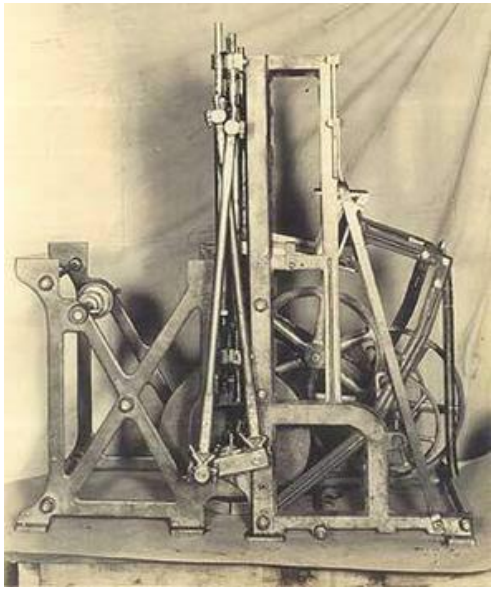
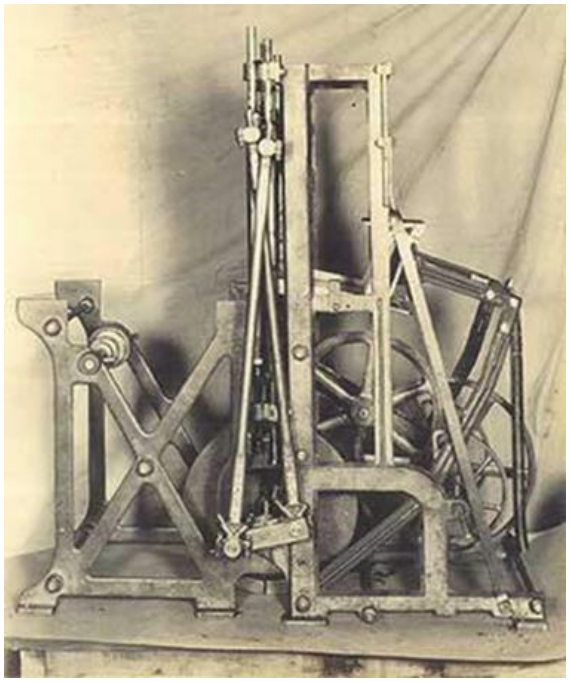
Otto Rohwedder



How long did it take for sliced bread to take off?



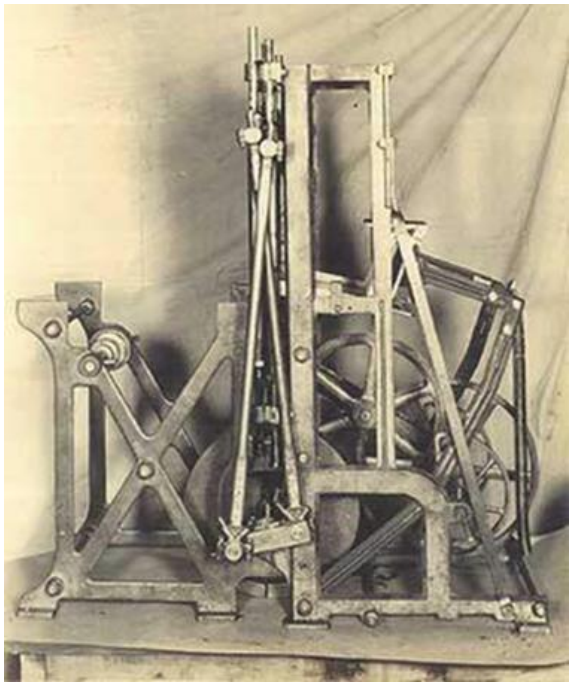
One year

Five years

Fifteen years

Fifty years

How long did it take for sliced bread to take off?



One year

Five years

Fifteen years

Fifty years

Leeds Institute of
Health Sciences

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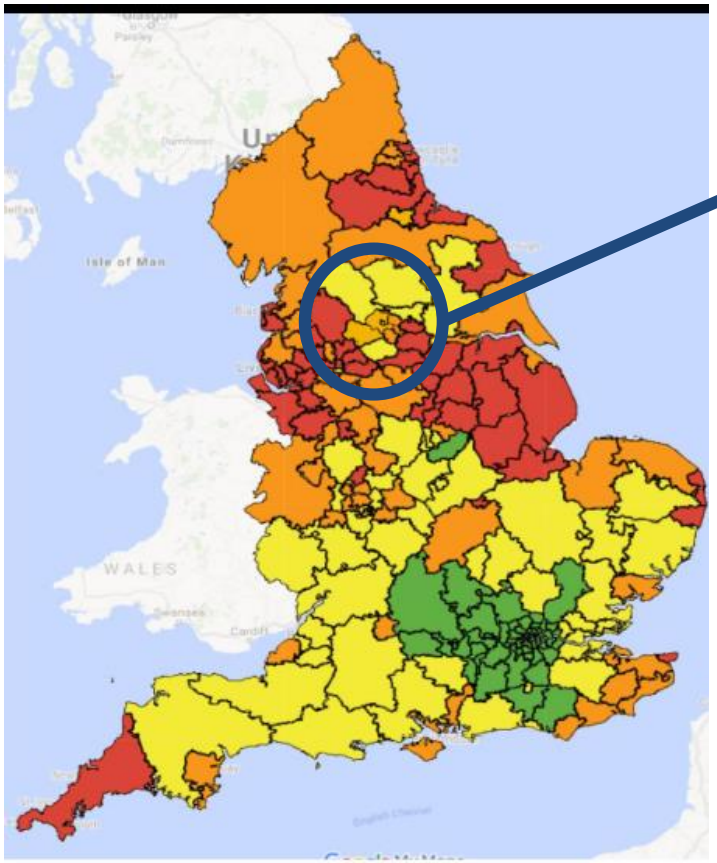
Audit and feedback: embedding research into practice and practice into research

Sarah Alderson and Robbie Foy



Airedale, Wharfedale & Craven
Bradford Districts
Bradford City
Leeds North
Leeds West
Leeds South & East
Calderdale
Wakefield
Greater Huddersfield
North Kirklees

Acknowledgements

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ASPIRE was funded by the National Institute for Health Research (NIHR) [Programme Grants for Applied Research (Grant Reference Number RP-PG-1209-10040)]. ENACT was funded by the NIHR [Health Services and Delivery Research programme (project reference 16/04/13). The implementation laboratory is funded by the NIHR Yorkshire and Humber Applied Research Collaborative. The views expressed are those of the author(s) and not necessarily those of the NIHR or the Department of Health and Social Care.

