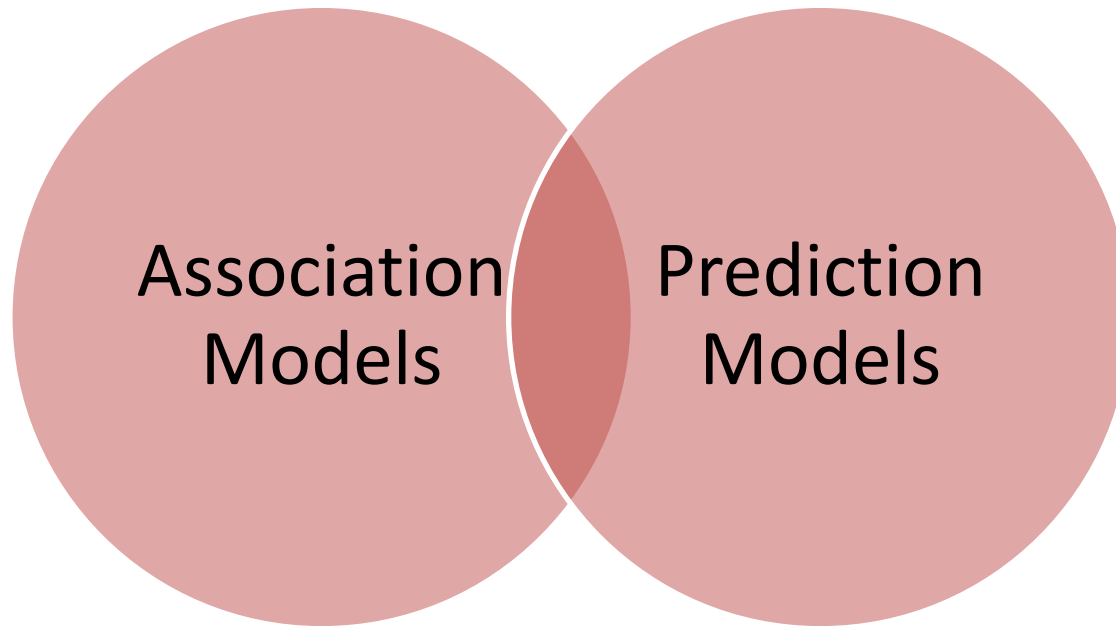
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Author Affiliations: Author affiliations are listed at the end of this article.

Group Information: a complete list of the members of the China Medical Treatment Expert Group for COVID-19 appears at the end of this article.

What other types of study designs are there?



The structure and information of an abstract will depend on the study design of the research.

A tool to help you write a
rigorous abstract for your study.



Enhancing the QUALity and
Transparency Of health Research

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What is a reporting guideline?



J Bras Pneumol. 2021;47(1):e20210057
https://dx.doi.org/10.36414/1806-3756/e20210057

CONTINUING EDUCATION:
SCIENTIFIC METHODOLOGY



Reporting guidelines: essential tools for manuscript writing in medical research

Juliana Carvalho Ferreira^{1,2}, Cecília M Patino^{1,3}

PRACTICAL SCENARIO

Researchers conducted a prospective cohort study and evaluated mechanical ventilator waveforms to calculate the incidence of patient-ventilator asynchrony⁽¹⁾ among 103 patients admitted to the ICU of a university hospital in São Paulo, Brazil. They reported that a high incidence of asynchrony was associated with increased weaning failure, but not with mortality. The publication of the study results was written following the Strengthening of Reporting of Observational studies in Epidemiology (STROBE) reporting guidelines.⁽²⁾

WHAT ARE REPORTING GUIDELINES?

Reporting guidelines are tools that guide authors who are writing a scientific paper on specific study items to be reported to increase the research rigor, reproducibility, transparency, and acceptance of the study results and conclusions by the scientific community. Reporting guidelines typically describe the development process and provide researchers with a checklist of recommended items to be reported according to each study design. The checklist is very helpful because it provides authors with a framework that is easy to follow and useful when designing the whole research project: from study protocol development to study implementation, data analysis, and manuscript writing.

