Writing the Methods and Results Sections

Methods Section

The Methods section is the second major section of a scientific article:

Introduction:	Why did you do the study? What was your hypothesis or purpose?
Methods:	**What did you do?**
Results:	What did you find?
Discussion:	What do your findings mean?

Topics to be covered include:

- Purpose, content, and suggested structure of the Methods section
- How to write the Methods section
- Tailoring the Methods section to a particular journal
- Verb tense

Purpose, Content, and Suggested Structure of the Methods Section

The purpose of the Methods section is to explain precisely what you did to answer your research question.

In the Methods section, you should provide enough detail that a reader in your field could repeat your study. One of the most common problems in Methods sections is lack of sufficient detail. For example, authors will forget to explain how the patients in a retrospective review were selected or forget to specify the total number of mice used in a set of experiments.

You should also explain *why* each experiment, intervention, or analysis was performed. One easy way to do this is to begin each section that describes a type of experiment with a "to" phrase stating the rationale. For example, "To investigate whether the cells had acquired features of anchorage-independent growth, we assessed the ability of the cells to grow in soft agar."

In reports of basic science studies, Methods sections often begin with a description of the materials used and how they were obtained. After this preliminary information, the individual experiments are described. Sometimes, though, the information about materials is presented in the sections about each experiment rather than in a separate section at the beginning of the Methods section. Either structure can work well.

In reports of retrospective clinical studies, Methods sections usually begin with a description of the source of the patient records reviewed for the study (for example, an institutional database); the criteria used to determine which patients were included and excluded; and the total number of patients ultimately included in the study.

In reports of prospective clinical studies, Methods sections usually begin with a detailed description of the inclusion and exclusion criteria used to determine eligibility for the trial. The actual numbers of patients included in each of the study subgroups, however, are not reported until the beginning of the Results section.

Subheadings are a useful way to organize material in the Methods section.

On the following pages are suggested outlines for Methods sections of basic science and clinical articles. These outlines are meant to serve as useful references during the writing process.

How to Write the Methods Section: Reports of Basic Science Studies

One way to write the Methods section of a basic science study is to create paragraphs for each main topic below that applies to your study. The following order works well in many articles.

Materials

- Describe the materials (for example, animals, drugs, reagents, equipment) used in the study.
- For drugs, use the generic name and specify the concentration and dose. (A trade name may be given in parentheses at first mention.) For reagents, specify the concentration and grade, if appropriate.
- Identify the suppliers of the materials and, if required by the journal, the geographic locations of the suppliers.

Cell Lines and Cultures

- Describe the cell lines and cultures that were used.
- Identify the suppliers of the cell lines and, if required by the journal, the geographic locations of the suppliers.
- Describe how the cultures were prepared.

Human Subjects

- Say whether institutional approval and written or oral informed consent were obtained, and if not, explain why not.
- Describe the source of the study population.
- List inclusion and exclusion criteria.
- Tell how samples were collected.
- Tell the number of samples included.

Animals

- Describe the standards of care that were followed in the care of animals.
- Identify the supplier of the animals.
- State how many animals were used.
- Describe what was done to the animals, including how they were killed.

Experiments

- Describe what experiments were performed, why each was performed, and specifically how each was performed. (Each experiment can be described in a separate paragraph, each beginning with an explanation of what the particular experiment was designed to determine.) Chronological order usually works best.

Statistical Tests

- Identify the statistical tests that were performed.
- State what each test was used to evaluate.
- State the values at which differences were considered statistically significant (for instance, $P < 0.05$).

How to Write the Methods Section: Reports of Retrospective Clinical Studies

One way to write the Methods section of a retrospective clinical study is to address each topic below that applies to your study. The following order works well in many articles.

