Wessex Trauma Network

University Hospital Southampton NHS Foundation Trust

Blood Transfusion in the Context of Trauma in Older People”

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Introduction – “me”

Consultant Orthogeriatrician – 2009 –current

“Jobbing Geriatrician”

Clinical Lead for Geriatrics UHS – 2010 – 2013

Clinical Lead for Major Trauma Rehabilitation – 2013 – present

Director of Major Trauma – 2016 to present

Chair of TARN – major trauma in older people working group

Principles

1. Complexity is our new reality
2. Frailty and multi-morbidity are not the same
3. Older people are a heterogeneous group
4. Older People benefit from aggressive management
5. Individualised care

Background – Trauma in Older People

Hip Fracture - > 70,000 cases per year

Major Trauma

- Defined as an Injury Severity Score >15
- Growing problem

Lower intensity “major Trauma”

- ISS 9-15

Background

Hip Fracture is a “Frailty” presentation

Hip fracture patients have multiple co-morbidities

- Managed need

Aggressive, integrated care reduces the risk of complications

Dementia and delirium are prevalent in this patient group

Demographics

Figure 3: Estimated and projected population aged 70 and over, United Kingdom, mid-2012 and mid-2037

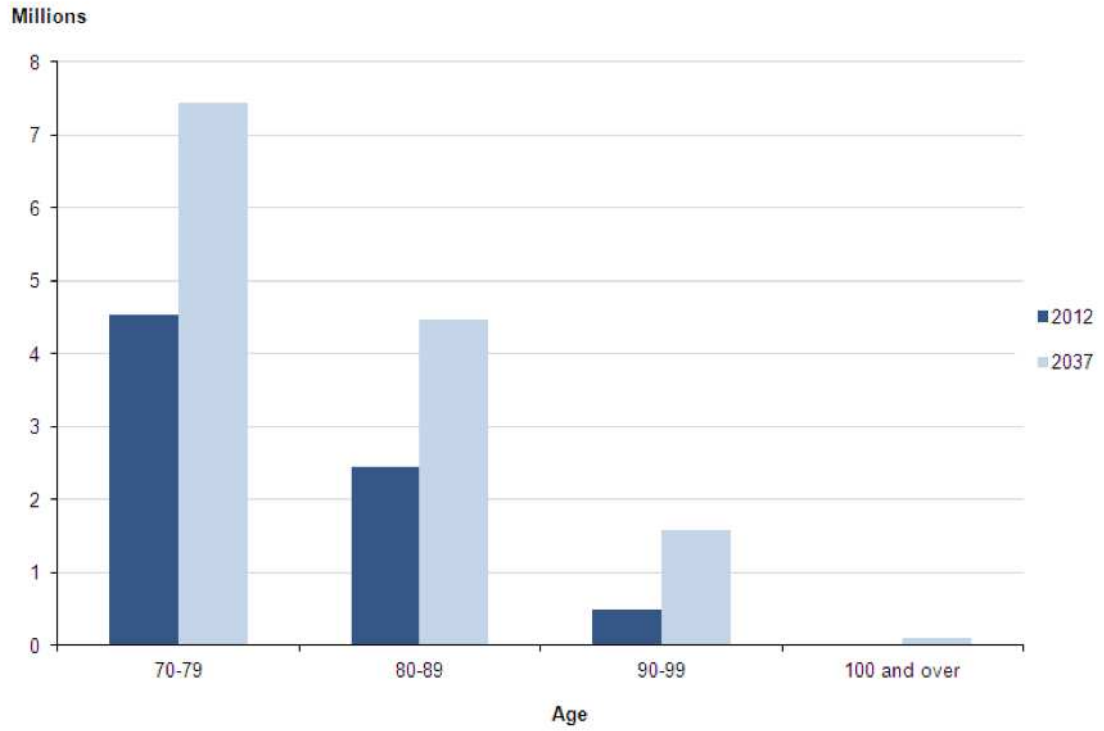
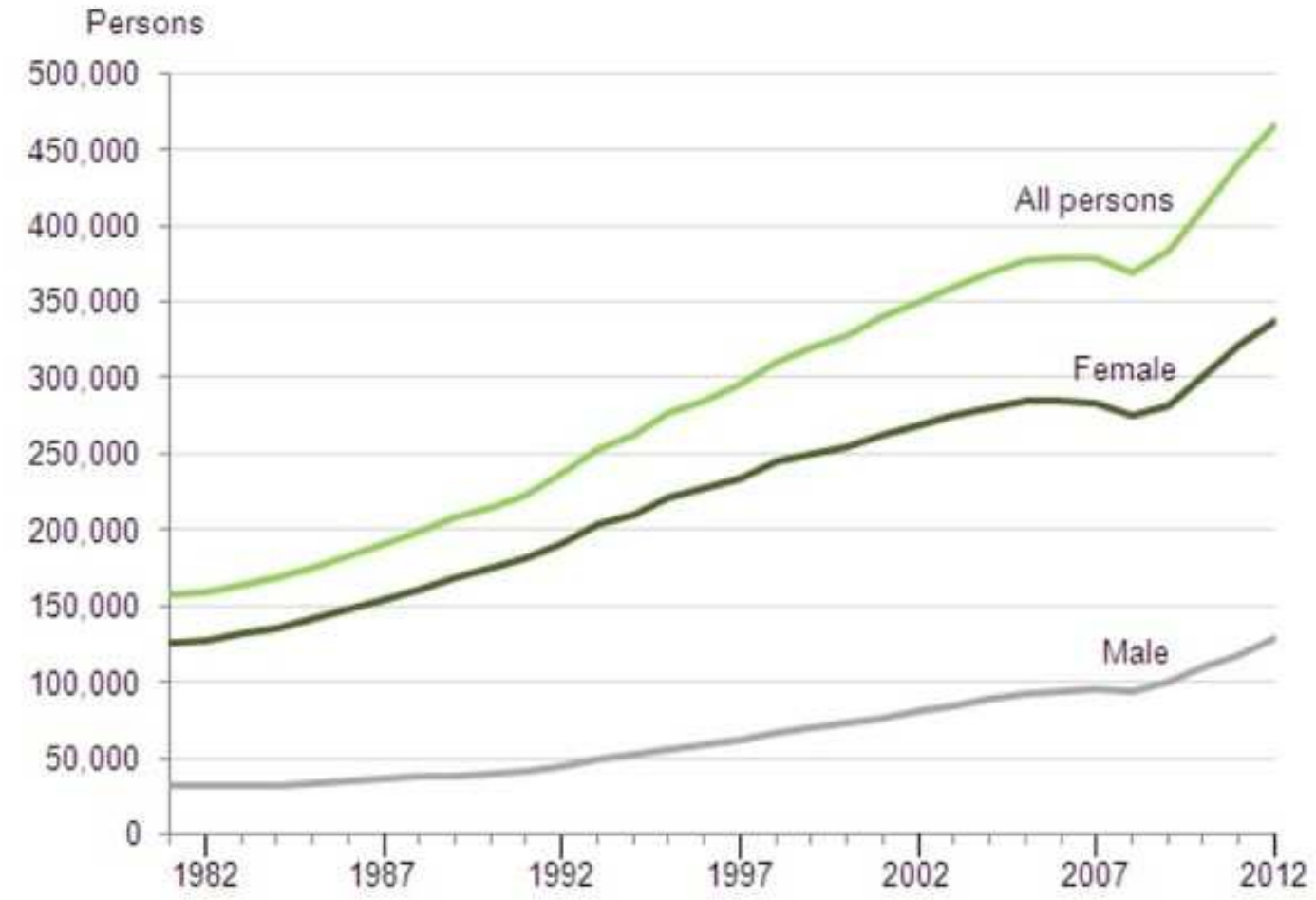