Reporting guidelines are specific to each study design (Table 1). The most commonly used reporting guidelines are those developed by the Enhancing the QUALITY and Transparency of health Research (EQUATOR) Network, a global initiative that seeks to improve the reporting quality of published health research globally.⁽³⁾ The most widely known EQUATOR guidelines are CONSORT Standards for Reporting Trials (CONSORT) for randomized clinical trials (RCTs) and STROBE for observational studies. Several guidelines share particular items, including the study design in the manuscript title and the participant flow diagram, which informs how many individuals were screened for eligibility, how many were excluded, and why. Other recommended items are specific to each type of study design (e.g., the type of randomization procedure used in RCTs within the CONSORT guideline).

WHY ARE REPORTING GUIDELINES IMPORTANT?

Using reporting guidelines ensures that authors report all critical components of a research study, which helps the reader clearly understand all relevant aspects of the study. This is essential because when a manuscript conveys accurate and complete study information, procedures can be replicated by other researchers, and results can be included in systematic reviews or used by clinicians to inform clinical decision making. For example, when a manuscript reports the findings of an RCT and fails to report how many potential participants were excluded from the trial, the generalizability and the internal validity of the results could be compromised. Similarly, if the manuscript in our practical scenario⁽¹⁾ failed to report how many participants had been lost during follow-up, readers would be unable to evaluate the risk of bias in that cohort study. Therefore, the results would not be useful for clinical decision making.

The international research community increasingly recognizes that using reporting guidelines improves the quality of research and helps minimize the waste of resources in poorly reported research studies. As a result, most medical journals that have a high impact require that RCTs be written according to CONSORT guidelines, and most observational studies include STROBE flow diagrams.

Table 1. Reporting guidelines for most study designs.

Study design	Reporting guideline
Randomized trials	CONSORT ^a
Observational studies	STROBE ^a
Systematic reviews	PRISMA ^a
Study protocols	SPIRIT, PRISMA-P
Diagnostic/prognostic studies	STARD
Prognostic studies	TRIPOD
Case reports	CARE ^a
Clinical practice guidelines	AGREE, RIGHT
Qualitative research	SRQR, COREQ
Animal preclinical studies	ARRIVE
Quality improvement studies	SQUIRE
Economic evaluations	CHEERS

Adapted from Equator Network.⁽³⁾ ^aThese reporting guidelines have extensions (additional versions) that focus on variations of the study design or are specific for abstracts.

It is a tool that guides researcher, when writing scientific papers, on the items that should be included in each sections of the paper, including the ABSTRACT!!!

The items of a reporting guideline will depend on the study design of the study.

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Browse for reporting guidelines by selecting one or more of these drop-downs:

Study type

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conference abstract

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1

[Transparent Reporting of Multivariable Prediction Models in Journal and Conference Abstracts: TRIPOD for Abstracts](#)



2

[STARD for Abstracts: essential items for reporting diagnostic accuracy studies in journal or conference abstracts](#)



3

[Draft STROBE checklist for conference abstracts](#)



4

[PRISMA for Abstracts: Reporting Systematic Reviews in Journal and Conference Abstracts](#)



5

[CONSORT for reporting randomised trials in journal and conference abstracts](#)



Reporting guidelines for main study types

[Randomised trials](#)

[CONSORT](#)

[Extensions](#)

[Observational studies](#)

[STROBE](#)

[Extensions](#)

[Systematic reviews](#)

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[ARRIVE](#)

[Quality improvement studies](#)

[SQUIRE](#)

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[CHEERS](#)

Translations

Some reporting guidelines are also available in languages other than English. Find out more in our [Translations section](#).

