How to read and appraise a paper

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Disclosures

- This is how I review (and write) manuscripts – it's not the only way or necessarily the best way
- but I have substantial experience and am frequently told that my reviews are valuable and manuscripts well-written

General objectives of manuscript review

- Is the topic significant and/or relevant?
- Does the background information justify the analysis?
- Do the hypotheses or research questions logically follow from the background?
- Are the methods appropriate?
  - Does the population or sample selected allow the hypotheses to be addressed?
  - Do the methods proposed answer the question?
    - Are the authors testing what they think they are?
  - Is the statistical analysis plan appropriate for the research question and study structure?
- Are the results likely to be reliable?
  - Presented clearly and logically
  - Internally consistent
  - Use of appropriate statistical analysis, including degree of variability and impact of multiple comparisons
- Are the conclusions supported by the results and do they consider limitations and possible sources of error?

Editorial Considerations

- Will the manuscript be of interest to journal readership?
- Does the manuscript fit the “mission” of the journal?
  - Only the best manuscripts - curation of content for readership
  - All manuscripts that meet the criteria for publication – readers determine whether they find the manuscript useful
- Does it fit with a theme of interest?
- Will the manuscript be cited, and will it have legs (continued citations year after year)?
- Plagiarism – content crawlers are very good
- Fraud and collusion

CONSORT: CONsolidated Standards Of Reporting Trials

SPECIAL COMMUNICATION

The CONSORT Statement: Revised Recommendations for Improving the Quality of Reports of Parallel-Group Randomized Trials

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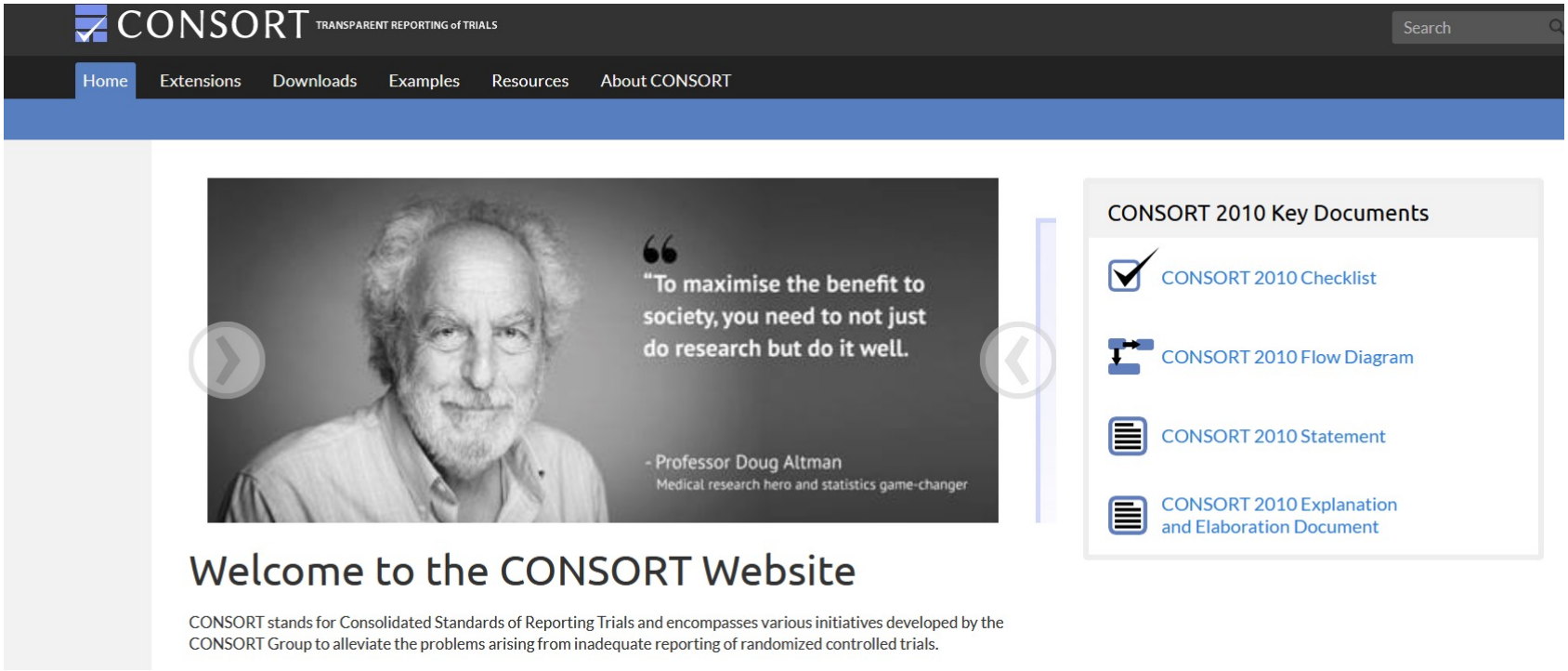
To comprehend the results of a randomized controlled trial (RCT), readers must understand its design, conduct, analysis, and interpretation. That goal can be achieved only through complete transparency from authors. Despite several decades of educational efforts, the reporting of RCTs needs improvement. Investigators and editors developed the original CONSORT (Consolidated Standards of Reporting Trials) statement to help authors improve re-

