Placenta Accreta Syndrome (PAS) & Caesarean Hysterectomy:

A Practical Pathway for Theatre Nurses

Rotunda Hospital 2021

AUTHORS & PATHWAY EXPLANATION

The Rotunda Hospital is one of the largest maternity hospitals in Ireland. Like all major maternity hospitals, it has experienced increasing cases of Placenta Accreta Syndrome alongside cases of emergency major obstetric haemorrhage.

Both of which can result in major morbidity and mortality to patients.

Theatre staff must be prepared for these events. This document in conjunction with a new training initiative, has aimed to revise and create new pathways for staff in the Rotunda Hospital to optimise patient care and safety in these challenging cases.

This practical theatre nurse pathway for the preparation of equipment and theatre procedure has been designed and will be reviewed every 2 years for updates.

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INTRODUCTION

WHAT IS PLACENTA ACCRETA SYNDROME (PAS)?

Placenta Accreta Syndrome (PAS), formerly known as morbidly adherent placenta, is the range of conditions where the placenta has become abnormally adherent to the uterus (womb). It includes: Placenta Accreta, Placenta Increta and Placenta Percreta.

- **Placenta Accreta** - grown beyond the endometrium and has attached strongly to the myometrium, the muscular layer of the uterus
- **Placenta Increta -** grown beyond the endometrium and has grown into and deeply invaded the myometrium
- **Placenta Percreta** - placenta can attach and grow so deeply into the lining of the uterus that it grows right through the outermost layer of the uterus (the uterine serosa) and often impacts other organs, such as the bladder

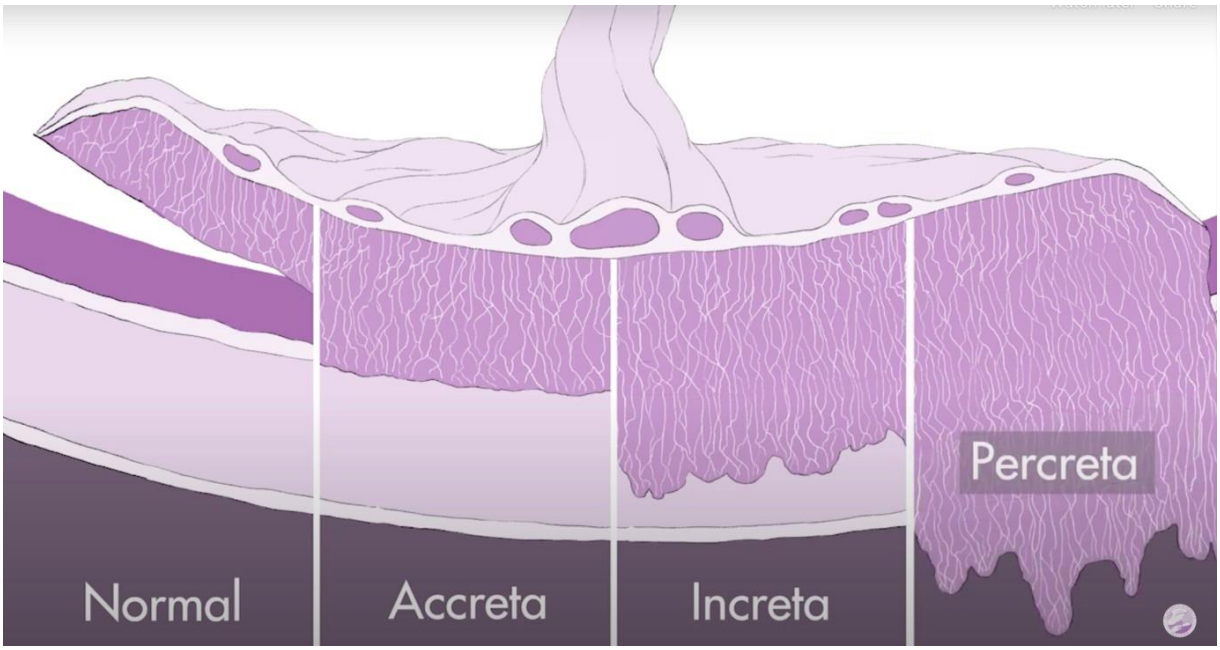


Image from Placenta Accreta Ireland

When a woman has any of these conditions the placenta cannot be delivered in the normal way. Attempts at removing the placenta may result in severe blood loss and maternal death if not treated. Therefore, the safest way to deliver a baby is by elective caesarean section, followed by an abdominal hysterectomy including the placenta (Caesarean Hysterectomy).

