

PRINCIPLES OF A&F

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GREETINGS FROM CANADA



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AUDIT AND FEEDBACK

- ▣ Any summary of clinical performance of health care over a specified period of time. The summary may also have included recommendations for clinical action. The information may have been obtained from medical records, computerised databases, or observations from patients.



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UNDERSTANDING AUDIT AND FEEDBACK

Nexus

ARTICLES

Effect of audit and feedback, and reminder messages on primary-care radiology referrals: a randomised trial

Martin Eccles, Nick Steen, Jeremy Grimshaw, Lois Thomas, Paul McNamee, Jennifer Soutter, John Wilsdon, Lloyd Matowe, Gillian Needham, Fiona Gilbert, Senga Bond

Summary

Background Radiological tests are often used by general practitioners (GPs). These tests can be overused and contribute little to clinical management. We aimed to assess two methods of reducing GP requests for radiological tests in accordance with the UK Royal College of Radiologists' guidelines on lumbar spine and knee radiographs.

Methods We assessed audit and feedback, and educational reminder messages in six radiology departments and 244 general practices that they served. The study was a before-and-after, pragmatic, cluster randomised controlled trial with a 2×2 factorial design. A random subset of GP patients' records were examined for concordance with the guidelines. The main outcome measure was number of radiograph requests per 1000 patients per year. Analysis was by intention to treat.

Findings The effect of educational reminder messages (ie, the change in request rate after intervention) was an absolute change of -1.53 (95% CI -2.5 to -0.57) for lumbar spine and of -1.61 (-2.6 to -0.62) for knee radiographs, both relative reductions of about 20%. The effect of audit and feedback was an absolute change of -0.07 (-1.3 to 0.9) for lumbar spine of 0.04 (-0.95 to 1.03) for knee radiograph requests, both relative reductions of about 1%. Concordance between groups did not differ significantly.

Interpretation 6-monthly feedback of audit data is ineffective but the routine attachment of educational reminder messages to radiographs is effective and does not affect quality of referrals. Any department of radiology that handles referrals from primary care could deliver this intervention to good effect.

Introduction

General practitioners (GPs) can overuse radiological tests, particularly lumbar spine^{1,2} and knee radiographs.³ Such tests are frequently of little clinical use. Guidelines for use of these investigations are in the UK Royal College of Radiologists' publication *Making the best use of a radiology department*.⁴ However, few studies have been done of interventions designed to change GPs' behaviour. Although these studies showed that GPs altered their use of radiological tests, they were badly designed,^{5,6} used inappropriate analysis,⁷ had short duration of follow-up,⁸ or omitted cost considerations.⁹ Grol¹⁰ and Lomas¹¹ have summarised the theory of how to change doctors' behaviour, and Oxman and colleagues¹² have reviewed the effectiveness of interventions. Specific prompts at the time of consultation are a powerful strategy¹³ and have been shown to alter GPs' behaviour—eg, when referring patients for infertility investigations¹⁴—but the effect of the widely-used strategy of audit and feedback is not so certain.^{15,16}

We assessed two methods (audit and feedback, and educational messages) of reducing GPs' requests for radiological tests in accordance with the UK Royal College of Radiologists' guidelines. Our hypothesis was that either intervention alone would be more effective than a control and that both interventions together would be more effective than either alone.

Methods

Study design

The study was based in six radiology departments in the north-east of England and Scotland and in GPs' surgeries (practices) that referred patients exclusively to them. The study was a before-and-after, pragmatic, cluster randomised controlled trial, with a 2×2 factorial design—practices were the units of randomisation and analysis.¹⁷ Randomisation, stratified by radiology department and practice size, was done by the study

▶ RCT of audit and feedback to 240 general practices in the North East of England and Scotland to reduce unnecessary lumbar spine and knee x-rays.



