



MTBI and Practice Guidelines

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Do We Need Guidelines?



Guideline Development

4 Principles

- Clear goals and scope
 - Clearly delineate desired health outcomes
- Assembly of guideline development group
 - Uni-disciplinary? Multidisciplinary?
- Identifying and assessing the evidence
- Translating evidence into clinical practice

Shekelle et al, BMJ 1999



Characteristics of Good Guidelines

Three domains

1. Clear statements about the **development and format** of the guidelines
 - Purpose and rationale
 - Clear identification of the target health problem
 - Clear identification of the patient group
 - Intended users of the guideline



Characteristics of Good Guidelines

2. Clear statements about the **evidence**

- Details about the method of identifying relevant studies
 - search strategy
 - Inclusion/exclusion criteria for studies
- Method of grading the evidence for quality
- Method of reaching consensus where expert opinion was used as evidence
- Specifications on how evidence was combined



Characteristics of Good Guidelines

3. Clear statement of how recommendations were formulated

- How did evidence develop into recommendations?
- What roles did empirical evidence vs. expert opinion play?
- Is strength of the recommendation linked clearly to the strength of the evidence?

Hayward et al., Ann Int Med 1993
Shaneyfelt et al., JAMA 1999



Do MTBI Guidelines Meet Guidelines?

Best Evidence Synthesis on Mild Traumatic Brain Injury:

WHO Collaborating Centre Task Force on Mild Traumatic Brain Injury

Journal of Rehabilitation Medicine, 2004

- Search and critical review of the MTBI literature
 - Included a search and critical review of the MTBI guidelines
 - Used Shaneyfelt's 25 criteria (3 domains) for rating guidelines

Peloso, Carroll, Cassidy et al., J Rehab Med 2004:43:106-112



Our Findings?

- We found **41** distinct guidelines related to practice
 - Only **5** reported their methodology for **assembling the evidence** used in the guideline's development
 - Only **3** could be considered **methodologically rigorous**
 - But two of these had to rely largely on **expert opinion**
 - Little empirical research available
- Only **1** could be considered based primarily on **empirical findings!**



Where Were the Problems?

- Development and format?
 - Most indicated what questions they were addressing, what patients, who the users were..
 - Few outlined the main preventive, diagnostic, and/or therapeutic options available
 - None indicated an “expiry date”



Where Were the Problems?

- Identification and summary of the evidence?
 - Very **poorly** met
 - **>50%** did not state how the evidence was identified
 - How was the literature searched?
 - E.g., Saying “Medline was searched...” is uninformative
 - How was **strength of the evidence** graded (if at all!)
 - How were empirical studies **combined**? How were empirical studies combined with expert opinion?
 - How was expert opinion **sought**?



Where Were the Problems?

- Formulation of the Recommendations
 - Also very poorly reported
 - What was the role of the developers' **value judgments**?
 - How were **patient preferences** considered?
 - **Limitations** in the available evidence were rarely considered
 - Most did not link **strength of the recommendation** to strength of the available evidence



COGS

Poor state of guidelines in general!

- Conference on Guideline Standards
 - “Guideline for developing guidelines”
 - Shiffman et al., Annals of Internal Medicine 2003;139:493-498
- 18 point criteria



State of the Evidence

- What evidence do we need?



Diagnosis/Assessment

- What kind of diagnostic evidence do we need to develop guidelines?



Diagnostic Evidence

- Sackett and Haynes
 - Phase I – Phase IV studies
 - Phase I and II – exploratory, preliminary
 - Cannot adequately inform guidelines
 - Phase III and IV
 - Confirmatory
 - Can be used to adequately inform guidelines

Sackett & Haynes, BMJ 2002;324:539-541



Phase I Diagnostic Studies

- Very common in the literature
 - Do test results differ between patients with the disorder and “normals”
 - **No** independent testing
 - Administration of gold standard may depend on results of test
 - No blind interpretation of findings
 - Gold standard, test not independently interpreted
 - Hypothesis generating, preliminary
 - Good basis for **future studies**
 - **NOT** a good basis for guidelines!



Phase II studies

- Are those with + test findings **more likely to have the disorder** than those with – test findings?
 - **No** independent administration of tests
 - Administration of gold standard may depend on results of diagnostic tests.
 - **No** blinding of test interpretation
 - Crucial second step in validating a diagnostic test
 - Still hypothesis generating
 - Still exploratory
 - NOT adequate basis for developing a guideline



Phase III Diagnostic Studies

- Do test results distinguish persons with and without the disorder
 - Representative sampling of persons **suspected to have the disorder**
 - Independent administration of test
 - All study patients are administered both the test and the gold standard – **regardless of test findings/gold standard results**
 - Interpretation of test findings and gold standard **blinded** to each other
 - Confirmatory: useful for guideline development
 - Rare!