- Subjects: Source of the study subjects (for example, chart review, database, patients in a previously reported prospective clinical study).
- Selection criteria: Criteria for selection of the overall study population (inclusion and exclusion criteria, including dates).
- Data reviewed: Types of data reviewed or extracted from patient records.
- Subgroups: How the study subgroups were defined.
- Numbers of patients: Numbers of patients ultimately included in the study and in each subgroup. (Information on numbers of patients is included in the Methods section in most but not all articles on retrospective clinical studies. When this information is not reported in the Methods section, it should be reported at the beginning of the Results section.)
- Approval of the study by an institutional review board and the use of an informed consent process for subjects (or the board's waiver of this process).
- Evaluations and interventions: Pretreatment evaluations, treatments and interventions, and follow-up evaluations for patients in the study. Provide general information only. If the evaluations or treatments (for example, chemotherapy regimens, drug doses, radiotherapy techniques) differed from patient to patient and the study was designed to show the effect of those differences on outcome, report the numbers of patients who got each type of evaluation or treatment at the point in the Results section where you report the outcomes.

- Outcome measures: Outcome measures and minimum differences that were considered clinically important.
- Statistical methods: Methods of statistical analysis, described in sufficient detail to permit replication.

How to Write the Methods Section: Reports of Prospective Clinical Studies

One way to write the Methods section of a prospective clinical study is to address each topic below that applies to your study. The following list is from the CONSORT statement (reprinted in full in the chapter "Checklists for Writing a Scientific Manuscript"), which provides recommendations for reporting prospective randomized clinical trials.

- Participants: Eligibility criteria for participants and the settings and locations where the data were collected.
- Interventions: Precise details of the interventions intended for each group and how and when they were actually administered.
- Outcome measures: Clearly defined primary and secondary outcome measures and, when applicable, any methods used to enhance the quality of measurements (for example, multiple observations, training of assessors).
- Sample size: How sample size was determined and, when applicable, explanation of any interim analyses and stopping rules.
- Randomization—sequence generation: Method used to generate the random allocation sequence, including details of any restriction (for example, blocking, stratification).
- Randomization—allocation concealment: Method used to implement the random allocation sequence (for example, numbered containers or central telephone), clarifying whether the sequence was concealed until interventions were assigned.
- Randomization—implementation: Who generated the allocation sequence, who enrolled participants, and who assigned participants to their groups.
- Blinding (masking): Whether or not participants, those administering the interventions, and those assessing the outcome were blinded to group assignment. If done, how the success of blinding was evaluated.
- Statistical methods: Statistical methods used to compare groups for primary outcomes; methods for additional analyses, such as subgroup analyses and adjusted analyses.

In addition to the items above, from the CONSORT statement, describe the procedures used to ensure ethical conduct of the study, such as approval of the study by an institutional review board and the use of an informed consent process for participants.

Tailoring the Methods Section to a Particular Journal

Location of the Methods Section

Most journals contain a separate Methods section just after the Introduction section and just before the Results section, but the placement of the Methods section in the article can vary. Some journals place the Methods section last, after the Discussion section. A few journals not only contain a separate Methods section but also include details of the methods in the figure legends. Other journals describe methods entirely in the figure legends, and still others exclude such descriptions from the figure legends. Be sure to read the author instructions and look at a couple of sample articles from your target journal to see how it handles the description of methods, and format your Methods section accordingly.

How Much Detail to Give

For journals with a broad readership, each method should be described in sufficient detail to allow readers in other fields to understand the study.

For specialized journals with narrower audiences, less detail should be used to describe methods that are well known to the target audience.

Wherever possible, when you describe a technique that has already been described in a previously published article, simply identify the technique (name it or describe it very briefly), and cite the published study in which the technique was previously described in detail. It is often helpful to the reader if you provide a brief description of the method. For example, "Histologic analysis was performed as previously described (3). Briefly, the tissue was cut into 5-μm sections, and every other section was stained with hematoxylin and eosin." Be sure to describe any modifications of the previously published technique.

Verb Tense

In the Methods section, use the **past tense.** For example, "Tissue specimens *were examined* using frozen section techniques while patients were still in the operating room."; "We *performed* PCR analysis…."

When describing experiences of human subjects or treatments of materials or animals that took place before the study, you may use the **past perfect tense.** For example, "In all patients in the study group, previous interferon-alfa therapy *had failed*."