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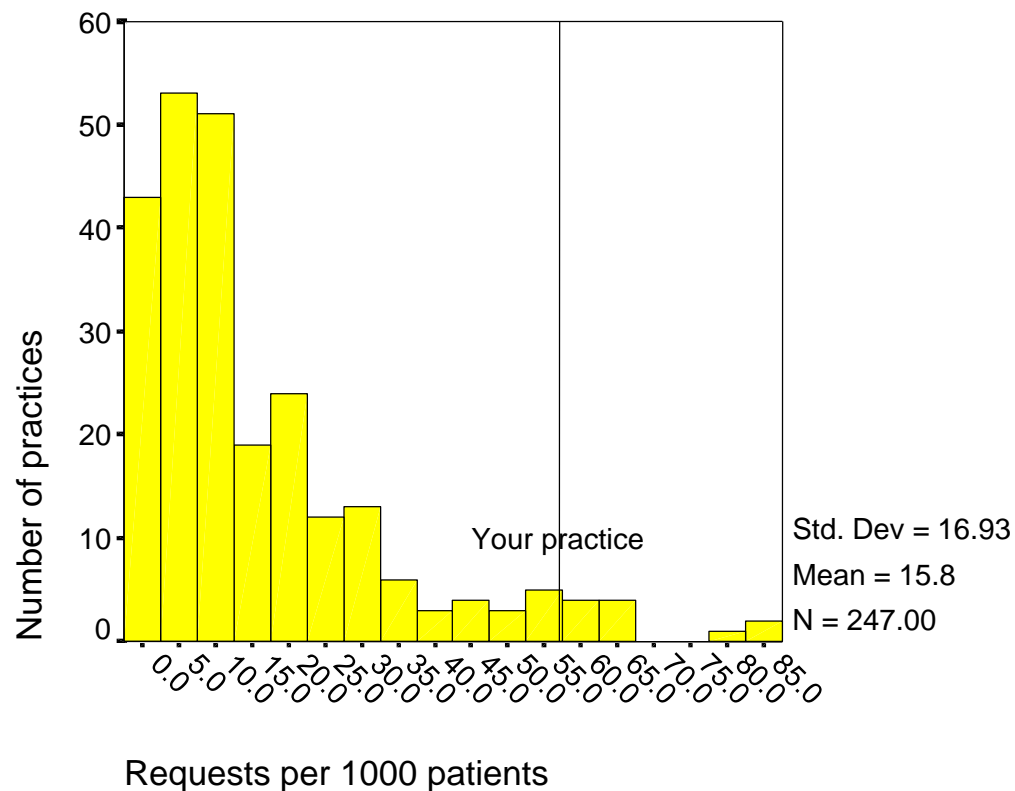
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UNDERSTANDING AUDIT AND FEEDBACK

NEXUS feedback



Requests for
knee x-rays



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UNDERSTANDING AUDIT AND FEEDBACK

DRAM

Articles

Effect of enhanced feedback and brief educational reminder messages on laboratory test requesting in primary care: a cluster randomised trial

Ruth E Thomas, Bernard L Lewis, Craig Ramsay, Martin Eccles, Jeremy Grimshaw

Summary

Background Laboratory services play an important part in screening, diagnosis, and management of patients within primary care. However, unnecessary use of laboratory tests is increasing. Our aim was to assess the effect of two interventions on the number of laboratory tests requested by primary-care physicians.

Methods We did a cluster randomised controlled trial using a 2x2 factorial design, involving 85 primary-care practices (370 family practitioners) that request all laboratory tests from one regional centre. The interventions were quarterly feedback of practice requesting rates for nine laboratory tests, enhanced with educational messages, and brief educational reminder messages added to the test result reports for nine laboratory tests. The primary outcome was the number of targeted tests requested by primary-care practices during the 12 months of the intervention. This study is registered as an International Standard Randomised Controlled Trial, number ISRCTN06490422.

Findings Practices that received either or both the enhanced feedback and the reminder messages were significantly less likely than the control group to request the targeted tests in total (enhanced feedback odds ratio 0.87, 95% CI 0.81-0.94, reminder messages 0.89, 0.83-0.93). The effect of the interventions varied across the targeted tests individually, although the number of tests requested for both interventions was generally reduced. Neither intervention was consistently better than the other.

Interpretation Enhanced feedback of requesting rates and brief educational reminder messages, alone and in combination, are effective strategies for reducing test requesting in primary care. Both strategies are feasible within most laboratory settings.

