Literature Search and Critical Appraisal

Martha Earl, MLS; Rebecca Harrington, MSLIS;
David Petersen, MSLIS; Daphne Norwood, MD, MPH

Goals and Objectives

• Describe the resources available at Preston Medical Library
• Prepare searchable questions and high yield search strategies
• Evaluate the citations received from a PubMed search for relevance and validity and access the full-text
• Use technology to monitor the literature and manage citations
• Critically appraise select articles and locate sources for critically appraised topics
• Share innovative and effective journal club structures
Quick Review on Scholarly Publishing

- Research impact tools for journals and authors: Web of Science, Scopus, Google Scholar, Cabell’s
- Scholarly publishing toolkits on UTHSC & UTK library research guides
- Predatory publishers: think, check, submit
- Open access journals and standards for publication
- Preston research guides and research support
Options other than Endnote

Research & Learning Connection
This research guide provides information and services to enhance the research experience of UTHSC faculty, staff, and students.

Effective research needs effective tools. Reference management tools/resources are crucial for research work. The primary purpose of each tool is to manage references and create citations and bibliographies within documents.

EndNote: It can be downloaded for free by UTHSC faculty, staff, and students with a valid HuSC EndNote account. EndNote has three platforms: CDS (most used), CDS (Mac with serial number required), and iPad app. The library created an EndNote Guide to show you how to use the program.

Zotero: Free to use, collect, manage, and cite research sources.

Choosing a Reference Management Tool

<table>
<thead>
<tr>
<th>Tool</th>
<th>EndNote Desktop</th>
<th>EndNote Basic</th>
<th>Zotero</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developer</td>
<td>Thompson Reuters</td>
<td>Thomson Reuters</td>
<td>Thompson Reuters</td>
</tr>
<tr>
<td>Released</td>
<td>2006</td>
<td>2004</td>
<td>2005</td>
</tr>
<tr>
<td>Cost</td>
<td>Free to UTHSC users</td>
<td>Free / Open Source</td>
<td>Free / Open Source</td>
</tr>
<tr>
<td>Free Storage</td>
<td>Unlimited</td>
<td>2G</td>
<td>2G (beta)</td>
</tr>
<tr>
<td>Platform</td>
<td>Desktop &amp; App for iOS, Android</td>
<td>Web &amp; App</td>
<td>Web &amp; App, App for iOS devices</td>
</tr>
<tr>
<td>OS</td>
<td>Windows, Mac</td>
<td>Windows, Mac</td>
<td>Windows, MAC, Linux</td>
</tr>
<tr>
<td>Tutorial</td>
<td>EndNote tutorials</td>
<td>EndNote tutorials</td>
<td>EndNote tutorials</td>
</tr>
</tbody>
</table>

Preston Medical Library

Published: October 1908

Visit, Museum, & Tours
The Preston Medical Library, located at 1524 Almeda Ave, is open Monday through Friday from 8:00 am to 5:00 pm. The library is closed on holidays.

Location: 1524 Almeda Ave, Houston, TX 77008

<table>
<thead>
<tr>
<th>Hours</th>
<th>Monday - Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mon-Thurs</td>
<td>8:00 am - 5:00 pm</td>
</tr>
<tr>
<td>Fri</td>
<td>8:00 am - 1:00 pm</td>
</tr>
</tbody>
</table>

News
We have made some changes to off-campus access for our e-books. Please see Preston Medical Library for more information.

If you are unable to get to the library or are using the library's resources from off-campus, you can use your UTHSC network to access the library's resources. Additionally, you can use the digital library catalog to find and access resources. The library is open during normal hours of operation.
AccessMedicine - not just ebooks

Cochrane - standard in systematic reviews
UpToDate

Practice changing updates

Author: Cassidy Driscoll MD, MPH

Date Updated: 8/25/2010

Cardiovascular medicine: Hypertension medicine - general surgery (August 2010)

Delegation for patients with renal insufficiency after non-cardiac surgery


Delegation for patients with renal insufficiency after non-cardiac surgery (NCS) is an increase use for such and it is often done in a non-regulated manner. In a study of 19 NCS patients with renal insufficiency (RI), 12 patients were admitted to the hospital, 8 patients were admitted to the ICU, 4 patients were admitted to the CVICU, and 2 patients were admitted to the CVICU. The RI patients were admitted to the hospital for a median of 2 days (range 0-20 days) and were discharged with a median of 4 days (range 0-20 days).

Complications of RI include pneumonia, 15 patients. The median of major bleeding was either between the groups of 0 versus 1 patients. We suggest adding delegation for two years to standard care of patients with RI. Better risk stratification in patients admitted to hospital after cardiovascular surgery can help patients with RI. (See also Delegation for patients with renal insufficiency after non-cardiac surgery, section on Delegation.)