The evaluation of feedback on opioid prescribing was supported by the Academy of Medical Sciences, The Wellcome Trust, Medical Research Council, British Heart Foundation, Arthritis Research UK, the Royal College of Physicians and Diabetes UK (Grant number: SGL017/1033).

FUNDED BY NIHR | National Institute for Health Research

316 family practices within 10 Clinical Commissioning Groups
West Yorkshire population: 2.24 million people

Willis TA, Collinson M, Glidewell L, Farrin AJ, Holland M, Meads D, et al. An adaptable implementation package targeting evidence-based indicators in primary care: A pragmatic clusterrandomised evaluation. PLoS Med 2020: 17(2): e1003045.

We identified ‘high impact’ recommendations

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Diabetes control

Blood pressure control

Anticoagulation in atrial fibrillation

Risky prescribing

Rushforth et al. BMC Family Practice 2015; 16:156

We analysed adherence to ‘high impact’ indicators

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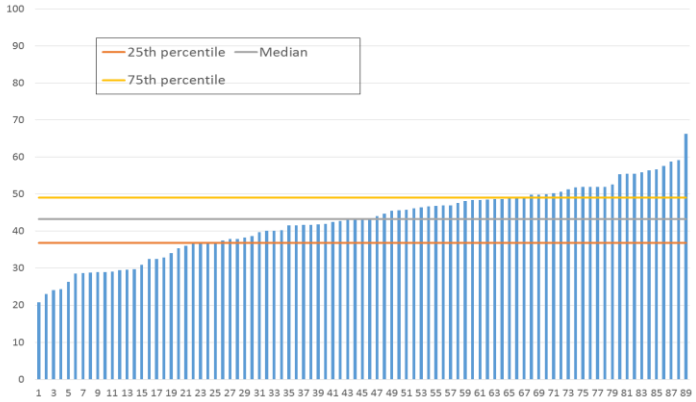
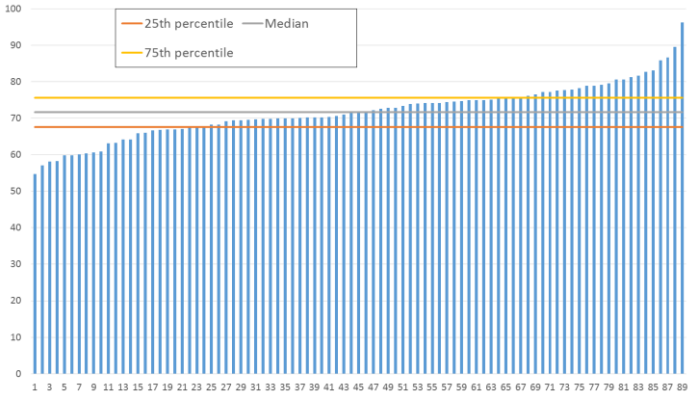
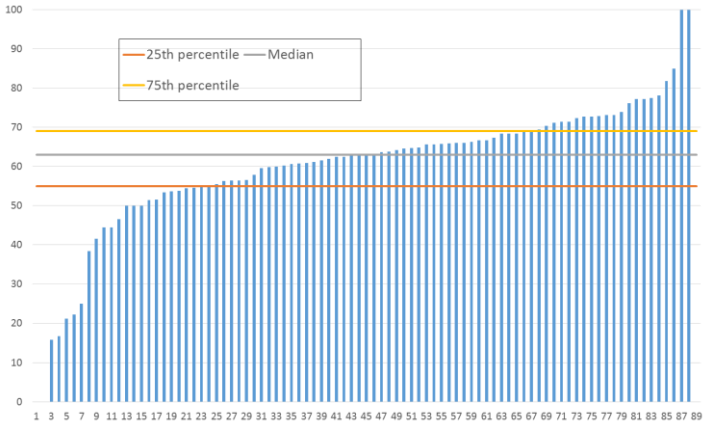


