Tips on Selecting the Right Journal & Writing the Manuscript

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Thursday Topics

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Thank You

- Kim E. Barrett, Chair, American Physiological Society (APS) Publications Committee
- Margaret Reich, APS Director of Publications and Executive Editor
- Dennis Brown, Editor, AJP-Cell; Alberto Najletti, AJP-Heart
- Writing and Presenting Scientific Papers (Birgitta Malmfors, Phil Garnsworthy, Michael Grossman)
- Essentials of Writing Biomedical Research Papers (Mimi Zeiger)
- Jay Piccirillo, MD; Roberto Civitelli, MD
Clear and Concise Scientific Writing
William Faulkner and Ernest Hemingway
“Loving all of it even while he had to hate some of it because he knows now that you don’t love because: you love despite; not for the virtues, but despite the faults.”
“All you have to do is write one true sentence. Write the truest sentence that you know.”
Hemingway: The Journalist

When challenged to write a full story in six words, he responded:

“For Sale: baby shoes, never worn.”

--Courtesy of Jay Piccirillo, MD
Choosing the Right Journal
Key Points to Consider

Before you write your manuscript:

♦ Identify your publishing objective (Rapid Communication? Original Research? Historical Perspective? Case Report?)

♦ Correctly identify the journal that is most likely to publish your work (e.g., using the Journal Citation Index, Editorial Board information and advice from Colleagues)
Key Points to Consider

- Identify placement for the specific audience (e.g., this is known in molecular biology, but you want to submit it to an infectious disease journal)
- Regarding the journal’s impact factor: Don’t necessarily shoot for the top, but don’t settle for the bottom, either.
  - The New England Journal of Medicine rejects up to 80 percent of submissions without review
Journal Impact Factor

Is a measure of the frequency with which the “average article” in a journal has been cited in a particular year and reflects a journal’s relative importance.
AJP-Endocrinology and Metabolism

Cites in 2007 to items published in 2006 = 1268
2005 = 1364
2004 = 2632

Number of items published in 2006 = 335
2005 = 301
2004 = 636

Cites to items 2632 = 4.138
Number of items 636

Impact Factor 2007: 4.138

Courtesy of Terri DuHadway, Elsevier, Inc.
Key Points to Consider

- Check the specific current scope and/or mission statement as to what the journal is publishing.
- Carefully read all of the author guidelines.
- Check for communication from the editor on the journal’s Web page or elsewhere (e.g., editorial).
- Check with your colleagues to see what is pertinent in your area of research.
Key Points to Consider

- What is the turnaround time for review?
- Are pre-submission reviews allowed? If so, how is this accomplished?
- What is the speed to publication in print and online?
- How many readers does the journal have and who are they? (Researchers? Clinicians?)
Key Points to Consider

- What is the journal’s acceptance/rejection rate?
- How does it compare to other journals in your field?
- Is there a recent change in journal leadership? New editors can change the direction of a journal’s content.
Tips for Success

- Know the journal, its editor, and why you submitted your paper there
- Follow the instructions for authors
- Avoid careless spelling, grammar, formatting mistakes
- Make sure references are appropriate and accurate
  - Remember who your reviewers might be!
- Ensure appropriate file format, including figures
  - Is the on-line version the one you want the reviewers to see?
- Confirm receipt of submission
Read the Instructions for Authors, especially those concerning the required figure formats.
Check the merged PDF before sending it for review.
When your paper has been edited for publication, check it again for errors introduced during the copyediting process.
Essential Elements of a Journal Article
Essential Elements of a Journal Article

- Based on what was known and unknown, why did you do the study? (**Introduction**)
- How did you do the study? (**Methods**)
- What did you find? (**Results**)
- What does it mean in the context of the existing body of knowledge? (**Discussion**)
- What scientific literature did you cite to support your arguments? (**References**)
- Graphics to enhance your viewpoint (**Figures/Tables**)
- Supplementary data?
Introduction

❖ Must be compelling, with

♦ A clear statement of the significance of your study,

♦ A sentence or two identifying your Research Question, and

♦ At least five or six key literature citations that will support the reason for your study.
Introduction

Main purposes:

