The Queen Elizabeth Hospital King's Lynn NHS Foundation Trust

Post-operative and Discharge Pathways for PBM

Claire L J Atterbury
CNS Transfusion and Haematology

The Queen Elizabeth Hospital King's Lynn NHS Foundation Trust

Plan for the worst and hope for the best

claire.atterbury@qehkl.nhs.uk

Where were we? What year?

'The mass of literature on the subject of Blood Transfusions accumulated during the past 25 years is so great, and most of it so readily available, that one shows lack of temerity at least to attempt a discussion of this subject before this audience. The transfusion of blood may be a life-saving procedure under certain circumstances. It may be a necessary supportive measure under others, but it is too often undertaken when the doctor can think of nothing else to do after all other therapy has failed. My objective today is to discuss briefly the common surgical and medical conditions for which transfusion of blood is indicated in which we can obtain good physiological results and to point out those conditions in which it is little more than a gesture done as it were to satisfy the urge to do something.'

NEJM

The New England
Journal of Medicine

VOLUME 215 SEPTEMBER 3, 1936 NUMBER 10

The Massachusetts Medical Society

SECTION OF MEDICINE

Lower Section Room, Municipal Auditorium, Springfield, Tuesday, June 9, 1936, 2 p. m.

PRESIDING:
Dr. William D. Smith, Boston, Chairman.
Dr. Laurence B. Ellis, Boston, Secretary.

CHAIRMAN SMITH: Will the meeting please come to order.

The first duty of the Section is the selection of the Chairman and the Secretary for the coming year, and, in accordance with the usual custom, the Chair will appoint as the Nominating Committee to suggest names Dr. Dwight O'Hara, Chairman, Dr. George R. Minot and Dr. Chester M. Jones. They will report later and abide the pleasure of the Section.

I do not see Dr. Hamilton here. Apparently she is delayed, so we will pass on to the second paper. To those of us who have had our moments of indecision whether to transfuse or not to transfuse in some of our medical problems, Dr. Bock's paper should be of interest. His subject is "The Use and Abuse of Blood Transfusions."

THE USE AND ABUSE OF BLOOD TRANSFUSIONS*

BY ARLIE V. BOCK, M.D.†

THE mass of literature on the subject of blood transfusions accumulated during the past twenty-five years is so great and most of it so readily available that one shows lack of temerity at least to attempt a discussion of the subject before this audience. The transfusion of blood may be a life-saving procedure under certain circumstances, it may be a necessary supportive measure under others, but it is too often undertaken when the doctor can think of nothing else to do after all other therapy has failed. My objective today is to discuss briefly the common surgical and medical conditions for which transfusion of blood is indicated, in which we can expect good physiological results, and to point out those conditions in which it is little more than a gesture, done, as it were, to satisfy the urge to do something.

SURGICAL INDICATIONS

1. *Shock.* Many theories of the cause of primary and secondary shock have been offered by able investigators, most of them recently reviewed briefly by Blalock.[1] Because of the complexity of the events no theory yet proposed can be considered the final answer as to the etiology of shock. We know that if treatment of the condition is to be successful it must accomplish two things, restoration of diminished blood volume and elevation of low blood pressure. Blood volume may be reduced by gross hemorrhage or it may be reduced by blood lost in the periphery of the body, as suggested by Freeman,[2] or by extravasation of serum through damaged capillaries. If hemorrhage has occurred, transfusion of blood, together with such supportive measures as heat, is the immediate indication. No other therapy is so successful. In shock without much or any hemorrhage, 6 per cent gum acacia in normal saline may be just as effective as blood, and has the advantage of greater availability. Repeated transfusions of blood or infusions of acacia may be necessary but, are usually not, if no delay has occurred in the first instance. Acacia may be used as a supportive measure until transfusion can be arranged. Prolongation of the shock state results in tissue asphyxia, capillary damage, petechial hemorrhages, and rapid change in general to an irreversible state.

One of the common accompaniments of shock is dehydration, a state associated with loss of water, base, chloride and increase of nonprotein nitrogen. When such a state exists, transfusion alone is not adequate therapy but normal salt solution, often in large quantities, should be administered intravenously, or it may be given in eight-ounce quantities by rectum every half hour. When facilities permit, serum chloride

*Read at the Annual Meeting of the Massachusetts Medical Society, Section of Medicine, Springfield, June 9, 1936.

†Bock, Arlie V.—Physician, Massachusetts General Hospital. For record and address of author see "This Week's Issue," page 469.

September 3rd 1936

With thanks to Aryer Shander

And where are we?

'The anaemia as I mentioned in a previous letter is chronic anaemia which can not be corrected without blood transfusion, and I leave it to you to organise that pre-operatively. I think once you have done that you will be safe to go ahead with surgery'.

GP to Ortho Consultant January *2013*

What is optimisation?

- Getting the best from patients for patients
- The whole package
  - Bloods – correct what you can
  - Stop drugs or make provision for not being able to stop
  - Work as a team with other specialities and/or GP as needed
  - Agree who will do what when and, importantly, why
- Communicate with the patients and explain
- Write a clear plan in the notes covering pre, intra and post op
- Communicate the plan with everyone – please.
- When should optimisation occur and who is responsible?

