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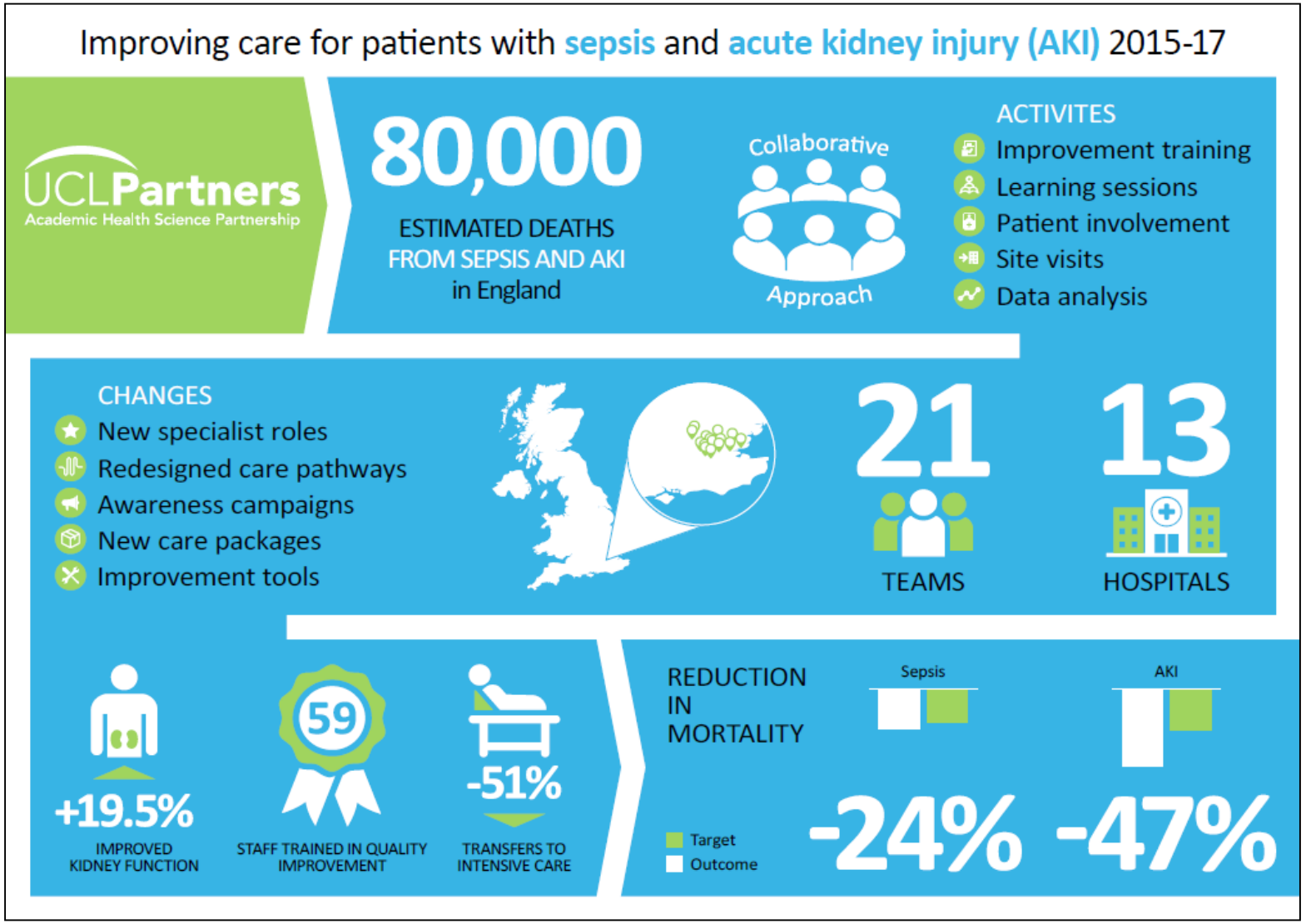
Safety in healthcare:
who - and what - drives change?