♦ To attract readers (significance)
♦ To tell the reader what to expect
♦ To introduce your research question
Introduction

When citing previous work, it should be written in present tense because just like saying “The Earth is Round,” once something is published, it is fact.
Methods

- Ensure that there is enough detail for someone else to reproduce your experiments.
- This section can be the most difficult to write since you must assume that your reader needs more detail than you may think is necessary to understand what you are talking about.
Methods

- Convert technical thoughts and concepts into words that are understandable and meaningful to the reader.
- Include
  - A clear presentation of the study design and
  - Measurement parameters used to evaluate the purpose of the study.
Tip:

Ask a colleague who has worked with you to read your Methods section to see if he or she can follow the methodology and to see whether you have left anything out. A poorly written Methods section is one reason your paper can be rejected.
Begin the Methods section with an overall description of the study in one or two sentences (e.g., “We performed….”)

Begin each subsection with a sentence of description to orient the reader to the general subtopic (e.g., for Study Population: “Our patient cohort included 100 male Caucasian children, ages 2-4 years.”)
Results

- Write in past tense.
- Write simply and clearly since it is the Results section that constitutes new knowledge to the world.
- Avoid redundancy. Do not repeat information that appears in your figures and tables.
Results

- Should report only the results that are pertinent to the question posed in the Introduction.
- Include results whether or not they support your hypothesis.
- Include both experimental and control group results.
- Include some data, but most data should be reported in figures and tables where the data are highly visible and easy to read. Also in the figures and tables: briefly describe your experimental approach so readers don’t need to return to the Methods section to see what you did.
Results

- Organization of Results section:
  - Should be chronological, in the order in which the experiments were done.

- Length of Results section:
  - Should be brief and as uncluttered as possible.
Discussion

- Open with a few statements about your results to orient the reader to what follows.
- Discussion should not be too long and verbose (avoid speculation).
- Discussion should put your results into context with existing knowledge and emphasize how your work changes/advances the field.
How to Structure the Discussion

- Go back to the questions posed in the Introduction
- Reread the hypotheses and objectives
- Focus on the purpose of the study, the “why”
- Make a list of 4-6 main themes that you would like to address
How to Structure the Discussion

- Start with a short 3-4-statement paragraph summarizing the essential findings.
- If the study objective was to test whether the drug X was safe and effective in treating disease Y in a population Z, then the first statement should directly say that:
  
  The study reported herein demonstrates that estrogen replacement therapy is safe and effective in reducing the incidence of hip fractures in postmenopausal women with osteoporosis.
Writing the Discussion

- Address each of the points of discussion in separate paragraphs
- Give your interpretation of the results in a way that leads the readers to understand the relevance of your findings
- Tell the readers how your results support the conclusions and the significance of the results
- Quote previous work in support of your findings and provide credibility to your claims
Writing the Discussion

- Quote work that does not agree with your findings; directly address and try to honestly interpret points of discordance

- Acknowledge limitations and weaknesses of your study – it will not affect reviewers’ assessment of paper’s value

- Consider using “hedging” verbs when discussing the implications of your work

  - *Our results suggest that estrogen replacement therapy in postmenopausal women might reduce morbidity and health care costs by reducing the number of fractures*
Writing the Discussion

- End the Discussion with a 4-5-statement paragraph summarizing again the main findings and their implications for patient treatment or future research.

- Consider starting the final paragraph with words framing a conclusion:
  - *In summary, our results demonstrate that…*
  - *In conclusion, we provide evidence for a therapeutic effect…*

- Some readers will skip to the end of the Discussion – use the final paragraph to provide your “punch-line”
Conclusion

- What is the take-home message?
- How should the results change the reader’s beliefs or actions?
- “Don’t be a wimp – take a stand”
- Don’t just repeat results one last time
- Offer suggestions for future research
Importance of Title and Abstract

- Articles are listed by title in databases
- Title should attract the interest of the reader
- Should give the “punch-line”
- Most readers will read only the abstract
- Abstract should provide complete information and further attract readers towards the paper
Formulating an Effective Title

- A concise statement written in active form, when possible
- Brief, simple and unambiguous
- A working title can be written at the outset
- The paper’s authors can suggest several titles then revise the title just before the manuscript is submitted.
Formulating an Effective Title