JAMA 285:1987, 2001

Consort-statement.org



Title and Authors

- Title and authors
  - Is the title informative and place the manuscript within a particular field of interest?
  - Do you know any of the authors either personally or by reputation
  - What institution(s) is the manuscript coming from
    - Be careful to avoid bias – this is important in understanding the context of the paper, but does not mean the paper is necessarily going to be “good” or “bad”
      - A paper describing one center’s experience means something very different coming from a central diabetes center in a small country vs. one of hundreds of diabetes centers in the US.

Abstract

- Structured summary of design, methods, results and conclusions
  - A well-written abstract will help you focus your review by flagging the likely issues to be watching for
- Does it contain all the necessary information to understand the basic background and intent of the study
- Type of study
  - Retrospective vs prospective
  - Formal registry vs chart review
  - Observational vs interventional
  - Randomized vs self-chosen
- Methods
- Primary results
- Conclusions

Background

- Establishment of significance of the study
- Sufficient justification for the study to be done (burden on participants)
- Clear statement of the hypothesis, aims and/or objectives of the study

Methods – Key Points

- Trial Design – including allocation ratio
  - Retrospective or prospective?
- Participants
  - Inclusion and exclusion criteria
    - Are they relevant to the hypothesis?
    - Rational choice of population; opportunity for disparities?
    - Sources of bias?
  - Setting and time frame of study
    - so long that there were secular changes in care?
    - What are the limits of generalization?
- Interventions
  - Detailed enough to allow replication?
  - Adherence measures

Methods – Key Points

- Randomized, single-arm, crossover, observational?
  - If randomized:
    - how allocated and by whom?
    - how was blinding maintained, if applicable, during allocation?
    - Restrictions – blocks, and block sizes – and rationale
  - If unrandomized:
    - what are the potential sources of error, confounding, and bias?
  - If crossover:
    - Is there risk of bleeding between interventions?
      - Note: bleeding can occur in other designs also
- Blinding
  - Who was blinded and how was it maintained?
  - Sources of possible unintentional unblinding?