Enhanced Recovery After Surgery

NHS

Enhanced Recovery Partnership Programme

Delivering enhanced recovery

Helping patients to get better sooner after surgery

First published 31 March 2010

Published to DH website, in electronic PDF format only

www.dh.gov.uk/publications

Optimising patients with anaemia prior to surgery

What should be done and why?		Where and when is best?
General health check including full blood count • If anaemic (haemoglobin in females below 12g/dL and males below 13g/dL) look for a cause. • If iron deficient, treat with oral iron and look for cause.	BEST PRACTICE	**GP surgery** • Optimise prior to referral. • Early detection of anaemia. • Time to treat iron deficiency or refer other anaemias.
Benefits of detecting anaemia prior to surgery • Earlier detection, more opportunity to treat anaemia and raise haemoglobin. • Higher haemoglobin at surgery, lack of symptoms of anaemia. Less likely to need blood transfusion. Own red cells physiologically better than transfused red cells.	EARLY + RESOURCES	**Pre-op clinic** • Optimise prior to surgery. • Treat iron deficiency. • Identify those who might need transfusion; counsel. • Specialist referral for cause of anaemia.
Cost of detecting anaemia prior to surgery • Detection of anaemia may lead to delay or cancellation of surgery to investigate and manage anaemia. • Investigation of anaemia may be costly and require specialist input. • Treatment of iron deficiency takes time (iv iron quicker than oral). • Detecting another illness causing anaemia may change priorities but patient remains symptomatic from joint disease.	TOO LATE	**Admission for surgery** • Anaemic patients likely to be transfused or cancelled. • Can still target blood.

Enhanced Recovery After Surgery

NHS

Enhanced Recovery Partnership Programme

Delivering enhanced recovery

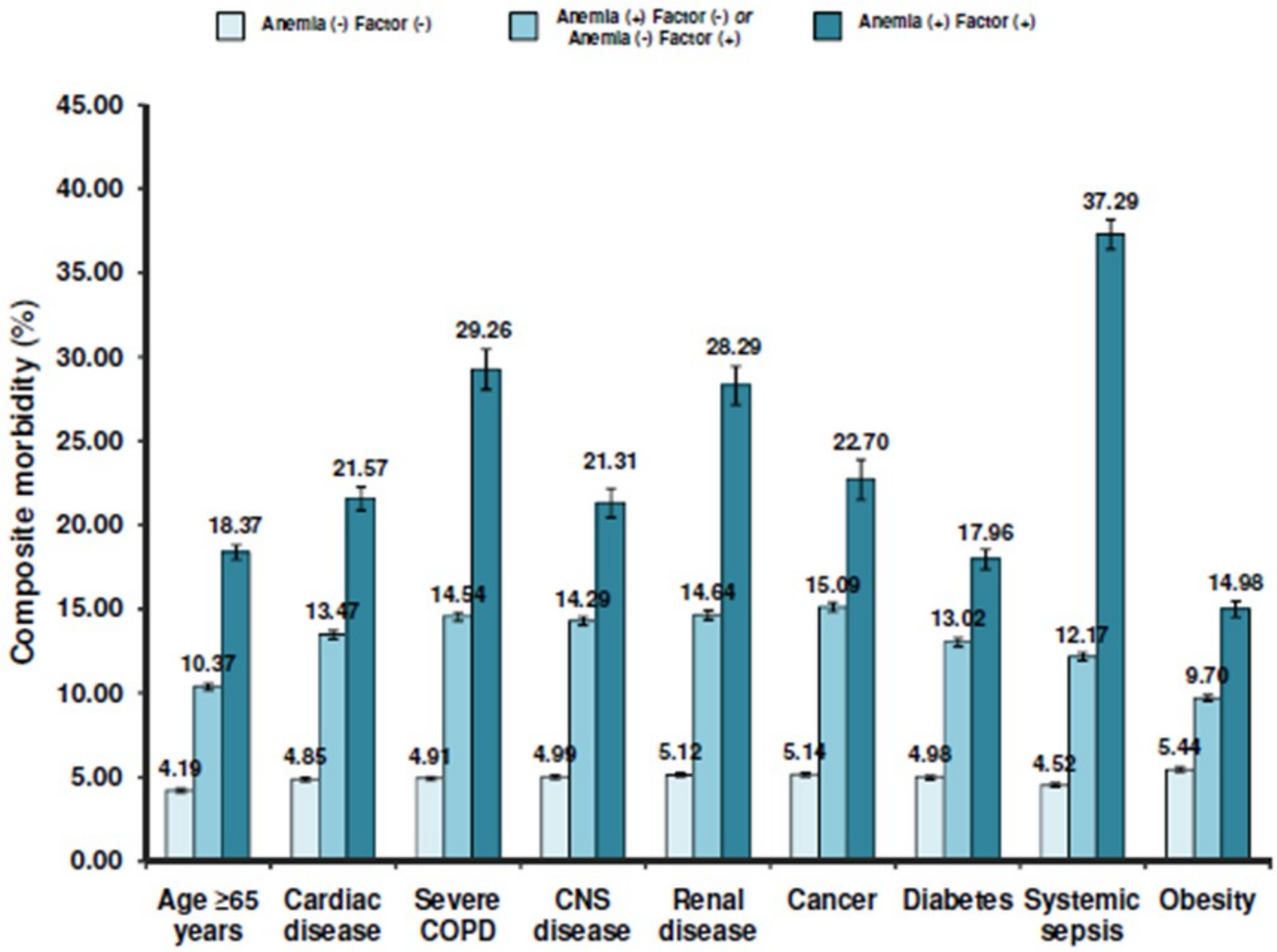
Helping patients to get better sooner after surgery