- Indicative titles
  - Tell what the study is about
    - *Comparison of two drug regimens in prevention of cardiovascular mortality*
    - *Morphological characterization of skeletal cells in Cbfa1-deficient mice*
  - More effective for review papers or oral presentations
Formulating an Effective Title

❖ Informative titles

♦ Tell the results of the study

♦ Should include a verb and read as a newspaper headline

♦ Estrogen reduces the risk of hip fractures in postmenopausal women

♦ Osteoprotegerin ligand is a cytokine that regulates osteoclast differentiation
Formulating an Effective Title

- Things to avoid in a title
  - Too many words
  - Abbreviations
  - Inconclusive or ambiguous statements
  - Passive verb form
  - Questions
Examples of Ineffective Titles

- *Changes in C-reactive protein and erythrocyte sedimentation rate during treatment of rheumatoid arthritis and their value for prediction of response to therapy*

  ♦ Wordy, indicative not informative, ambiguous

- Alternative: *Changes in C-reactive protein and erythrocyte sedimentation rate predict response to immunosuppressive therapy in rheumatoid arthritis*
Examples of Ineffective Titles

- A comparative study of the metastable equilibrium solubility behavior of high-crystallinity and low-crystallinity carbonated apatites using pH and solution strontium as independent variables

  - Overlong, indicative not informative, tells about methods not results
The Abstract

- Brief (100-250 words) synopsis of the work
- Should contain enough information to understand the work without reading the paper
- Should be informative, like the title
- Indicative abstracts may be suitable for reviews
The Abstract

- Structured Abstracts
  - Include headings
    - Objective, Background, Methods, Results, Conclusions

- Unstructured Abstracts
  - More common
  - Stand-alone single paragraph describing the entire work
Writing an Effective Abstract

- Draft abstract at the beginning following the outline, revise and finalize after paper is completed
- Lay out an outline of your results
- Start with 1-2 sentences of background
- State your objective in one sentence
- Start describing the results briefly mentioning the methodological approach
- Link findings to one another by a logical thread
Writing an Effective Abstract

- Things to avoid in abstract
  - Too many words
    - Comply with journal word limitation!
  - Too-long introduction
    - Limit to 1-2 statements
  - Too many methodological details
    - Include general approach and models
  - Too many details in results
    - Avoid too many numbers, statistical data, etc.
Example of Good Abstract

N-cadherin acts upstream of VE-cadherin in controlling vascular morphogenesis

Yang Luo and Glenn L. Radice

Center for Research on Reproduction and Women's Health, University of Pennsylvania School of Medicine, Philadelphia, PA 19104