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The Impact of Library Resources and Services on the Scholarly Activity of Medical Faculty and Residents

Alexandria C. Queenberg, Garry Delicheng, Martha Sel, Kelby Leonard & Cynthia J. Vought

https://doi.org/10.20347/GD-2016-139

Table 1 of 1
Table 1. Use of services/resources by purpose.

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Percent &quot;yes&quot;</th>
<th>Services/resource utilisation</th>
<th>Percent residents</th>
<th>Percent Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Published article(s) or book chapter(s)</td>
<td>48</td>
<td>Requested a literature search</td>
<td>66.7</td>
<td>72.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Accessed online material myself</td>
<td>50.0</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Requested articles from PRLs</td>
<td>66.7</td>
<td>73</td>
</tr>
<tr>
<td>Presented poster(s) or paper(s)</td>
<td>59</td>
<td>Requested a literature search</td>
<td>66.7</td>
<td>56.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Accessed online material myself</td>
<td>85.3</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Requested articles from PRLs</td>
<td>85.3</td>
<td>82.1</td>
</tr>
</tbody>
</table>
How Readers Discover Content in Scholarly Publications

By Tracy Gardner and Simon Inger

Published by Renew Publishing Consultants, a trading name of Simon Inger Consulting Ltd
Published August 2018

The full dataset can be found at https://doi.org/10.6084/m9.figshare.7016735.v1
The report can be downloaded at renew.pub/discovery2018
Trend Analysis: Journal Article Search

Trend from 2005 – 2018

When you need to do a search for articles on a specific subject, where on the web do you start that search?

- A specialist bibliographic database (e.g., EBSCOhost, ProQuest)
- Library catalog
- Library web pages
- Library website
- Library search engines

Research Guides

Preston Medical Library is here to support you in your research. Here are some resources to help you:

- Library
- Hours
- Events
- Online Resources
- Subject Guides
- Search Tips

General Resources:
- Copyright
- Headings
- Paraphrasing
- Publication Date

Subject Specific Resources by Department:
- Anatomy
- Cancer Medicine
- Dermatology
- Endocrinology
- Internal Medicine
- Orthopedics
- Pediatrics
- Surgery
- Transplantation
- Urology
- Vascular

Search This Guide

9/19/2018
Introducing the Librarians

Preston Medical Library

Martha Earl

Associate Professor/Library Director, MLS, AHIP
Liaison to: Anesthesiology, Dean's Office, Family Medicine
Serves on: IRB, AAPTC, Research Resources Committee
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Serves on: Nursing Practice and Quality & Patient Safety Councils
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Email: dpetersen@utmck.edu

Kelsey Grabeel
Assistant Professor/Assistant Director of the Health Information Center, MSIS, AHIP
Focuses on: patient/consumer health literacy
Serves on: IRB, Patient Education Committee
Email: kgrabeel@utmck.edu
A Busy Place in 2018…

- Over 54,000 people have visited us this year (GSM, public, staff)
- Over 26,000 unique hits to the Preston Medical library webpage
- Over 5,000 hours of study/conference room use
- 70 sessions taught and over 1150 people trained by librarians
- Over 2,200 full-text article requests fulfilled

Literature searches by the numbers

- For calendar year 2018, we have conducted 343 literature searches
- Average literature search was completed in less than 4 days, with median time at 1 day
- Approximately 40% of all literature searches come from GSM employees
Number of Literature Searches by Affiliation for Year 2018

- Administrator
- Faculty
- Nurse
- Other
- Physician
- Resident/Fellow
- Staff

Number of Literature Search Requests by Department for Year 2018
Literature Search Requests

• Via email – can also use library@utmck.edu
• Online form – under “Services” on library homepage
• Call us – x9525, or come in
Dr. Wilson’s Search

I need a randomized control trial about the utility of nasal atomizers, specifically with Midazolam, for conscious sedation of men getting vasectomies.

You can Google.....

Google

the utility of nasal atomizers of Midazolam for conscious sedation of men getting

Sedation with intranasal midazolam in adults undergoing upper ...
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3002/
Cited by 12 - Related articles
The use of intranasal (IN) midazolam in adults for sedation in upper ... In the first group (n = 30), patients received IN midazolam. Adult, Aged, Conscious Sedation*, Injections, Intravenous, Male, Midazolam/Administration & Dosage*, Middle-Aged; Prospective Studies
Missing: atomizers-vasectomies

Midazolam for sedation before procedures. - NCBI
Cited by 27 - Related articles
May 20, 2016 - BACKGROUND: Midazolam is used for sedation before diagnostic and therapeutic procedures. Administration by several routes including oral, intravenous, intranasal and intramuscular is rare (RR 4.01, 95% CI 1.92 to 6.40; moderate-quality evidence).
Missing: utility atomizers men vasectomies
But you may not be able to access what you find

From Google link:

From the Preston Medical Library website:

**PubMed Tricks: MeSH Terms**
(listed under article’s abstract)

Left-click
PubMed Tricks:
Use filters on your search results

Saving Searches and Search Results
My NCBI

- Create collections of search results
- Save and revisit recent activity
- Save search strategies and have them run automatically (daily, weekly, monthly)
- NCBI Site Preferences: Highlight search words, set up Result Display Settings, show Abstract Supplemental Data
  - Outside Tool (full text links): can use University of Tennessee Health Science Center

Citation Manager: EndNote

- EndNote Desktop: Download on to your computer – Full version
- EndNote Basic: Access/Share references anywhere with internet connection – Light version of EndNote, but a must for EndNote Sync and library sharing
- EndNote for iPad: Sync references back to your computer and EndNote Basic – Limited version
How can EndNote help you?

• Organize references in folders
• Remove duplicates
• Find full text of articles in PDF format
• Share references
• Insert references into a paper in the desired format (e.g., AMA)
• Create bibliographies
• Find the best fit journals for your manuscript
Interpreting Literature Search Results

G. Anthony Wilson, MD

Faculty Development Perspective

- Resources available at Preston Medical library.
- **How to prepare searchable questions** and high yield search strategies.
- Evaluate citations received from a PubMed search for relevance and validity and access the full text.
- Use technology to monitor literature and manage citations.
- **Critically appraise select articles and locate sources for critically appraised topics.**
- Share innovative and effective journal club structures.
How do you and your learners come up with searchable questions and important topics?

Bloom et al, 1956.
Patient Care and using SNAPPSP –PLUS to generate questions

- Summarize history and exam.
- Narrow differential diagnosis to a few possibilities (commit your learner)
- Analyze the differential by comparing and contrasting
- Probing by asking about ambiguities, different approaches
- Planning patient management
- Select a topic for further learning PLUS frame the topic question as a PICO, as an educational prescription.


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### Question Categories

**Bedside SNAPPSP-Plus Presentations (190) on Internal Medicine Clerkship, University of Minnesota Medical School, 2006-2010**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Definition</th>
<th>No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical diagnosis</td>
<td>How to properly gather findings; H+P; tests</td>
<td>37 (19%)</td>
</tr>
<tr>
<td>Data Acquisition</td>
<td>How to interpret findings from H+P; tests</td>
<td></td>
</tr>
<tr>
<td>Data Interpretation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Therapy</td>
<td>How to select treatment</td>
<td>112 (59%)</td>
</tr>
<tr>
<td>Harm</td>
<td></td>
<td>5 (3%)</td>
</tr>
<tr>
<td>Patient Safety</td>
<td>Preventable medical errors</td>
<td></td>
</tr>
<tr>
<td>Complications</td>
<td>Complications from treatment/tests/exposure</td>
<td></td>
</tr>
<tr>
<td>Prognosis</td>
<td>Estimate patient’s likely course and anticipate complications</td>
<td>11 (6%)</td>
</tr>
<tr>
<td>Prevention</td>
<td>How to reduce the chance of disease by identifying/modifying risk factors and diagnosing earlier by screening.</td>
<td>8 (4%)</td>
</tr>
<tr>
<td>Cost Analysis</td>
<td>Cost comparisons</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Basic Science/Other</td>
<td>Basic Science, Physiology, Pharmacokinetics, Other</td>
<td>7 (4%)</td>
</tr>
</tbody>
</table>

PICO – creating an effective search

<table>
<thead>
<tr>
<th>Patient</th>
<th>Broad Search</th>
<th>Narrow Search</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leave Blank</td>
<td>Age range, Age descriptor, Sex, Ethnicity</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Broad Search</th>
<th>Narrow Search</th>
</tr>
</thead>
<tbody>
<tr>
<td>General descriptor/category</td>
<td>Specific intervention</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Broad Search</th>
<th>Narrow Search</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leave Blank or general descriptor</td>
<td>Comparison intervention</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Broad Search</th>
<th>Narrow Search</th>
</tr>
</thead>
<tbody>
<tr>
<td>General outcome/mortality/morbidity</td>
<td>Specific diagnosis, clinical outcome, cost</td>
<td></td>
</tr>
</tbody>
</table>

PICO Scoring Rubric

From a Study of Internal Medicine Clerkship Students and Bedside SNAPPS Presentations, University of Minnesota Medical School, 2006-2010

