

**In search of evidence
for the added value of hospital pharmacists
– turning mistakes into learning points!**



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Disclosure Statement

Conflict of interest: nothing to declare



Questions

1. To implement new clinical pharmacy services - are robust scientific studies always needed? Y/N
2. Should protocol fidelity always be measured? Y/N
3. Research is sometimes a waste of time and effort Y/N



Learning objectives

At the end of this session, participants should be able to:

- To list the most obvious, avoidable mistakes that can be made when conducting a research study.
- To describe measures to avoid these mistakes and strengthen the scientific quality of the study.



What evidence do we have that hospital pharmacists add value?

1. Comprehensive pharmacist interventions' effects on hard clinical patient outcomes:

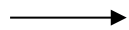
- Typical: Do medication reviews reduce hospital readmissions?



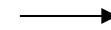
Comprehensive medication review with clinical pharmacists as team members:



Hospital admission



- Medication reconciliation
- Patient interview

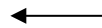


- Medication review followed by advice to physician
- Drug monitoring
- Patient education

•Follow-up phone call(s)



Hospital discharge



- Discharge counseling to patient
- Discharge information and referral to primary care physician



Examples:

Systematic reviews and meta analyses:



Medication review in hospitalised patients to reduce morbidity and mortality (Review)

Christensen M, Lundh A

Cochrane Database Syst Rev. 2016 Feb 20;2

“Publications involving The Cochrane Collaboration tend to receive world-wide attention, the word Cochrane is thought by many to be synonymous with high scientific quality and their reports are cited frequently.”

Inclusion criteria:

- Randomised controlled trials
- comprehensive medication reviews in hospital setting
- elderly patients
- effects on mortality and hospitalization



The first review from 2013 included 6 trials
an up-dated version 2016 included 10 trials.

AUTHORS' CONCLUSIONS:

We found no evidence that medication review reduces mortality or hospital readmissions, although we did find evidence that medication review may reduce emergency department contacts.

High-quality trials with long-term follow-up are needed to provide more definitive evidence for the effect of medication review on clinically important outcomes such as mortality, readmissions and emergency department contacts...

Therefore, if used in clinical practice, medication reviews should be undertaken as part of a clinical trial with long-term follow-up



However:

1. Were the authors aware of the definition of a medication review?
 - One study included only the use of screening instruments (STOPP and START) applied to the patients' drug lists.
 - One study included only medication review at the discharge meaning only a few drug changes were made.
2. None of the included studies used mortality as an outcome measure.
3. Acceptance rates ranged from 18% to 94 %

The authors of the Cochrane Systematic Review have not mentioned these limitations.



Examples:

Other systematic reviews and meta analyses:

The effect of early in-hospital medication review on health outcomes: a systematic review

Corinne M. Hohl,^{1,2} Maeve E. Wickham,^{1,2} Boris Sobolev,^{2,3} Jeff J. Perry,^{4,5} Marco L. A. Sivilotti,⁶ Scott Garrison,⁷ Eddy Lang,⁸ Penny Brasher,^{2,12} Mary M. Doyle-Waters,² Baljeet Brar,¹ Brian H. Rowe,⁹ Joel Lexchin^{10,11} & Richard Holland¹³

Age and Ageing 2014; **43**: 174–187
doi: 10.1093/ageing/agt169
Published electronically 5 November 2013

SYSTEMATIC REVIEWS

Pharmacist-led interventions to reduce unplanned admissions for older people: a systematic review and meta-analysis of randomised controlled trials

REBECCA THOMAS¹, ALYSON L. HUNTLEY^{2*}, MALA MANN³, DYTED HUWS³, GLYN ELWYN⁴, SHANTINI PARANJOTHY¹, SARAH PURDY²

Hohl CM et al, *Br J Clin Pharmacol*. 2015 Jul;80(1):51-61

7 RCTs included

CONCLUSIONS:

...This systematic review failed to identify an effect of pharmacist-led medication review on health outcomes.

20 RCTs included; 16 for older people in general and 4 for older people with heart failure

CONCLUSIONS:

...evidence suggests that interventions led by hospital pharmacists reduce unplanned admissions in (only) older patients with heart failure



Examples:

Other systematic reviews and meta analyses:

Medication Reviews by Clinical Pharmacists at Hospitals Lead to Improved Patient Outcomes: A Systematic Review

Trine Graabæk¹ and Lene Juul Kjeldsen²

¹Department of Quality, Hospital South West Jutland, Esbjerg, Denmark and ²The Research Unit for Hospital Pharmacy, Amgros I/S, Copenhagen, Denmark

(Received 30 November 2012; Accepted 14 February 2013)

Basic & Clinical Pharmacology & Toxicology, 2013, 112, 359–373

31 studies included in the review: 21 descriptive studies and 10 controlled studies, of which 6 were randomized controlled trials.

In conclusion, the reviewed studies generally showed positive effects on medication use, health service use and costs. Large variability in design, methodologies and outcome measures of the studies!

Several outcomes were non-significant. These were often associated with low sample sizes or low acceptance rates of the pharmacists' recommendations.



What evidence do we have that hospital pharmacists add value?