Endothelial cells express two classic cadherins, VE-cadherin and N-cadherin. The importance of VE-cadherin in vascular development is well known; however, the function of N-cadherin in endothelial cells remains poorly understood. Contrary to previous studies, we found that N-cadherin localizes to endothelial cell–cell junctions in addition to its well-known diffusive membrane expression. To investigate the role of N-cadherin in vascular development, N-cadherin was specifically deleted from endothelial cells in mice. Loss of N-cadherin in endothelial cells results in embryonic lethality at mid-gestation due to severe vascular defects. Intriguingly, loss of N-cadherin caused a significant decrease in VE-cadherin and its cytoplasmic binding partner, p120ctn. The down-regulation of both VE-cadherin and p120ctn was confirmed in cultured endothelial cells using small interfering RNA to knock-down N-cadherin. We also show that N-cadherin is important for endothelial cell proliferation and motility. These findings provide a novel paradigm by which N-cadherin regulates angiogenesis, in part, by controlling VE-cadherin expression at the cell membrane.
Abstract. Distal-less-related gene Dlx5 is a bone-inducing transcription factor. Dlx5 deficient mice demonstrated craniofacial abnormalities with delayed ossification of the cranium and abnormal osteogenesis. The objectives of this study were to determine the effect of Dlx5 on regulation of bone matrix protein expression and mineralization in a transgenic model. We have recently generated BSP/TVA transgenic mice in which a 4.9 kb murine bone sialoprotein (BSP) promoter was linked to an avian retroviral receptor gene, TVA. This model can be used to study osteogenic differentiation, gene expression and regulation in vivo. In the current study we infected the 5-day-old BSP/TVA mice with replication competent retroviral vectors expressing Dlx5 (RCAS-Dlx5WT) or mutated Dlx5 (RCAS-Dlx5RH), respectively. The viral constructs were delivered through peritoneal injection. An empty RCAS vector served as a control. Calvarial tissues were harvested 1, 2, 3 and 4 weeks after infection. RT-PCR was performed to determine the expression of matrix proteins. Calvarial cells were also isolated from BSP/TVA mice and cultured with the same viral vectors to evaluate the Dlx5 effect in promoting bone mineralization. Our results showed that BSP, osteopontin (OPN) and alkaline phosphatase (ALP) expression in calvarial bone increased 20% to 62% in average after RCAS-Dlx5 infection but decreased over 20% with the mutated Dlx5 infection. The promoting effect of Dlx5 on osteogenic gene expression diminished 4 weeks after viral infection. Over-expression of Dlx5 in cultured calvarial cells also enhanced BSP expression with a peak level at day 3 and OPN and ALP at day 5, respectively. Dlx5 also accelerated bone mineralization. A two- to three-folds increase in bone nodule formation was seen in the cultured calvarial cells at week 2. In contrast, Dlx5 inhibited the expression of osteocalcin (OCN) significantly both in vivo and in vitro while Dlx5RH increased its expression. We thus concluded that wild type Dlx5 promotes osteogenic differentiation, major bone matrix protein expression and mineralization in this transgenic model. BSP/TVA mice provide an excellent in vivo model for osteogenic studies.
Relationship of Incorrect Dosing of Fibrinolytic Therapy and Clinical Outcomes

Context Incorrect dosing of alteplase has been associated with worse clinical outcomes in patients. However, patients at high risk of adverse events are more prone to dosing errors, thus confounding this relationship.

Objective To determine if the association between incorrect dosing of alteplase and adverse outcomes is related to cause and effect or to confounding.

Design, Setting, and Patients Observational analysis in May 2004 of a double-blind, double-dummy trial of 16,949 patients with ST-segment elevation myocardial infarction who were enrolled in the Assessment of the Safety and Efficacy of a New Thrombolytic (ASSENT-2) trial and were assigned to either a bolus of tenecteplase (with alteplase placebo bolus plus infusion) or a bolus of alteplase (with tenecteplase placebo plus infusion).

Main Outcome Measures Thirty-day mortality, in-hospital stroke, and major bleeding associated with incorrect dosing of active alteplase compared with placebo alteplase.

Results Incorrect dosing occurred in 4.9% of patients who received active alteplase and in 4.6% of patients who received alteplase placebo. Patients receiving incorrect doses of alteplase or alteplase placebo were more likely to be older, female, black, shorter, have lower body weight and systolic blood pressure, and have a higher Killip class at presentation. Thirty-day mortality was higher in patients who received an overdose (9.8%) or undertose (19.5%) of alteplase compared with those who received a correct dose (5.4%). The same pattern was present in patients who received an alteplase placebo (10.0% for overdose, 23.5% for undertose, and 5.4% for correct dose). Similar patterns were seen for in-hospital intracranial hemorrhage and major bleeding. The higher rates of adverse outcomes with incorrect dosing were largely accounted for by adjusting for baseline characteristics.

Conclusions The relationship between incorrect dosing and patient outcome in ASSENT-2 is primarily due to confounding factors rather than incorrect dosing itself. These data highlight the need for caution when ascribing a causal relationship to associations between incorrect dosing and adverse outcomes.

JAMA. 2005;293:1746-1750

www.jama.com
Figures and Tables

- Figures and tables should form a clear sequence that tells the story of the paper.
- Each figure and table will prepare reader for the next figure and table.
- Figures and tables must clearly state what the text states, but not simply be repetitive.
- Use the fewest figures and tables needed to tell the story.
- Do not present the same data in figure and table.
Figure or Table?

If the details matter, use a table instead of a figure, or supplement the figure with details in the text.
Tables
Tables: In General…..