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Score</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>[P?]</td>
<td>1</td>
<td>What is celiac sprue?</td>
</tr>
<tr>
<td>[I]</td>
<td>2</td>
<td>Is a D-dimer useful?</td>
</tr>
<tr>
<td>[P] [I?]</td>
<td>3</td>
<td>What therapy is best for patients with pulmonary embolism?</td>
</tr>
<tr>
<td>[P] [I?] [O?]</td>
<td>4</td>
<td>What is the best treatment for analgesic rebound headaches?</td>
</tr>
<tr>
<td>[P] [I] [O?]</td>
<td>5</td>
<td>Could stimulants be useful for chronic fatigue syndrome?</td>
</tr>
<tr>
<td>[P] [I] [O]</td>
<td>6</td>
<td>What antibiotics eradicate Helicobacter pylori?</td>
</tr>
<tr>
<td>[P] [I] [C] [O?]</td>
<td>7</td>
<td>Do acetaminophen and an NSAID combined improve osteoarthritis better than either one alone?</td>
</tr>
<tr>
<td>[P] [I] [C] [O]</td>
<td>8</td>
<td>In patients with suspected PE is CT Pulm Angio vs VQ scan more sensitive to r/o PE?</td>
</tr>
</tbody>
</table>

GRADING RUBRIC PICO elements clearly stated 0=no, 1=somewhat, 2=yes

Librarians as part of the clinical team

Banks et al., Decreased hospital length of stay associated with presentation of care associated with presentation of cases at morning report with librarian support. *J Med Libr Assoc.* 95(4) October 2007.

- Case-control study with 55 cases and 136 controls. Out of 105 eligible cases (2004-2005), 55 had at least one matched control. Controls chosen from 19,210 admissions at LSU 200-2005.

- Cases vs Controls: LOS 3 days vs 5 days (p<0.024), Hospital charges $7,045 vs $10,663 for control. No difference in 30 day readmission.

**SNAPPS PLUS - PRACTICE**
50 year old Southern Asian male presents to the Family Practice Department requesting a vasectomy. His wife is 8 years younger and they have completed their family. He is completing antibiotics for a recent sinus infection. He tells you he is a bit anxious about the procedure which he would like to be minimally invasive without an IV, if possible.

Past Medical History: Hepatitis C, treated 3 years ago. Hypertension. GERD

Meds: Diltiazem XR 240 mg daily, Tagamet HB 200 mg daily as needed (OTC), Clarithromycin NKDA

PE: 145/85, 70, 16 5'9" Weight 280 lbs
Cardiac – RRR no m/g/r
Pulmonary – CTA
Abdomen – Obese, soft, NT, no organomegaly
Ext exam – mild edema.

Your colleague does office vasectomy and you have heard that nasal midazolam is used at ETCH. You are considering this for him.

QUESTIONS?????
### A PICO Approach to Assessing the Abstract for Relevance

<table>
<thead>
<tr>
<th>Category</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title and Abstract</td>
<td>Does this interest you? Is it important to your practice?</td>
</tr>
<tr>
<td>Patient Population</td>
<td>Evaluate Figure 1! Does the patient population look like your patient?</td>
</tr>
<tr>
<td>Intervention</td>
<td>Is the intervention one that is available to you?</td>
</tr>
<tr>
<td>Comparison</td>
<td>Is the comparison one that is used at your institution?</td>
</tr>
<tr>
<td>Outcome</td>
<td><strong>Patient Oriented?</strong> Morbidity, Mortality, Quality of Life or just Disease Oriented? Number PVC's, Time to procedure</td>
</tr>
<tr>
<td></td>
<td>Is the outcome difference clinically significant?</td>
</tr>
<tr>
<td></td>
<td>Cherchez la “p”! Is the p-value &lt;0.05 (or better p&lt;0.01)</td>
</tr>
</tbody>
</table>

### Identify the Study Type

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Total</th>
<th>1990 (n=133)</th>
<th>2000 (n=123)</th>
<th>2010 (n=106)</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Descriptive</td>
<td>55 (15.2%)</td>
<td>36 (26.9%)</td>
<td>9 (7.3%)</td>
<td>21 (20.2%)</td>
<td>0.001</td>
</tr>
<tr>
<td>Cross-sectional</td>
<td>52 (14.4%)</td>
<td>25 (18.8%)</td>
<td>21 (17.3%)</td>
<td>5 (4.8%)</td>
<td></td>
</tr>
<tr>
<td>Case control</td>
<td>15 (5.5%)</td>
<td>10 (7.5%)</td>
<td>5 (4.1%)</td>
<td>4 (3.8%)</td>
<td></td>
</tr>
<tr>
<td>Cohort</td>
<td>56 (15.5%)</td>
<td>9 (6.8%)</td>
<td>23 (18.8%)</td>
<td>24 (22.6%)</td>
<td></td>
</tr>
<tr>
<td>Meta-analysis/systematic reviews</td>
<td>3 (0.9%)</td>
<td>2 (2.2%)</td>
<td>1 (1.4%)</td>
<td>0 (0.0%)</td>
<td></td>
</tr>
<tr>
<td>RCT</td>
<td>67 (18.6%)</td>
<td>14 (10.5%)</td>
<td>33 (26.6%)</td>
<td>23 (22.1%)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>87 (24.1%)</td>
<td>39 (29.3%)</td>
<td>29 (23.6%)</td>
<td>19 (17.7%)</td>
<td></td>
</tr>
<tr>
<td>Statistical software</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAS</td>
<td>90 (24.9%)</td>
<td>7 (5.3%)</td>
<td>51 (41.3%)</td>
<td>35 (33.7%)</td>
<td>0.001</td>
</tr>
<tr>
<td>SPSS</td>
<td>23 (6.4%)</td>
<td>8 (6.0%)</td>
<td>6 (4.9%)</td>
<td>14 (13.2%)</td>
<td>0.062</td>
</tr>
<tr>
<td>STATA</td>
<td>41 (11.4%)</td>
<td>9 (6.8%)</td>
<td>12 (9.8%)</td>
<td>24 (22.7%)</td>
<td>0.001</td>
</tr>
<tr>
<td>Not specified</td>
<td>152 (42.1%)</td>
<td>56 (42.2%)</td>
<td>56 (45.6%)</td>
<td>40 (37.7%)</td>
<td></td>
</tr>
<tr>
<td>Biopsychometric data</td>
<td>164 (45.3%)</td>
<td>50 (37.3%)</td>
<td>64 (52.0%)</td>
<td>41 (38.7%)</td>
<td>0.267</td>
</tr>
<tr>
<td>Labs values used/ measured</td>
<td>180 (50.0%)</td>
<td>54 (40.5%)</td>
<td>65 (52.9%)</td>
<td>61 (57.4%)</td>
<td>0.185</td>
</tr>
</tbody>
</table>

