

# **How To Write a Medical Manuscript**

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# Outline

- **Start Early**
- **Focus on highly visible components**
- **Develop a systematic approach to the body**
- **Finish strong**
- **Helpful tips**

# Preparing Manuscripts for Submission to Medical Journals: The Paper Trail

## SELECTED TOPICS

**H. GILBERT WELCH, MD, MPH**

*Editor*

*Effective Clinical Practice.*  
1999;2:131–137.

# Starting Early

- **Writing is a complex task**
  - Requires energy
  - Quiet reflection
- **Road is never straight**
  - Can be rough
  - Lots of dead ends
- **In Short - it takes time**

# Prior to completion of the project

- 3 components can be started before completion of the project
- **Introduction:**
  - Sketch out intro during conception of project or during grant application
- **Methods:**
  - Draft while work is being done: running tally of what is being done as its being done
- **Skeleton forms of Numeric Data**
  - Dummy tables

# Advantages of Early Start

- **Intro: clarifying motivation for the paper helps you identify context of your work**
- **Methods: documenting methods as you go helps avoid having to reconstruct them later**
- **Dummy tables help focus analytic effort**
- **Most importantly writing early focuses critical thinking about your work**
  - **Future projects, gaps in the literature**

# Writing Early

- Invest time in thinking about the main message of the paper
- Distill into a few succinct points
  - Why you did what you did
  - What you did
  - What you found
  - What did it mean
- Crystalize further into key messages or take home points

# Focus on High Visibility Components

- **Title – should be catchy and reflect the work**
- **Abstract**
  - Often the only thing a reader looks at when doing a Medline search
  - Too often tacked on just prior to submission
  - Should undergo same rigorous review as the paper
- **Figures and tables**

# Focus on High Visibility Components

- **Tables and figures:**
- **Visual elements critical**
- **Tables: numeric displays**
  - **Make the paper more readable by removing numeric values from text- hint remove numeric values from text.**
  - **Can be used to synthesize current literature**
  - **Explain variables**
  - **Present wording for survey questions**

# Focus on High Visibility Components

- **Figures:**
  - Clear informative figures are invaluable
  - Visual impact- best way to convey main finding of the study
  - Display trends or group results
  - Display detailed process simply
- **Work to develop a coherent message that can stand alone – convey major result and methods as well.**

# **Develop a Systematic Approach**

- **Systematic approach makes writing easier**
- **Consider the journal you wish to submit to**
- **Read instructions for authors**
- **Uniformed requirements for manuscripts submitted to biomedical journals**

# Brevity

- Encourages reader to move from one piece of text to the next
- Sentences should be short simple direct
- So should the paper
- Beware- this does not come simply
- Paragraphs need purpose
  - stated in topic sentence
  - Linked
  - Support central argument or message

# Introduction

- **Paramount importance in getting reader to continue on**
- **Helps reviewers and editors judge papers importance**
- **Address why work was done and more importantly why the reader should care**
- **Use three paragraph introduction**

# Introduction

- **3 paragraphs**
  - **Big picture – lung cancer is leading cause of cancer death in US accounting for more deaths than breast colon and prostate combined**
  - **Smaller picture – accurate staging is critical because treatment options and prognosis differ significantly by stage**
  - **Our picture – we undertook this study to assess the accuracy of EBUS-FNA in staging the mediastinum in patients with lung cancer**

**TABLE 1****Framework for a Three-Paragraph Introduction**

PARAGRAPH	QUESTION	EXAMPLES OF CENTRAL IDEA		
		EXAMPLE 1	EXAMPLE 2	EXAMPLE 3
1	What is the general problem or current situation?	Otitis media is the most common reason that children receive antibiotics.	Evidence is accumulating that carotid endarterectomy reduces stroke risk in many patients with carotid stenosis.	Diabetic nephropathy is the most common cause of end-stage renal disease.
2	What is the specific problem or controversy?	Many patients receiving the diagnosis of otitis media have no microbiological evidence of infection.	Despite increasing information, decision making about carotid endarterectomy remains difficult.	Although screening for microalbuminuria is recommended for all diabetic patients, many physicians do not comply with the recommendation.
3	How will this study help?	To better delineate the vagaries of the otologic examination, we studied interobserver variability in the diagnosis of otitis media.	To help clinicians assess the relative benefits of carotid endarterectomy, we calculated the number of operations needed to prevent one major stroke or death under different conditions.	To investigate a simpler strategy for diabetic nephropathy, we used a decision model to simulate the effects of treating all patients with angiotensin-converting enzyme inhibitors.