Introduction

Laboratory services play an important part in screening, diagnosis, and management of patients within primary care. Use of laboratory tests has increased substantially in recent years,^{1,2} and a survey of UK laboratories showed an 83% increase in requests for tests from primary care between 2000 and 2004.³

There are many potential reasons for this rise, including the development of new useful tests and the effect of new guidelines and contracts.^{4,5} However, evidence suggests that unnecessary ordering of tests could be a component of this increase.^{6,7} Unnecessary test requesting is not only a burden on laboratory resources, but also can lead to subsequent unnecessary investigation and treatment of healthy individuals with false-positive results.^{8,9} Furthermore, unnecessary requests are an inappropriate use of the finite resources available for health-care provision as a whole.

The effectiveness of strategies to change the practice of health professionals in general, and test requesting in particular, has varied.¹⁰⁻¹² Reviews have suggested that audit and feedback of test ordering rates, educational messages, test request form changes, reminders, and computer-decision support are all potentially effective methods of changing test ordering behavior.^{13,14} A systematic review¹⁵ that focused on studies evaluating

methods to improve diagnostic test requesting, including 49 studies with a control group, showed that most interventions assessed were effective. However, conclusions drawn from the study are limited by methodological flaws, such as lack of a randomised comparison group in 41 of the 49 studies. Additionally, few studies assessed the effectiveness of these interventions within a primary-care setting. A systematic review¹⁶ that included 85 randomised trials showed that audit and feedback have small to moderate effects on health professionals' practice; however, the evidence for test requesting within the primary-care setting is sparse since only two of the trials studied the effect of feedback on laboratory test requesting within primary care. The authors concluded that their review does not provide support for unevaluated use of audit and feedback. Furthermore, current systematic reviews suggest that single-intervention strategies could be as effective as multiple complex interventions in changing health-profession practice.^{17,18} At the time of planning the current study, we had recently completed a cluster randomised trial of two strategies to reduce requests for lumbar spine and knee radiographs in primary care.¹⁹ We reported that although simple, comparative audit and feedback of request rates had no discernible effects, the provision of educational reminder messages led to a 20% relative

▶ RCT of audit and feedback to 90 general practices in the North East of Scotland (subset of NEXUS practices) to reduce nine unnecessary laboratory tests



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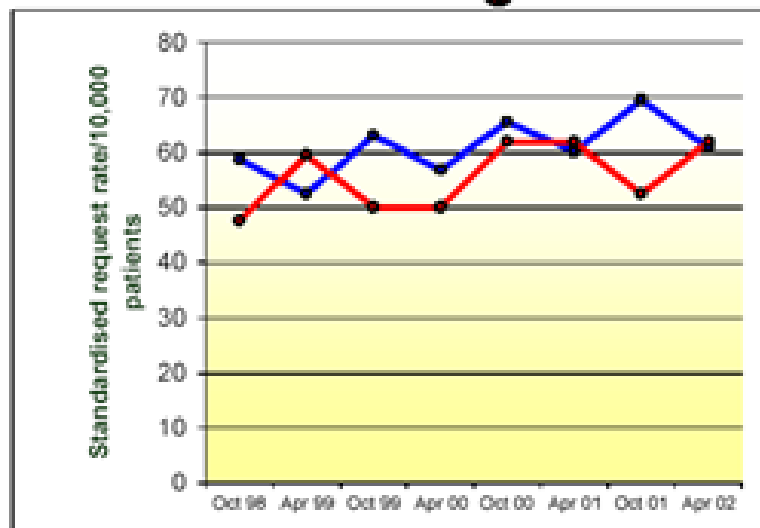


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UNDERSTANDING AUDIT AND FEEDBACK

DRAM feedback

Follicle Stimulating Hormone



Grampian Average	60.7
Your Practice	61.9

Follicle Stimulating Hormone (FSH) is released by the pituitary gland and acts to stimulate sex hormone production and reproductive processes. **In general, FSH testing is of limited value in the assessment of menopausal status in women over 40 years of age, and so should not be requested for this purpose.** Menopausal/Peri-menopausal status is best confirmed retrospectively based on clinical symptoms, signs and frequency or absence of menstruation. Biochemical measurement adds little to this classification, and may mislead.



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UNDERSTANDING AUDIT AND FEEDBACK

▶ Which (if any) feedback intervention was effective?

