From 10 essential papers for the practice of EBM to 10(?) on teaching EBM

EBHC Conference 2019, Taormina, Sicily

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Disclosure statement

[Other than cognitive biases towards my own work]

I have no actual or potential conflict of interest in relation to this presentation

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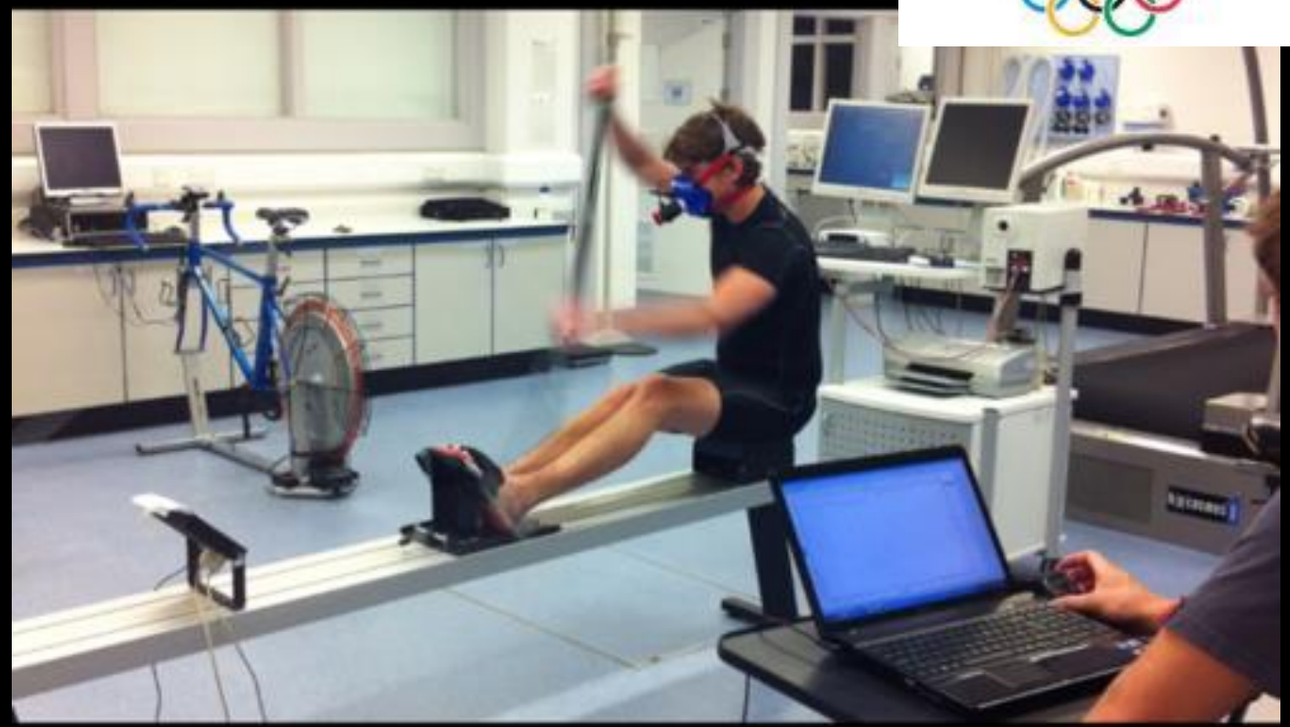


FBM

One day Intro to EBM

March - Practicing EBHC - Oxford

Introduction to EBM (ppt - 7.8MB) **Paul Glasziou**


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Tutor

Dr David Nunan

Module Coordinator

David Nunan is a Departmental Lecturer and Senior Research Fellow in Evidence-based Medicine.

Ten essential papers for the practice of evidence-based medicine

David Nunan,[1,2] Jack O Sullivan,[1,2] Carl Heneghan,[1,2] Annette Pluddemann,[1,2] Jeffrey Aronson,[2] Kamal Mahtani[1,2]

10.1136/ebmed-2017-110854

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Abstract

In this article we signpost readers to 10 papers we consider essential reading for anyone starting out on an evidence-based medicine journey. We have considered papers consisting a mix of old and new, seminal and cutting-edge that offer insight into what evidence-based medicine is, where it came from, why it matters and what it has achieved. This is balanced against some of the common criticisms of evidence-based medicine and efforts to tackle them. We have also highlighted papers acknowledging the importance of teaching and learning of the principles of evidence-based medicine and how health professionals can better use evidence in clinical decisions with patients.