# Introduction

- **First sentence must be strong and catch the readers attention**
- **Second paragraph focuses on specific problems that research addresses**
- **Gaps in the literature**
- **Third paragraph focuses on the motivation for the study**
- **By end of intro reader should want to move on.**

# Methods

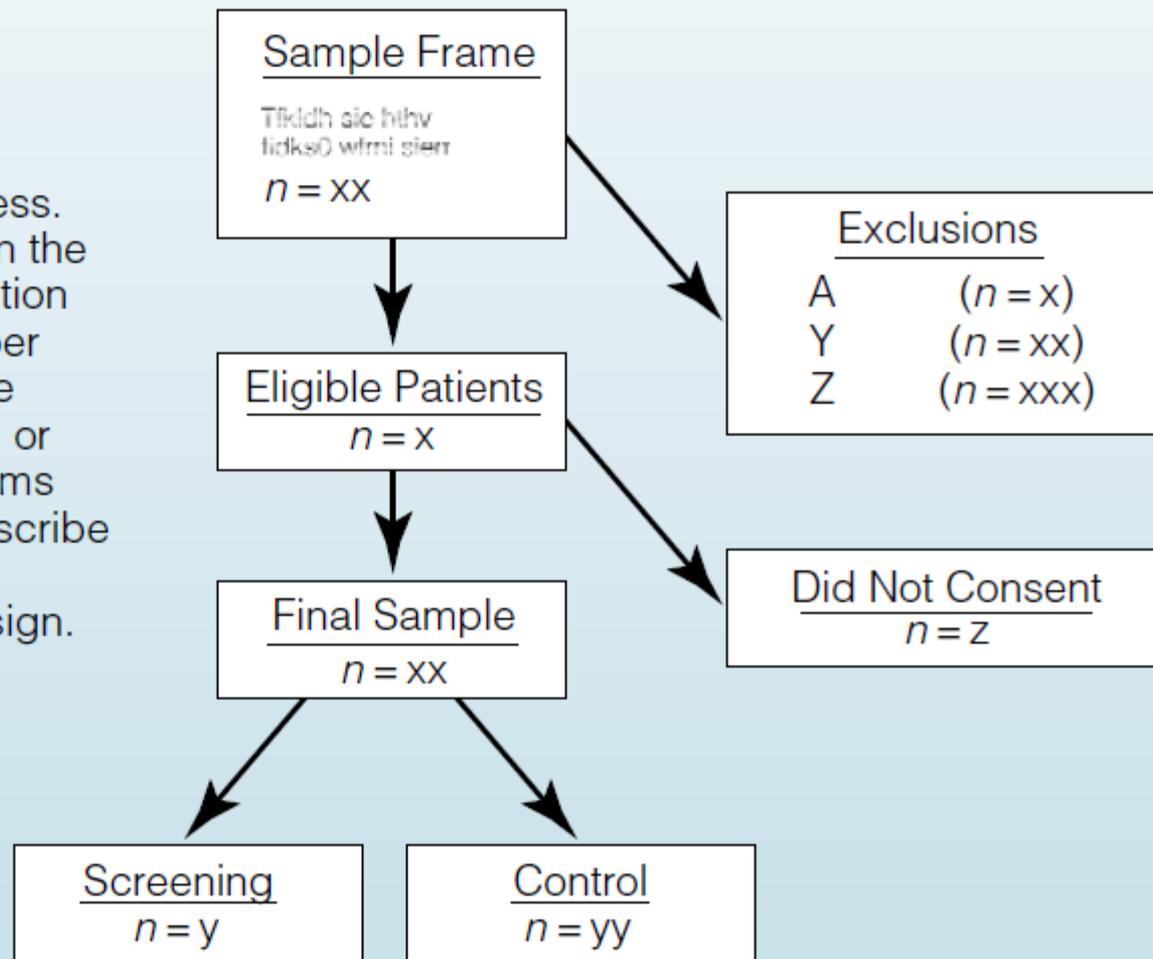
- **Clear overview of what was done**
- **Tension between brevity and completeness**
- **Some information about generalizability – how were patients included, from what population**
- **Pay attention to labels – brief yet intuitive**
- **What will you call the outcome measure**
- **Develop list of frequently used abbreviations – keep consistent throughout**

# Methods

- **Relatively rigid structure especially for RCT**
- **Use subheadings**
  - **Overview**
  - **Setting**
  - **Inclusion/exclusion**
  - **Primary/secondary outcomes**
  - **Analysis**
- **Check journal for guidance, can remove subheadings later but they help organize**
- **Consider figure**

## Flow Diagrams

Use simple drawings to communicate any process. Although most familiar in the context of sample selection (e.g., to detail the number of participants who were eligible, were excluded, or consented), flow diagrams are equally useful to describe computer algorithms, guidelines, or study design.