- NEXUS
- DRAM
- Both
- Neither



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UNDERSTANDING AUDIT AND FEEDBACK

▣ NEXUS

- No effect

▣ DRAM

- 16% relative reduction
- Reductions seen in 8/9 tests



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UNDERSTANDING AUDIT AND FEEDBACK

▶ Why were the results of NEXUS and DRAM different:

- Differences in targeted behaviours
- Difference in number of targeted behaviours
- Differences in recipients (learning curve)
- Differences in feedback presentation
- Chance



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CURRENT STATE OF IMPLEMENTATION SCIENCE – AUDIT AND FEEDBACK

- Cochrane 2012 review – 140 trials of audit and feedback, median absolute improvement +4%, interquartile range +1% to +16%
- Larger effects were seen if:
 - baseline compliance was low.
 - the source was a supervisor or colleague
 - it was provided more than once
 - it was delivered in both verbal and written formats
 - it included both explicit targets and an action plan

Ivers (2012) *Cochrane Library*



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COMPLEXITY OF FEEDBACK – POTENTIAL EFFECT MODIFIERS

Annals of Internal Medicine

ACADEMIA AND THE PROFESSION

Practice Feedback Interventions: 15 Suggestions for Optimizing Effectiveness

Jamie C. Brehaut, PhD; Heather L. Colquhoun, PhD; Kevin W. Eva, PhD; Kelly Carroll, MA; Anne Sales, PhD; Susan Michie, PhD; Noah Ivers, MD, PhD; and Jeremy M. Grimshaw, MD, PhD

Electronic practice data are increasingly being used to provide feedback to encourage practice improvement. However, evidence suggests that despite decades of experience, the effects of such interventions vary greatly and are not improving over time. Guidance on providing more effective feedback does exist, but it is distributed across a wide range of disciplines and theoretical perspectives.

Through expert interviews; systematic reviews; and experience with providing, evaluating, and receiving practice feedback, 15 suggestions that are believed to be associated with effective feedback interventions have been identified. These

suggestions are intended to provide practical guidance to quality improvement professionals, information technology developers, educators, administrators, and practitioners who receive such interventions. Designing interventions with these suggestions in mind should improve their effect, and studying the mechanisms underlying these suggestions will advance a stagnant literature.

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For author affiliations, see end of text.