We have also translated some of our website pages into other languages:

[EQUATOR resources in Spanish](#)

[EQUATOR resources in Portuguese](#)

[EQUATOR resources in German](#)

STROBE Statement—Items to be included when reporting observational studies in a conference abstract

Item	Recommendation
Title	Indicate the study's design with a commonly used term in the title (e.g cohort, case-control, cross sectional)
Authors	Contact details for the corresponding author
Study design	Description of the study design (e.g cohort, case-control, cross sectional)
Objective	Specific objectives or hypothesis
Methods	
Setting	Description of setting, follow-up dates or dates at which the outcome events occurred or at which the outcomes were present, as well as any points or ranges on other time scales for the outcomes (e.g., prevalence at age 18, 1998-2007).
Participants	<p><i>Cohort study</i>—Give the most important eligibility criteria, and the most important sources and methods of selection of participants. Describe briefly the methods of follow-up</p> <p><i>Case-control study</i>—Give the major eligibility criteria, and the major sources and methods of case ascertainment and control selection</p> <p><i>Cross-sectional study</i>—Give the eligibility criteria, and the major sources and methods of selection of participants</p> <p><i>Cohort study</i>—For matched studies, give matching and number of exposed and unexposed</p> <p><i>Case-control study</i>—For matched studies, give matching criteria and the number of controls per case</p>
Variables	Clearly define primary outcome for this report.
Statistical methods	Describe statistical methods, including those used to control for confounding
Results	
Participants	Report Number of participants at the beginning and end of the study
Main results	<p>Report estimates of associations. If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period</p> <p>Report appropriate measures of variability and uncertainty (e.g., odds ratios with confidence intervals)</p>
Conclusions	General interpretation of study results

[Link to reporting guideline](#)

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CONCLUSIONS AND RELEVANCE Vigorous exercise in early adulthood and increased exercise over 8 years was associated with lower risk of mortality in adult survivors of childhood cancer.

Abstract: Summary and Lessons Learned

- Specific section that you need to write, and format according to the study design
- There are very useful online resources that can guide you (EQUATOR network)
- Title should ALWAYS! include the study design
- Abstracts should catch your audience's attention!
- Using reporting guidelines makes the process of writing more efficient

Have you ever created and presented a Research Poster?

What strategy did you use?

Poster Presentation

Goals

- **Develop skills**
 - Data management and exploration
 - Develop and implement a data analysis plan
 - Summarize the research results
 - Interpret the research results
 - Teamwork
- **Poster development and presentation**
 - Summarize the setup of the study from which the dataset came from
 - Describe the methods used in analyzing the data
 - Describe the main findings from the analysis
 - Describe the conclusions drawn from the main findings

Research Presentation

- 1) Prepare a poster summarizing your goals, methods, and main findings
- 2) Prepare a 4-minute group presentation summarizing your poster
- 3) Record the group presentation on Monday of the final week of the program
- 4) Present at a poster presentation on the last day of the summer program

LA BeST Poster Presentation Guidelines

Each group will produce one poster, on which all group members are expected to contribute. Your poster should include:

1. A descriptive title and a listing of all members of each group along with affiliations - in alphabetical order
2. A summary of the overall setup, methods, data description, main findings, and conclusions from each group project
3. Acknowledgements of funding sources, and individuals/groups that have helped with the conduct of the project and/or preparation of the poster

Poster dimensions:

Poster boards are **landscape format (short and wide)**

Poster dimensions are (24 inches height x 36 inches width)