Some authors use the present tense in the Methods section, probably because they perform a particular procedure the same way every time for every study. However, this is incorrect. What matters is not how they usually perform a procedure (present tense) but how they performed it (past tense) for the study being described.

Results Section

The Results section is the third major section of a scientific article:

Introduction:	What was your hypothesis or purpose? Why did you do the study?
Methods:	What did you do?
Results:	**What did you find?**
Discussion:	What do your findings mean?

Topics to be covered include:

- Purpose and content of the Results section
- Suggested structure of the Results section
- Verb tense
- Use of figures and tables
- Use of "data not shown"
- Highlighting important findings
- Strategy for writing the Results section

Purpose and Content of the Results Section

The purpose of the Results section is to provide a straightforward account of your findings.

Often, authors make the Results section unnecessarily long and complex by including information there that actually belongs in the Methods section or the Discussion section. To make sure that your Results section is as streamlined and clear as possible, remember the following 2 principles:

The methods should not be described in detail in the Results section. The methods are described in the Methods section, so there is no need to describe them in detail in the Results section. However, it is OK—and even useful—to mention the type of experiment, intervention, or analysis performed to obtain the result being reported. For example, *"Western blotting* revealed that protein levels were higher in A cells than in B cells." Even if the journal prints the Methods section at the end of the article (rather than before the Results), do not include detailed descriptions of the methods in the Results section. The only information about your methods that you should include in the Results section is the information that is absolutely necessary for the reader to understand your data.

The findings should not be interpreted in depth in the Results section. In-depth interpretation should appear in the Discussion section instead. However, it is acceptable to include a little bit of interpretation in the Results section. This can often be accomplished with a phrase or, at most, a sentence: For example, "These results indicated that the improved survival seen in group A was not due to selection bias." Below are 2 more examples of appropriate interpretation in the Results section.

Example 1: In the following long passage, the authors have used interpretive phrases (in bold) that help the reader follow along. These phrases point out a contrasting finding, a result that conflicts with the general pattern of the findings, and an especially interesting finding.

> *Gene Expression Profiles Predict the Aggressive Behavior of Previously Uncharacterized Normal and Tumor-Derived Mammary Epithelial Cells*
>
> Expression levels for the 24 consensus genes in the cell lines examined relative to the reference cell line MCF10A are shown in Fig. 3B. The gene expression profiles (GEPs) of SUM44PE and SUM52PE resembled the weakly invasive breast cancer (BC) consensus most closely, each having correlation

coefficients with the weakly invasive BC consensus of 0.95. The GEPs of BRF71T1, HBL-100, SUM159PT, and SUM1315mo2 cells were most similar to the highly invasive BC consensus, with correlation coefficients ranging from 0.82 to 0.88 (Fig. 3B). Thus, each of these cell lines could be classified as weakly or highly aggressive based upon its correlation with the weakly or highly invasive BC GEP.

In contrast, the cells derived from reduction mammoplasty (that is, 48RS and 184B5) had GEPs that were more similar to the MCF10A GEP than to either the weakly or highly invasive BC consensus GEP (compare Fig. 3, A and B), as seen by the low number of genes with expression ratios that differed from MCF10A by more than 2-fold. **One notable exception** was the elevated level of osteonectin mRNA (#19) found in the 48RS, which was also observed in the very similar GEPs of two other cell strains derived from reduction mammoplasties (data not shown). The correlation between 48RS and the highly invasive BC GEP decreased from 0.59 to 0.36 when osteonectin was excluded from the calculation. **We were surprised that** the DCIS-derived cell line SUM102PT had a GEP that was also more similar to the reference MCF10A than to either consensus, although we detected significant differences in the expression of other genes analyzed by the cDNA arrays (data not shown).

(Adapted with permission from Zajchowski DA et al. Identification of gene expression profiles that predict the aggressive behavior of breast cancer cells. Cancer Res 61:5168–5178, 2001.)

Example 2: In the following example, the authors have speculated about 2 findings in the Results section (bold passages). This is OK because the speculation is brief and focuses on specific findings.