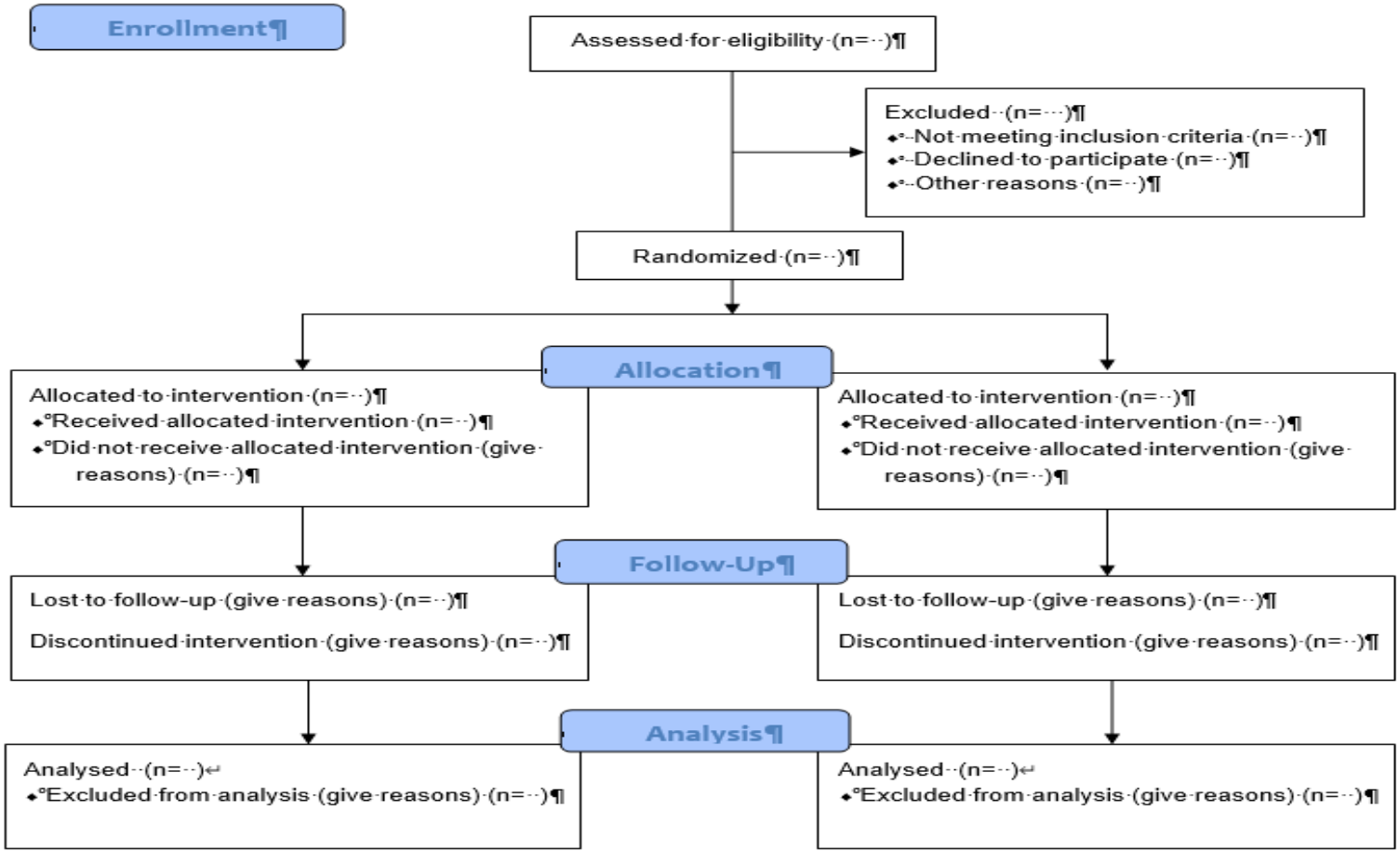
Methods – Key Points

- Methods
  - Are the selected outcome(s) appropriate for the study questions?
  - Are they being measured correctly? – alternatives discussed and justified?
  - Parameters of the methods provided – variability, cross-reactivity, sensitivity
  - Calculations for derived outcomes provided?
- Statistical analysis
  - Sample size and how determined – critical to understanding both type 1 and type 2 error
  - Primary statistical methods for comparing primary and secondary outcomes
  - Confounders and modeling
  - Prespecified secondary, subgroup, and/or sensitivity analyses and adjustments
- Regulatory
  - Registration in a trial database, such as ClinicalTrials.gov
    - Is study substantially the same as registered?
    - Access to protocol
    - Sources of funding and risks for bias – including sources of medications

Results

- Participants
  - Number approached, screened, eligible, randomized, received treatment, completed study, and analyzed
  - CONSORT or flow diagram of participant progress through the study

Participant flow



Results

- Participants
  - Number approached, screened, eligible, randomized, received treatment, completed study and analyzed
    - CONSORT or flow diagram of participant progress through the study
  - Dates of recruitment and follow-up
    - Did study meet recruitment goals and why was the study ended?
  - Table 1 – baseline demographic and clinical characteristics
- For primary outcome, results in each group and estimate of effect size (relative and absolute)
- Adjustments and modeling
  - Justification?
- For prespecified secondary or subgroup analyses, results and estimate of effect size
  - impact of multiple comparisons
- For exploratory secondary or subgroup analyses
  - transparency

Harms – safety reporting

- All related risks, unexpected events, and unintended consequences

Discussion

- Summary of findings and conclusions
  - Are conclusions supported by the findings?
  - Do findings/conclusions address the original hypothesis/objectives
  - Have extraneous data-mining conclusions been included
- Implications of the findings and next steps
  - Balancing of benefits and harms
- Strengths
  - Justified?
- Limitations
  - Sources of error and/or bias
  - power
  - Generalizability
  - Confounding and how it was addressed in the design or analysis
  - Multiplicity of analysis; exploratory vs. definitive analyses

Other CONSORT extensions

Designs	Interventions	Data
Cluster Trials	Herbal Medicinal Interventions	CONSORT-PRO
Non-Inferiority and Equivalence Trials	Non-Pharmacologic Treatment Interventions	Harms
Pragmatic Trials	Acupuncture Interventions	Abstracts
N-of-1 Trials	Chinese Herbal Medicine Formulas	Equity
Pilot and Feasibility Trials	Social and Psychological Interventions	Randomised Crossover Trial Reporting
Within Person Trials		
Multi-Arm Parallel-Group Randomized Trials		
Adaptive Designs		

Questions?