Management of Major Obstetric Haemorrhage

Dr Issie Gardner

St Michael's Hospital
Bristol

March 2012

University Hospitals Bristol NHS
NHS Foundation Trust

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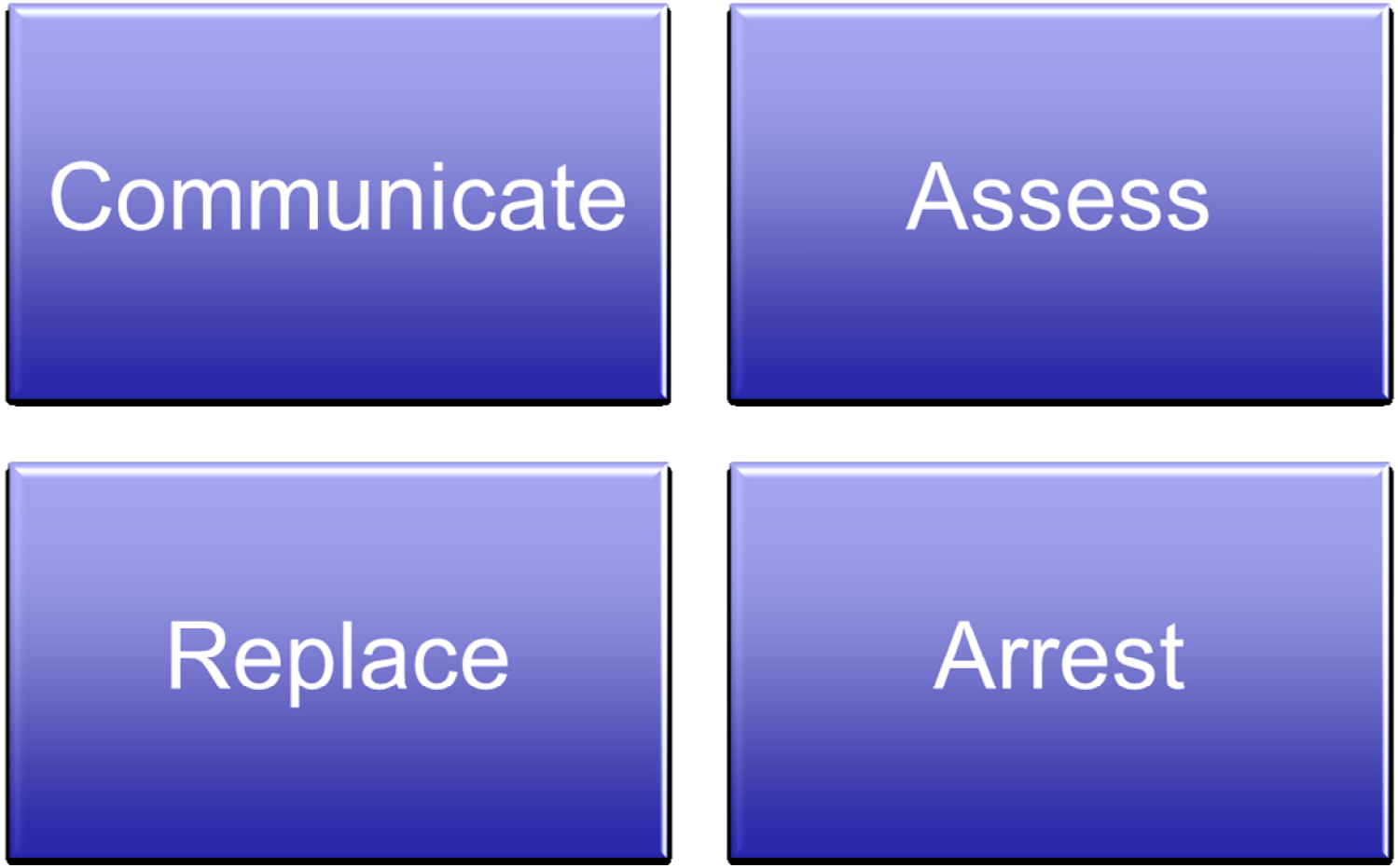

Obstetric Haemorrhage

- **Importance globally**
- **UK**
- Recognise the problem
- Involve appropriate staff
- Know your local guidelines
- New interventions

Haemorrhage deaths

- **Substandard care** **66%**
  - **Lack of observations**
  - **Antenatal anaemia**

- **Women declining blood** **1**

Remember Ethnic minorities

Morbidity

DOI: 10.1111/j.1471-0528.2007.01533.x
www.blackwellpublishing.com/bjog

Learning from adverse clinical outcomes: major obstetric haemorrhage in Scotland, 2003–05

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Accepted 20 August 2007.

