

# Massive Transfusion in Galway University Hospitals (GUH) 2006-2010

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GALWAY UNIVERSITY HOSPITALS

# Definition of Massive Blood Transfusion

- An ongoing transfusion requirement in an adult of  $> 150\text{mls}$  per minute
- Replacement of  $>50\%$  of blood volume in  $<3\text{hrs}$ .
- Replacement of one blood volume, **or transfusion of  $>10$  units RCC in 24hrs**



# Management of Acute Massive Blood Loss at GUH's

- Communication
- Arrest bleeding
- Request lab investigations
- O Rh D Neg emergency blood
- Coagulation factor deficiency
- Platelet count
- Fibrinogen of  $>1.5-2.0\text{g/L}$
- Consider factor VIIa



# Objectives

- Retrospectively review massive transfusion management in Galway University Hospitals over a four year period
- To examine the volume of blood components and products used
- To establish the ratio of components / products to Red Cells transfused

# Method

- 4 year audit (2006 – 2010)
- Identified in GBTE
- Investigated & Recorded by Haemovigilance Officer
- Retrospective data analysis

# Audit Template

**Audit of Massive Transfusions**

Date of transfusion

Diagnosis \_\_\_\_\_

Reason for transfusion \_\_\_\_\_

Surgical procedure \_\_\_\_\_

Surgery category  Emergency  Elective    Surgery date     Surgery time \_\_\_\_\_

Past medical Hx \_\_\_\_\_

Past surgical Hx \_\_\_\_\_

Medications \_\_\_\_\_

Was the patient on anti-coagulants/anti-fibrinolytics  Yes  No

If Yes, how many days prior to surgery were they discontinued \_\_\_\_\_

What was the recorded blood loss \_\_\_\_\_

What volume of crystalloids / colloids did the patient receive? \_\_\_\_\_

Was intra-operative cell salvage used?  Yes  No    Was post-operative cell salvage used?  Yes  No

Had the patient pre-donated autologous blood?  Yes  No

Did the patient receive any O Rh Neg emergency blood?  Yes  No

Were the Blood Bank informed that O Rh Neg emergency blood had been used?  Yes  No  N/A

Blood/Blood products administered

Date & Time	Red Cells	Plasma	Platelets	Cryoprecipitate	Novoseven

How many units of Red Cells / Plasma / Platelets was given prior to administration of Novoseven?

Date & Time	HB	HCT	PT	APPT	INR	Fibrinogen

Patient name \_\_\_\_\_  
Board number \_\_\_\_\_ DOB   
Consultant \_\_\_\_\_

Were Hb levels carried out locally in theatre  Yes  No

Were U&E results carried out  Yes  No

Was a Consultant Anaesthetist involved  Yes  No

Was a request form for all blood and blood products sent to the Blood Bank?  Yes  No

Was a prescription in place for all blood and blood products?  Yes  No

Was the peelable label for all blood and blood products in the blood transfusion document?  Yes  No

Did it contain two signatures, date and time of administration?  Yes  No

Were observations carried out according to protocol?  Yes  No

Did the patient experience any adverse reaction to the blood or blood products?  Yes  No