Confirmation of Comparative Genomic Hybridization Data by FISH

FISH analysis on touch preparations of six endocrine pancreatic tumors (EPTs) confirmed the comparative genomic hybridization (CGH) results of chromosome arms 9q and 6q (Table 1). Two benign insulinomas without chromosome imbalances (from patients 2 and 3) presented two copies of the centromere and locus-specific probe per nucleus for both chromosome arms in the FISH analysis, indicating that these tumors have a diploid DNA content. . . . The other insulinoma (from patient 11) turned out to harbor two genetically heterogeneous cell populations exhibiting three and four copies of the chromosome 9 probes. Because we blocked repeated sequences with Cot-1 DNA, we could not analyze the centromeric region by CGH, **which probably explains the detection of only the 9q34**

> **gain.** . . . In the malignant insulinoma of patient 24, FISH again detected different cell populations with the chromosome 9 probes. In addition to a major population with four copies of both centromere 9 and 9q34, 25% of the nuclei demonstrated a clear duplication of the c-abl target at 9q34. In addition, a number of very large nuclei were observed in between these nuclei containing two sometimes very large centromere spots together with up to 12 9q34 signals (Fig. 2B), **suggesting that amplification of this target had occurred.** The frequency of these cells (5%) was, however, much too low to identify this amplification as such by CGH.
>
> (Adapted with permission from Speel EJ et al. Genetic evidence for early divergence of small functioning and nonfunctioning endocrine pancreatic tumors: gain of 9Q34 is an early event in insulinomas. Cancer Res 61:5186–5192, 2001.)

Suggested Structure of the Results Section

In the Results section, report the findings for each experiment described in the Methods section. As much as possible, the order in which the findings are presented in the Results section should be the same as the order in which the corresponding experiments are described in the Methods section.

Subheadings are a useful way to organize material in the Results section. In some cases, especially in basic science articles, the subheadings in the Results section can correspond 1 to 1 with the subheadings in the Methods section—in other words, you can use the same subheadings in Methods and Results. However, it is not always possible to use this technique.

For **basic science articles,** sometimes you can organize subsections of the Results section as follows:

- Begin with a phrase or sentence that reminds readers of the experiment or analysis you performed.
- Describe the findings from that experiment or analysis, referring to figures and tables as appropriate.
- Close with a sentence that indicates what is most important about the data you have just presented.

An example of this suggested structure is shown below.

> *Responses of Normal, Premalignant, and Malignant Human Bronchial Epithelial (HBE) Cells to Deguelin*
>
> To determine whether deguelin could be a potential lung cancer chemopreventive agent, we first examined its effects on the growth of normal, premalignant, and malignant HBE cells. The growth of premalignant and malignant HBE cell lines was inhibited by deguelin in a dose- and time-dependent manner (Fig. 2A). After testing a range of concentrations from 10^{-9} M to 10^{-7} M, we determined that the IC_{50} for deguelin was less than 10^{-8} M. Deguelin had minimal effect on the growth of normal HBE cells. Of all the cell lines, premalignant 1799 cells, which represent the earliest stage in the lung cancer model, were the most sensitive to deguelin, with exposure to 10^{-7} M deguelin for 1 day decreasing cell growth by 67.1% (95% CI, 64.1% to 70.1%). Because BEAS-2B cells have only a few of the properties of premalignant HBE cells in vivo, we also tested the effects of deguelin on cells from another immortalized cell line, HB56B. Dose- and time-dependent growth-inhibitory effects of deguelin in these cells were also detected (Fig. 2A). These results suggest that deguelin preferentially inhibited growth of premalignant HBE cells.
>
> (Adapted from Chun KH et al. Effects of deguelin on the phosphatidylinositol 3-kinase/Akt pathway and apoptosis in premalignant human bronchial epithelial cells. J Natl Cancer Inst 95:291–302, 2003. Reprinted with permission.)

A similar structure can also sometimes be used in **clinical articles,** with the following exception: For clinical articles, there is usually no need for an opening sentence that reminds readers of the intervention or analysis you performed.

Verb Tense

In the Results section, as in the Methods section, use the **past tense**. For example, "Serum levels of Her-2/neu *correlated* with disease-free survival."; "PCR analysis showed that 3 genes *were expressed*...."