2/3 of near miss morbidity

3.7 per 1000 maternities

Preparation for delivery

Increase in red cell mass
Increase in clotting factors
Increase in plasma volume

Uterine Blood flow increases

- **50ml/min to 500-800ml/min at term**

Delivery

Placental separation endometrial arteries torn

Blood loss prevented

uterine contraction

by arterioles constricting

platelet aggregation → clot formation

Haemorrhage causes

APH	placenta praevia abruption
Tone	uterine atony (75-90%)
Tissue	retained products
Trauma	vaginal/cervical lacerations, ruptured uterus, broad ligament haematoma
Thrombin	coagulopathies

APH: Praevia risk factors

Previous caesarean sections (RR 2.6, 95% CI 2.3–3.0 with a background rate of 0.5%)[46]
One previous caesarean section OR 2.2 (95% CI 1.4–3.4 with a background rate of 1%)[47]
Two previous caesarean sections OR 4.1 (95% CI 1.9–8.8)
Three previous caesarean sections OR 22.4 (95% CI 6.4–78.3)
Previous termination of pregnancy
Multiparity
Advanced maternal age (>40 years)
Multiple pregnancy
Smoking
Deficient endometrium due to presence or history of: • uterine scar • endometritis • manual removal of placenta

PPH: risk factors

↑ **parity**

↑ **uterine distension (multiple pregnancy, large babies)**

prolonged labour

previous PPH

operative delivery (especially emergency LSCS)

maternal obesity

antepartum haemorrhage (abruption/ praevia)

Haemorrhage

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Obstetric haemorrhage continuum

Minor	> 500 -1000ml
Moderate	> 1000 -1500ml
Major	> 1500 - 2000ml
Massive	> 2000ml

Intervene before life threatening

The following table summarises the management of obstetric haemorrhage. The details of management follow the table

PPH	COMMUNICATE	ASSESSMENT and RESUSCITATION	MONITOR	ARREST BLEEDING
MINOR 500ml - 1000ml	-Inform midwife in-charge -Pull emergency buzzer if brisk loss -Alert the obstetric and anaesthetic ST3 or a competent ST1-2	-Check pulse, blood pressure -Assess cause of bleeding -Gain IV access -Take bloods for FBC, Group and save and coagulation screen	-Monitor pulse and BP every 15 min **Attach NIBP, pulse oximeter** -If blood loss continues use the haemorrhage documentation chart	**Manage the source of bleeding** **Placental abruption or placenta praevia:** • Consider delivery **Tone** • Rub up contraction • 2nd syntocinon or syntometrine • syntocinon infusion • Misoprostol **Tissue** • EUA and removal of placenta
MODERATE 1000ml-1500ml	-Pull emergency buzzer -Call ST3 obstetrician and anaesthetist -Alert ST6 or above obstetrician	As above plus - Check airway and breathing - Give oxygen by mask -Evaluate circulation - 2nd IV access - IV fluids (Hartmann's) - If bleeding continues request urgent blood - Consider 2222 call to trigger major haemorrhage procedure	As above plus - Start HDU chart -Record minimum of 15 min vital signs -Hourly urine output - use the haemorrhage documentation chart	
MAJOR	-ST6 or above	As above		

Massive obstetric haemorrhage

Blood loss of > 2000mls or > 1500 ml with ongoing loss and/or signs of circulatory collapse:

- **Tachycardia (pulse> 120)**
- **Hypotension (systolic bp< 80mmhg)**
- **Tachypnoea (> 30 breaths per minute)**
- **Confusion**

If signs circulatory collapse present MOH irrespective of measured blood loss

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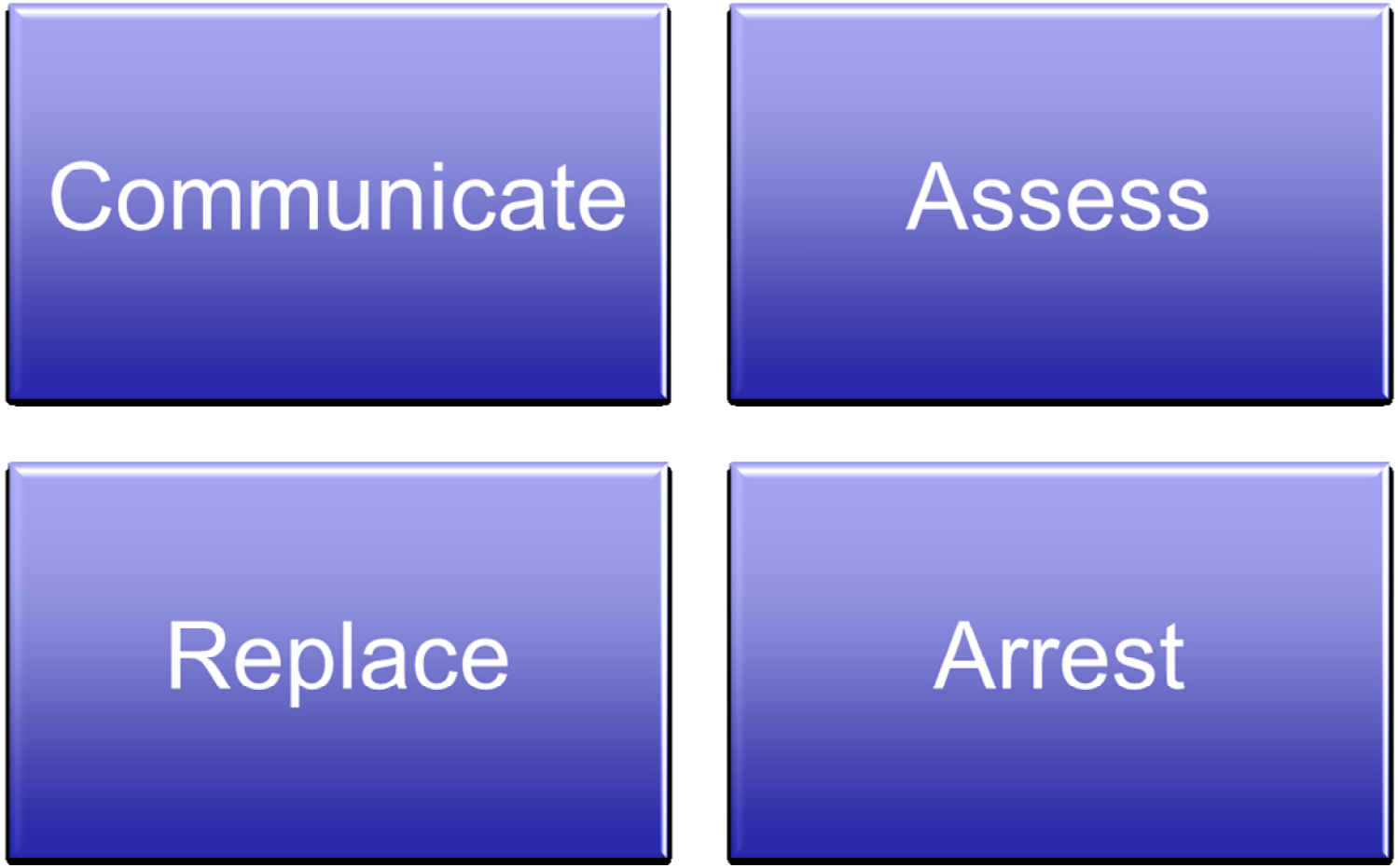
Diagnosis