WHAT ARE THE RISK FACTORS?

The most common risk factors are:

- Previous C/Section
- Having a low-lying placenta (placenta previa)
- Combination of previous C/Section and placenta previa (greatest risk)
- Previous surgery on the uterus
- IVF
- May have no known risk factors (very rare)

HOW COMMON IS IT & WHAT ARE THE RISKS?

The prevalence of PAS is increasing in conjunction with the increasing caesarean section rate.

An Irish institutional cohort study of 157 162 multiparous women delivered over a 36-year period. Caesarean delivery rates increased from 4.1% in 1975 to 20.7% in 2010. Incidence of PAS disorders increased from 1.65 per 1000 women to 2.37 per 1000 women with prior caesarean delivery between 2003 and 2010. 2

Prevalence has increased in Ireland by 34% from 2005-2010.

This condition can have significant and life changing consequences. It is associated with a significantly higher chance of the following: Haemorrhage, Hysterectomy, Blood Transfusion, Anaemia, Abdominal organ injury and Intensive care unit admission.

Mortality across high income countries is still reported as high as **7%**.

THE DIAGNOSIS OF PAS & PRE-OPERATIVE PATHWAY

DIAGNOSIS

Antenatal diagnosis of PAS is critical and results in the reduction of maternal morbidity by:

- Reduction of peripartum blood loss and need for blood transfusion
- Planned delivery in appropriate setting
- Reduce need for emergency hysterectomies

All patients with suspected PAS are referred to the Placenta Accreta Syndrome MDT which is held once every month with our colleagues at the National Maternity Hospital.

MRI can be performed alongside regular USS by a Maternal Medicine specialist.

PRE-OPERATIVE PATHWAY

A pre-operative pathway is key to preparing the patient and their family for what can be major surgery with significant risks of complications.

This will include:

- Optimisation of pre-operative Hb level
- Pre-op review and assessment by Anaesthetic Team
- Pre-op review and assessment by Consultant Gynaecological Oncologist
- Regular pre-op review and assessment by Consultant Maternal Medicine Specialist
- PAS-MDT decision on optimal gestational age for delivery and location of delivery
- Discussion and review by Neonatal Team
- Antenatal steroid administration
- Plan for the event of emergency delivery
- Surgical plan including incision, type of anaesthetic also to be made in advance with consent completed
- Plan for admission with HDU and neonatal bed booked
- Blood crossmatch (x 4-6 units)
- Cell salvage available

OPERATING THEATRE PREPARATION & POSITION

PRE-OPERATIVE HUDDLE

It is best practice before major surgical cases for all members of the team to meet beforehand. This should take place in theatre. All essential personnel should be present including:

- Consultant Anaesthetist & Anaesthetic Nurse x2 (1 x airway & lines, 1 x cell savage, blood products & scribe)
- Consultant Obstetrician
- Consultant Gyanecological Oncologist
- Scrub nurse x2 & all circulating nursing x2
- Midwife
- Neonatal Team
- ADOM/ Theatre manager
- Pharmacy
- Laboratory & haemovigilance officer

Team introduction should be made and the surgical lead should present case to the team.

The patients name, age, gestational age, obstetric and surgical history and what the planned procedure is should be confirmed.