Introduction

As an introduction to evidence-based practice, we as a group of evidence-based researchers, clinicians and editors have collated the top 10 papers we consider most helpful when starting on the journey of evidence-based medicine (EBM). We have based our selection on our experience of teaching a wide range of individuals and describe why we consider each paper to be important.

EBM: what it is and what it is not

In 1996, the *BMJ* published an editorial by Sackett and others, in which they defined EBM as *'the conscientious, explicit* and judicious use of current best evidence in making decisions about the care of individual patients'.[1] By emphasising the essential components of EBM, they made it clear that evidence, values and expertise play similar roles in clinical decision making.

EBM: a new approach to teaching the practice of medicine

Although the 1996 paper by Sackett *et al* clarified what EBM is and what it is not, the term and concept had already been introduced in a 1992 paper by the flawed through the use of inappropriate designs, unrepresentative samples, small samples, incorrect methods of analysis and faulty interpretation'.

Echoing the realisation by Sackett and colleagues that much of medical practice lacked evidence of effectiveness and that much research was inadequate, Altman concluded: 'We need less research, better research, and research done for the right reasons'. Now, 22 years later, the call to arms has been repeated in the EBM Manifesto for Better Healthcare.[4]

Assessing the quality of research

A cornerstone of evidence-based practice is the ability to assess the quality of the evidence and the research that underpins it—often easier said than done. Glasziou and colleagues published an editorial in the BMJ, aimed at helping clinicians and researchers to assess research.[5] They suggested five general principles:

1. Different types of research are needed to answer different types of clinical questions.
2. Irrespective of the type of research, systematic reviews are necessary.
3. Adequate grading of the quality of evidence goes beyond the categorisation of research design.
4. Assessment of the benefit to harm balance should draw on a variety of types of research.
5. Clinicians need efficient search strategies for identifying reliable clinical research.

Empirical evidence of bias. Dimensions of methodological quality associated with estimates of treatment effects in controlled trials

The relevance of the methods used in clinical trials to the results that emerge was highlighted in this seminal paper by Schulz and colleagues.[6] They found that knowledge of treatment allocation inflated the effect of an intervention by an average of 41%. Failure to blind group allocation could overestimate the intervention effect by


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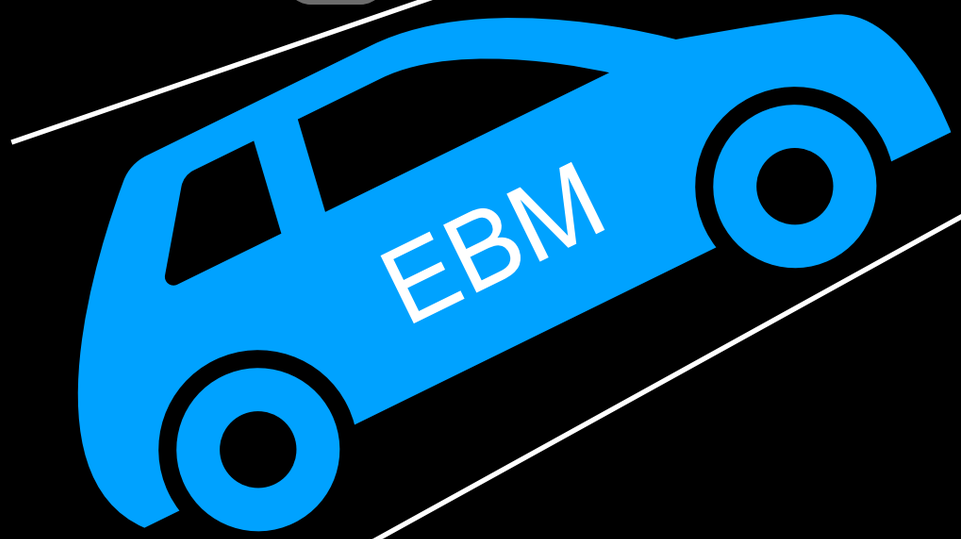
EBM