- Tables present facts more compactly.
- They provide side-by-side comparisons of facts.
- Many readers ignore or skim the text of a results section and just look at the tables.
- Even so, do not ignore the text to present all of your data in tables. The tables and text should support each other. Introduce the table in the text with 1-2 sentences.
Table 1. Effect of temperature on growth of oak (*Quercus*) seedlings

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>-50</td>
<td>0</td>
</tr>
<tr>
<td>-40</td>
<td>0</td>
</tr>
<tr>
<td>-30</td>
<td>0</td>
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<tr>
<td>-10</td>
<td>0</td>
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<td>0</td>
<td>0</td>
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<td>10</td>
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<td>20</td>
<td>7</td>
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<tr>
<td>30</td>
<td>8</td>
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<tr>
<td>40</td>
<td>1</td>
</tr>
<tr>
<td>50</td>
<td>0</td>
</tr>
</tbody>
</table>
Table 1. Oxygen requirements of various species of Streptomyces

<table>
<thead>
<tr>
<th>Organism</th>
<th>Growth under aerobic conditions</th>
<th>Growth under anaerobic conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>S. griseus</td>
<td>+</td>
<td>--</td>
</tr>
<tr>
<td>S. Coelicolor</td>
<td>+</td>
<td>--</td>
</tr>
<tr>
<td>S. Nocolor</td>
<td>--</td>
<td>+</td>
</tr>
<tr>
<td>S. Everycolor</td>
<td>+</td>
<td>--</td>
</tr>
<tr>
<td>S. Greenicus</td>
<td>--</td>
<td>+</td>
</tr>
<tr>
<td>S. Rainbowenski</td>
<td>+</td>
<td>--</td>
</tr>
<tr>
<td>This table is not really needed.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Tables

Four main parts of a table:

- Title
- Column headings
- Body
- Footnotes
Table Title

- The table title states the topic or the point.
- Be brief (one sentence), but specific and concise. Omit unnecessary words.
- Can provide background, such as the topic of the study and total enrollment:
  - “Characteristics of the 154 spinal fusion patients at time of enrollment.”
Arrange columns and rows of data to reveal trends or permit easy comparison.

Placement of standard deviation depends on how data will be compared.

Align data on decimal point or ± sign.

Indicate missing data with —; do not leave blank.
Footnotes

- Footnotes are phrases or sentences below the body of the table that explain items in the table.
- Keep footnotes to a minimum.
- A footnote can be used in place of a column of data that is all the same.
- Don’t overdo symbols in the footnotes so that they looked cluttered and overdone.
Types of Tables

- Lists
- Characteristics of subjects
- Comparison of demographic characteristics of cases and controls
- What happened to subjects during the study
- Outcomes in study population
- Comparisons of groups of subjects
Figures
Figures

- To know what is an effective figure, pick up any journal
- A good figure tells a piece of the story basically without any words
- A group of good figures tells the entire story of a manuscript in a very simple fashion
Basic Science Example

Animals that overexpress the anti-apoptotic protein Bcl-2 in their gut epithelium were made septic via cecal ligation and puncture. Twenty four hours later, animals were sacrificed. Intestinal tissue was stained for active caspase 3 via standard immunohistochemical techniques. The results demonstrate that Bcl-2 decreases sepsis-induced gut epithelial apoptosis.
Or
Clinical Example

A total of 4283 patients were admitted to the surgical intensive care unit between January 1, 1998 and December 31, 2000. Infection rates were followed on a monthly basis on all patients who had a central venous catheter. A total of 74 catheter-related bloodstream infections occurred in 6874 catheter days (10.8 per 1000 catheter days) in the 18 months prior to the intervention. Following the implementation of the education module, the number of catheter-related bloodstream infections fell to 26 in 7044 catheter days (3.7 per 1000 catheter days), a decrease of 66% (p<0.0001).
Or

SICU Bloodstream Infections Jan '98 - Dec. '00

BSI Intervention

Month/Year

Rate/1000 Catheter Days

Jan  '98
March  '98
May    '98
July   '98
Sept   '98
Nov    '98
Jan    '99
March  '99
May    '99
July   '99
Sept   '99
Nov    '99
Jan    '00
March  '00
May    '00
July   '00
Sept   '00
Nov    '00
...
Figures