Some authors use the present tense in the Results section, but this is incorrect. In scientific writing, by convention, present tense is reserved for describing established facts (for example, "DNA *has* a double-helix structure.") and general conclusions (for example, at the end of an

article: "We conclude that the side effect profile of this new drug *is* superior to that of the previous standard drug."). Neither established facts nor general conclusions should appear in the Results section.

Use of Figures and Tables

In most basic science articles and in many clinical articles, most of the data in the Results section should be presented in figures and tables. The first mention of each table and figure almost always belongs in the Results section.

Creating your tables and figures forces you to organize and analyze your data. Once you have decided which data tell the story of your science and have created these visual elements, the Results section should be easier to write. The chapter "Effective Figures and Tables" gives detailed guidelines on creating these important elements of your article.

Text vs. Figure vs. Table

Should you present your data in the text, or in a figure or table? If your data can be presented in 1 or 2 sentences in the text, it is generally best to do that. If presenting the data in the text would require more than 2 sentences, a table or figure may be better.

If you decide to include tables in your article, keep in mind that important patterns and trends may not be obvious in tables consisting entirely of raw data. It may be more effective to summarize or concentrate your data, creating fewer and shorter tables that give the reader a better overall picture of your findings. Trends in and relationships between data can also be shown effectively in graphs.

Limiting the Numbers of Figures and Tables

If the journal limits the number of figures or tables, be careful not to exceed those limits. Even if there are no such limits, including too many photographs or other types of figures may reduce the impact of those that are vital to conveying your message. Some journals count a figure with multiple panels as 1 figure, but do not abuse this privilege; all panels of a figure should be closely related to the same set of experiments and data. If you have several tables, it may be possible to combine some of them. Furthermore, if the results for an entire set of experiments are similar, you can show the results for only 1 experiment and note in the text and in

the figure legend that the results shown in the figure are representative of the results of the other experiments. An example of this technique is shown below.

> Figure 1. Western blot analyses showing higher expression of total protein Z in group 1 (top) than in group 2 (bottom). **Data are representative of similar results obtained in 3 independent experiments** performed for both groups.

Minimizing Repetition between the Text and Figures and Tables

Be sure to minimize repetition between the text in the Results section and your figures and tables. For example, suppose your article includes a table showing the characteristics of patients in the 2 subgroups within a clinical trial. The first few rows might look like this:

Characteristic	Group A (n = 58)	Group B (n = 60)
Median age (range)	62 years (43–80 years)	61 years (55–82 years)
Clinical stage, no. patients (%)		
IIIa	36 (62)	34 (57)
IIIb	20 (34)	21 (35)
IV	2 (3)	5 (8)

When you refer to this table in the text, you might wish to mention some of the most important findings shown in the table. Of the 2 options below, option B is better because it summarizes the information in the table rather than repeating it.

Option A: Stage IV disease was rare in both groups—only 2 patients (3%) in group A and 5 patients (8%) in group B had stage IV disease (Table 1).

Option B: Stage IV disease was rare in both groups (Table 1).

Checking the Consistency and Accuracy of Numbers and Percentages in Figures and Tables

Before submitting your article, be sure to double-check all numbers and percentages for accuracy, and make sure that the data match in all parts of the article (Abstract, Results, Discussion, tables, and figures).

In addition, always refer to the author instructions of the journal for guidelines on preparing and submitting figures and tables.

Use of "Data Not Shown"

It is not always necessary or advisable to show all your data. In the text of the Results section, authors sometimes use the phrase "data not shown" in parentheses instead of giving the actual data. This phrase shows readers that the absence of data was not an oversight on your part. Use this technique sparingly. If you use "data not shown," limit its use to:

- Findings for which the exact numbers themselves are unimportant (for example, data showing a lack of effect on the study population),
- Findings similar to other findings for which supporting data *are* presented, and
- Results of routine assays, such as Lineweaver-Burk plots.