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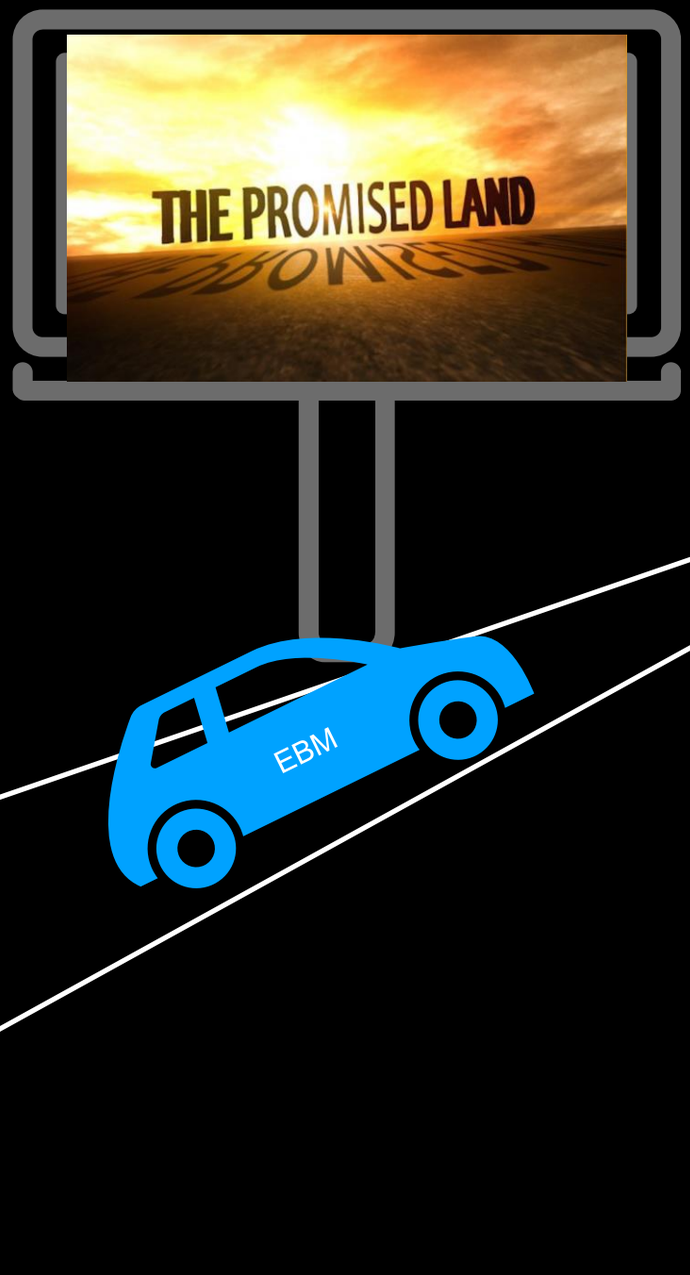
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EBM

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What is the evidence that postgraduate teaching in EBM changes anything? A systematic review

EBM: a new approach to teaching the practice of medicine

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EBM: a commentary on common criticisms

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EBM: a new approach to teaching the practice of medicine

Evidence-Based Medicine

A New Approach to Teaching the Practice of Medicine

Evidence-Based Medicine Working Group

A NEW paradigm for medical practice is emerging. Evidence-based medicine de-emphasizes intuition, unsystematic clinical experience, and pathophysiologic rationale as sufficient grounds for clinical decision making and stresses the examination of evidence from clinical research. Evidence-based medicine requires new skills of the physician, including efficient literature searching and the application of formal rules of evidence evaluating the clinical literature.

An important goal of our medical residency program is to educate physicians in the practice of evidence-based medicine. Strategies include a weekly, formal academic half-day for residents, devoted to learning the necessary skills; recruitment into teaching roles of physicians who practice evidence-based medicine; sharing among faculty of approaches to teaching evidence-based medicine; and providing faculty with feedback on their performance as role models and teachers of evidence-based medicine. The influence of evidence-based medicine on clinical practice and medical education is increasing.