Impact of potential improvements in length of stay assessed using 2008-09 HES data

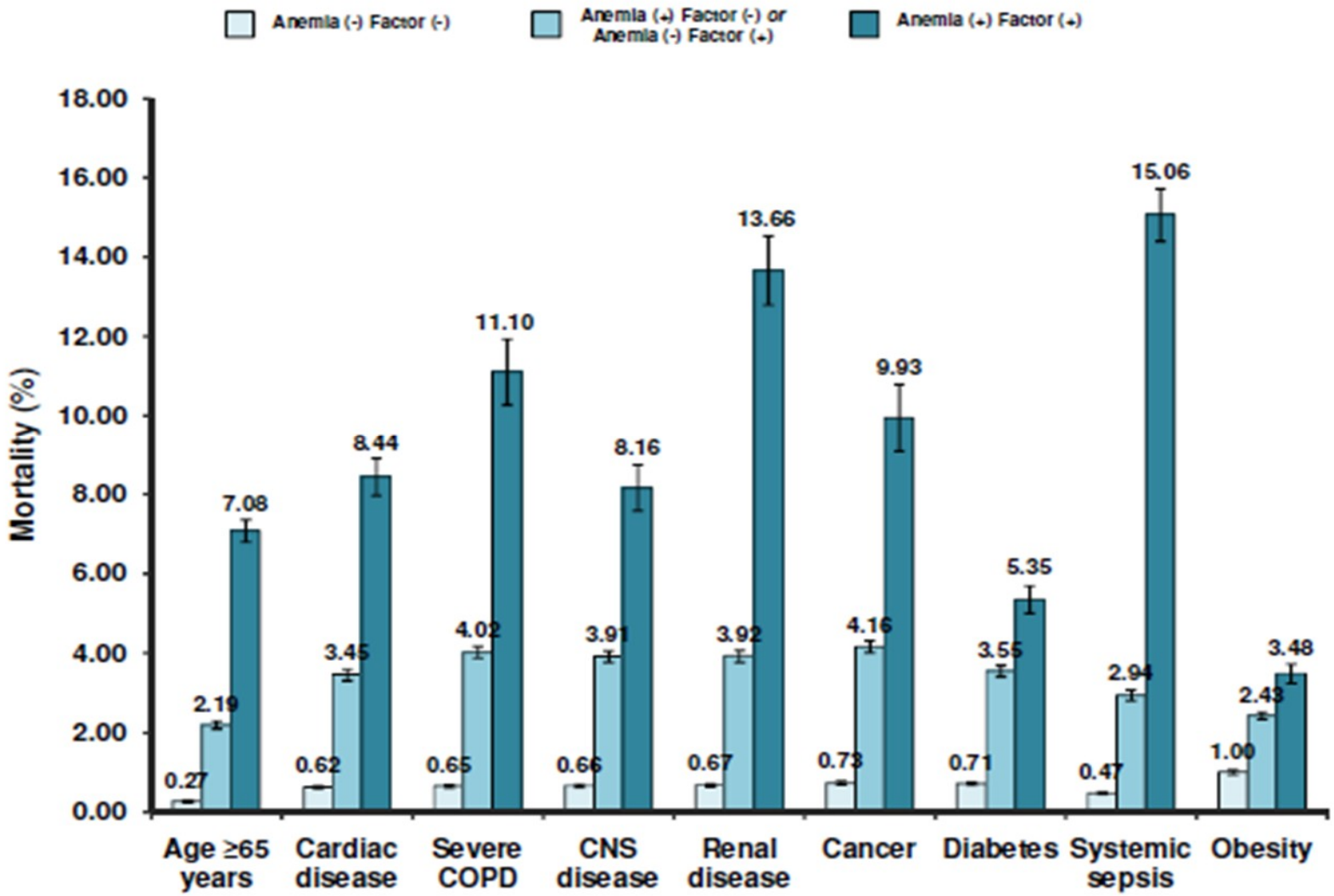
Procedure group	Current mean LOS	Current median LOS	No. major providers	Total no. patients	Potential mean LOS (1)	Potential mean LOS (2)	Potential median LOS (3)	Potential bed days saved (4)
Colectomy	10.2	8	152	10,300	7.9	8.4	6	17,900
Excision of rectum	12.4	9	148	9,500	9.1	10.0	7	23,600
Primary hip replacement	6.3	5	157	55,100	5.1	5.6	4	58,900
Primary knee replacement	6.1	5	156	64,500	5.0	5.5	4	63,200
Bladder resection	16.5	14	56	1,200	12.5	13.7	11	4,000
Prostatectomy	4.7	4	71	3,000	3.1	3.6	2	3,800
Hysterectomy	4.3	4	153	36,500	3.1	3.5	3	34,800
								206,200

First published 31 March 2010
Published to DH website, in electronic PDF format only
www.dh.gov.uk/publications