General Poster Rules

3 min summary of your work

Visual appealing and clear

May be viewed when you aren't present

Repeat main points at least twice

QR code to your lab or personal website



Poster Layout

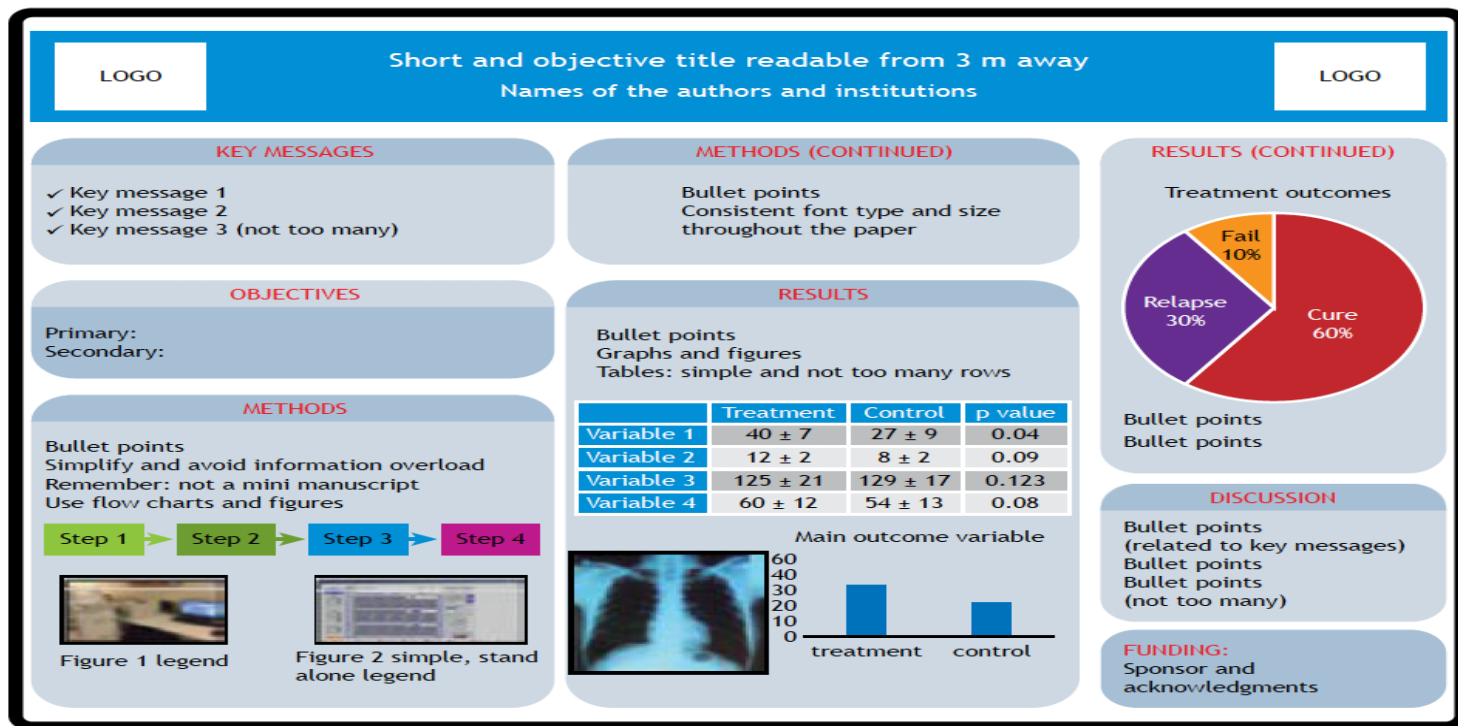
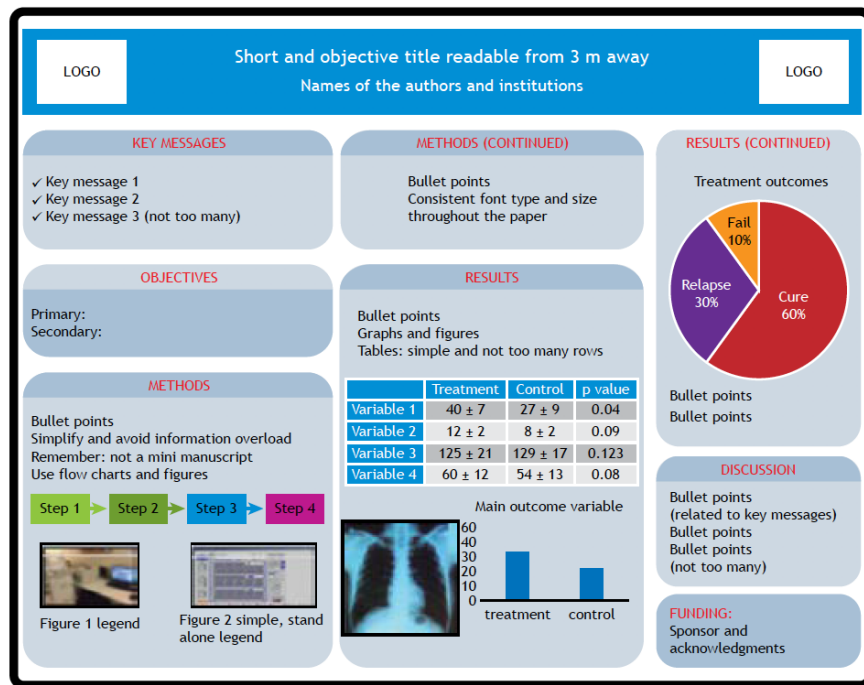