CLINICAL SCENARIO

A junior medical resident working in a teaching hospital admits a 43-year-old previously well man who experienced a witnessed grand mal seizure. He had never had a seizure before and had not had any recent head trauma. He drank alcohol once or twice a week and had not had alcohol on the day of the seizure. Findings on physical examination are normal. The patient is given a loading dose of phenytoin intravenously and the drug is continued orally. A computed tomographic head scan is completely normal, and an electroencephalogram shows only nonspecific findings. The patient is very concerned about his risk of seizure recurrence. How might the resident proceed?

The Way of the Past

Faced with this situation as a clinical clerk, the resident was told by her senior resident (who was supported in his view by the attending physician) that the risk of seizure recurrence is high (though he could not put an exact number on it) and that was the information that should be conveyed to the patient. She now follows this path, emphasizing to the patient not to drive, to continue his medication, and to see his family physician in follow-up. The patient leaves in a state of vague trepidation about his risk of subsequent seizure.

The Way of the Future

The resident asks herself whether she knows the prognosis of a first seizure and realizes she does not. She proceeds to the library and, using the Grateful Med program,[1] conducts a computerized literature search. She enters the Medical Subject Headings terms *epilepsy*, *prognosis*, and *recurrence*, and the program retrieves 25 relevant articles. Surveying the titles, one[2] appears directly relevant. She reviews the paper, finds that it meets criteria she has previously learned for a valid investigation of prognosis,[3] and determines that the results are applicable to her patient. The search costs the resident $2.68, and the entire process (including the trip to the library and the time to make a photocopy of the article) took half an hour.

The results of the relevant study show that the patient risk of recurrence at 1 year is between 43% and 51%, and at 3 years the risk is between 51% and 60%. After a seizure-free period of 18 months his risk of recurrence would likely be less than 20%. She conveys this information to the patient, along with a recommendation that he take his medication, see his family doctor regularly, and have a review of his need for medication if he remains seizure-free for 18 months. The patient leaves with a clear idea of his likely prognosis.

A PARADIGM SHIFT

Thomas Kuhn has described scientific paradigms as ways of looking at the world that define both the problems that can legitimately be addressed and the range of admissible evidence that may bear on their solution.[4] When defects in an existing paradigm accumulate to the extent that the paradigm is no longer tenable, the paradigm is challenged and replaced by a new way of looking at the world. Medical practice is changing, and the change, which involves using the medical literature more effectively in guiding medical practice, is profound enough that it can appropriately be called a paradigm shift.

The foundations of the paradigm shift lie in developments in clinical research over the last 30 years. In 1960, the randomized clinical trial was an oddity. It is now accepted that virtually no drug can enter clinical practice without a demonstration of its efficacy in clinical trials. Moreover, the same randomized trial method increasingly is being applied to surgical therapies[5] and diagnostic tests.[6] Meta-analysis is gaining increasing acceptance as a method of summarizing the results of a number of randomized trials, and ultimately may have as profound an effect on setting treatment policy as have randomized trials themselves.[7] While less dramatic, crucial methodological ad-

A complete list of members of the Evidenced-Based Medicine Working Group appears at the end of this article.

Reprint requests to McMaster University Health Sciences Centre, Room 3W10, 1200 Main St W, Hamilton, Ontario, Canada L8N 3Z5 (Gordon Guyatt, MD).

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Teaching the Practice of Medicine

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EBM: a new approach to teaching the practice of medicine

*"EBM requires **new skills** of the physician, including efficient literature searching and the application of formal rules of evidence evaluating the clinical literature."*

EBM: what it is and what it is not

Editorials

Evidence based medicine: what it is and what it isn't

BMJ 1996 ; 312 doi: https://doi.org/10.1136/bmj.312.7023.71 (Published 13 January 1996)
Cite this as: *BMJ* 1996;312:71

David L Sackett,William M C Rosenberg,J A Muir Gray,R Brian Haynes,W Scott Richardson

