AACC

Better health through laboratory medicine.

PEARLS OF LABORATORY MEDICINE

Preparing Manuscripts for Publication: Advice from a Journal Editor

Titles, Abstracts, and Figures

Dr. Thomas Annesley

CCTC Clinical Chemistry Trainee Council

Objectives of the Presentation

Emphasize 3 items in a manuscript that create a first impression for an editor, peer reviewer, and reader

Illustrate the importance of clarity in your message

Give you examples of how to give your manuscript more appeal

You Write Not Just To Be Published.

You Write To Be Read.

Components of a Scientific Paper

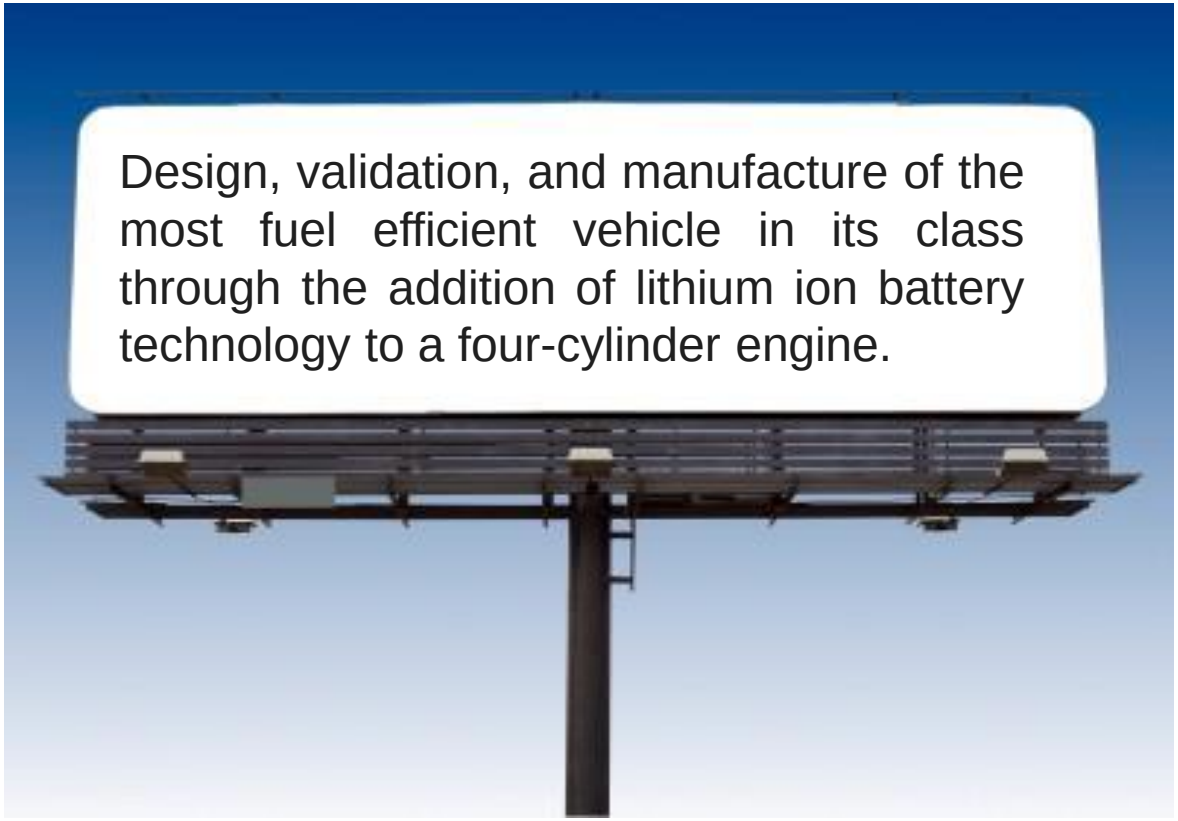
Title
Abstract
Introduction
Methods
Results
Discussion
Summary
References
Figures
Tables

Components That Affect First Impressions

Title

Abstract

Figures


Design, validation, and manufacture of the most fuel efficient vehicle in its class through the addition of lithium ion battery technology to a four-cylinder engine.

What was the topic and message of this billboard?

Title (The Billboard)

Title

First thing readers see

Draws readers with key words or terms

Brief while adequately describing content

Avoid catchiness unless a special article

Stand on its own without need to read paper

Title

How long should a title be?