John Welch

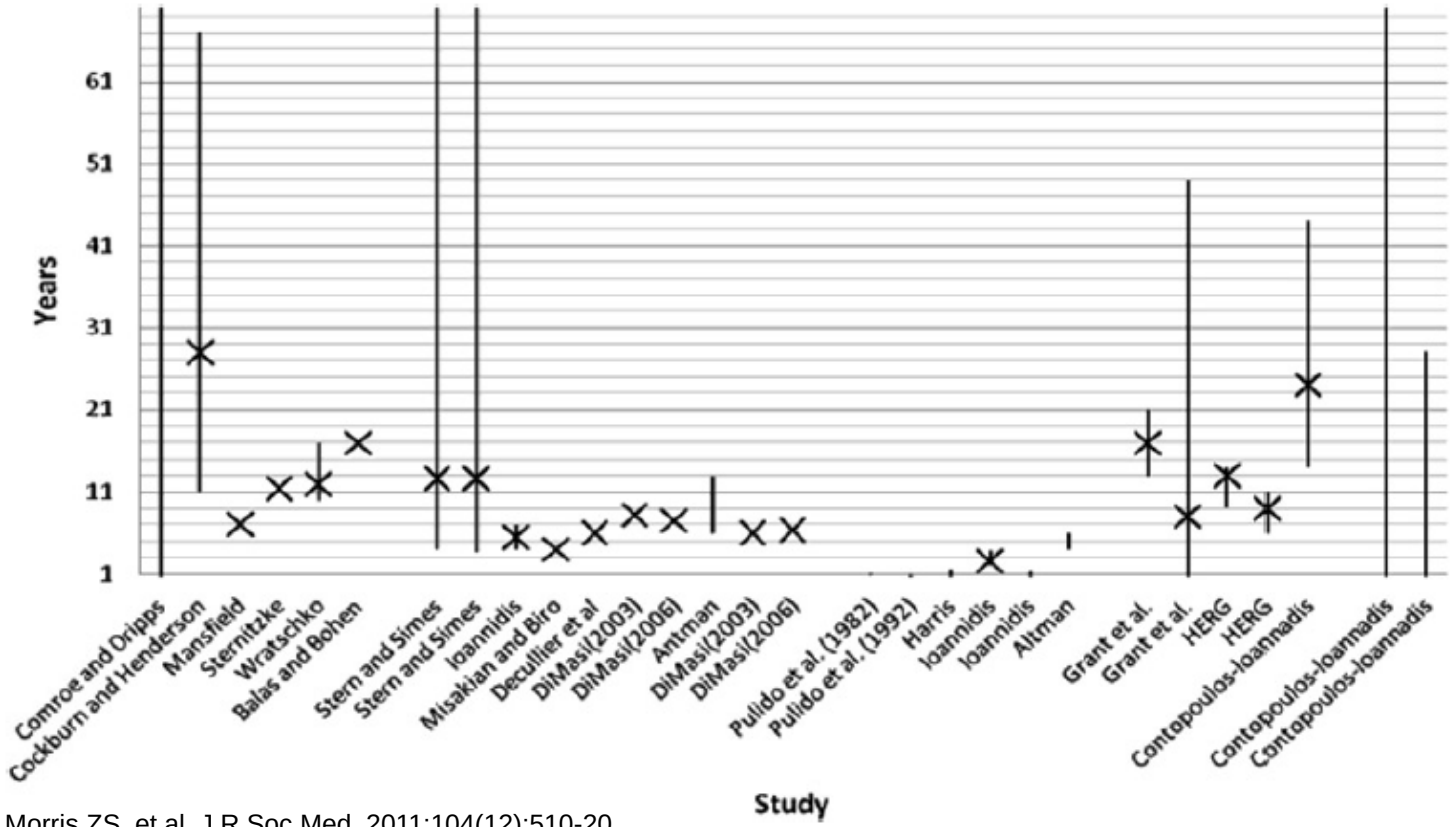

Improving care for patients with sepsis and acute kidney injury (AKI) 2015-17
UCLPartners
Academic Health Science Partnership
80,000
ESTIMATED DEATHS FROM SEPSIS AND AKI in England
Collaborative
Approach
ACTIVITES
Improvement training
Learning sessions
Patient involvement
Site visits
Data analysis
CHANGES
New specialist roles
Redesigned care pathways
Awareness campaigns
New care packages
Improvement tools
21
TEAMS
13
HOSPITALS
+19.5%
IMPROVED KIDNEY FUNCTION
59
STAFF TRAINED IN QUALITY IMPROVEMENT
-51%
TRANSFERS TO INTENSIVE CARE
REDUCTION IN MORTALITY
Sepsis
AKI
Target
Outcome
-24%
-47%

Evidence drives change …

but it usually takes a long time

The answer is 17 years, what is the question: understanding time lags in translational research

Chart showing the approximate range and average time lag reported in studies of time lags in health research. NB – HERG is the Health Economics Research Group at Brunel University



Morris ZS, et al. J R Soc Med. 2011;104(12):510-20.