*"Evidence based medicine is the **conscientious**, **explicit,** and **judicious use** of current best evidence in making decisions about the care of individual patients."*

EBM: what it is and what it is not

External clinical evidence ***can inform, but can never replace, individual clinical expertise****, ….decides whether the external evidence applies to the individual patient at all and, if so, how it should be integrated into a clinical decision*

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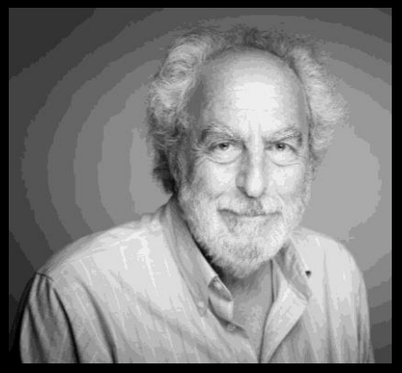

Editorials

The scandal of poor medical research

BMJ 1994 ; 308 doi: https://doi.org/10.1136/bmj.308.6924.283 (Published 29 January 1994)
Cite this as: *BMJ* 1994;308:283

Linked Opinion
Richard Smith: Medical research—still a scandal

D G Altman

*"We need **less** research, **better** research, and research done for the **right reasons**"*

The scandal of poor medical research

*"The development of the **EQUATOR Network** to improve reports of research and the 2014 Lancet series of papers on ways of increasing value and reducing waste in research are just two examples of testimony to the enduring influence of Doug's 1994 call for…."*

Iain Chalmers, health services researcher and a founder of the Cochrane Collaboration

equator network

Enhancing the QUAlity and Transparency Of health Research

EQUATOR resources in Portuguese | Spanish

Your one-stop-shop for writing and publishing high-impact health research

find reporting guidelines | improve your writing | join our courses | run your own training course | enhance your peer review | implement guidelines

Library for health research reporting

The Library contains a comprehensive searchable database of reporting guidelines and also links to other resources relevant to research reporting.

- Search for reporting guidelines
- Not sure which reporting guideline to use?
- Reporting guidelines under development
- Visit the library for more resources

Reporting guidelines for main study types

Randomised trials	CONSORT	Extensions	Other
Observational studies	STROBE	Extensions	Other
Systematic reviews	PRISMA	Extensions	Other
Case reports	CARE	Extensions	Other
Qualitative research	SRQR	COREQ	Other
Diagnostic / prognostic studies	STARD	TRIPOD	Other
Quality improvement studies	SQUIRE		Other
Economic evaluations	CHEERS		Other
Animal pre-clinical studies	ARRIVE		Other
Study protocols	SPIRIT	PRISMA-P	Other
Clinical practice guidelines	AGREE	RIGHT	Other

See all 401 reporting guidelines

Funders: reporting guidelines key for research reproducibility and reliability

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February 1, 1995, Vol 273, No. 5 >

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ARTICLE | February 1, 1995

Empirical Evidence of Bias

Dimensions of Methodological Quality Associated With Estimates of Treatment Effects in Controlled Trials

Kenneth F. Schulz, PhD, MBA; Iain Chalmers, MBBS, MSc; Richard J. Hayes, MSc; Douglas G. Altman

JAMA. 1995;273(5):408-412. doi:10.1001/jama.1995.03520290060030.

Article | References

ABSTRACT

Empirical evidence of bias. Dimensions of methodological quality associated with estimates of treatment effects in controlled trials

Level of Allocation Concealment	Ratio of Odds Ratios (95% Confidence Interval)	χ^2 (*df*)	*P*
Adequate	1.00 (referent)		
Unclear	0.67 (0.60-0.75)	57.9 (2)	<.001
Inadequate	0.59 (0.48-0.73)		