- **Assessing blood loss**
  - underestimation most likely
- **Compensation can lead to late diagnosis**
  - Tachycardia
  - Hypotension
  - Poor peripheral perfusion
  - Altered conscious state
  - Unexplained metabolic acidosis

Management of Major Obstetric Haemorrhage

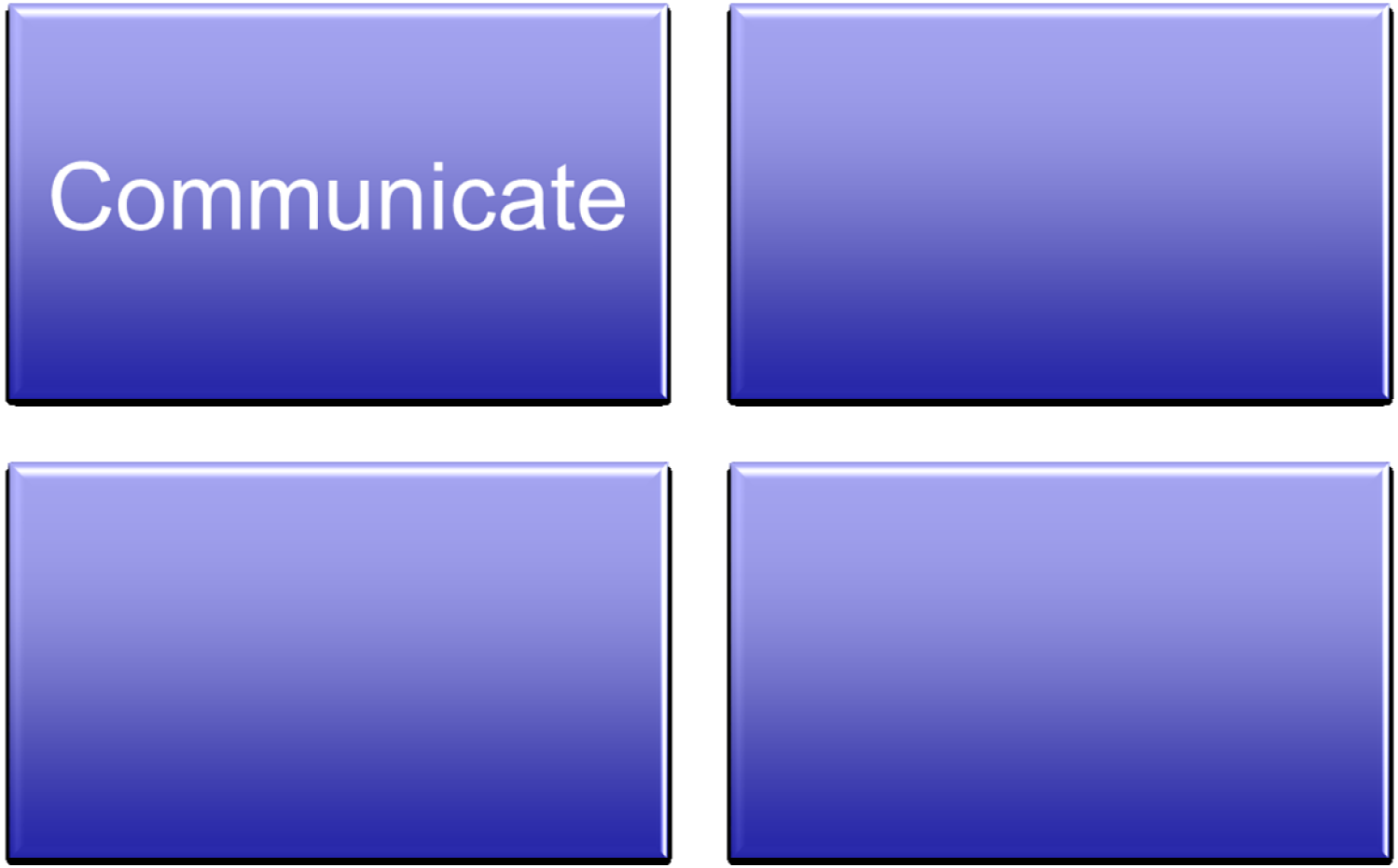


Management

Multidisciplinary approach

- **midwives**
- **obstetricians**
- **anaesthetists**
- **theatre staff**
- **haematologist / BTS**
- **porters**
- **ITU**