Confirmation of the following elements should be made:

Patient Information	Anaesthetic Considerations	Surgical Considerations	Neonatal / Post op concerns
Consent	GA / CSE	Confirm surgical incision	Confirm Neonatal bed available
Patient Hb pre op	Line requirement	Need for USS? ?display of scans in OT	Confirm maternal HDU bed available
BMI concerns	Antibiotic cover	Discuss surgical concerns – potential bladder involvement/need for ureteric stenting etc	
Where partner is waiting	Cell Salvage / Blood products available	Additional equipment confirmed	

THEATRE PREPARATION

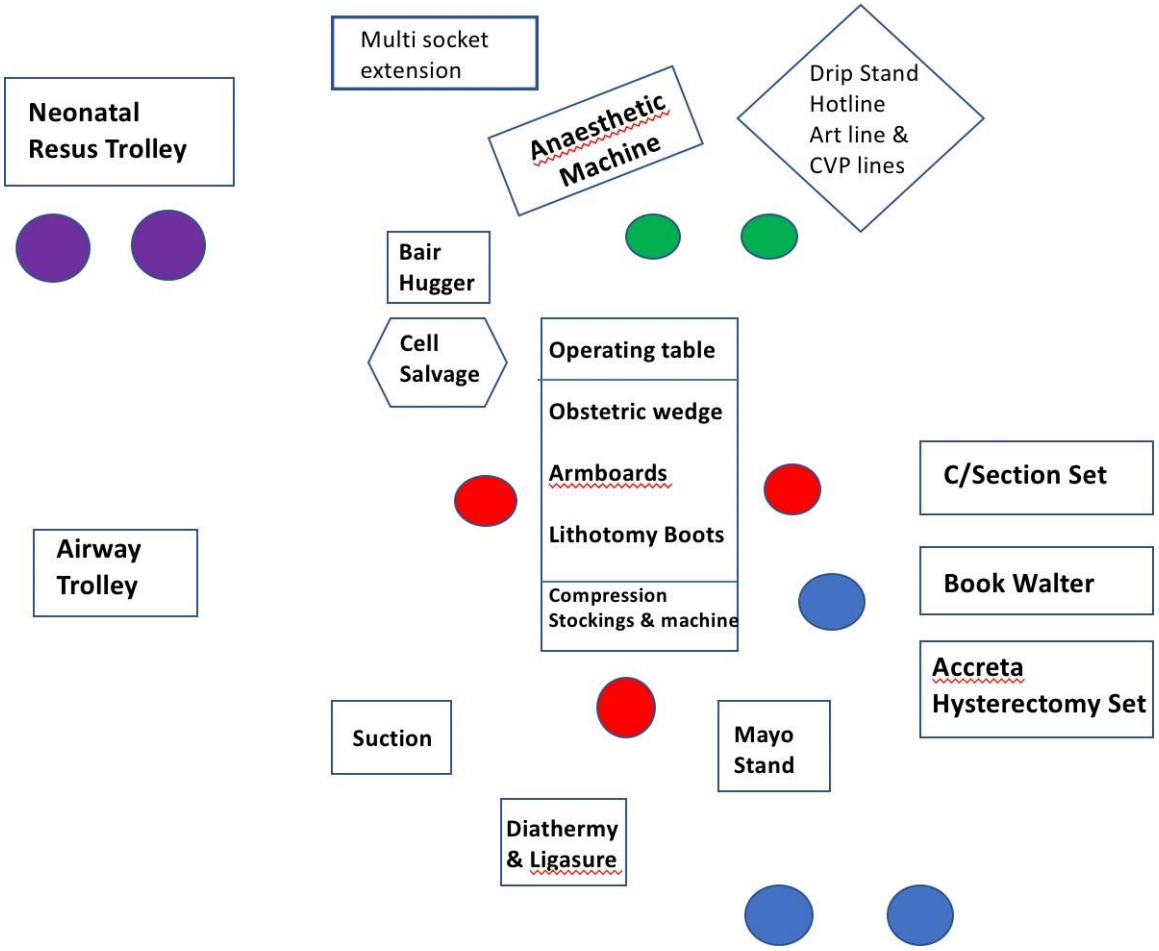
These complex cases should be first on the theatre list. Early preparation is key.

Important points to remember include:

- It is best to only have necessary equipment in the room as there is a lot of personnel involved in these surgeries.
- All extra drip stands and clutter should be removed from the theatre.
- The patient will be placed in **lithotomy** for the case.
- The use of the obstetric wedge will depend on the surgeons approach to the surgery and patients position.
- The urinary catheter should be placed under the right leg and the hourly bag in view of the anaesthetic team.
- Sequential compression stockings should also be used.