Figure 1: Population aged 90 and over, 1981-2012, England and Wales



Source: Office for National Statistics

THE TRAUMA AUDIT & RESEARCH NETWORK

England & Wales

MAJOR TRAUMA IN OLDER PEOPLE

2017

TARN

THE TRAUMA AUDIT & RESEARCH NETWORK

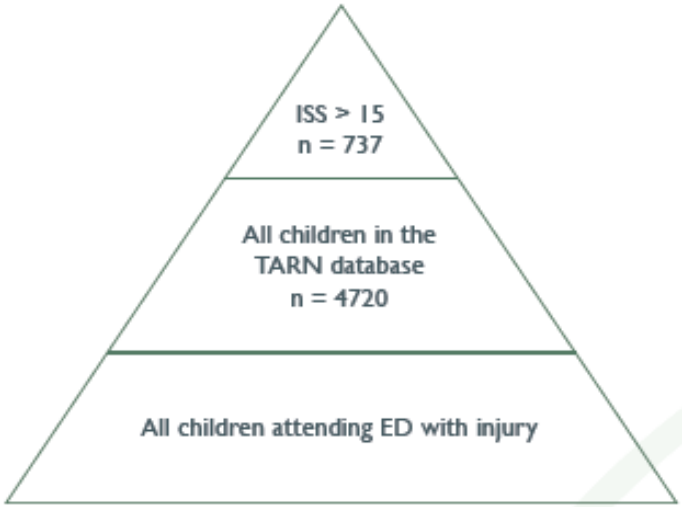


Figure 1 (2012 data)

737 ISS >15

TARN Older People

8,000 ISS > 15 (X10 of age 0-16)

Commonest group of major trauma patients are now female, over 60 and suffer a low energy accident, usually a fall from less than 2m

8,000

Blood Transfusion - Background

One of the most controversial areas of hip fracture care

Many crossovers with major trauma

- Initial resuscitation
- Pre-operative optimisation
- Peri-operative care
- Post-operative care
  - Complications
  - Rehabilitation
  - Delirium

Frailty

There are 2 main schools of thought for frailty

- Rockwood – Cumulative deficit model
  - An accumulation of “deficits” with ageing incorporating medical, social aspects lead to a “Frailty Index” which correlates to outcome
- Fried – Phenotype model
  - Physical characteristics associated with frailty
  - (unintentional weight loss, reduced muscle strength, reduced gait speed, self-reported exhaustion and low energy expenditure

Co morbidity	No (%)
Cardiovascular Disease	24%
Stroke	13%
Respiratory disease	14%
Renal Disease	3%
Diabetes	9%
Rheumatoid Disease	3%
Parkinson's Disease	4%
Malignancy	8%
Paget's Disease	1%
Current Smokers	10%
Enteral Steroids	1%
No of Co morbidities	
1	35%
2	17%
3 or more	7%

Adapted from Roche et al.

Triage

Often not recognised

3% from within hospitals

Treatment often delayed

Delayed or no transfer to MTC

Who is treating these patients?

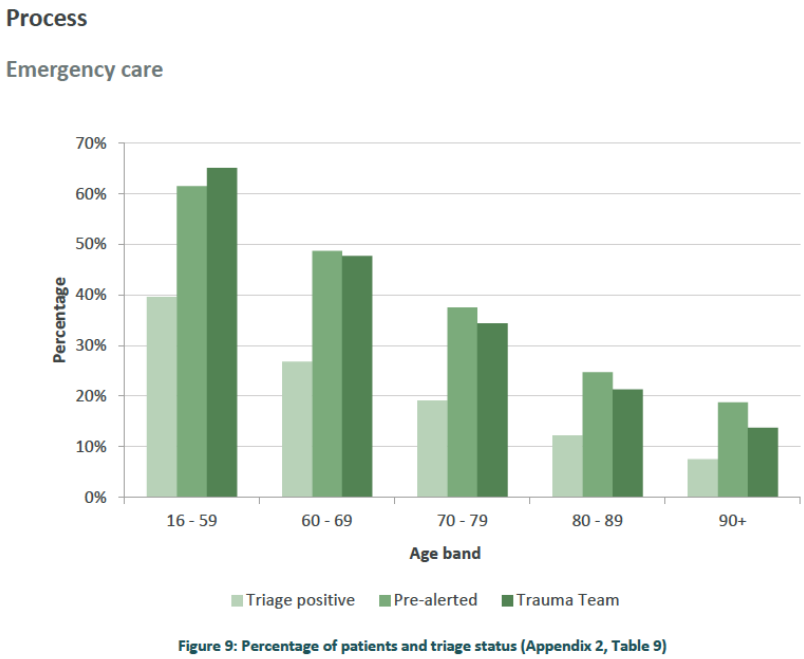


Figure 9: Percentage of patients and triage status (Appendix 2, Table 9)