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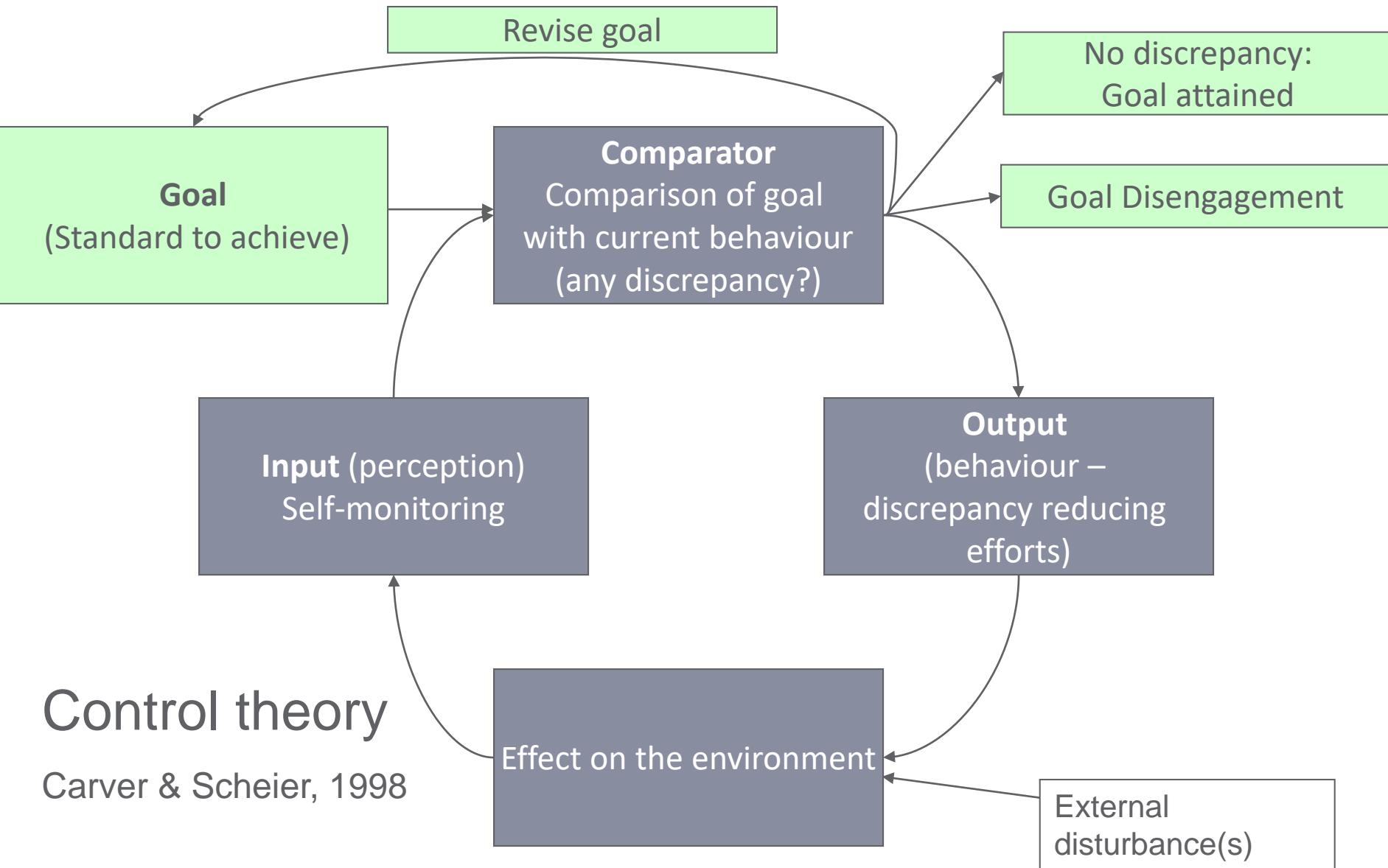
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COMPLEXITY OF FEEDBACK – POTENTIAL EFFECT MODIFIERS

- ▶ Be provided multiple times
- ▶ Present feedback as soon as possible
- ▶ Provide individual rather than general data
- ▶ Include clear comparators that reinforce desired behaviour change
- ▶ Support an action perceived to be a priority for recipients
- ▶ Recommend actions that can improve and are under control of the recipient
- ▶ Recommend a specific action
- ▶ Tailor feedback interventions based on situation-specific barriers
- ▶ Closely link visual display and summary message
- ▶ Be presented in multiple ways
- ▶ Minimize cognitive load
- ▶ Address barriers that prevent use of the feedback
- ▶ Provide short, actionable messages followed by more detail
- ▶ Address credibility of the information
- ▶ Increase motivation to change practice
- ▶ Encourage social construction of feedback rather than passive delivery



Control theory

Carver & Scheier, 1998

CONTROL THEORY

▣ Some assumptions:

- Audit and feedback is salient and actionable
- Healthcare professionals motivated to undertake targeted behavior
- Healthcare professionals undertaking clinical care receive feedback
- Healthcare professionals trust data collection/analysis process
- Changing targeted behavior is under the control of the targeted healthcare professionals