THEATRE LAYOUT

The following is a typical example of how the theatre should be laid out on the day.



Personnel Key:

- Anaestetist & Anaesthetic Nurse
- Surgical Team
- Scrub Nurse & Nursing Team
- Neonatal Team

ANAESTHETIC REQUIREMENTS

The Anaesthetic Nurse is crucial to this pathway and needs to plan for a major case with the Consultant Anaesthetist.

Important points to remember:

- These patients are understandable extremely anxious and you are key to helping them through this part of their journey.
- Majority of cases will be under general anaesthetic (GA) but epidural or combined spinal-epidural may also be used.
- All lines and all preparation **must** be done before the GA is commenced.
- Two or more large bore peripheral lines will likely be required and will normally include: a hotline, an arterial line and possibly a central line.
- A large bore IV cannula to be used for induction and then all other lines to be placed post intubation.
- With a long surgery time patient temperature must be maintained and monitored.
- The under heated mattress along with a Bair hugger must be available for use.
- The requirements for cell savage and rapid infuser should be assembled prior to the patient coming to theatre.
- The patient's armband should be taped onto left shoulder or a second armband available for ordering of intra operative blood tests, recording of ABGs and checking of blood products during the case.

EQUIPMENT REQUIRED FOR ARTERIAL/CVP LINE

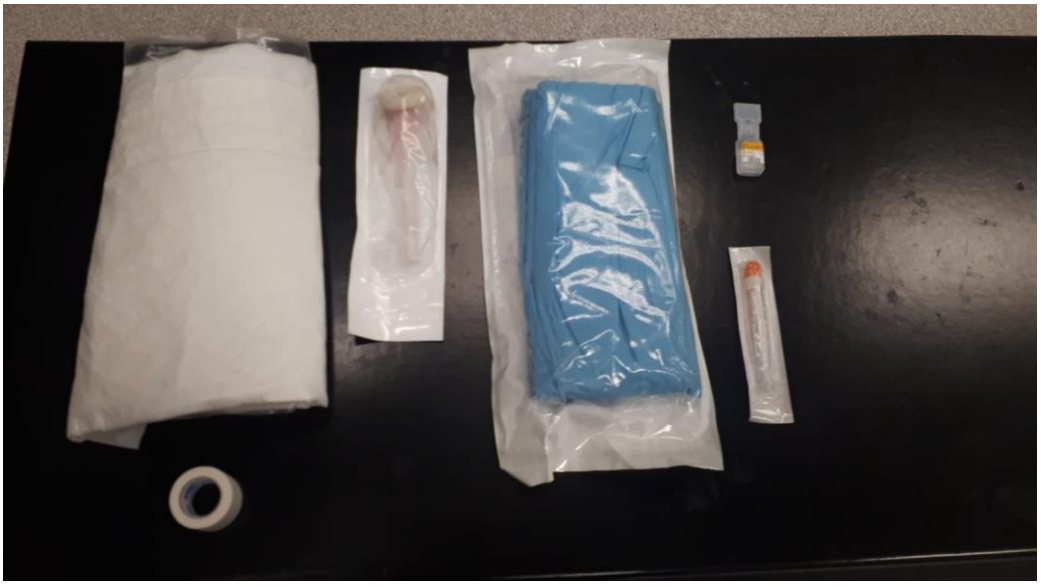
Equipment Name	Details
Pressure bag and 1litre NaCl	To flush through line
Double Art/CVP set	
Bracket	To hold Art/CVP to drip stand at appropriate level
Transducer cables x 2	To connect Art/ CVP to monitor for measurement

Example:

EQUIPMENT FOR ARTERIAL LINE INSERTION

Equipment Name	Details
Bag of Gelofusion wrapped in Inco sheet	To place under wrist for ease of access when inserting line and absorb any spillages while inserting Art line
Tape	To hold hand in position for insertion of line
Chloraprep	To clean area prior to insertion of invasive line
Arterial line pack	Contains all materials needed for insertion of arterial line
ABG syringe	For pre op gas to have baseline blood values prior to surgery
Lidocaine	Only used if placing arterial line while the patient is awake to numb area