# Methods

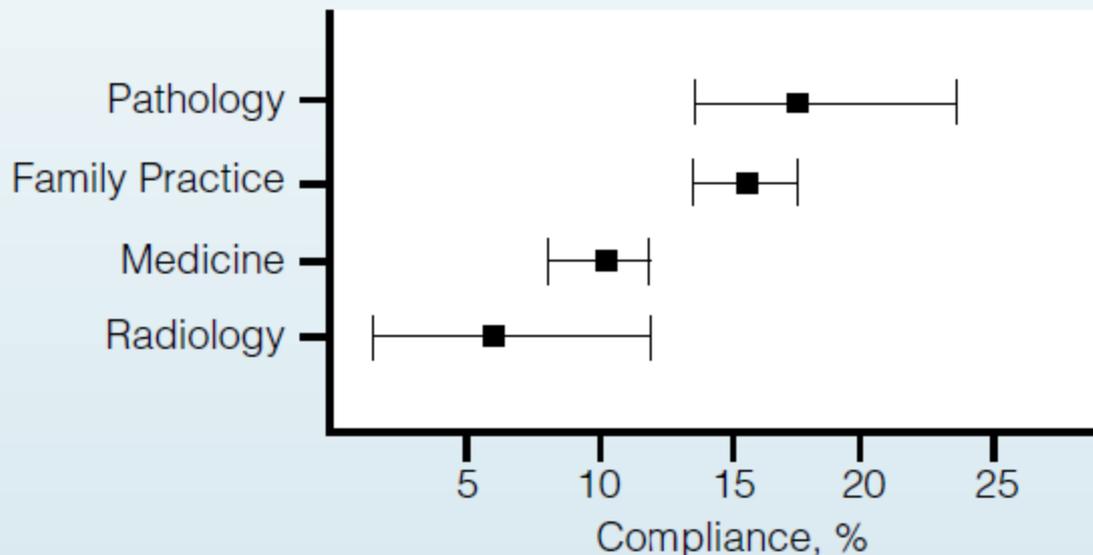
- **Use appendices to provide details of the analysis or specific data collection instruments (e.g. QOL or survey instruments)**
- **Of interest to reviewers or researchers interested in replicating the work**
- **If the methods were detailed in a previous manuscript you may refer to that manuscript and describe them briefly in the present work**

# Results

- **Short and to the point**
- **Distinguish primary vs secondary results and report primary first**
- **Use figures/tables to help decrease the amount of text.**
- **Don't repeat what is in the tables but refer to them highlighting only major findings in text form**