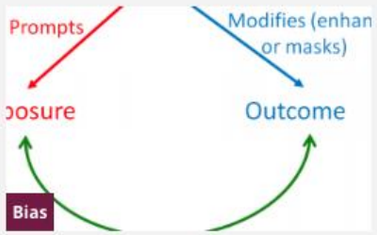
41%

33%

Catalogue of Bias

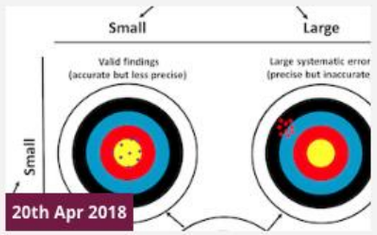
Welcome to the Catalogue of Bias

A collaborative project mapping all the biases that affect health evidence



Bias

Confounding by indication



20th Apr 2018

A Word About Evidence: 5. Bias—previous definitions

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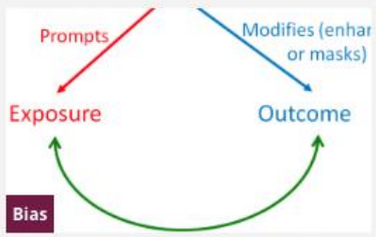

Bias

Confounding

10th Apr 2018

A Word About Evidence: 4. Bias—etymology and usage

Evidence Live

Evidence Live

Most viewed biases

- Detection bias
- Ascertainment bias
- Perception bias
- Recall bias
- Attrition bias
- Confounding by indication
- Selection bias
- Wrong sample size bias
- Allocation bias
- Prevalence-incidence (Neyman) bias

Allocation bias

Systematic difference in how participants are assigned to comparison groups in a clinical trial.

Background

Allocation bias may result if investigators know or predict which intervention the next eligible participant is supposed to receive. This knowledge may influence the way investigators approach potentially eligible participants and how they are assigned to the different groups, thereby selecting participants with good prognoses (i.e. anticipated good outcomes and treatment responses) into one group more than another.

In a trial of different blood pressure medications the use of sealed envelopes to conceal the allocation schedule resulted in imbalances in baseline blood pressure between the treatment and control groups. In turned out that participants in the control group already had lower blood pressures compared to participants in the treatment group at the outset. The observed imbalance could have arisen if the investigator opened the envelopes before allocating participants to groups.

cebmoxford
David Nunan - Allocation bias
SOUNDCLOUD
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3:04
▶ 110

Cite as

Catalogue of Bias Collaboration. Spencer EA, Heneghan C, Nunan D. **Allocation bias**. In: Catalogue of Bias 2017. https://catalogofbias.org/biases/allocation-bias/

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The James Lind Library

The need to compare like-with-like in treatment comparisons

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Learning In Practice

What is the evidence that postgraduate teaching in evidence based medicine changes anything? A systematic review

BMJ 2004 ; 329 doi: https://doi.org/10.1136/bmj.329.7473.1017 (Published 28 October 2004)
Cite this as: *BMJ* 2004;329:1017

Arri Coomarasamy, specialist registrar in obstetrics and gynaecology (arricoomar@blueyonder.co.uk) [1],
Khalid S Khan, consultant obstetrician and gynaecologist [1]

"Both standalone courses and integrated teaching improve knowledge"

"Improvements in skills, attitudes, and behaviour, however, come about ***when teaching is integrated into clinical practice;*** *standalone courses bring about no change"*