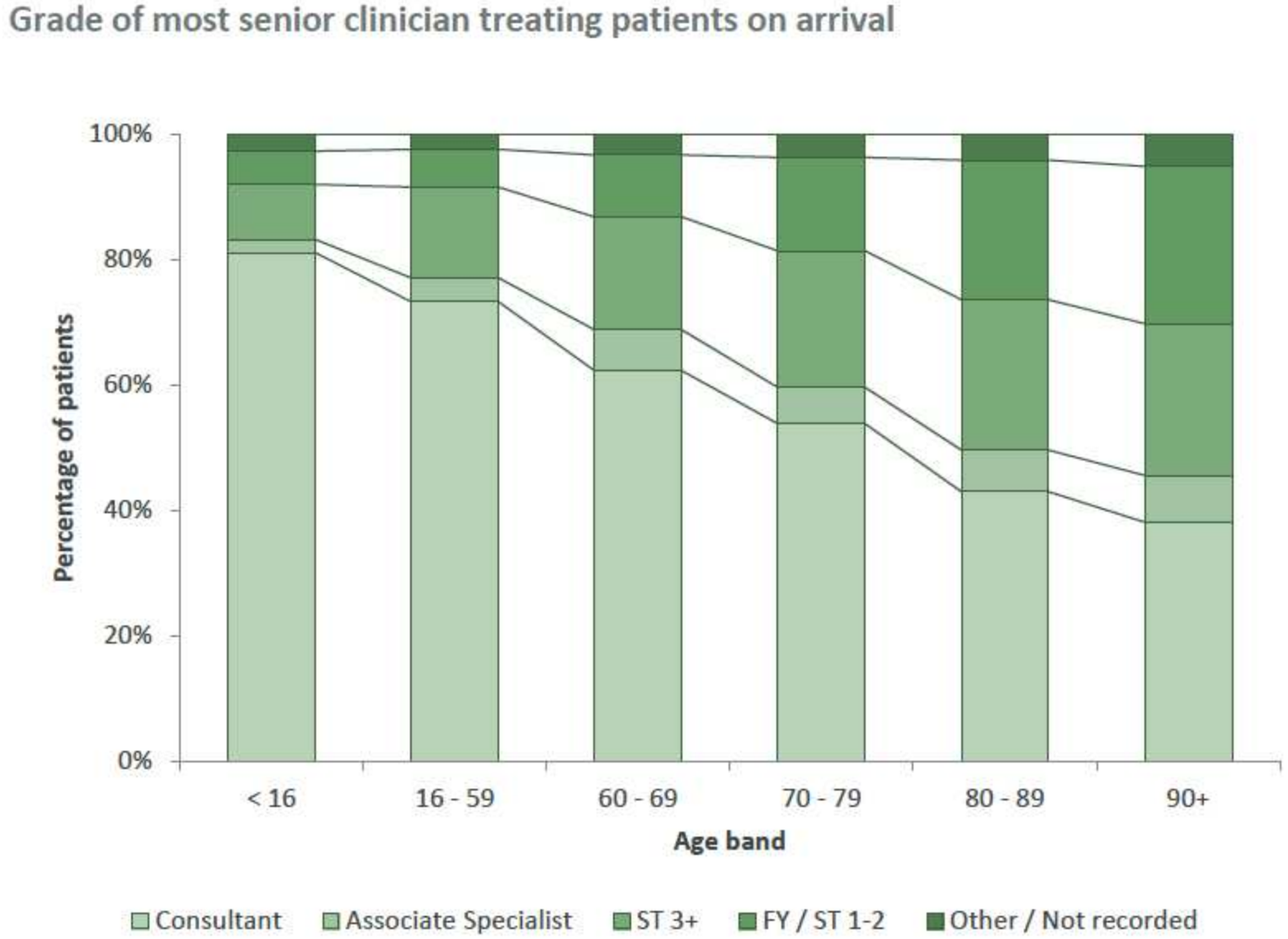


Figure 10: Age and seniority of initial treating clinician (Appendix 2, Table 10)