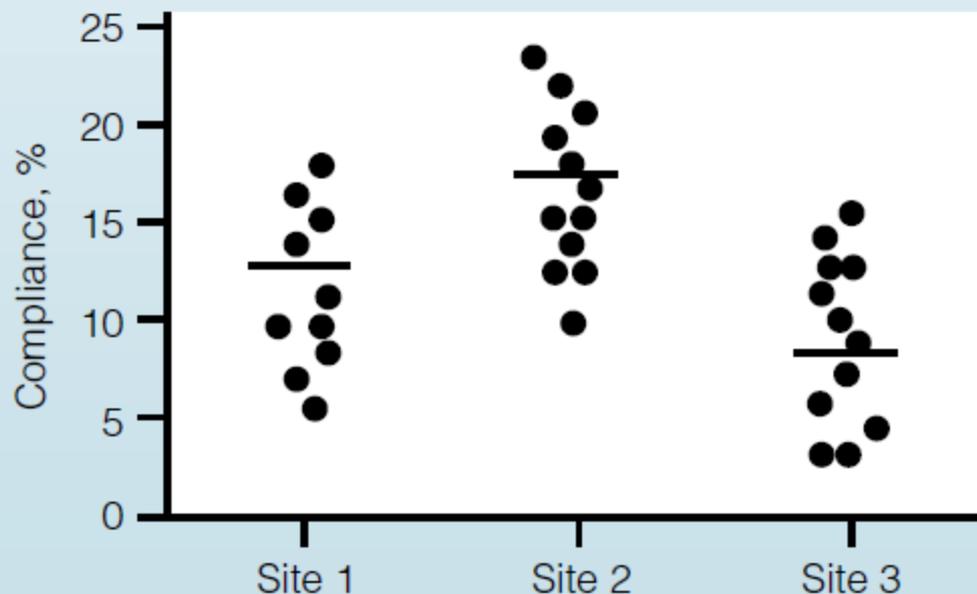
### 95% Confidence Intervals

Consider a figure whenever you are reporting several confidence intervals using the same metric. Although most commonly seen in reporting relative risks or odds ratios, a figure is an option whenever the confidence intervals refer to the same variable.

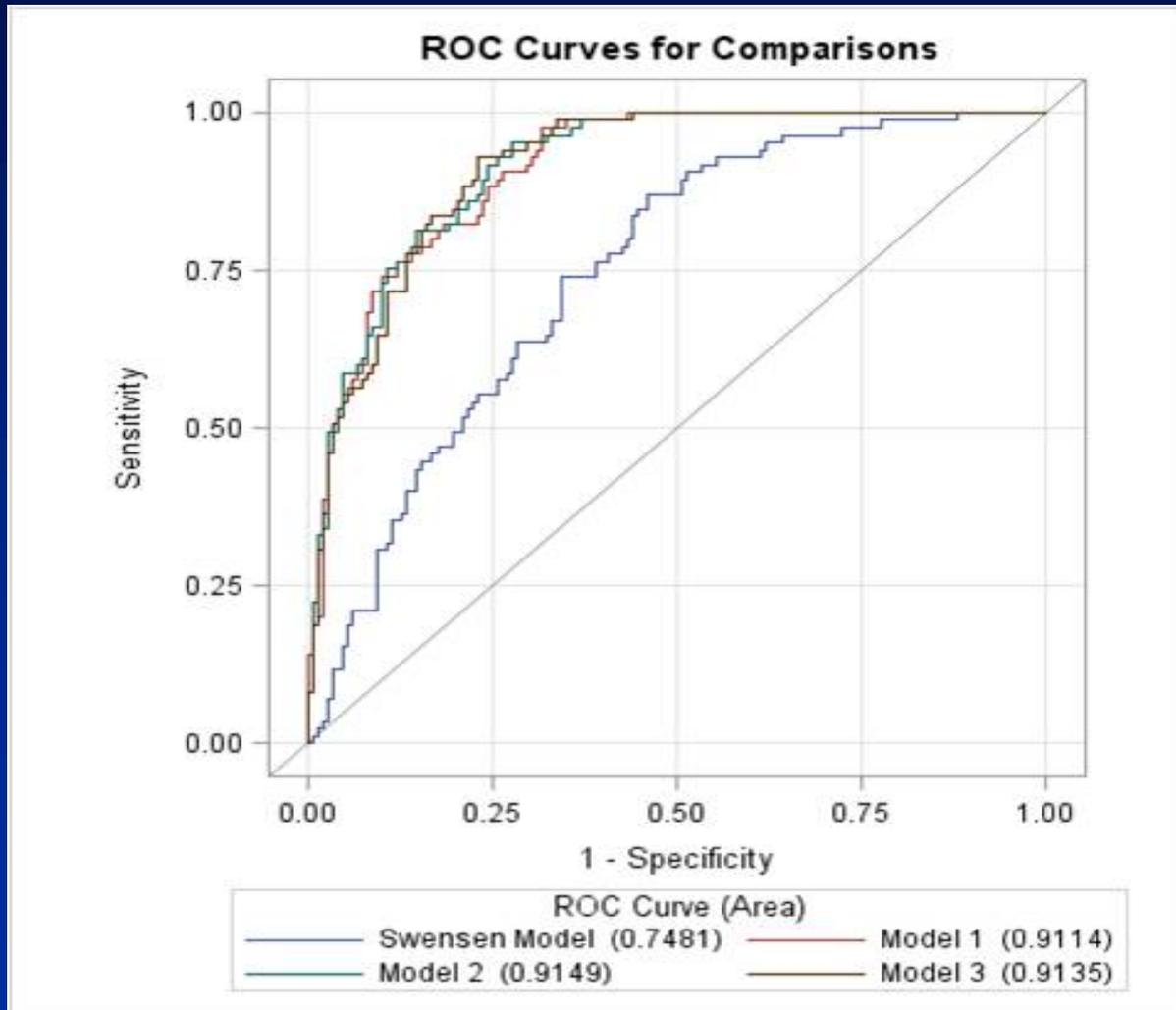


### Individual Data Points

Communicate the distribution of data by graphing individual data points when feasible (i.e., moderate sample sizes).