It should be just right

Shorter is better

15 words or less

Some journals have word limits

Avoid phrases such as “a study of”, “investigations on”, “novel study of”

Title

Use common abbreviations only

CDC, FDA, IRS, DNA, PCR, HPLC

Included key words you want indexing services to use

Unless human subjects, state species

Title

Word use and order are important!

H1N1 virus testing on mice using polymerase chain reaction.

Blood from organ donors stored on ice yields higher crossmatch percentages.

Title

Treatment of Pediatric Melanoma Patients with Lasers.

Laser Treatment for Pediatric Melanoma.

Original Title

Development and evaluation of a new ELISA for the sensitive detection of Lupus-specific anti-nuclear antibodies.

Revised Title

New ELISA for detecting Lupus-specific anti-nuclear antibodies.

Original Title

A validated method for simultaneous screening and quantification of multiple opiates by solid phase extraction and UPLC-MS/MS.

Revised Title

Simultaneous screening and quantification of 14 opiates in whole blood by solid phase extraction and UPLC-MS/MS.

Original Title

Evaluation of siRNA molecules as sensitive and specific biomarkers of hepatic injury.

Revised Title

Plasma siRNA 114β, 146-CE, and 166-α are biomarkers of hepatic injury.

Original Title

Pilot and early proficiency testing results from newborn screening tests for Cystic Fibrosis: Measurements of trypsin in dried-blood spots.

Revised Title

Proficiency testing results for dried-blood spot trypsin for newborn screening for Cystic Fibrosis.

Original Title

Value of amniotic fluid sphingomyelin quantification in fetuses with G1-α gene mutations of unclear significance.

Revised Title

Amniotic fluid sphingomyelin quantification is useful for identifying G1-α gene mutations of unclear significance.

Who is your audience?
What do you want to Google to display?

Amniotic fluid sphingomyelin quantification is useful for identifying G1-α gene mutations of unclear significance.

G1-α gene mutations of unclear significance can be identified by amniotic fluid sphingomyelin quantification.

Blood stored on ice yields higher crossmatch percentages for organ donors.

Higher organ donor crossmatch percentages for blood stored on ice.

Proficiency Testing Results for Dried-Blood Spot Trypsin for Newborn Screening for Cystic Fibrosis.

Newborn Screening for Cystic Fibrosis: Proficiency Testing Results for Dried-Blood Spot Trypsin.

Begin the title with the important word

What group of readers would be interested in the contents of papers with these titles?

Example 1

Halothane-Anesthesia Impairs Pulmonary Function in Newborn Lambs *Anesthesiologists*

Example 2

Impaired Pulmonary Function in Newborn Lambs Anesthetized with Halothane *Pulmonologists*

Who is your audience?
What do you want to emphasize?
What do you want search engines to display?

Plasma methotrexate quantification is useful for identifying potentially fatal drug dosages *Clinical Chemist*

Potentially fatal drug dosages can be identified by plasma methotrexate concentrations quantification *ER Physician*

Summary - Titles

Be brief yet clear

Word use and order are important

If possible, begin the title with the important word

Use key words/terms (reader interest, indexing)

Avoid abbreviations unless common term

State species for non-human studies

The Abstract (The Elevator Talk)

Abstract (The Elevator Talk)

Make or break decision point for editors
First impression for reviewers
Affect the citation rate for a paper

Rationale for the study
Study design and methods used
Results
Conclusions supported by the data

Tell a Story by Answering Questions

Introduction – What problem, question, or hypothesis is being studied? Why would it be of interest to the reader?

Methods – How did you perform the study, answer the question, or test the hypothesis?

Results – What did you find? Did you solve the problem, prove the hypothesis, or answer the question?

Discussion – What do your results mean? What value do they add to the scientific literature?

Abstract

Write (or rewrite) the abstract after completing the main text

How can you summarize something that has not been written?

Abstract

Background - Present or past tense

Methods - Past tense

Results - Past tense

Conclusions - Present tense

Abstract

Common Problems -

Background section fails the logic test

Methods section lacks sufficient detail

Results section is too generic

Conclusions section restates the results

Which text is more informative?

Background: Atherosclerotic disease is a major cause of death in the United States. We investigated which analyte, IL-6 or β-selectin, would be a better prognostic marker for atherosclerotic disease.

Background: Serum concentrations of the vascular inflammation marker β-selectin correlate with atherosclerotic disease severity, but β-selectin has a large intra-individual variation. We investigated whether interleukin-6 (IL-6), another marker of vascular inflammation, could predict disease severity and mortality risk.