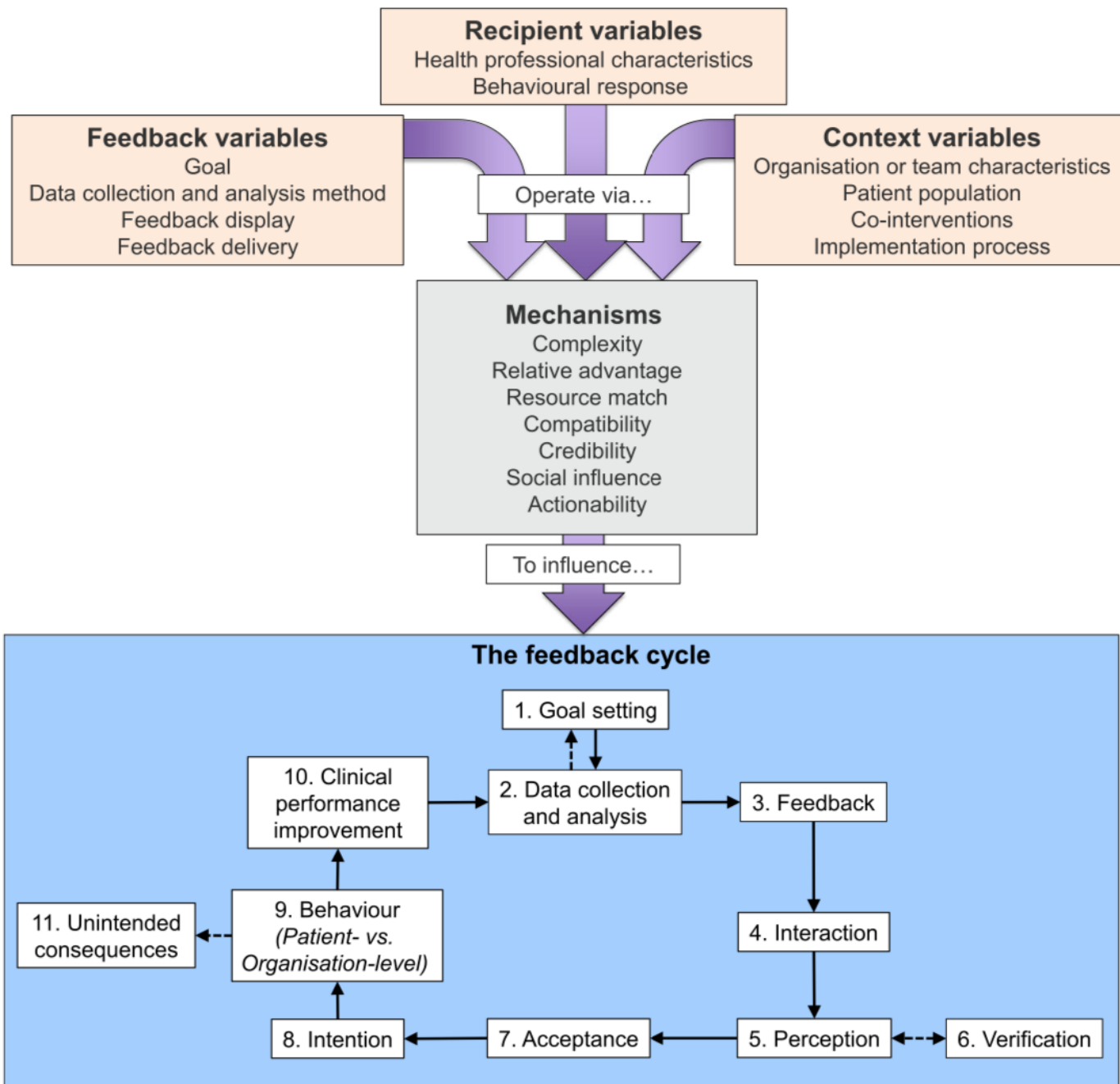
SYSTEMATIC REVIEW

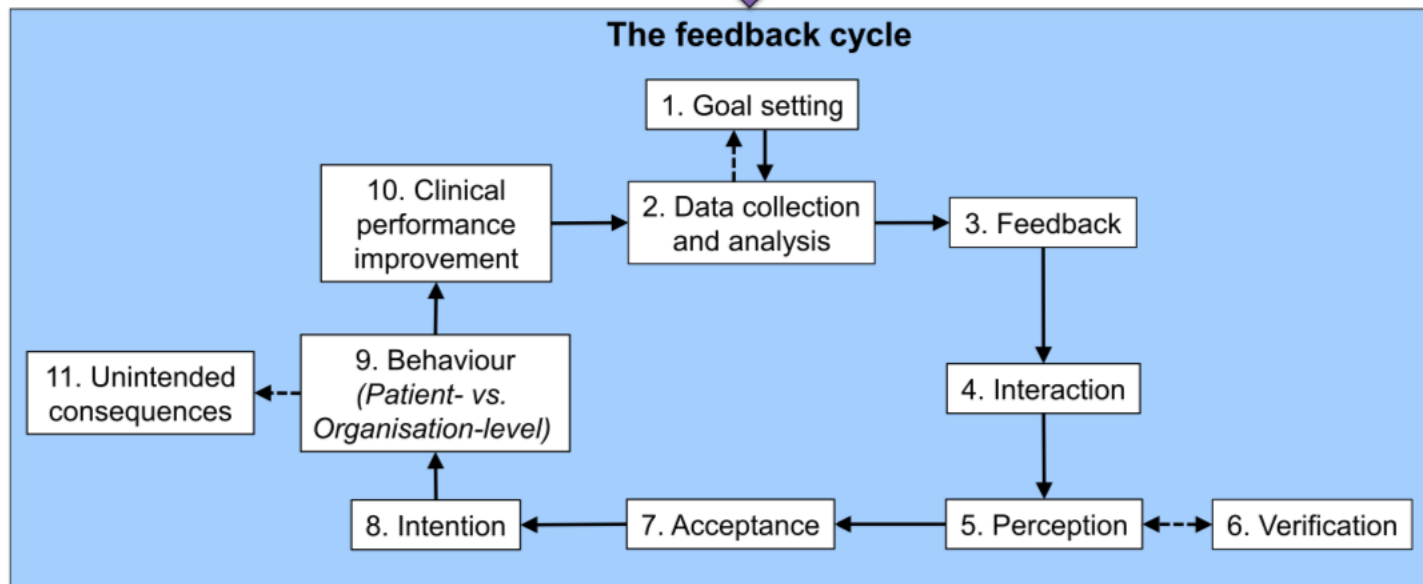
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Clinical Performance Feedback Intervention Theory (CP-FIT): a new theory for designing, implementing, and evaluating feedback in health care based on a systematic review and meta-synthesis of qualitative research