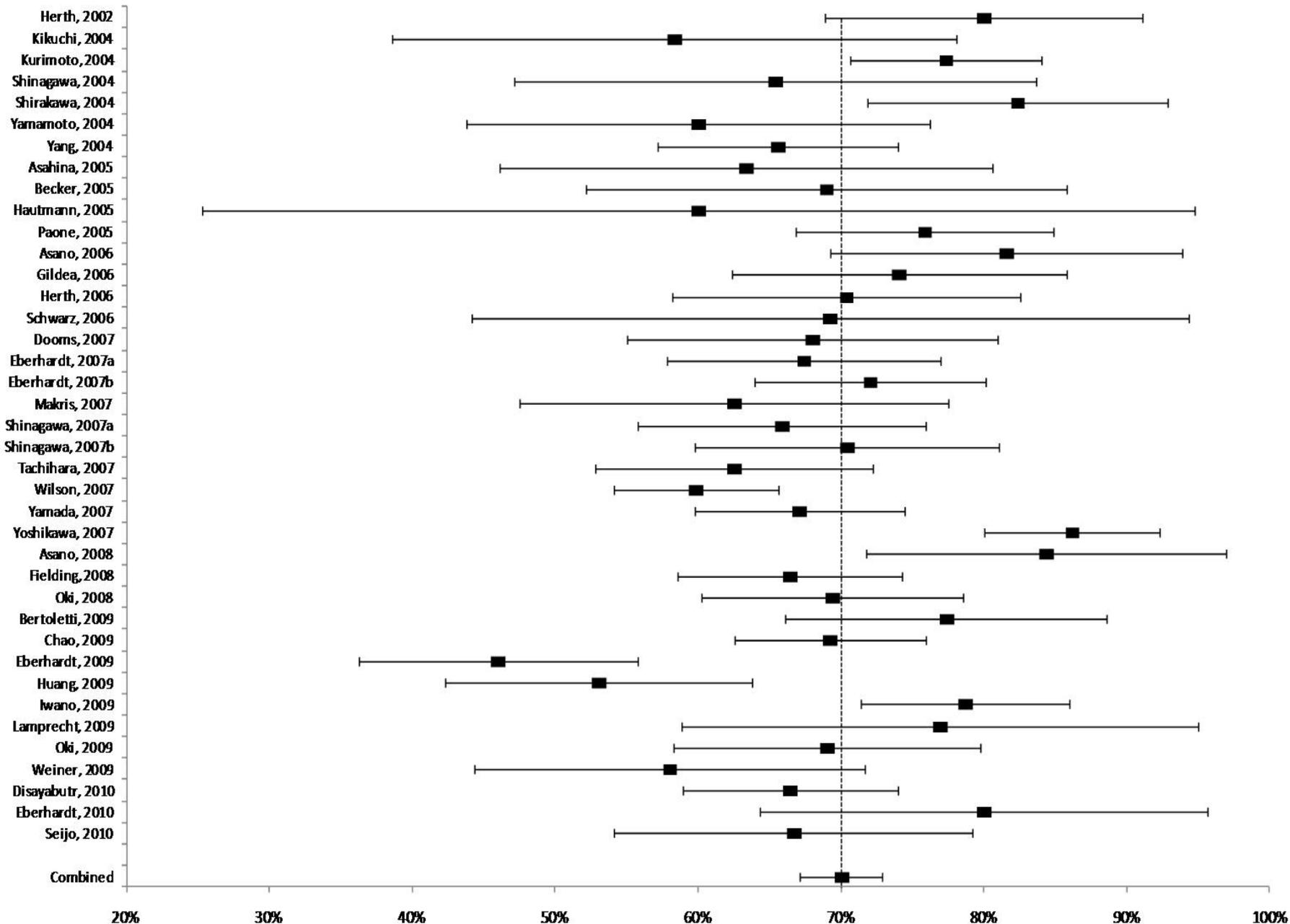


# Results



. Improvement in AUROC in models 1-3 compared with the Swensen Model

### Meta Analysis Summary of Diagnostic Yield



# Discussion

- **Summarize work and put into context**
- **Restate important results**
  - This study had 3 main findings...
- **Put this into context with a more thorough literature review than was appropriate for the introduction**