Road to nowhere

Land of the Damned

DIAMOND REXX

Not so

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EBM Learners

Road to nowhere

Not so THE PROMISED LAND

Land of the Damned DIAMOND REXX

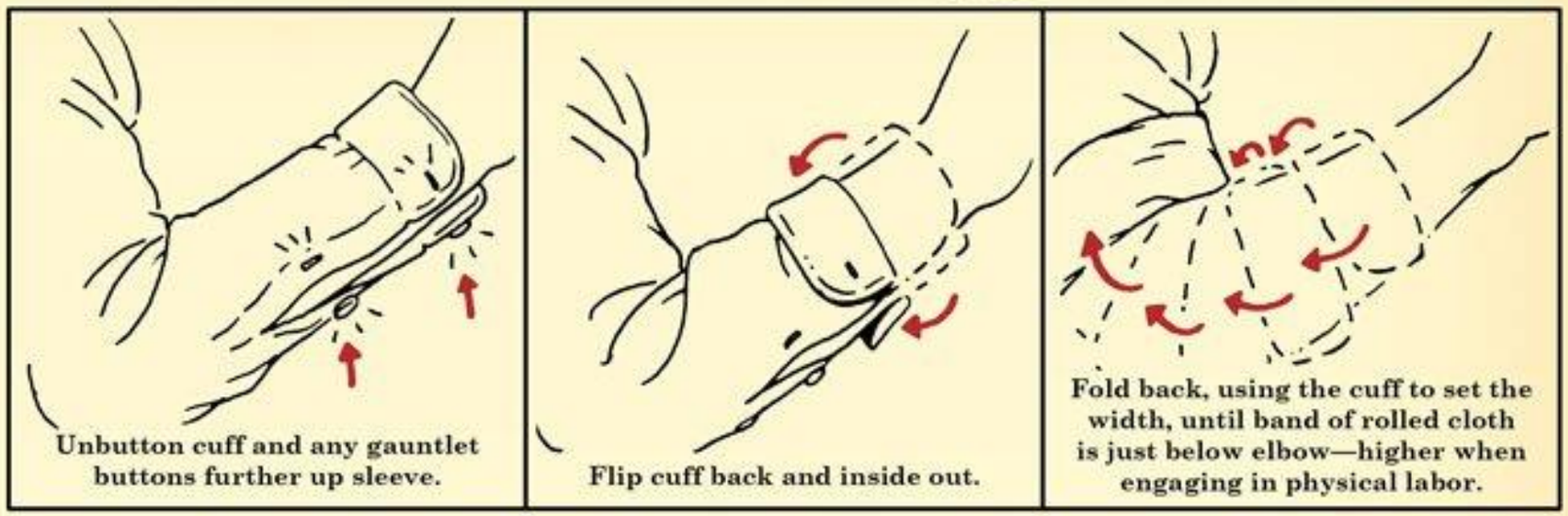
EBM Educators

How to Roll Your Shirt Sleeves: Your 60-Second Guide

The Art of Manliness Est. 2008

The Basic Roll

Best for: Performing physical labor
Benefits: Simple and intuitive



Unbutton cuff and any gauntlet buttons further up sleeve.

Flip cuff back and inside out.

Fold back, using the cuff to set the width, until band of rolled cloth is just below elbow—higher when engaging in physical labor.

The Casual Forearm Roll

Best for: Casual dress, thin arms, layers
Benefits: Involves the least folding, easiest to unroll without wrinkles

Unbutton cuff. Undo gauntlet buttons according to preference. Flip cuff back and inside out.

Fold over once, hiding cuff behind a band of sleeve fabric.

Stop there and tuck corners of cuff in neatly.

The Master/Italian Roll

Best for: Rolling sleeves with style, showing off cuffs with inner contrasting color
Benefits: Easy to adjust and unfold

Unbutton cuff. Undo gauntlet buttons according to preference. Flip cuff back and inside out.

Pull flipped cuff all the way to just below elbow without folding, turning sleeve inside out as it goes.

Take bottom of inside-out portion and fold it up until it traps bottom of cuff. Show as much of the inside-out cuff as you desire.

Groups 4-5

1st round - Initial list of papers [15 mins]

2nd round - Top 3 papers [10 mins]

3rd round - Top paper [5 mins] and discussion [10 mins]

Max 150 words on top paper [10 mins]

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Start the presentation.

Groups 4-5

1st round - Initial list of papers [15 mins]

2nd round - Top 3 papers [10 mins]

3rd round - Top paper [5 mins] and discussion [10 mins]

Max 150 words on top paper [10 mins]

What next?

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BMJ Evidence Based Medicine 2020;XXX:xXXXXX doi: 10.XXXX/bmj.XXXXX (Published X XXXX 2020)

Ten essential papers for the teaching of evidence-based medicine

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Abstract

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BMJ Journals

BMJ Evidence-Based Medicine

Editorials

What next for education in evidence-based health care? A call for submissions

David Nunan, Rod Jackson, Carl Heneghan

Correspondence to: D Nunan david.nunan@phc.ox.ac.uk

MARCH 20th 2020

Full collection launch at EBM Live 2020

EBM Live

CEBM

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The Peter Gilgan Centre for Research and Learning

6 – 8 July 2020

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UNIVERSITY OF TORONTO

SickKids

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