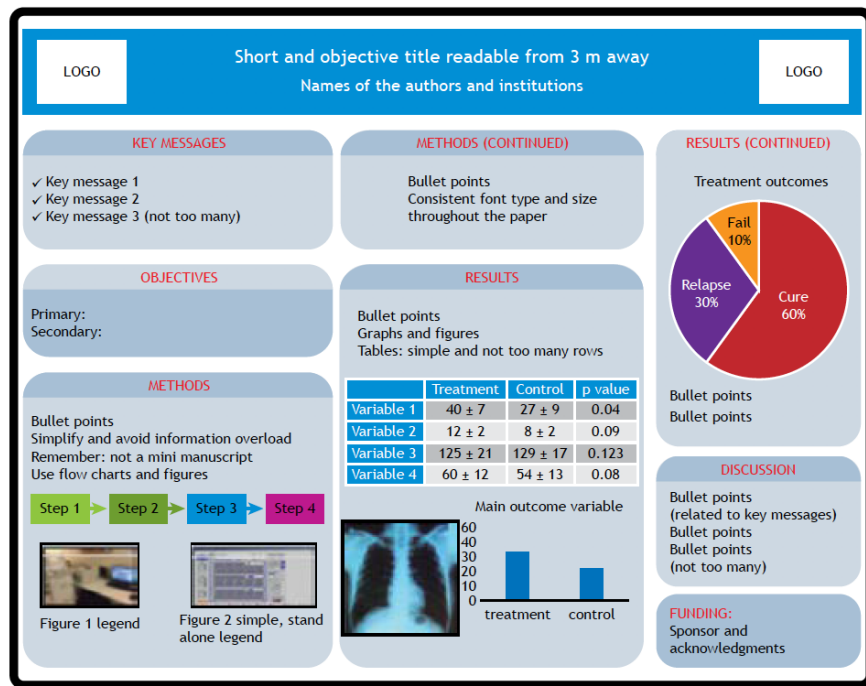
Figure 1. Poster model with examples of headers, figures, graphs, color, and font size.



KEY MESSAGES

- A poster is not a mini manuscript; avoid communicating too much information
- Be mindful of using a small font size that is hard to read from a comfortable distance
- Substitute text for figures and graphs whenever possible
- Practice presenting your poster to your friends and colleagues at least five times
- Be prepared, look and act professionally, and make it worth the effort

LAsBeST@USC Instructions



Prepare poster summarizing

1. Goals
2. Methods
3. Main findings

Things to include:

1. Describe the data
 - summary statistics
 - visualization techniques
2. Fit models
3. Summarize finding using tabular and/or graphical displays
4. Provide interpretation of main findings and final models

Figure 1. Poster model with examples of headers, figures, graphs, color, and font size.

Each Project has a QR code

- Group 1: Environmental Health and the HELIX Project
- Group 2: Benefits and disparities in the transition to EVs in California
- Group 3: Single cell analysis of renal carcinoma
- Group 4: Genetic Analysis of Disease in Diverse Individuals

You have access to a template

USC University of Southern California		Title Author List	LA's BEST @USC
KEY MESSAGES	RESULTS	RESULTS (Cont.)	
OBJECTIVES			
METHODS			
		DISCUSSION	

You are invited to get creative

PRESENTER: **Leeroy** Jenkins

INTRO:

- Who cares? Explain why your study matters in the fastest, most brutal way possible (feel free to add graphics!).