- Clear figures come from careful design and labeling.
- Visual design is important.
- Before spending a lot of time and effort (and, sometimes, money) creating a figure, do a pencil sketch first and show it to colleagues. Include the legend.
Figure Legend

- Describes the purpose and content of the figure.
- Keep it simple.
- Do not repeat excessive experimental detail.
Republishing Figure

- To republish a figure that has already been published, first obtain permission from the copyright holder (e.g., previous publisher).
- As a courtesy, obtain permission from the original author.
- In your paper, give full credit to the source and publisher and indicate you have permission.
Photographs

- Never assume readers will recognize anything.
- Label everything that is relevant.
- Expensive to publish (especially color).
- Check clarity of photograph by Xeroxing.
- Provide a ruler or state the magnification.
- Use photos of patients only if you have written informed consent before the photograph was taken.
Diagrams

- Diagrams are good to show flow and organization.
- Err on the side of simplicity.
- Portray sampling schemes vertically.
- Portray timelines horizontally.
FIGURE 7.1 Sampling scheme for the study

2,311 subjects contacted

1,485 agree to participate

691 ineligible
135 refuse

Randomization

735 intervention

750 control

36 die or dropout

699 complete study

709 complete study

41 die or dropout

subjects who are no longer enrolled in the study; those who remain at each stage are included in ovals.
FIGURE 7.2 Timing of measurements
Presentation of Numerical Data

- Can be most difficult type of presentation.
- Numerical figures should be used when the overall pattern is more important than actual values.
- Always check for mishaps or potential misunderstanding (e.g., crossing lines with no meaning).
- Very effective to demonstrate NO relationship.
Types of Numerical Figures

- Pie Charts
- Scatter Plots
- Bar Graphs
- Line Graphs
FIGURE 7.3 Mean heart rate in beats per minute by day of treatment in five patients
FIGURE 7.4 Differing effects of treatment with successol in patients with low renin (diamonds) and high renin (squares) hypertension. The filled shapes indicate the means; the bars indicate the 95% confidence intervals.
FIGURE 7.10 Lack of association between thyroid-stimulating hormone (TSH) and glucose levels in patients attending a weight-loss clinic.
Scatter Plots

Two-axis graph that plots individual data points and fits a mathematical function to the points to show strength of correlation
FIGURE 7.12 Correlation between height and weight in 10 subjects
Figure 8. A scattergram. Individual data points are plotted, a regression line shows a linear correlation, and the correlation coefficient ($r$) indicates that the correlation is strong.
Bar Graphs

- One-axis graph that compares amounts or frequencies for classes of a discontinuous variable.
- Valuable for displaying results by categories of subjects or depicting conditions before and after an intervention.
- Difficult to include confidence intervals.
- Key Question: How best to display pattern of data?
  - Values being compared should be side-by-side
Figure 10. A vertical bar graph. Ratios are shown for two variables ($^{125}_{	ext{I}}$, $^{99}_{	ext{Tc}}$), each under two conditions (saline, monokine). The variables and the conditions are identified in the labels under the bars.
FIGURE 7.13 Likelihood of admission to an intensive care unit (as a proportion of all hospital admissions) by age and sex.
FIGURE 7.14 Likelihood of admission to an intensive care unit (as a proportion of all hospital admissions) by age and sex
FIGURE 7.20 Proportions of students in 1985, 1995, and 2005 choosing various primary care specialties
Line Graphs

- Two-axis graph on which curves, data points, or both show the relationship between two variables:
  - Independent variable on $x$-axis
  - Dependent variable on $y$-axis
- Because they connect points, line graphs are great at demonstrating what has happened to a subject or group of subjects.
- Beware of overcrowding; four groups of connected points are plenty.
FIGURE 7.24 Mortality risk modeled as a function of age and sex
FIGURE 7.25 Mortality risk modeled as a function of age and sex. Error bars indicate 95% confidence intervals for modeled risk.
Tip: Explanation of statistical information in graphs should include:

♦ Whether data points or bars represent individual, mean, or median values.

♦ Whether error bars represent standard deviations (SD), standard errors of the mean (SEM), confidence intervals (CI), or range.

♦ Sample size.
International Committee of Medical Journal Editors

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http://www.icmje.org