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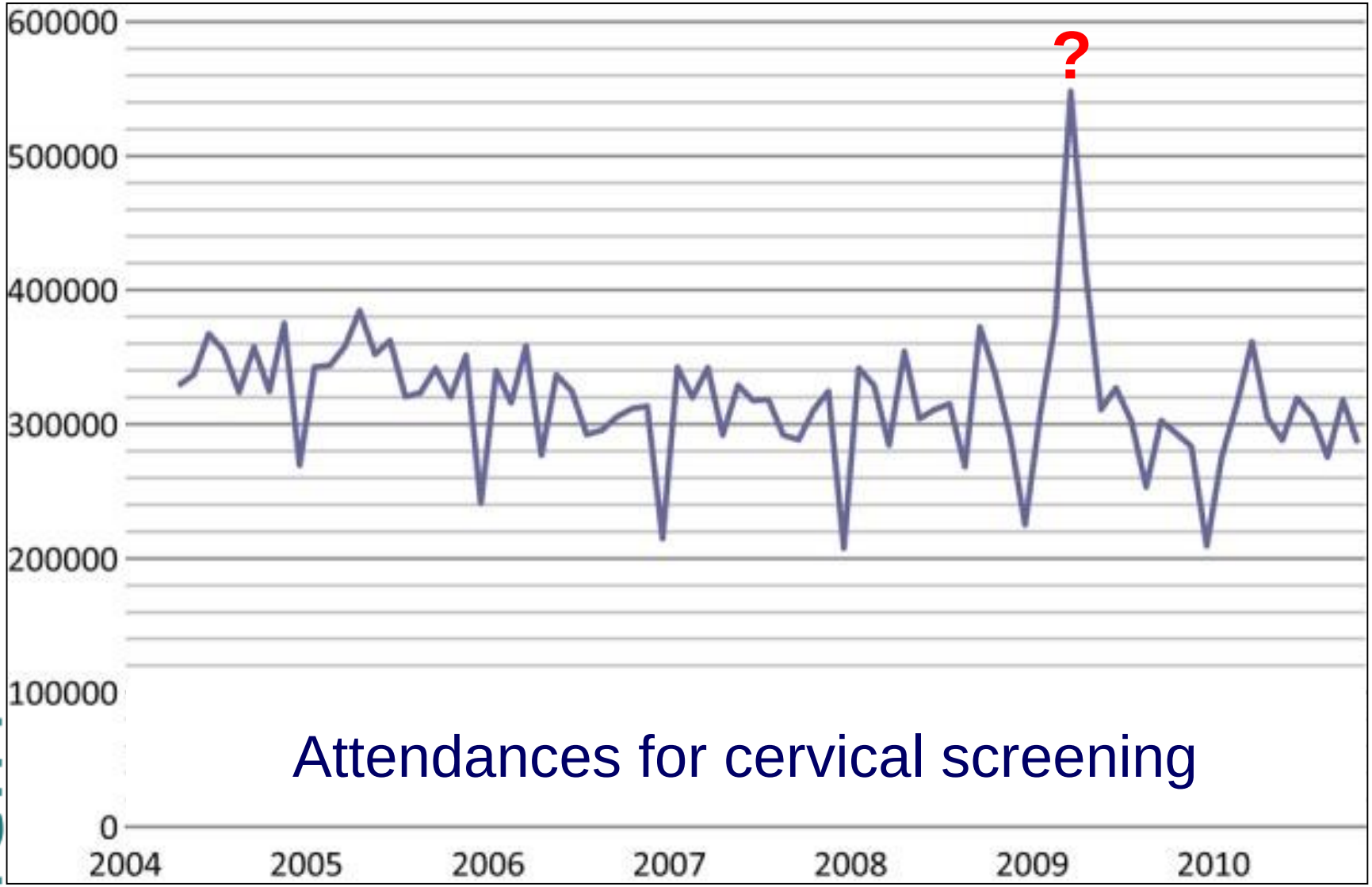
The New England
Journal of Medicine

VOLUME 340 FEBRUARY 11, 1999 NUMBER 6

A MULTICENTER, RANDOMIZED, CONTROLLED CLINICAL TRIAL OF TRANSFUSION REQUIREMENTS IN CRITICAL CARE

PAUL C. HÉBERT, M.D., GEORGE WELLS, PH.D., MORRIS A. BLAJCHMAN, M.D., JOHN MARSHALL, M.D., CLAUDIO MARTIN, M.D., GIUSEPPE PAGLIARELLO, M.D., MARTIN TWEEDDALE, M.D., PH.D., IRWIN SCHWEITZER, M.SC., ELIZABETH YETISIR, M.SC., AND THE TRANSFUSION REQUIREMENTS IN CRITICAL CARE INVESTIGATORS FOR THE CANADIAN CRITICAL CARE TRIALS GROUP*

"a threshold for red-cell transfusion as low as 7.0 g of hemoglobin per deciliter, combined with maintenance of hemoglobin concentrations in the range of 7.0 to 9.0 g per deciliter, was at least as effective as and possibly superior to a liberal transfusion strategy … in critically ill patients with normovolemia"



Lancucki L, et al. J Med Screen. 2012;19(2):89-93.

0.4 million extra attendances in 2008–09.

Lancucki L, et al. J Med Screen. 2012;19(2):89-93.

CNN Health » Food | Fitness | Wellness | Parenting | Vital Signs International Edition +

The 'Charlie Sheen effect' really did help HIV awareness

By Sandee LaMotte, CNN
Updated 2152 GMT (0552 HKT) February 22, 2016

- **Photos:** Celebrities and HIV
- Actor Charlie Sheen told NBC's "Today" show on Nov. 17, 2015 that he was diagnosed as HIV-positive about

Charlie Sheen's disclosure produced most Google searches on HIV ever recorded in U.S.

Parachute use to prevent death and major trauma related to gravitational challenge: systematic review of randomised controlled trials

Gordon C S Smith, Jill P Pell

What is already known about this topic

Parachutes are widely used to prevent death and major injury after gravitational challenge

Parachute use is associated with adverse effects due to failure of the intervention and iatrogenic injury