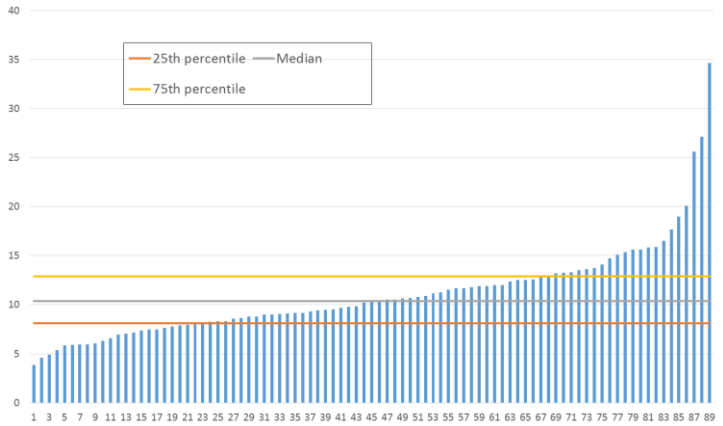
Diabetes control



Blood pressure control



Anticoagulation in atrial fibrillation



Risky prescribing

Willis et al. PLoS ONE 2017;12: e0177949

We developed an adaptable implementation package

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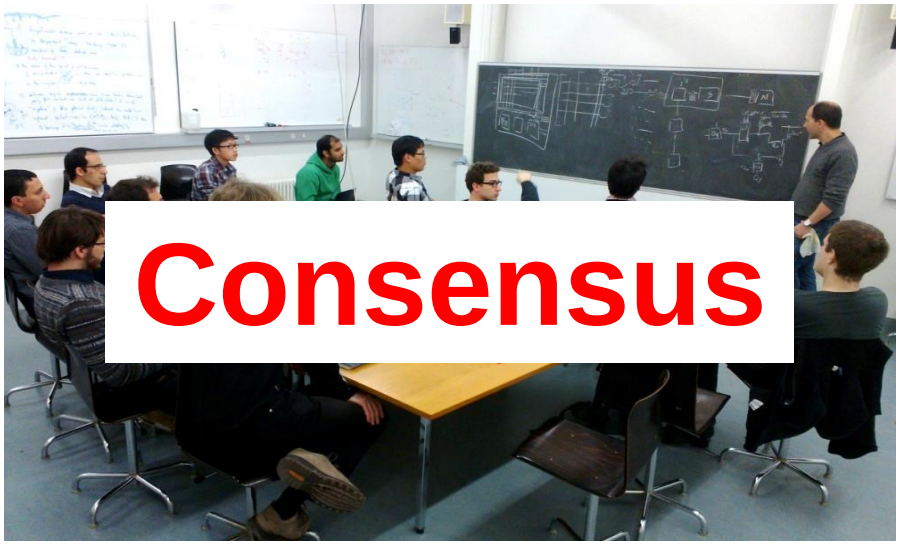
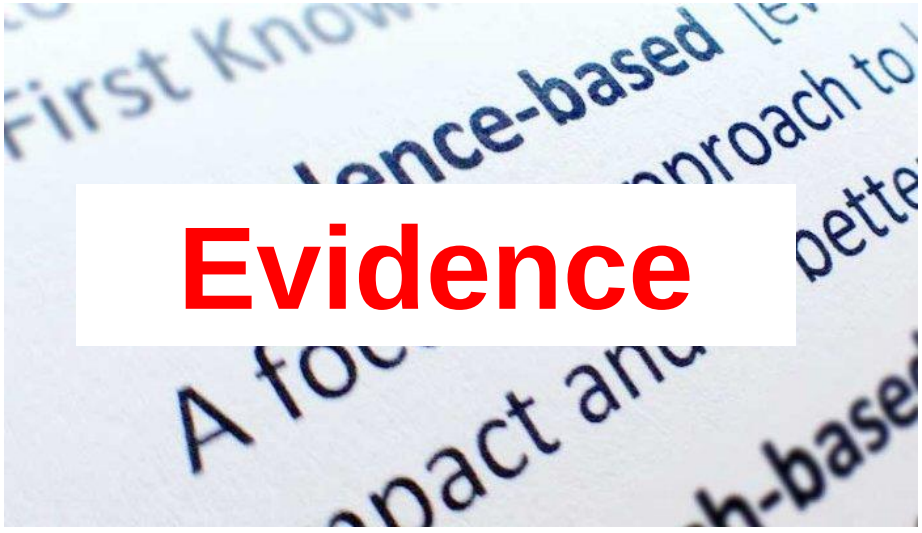
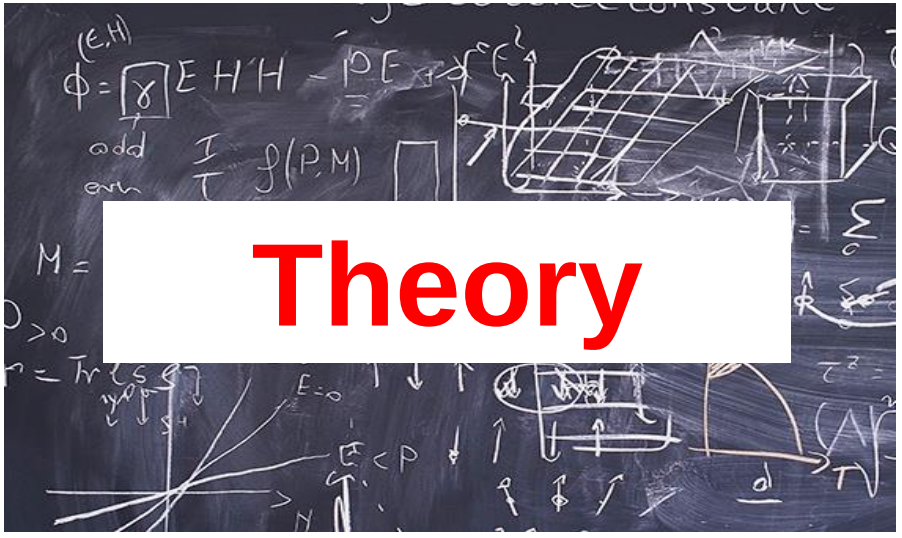






Lawton et al. Implementation Science 2016; 11:113

ASPIRE

4

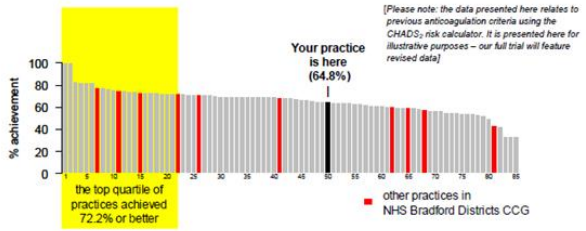
How well is your practice doing?

Parklands Medical Centre

Achievement in participating practices across West Yorkshire

The graph below demonstrates:

- Your practice (black bar) and % treated according to NICE guidance (64.8%)
- Achievement throughout West Yorkshire overall (range 0% – 100%)
- The top quartile of practices within West Yorkshire (shaded area – achieving 72.2% or above)
- Other practices within your CCG (red bars, n=4)



Your practice achievement on individual indicators

Indicators (for patients with atrial fibrillation)	Proportion of patients (%)	Number of patients	Number of patients to be reviewed	Proportion of patients to be reviewed (%)
AF register + $CHADS_2$ score of 1 receiving anticoagulation / anti-platelet	82.4	14/17	3	17.6
AF register + $CHADS_2$ score of 1 receiving anticoagulation / anti-platelet OR contraindication for anticoagulation / anti-platelet	100	17/17	0	0
AF register + $CHADS_2$ score of 2 or above receiving anticoagulation	64.8	59/91	32	35.2
AF register + $CHADS_2$ score of 2 or above receiving anticoagulation OR contraindication for anticoagulation	94.5	86/91	5	5.5

We have analysed anticoagulation treatment in 4,773 patients with AF from a random sample of 88 general practices across West Yorkshire. Anticoagulation treatment was less likely to be prescribed to females and patients aged 80 years and older. However, much variation cannot be explained away by patient factors and is likely to be related to differences in clinician behaviour.

We estimate that there were approximately 7,170 untreated, potentially eligible patients across practices in West Yorkshire. Treating these patients with anticoagulation could prevent around 180 strokes per year.

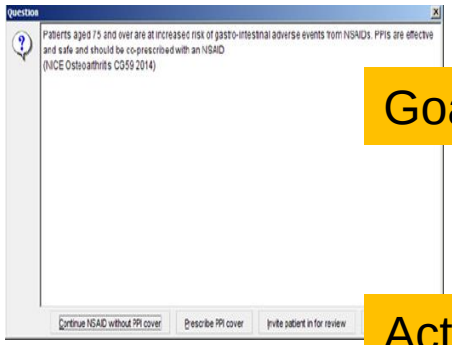
For every 40 at risk patients your practice treats with anticoagulation, you may be preventing one stroke per year. Could you prevent another?