Methods: We divided patients into 4 groups. Specimens from each patient were tested for interleukin-6 and β-selectin and matched against the patient's disease group. During the study period, these analytes were measured again to determine whether concentrations changed with disease severity. Mortality was also monitored for each group to investigate any relationship between IL-6 or β-selectin and the risk of death.

Methods: Consecutive outpatients undergoing evaluation for peripheral vascular disease (PVD) were divided into categories ranging from no functional impairment (group 1) to severe functional impairment (group 4). Blood was collected at baseline and quarterly over 3 years. Serum IL-6 and β-selectin were quantified to calculate intra-individual variation and to assess the relationships of these markers to disease severity and mortality.

Results: The IL-6 concentrations were different between groups, with the IL-6 concentrations significantly different between groups 1 and 3, and 1 and 4. Although IL-6 and β-selectin concentrations both changed, β-selectin changed by only 10 to 30%. Changes in disease severity were reflected in changes in IL-6. IL-6 values were the same for men and women, and did not show any relationship with patient age. Intra-individual variation for IL-6 was much lower than that for β-selectin.

Results: Baseline median IL-6 concentrations were 12, 26, 96, and 144 µg/L for categories 1 to 4, respectively ($P<0.001$ for categories 3 and 4 vs 1), and were not related to age or gender. Median β-selectin increased 30% across the 4 categories. Increased disease severity and mortality were associated with higher IL-6 concentrations ($P<0.01$ for both), but not β-selectin. Intra-individual variation for group 1 was 14% for IL-6 and 36% for β-selectin.

Conclusions: IL-6 and β-selectin concentrations change with a change in heart disease severity. Intra-individual variation of IL-6 was also much lower than β-selectin, further validating the use of IL-6 over β-selectin. Further work is needed to confirm this observation.

Conclusions: IL-6 appears to be a better marker of disease severity and mortality than β-selectin in patients with PVD, exhibiting lower intra-individual variation and significant concentration changes with increasing disease severity.

Both abstracts contained 207 words

But one abstract was more informative

Emphasize and reuse those key words and terms

(subliminal advertising)

Abstract

Background: Serum concentrations of the vascular inflammation marker β-selectin correlate with atherosclerotic disease severity, but β-selectin has a large intra-individual variation. We investigated whether interleukin-6, another marker of vascular inflammation, could predict disease severity and mortality.

Methods: Consecutive outpatients undergoing evaluation for peripheral vascular disease were divided into categories ranging from no functional impairment (group 1) to severe functional impairment (group 4). Blood was collected at baseline and quarterly over 3 years. Serum interleukin-6 and β-selectin were quantified to calculate intra-individual variation and to assess the relationships of these markers to disease severity and mortality.

Results: Baseline median interleukin-6 concentrations were 12, 26, 96, and 144 µg/L for categories 1 to 4, respectively (P<0.001 for categories 3 and 4 vs. 1), and were not found related to age or gender. Median β-selectin concentrations increased 30% across the 4 categories. Increased disease severity and mortality were associated with higher interleukin-6 concentrations (P<0.01 for both), but not β-selectin. Intra-individual variation for group 1 was 14% for interleukin-6 and 36% for β-selectin.

Conclusions: Interleukin-6 appears to be a better marker of disease severity and mortality than β-selectin in patients with peripheral vascular disease, exhibiting lower intra-individual variation and significant concentration changes with increasing disease severity.

Summary - A Well-Written Abstract

Stands on its own without need to read the paper

States the hypothesis, question, or objective of the study

Completes the story by answering the hypothesis/question

Contains key words/terms found in Title and Introduction

Stays within the allowed word count

Does not contain information absent in the paper

Summary - A Well-Written Abstract

Does not make conclusions unsupported by the data

Limits the use of abbreviations

Follows the order of the main text (e.g., IMRAD)

Does not include references

Does not cite tables or figures

Uses the same topic words repeatedly to drive home the message

Graphs

A good graph has several attributes:

It draws attention to the data and not the graph itself.

The data points (symbols) and connecting lines are easy to read and distinguish.

Both the numbers and labels for the axes are readable and their meaning clear.

The two axes lengths are visually balanced (ratio of x-axis to y-axis = 1.0 to 1.3).

Graphs

A good graph has several attributes:

The scales used on each axis match the range of the data.