# Discussion

- **Limitations –**
  - **Valid limitations must be identified and discussed**
  - **Especially if they threaten the results**
  - **No paper is perfect – key is to let the reader know what can be confidently learned and what is speculative**
  - **Expected criticisms that are not valid should be introduced and rebutted.**

# Discussion

- The work should be put into perspective
- Assess generalizability
- Discuss clinical implications
- Speculate a little but not too much
- Don't overstate the results
- Consider what's next

**TABLE 2****Framework for the Discussion Section**

<b>QUESTION TO ADDRESS</b>	<b>CONTENT</b>		
What's the central finding?	Restate finding.  Place in the context of other work.		
Could it be wrong?	Identify and deal with threats to validity. Consider alternative explanations for your findings given the study design:		
	<b>BEFORE/AFTER</b>	<b>OBSERVATIONAL</b>	<b>RANDOMIZED TRIAL</b>
	Temporal trend Regression to the mean Selection bias	Loss to follow-up Low response rate Recall bias Unmeasured confounding	Inadequate blinding Ascertainment bias Loss to follow-up
What does it mean?	Put your work in perspective. Assess its generalizability, and speculate about its implications.  Specify what you think should happen next.		

# Finish Strong

- **Good papers are products of revisions**
- **Revisions require feedback**
- **Don't wait until manuscript is done – send it out in bite sized pieces**
- **Need a cadre of internal reviewers**
- **Big names may not have time or inclination. Junior faculty may be fine.**

# General vs Expert reviewers

- **General reviewer**

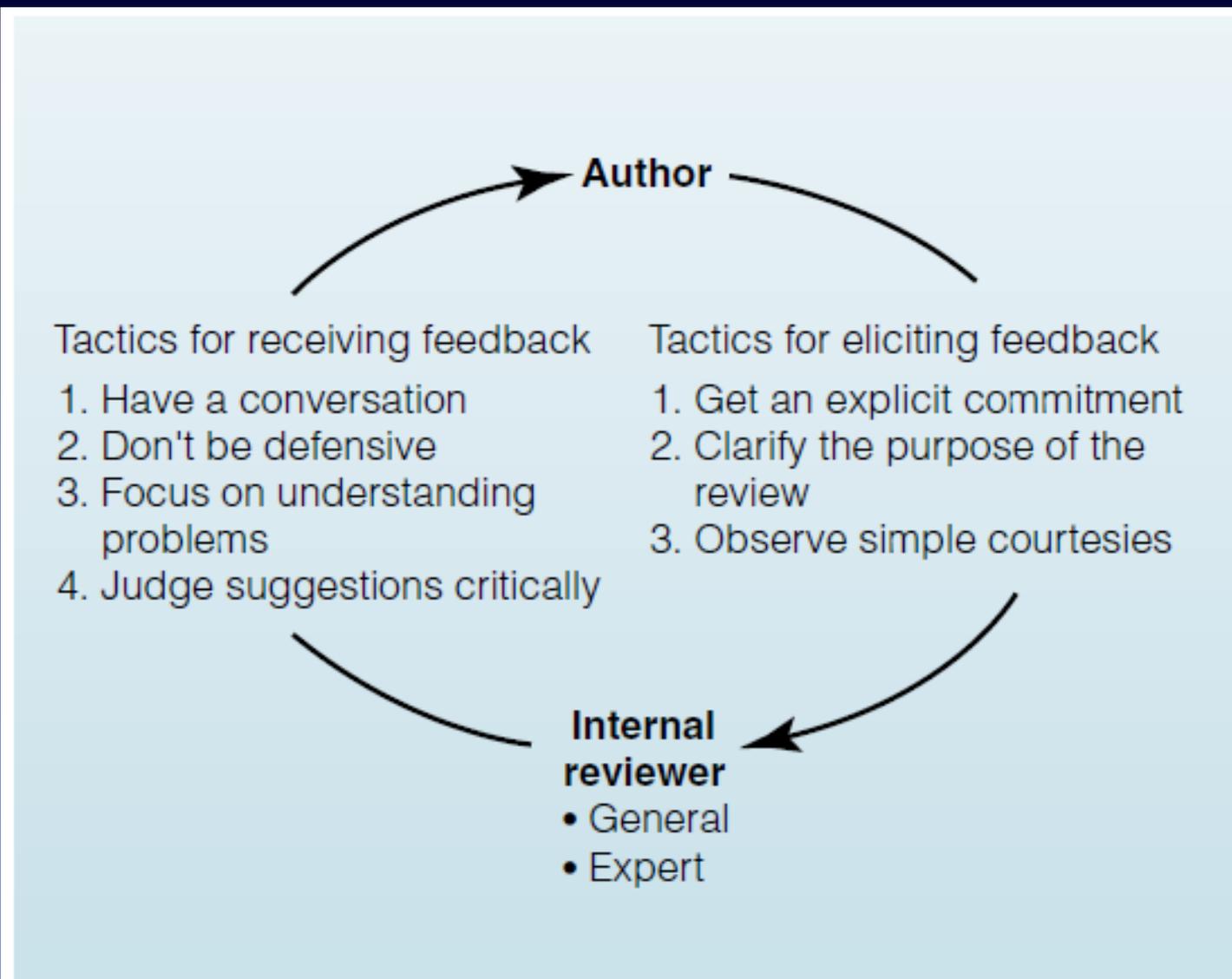
- Is the manuscript understandable
- Anyone can be a general reviewer
- Better if they read the journal you are submitting to but aren't in your research circle