© Copyright University of Leeds 2014

Persuasive messaging

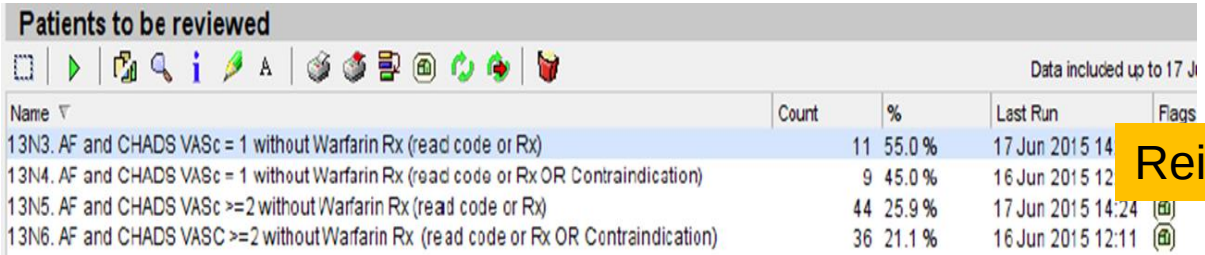
Peer comparison

Problem solving



Goal setting

Action planning



Reinforcement

Glidewell et al. Implementation Science 2018;13:32

We did a rigorous ‘real world’ trial

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Willis et al. Implementation Science 2016;11:25

Adapted implementation package	40 practices	40 practices
Diabetes control	Intervention	Control
Risky prescribing	Control	Intervention

Adapted implementation package	32 practices	32 practices
Blood pressure control	Intervention	Control
Anticoagulation in atrial fibrillation	Control	Intervention

ASPIRE
Action to Support Practices Implementing Research Evidence

What worked?

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Diabetes control

Blood pressure control

Anticoagulation in atrial fibrillation

Risky prescribing

Risky prescribing

Control 6.0% versus intervention 4.9%

Odds ratio 0.81 (97.5% CI 0.67 to 0.99)

Incremental cost-effectiveness ratio of £1,359 per quality-adjusted life year

Across 18300 patients

What we did next…

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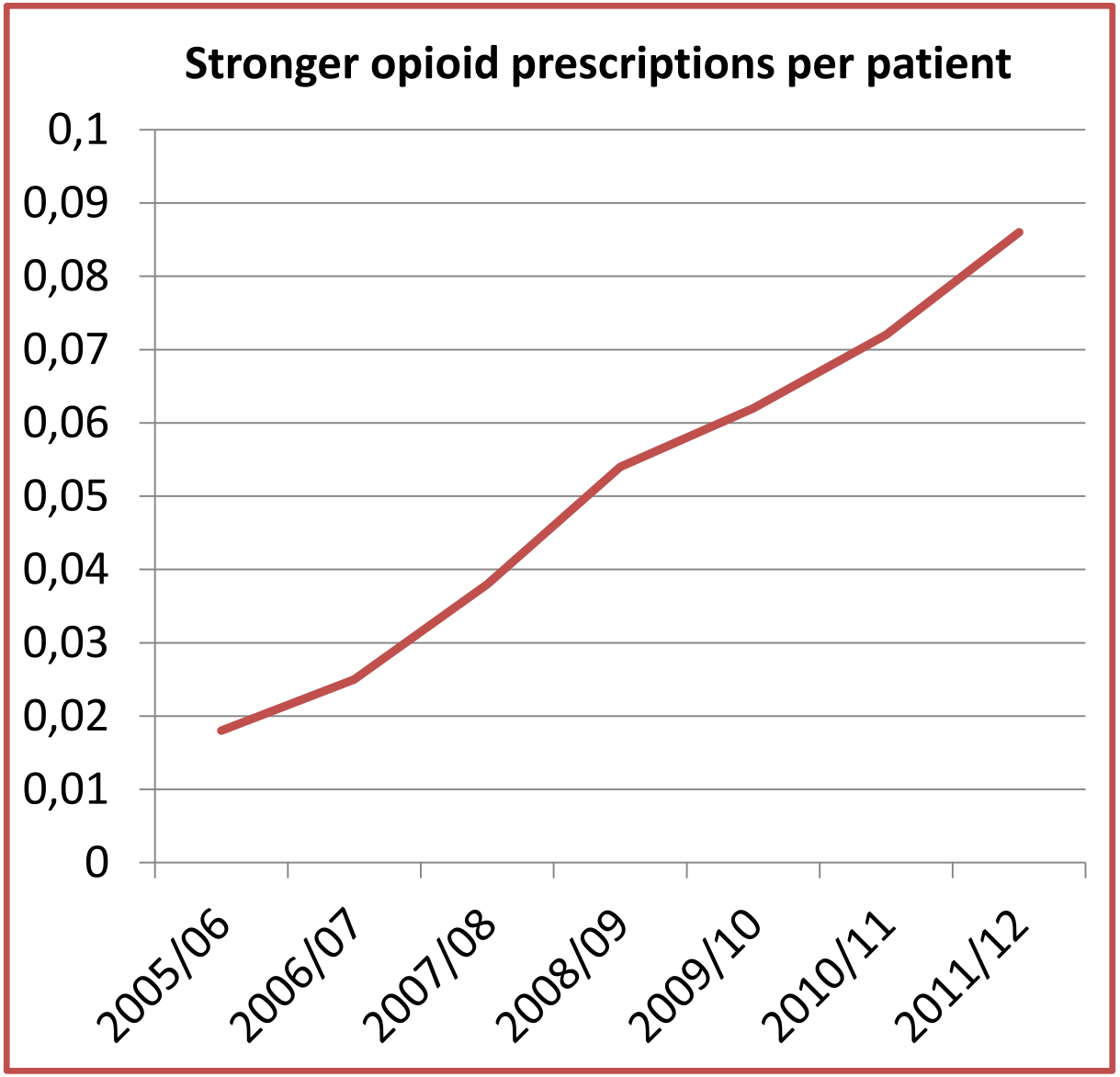


Foy et al. BMJ Open 2016;6:e010276.