Management of Major Obstetric Haemorrhage



Massive Obstetric Haemorrhage

Blood loss > 1500ml
with ongoing haemorrhage
and /or signs of circulatory collapse

Call for help
2222 call for Obstetric emergency team
Consultant anaesthetist and obstetrician to attend
Alert Haematology senior specialist trainee
Theatres on standby

Assess and monitor

Vital signs:
Pulse, bp, perfusion

Identify cause:
tone tissue, thrombin, trauma

Estimate blood loss

Order blood and blood products
(Obtaining Blood Urgently)

FBC, coagulation and fibrinogen
,U&Es, LFTs Cross match

Haemacue HB

HDU chart

Consider central/art line

Arrest bleeding

Bimanual compression

Empty bladder – insert foley

Syntocinon 5iu /Ergometrine 0.5mg
Max 2 doses (PET synto 5iu slow iv)

Syntocinon infusion (30 iu in 500ml N Saline at 125ml/hr)

Misoprostol 400 mcg Sublingual/ rectal - repeat after 20 mins if necessary

Replace + Resuscitate

ABC

Oxygen mask 15litres

IV access 14g cannula x 2

Crystalloid/ colloid 2000ml

Blood (oneg/ electronic issue/ group specific /crossmatched)

Blood products (FFP, Plt, Cryo)

Keep warm (rapid infusor/ warming

NHS
National Patient Safety Agency

Rapid Response Report

NPSA/2010/RRR017

From reporting to learning

21 October 2010

The transfusion of blood and blood components in an emergency

Issue

The urgent provision of blood for life threatening haemorrhages requires a rapid, focused approach as excessive blood loss can jeopardise the survival of patients. Early recognition of major blood loss and immediate effective interventions are vital to avoid hypovolaemic shock and its consequences. One such action is the rapid provision of blood and blood components, for which effective communication between all personnel involved in the provision and transportation of blood is key.

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Poster

MAJOR HAEMORRHAGE PROCEDURE
Central Delivery Suite

This procedure should be activated if immediate delivery of blood is required for a patient with rapid blood loss.

1. Call 2222

"I would like to trigger the major haemorrhage procedure in CENTRAL DELIVERY SUITE extension xxxxx"

2. Switchboard will connect you to blood bank:-

   Provide patient identification details

   Request shock pack and/or specific products if required

3. Phone St Michael's Porters Lodge (ext 25325) and tell them:-

   Either: taxi to wait for blood samples

   Or: taxi to go to BRI porters lodge and await blood box

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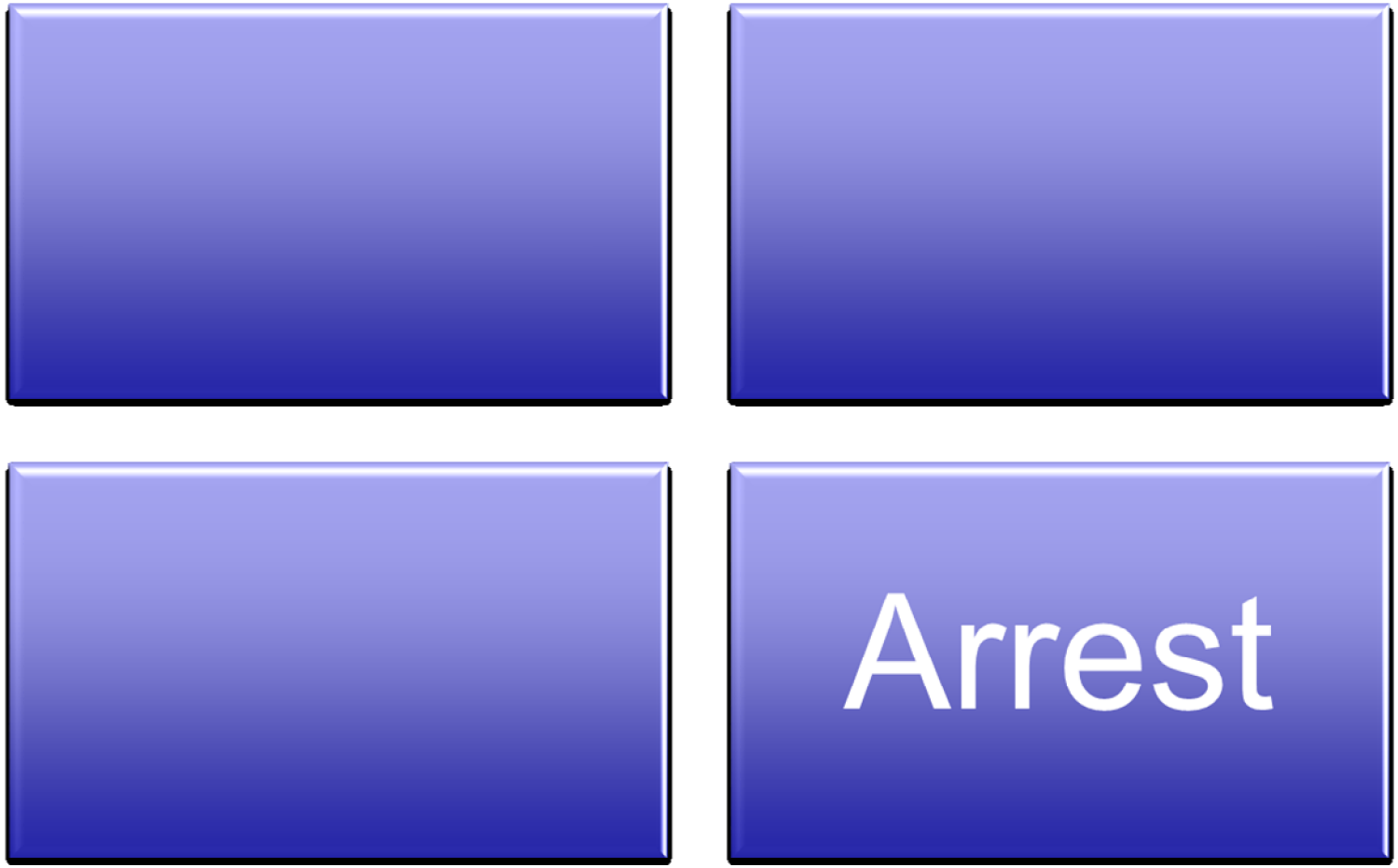