Studies of free fall do not show 100% mortality

What this study adds

No randomised controlled trials of parachute use have been undertaken

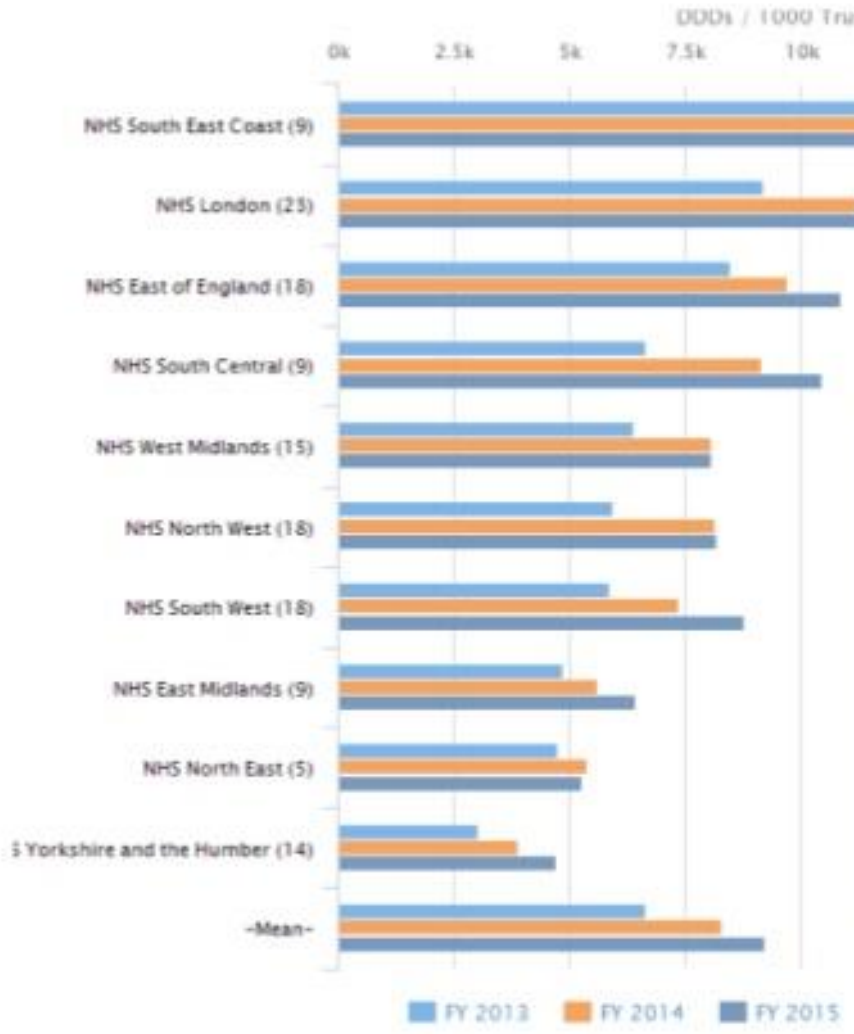
The basis for parachute use is purely observational, and its apparent efficacy could potentially be explained by a "healthy cohort" effect

Individuals who insist that all interventions need to be validated by a randomised controlled trial need to come down to earth with a bump

BMJ. 2003;327(7429):1459-61.

Directives & incentives drive change

Has 2015-6 Sepsis CQUIN ↑ ED IV AB use?



Improvement

Overall 9.3% ↑ in rolling 12 mth from April to March
(info from Rx-Info Define software)

CEM audit of IV AB in 60 mins:
2011 = 27% (IQR 17-37%)
2013 = 32% (IQR 20-44%)

CQUIN Sepsis
2015-6 Q2 = 49%, Q3 = 58%

61% of red flags required Abs

Day 3 review in 2016-7 CQUIN

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Headline cases & sanctions drive change

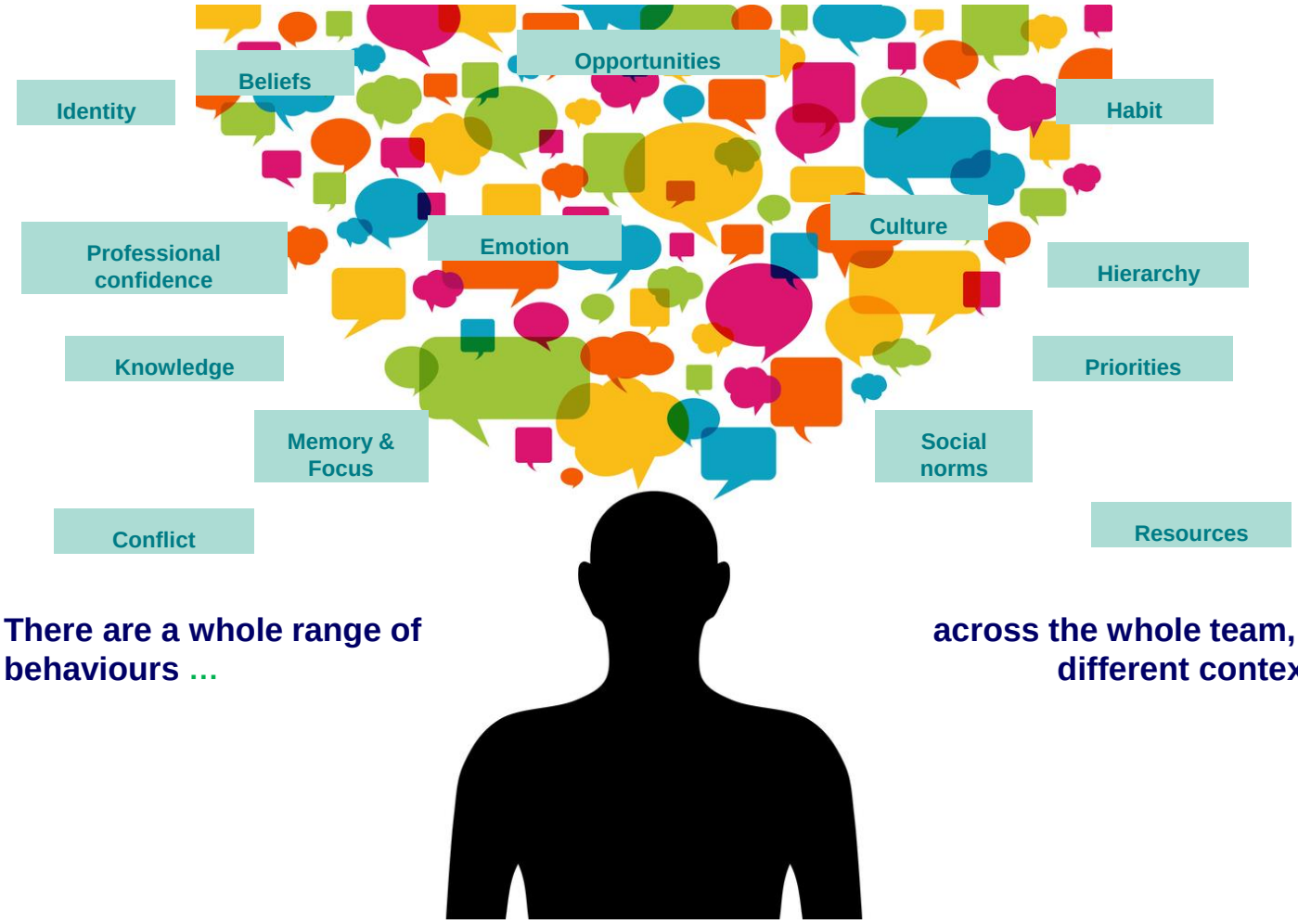
Court told there should have been 'no possibility' for a nurse to accidentally kill a pensioner in a blood transfusion blunder