Visual message and summary message closely linked

Provide multiple and frequent feedback

Comparators that reinforce desired behaviour

Easily interpretable feedback

Provide individual rather than general data

Provide in more than one way

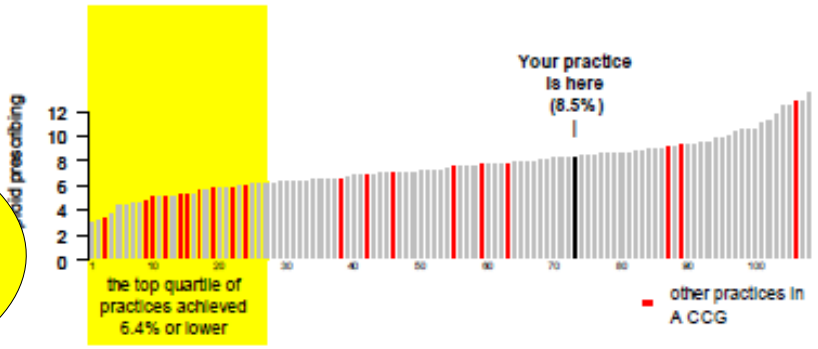
How is your practice doing?

1

Achievement in participating practices across West Yorkshire

The graph below demonstrates:

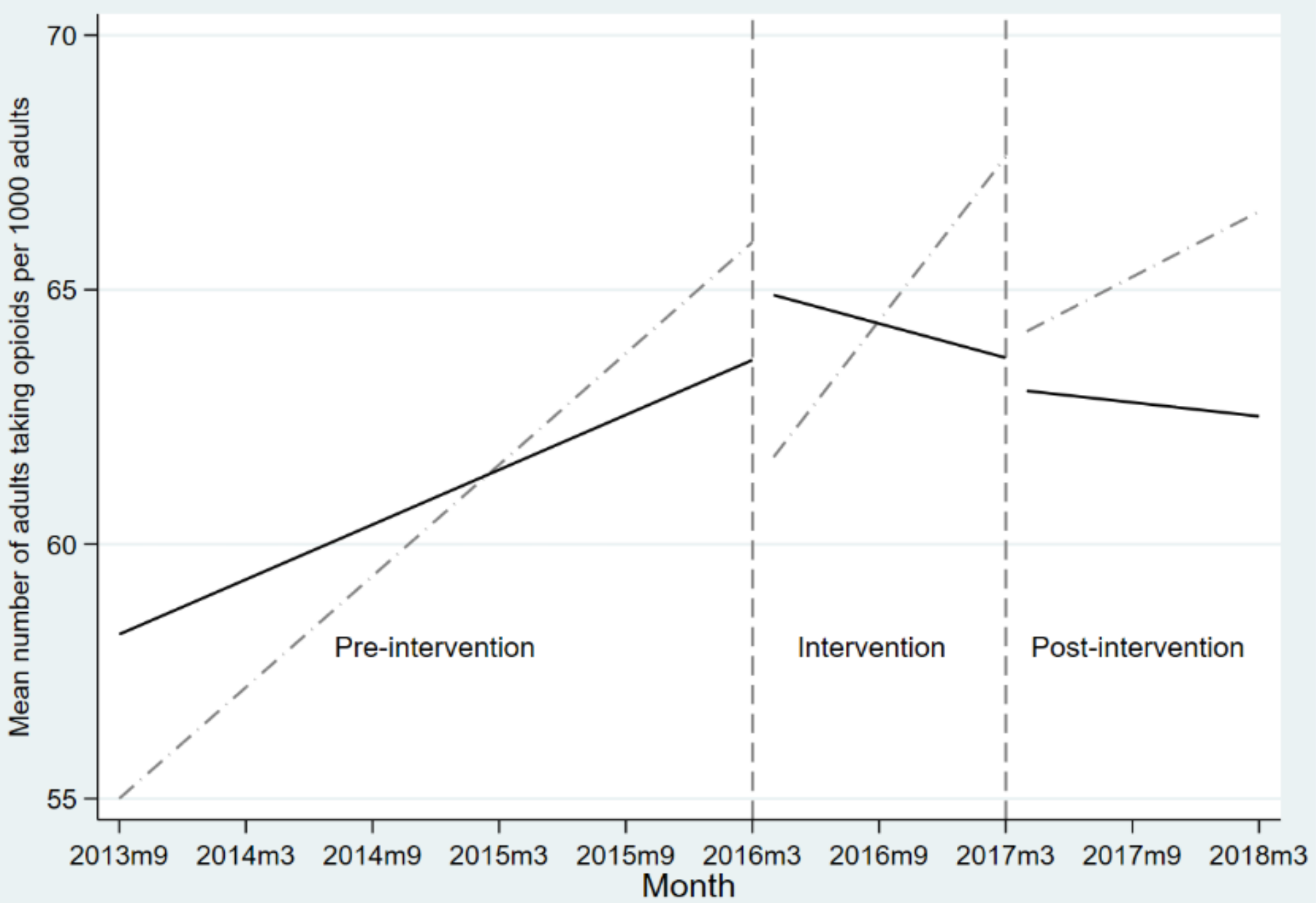
…ur practice (black bar) and percentage of the practice population prescribed opioids (354%) in the last 8 …eks; a lower value indicates better clinical practice. The audit data exclude patients with a cancer …gnosis, on the palliative care register or drug addiction diagnosis.



- Achievement throughout West Yorkshire overall (range 3.1 to 13.6%)
- The best achieving practices within West Yorkshire (yellow box – achieving 6.4% or below)
- Other practices within A CCG CCG (red bars)

Your practice achievement on individual indicators:

Risk Factor	Number of patients
Prescribed strong opioids	14
Men aged under 50 years and prescribed strong opioids	2
Patients aged over 75 years and prescribed strong or weak opioid	37
Women aged over 65 years and prescribed strong or weak opioid	53
Polypharmacy (on 10 or more repeat prescriptions) and prescribed strong or weak opioid	93
All mental health diagnoses and prescribed strong or weak opioid	69
Severe mental health diagnoses and prescribed strong or weak opioid	6
Taking antidepressant and a strong or weak opioid	53
Taking benzodiazepines and a strong or weak opioid	35



Alderson SL, Farragher TM, Willis TA, Carder P, Johnson S, Foy R. PLOS Med 2021

15,000	Over-75s	£0.9 million
Referrals	Analgesics	Acceptability

Wood et al. BJGP 2021. doi: 10.3399/BJGP.2020.1117

What happened next?

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rethink

Gabapentinoid painkiller prescribing

AntiMicrobial Prescribing

What now?