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Ergometrine

Side effects

- arterial vasoconstrictor
  - increases BP and CVP, fall HR
- nausea and vomiting

Cautions

- hypertensive disease
- coronary artery disease
  - can cause vasospasm

Only used in 46% near misses

Surgical interventions

consider early

EUA

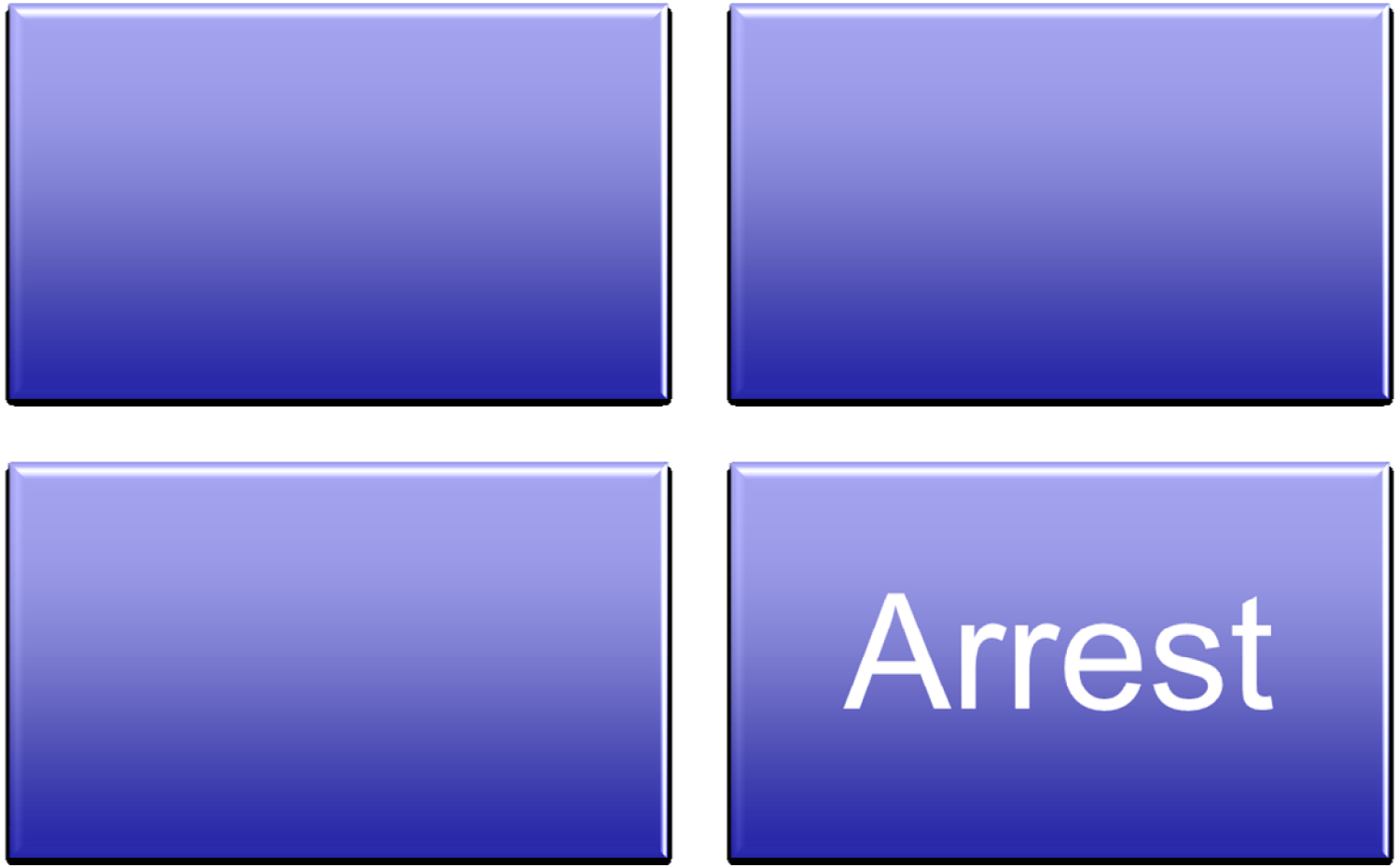
Intra uterine balloon

B Lynch suture

Internal iliac ligation

Hysterectomy

Surgical interventions



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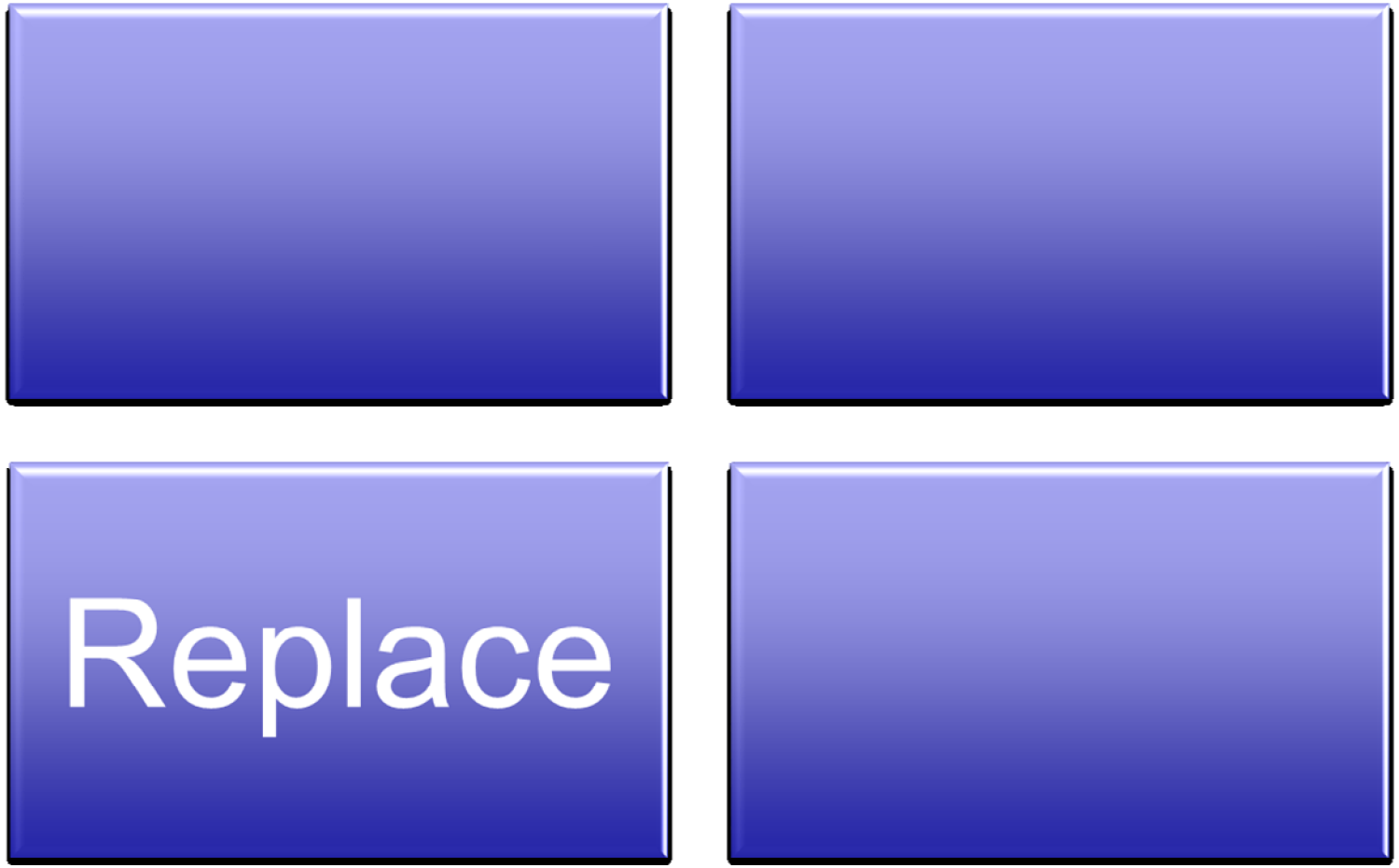

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Lessons from the battlefield

- **early aggressive use blood components**
- **haemostatic resuscitation**
- **massive transfusion protocol**

Transfusion for trauma: civilian lessons from the battlefield?
P. Moor , D. Rew , M. J. Midwinter and H. Doughty Anaesthesia 2009:64: 469-472

Remember clotting factors

Coagulopathy

- Dilution
  - primary cause in major bleeding

- Disseminated intravascular (DIC)
  - AFE, abruption, sepsis

Component therapy

FFP 12-15ml/kg to get PT < 1.5

Cryoprecipitate to get fibrinogen > 1g/dl

Platelets > 50 x 10^9/l

SHOCK PACK A: Available immediately from CDS Fridge 4 units of O negative	SHOCK PACK B: (1st issued by lab for SMH) 4 units RBC 4 units FFP	SHOCK PACK C: (2nd issued by lab for SMH) 4 units RBC 4 units FFP 1 adult dose platelets

Additional clotting factors eg cryoprecipitate must be requested separately if required eg abruption, amniotic fluid embolism or sepsis.