*Chi-square for difference by year. †Includes case studies, comparative studies. ‡Includes nested case control. doi:10.1371/journal.pone.0077301.801


https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0077301
### Levels of Evidence

<table>
<thead>
<tr>
<th>Level of Evidence</th>
<th>Type of Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a</td>
<td>Systematic review of randomized controlled trials (RCT's)</td>
</tr>
<tr>
<td>1b</td>
<td>One well-designed RCT (multi-centered, well powered)</td>
</tr>
<tr>
<td>2a</td>
<td>Systematic Review of cohort studies</td>
</tr>
<tr>
<td>2b</td>
<td>Individual cohort studies and low-quality RCT's</td>
</tr>
<tr>
<td>3a</td>
<td>Systematic reviews of case-controlled studies</td>
</tr>
<tr>
<td>3b</td>
<td>Individual case-controlled study</td>
</tr>
<tr>
<td>4</td>
<td>Case Series, poor quality cohort and case-control studies</td>
</tr>
<tr>
<td>5</td>
<td>Expert opinion based on clinical experience; bench research</td>
</tr>
</tbody>
</table>

Sackett, 2000

### Look at the Statistics
A Couple of Terms

Hypothesis – Usually null (no change). You are trying to disprove the null hypothesis.

P- Value

It's the Probability Statistic.

$P \leq 0.05$ corresponds to 1.96 (about 2) standard deviations for a normal distribution (2-tailed test).
This approximates about a 1 in 22 probability of being disproving the null hypothesis by chance alone.

Power

The likelihood that the study correctly rejects the null hypothesis.
Power analysis calculates minimum sample size.

---

Statistical Knowledge:
Where are we starting from?

In 2006, 277 internal medicine residents completed a biostatistics test of statistics used in the literature.

- Percent of correct answers: 41%
- Percent residents who said they did not understand all the concepts they encountered in the literature: 75%
- Percent that thought it was important to understand these concepts to be an effective literature reader: 95%

More recent studies (2012, 2016) indicate that we have not made much progress with plastic surgery residents or pharmacists despite increased emphasis on EBM topics in medical schools.