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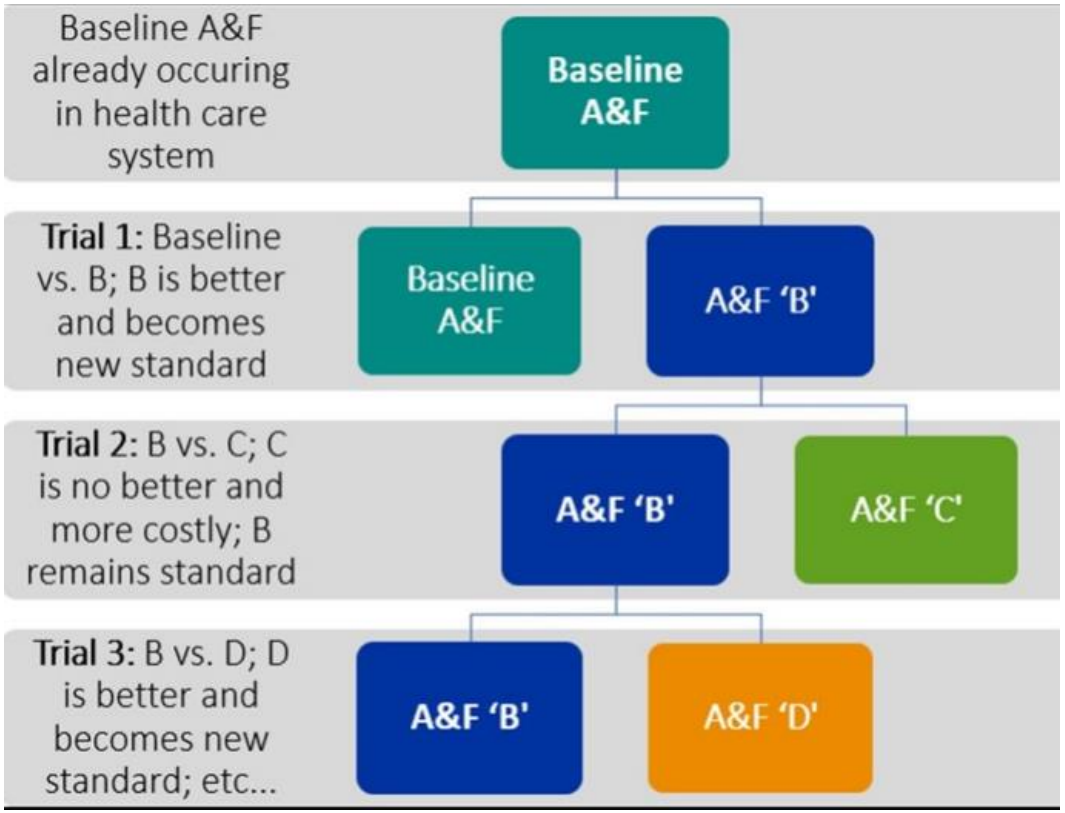

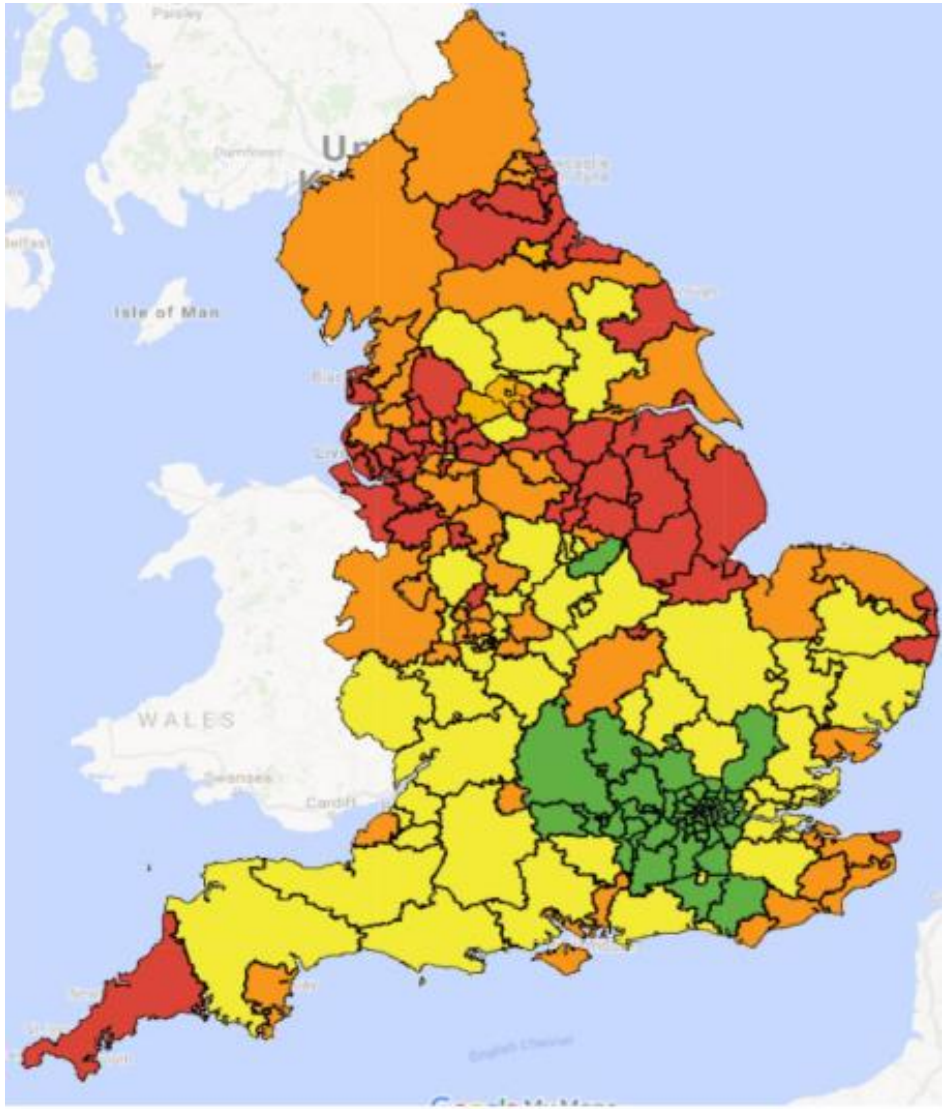
Isle of Man
WALES
Cardiff
Swansea

5%

10%

20%

40%

WHY USE TWO?
WHEN ONE WILL DO
Transfusing one unit of blood at a time reduces the risk of an adverse event – Transfuse one then reassess
BLOOD IS A GIFT
USE IT WISELY
To find out more go to http://staffnet/TransfusionMedicine/blood_is_a_gift.asp
NZBLOOD

5%

10%

20%

40%

WHY USE TWO?
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BLOOD IS A GIFT
USE IT WISELY
To find out more go to http://staffnet/TransfusionMedicine/blood_is_a_gift.asp
NZBLOOD