2. Studies with specific interventions, targeting specific diagnoses or outcomes:

- Medication error rate
- Appropriateness of prescribing (according to MAI, STOPP/START, Beers...)
- Blood glucose control (and BP, lipids, INR...)
- Adherence to treatment
- Satisfaction (patients, physicians, nurses...)
- Cost savings/avoidance
- Etc, etc, etc, etc...

Here it is easier to show positive results!



**...In search of evidence
for the added value of hospital pharmacists...**

What outcomes should our services be judged by?

What is reasonable and fair?

When can we stop trying to prove that we should be
involved in patient centred care?



Using small, serial, (student) projects to expand practice

- Is there a problem and how big is it? Measure!
- Introduce solution/intervention/service.
- Measure effect on problem after service is in place
- Assess satisfaction and take on board suggestions
- Ensure funding – implement service
- Repeat in new clinic

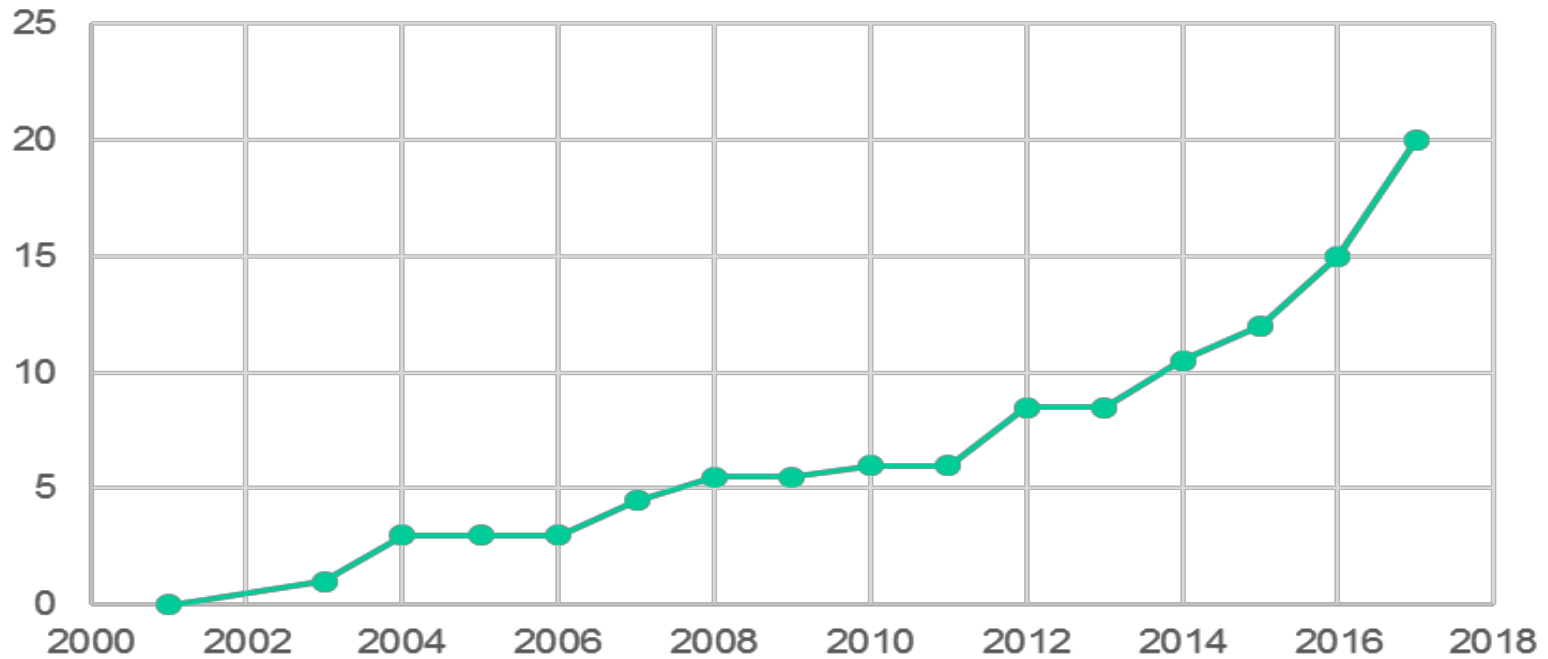


"Research light?"



Show benefit → expand your practice!