Morbidity


Anemia (-) Factor (-)
Anemia (+) Factor (-) or Anemia (-) Factor (+)
Anemia (+) Factor (+)
Composite morbidity (%)
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
4.19
10.37
18.37
4.85
13.47
21.57
4.91
14.54
29.26
4.99
14.29
21.31
5.12
14.64
28.29
5.14
15.09
22.70
4.98
13.02
17.96
4.52
12.17
37.29
5.44
9.70
14.98
Age ≥65 years
Cardiac disease
Severe COPD
CNS disease
Renal disease
Cancer
Diabetes
Systemic sepsis
Obesity

Mortality

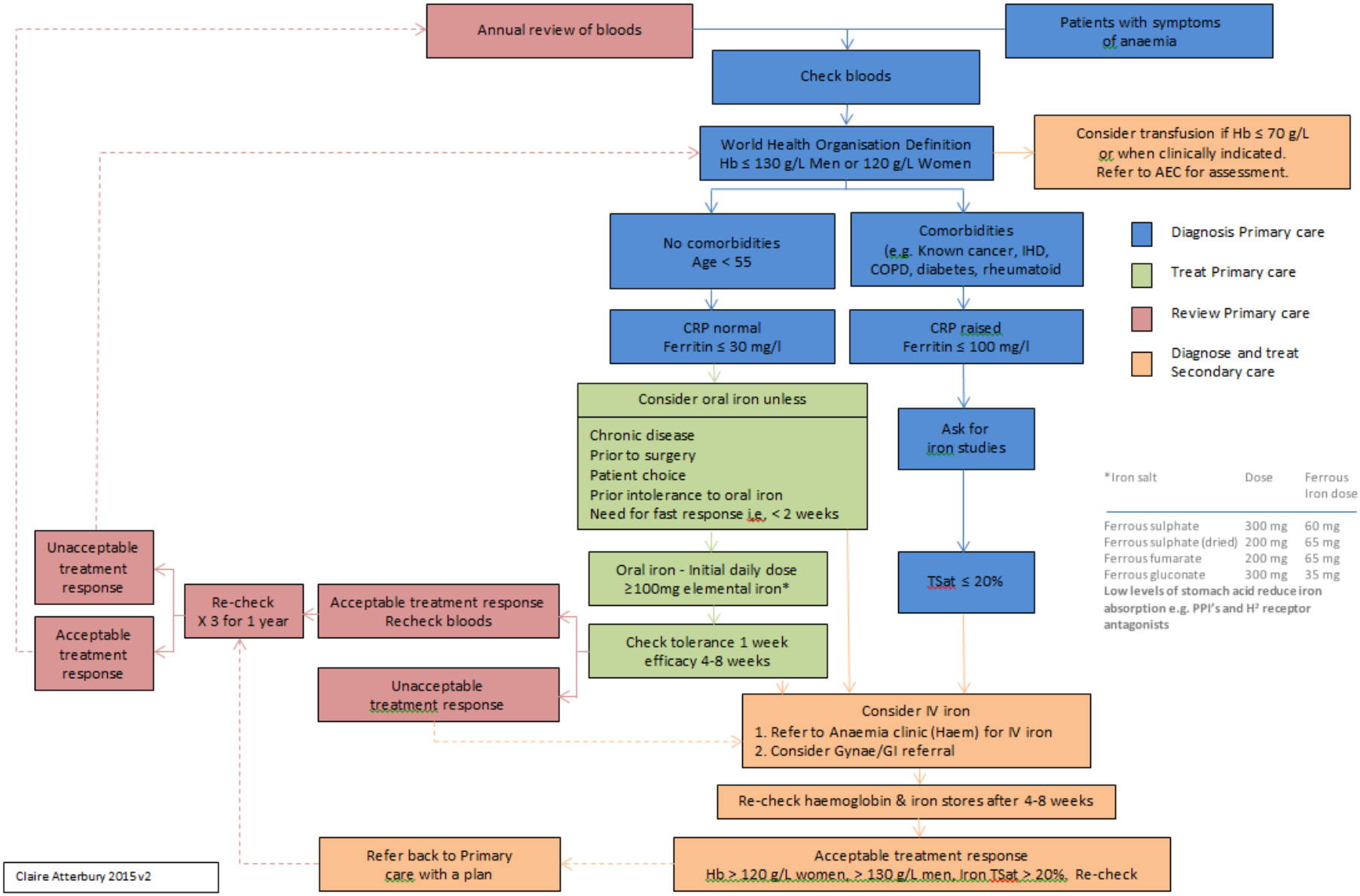

Anemia (-) Factor (-)
Anemia (+) Factor (-) or Anemia (-) Factor (+)
Anemia (+) Factor (+)
Mortality (%)
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
0.27
2.19
7.08
0.62
3.45
8.44
0.65
4.02
11.10
0.66
3.91
8.16
0.67
3.92
13.66
0.73
4.16
9.93
0.71
3.55
5.35
0.47
2.94
15.06
1.00
2.43
3.48
Age ≥65 years
Cardiac disease
Severe COPD
CNS disease
Renal disease
Cancer
Diabetes
Systemic sepsis
Obesity

Optimising Surgical Patients with Anaemia?