METHODS

- How did you find this?
- Collected [what] from [population]
- How you tested it.
- Illustrate your methods if you can!

RESULTS

- Graph/table with **essential results only**.
- All the other correlations in the ammo bar.

DISCUSSION

- "If this result actually generalized and I didn't have to humbly disclaim the possibility of a thousand confounds and limitations, it would imply that...."

Main finding goes here,
translated into **plain English**.
Emphasize the important words.



Take a picture to
download the full paper

Title:
Subtitle

Leeroy Jenkins, author2,
author3, author4, author5,
author6, author7, author42

AMMO BAR

Delete this and replace it
with your...

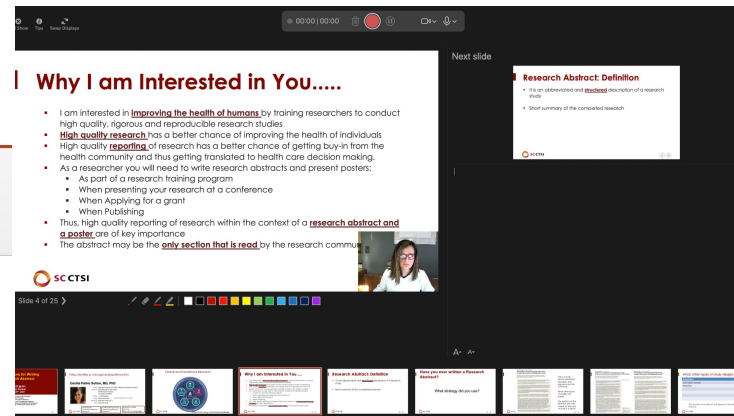
- Extra Graphs
- Extra Correlation tables
- Extra Figures
- Extra nuance that you're worried about leaving out.
- Keep it messy!** This section is just for you.

But keep the
logos and
acknowledgements



Preparing for the Presentation

1. Decide what section each of you will present, but make sure you know all the sections
2. Write out what each one will say, every single word!
3. Practice presenting your section, many times
4. Use PowerPoint capabilities to practice
5. Record your presentation so you can evaluate identify what sections to work on.
e.g., Write out what each one will say using