Did the patient recover fully?  Yes  No

Did the patient require ICU / HDU admission?  Yes  No

Did the patient require any further surgery?  Yes  No

What was the post-operative / post-transfusion hospital stay? \_\_\_\_\_

Could this bleed have been prevented / managed differently?  Yes  No

If Yes, please explain

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

# Results

87 cases

30%

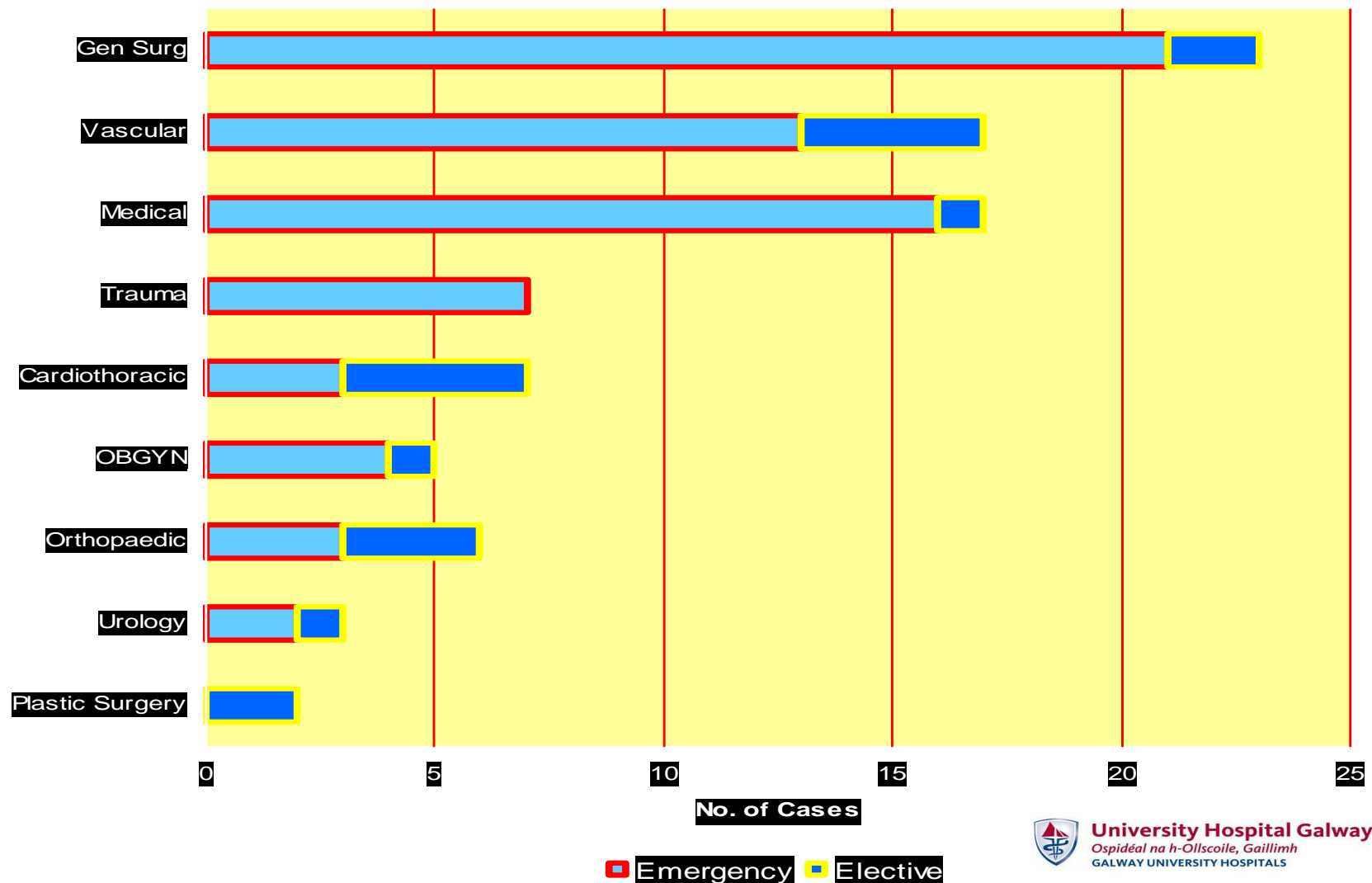
70%

Female

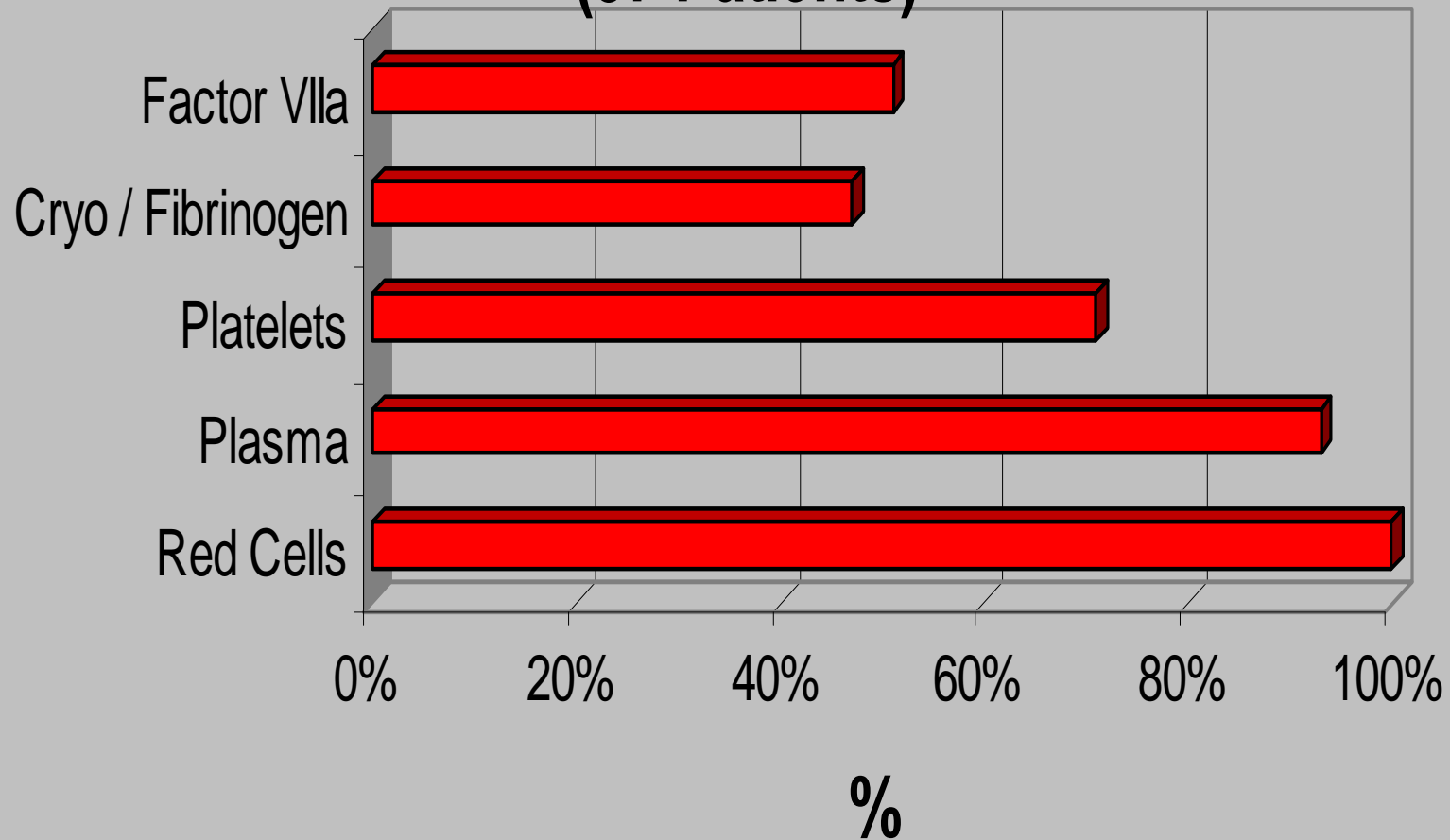
Male

- Mean age: 64 yrs
- Range: 20 – 88 yrs

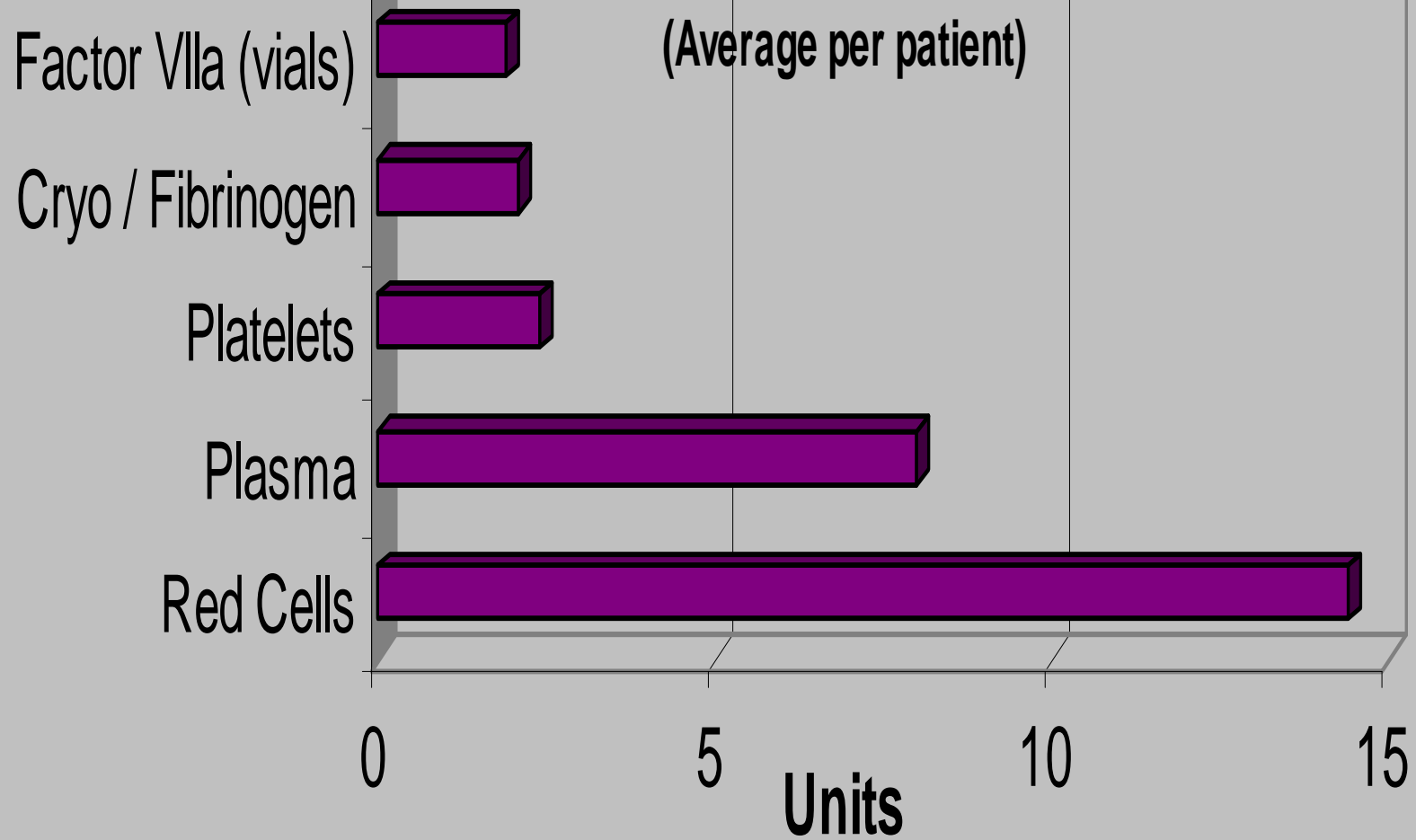
# Events per discipline



# Blood Components/Products Transfused (87 Patients)



## Blood Components/Products Used



# Red Cell v Product Ratio

	RCC:Plasma	RCC:Plts	RCC:Cryo/ fibrinogen	RCC:fVIIa