Benjamin Brown^{1,2*} , Wouter T. Gude³, Thomas Blakeman², Sabine N. van der Veer¹, Noah Ivers⁴, Jill J. Francis^{5,6}, Fabiana Lorencatto⁷, Justin Presseau^{6,8,9}, Niels Peek¹ and Gavin Daker-White²





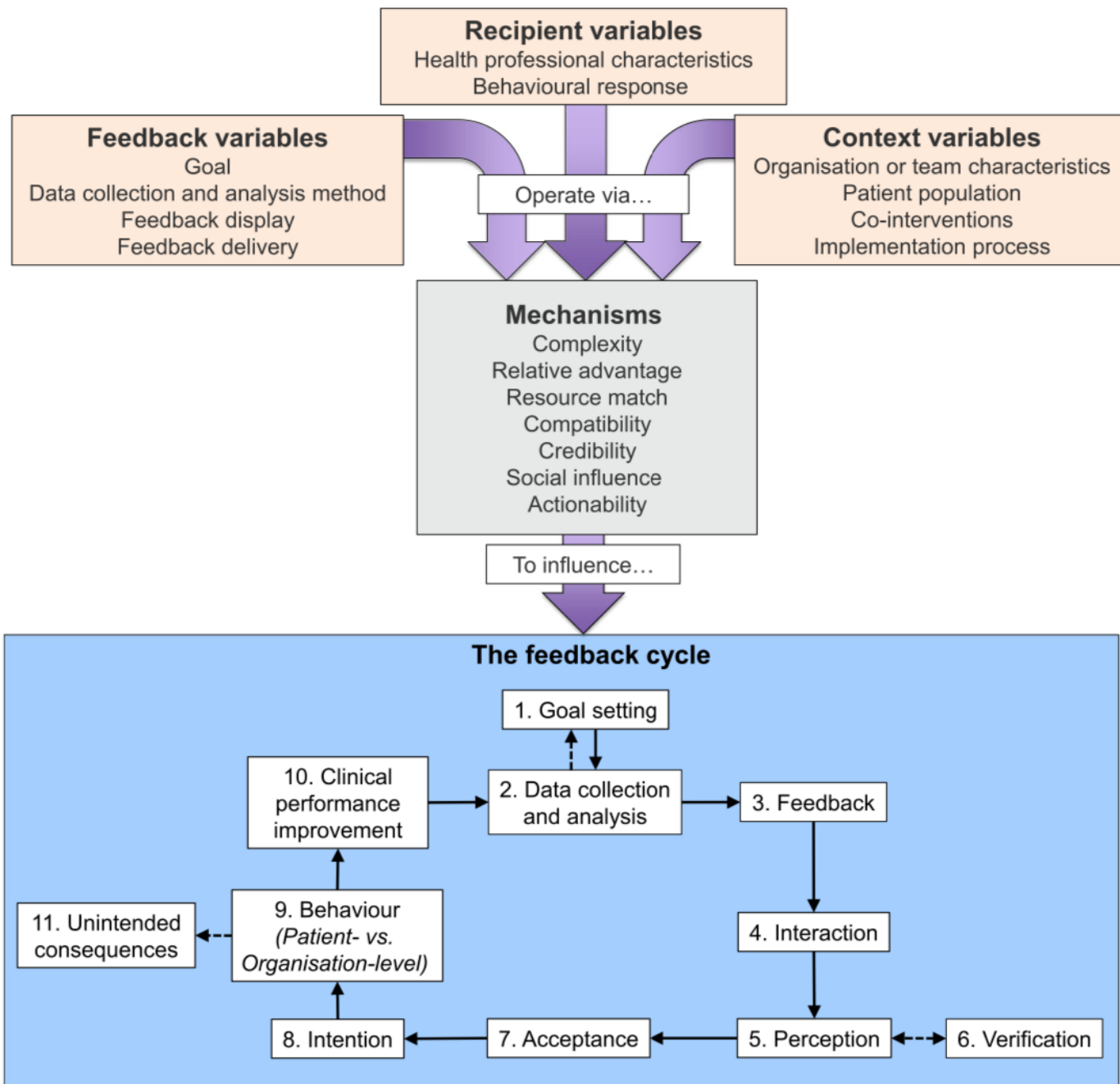
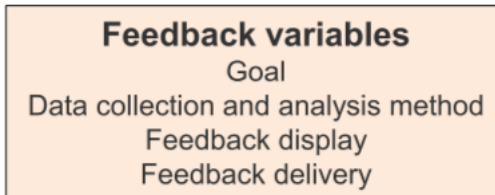