Initial resuscitation

Massive transfusion covered in a later talk

High use of anti-platelet and anti-coagulant medication in this patient group (ferrigno et al)

- ^ transfusion requirements
- ^ LOS

Higher use of Blood Products in Older Level 1 trauma (Rizoli et al)

- ?? Related to altered coagulopathic response
- ? Anticoags and antiplatelets

Higher Rate of “missed bleeding” on primary survey

MTP – survival comparable to younger people (Murray et al)

Pre-operative management

Transfusion and Low Hb both predictors of poor outcome

Restrictive Vs Liberal Transfusion Protocol

<7g/dl vs <10 g/dl

Relevance of fracture Site

Complications of Transfusion

- Infection
- Circulatory overlaod

Intolerance of anaemia

- Frailty
- Co-morbidities

Transfusion Triggers

Confusing picture

Cochrane review relies heavily on a couple of studies

FOCUS

Liberal or Restrictive Transfusion in
after Hip Surgery

Jeffrey L. Carson, M.D., Michael L. Terrin, M.D., M.P.H., Helaine No
Bernard R. Chaitman, M.D., George G. Rhoads, M.D., M.P.H., George
Lauren Beaupre, P.T., Ph.D., Kevin Hildebrand, M.D., William Mac
Donald Richard Cook, B.M.Sc., M.D., Gwendolyn Dobbin, C.C.R.P., Khw
Rebecca A. Horney, B.A., and Jay Magaziner, Ph.D., M.S.Hyg.

Table 2. Hemoglobin Levels and Transfusions.*

Variable	Liberal Strategy (N=1007)	Restrictive Strategy (N=1009)	P Value
Hemoglobin level — g/dl			
Before surgery	11.3±1.5	11.3±1.5	0.70
During eligibility screening	9.0±0.8	9.0±0.8	0.98
Before transfusion	9.2±0.5	7.9±0.6	<0.001
Estimated blood loss during surgery — ml†	209±179	232±257	0.03
Transfusions before randomization			
0 units — no./total no. (%)	754/1006 (75.0)	720/1008 (71.4)	
≥1 unit — no./total no. (%)	252/1006 (25.0)	288/1008 (28.6)	0.07
Total no. of units	452	531	
Transfusions after randomization			
0 units — no./total no. (%)	33/1003 (3.3)	594/1007 (59.0)	
1 unit — no./total no. (%)	420/1003 (41.9)	246/1007 (24.4)	
2 units — no./total no. (%)	346/1003 (34.5)	127/1007 (12.6)	
3 units — no./total no. (%)	132/1003 (13.2)	24/1007 (2.4)	
≥4 units — no./total no. (%)	72/1003 (7.2)	16/1007 (1.6)	<0.001
Total no. of units	1866	652	
Storage of units transfused after randomization — days‡	22.0±9.5	22.1±9.9	0.83
Leukoreduced units transfused after randomization — %§	90.2	88.6	0.25
Major protocol violation — no./total no. (%)¶	91/1006 (9.0)	56/1007 (5.6)	0.003
Transfusion because of symptoms — no./total no. (%)‖			
Rapid bleeding	5/1006 (0.5)	14/1007 (1.4)	0.04
Chest pain	4/1006 (0.4)	9/1007 (0.9)	0.17
Congestive heart failure	1/1006 (0.1)	10/1007 (1.0)	0.007
Tachycardia or hypotension	43/1006 (4.3)	123/1007 (12.2)	<0.001

Restrictive *versus* Liberal Transfusion Strategy in the Perioperative and Acute Care Settings