Tick marks are used appropriately.

The legend is clear and concise.

The message can be understood without referring back and forth to the main text.

The data deserve to be graphed.

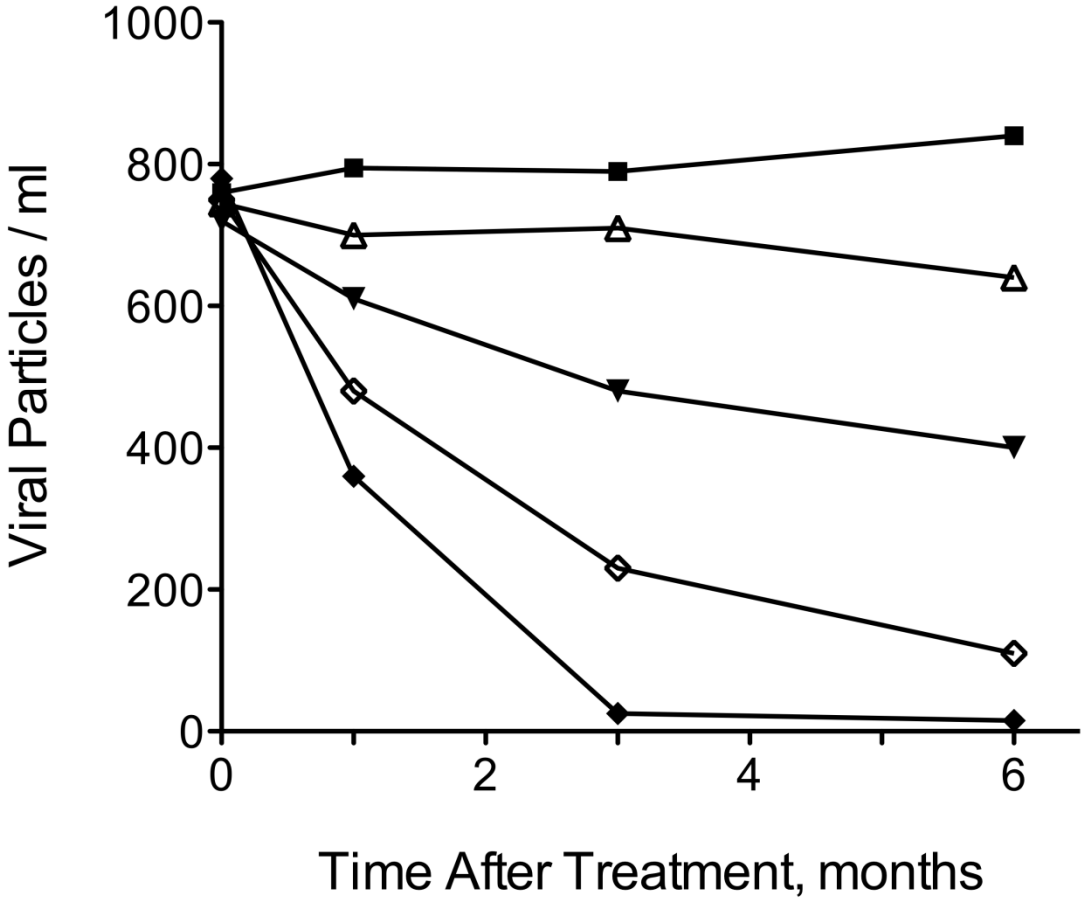


Figure 1. Change in blood viral load during daily oral treatment with albenovir. ■, no treatment; △, 2 mg/kg; ▼, 5 mg/kg; ◇, 10 mg/kg; ◆, 20 mg/kg.