Clinical pharmacy in the Uppsala region

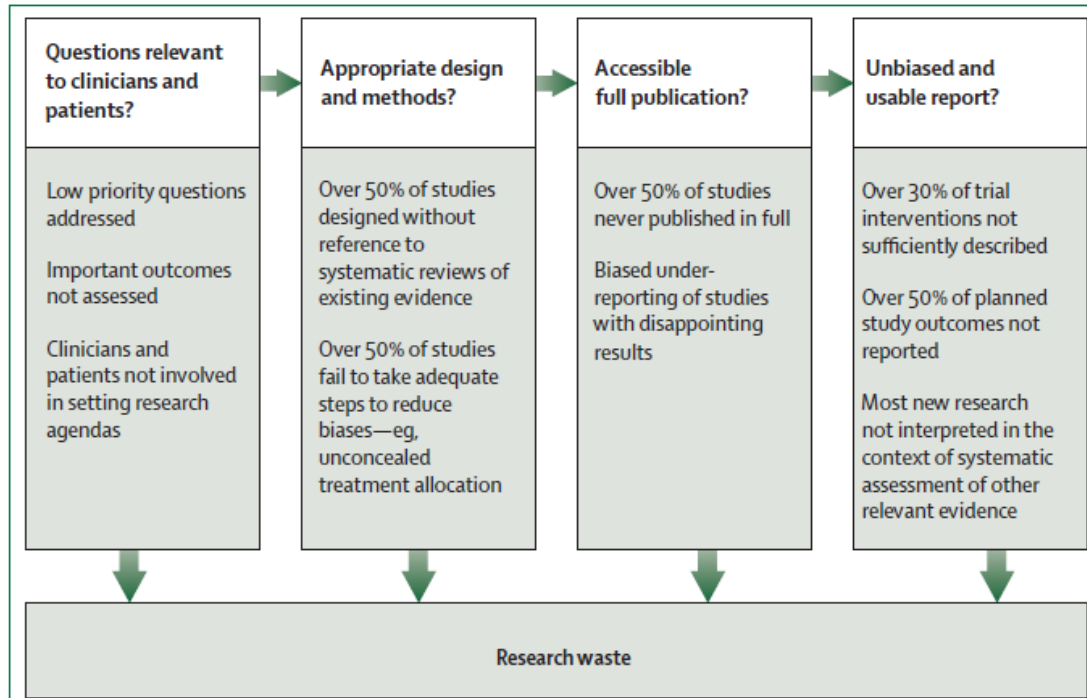


Phil Wiffen



Research waste?

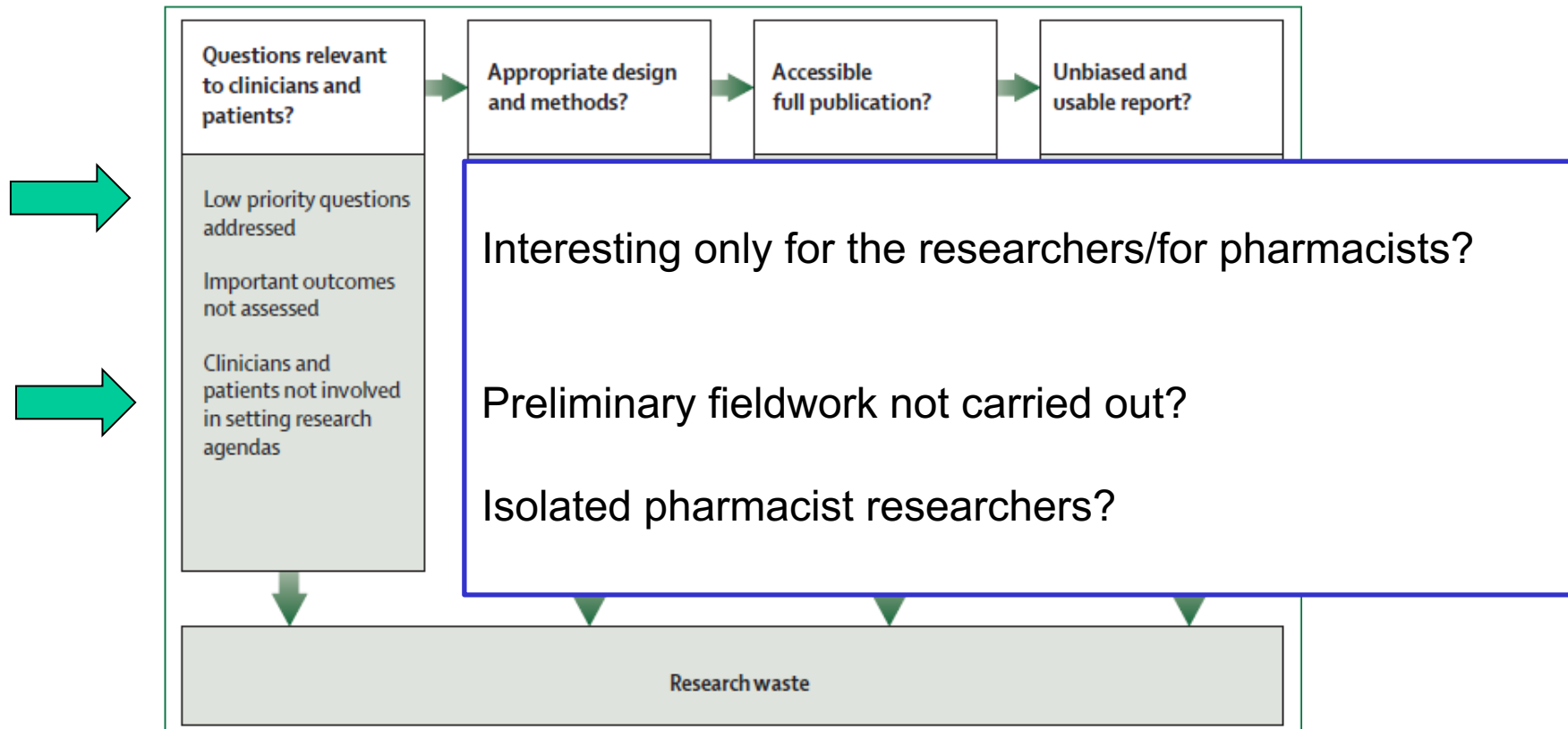
Editor in Chief of the European Journal of Hospital Pharmacy (*EJHP*)