Phase IV Diagnostic Test

- Does application of the test impact on health outcomes?
 - Does using the test actually **improve** patient care/outcomes?
 - All aspects of phase III tests
 - Plus validation of health outcomes
 - The most important for guidelines
 - The most rare



MTBI Task Force

- By 2004
 - 32% of published diagnostic studies met minimal review criteria (Borg et al., J Rehab Med 2004)
 - **Two** Phase III studies on MTBI diagnosis
 - No Phase IV studies
- More recently?
 - Good evidence for screening adults in emergency
 - Steill et al., 2001
 - Haydel et al., 2000
 - Some improvement



Interventions?

- Gold standard – RCT's
 - But
 - Quality of RCT's variable
 - Random assignment not always ethically possible or practical
 - Is a “poor” RCT better than a well-designed/conducted cohort study????
- What determines a good **RCT**
 - CONSORT Statement

Altman et al., Ann Int Med 2001;134:663-694



CONSORT Statement

- **Adequate randomization**
 - E.g., random numbers table
 - Quasi-random design subject to bias
 - Usually pretty well done now
 - Group allocation should not be **predictable!**
 - **Blind allocation to treatment group**
 - Person allocating group membership blinded to which group is which
 - Cannot influence group membership
 - » Often still not reported



CONSORT Statement

- Sample size determination
 - Need adequate numbers to **minimize Type II error**
 - Failure to identify a **clinically important** effect that is actually **present**
 - Important in planning RCT
 - Important in RCT interpretation only if no effect size was found
 - Post-hoc power calculations not relevant!
 - » Confidence intervals more informative at that point!
 - Need adequate numbers to ensure that randomization resulted in **equivalent groups** at baseline!
 - Less clear-cut than sample size calculations
 - Less attention paid to this problem!



CONSORT Statement

- **Blinding (Masking)?**
 - Blinding of participants, health care providers to group assignment prevents expectation effects
 - Ideal
 - Often just not possible
 - Blinding of those assessing outcomes?
 - Again, ideal – prevents detection bias
 - Not possible when outcomes are self reported
 - If blinding was done, does study report how **successful** the process was?
 - “unblinding” very common



CONSORT Statement

- What if blinding not possible?
 - Can assess expectations
 - Growing body of evidence that treatment expectations affect treatment success



Other Threats to Validity?

- Analysis

- Intention to treat analysis

- Analyze all participants according to their original group assignment
 - Preserves randomization
 - If patients do not comply with treatment, this may underestimate treatment effects
 - Not appropriate to assess adverse events!
 - Always need to know what authors mean when they say “intention to treat” analysis was used!!!

- “per protocol” or “on treatment” analysis

- Restricting analysis to those participants who fulfilled the protocol
 - But “known and unknown” confounders are no longer equalized among groups!

- Use both??? Also adjust for baseline characteristics!

- Need to see estimates of precision (confidence intervals) – **not just p values!**



MTBI Literature?

- From 1980 to 2004...
 - 36% of the intervention studies were considered to have minimal scientific validity! (Borg et al., J Rehab Med 2004)
 - Studies were **small**
 - Insufficient power
 - Failure of randomization to equalize groups
 - High loss to **follow-up**
 - Introduces bias
 - Loss of power
 - Recent perusal of the literature?
 - Some improvement
 - But still small, poorly reported trials



Gaps in the Literature?

- Still short of evidence to develop and validate ...
 - Clinical decision rules for when young children with MTBI need imaging
 - Clinical decision rules for when elderly adults with MTBI need imaging
- Evidence based, validated return-to-play guidelines
 - Challenging area to study
- Alcohol, drug addiction is a risk factor for head injuries
 - But still do not know much about how these factors impact on recovery, diagnosis, intervention



Practice Guidelines

- Development of guidelines
 - Requires evidence
 - Preferably systematic searches and critical reviews
 - Requires expert opinion
 - Where evidence is weak or limited
 - To move between the evidence to practice recommendations
 - Requires views and opinions of other stakeholders
 - To ensure applicability, acceptance, usability



Lessons to be Learned?

- Practice guidelines are important
 - But need to be based on **valid evidence**, interpreted in **clinically meaningful** ways
- Without adequate evidence?
 - Guidelines are opinion-based and could be harmful
 - Weak evidence leads to weak guidelines
- Without well-considered clinical judgment, consideration of other stakeholders' views?
 - Guidelines lose practicality and clinical usefulness

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