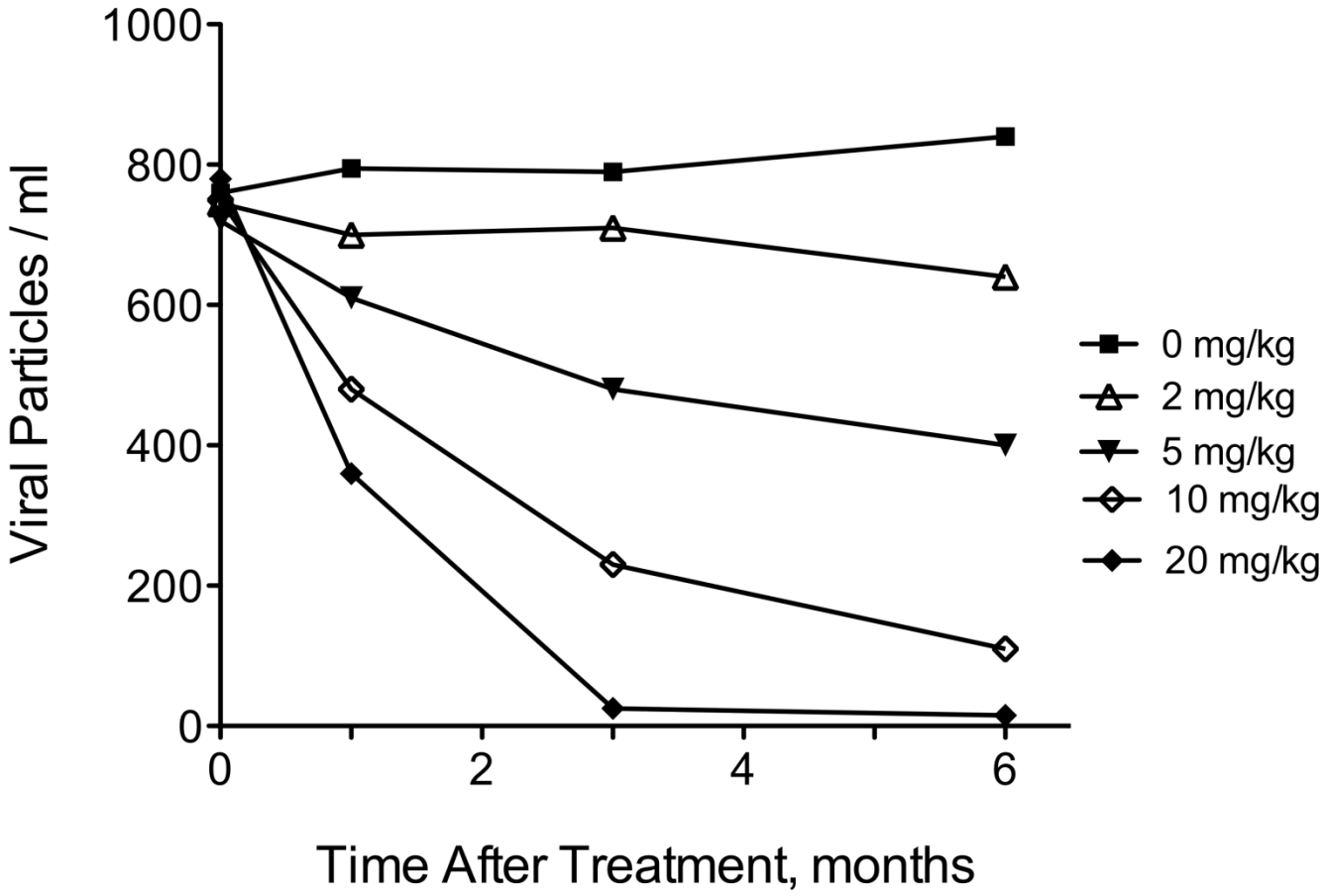


Figure 2. Change in blood viral load during daily oral treatment with albenovir.