Chalmers and Glasziou.
Lancet 374 pp86-89 2009



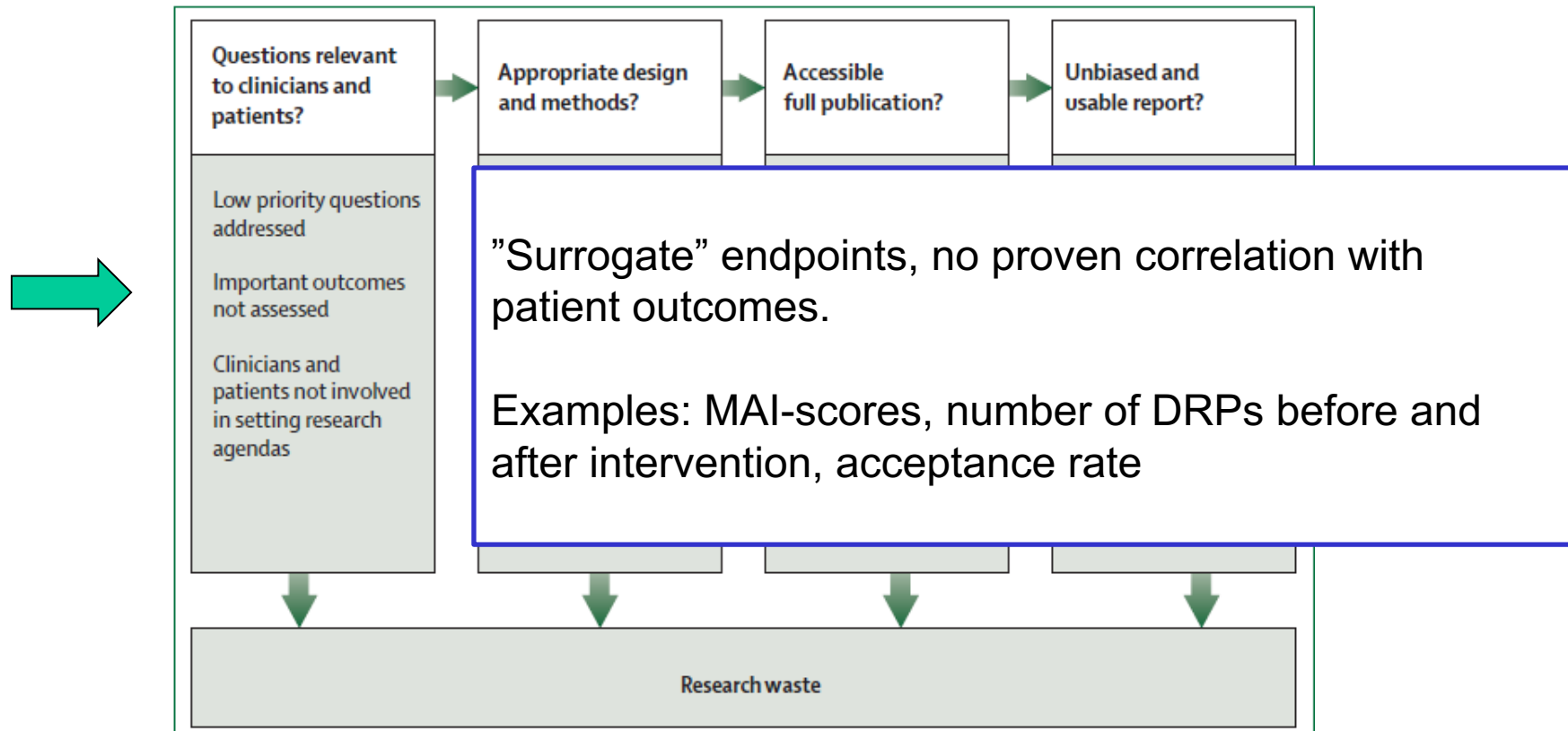
Research waste?