Audit and Feedback INterventions to Increase evidence-based Transfusion practIcE

Stanworth S, Francis JJ, Farrin A, Foy R, Gould N, Lorencatto F, Morris S, Hartley S, Walwyn R, Grant-Casey J, Glidewell L, Grimshaw J, Rowley M, Deary A, During C, McIntyre S, Swart N, Patel R, Smith J, Moreau L, Cicero R, Smith I, Morris T, Campbell H, Michie S, Murphy M

We examined feedback practice

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Standards agreed by audit group

Hospitals audit consecutive cases over 2-3 months

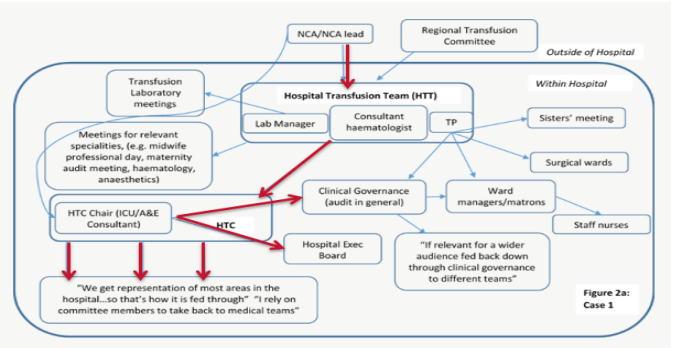
Feedback reports delivered ~ 1 year later

Table 3: Patient Blood Management algorithms: overall performance (see algorithms in Annex 1)

Algorithm	Standard MET	Standard NOT MET	EXCLUDED	INSUFFICIENT DATA	% standard MET*	YOUR SITE: % standard MET*
PBM1	1305	1531	1044	17	46%	%/
PBM2	28	214	3529	126	12%	% (/)
PBM3	3	129	3655	110	2%	% (/)
PBM4	71	182	3529	115	28%	% (/)
PBM5	340	201	3279	77	63%	% (/)
PBM6	661	134	3027	75	83%	% (/)
PBM7	133	675	3027	62	16%	% (/)
PBM8	669	2088	996	144	24%	% (/)
PBM9	920	1492	1358	127	38%	% (/)
PBM10	1714	312	1748	123	85%	% (/N
PBM11	175	1910	1748	64	8%	% (/)

** MET/(MET+NOT MET)*

	Recommendation	Action required by
1	Trust Boards and Clinical Commissioning Groups (CCGs) must work together to encourage change	Trust boards and CCGs



We therefore enhanced feedback in two ways

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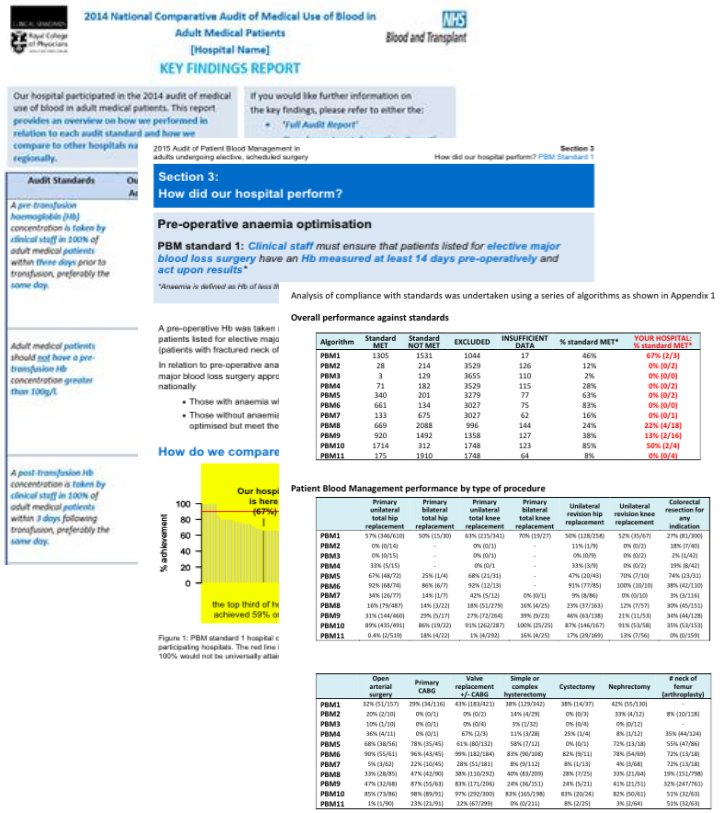

2014 National Comparative Audit of Medical Use of Blood in Adult Medical Patients
[Hospital Name]
Blood and Transplant
KEY FINDINGS REPORT

Our hospital participated in the 2014 audit of medical use of blood in adult medical patients. This report provides an overview on how we performed in relation to each audit standard and how we compare to other hospitals nationally.

If you would like further information on the key findings, please refer to either the:
- *'Full Audit Report'*

2015 Audit of Patient Blood Management in adults undergoing elective, scheduled surgery

Section 3
How did our hospital perform? PBM Standard 1

Section 3:
How did our hospital perform?

Pre-operative anaemia optimisation

PBM standard 1: *Clinical staff must ensure that patients listed for elective major blood loss surgery have an Hb measured at least 14 days pre-operatively and act upon results**

*Anaemia is defined as Hb of less th

Audit Standards

A pre-transfusion haemoglobin (Hb) concentration is taken by clinical staff in 100% of adult medical patients within three days prior to transfusion, preferably the same day.

Adult medical patients should not have a pre-transfusion Hb concentration greater than 100g/L

A post-transfusion Hb concentration is taken by clinical staff in 100% of adult medical patients within 3 days following transfusion, preferably the same day.