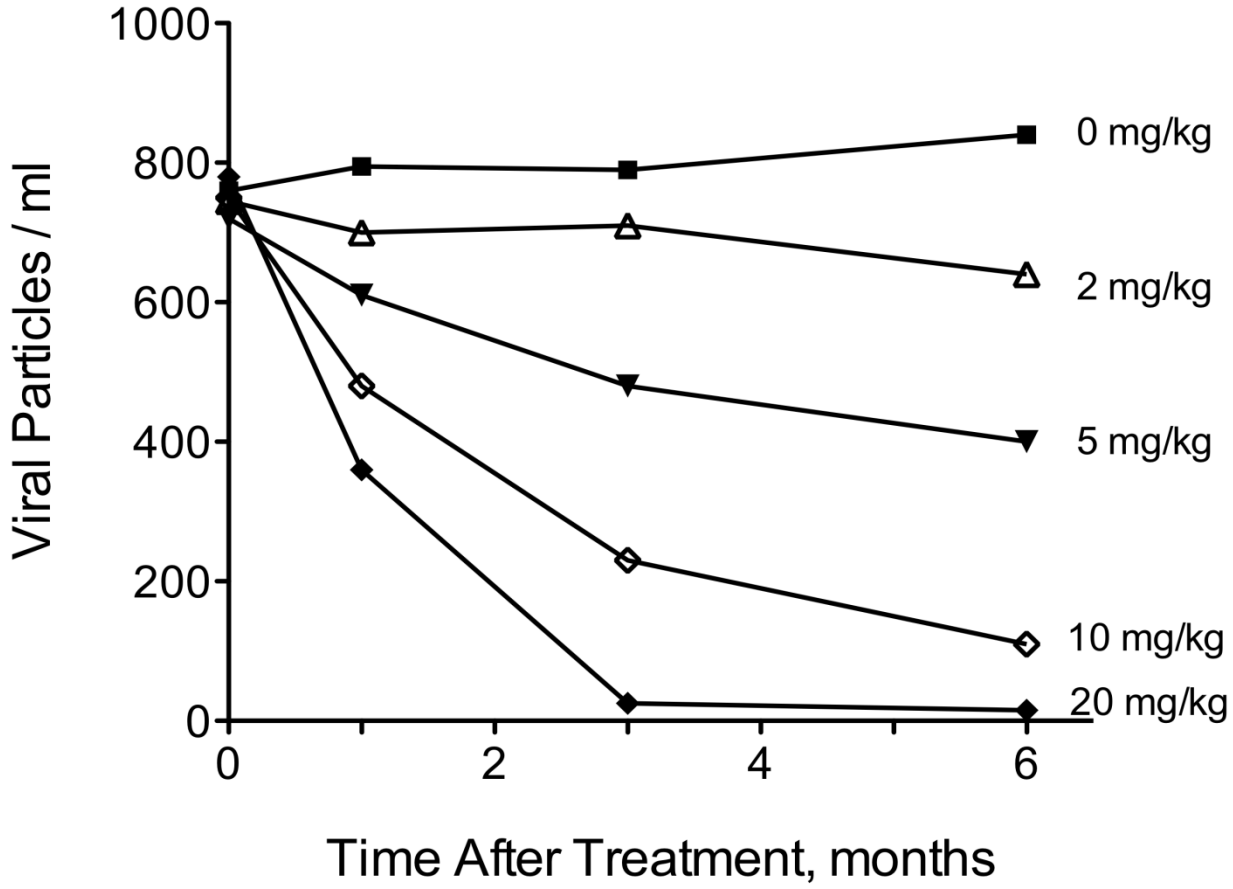


Figure 2. Change in blood viral load during daily oral treatment with albenovir.