Chalmers and Glasziou.
Lancet 374 pp86-89 2009



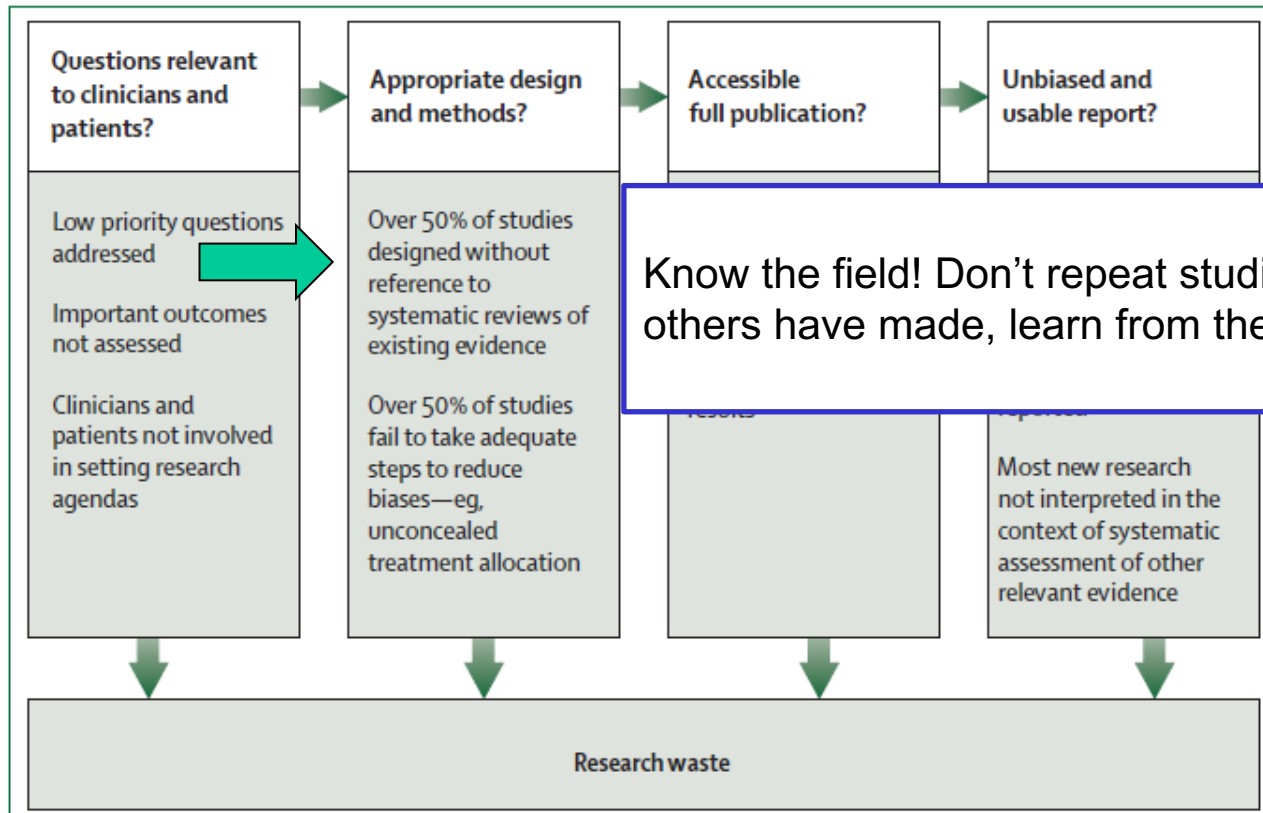
Research waste?



Chalmers and Glasziou.
Lancet 374 pp86-89 2009



Research waste?