Example:



EQUIPMENT FOR INSERTION OF CVP/ VASCATH

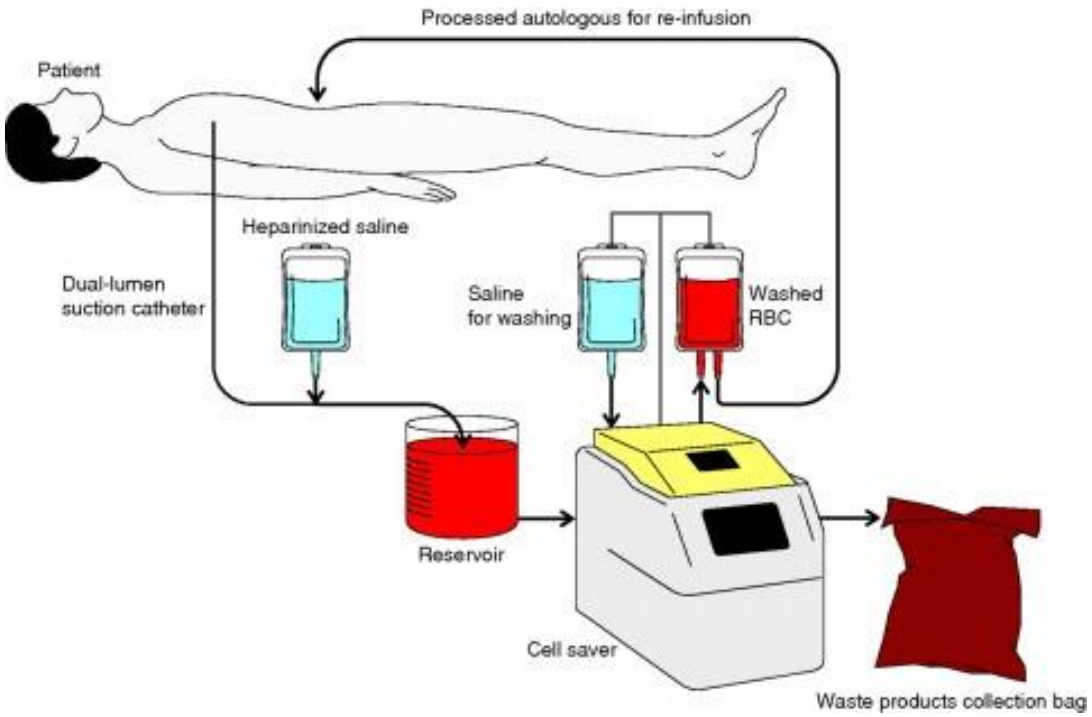
Equipment Name	Details
Inco sheet under patients right shoulder	To absorb any spillages when inserting line
Chloraprep	To clean skin prior to placing invasive line
CVP pack	Contains all basics for insertion of line
CVP/Vascath pack	Anaesthetist may use one of these as central venous access in patient
10mls NaCl amp x 2	To flush line prior to insertion
Tegraderm dressing	Dr. Thornton will use this to cover line in patient as he doesn't like one in the pack

Example:

CELL SALVAGE

SET UP GUIDANCE FOR CELL SALVAGE

Consent for autologous transfusion should be obtained pre-operatively.



Cell Salvage set up steps (Pre-op)

- Collect all the necessary equipment on a trolley in advance
- Put the reservoir (filter) in the cell salvage machine, the three blue inlets should face the operating site, the yellow suction port should be at the back.
- Connect the suction tube to the **Yellow** port.
- Close the bottom outlet completely in the reservoir B (**Red**).
- Hang a litre bag of NaCl and add 30,000 units i.e. Heparin Sodium. Attach the Heparin label to the bag (signed by 2 people)
- Plug in both power cables (**Black**)
- Turn them on and check whether they are working (keep them on)
- Connect the A.A. cable to the Heparin solution and to the middle **(Blue**) inlet port.
- As the scrub nurse connects the Yankauer suction nozzle to the other end of the A.A. cable, run the Heparin solution and keep the suction on, collect at least 200ml of

solution in the filter reservoir by tapping the canister. Then slow down the drip 1gtt/second.