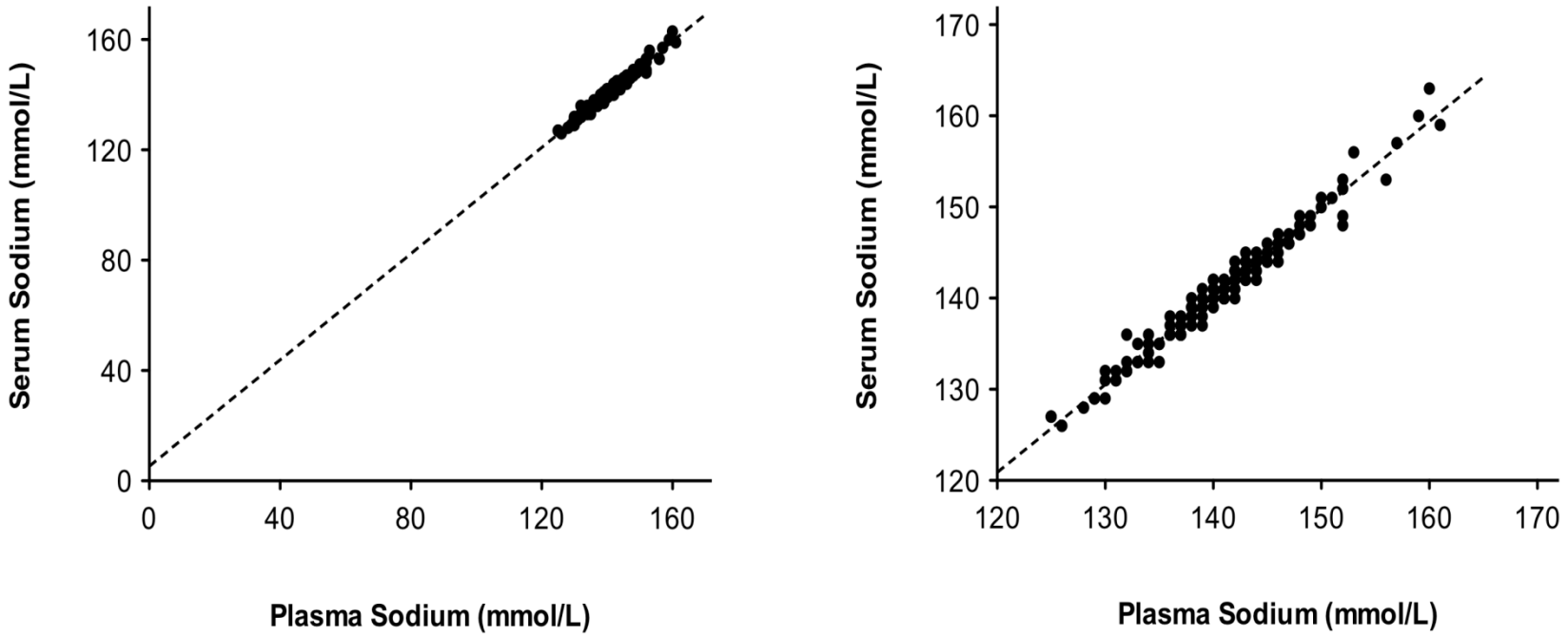


Figure 3. Plasma versus serum sodium for paired specimens from 150 patients.

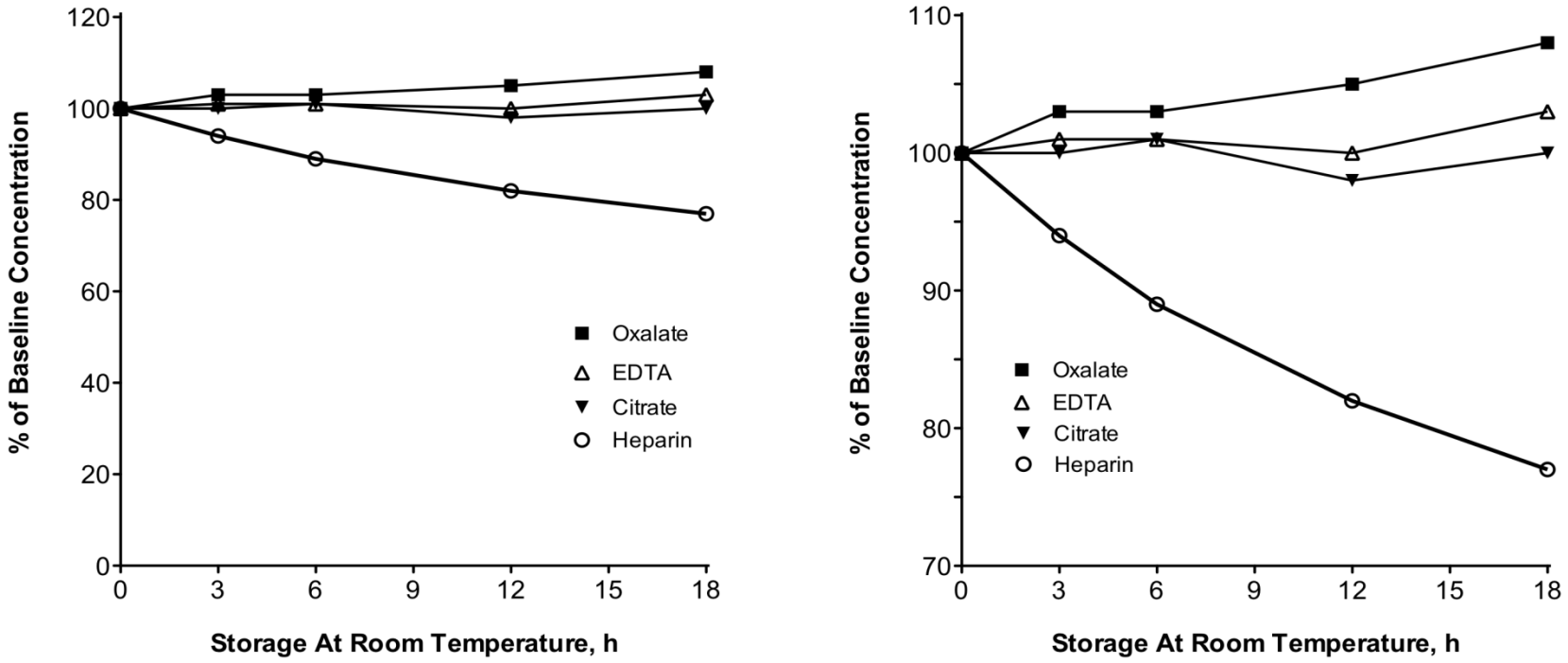


Figure 4. Percent change in plasma alanine concentration after storage of whole blood at room temperature. (Note expanded y-axis scale).