Hand out JAMA Biostatistics Test


<table>
<thead>
<tr>
<th>Characteristics</th>
<th>1990 (n = 138)</th>
<th>2000 (n = 122)</th>
<th>2010 (n = 106)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Descriptive statistics</td>
<td>124 (91.2%)</td>
<td>122 (100%)</td>
<td>166 (100%)</td>
<td></td>
</tr>
<tr>
<td>Low-level statistical measures†</td>
<td>166 (91.2%)</td>
<td>116 (95.1%)</td>
<td>166 (100%)</td>
<td>0.001</td>
</tr>
<tr>
<td>Mortality &amp; mortality</td>
<td>76 (55.4%)</td>
<td>60 (48.3%)</td>
<td>77 (49.0%)</td>
<td>0.011</td>
</tr>
<tr>
<td>ANOVA</td>
<td>28 (20.7%)</td>
<td>24 (19.8%)</td>
<td>15 (11.2%)</td>
<td>0.014</td>
</tr>
<tr>
<td>Chi-square</td>
<td>54 (40.0%)</td>
<td>51 (41.8%)</td>
<td>51 (40.3%)</td>
<td>0.471</td>
</tr>
<tr>
<td>Fisher exact</td>
<td>19 (14.3%)</td>
<td>13 (10.9%)</td>
<td>20 (12.9%)</td>
<td>0.553</td>
</tr>
<tr>
<td>Mann-Whitney</td>
<td>11 (8.3%)</td>
<td>15 (12.0%)</td>
<td>7 (4.7%)</td>
<td>0.011</td>
</tr>
<tr>
<td>Spearman's correlation</td>
<td>28 (21.1%)</td>
<td>31 (25.4%)</td>
<td>31 (20.4%)</td>
<td>0.109</td>
</tr>
<tr>
<td>t-test</td>
<td>27 (20.3%)</td>
<td>23 (18.8%)</td>
<td>26 (16.4%)</td>
<td>0.517</td>
</tr>
<tr>
<td>Power</td>
<td>7 (5.7%)</td>
<td>2 (1.7%)</td>
<td>26 (16.4%)</td>
<td>0.001</td>
</tr>
<tr>
<td>Pearson correlation coefficient</td>
<td>13 (9.8%)</td>
<td>16 (13.0%)</td>
<td>14 (11.2%)</td>
<td>0.003</td>
</tr>
<tr>
<td>Logistic regression</td>
<td>17 (12.6%)</td>
<td>11 (9.0%)</td>
<td>8 (7.4%)</td>
<td>0.013</td>
</tr>
<tr>
<td>Simple linear regression</td>
<td>13 (9.8%)</td>
<td>11 (9.0%)</td>
<td>13 (12.2%)</td>
<td>0.600</td>
</tr>
<tr>
<td>Multiple regression</td>
<td>12 (9.1%)</td>
<td>11 (9.0%)</td>
<td>24 (22.1%)</td>
<td>0.001</td>
</tr>
<tr>
<td>Multiple comparison</td>
<td>7 (5.3%)</td>
<td>6 (5.0%)</td>
<td>9 (8.5%)</td>
<td>0.003</td>
</tr>
<tr>
<td>Multiple regression</td>
<td>12 (9.1%)</td>
<td>11 (9.0%)</td>
<td>24 (22.1%)</td>
<td>0.001</td>
</tr>
<tr>
<td>Multivariate regression</td>
<td>17 (12.6%)</td>
<td>16 (13.0%)</td>
<td>19 (17.0%)</td>
<td>0.010</td>
</tr>
<tr>
<td>Cox model</td>
<td>19 (14.3%)</td>
<td>17 (13.9%)</td>
<td>24 (22.4%)</td>
<td>0.001</td>
</tr>
<tr>
<td>Kaplan-Meier</td>
<td>5 (3.9%)</td>
<td>13 (10.7%)</td>
<td>24 (22.4%)</td>
<td>0.001</td>
</tr>
<tr>
<td>Sensitivity analysis</td>
<td>30 (22.3%)</td>
<td>44 (35.9%)</td>
<td>52 (40.3%)</td>
<td>0.001</td>
</tr>
<tr>
<td>Information to treat</td>
<td>6 (4.5%)</td>
<td>16 (13.0%)</td>
<td>21 (22.0%)</td>
<td>0.002</td>
</tr>
<tr>
<td>Transformation</td>
<td>9 (6.5%)</td>
<td>12 (8.0%)</td>
<td>16 (14.0%)</td>
<td>0.674</td>
</tr>
</tbody>
</table>


*Includes statistics in which these were n = 10 across all three years of review; includes standard deviations, standard errors, confidence intervals, and p-values. †Includes odds ratios, relative risks, attributable risks, sensitivity, and specificity.
The Statistician on Your Team

R. Eric Heidel, Ph.D
Division of Biostatistics
Graduate School of Medicine

Available for GSM faculty and residents
Mentors grad students from UTK

Areas of interest: education, simulation, research
design, QI, clinical outcomes, survey creation,
psychometrics, diagnostic testing, epidemiology.

Some Statistics about Publication Statistics

• As of August 1, 2018 there are 5,293 journals indexed for MEDLINE.

• AIM (Abridged Index Medicus) aka “Core journals” is a subset of PubMed Limits – list of 120 core clinical English language journals created in 1970.

• CONSORT is a joint agreement among journals about transparency and consistency with statistics reporting of RCTs. In 2010, this was updated with a checklist.

• Only 593 journals have endorsed (require) CONSORT checklist. Most core journals do.