- Have a robust system for monitoring anaemia pre, peri and post operatively
- Make sure if you need GPs to assist post discharge you communicate a clear plan and include a goal and criteria for referral in if it is not manageable in the community
- Anyone with an Hb below the WHO criteria is anaemic – get advice (Renal, Haematology, Oncology etc etc)
- Audit re-admission rates in specialities

The Queen Elizabeth Hospital NHS
King's Lynn
NHS Foundation Trust

Algorithm for the Initial Management of Iron Deficiency in GP Surgeries



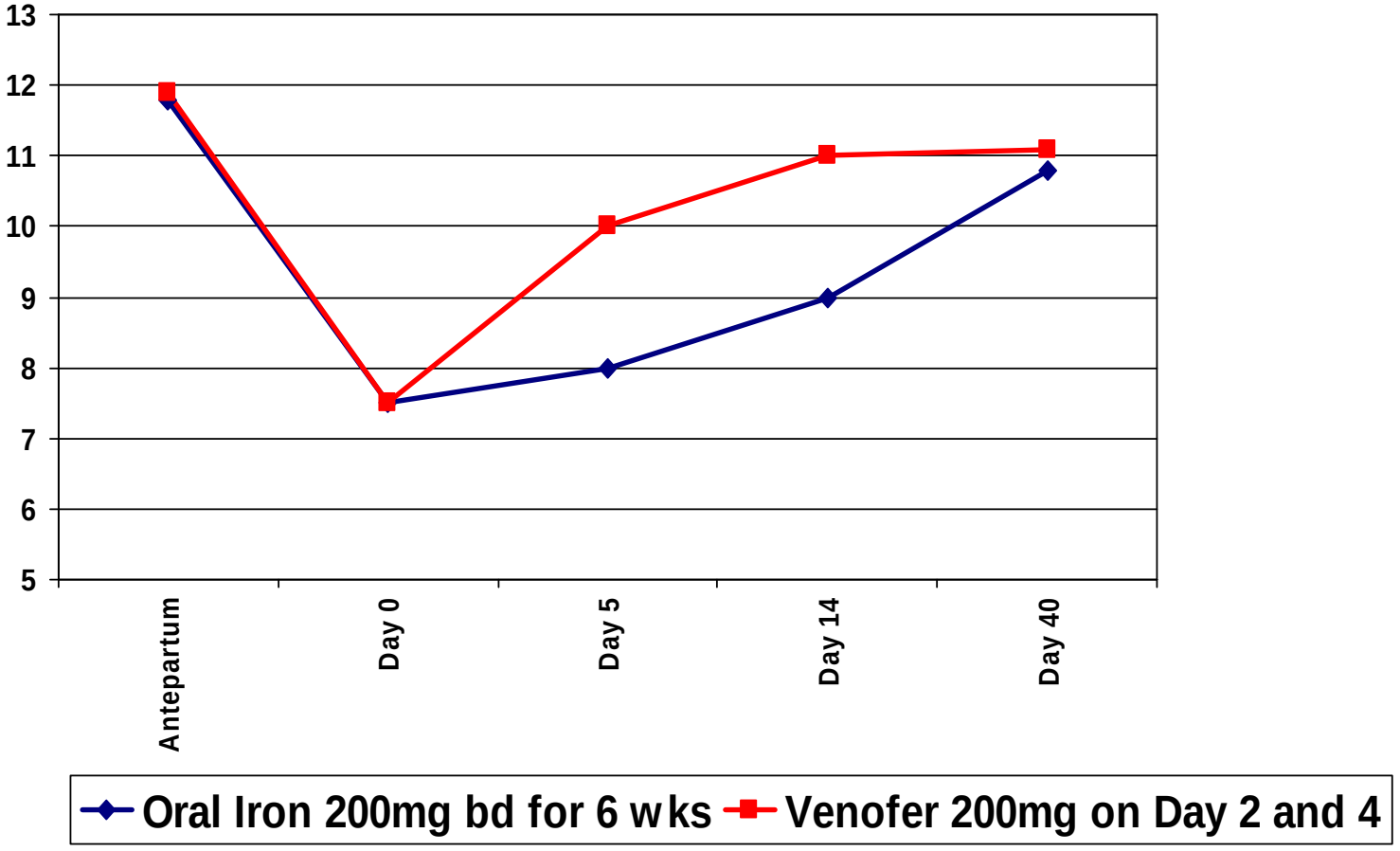
*Iron salt	Dose	Ferrous Iron dose
Ferrous sulphate	300 mg	60 mg
Ferrous sulphate (dried)	200 mg	65 mg
Ferrous fumarate	200 mg	65 mg
Ferrous gluconate	300 mg	35 mg

Low levels of stomach acid reduce iron absorption e.g. PPI's and H^2 receptor antagonists