- Experienced nurse allegedly killed pensioner by injecting him with wrong blood
- She injected 76-year-old Ali Huseyin with Irfan Hussain's blood
- He died within hours of the catastrophic blunder at the London Heart Hospital
- Prosecutors say her series of 'bad' mistakes should have been impossible

To change practice we need to understand it

- Why are practices – behaviours - as they are?
- What needs to change for desired practice/s to occur?

  i.e., what are the barriers and levers to this practice?

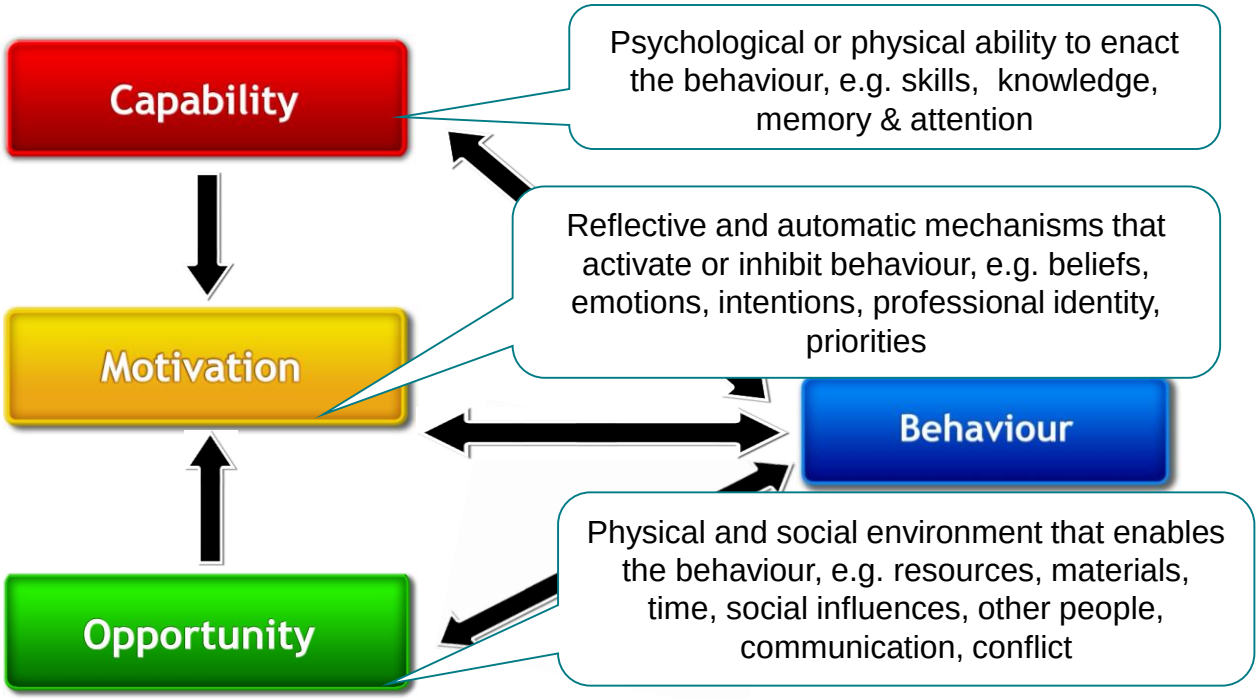


There are a whole range of behaviours …

across the whole team, in different contexts

COM-B model:

behaviour occurs as an interaction between three necessary conditions



Michie S, et al. Implement Sci. 2011;6:42.

Steinmo S, et al. Implement Sci. 2015;10:111.