GUIDE YOUR LEARNERS TO CORE JOURNALS TO ASSURE SOME INCREASED TRANSPARENCY AND REVIEW ALTHOUGH CONSORT STILL INCOMPLETELY UTILIZED.
<table>
<thead>
<tr>
<th>Section/Topic</th>
<th>Item No</th>
<th>Checklist item</th>
<th>Reported on page No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title and abstract</td>
<td>1a</td>
<td>Identification as a randomised trial in the title</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1b</td>
<td>Structured summary of trial design, methods, results, and conclusions (for specific guidance see CONSORT for abstracts)</td>
<td></td>
</tr>
<tr>
<td>Introduction</td>
<td>2a</td>
<td>Scientific background and explanation of rationale</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2b</td>
<td>Specific objectives or hypotheses</td>
<td></td>
</tr>
<tr>
<td>Methods</td>
<td>3a</td>
<td>Description of trial design (such as parallel, factorial) including allocation ratio</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3b</td>
<td>Important changes to methods after trial commencement (such as eligibility criteria), with reasons</td>
<td></td>
</tr>
<tr>
<td>Participants</td>
<td>4a</td>
<td>Eligibility criteria for participants</td>
<td></td>
</tr>
<tr>
<td>Interventions</td>
<td>5</td>
<td>The interventions for each group with sufficient details to allow replication, including how and when they were actually administered</td>
<td></td>
</tr>
<tr>
<td>Outcomes</td>
<td>6a</td>
<td>Completely defined pre-specified primary and secondary outcome measures, including how and when they were assessed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6b</td>
<td>Any changes to trial outcomes after the trial commenced, with reasons</td>
<td></td>
</tr>
<tr>
<td>Sample size</td>
<td>7a</td>
<td>How sample size was determined</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7b</td>
<td>When applicable, explanation of any interim analyses and stopping guidelines</td>
<td></td>
</tr>
<tr>
<td>Randomisation:</td>
<td>8a</td>
<td>Method used to generate the random allocation sequence</td>
<td></td>
</tr>
<tr>
<td>Sequence</td>
<td>8b</td>
<td>Type of randomisation; details of any restriction (such as blocking and block size)</td>
<td></td>
</tr>
<tr>
<td>Allocation</td>
<td>9</td>
<td>Mechanism used to implement the random allocation sequence (such as sequentially numbered containers), describing any steps taken to conceal the sequence until interventions were assigned</td>
<td></td>
</tr>
<tr>
<td>Implementation</td>
<td>10</td>
<td>Who generated the random allocation sequence, who enrolled participants, and who assigned participants to interventions</td>
<td></td>
</tr>
<tr>
<td>Blinding</td>
<td>11a</td>
<td>If done, who was blinded after assignment to interventions (for example, participants, care providers, those assessing outcomes) and how</td>
<td></td>
</tr>
<tr>
<td></td>
<td>11b</td>
<td>If relevant, description of the similarity of interventions</td>
<td></td>
</tr>
<tr>
<td>Statistical methods</td>
<td>12a</td>
<td>Statistical methods used to compare groups for primary and secondary outcomes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12b</td>
<td>Methods for additional analyses, such as subgroup analyses and adjusted analyses</td>
<td></td>
</tr>
<tr>
<td>Results</td>
<td>13a</td>
<td>For each group, the numbers of participants who were randomly assigned, received intended treatment, and were analysed for the primary outcome</td>
<td></td>
</tr>
<tr>
<td>Participant flow (a diagram is strongly recommended)</td>
<td>13b</td>
<td>For each group, losses and exclusions after randomisation, together with reasons</td>
<td></td>
</tr>
<tr>
<td>Recruitment</td>
<td>14a</td>
<td>Dates defining the periods of recruitment and follow-up</td>
<td></td>
</tr>
<tr>
<td></td>
<td>14b</td>
<td>Why the trial ended or was stopped</td>
<td></td>
</tr>
<tr>
<td>Baseline data</td>
<td>15</td>
<td>A table showing baseline demographic and clinical characteristics for each group</td>
<td></td>
</tr>
<tr>
<td>Numbers analysed</td>
<td>16</td>
<td>For each group, number of participants (denominator) included in each analysis and whether the analysis was by original assigned groups</td>
<td></td>
</tr>
<tr>
<td>Outcomes and estimation</td>
<td>17a</td>
<td>For each primary and secondary outcome, results for each group, and the estimated effect size and its precision (such as 95% confidence interval)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>17b</td>
<td>For binary outcomes, presentation of both absolute and relative effect sizes is recommended</td>
<td></td>
</tr>
<tr>
<td>Ancillary analyses</td>
<td>18</td>
<td>Results of any other analyses performed, including subgroup analyses and adjusted analyses, distinguishing pre-specified from exploratory</td>
<td></td>
</tr>
<tr>
<td>Harms</td>
<td>19</td>
<td>All important harms or unintended effects in each group (for specific guidance see CONSORT for harms)</td>
<td></td>
</tr>
<tr>
<td>Discussion</td>
<td>20</td>
<td>Trial limitations, addressing sources of potential bias, imprecision, and, if relevant, multiplicity of analyses</td>
<td></td>
</tr>
<tr>
<td>Generalisability</td>
<td>21</td>
<td>Generalisability (external validity, applicability) of the trial findings</td>
<td></td>
</tr>
<tr>
<td>Interpretation</td>
<td>22</td>
<td>Interpretation consistent with results, balancing benefits and harms, and considering other relevant evidence</td>
<td></td>
</tr>
<tr>
<td>Other information</td>
<td>23</td>
<td>Registration number and name of trial registry</td>
<td></td>
</tr>
<tr>
<td>Protocol</td>
<td>24</td>
<td>Where the full trial protocol can be accessed, if available</td>
<td></td>
</tr>
<tr>
<td>Funding</td>
<td>25</td>
<td>Sources of funding and other support (such as supply of drugs), role of funders</td>
<td></td>
</tr>
</tbody>
</table>
Cross-sectional sample of RCTs before and after the publication of CONSORT.