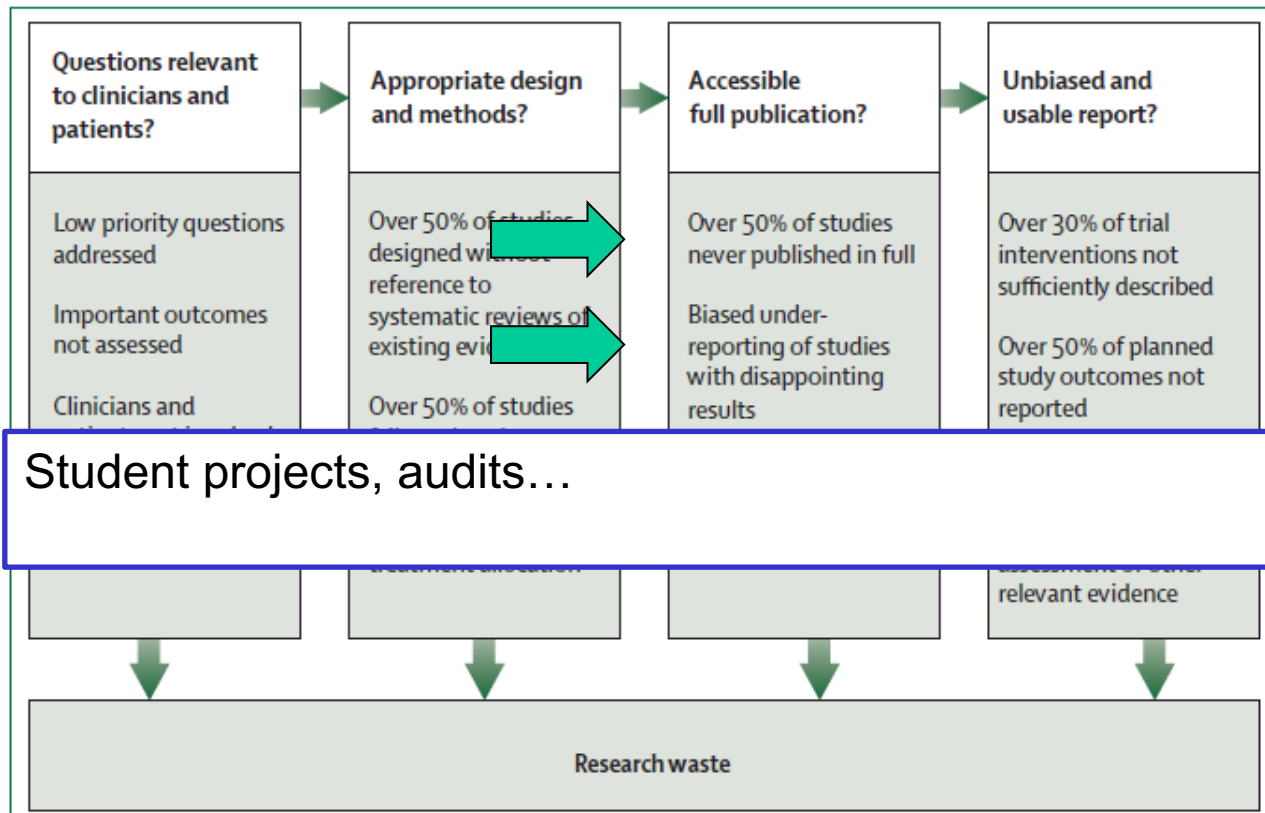


Know the field! Don't repeat studies or mistakes others have made, learn from them.

Chalmers and Glasziou.
Lancet 374 pp86-89 2009



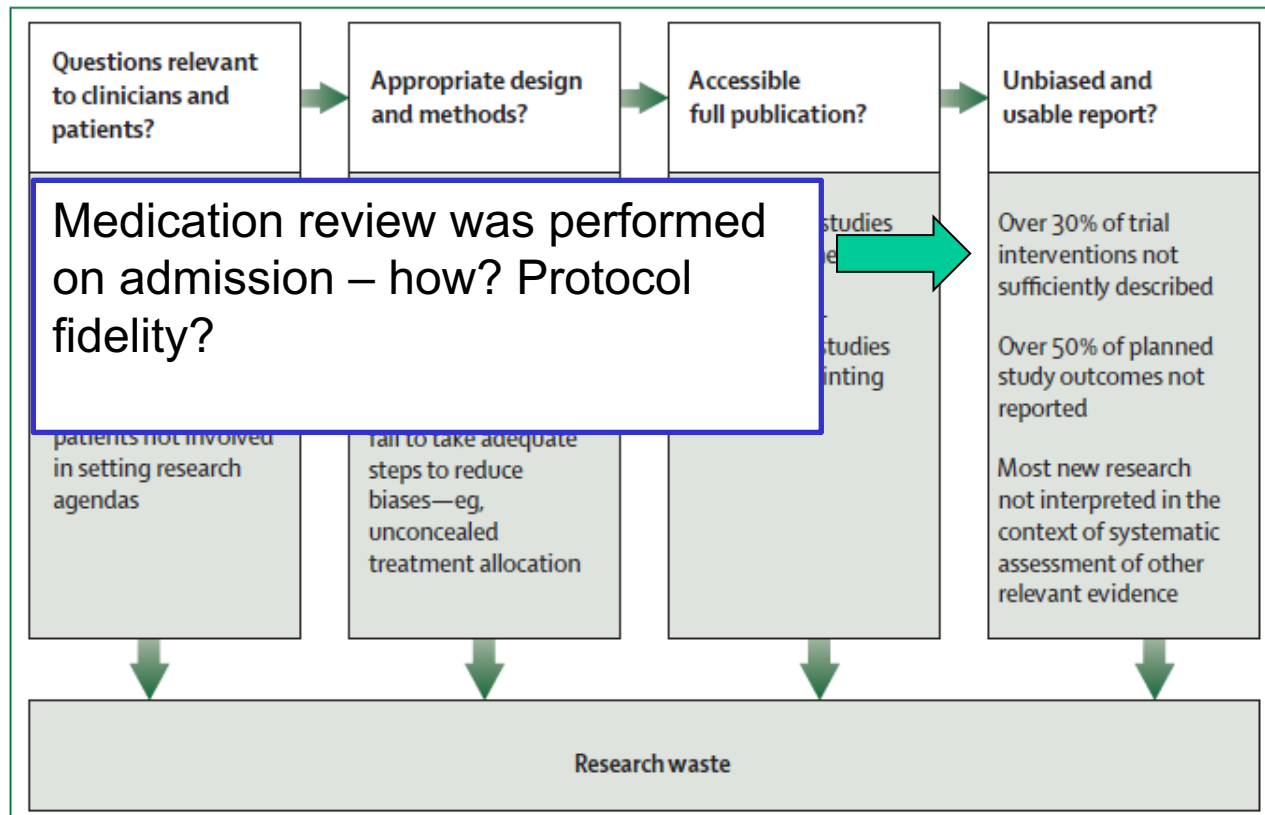
Research waste?



Chalmers and Glasziou.
Lancet 374 pp86-89 2009



Research waste?



Chalmers and Glasziou.
Lancet 374 pp86-89 2009



Research waste?