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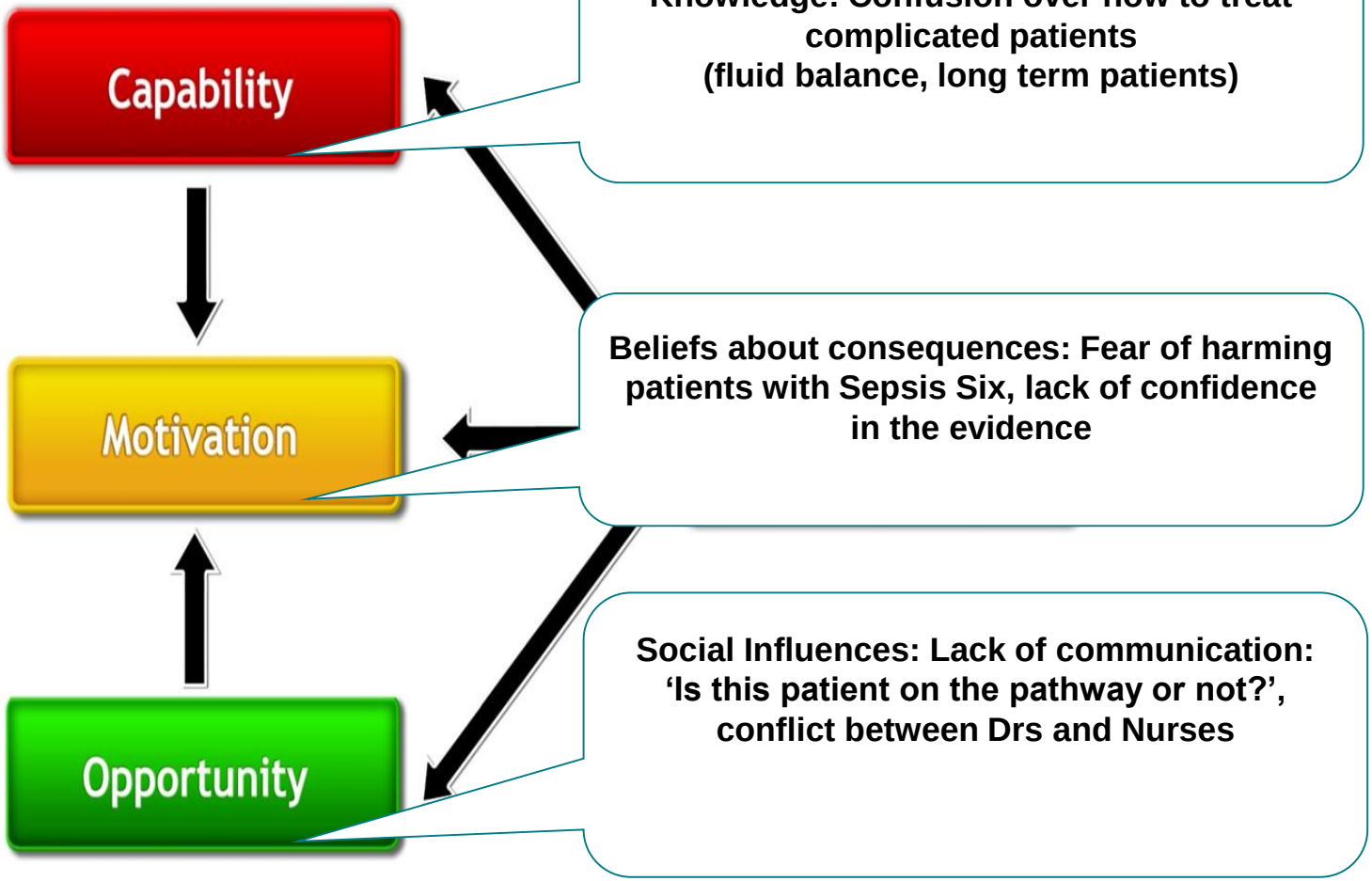
BARRIERS



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Steinmo et al. Implementation Science (2015) 10:111
DOI 10.1186/s13012-015-0300-7

IMPLEMENTATION SCIENCE

RESEARCH Open Access

Characterising an implementation intervention in terms of behaviour change techniques and theory: the 'Sepsis Six' clinical care bundle

Siri Steinmo[1*], Christopher Fuller[2], Sheldon P. Stone[3] and Susan Michie[1]

Steinmo S, et al. Implement Sci. 2015;10:111.