Fibrinogen concentrate and Factor VIIa stored on CDS for use after discussion with Consultant Haematologist

Avoid use of the air tube system (chute) in major haemorrhage. A special emergency arrangement has been made with the taxi company for immediate dispatch

Call blood bank to stand down when haemorrhage is under control

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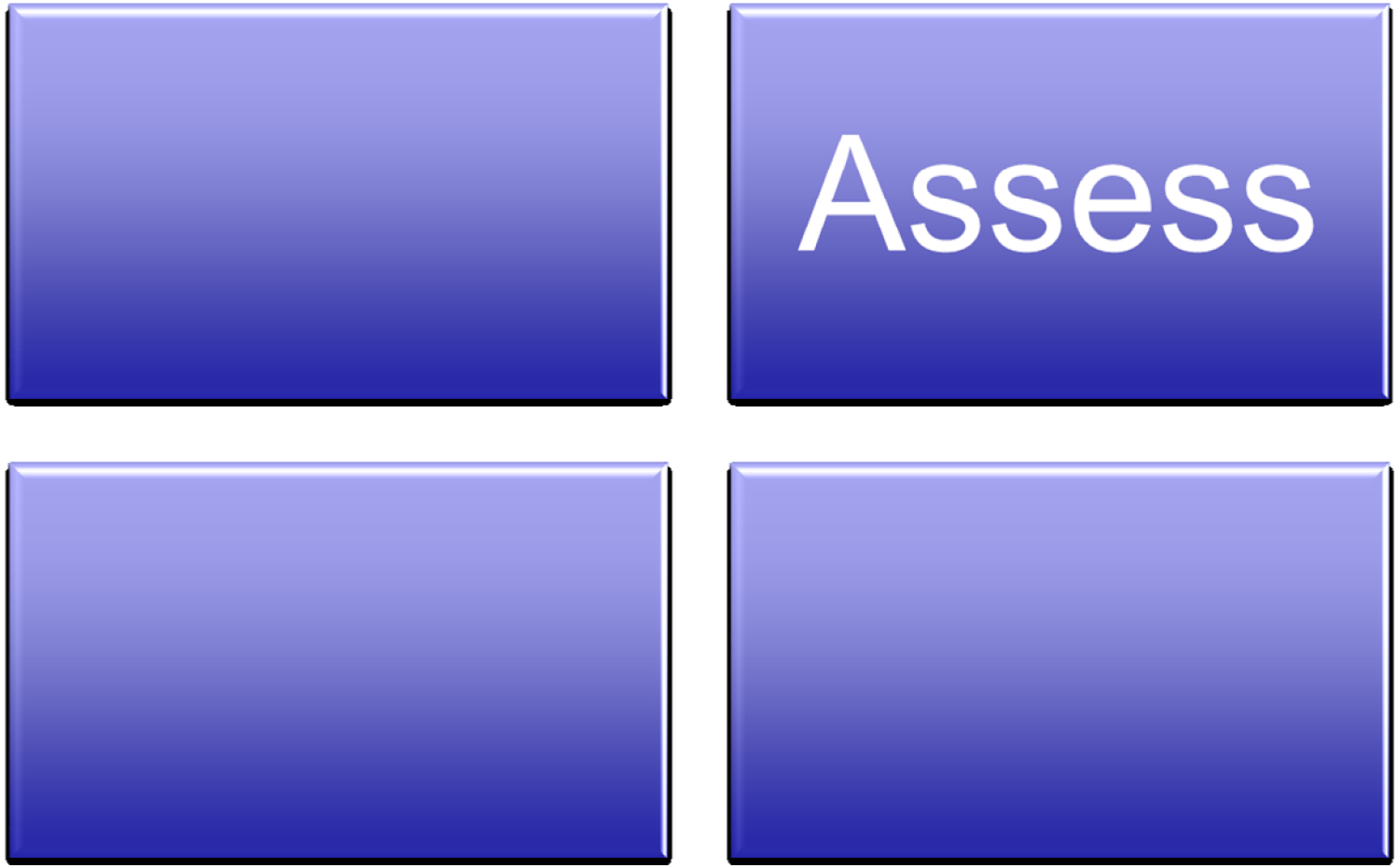

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Obstetric Haemorrhage Record

Patient ID:

Date:

EBL:

Role	Name	Time
Midwife		
Senior Midwife		
Obstetric F2/ ST1-2		
Obstetric ST3 - 5		
Obstetric ST6-7/ SST		
Obstetric Consultant		
Anaesthetic ST		
Anaesthetic Consultant		
Theatre Practitioner		
Other		

Initial Management	Time	
Oxygen 15 litres		
IV access - venflon 1 - venflon 2		
Bloods taken		
Consider cause	[illegible]	[illegible]
	[illegible]	[illegible]
Attach monitoring	ECG	BP
	SPO2	HDU Chart
Placenta delivered	Yes	
	No	
Placenta complete	Yes	
	No	

Arrest Bleeding		
Action	Time	
Bimanual compression		
Catheter in		
Drug	**Dose**	**Time**
Syntometrine or Syntocinon or Carbotecin	1 amp IM 10 u IM/IV 100 mcg IV	
Rpt Syntometrine or Rpt Syntocinon	1 amp IM 10 u IM/IV	
Syntocinon 30 units in 500 ml N.Saline	125 mls/hr	
*Ergometrine	500mcg IM	
Misoprostol	400 mcg sl/pr	
Misoprostol (after 20 minutes)	400 mcg sl/pr	
**Carboprost	250 mcg im	
Carboprost (after 15 minutes)	250 mcg im	
Carboprost (after 15 minutes and up to 8 doses)	250 mcg im	
Other		

Surgical Management	
Time into theatre	
EUA	
Laparotomy	
B-lynch	
Rusch Balloon	
Hysterectomy	
Other	

Major Haemorrhage Procedure activated?