A pre-operative Hb was taken
patients listed for elective majo
(patients with fractured neck of

In relation to pre-operative ana
major blood loss surgery appro
nationally

- Those with anaemia wl
- Those without anaemi
optimised but meet the

How do we compare

Figure 1: PBM standard 1 hospital c
participating hospitals. The red line
100% would not be universally attai

Analysis of compliance with standards was undertaken using a series of algorithms as shown in Appendix 1

Overall performance against standards

Algorithm	Standard MET	Standard NOT MET	EXCLUDED	INSUFFICIENT DATA	% standard MET*	YOUR HOSPITAL: % standard MET*
PBM1	1305	1531	1044	17	46%	67% (2/3)
PBM2	28	214	3529	126	12%	0% (0/2)
PBM3	3	129	3655	110	2%	0% (0/0)
PBM4	71	182	3529	115	28%	0% (0/2)
PBM5	340	201	3279	77	63%	0% (0/2)
PBM6	661	134	3027	75	83%	0% (0/0)
PBM7	133	675	3027	62	16%	0% (0/1)
PBM8	669	2088	996	144	24%	22% (4/18)
PBM9	920	1492	1358	127	38%	13% (2/16)
PBM10	1714	312	1748	123	85%	50% (2/4)
PBM11	175	1910	1748	64	8%	0% (0/4)

Patient Blood Management performance by type of procedure

	Primary unilateral total hip replacement	Primary bilateral total hip replacement	Primary unilateral total knee replacement	Primary bilateral total knee replacement	Unilateral revision hip replacement	Unilateral revision knee replacement	Colorectal resection for any indication
PBM1	57% (346/610)	50% (15/30)	63% (215/341)	70% (19/27)	50% (128/258)	52% (35/67)	27% (81/300)
PBM2	0% (0/14)	-	0% (0/1)	-	11% (1/9)	0% (0/2)	18% (7/40)
PBM3	0% (0/15)	-	0% (0/1)	-	0% (0/9)	0% (0/2)	2% (1/42)
PBM4	33% (5/15)	-	0% (0/1	-	33% (3/9)	0% (0/2)	19% (8/42)
PBM5	67% (46/72)	25% (1/4)	68% (21/31)	-	47% (20/43)	70% (7/10)	74% (23/31)
PBM6	92% (60/74)	86% (6/7)	92% (12/13)	-	91% (77/85)	100% (10/10)	38% (42/110)
PBM7	34% (26/77)	14% (1/7)	42% (5/12)	0% (0/1)	9% (8/86)	0% (0/10)	3% (3/116)
PBM8	16% (79/487)	14% (3/22)	18% (51/279)	36% (4/25)	23% (37/163)	12% (7/57)	30% (45/151)
PBM9	31% (144/468)	29% (5/17)	27% (72/264)	39% (9/23)	46% (63/138)	21% (11/53)	34% (44/128)
PBM10	89% (435/491)	86% (19/22)	91% (262/287)	100% (25/25)	87% (146/167)	91% (53/58)	35% (53/153)
PBM11	0.4% (2/519)	18% (4/22)	1% (4/292)	16% (4/25)	17% (29/169)	13% (7/56)	0% (0/159)

	Open arterial surgery	Primary CABG	Valve replacement +/- CABG	Simple or complex hysterectomy	Cystectomy	Nephrectomy	# neck of femur (arthroplasty)
PBM1	32% (51/157)	29% (34/116)	43% (183/421)	38% (129/342)	38% (14/37)	42% (55/130)	-
PBM2	20% (2/10)	0% (0/1)	0% (0/2)	14% (4/29)	0% (0/3)	33% (4/12)	8% (10/118)
PBM3	10% (1/10)	0% (0/1)	0% (0/4)	3% (1/32)	0% (0/4)	0% (0/12)	-
PBM4	36% (4/11)	0% (0/1)	67% (2/3)	11% (3/28)	25% (1/4)	8% (1/12)	35% (44/124)
PBM5	68% (38/56)	78% (35/45)	61% (80/132)	58% (7/12)	0% (0/1)	72% (13/18)	55% (47/86)
PBM6	90% (55/61)	96% (43/45)	99% (182/184)	83% (90/108)	82% (9/11)	78% (54/69)	72% (13/18)
PBM7	5% (3/62)	22% (10/45)	28% (51/181)	8% (9/112)	8% (1/13)	4% (3/68)	72% (13/18)
PBM8	33% (28/85)	47% (42/90)	38% (110/292)	40% (83/209)	28% (7/25)	33% (21/64)	19% (151/798)
PBM9	47% (32/68)	87% (55/63)	83% (171/206)	24% (36/151)	24% (5/21)	41% (21/51)	32% (247/761)
PBM10	85% (73/86)	98% (89/91)	97% (292/300)	83% (165/198)	83% (20/24)	82% (50/61)	51% (32/63)
PBM11	1% (1/90)	23% (21/91)	22% (67/299)	0% (0/211)	8% (2/25)	3% (2/64)	51% (32/63)

Content

Support

We evaluated two ways of enhancing feedback (twice)

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UK Hospitals

↓

Baseline audit data:
Appropriateness of transfusions

↓

Randomisation

↓

Standard Content + Standard Support	Enhanced Content + Standard Support	Standard Content + Enhanced Support	Enhanced Content + Enhanced Support

↓

Follow up audit data (12months):
Appropriateness transfusions = outcome data

Trial 1: Surgery

155 clusters
2714 & 2222
patient records
Interventions **Oct 2015**

Trial 2: Haematology

167 clusters
~4000 & ~4000
patient records
Interventions **Aug 2016**

Field Marshall Helmuth Karl Bernhard Graf von Moltke

What happened

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Engagement with interventions and the audit itself

Credibility of audit standards

Delivered two major, complex trials within a national clinical audit programme

Aligning trial and audit processes

Collaborative relationship

ENACT

Enhancing NAtional Clinical audiT and feedback

Embedded trials within national clinical audit programmes: a qualitative interview study of enablers and barriers

Alderson S, Willis T, Wood S, Lorencatto F, Francis J, Ivers N, Foy R

What we did

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31 interviews with feedback researchers, audit staff and healthcare professionals

Explored barriers to and enablers of embedding audit and feedback trials within clinical audit programmes

Guided by behaviour change theory

Synthesized findings into 10 top tips for successful collaboration

Top tips – Capacity for Research

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1. Consider what extra resources the audit programmes will need

2. Agree timelines with both research and audit team

Top tips – Logistics

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3. Review and agree processes for data extraction, sharing, checking and cleaning

Top tips – Leadership

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4. Identify an enthusiastic leader

5. Promote an understanding of equipoise to ensure that negative trial results are not misrepresented as research failures or lack of audit impact

Top tips – Build Relationships

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6. Ensure and agree priorities for research and clinical audit programme

7. Start with small changes to avoid alienating end-users

Top tips – Build Relationships

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8. Choose audit standards that are underpinned by a strong evidence & have scope for improvement

9. Balance research ambitions with pragmatic actions

Top tips – Build Relationships

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10. Recognise small improvements may have significant population health benefits – message needs to be heard by funders, commissioners and health care systems

Conclusion

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Continuous small improvements can translate into large population effects

Routinely collected data allow sustainability

… as does aligning service and research needs within longstanding partnerships