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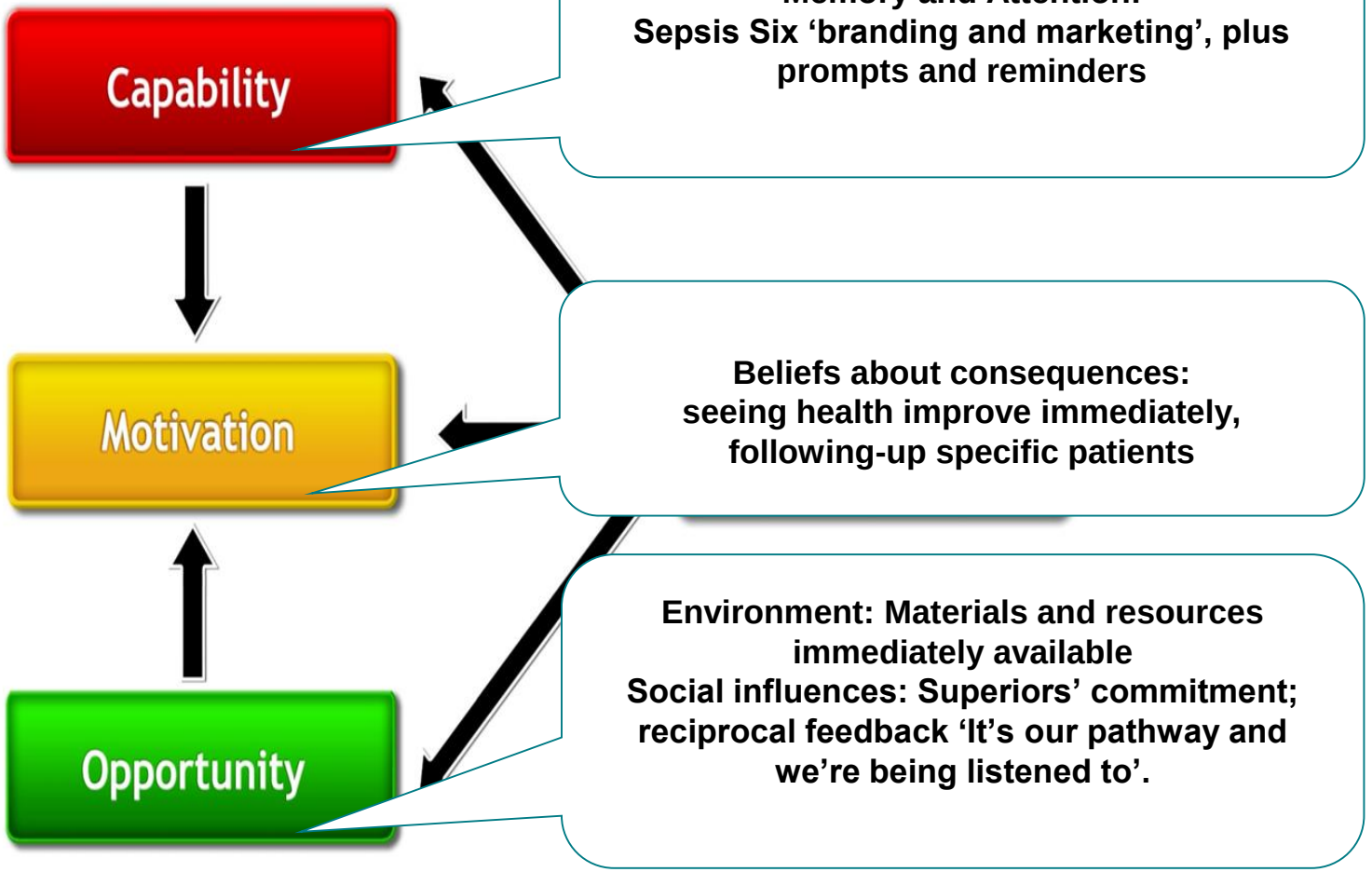
LEVERS



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Solutions based on what was found

- Fear of harming patients with stat fluid
- Need for superiors' commitment
- Lack of doctors at night
- Empowered staff = change
- Materials at hand

- Education modified to address fluid volume issue
- Written agreement drafted by ward clinical leads
- Night coordinator training
- Development of Sepsis Champion roles
- All areas have designated sepsis trolley or area

Islam *et al. Implementation Science* 2012, **7**:93
http://www.implementationscience.com/content/7/1/93

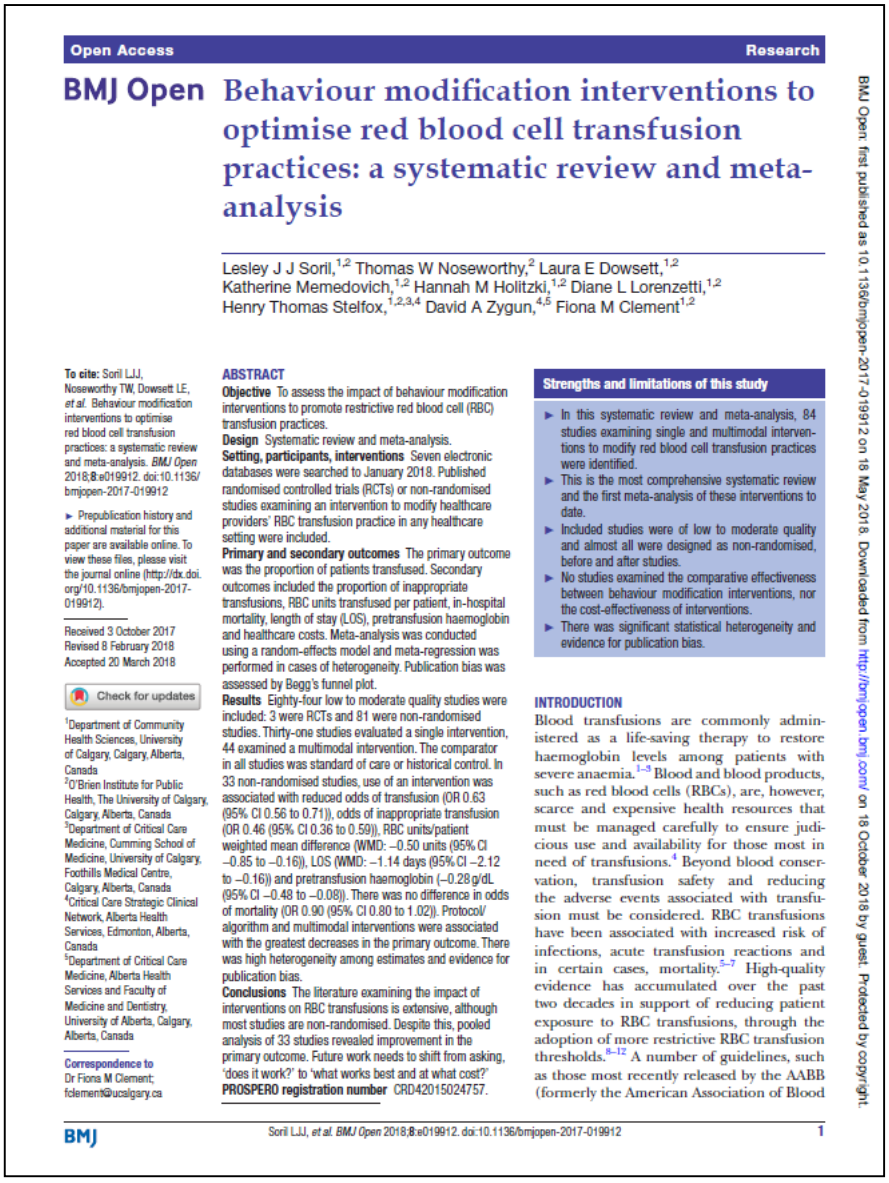
IMPLEMENTATION SCIENCE

RESEARCH Open Access

A cross-country comparison of intensive care physicians' beliefs about their transfusion behaviour: A qualitative study using the theoretical domains framework