General Presentation Principles



Communicate, Advertise, Discuss



Clear Research Question



Two Main Points



Visually appealing



Rule of Six

Exercise on Easy Graphics

- First point
- Second point
- Third point
- Fourth point

Step 1: Make a carefully edited list

Exercise on Easy Graphics

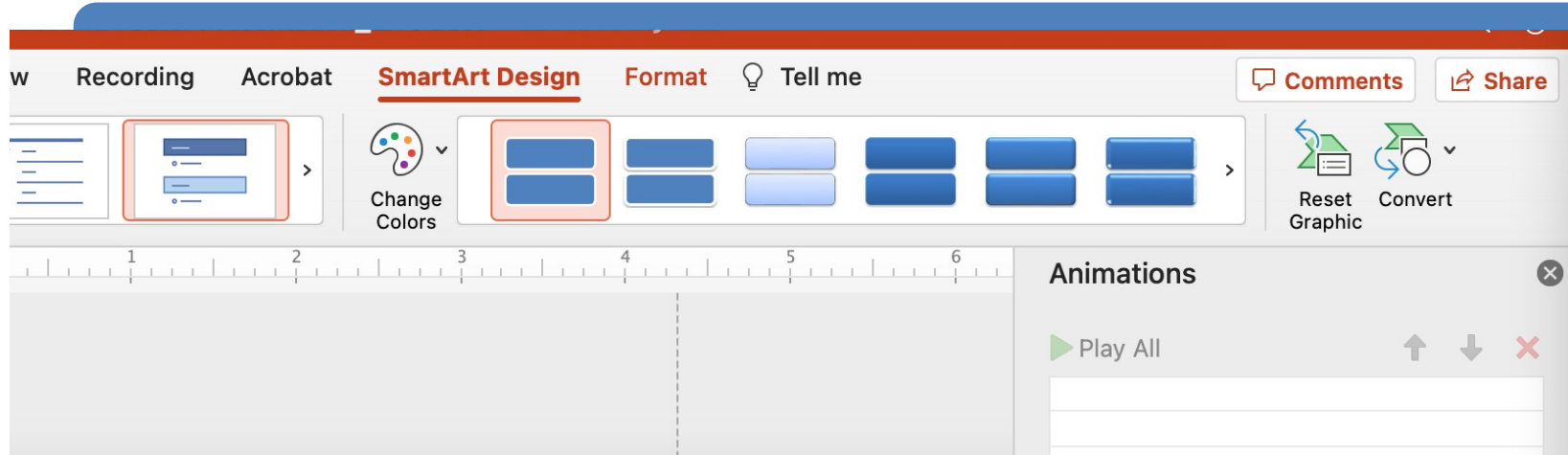
First point

Second point

Third point

Fourth point

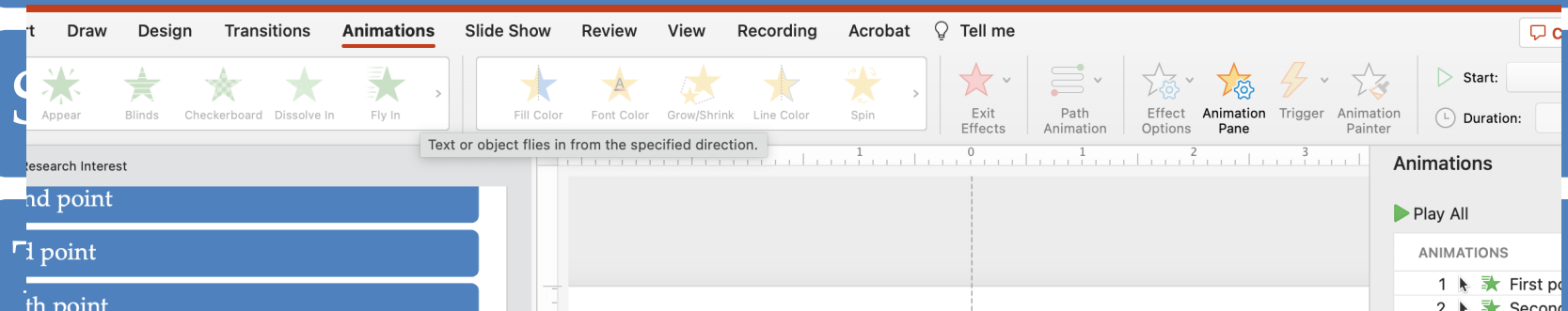
Exercise on Easy Graphics



Fourth point

Exercise on Easy Graphics

First point



Fourth point

Samples from Summer 2023



Let's summarize what we learned

- Posters that are clear and concise do not intimidate the audience
- Practice and write down every word you are going to say. PRACTICE!
- Keep it easy to read, use graphs and tables, avoid word overload
- Take advantage of Powerpoint capabilities

Exercise: Outline your poster

- Objectives:
 - What is the significance to health?
 - Why is your research question important?
 - What is your study's hypothesis?
- Methods:
 - How were participants selected? (Flow diagram, Figure 1)
 - How was the data collected?
 - What variables were collected?
 - Was the data transformed/changed for analysis?
 - What analysis methods did you use?
- Results:
 - Table 1: Describe study population: characteristics important to understand the results? Are they different between exposure groups?
 - What are main results? (Table/Figure 2)
 - What other results are you presenting?
- Discussion
 - What do these results mean compared to other studies?
 - What is new? Why might it be different?
 - What is similar? Does this build confidence?