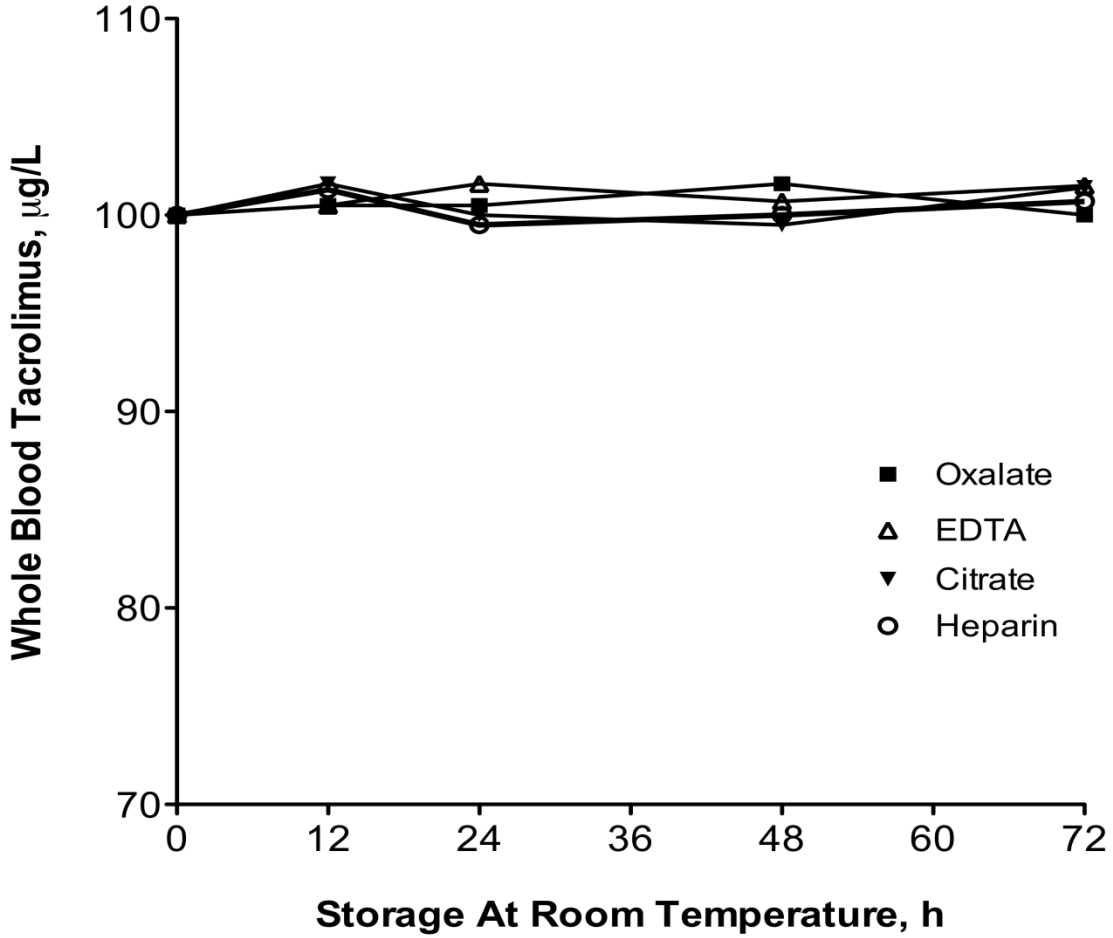


Figure 5. Percent change in whole blood tacrolimus concentration after storage at room temperature.

Summary - Graphs

Should be self-explanatory

Emphasize the data, not the overall graph

Consider how the graph will look in page print

Do not include a figure if it wastes space

Consider a table (or just text) instead of the figure

Take Home Lessons

Titles are your billboard

The abstract is your elevator talk

The quality and clarity of your graphs is important

Thank you for participating in this *Clinical Chemistry* Trainee Council Webcast

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