Rafat Islam[1], Alan T Tinmouth[1,2*], Jill J Francis[3], Jamie C Brehaut[1,4], Jennifer Born[1], Charlotte Stockton[5],

- **Beliefs about capabilities**: confident to not transfuse if patients' clinical condition is stable
- **Beliefs about consequences**: positive beliefs of reducing infection and saving resources and negative beliefs about risking patients' clinical outcome and potentially more work
- **Social influences**: transfusion decision is influenced by team members and patients' relatives
- **Behavioural regulation**: wide range of approaches to encourage restrictive transfusion



Open Access Research

BMJ Open

Behaviour modification interventions to optimise red blood cell transfusion practices: a systematic review and meta-analysis

Lesley J J Soril,[1,2] Thomas W Noseworthy,[2] Laura E Dowsett,[1,2] Katherine Memedovich,[1,2] Hannah M Holitzki,[1,2] Diane L Lorenzetti,[1,2] Henry Thomas Stelfox,[1,2,3,4] David A Zygun,[4,5] Fiona M Clement[1,2]

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► Prepublication history and additional material for this paper are available online. To view these files, please visit the journal online (http://dx.doi.org/10.1136/bmjopen-2017-019912).

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ABSTRACT

Objective To assess the impact of behaviour modification interventions to promote restrictive red blood cell (RBC) transfusion practices.

Design Systematic review and meta-analysis.

Setting, participants, interventions Seven electronic databases were searched to January 2018. Published randomised controlled trials (RCTs) or non-randomised studies examining an intervention to modify healthcare providers' RBC transfusion practice in any healthcare setting were included.

Primary and secondary outcomes The primary outcome was the proportion of patients transfused. Secondary outcomes included the proportion of inappropriate transfusions, RBC units transfused per patient, in-hospital mortality, length of stay (LOS), pretransfusion haemoglobin and healthcare costs. Meta-analysis was conducted using a random-effects model and meta-regression was performed in cases of heterogeneity. Publication bias was assessed by Begg's funnel plot.

Results Eighty-four low to moderate quality studies were included: 3 were RCTs and 81 were non-randomised studies. Thirty-one studies evaluated a single intervention, 44 examined a multimodal intervention. The comparator in all studies was standard of care or historical control. In 33 non-randomised studies, use of an intervention was associated with reduced odds of transfusion (OR 0.63 (95% CI 0.56 to 0.71)), odds of inappropriate transfusion (OR 0.46 (95% CI 0.36 to 0.59)), RBC units/patient weighted mean difference (WMD: −0.50 units (95% CI −0.85 to −0.16)), LOS (WMD: −1.14 days (95% CI −2.12 to −0.16)) and pretransfusion haemoglobin (−0.28 g/dL (95% CI −0.48 to −0.08)). There was no difference in odds of mortality (OR 0.90 (95% CI 0.80 to 1.02)). Protocol/algorithm and multimodal interventions were associated with the greatest decreases in the primary outcome. There was high heterogeneity among estimates and evidence for publication bias.

Conclusions The literature examining the impact of interventions on RBC transfusions is extensive, although most studies are non-randomised. Despite this, pooled analysis of 33 studies revealed improvement in the primary outcome. Future work needs to shift from asking, 'does it work?' to 'what works best and at what cost?'

PROSPERO registration number CRD42015024757.

Strengths and limitations of this study

- In this systematic review and meta-analysis, 84 studies examining single and multimodal interventions to modify red blood cell transfusion practices were identified.
- This is the most comprehensive systematic review and the first meta-analysis of these interventions to date.
- Included studies were of low to moderate quality and almost all were designed as non-randomised, before and after studies.
- No studies examined the comparative effectiveness between behaviour modification interventions, nor the cost-effectiveness of interventions.
- There was significant statistical heterogeneity and evidence for publication bias.

INTRODUCTION

Blood transfusions are commonly administered as a life-saving therapy to restore haemoglobin levels among patients with severe anaemia.[1–3] Blood and blood products, such as red blood cells (RBCs), are, however, scarce and expensive health resources that must be managed carefully to ensure judicious use and availability for those most in need of transfusions.[4] Beyond blood conservation, transfusion safety and reducing the adverse events associated with transfusion must be considered. RBC transfusions have been associated with increased risk of infections, acute transfusion reactions and in certain cases, mortality.[5–7] High-quality evidence has accumulated over the past two decades in support of reducing patient exposure to RBC transfusions, through the adoption of more restrictive RBC transfusion thresholds.[8–12] A number of guidelines, such as those most recently released by the AABB (formerly the American Association of Blood

Pooled analysis of 33 studies revealed improvement in the primary outcome (proportion of patients transfused).

Future work needs to shift from asking, 'does it work?' to **'what works best and at what cost?**

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Comments & Questions?