<b>Total</b>	1.9:1	8.2:1	14.3:1	14.8:1
<b>Alive</b>	1.8:1	8.6:1	15.7:1	22:1
<b>RIP</b>	2.0:1	8.0:1	13.4:1	11.8:1



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# O Rh D Neg Emergency RCC

**20 patients (23%) received  
O Rh D Neg emergency RCC**

- Average 4.4 units
- Range: 1-14 units



# Intra-operative Cell Salvage

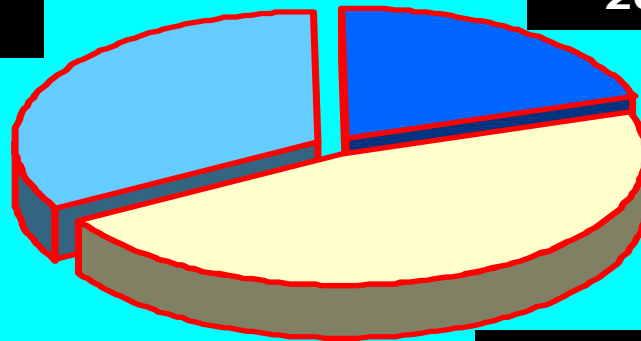
Used in 17 cases (20%)

- Vascular ( 12 ) of 17
- Cardiac ( 3 ) of 7
- Trauma ( 1 ) of 7
- Ortho ( 1 ) of 6

# Patient Survival following Massive Haemorrhage

**Mortality  
within 24 hrs  
33%**

**Mortality  
prior to  
discharge  
20%**



**Survival  
47%**



# International mortality figures

*Riskin D. J. et al, 2009. Massive Transfusion Protocols: The Role of Aggressive Resuscitation Versus Product Ratio in Mortality Reduction. Journal of American College of Surgeons 22, pp 198-205.*

2003 - 2005: 45% mortality 40 patients

Introduction of Guidelines

2005 - 2007: 19% mortality 37 patients

# Audit Limitations

- GUH's massive transfusion guidelines based on laboratory results
- International guidelines based on replacement ratios
- International figures

# Recommendations

- Increase awareness through education & training
- Prospective audit using replacement ratio comparison
- Larger scale: co-ordinated international approach
- Smaller scale: national input

# Issues for Consideration

- Early Identification of cases
- Awareness of Massive Transfusion Protocol
- Lab assays / Thromboelastography (TEG)
- Optimum use of products

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