“A major limitation of many pharmacy practice research studies is that *most do not provide many details of the intervention*. This is important because it limits the reproducibility of the findings. **Tell us what you did!**”

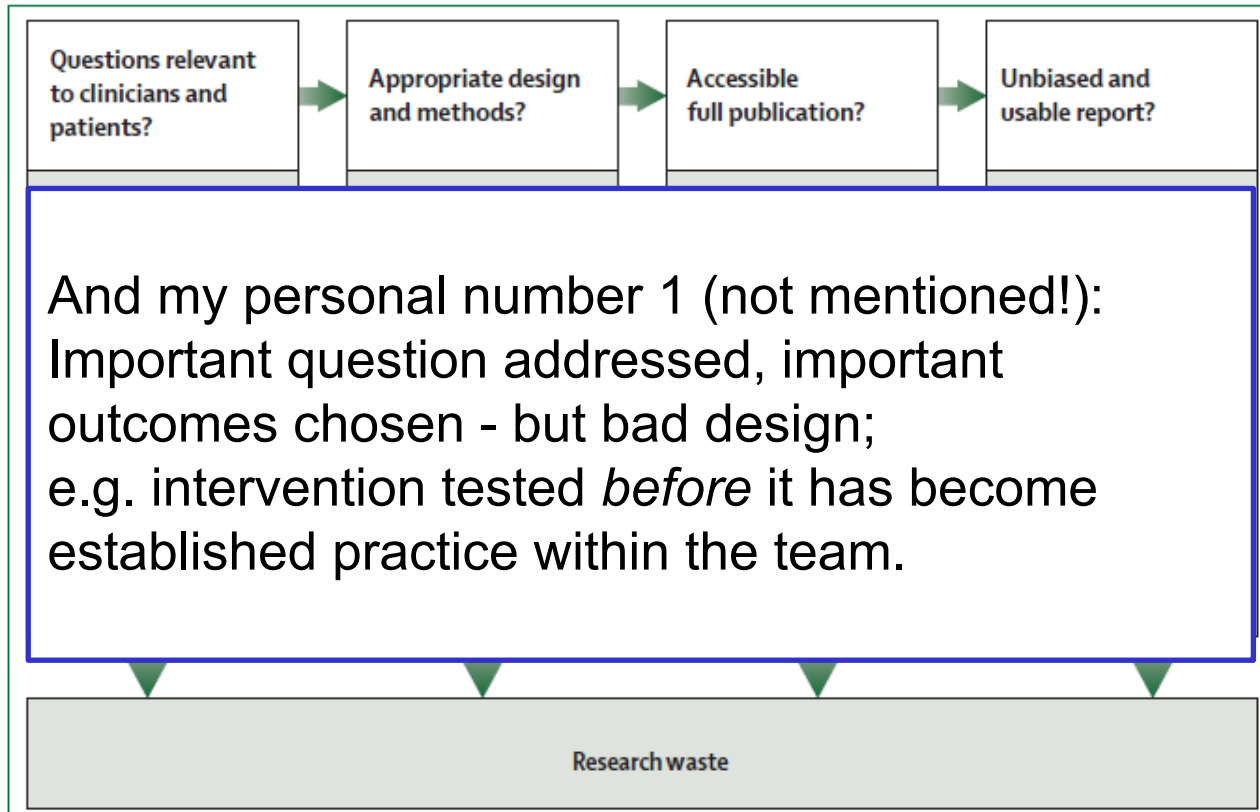
In addition, the “dose” of the intervention is not well reported in pharmacy practice research studies. Dose refers to adherence to the protocol including follow-up, education, and any other component of the intervention. **Tell us if you actually did it!**

“Not reporting the above is like a drug company performing a clinical trial in which a *mysterious* drug is administered at an *unknown* dosage - but in a randomized, controlled fashion”

**Systematic Reviews of Pharmacy Practice Research:
Methodologic Issues in Searching, Evaluating, Interpreting, and Disseminating Results**
Theresa L Charrois, Tamara Durec, and **Ross T Tsuyuki**
Ann Pharmacother 2009;43:118-22.



Research waste?



Chalmers and Glasziou.
Lancet 374 pp86-89 2009



The 80+ study – Uppsala University Hospital (2005-2007)

Study population:

- Patients 80 years or older admitted to two internal medicine wards: 400 patients (201+199)

Study aim:

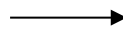
- To investigate the effectiveness of interventions performed by ward-based pharmacists



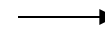
Intervention steps:



Hospital admission



- Medication reconciliation
- Patient interview

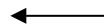


- Medication review followed by advice to physician
- Drug monitoring
- Patient education

•Follow-up phone call(s)



Hospital discharge



- Discharge counseling to patient
- Discharge information and referral to primary care physician



The 80+ study

Results (12-months follow-up):

- Reductions in hospital visits (16%), drug related readmissions (80%) and visits to ED (46%) for the intervention group.
- €200 lower cost per patient, when cost of intervention included

ORIGINAL INVESTIGATION

A Comprehensive Pharmacist Intervention to Reduce Morbidity in Patients 80 Years or Older

A Randomized Controlled Trial

Ulrika Gillespie, MSc Pharm; Anna Alassaad, MSc Pharm; Dan Henrohn, MD, MSc, Pharm; Hans Garmo, PhD; Margareta Hammarlund-Udenaes, PhD; Henrik Toss, MD, PhD; Åsa Kettis-Lindblad, PhD; Håkan Melhus, MD, PhD; Claes Morlin, MD, PhD

Background: Patients 80 years or older are underrepresented in scientific studies. The objective of this study was to investigate the effectiveness of interventions performed by ward-based pharmacists in reducing morbidity and use of hospital care among older patients.