- **Expert reviewers**

- Prepare you for the journal editor and reviewer
- Look for flaws in the research
- Make sure you are not missing important references, arguments

# Eliciting feedback

- **Get a commitment**
  - Ask before you send the paper
  - Give a time range for getting it back
  - Good reviewers have lots of time demands. If you can't wait move on.
- **Specify the type of review you need**
  - Methods, flow, argument logic, general readability, etc



**FIGURE 3. Tactics to maximize the productivity of the internal review process.**

# Simple Courtesies

- **Provide the manuscript in readable format**
  - Double or triple spaced
  - Numbered pages
- **Don't ask for specific review of moving target**
  - e.g. review a section that has already been deleted
- **Elicit a conversation with reviewer.**  
**Makes them feel part of the process**

# Receiving Feedback

- Discussion with reviewer helps clarify notes on manuscript and often allows for further discussion
- Don't be defensive. Leave ego at home
  - You want best shots – prepares you for the journal reviewers
- Focus on understanding problems
  - Assume a problem exists
  - Understand the reason for the concern and address it.

# Receiving Feedback

- **Be critical of review not reviewer**
  - **Can get bogged down in conflicting reviews**
  - **Problems identified by reviewers may be valid but sometimes solutions may be wrong**
  - **Separate style from substance**
  - **When you find yourself reverting to prior revisions its probably time to stop**

# Getting Better

- Takes time
- Don't rush the process
- Get general structure and message right before fiddling with fine detail
- But it down for a bit and pick it back up
- Revise frequently
- Lower barriers to revision
- Look at big picture and scrutinize structure – move pieces if needed

**TABLE 3****Getting Better****BASIC APPROACH****COMMENTS****Improve the paper**

Don't rush the process

Allow yourself the time to step back, digest, and read your work with a fresh perspective

Revise frequently

Look hard at your structure again

Check for consistency

Eliminate repetition and clutter

Respond to reviews by journal editors and peer reviewers

Strike a balance between intransigence and acquiescence

Detail what was changed (and make it easy to find the changes)

Provide a rationale for what was not changed

**Improve your skills**

Read and critique others

Serve as an internal reviewer for others

Serve as a peer reviewer

# **This and that**

- **Choose journals you have a realistic chance of getting into. Ok to shoot high once as they usually reject quickly**
- **Get used to rejection**
- **If you get rejected see what you can revise from the reviews and do it QUICKLY**
- **Resubmit within 2 weeks**
- **There should never be a reason you don't get published.**

# Take-Home Points

- Start writing before your project is completed.
- Focus your attention on what readers are most likely to look at: the title, abstract, tables, and figures.
- Develop a systematic approach to the introduction, methods, results, and discussion.
- Improve the paper by learning how to get and incorporate useful feedback.