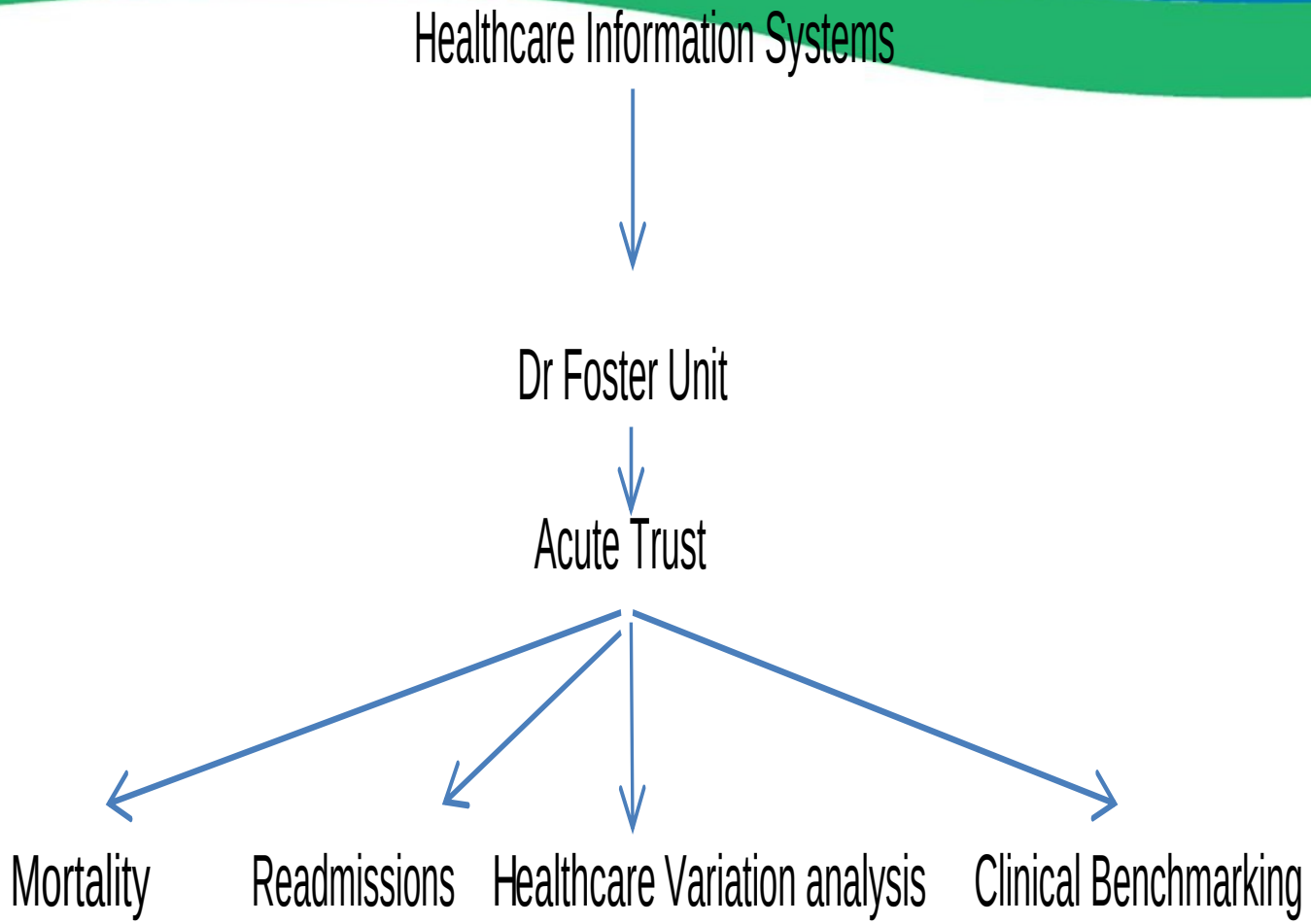
Claire Atterbury 2015 v2

Oral Iron vs Venofer in the Postpartum

(Dr Nav Bhandal, John Radcliffe, Oxford, personal communication but in BJOG April 2007)



What about Medicine?


Healthcare Information Systems
Dr Foster Unit
Acute Trust
Mortality
Readmissions
Healthcare Variation analysis
Clinical Benchmarking

2014

- The Trust was informed by the Imperial College based Dr Foster unit in January 2014 ***that the mortality rate for patients with a primary diagnosis code of "deficiency and other anaemias" had reached alert level*** (15 patients)
- There are a number of reasons for this.
  - The Trust does not manage these patients optimally leading to a higher risk of death
  - Primary Care does not manage these patients optimally, leading to a higher risk of death after admission to hospital
  - This primary diagnosis during the first episode of care did not accurately represent the patients main problem

The Queen Elizabeth Hospital NHS
King's Lynn
NHS Foundation Trust

Data analysis

	age	date adm	date death	adm diagnosis	cause death	Date DNA-CPR	Ward (s)	Brief clinical summary	Comments	Standard of documentation (major omissions)	ncepod class
1	81	5.9.12	5.9.12	Microcytic anaemia (documented originally in June 2012) No mention of significant jaundice	Unclear	5.9.12	A&E MAU	Admitted in June 2012 with iron deficiency anaemia. Investigated Gastritis on endoscopy and colonoscopy NAD June. CT scan no evidence of malignancy. No repeat blood samples until 3.9.12 when re-presented with Jaundice and anaemia. Admitted to A&E 12.32 Clerked 15.32 (wife contacted 16.40 to inform patient very unwell) Admitted to MAU 17.20 patient became unresponsive as transferred RIP 19.12 On review acute admission looks like haemolysis.	VTE risk assessment not completed. 1 dose of iV ferrinject given 14.6.13. Previous history of erosive gastritis. Discharged home with plan for GP to follow up – documented on discharge summary but not clearly. Follow up box not completed. KOB clinic follow up documented for two weeks post discharge – no evidence that this happened	VTE risk assessment not properly completed. Immediate management plan: IV fluids written and gelofusine given but no |V fluids prescribed after this 4 unit cross match but no blood prescribed or requested	5 GP follow up not apparent no repeat FBC. OPA follow up not arranged Acute admission poorly managed