Methods: A randomized controlled study of patients 80 years or older was conducted at the University Hospital of Uppsala, Uppsala, Sweden. Four hundred patients were recruited consecutively between October 1, 2005, and June 30, 2006, and were randomized to control (n=201) and intervention (n=199) groups. The interventions were performed by ward-based pharmacists. The control group received standard care without direct involvement of pharmacists at the ward level. The primary outcome measure was the frequency of hospital visits (emergency department and readmissions [total and drug-related]) during the 12-month follow-up period.

Results: Three hundred sixty-eight patients (182 in the

intervention group and 186 in the control group) were analyzed. For the intervention group, there was a 16% reduction in all visits to the hospital (quotient, 1.88 vs 2.24; estimate, 0.84; 95% confidence interval [CI], 0.72-0.99) and a 47% reduction in visits to the emergency department (quotient, 0.35 vs 0.66; estimate, 0.53; 95% CI, 0.37-0.75). Drug-related readmissions were reduced by 80% (quotient, 0.06 vs 0.32; estimate, 0.20; 95% CI, 0.10-0.41). After inclusion of the intervention costs, the total cost per patient in the intervention group was \$230 lower than that in the control group.

Conclusion: If implemented on a population basis, the addition of pharmacists to health care teams would lead to major reductions in morbidity and health care costs.

Trial Registration: clinicaltrials.gov Identifier: NCT00661310

Arch Intern Med. 2009;169(9):894-900



The 80+ study, what did we miss?

- Only 3 pharmacists involved (and extremely likeable ; -)
- Randomization at patient level: contamination bias!
- Under-powered
- 80+ patients
- Intervention not well described



New attempt 2017: the MedBridge study!

Contemporary Clinical Trials 61 (2017) 126–132



Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

Contemporary Clinical Trials

journal homepage: www.elsevier.com/locate/conclintrial

Medication Reviews Bridging Healthcare (MedBridge): Study protocol for a pragmatic cluster-randomised crossover trial

Thomas G.H. Kempen^{a,*}, Maria Bertilsson^b, Karl-Johan Lindner^c, Johanna Sulku^{d,e},
Elisabet I. Nielsen^f, Angelica Högberg^e, Tomas Vikerfors^g, Håkan Melhus^h, Ulrika Gillespie^a

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^f Department of Pharmaceutical Biosciences, Uppsala University, Uppsala, Sweden

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^h Department of Medical Sciences, Uppsala University, Uppsala, Sweden



Medication Reviews Bridging Healthcare:

A multicentre, cluster-randomised, three treatment crossover trial



Thomas Kempen, apotekare och projektsamordnare för Medbridge-studien. Foto: Privat.

Bra start för unik studie av klinisk farmaci

📅 27 februari 2017

Medbridge-studien är igång i Uppsala och Gävle och har fått en bra start. Svensk Farmaci fick ett samtal med Thomas Kempen, apotekare och projektsamordnare för den unika studien av klinisk farmaci i Sverige.

Website: akademiska.se/MedBridge

And: clinicaltrials.gov/ct2/show/NCT02999412



The MedBridge study

Eight wards in four hospitals in three regions: Uppsala, Gävle, Enköping, Västerås

Total number of patients: >2300 patienter

Prerequisite: *established* multiprofessional teams including clinical pharmacists performing medication reviews

Inclusion criteria:

- ≥ 65 years, admitted to study ward

Exclusion criteria:

- Palliative care patients
- Previous medication review within 30 days
- Less than 24 hour-admission
- Residing outside the three regions



The MedBridge study

Aim: To study the effects of hospital-initiated medication reviews, including active follow-up, on elderly patients healthcare consumption.

Design: Multicentre, three-treatment, cluster-randomised, crossover trial with study periods of 8 weeks.

Interventions:

1. Comprehensive medication review during hospital stay
2. Same as 1 with the addition of active follow-up into primary care.
3. Usual care.



The MedBridge study

Primary outcomes: Incidence of unplanned hospital visits (re-admissions + emergency department visits) after 12 months.

Secondary outcomes:

- Unplanned hospital admissions
- Emergency department visits
- Drug-related re-admissions*
- Unplanned primary care contacts
 - after 30 days, 3, 6 and 12 months.
- Total costs of hospital based care, 12 months

Timeframe: Inclusion – 2017/2018; follow-up – 2018/2019; analyses and publication – 2019/2020.



Drug-related admissions

Pro:

- Our special field – we are the best at identifying and preventing them!
- Probably our best chance of having a large impact on clinical outcomes measures

Con:

- They always include grades of subjectivity
- No standardised, quick way to measure them (yet!)



Questions

1. To implement new clinical pharmacy services - are robust scientific studies always needed? **N**
2. Should protocol fidelity always be measured? **Y**
3. Research is sometimes a waste of time and effort **Y**



**Pharmacy practice research,
keep up the good work and remember to have fun!**



Thank you for your attention!

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