Yes ☐ No ☐ Call time:

Request for: RCC FFP Platelets Cryo

(circle all ordered on initial call)

Time of arrival Red Cells (RCC):

FFP: Platelets: Cryo:

Stand down time:

Fluid Resuscitation		
Type	Volume	Time
Crystalloid		
Colloid		
Blood / blood products		
O negative		
Group specific / cross matched		
FFP		
Platelets		
Cryoprecipitate		
Tranexamic acid		
Factor VIIa		
Other		
Cell salvage Y/N		

Additional Equipment	Time
Fluid warmer	
Arterial blood pressure	
CVP	

*Ergometrine to be given if specified by anaesthetist. **Leave 20 mins between last dose misoprostol & first dose Carboprost
Ensure bag numbers are recorded for all blood products given on anaesthetic chart/ maternity notes before bags returned to lab

Interventional Radiology

Royal College of Obstetricians and Gynaecologists

Setting standards to improve women's health

Green-top Guideline
No. 52

May 2009

Minor revisions November 2009 and April 2011

Available evidence on prophylactic occlusion or embolisation of pelvic arteries in the management of women with placenta accreta is equivocal. The outcomes of prophylactic arterial occlusion require further evaluation.

B

Tranexamic acid

Effects of tranexamic acid on death, vascular occlusive events, and blood transfusion in trauma patients with significant haemorrhage (CRASH-2): a randomised, placebo-controlled trial

*CRASH-2 trial collaborators**

Summary

Background Tranexamic acid can reduce bleeding in patients undergoing elective surgery. We assessed the effects of early administration of a short course of tranexamic acid on death, vascular occlusive events, and the receipt of blood transfusion in trauma patients.

Methods This randomised controlled trial was undertaken in 274 hospitals in 40 countries. 20 211 adult trauma patients with, or at risk of, significant bleeding were randomly assigned within 8 h of injury to either tranexamic acid (loading dose 1 g over 10 min then infusion of 1 g over 8 h) or matching placebo. Randomisation was balanced by centre, with an allocation sequence based on a block size of eight, generated with a computer random number generator. Both participants and study staff (site investigators and trial coordinating centre staff) were masked to treatment allocation. The primary outcome was death in hospital within 4 weeks of injury, and was described with the following categories: bleeding, vascular occlusion (myocardial infarction, stroke and pulmonary embolism), multiorgan failure, head injury, and other. All analyses were by intention to treat. This study is registered as ISRCTN86750102, Clinicaltrials.gov NCT00375258, and South African Clinical Trial Register DOH-27-0607-1919.

Findings 10 096 patients were allocated to tranexamic acid and 10 115 to placebo, of whom 10 060 and 10 067, respectively, were analysed. All-cause mortality was significantly reduced with tranexamic acid (1463 [14·5%] tranexamic acid group *vs* 1613 [16·0%] placebo group; relative risk 0·91, 95% CI 0·85–0·97; p=0·0035). The risk of death due to bleeding was significantly reduced (489 [4·9%] *vs* 574 [5·7%]; relative risk 0·85, 95% CI 0·76–0·96; p=0·0077).

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See Online/Comment
DOI:10.1016/S0140-6736(10)60939-7

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Shakur *et al. Trials* 2010, **11**:40
http://www.trialsjournal.com/content/11/1/40

TRIALS

STUDY PROTOCOL Open Access

The WOMAN Trial (World Maternal Antifibrinolytic Trial): tranexamic acid for the treatment of postpartum haemorrhage: an international randomised, double blind placebo controlled trial

Haleema Shakur*[1], Diana Elbourne[4], Metin Gülmezoglu[2], Zarko Alfirevic[3], Carine Ronsmans[5], Elizabeth Allen[4] and Ian Roberts[1]

Abstract

Background: Each year, worldwide about 530,000 women die from causes related to pregnancy and childbirth. Of the deaths 99% are in low and middle income countries. Obstetric haemorrhage is the leading cause of maternal mortality, most occurring in the postpartum period. Systemic antifibrinolytic agents are widely used in surgery to prevent clot breakdown (fibrinolysis) in order to reduce surgical blood loss. At present there is little reliable evidence from randomised trials on the effectiveness of tranexamic acid in the treatment of postpartum haemorrhage.

Drills and preparation

- Regular ward rounds
- Identify risk factors
- Be familiar with equipment and guidelines (fire drills)
- Senior staff
- Communication

Haemorrhage

- Haemorrhage is the leading cause of maternal death globally and continues to cause maternal deaths in UK.
- Although the number of women who die from haemorrhage in UK is falling 66% associated with substandard care.
- Recognise the problem – regular observations and MOEWS charts.
- Involve appropriate staff – call for help, multidisciplinary care, senior staff.
- Know your local policies – Management of Haemorrhage and Obtaining Blood Urgently.
- New interventions – tranexamic acid, avoiding coagulopathy (shock packs), interventional radiology, cell salvage.

Haemorrhage References

- CMACE 2006 -2008
- AAGBI Safety Guideline Management of Massive Haemorrhage
- RCOG Green Top Guidelines
  - APH No. 63 2011
  - PPH No. 52 2009

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