NCEPoD classification

Grade 1
Good practice: A standard that you would accept from yourself, your trainees and your institution.
Grade 2
Room for improvement: Aspects of clinical care that could have been better.
Grade 3
Room for improvement: Aspects of organisational care that could have been better.
Grade 4
Room for improvement: Aspects of both clinical and organisational care that could have been better.
Grade 5
Less than satisfactory: Several aspects of clinical and/or organisational care that were well below that you would accept from yourself, your trainees and your institution

The Queen Elizabeth Hospital NHS
King's Lynn
NHS Foundation Trust

Summary of Results 2014

1) 3/15 patients had a known diagnosis leading to the anaemia that should have been documented in the first episode of care (prostate cancer, lung cancer and lymphoma)
2) 7/15 patients had anaemia documented at least 1 month (range 1-9 months) prior to the urgent hospital admission. 5 of these are iron deficiency anaemias.
    - 5/7 had anaemia documented and there appears to be no further investigation or treatment prior to the acute admission.
    - 1/7 had been discharged from an acute admission with follow up not arranged.
    - 1/7 refused investigation but does not appear to have been offered treatment for iron deficiency
3) 7/15 patients who presented as an acute admission had a malignancy diagnosed as the outcome of the admission
    - 2 acute myeloid leukaemia
    - 3 colon cancer
    - 1 lung cancer
    - 1 cancer unknown primary
4) 4/15 patients did not benefit or require acute hospital admission but may have benefited from discussion with hospital consultant team to support community care decisions
    - 4 frailty/multiple co-morbidities/dementia
    - 3 admitted from community care

Themes 2014

The Queen Elizabeth Hospital King's Lynn NHS Foundation Trust

1)Current malignancy is not being recognised/documented as a cause of anaemia in the first episode of care.

2)46% of patients had anaemia documented at least one month prior to admission. All of these appear to be iron deficiency. It is likely more active management of this would have prevented these acute admissions.

3)46% of patients admitted were diagnosed with a new malignancy as a result of the hospital admission.

4)25% of patients did not required acute hospital admission and could have been managed in the community with acute hospital support

The Queen Elizabeth Hospital NHS
King's Lynn
NHS Foundation Trust

2015

- The Trust was informed by the Imperial College based Dr Foster unit in January 2014 ***that the mortality rate for patients with a primary diagnosis code of "deficiency and other anaemias" had reached alert level*** (12 patients)
- There are a number of reasons for this.
  - The Trust does not manage these patients optimally leading to a higher risk of death
  - Primary Care does not manage these patients optimally, leading to a higher risk of death after admission to hospital
  - This primary diagnosis during the first episode of care did not accurately represent the patients main problem

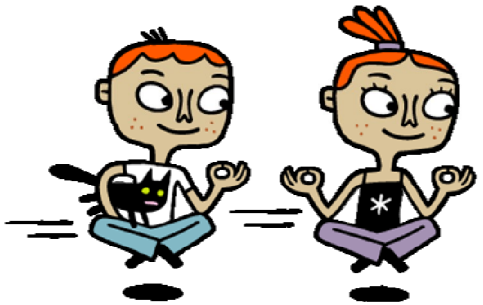
Themes

1)Current malignancy is not being recognised/documented as a cause of anaemia in the first episode of care.

2)50% of patients had anaemia documented prior to admission. CKD being the likely cause from superficial investigation

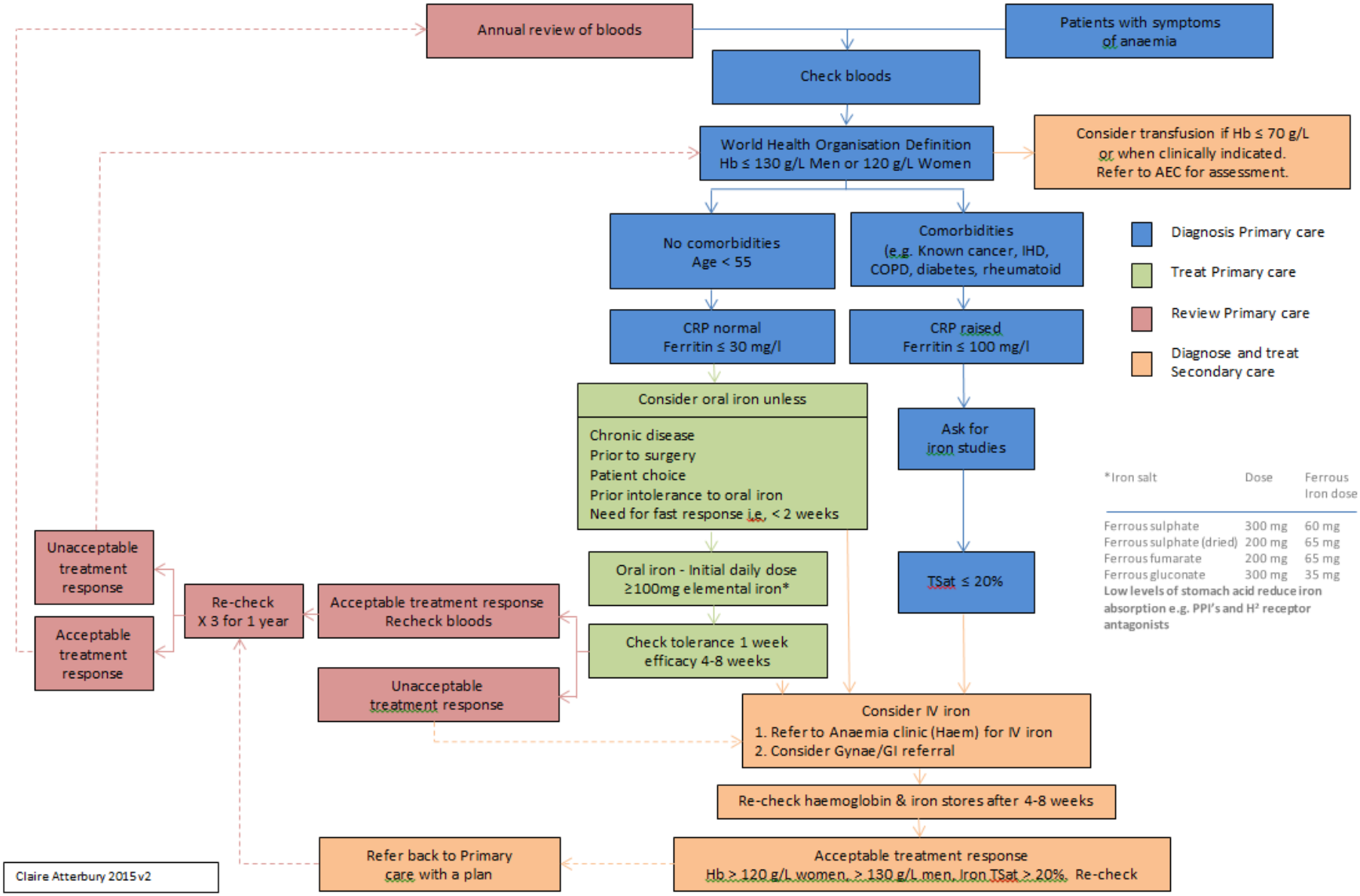
3)45% of patients admitted had an end stage malignancy documented