Table 5 Forty-two high-confidence hypotheses from Clinical Performance Feedback Intervention Theory

Hypothesis: Feedback interventions are more effective when ...	Relevant feedback cycle process(es)	Key explanatory mechanism(s)	Illustrative paper reference
<i>Feedback variables</i>			
<i>Goal</i>			
1. <i>Importance</i> : ... They focus on goals recipients believe to be meaningful and often do not happen in practice.	<i>Acceptance, Intention</i>	<i>Compatibility, Credibility</i>	
2. <i>Controllability</i> : ... They focus on goals perceived to be within the control of the recipients.	<i>Acceptance, Intention</i>	<i>Actionability</i>	[62]
3. <i>Relevance</i> : ... They focus on goals perceived as relevant to recipients' jobs.	<i>Acceptance, Intention</i>	<i>Actionability, Compatibility, Relative advantage</i>	[64]





- ▶ **Goal** – importance, controllability, relevance
- ▶ **Data collection and analysis method** - minimize burden on recipients, accuracy, ***ability to exclude non-eligible patients***
- ▶ **Feedback display** - performance level has room for improvement, identify which patients contributed to analyses, specificity, timeliness, ***trend*** (show current performance in relation to past performance), benchmarking, prioritization, usability
- ▶ **Feedback delivery** – ***function*** (perceived as supportive of positive change), source knowledge and skill, ***active delivery***, delivery to a group



Context variables

Organisation or team characteristics
Patient population
Co-interventions
Implementation process

- ▶ **Organisation or team characteristics - *Organisational resources, competing priorities, leadership support, champions, teamwork, intraorganisational networks, extraorganisational networks, workflow fit***
- ▶ **Co-interventions – *peer discussion, problem solving, action planning, external change agents***
- ▶ **Implementation process – *adaptability, training and support, observability, cost, ownership***



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SOME OBSERVATIONS

- ▶ Multiple convergent theory and empirical work on how to optimize A&F
- ▶ Recommendations can be conflicting and likely impossible to implement all at same time
- ▶ Needs careful consideration of context and resources to determine which recommendations to enact when designing and delivering feedback
- ▶ Further research needed to consolidate (and extend) this knowledge base.



Thanks!

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