A Context-specific Systematic Review and Meta-analysis of Randomized Controlled Trials

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ABSTRACT

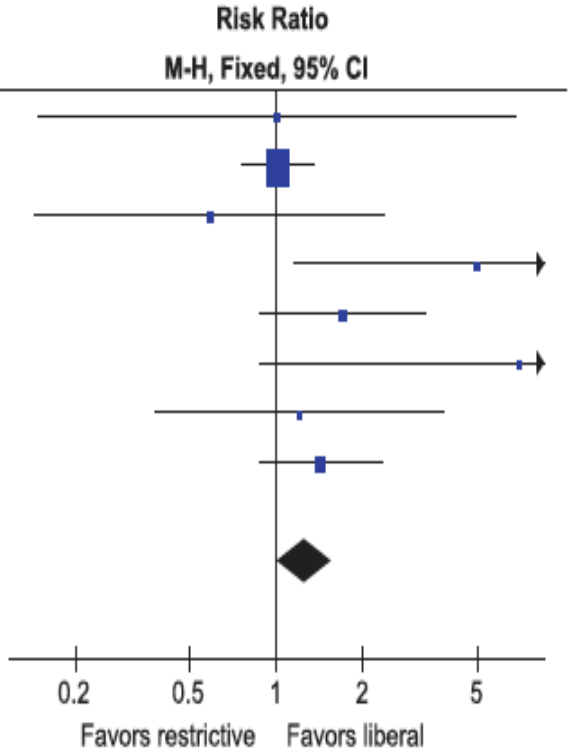
Background: Blood transfusions are associated with morbidity and mortality. However, restrictive thresholds could harm patients less able to tolerate anemia. Using a *context-specific* approach (according to patient characteristics and clinical settings), the authors conducted a systematic review to quantify the effects of transfusion strategies.

Methods: The authors searched MEDLINE, EMBASE, CENTRAL, and grey literature sources to November 2015 for ran-

Group 2 studies	Restrictive Events	Restrictive Total	Liberal Events	Liberal Total	Weight	Risk Ratio M-H, Fixed, 95% CI
Carson 1998[49]	2	42	2	42	1.5%	1.00 [0.15, 6.77]
Carson 2011[50]	84	1007	83	1005	61.5%	1.01 [0.76, 1.35]
Fan 2014[52]	3	94	5	92	3.7%	0.59 [0.14, 2.39]
Foss 2009[8]	10	60	2	60	1.5%	5.00 [1.14, 21.86]
Gregersen 2015[9]	21	144	12	140	9.0%	1.70 [0.87, 3.32]
Grover 2006[54]	7	130	1	130	0.7%	7.00 [0.87, 56.10]
Parker 2013[63]	6	100	5	100	3.7%	1.20 [0.38, 3.81]
So-Osman 2010[68]	35	299	25	304	18.4%	1.42 [0.87, 2.32]
Total (95% CI)		**1876**		**1873**	**100.0%**	**1.24 [1.00, 1.54]**
Total events	168		135			

Heterogeneity: Chi² = 10.32, df = 7 (P = 0.17); I² = 32%

Test for overall effect: Z = 1.96 (P = 0.05)



Pre-operative Optimisation

Routinely lose 2g/dl

Relevance of surgical procedure

Aim for Hb >10 in all patients pre-operatively

- High Rate of intra/post operative hypotension

Haemacue/VBG in recovery

- Aim Hb >10 in all

Peri-operative Care

Close monitoring of Hb 72 hours peri-operatively;

- Circulatory overload
- Delayed decrease in Hb
- Stress Ulceration

Post Operative Care

Even more controversial

Very Limited evidence of “best practice”

- Rehabilitation
- Delirium prevention

Heterogenous group

- Personalised management

The Future

Erythropoiesis stimulation

Iron infusions to reduce ABT use

Tranexamic acid peri-operatively

Summary

Early & Aggressive intervention

Aggressive pre-optimisation

“At present” – Liberal peri-operative transfusion policy

More work in post-op phase

Thank You

ANY QUESTIONS