Use Appraisal Worksheets

- McMaster Centre for Evidence Based Medicine
  “Teaching Evidence-Based Medicine” Workshop
  https://ebm-tools.knowledgetranslation.net/worksheet

- Same worksheets but with relevance questions and distilled to one page from Tufts.
  https://medicine.tufts.edu/Education/Academic-Departments/Clinical-Departments/Family-Medicine/Information-Mastery/Worksheets

- One for each type of questions (Diagnosis/Treatment/Prognosis/Harm).
- Checklists include various important components (gold standard, blinding, biases)
CATs (Critically Appraised Topics)
Your Teaching Cheat Sheet

• ACP Journal Club (uses same rubric as critical appraisal worksheets)
  Impact scores rated by volunteer doctors in different specialties
  Standard approach for analysis
  Calculates NNT, Sensitivity and Specificity for you.

• Other Suggestions for sources of CAT's from other specialties?

Sharing the Journey: Journal Clubs
Journal Clubs

Traditional
• One Article chosen by faculty
• Can be lecture format
• Everyone faces front of room.
• Distribute articles 1 week in advance
• Food!

Best/Newer Practices
• Learner driven topics/articles with Mentorship/preset goals and objectives.
• Multiple articles/pro-con debates/voting cards/divide work with critical appraisal worksheets
• Best to distribute articles 1 week/but real time done too.
• Food!

Gottlieb et al, 2018

Transition to Independent Practice Journal Club
Led by Fellows/Recent Alumni
University of Toronto Internal Medicine

WAR STORIES:
Diagnostic challenges, unexpected outcome, ethical dilemma, communication challenge, regulatory or process issue.

MEASURING UP:
Practice-changing journal articles, Clinical Metrics, Practice Management, Scholarly Activity, Teaching

NAVIGATING UNCHARTED TERRITORIES
Writing a reference letter, giving feedback, beginning research

Macmillan, 2016
Advent of the E-Journal Club

- Wiki Journal Club
- Twitter #UroJC, #NephJC
- Facebook – NEJM journal watch
- Apps – Figure 1
- Annals of Family Medicine online discussion TRACK with editorial synthesis published in the journal “On Track”
- Audience can share any experiences with e-journal clubs?

Interactive Journal Club Model

Rosemont SOM, Las Vegas

Designated Leader

- Selects topic and article
- Prepares slides to promote discussion of each step
  - Journal Article Title
  - Title Analysis
  - Methods Review
  - Slide of Each Figure
  - Figure Analysis
  - Summary

Rosenthal et al., 2016.
ANALYSIS OF THE TITLE

1. Restate the title in your own words

2. What do the authors claim they will demonstrate in their study?

3. What do they have to prove to you?

Methods Review

How would you design this study?

What tests/experiments would you use if you were performing this study?
ANALYSIS OF THE DATA –
EACH FIGURE/TABLE CAN BE ASSIGNED TO A GROUP

**Review the methods
1. Describe the figures as if to a blind person, recreate the meaning in words.

1. If relevant, compare/contrast the data sets or parameters.

2. Discuss the findings and their meaning.
   A. Experimental Method
   B. Scientific Findings
   C. Relevance and Veracity

4. Relate the findings to previous figures

5. What would you do next?

Summary

1. Did the authors prove what they claimed in the title?

2. If you were to summarize this study for a colleague, what are the major lessons (limit to 3) learned from the article?

3. What would you have done differently?
Another Flipped Classroom Approach
(we use in Capstone/IM course here)

- Use critical appraisal worksheets
- Inform the group about the goals and objectives/methods
- Be clear about the purpose of reviewing the article. Is it for application to a specific patient circumstance, general clinical application or for research?
- Divide into groups of 2-3 (depending on classroom size) and inform all will answer relevance questions. Break rest of analysis into groups.
- Give 10-20 minutes depending on complexity of article.
- Reconvene and review answers/explanations.
- Leader should have independently reviewed article to encourage further questions/counterpoints.
- Bonus attendees: Contact expert (specialist) to give background/relevance/impact
  Librarian to help with other questions/literature
  Statistician to help with tricky statistics.

Does midazolam enhance pain control in prehospital management of traumatic severe pain?