Here is an example:

> In the tumor-bearing nude mice, virus titers were significantly higher in the brain than in the bone marrow, spleen, liver, testes, or ovaries (Table 1). Patterns of infectivity were the same in the non–tumor-bearing nude mice (data not shown).

Be sure not to confuse "data not shown" with "unpublished results." The phrase "unpublished results" is used when you refer to a finding from another study (by either your own group or another group) that has not yet been published. The phrase "unpublished results" is almost never used in Results sections.

Highlighting Important Findings

Perhaps you would like the reader to know which results you think are most important. One strategy for highlighting important findings is to insert a summary statement before or after the detailed listing of results.

In the example shown below, the authors use a summary sentence (underlined) to describe the general pattern of their findings. Immediately after this sentence, they describe the actual detailed findings (in bold).

> *Comparative Genomic Hybridization Patterns Differ by Age of Patient*
>
> This analysis included 10 pure teratomas (six mature and four immature teratomas). All of the mature teratomas and three immature teratomas showed normal comparative genomic hybridization (CGH) profiles (Tables 2 and 3). One immature ovarian teratoma showed gain of chromosome 14. All of the malignant germ cell tumors (GCTs) showed chromosomal imbalances on CGH analysis (Tables 2 and 3). Specific CGH profiles did not correlate with histological differentiation or tumor site. **However, two distinct CGH patterns could be distinguished by age. Regardless of site, malignant GCTs in infants and children younger than 8 years (n = 16) most commonly showed imbalances at chromosome 1 (loss of 1p and/or gain of 1q), gain of 3p, loss of 4 and 6q, and gain of 20q. Only one ovarian malignant GCT in a 4-year-old girl showed gain of 12p. Conversely, gain of 12p was the most consistent aberration found in GCTs arising after 8 years of age and was found in 11 of 16 tumors.** Other recurrent aberrations in adolescents were gain of 1q, gain of chromosome 8 and 21, and loss of chromosome 13. One tumor (number 19) showed loss of chromosome 11 and 15. Because this tumor showed biallelic expression of IGF-2, the tumor is most probably polyploid. Four other tumors showed gain of chromosome 15. Otherwise, no chromosomal imbalances of the chromosomes 11 and 15 were detected with CGH.
>
> (Adapted with permission from Schneider DT et al. Multipoint imprinting analysis indicates a common precursor cell for gonadal and nongonadal pediatric germ cell tumors. Cancer Res 61:7268–7276, 2001.)

When the journal permits subheadings in the form of sentences, the subheadings can also be used to highlight the most important findings. In the example above, the subheading "Comparative Genomic Hybridization Patterns Differ by Age of Patient" helps readers recognize the importance of the paragraph that follows.

Strategy for Writing the Results Section

The following is a practical strategy for writing the Results section.

- Construct your figures and tables.
- Outline the Results section using subheadings.
- Under each subheading, list the figures and tables that you will talk about in that section.
- Write the text corresponding to each subheading. Refer to figures and tables as appropriate, and minimize repetition between text and figures and tables.
- Make sure that a result is provided for each method described in the Methods section.
- When you have finished, make sure that data in the text match data in the figures and tables.

Activity 1

Outlining Your Methods and Results Sections

Write either an informal outline or a list of phrases or statements for the Methods and Results sections of an article on your current research. Some outlines will be discussed in class. If yours is not discussed in class, we will be happy to review it afterward and give you our comments. Please put your name on it before giving it to an instructor.

Methods and Results — *Prospective Studies* Worksheet

Methods

- Use past tense.
- Provide enough detail to permit duplication.
- Include the information below if appropriate and in the most logical sequence.

Patient recruitment

eligibility criteria (inclusion and exclusion)

setting(s) / location(s) where data collected

sample size (how determined, interim analyses, stopping rules, if applicable)

Ethical considerations

IRB approval

patient informed consent or waiver of consent

Interventions for each group

drugs (dose, route of administration, treatment schedule [how and when administered])

Outcome measures

primary

secondary

methods used to enhance quality of measurements (if applicable)

Randomization

sequence generation, allocation concealment, implementation

Blinding

Treatment complications, drop-outs from trial

Statistical methods / considerations

(usually presented last in section)

primary outcome comparisons

additional analyses

computer programs

significance levels

Results

- **Begin with number of patients included in each subgroup.**
- Use past tense.
- Do not duplicate data (in text, tables, and figures).
- If data are presented in tables and figures, summarize in text.