4)30% of patients did not required acute hospital admission and could have been managed in the community with acute hospital support



The Queen Elizabeth Hospital NHS
King's Lynn
NHS Foundation Trust

Algorithm for the Initial Management of Iron Deficiency in GP Surgeries



*Iron salt	Dose	Ferrous Iron dose
Ferrous sulphate	300 mg	60 mg
Ferrous sulphate (dried)	200 mg	65 mg
Ferrous fumarate	200 mg	65 mg
Ferrous gluconate	300 mg	35 mg

Low levels of stomach acid reduce iron absorption e.g. PPI's and H^2 receptor antagonists

Finally - the Serious Incident

- 18 year old girl
- Trainee Paramedic
- Newly diagnosed Ulcerative Colitis
- No Menorrhagia
- 1 year history of rectal bleeding
- Saw GP (not her usual one) complaining of symptoms of anaemia – GP asked for Bloods
- Hb 78g/l, Ferritin 4
- GP spoke to AEC who admitted her and gave her one unit of blood and 1000mg Ferinject

The contributing factors

1. The age of this patient is very different to the usual elderly anaemic case load seen on AEC.
2. There was a lack of detailed written and verbal communication between AEC medical and nursing staff about the expectations and specific treatment requirements for this particular patient rather than 'one size fits all'.
3. Lack of GP communication with the Gastroenterology department about ongoing bleeding and anaemia.
4. The analyser in Blood Sciences was out of action so a rapid test was unavailable.
5. Lack of information about said analyser from the Blood Sciences Laboratory when asked how long the test would take.
6. There was a recent result showing the patient was profoundly iron deficient but the AEC doctor decided to transfuse rather than waiting for another iron test to be reported.
7. The focus of getting the patient treated in the most appropriate area led to a lack of senior doctor review as no senior (registrar or consultant) was requested to assess the treatment plan or teach the SHO.
8. There was inadequate inter-professional challenge from the Laboratory staff in Transfusion.
9. There was no plan for the patient to be followed up or reviewed communicated to the GP by the Gastroenterology Team.

Route Causes

1. Failure of management and follow up of anaemia in the Gastroenterology specialist outpatient clinic.
2. The patient was referred into the Trust by the GP for avoidable transfusion.
3. There was no review of the patient by a senior AEC/ MAU Consultant.

General Practitioners are often unaware that transfusion practice and the, testing, diagnosis and treatment of anaemia (even in bleeding patients) has changed considerably in the past few years – particularly in terms of British Statute. This is a national Issue as well as local one as the Royal College of GPs declined involvement at national level.	H	a. b. c. d.	Information must be offered to GPs and training given within surgeries. An algorithm for the investigation and diagnosis of anaemia in Primary Care must be introduced with a clear pathway for onward referral to secondary care if necessary. Information for patients on anaemia must be available at the surgery to enable them to ask questions and make treatment choices. (NB the NHSBT has a free and comprehensive patient information booklet on anaemia). Community Matrons should also receive training in the signs, symptoms, investigations and treatment of anaemia particularly around anaemia in chronic disease and admission prevention.	The CCG led by Dr Ian Mack Chair WNCCG (West Norfolk) and Dr Mark Funnel GP at WNCCG and assisted by Claire Atterbury Advanced Practitioner in Haematology & Transfusion Medicine (H&TM)		To be confir-med with WN CCG.		