- Do not repeat methods.
- Limit speculation about meaning of results.
- Highlight important findings (with summary/introductory sentence, header).

Result 1

header

remind readers of what was assessed

findings (including reference to table or figure)

what is most important about data

Result 2

header

remind readers of what was assessed

findings (including reference to table or figure)

what is most important about data

Result 3

header

remind readers of what was assessed

findings (including reference to table or figure)

what is most important about data

Result 4

header

remind readers of what was assessed

findings (including reference to table or figure)

what is most important about data

Etc.

Methods and Results — *Basic Science Studies* Worksheet

Methods

- Use past tense.
- Provide enough detail to permit duplication of study.
- Include the information below if appropriate and in the most logical sequence.

Materials (and suppliers)

drugs, reagents, equipment (can be presented under each experiment)

Cell lines and cultures

which ones, suppliers, how prepared

Human subjects

IRB approval

informed consent

source of study population

inclusion and exclusion criteria

sample collection and number of samples

Animals

standards of care, suppliers, how many, how treated, including how killed

Experiment 1

header

what was done and why *("To investigate xxxx, we....")*

Experiment 2

header

what was done and why *("To investigate xxxx, we....")*

Experiment 3

header

what was done and why *("To investigate xxxx, we....")*

Experiment 4

header

what was done and why *("To investigate xxxx, we….")*

Etc.

Statistical tests

what the comparisons/evaluations were, which tests were used, significance levels, software

Results

- Use past tense.
- Do not duplicate data (in text, tables, and figures).
- If data are presented in tables and figures, summarize most important findings in text.
- Do not repeat methods.
- Limit speculation about meaning of results.
- Highlight important findings (with summary/introductory sentence, header).

Experiment 1

header

remind readers of which experiment (*"Using…, we found...." or*

"[name of technique/experiment] showed that....")

findings (including reference to table or figure)

what is most important about data

Experiment 2

header

remind readers of which experiment (*"Using..., we found...." or "[name of technique/experiment] showed that...."*)

findings (including reference to table or figure)

what is most important about data

Experiment 3

header

remind readers of which experiment (*"Using..., we found...." or "[name of technique/experiment] showed that...."*)

findings (including reference to table or figure)

what is most important about data

Experiment 4

header

remind readers of which experiment (*"Using…, we found...." or*

"[name of technique/experiment] showed that....")

findings (including reference to table or figure)

what is most important about data

Etc.

Methods and Results — *Retrospective Studies* Worksheet

Methods

- Use past ('did') and/or past perfect ('had done') tense.
- Provide enough detail to permit duplication.
- Include the information below if appropriate and in the most logical sequence.

Study subjects

source

selection criteria (inclusion and exclusion)

setting(s) / location(s) where data collected

Ethical considerations

IRB approval

patient informed consent or waiver of consent

Study design

types of data reviewed

subgroups and how defined

number of patients included (in Methods or Results)

Evaluations and interventions for each group

pretreatment evaluations

treatments and interventions

follow-up evaluations for patients in the study

Outcome measures

Statistical methods

primary outcome comparisons

additional analyses

computer programs

significance levels

Results

- Use past tense.
- Do not duplicate data (in text, tables, and figures).
- If data are presented in tables and figures, summarize in text.
- Do not repeat methods.
- Limit speculation about meaning of results.
- Highlight important findings (with summary/introductory sentence, header).

Result 1

header

remind readers of what was assessed

findings (including reference to table or figure)

most important thing about data

Result 2

header

remind readers of what was assessed

findings (including reference to table or figure)

most important thing about data

Result 3

header

remind readers of what was assessed

findings (including reference to table or figure)

most important thing about data

Result 4

header

remind readers of what was assessed

findings (including reference to table or figure)

most important thing about data

Etc.