- Try using the general suction to suck out the amniotic fluid, placental debris, vernix caseosa etc.
- Use the cell salvage suction for fresh bleeding, encourage team to use less swabs to clean the surgical field.
- As soon as more than 400ml of blood collected in the canister (reservoir), after consulting the anaesthetist, set up the (processor) washing and collecting the red cells to be transfused back to the patient within 6 hours.

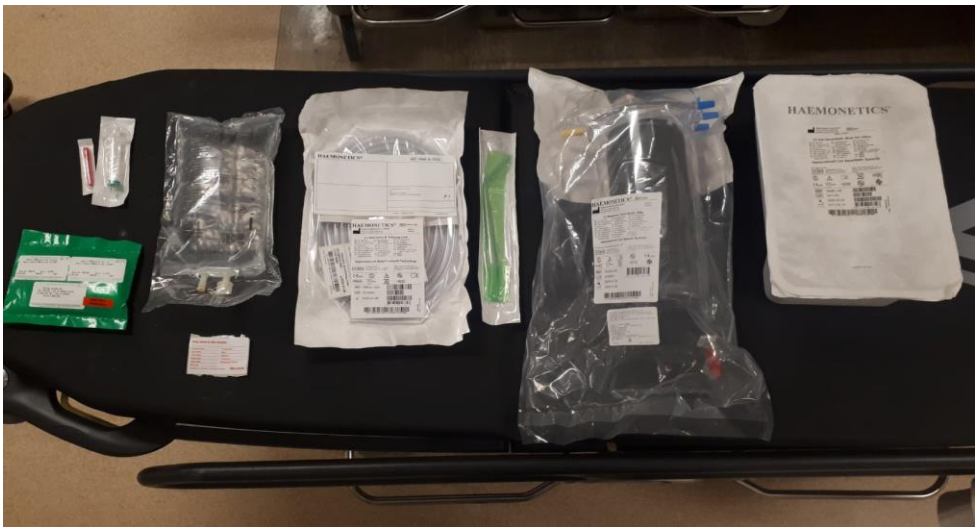
Processing and Transfusion

- Hang 2L of NaCl .
- Open the bowl set (processor).
- Hang the washed, waste fluid collection bag.
- Put the bowl and lock it, try to spin the bowl manually
- Put the tricoloured tube set and close the lids.
- Connect both the yellow cables to both the NaCl bags and keep one clamp open to flow at a time.
- Connect the **Blue** cable to the red cell collecting bag
- Connect the **Red** cable to the bottom outlet of the filter reservoir (allow it to flow).
- Keep the centrifuge machine on.
- Once everything is connected, start the processing by pressing the start button (make sure it's in Auto mode).
- Keep an eye on the monitor panel to follow any other instruction.
- Once it's washed automatically the washing process will stop and red cells will be collected with a 60 sec of pause.
- Once 750ml of collected fluid washed, for further washing of collected blood you need to press start button again
- Keep an eye on NaCl washing fluid, it should not run out
- If washing finished and after 2 minutes the bowl is not being empty please press (empty) button to collect clean red cell.
- Start transfusion as soon as 300ml blood collected, by add the special filter cable (supplied for cell salvaged blood).
- The collected blood should flow by gravity. **No pressure bag applied.**
- Please keep informing the anaesthetist the amount of red cells transfusing (if a large amount is being given back there is no plasma or platelet being collected via cell salvage so that it can be replaced by (lab. supply).

EQUIPMENT TO SET UP CELL SAVAGE

Equipment Name	Details
30000 units of heparin in 1L NaCl	To prevent any red cells that are collected from clotting
Cell Savage suction and Yankeur	To collect blood during case
Blood collection canister	To store all blood collecting during case for possible transfusion
Centrifuge Bowl	Used to separate red blood cells for transfusion back to patient

Example:



ANAESTHETIC REQUIREMENTS IN CASE OF MAJOR HAEMORRHAGE

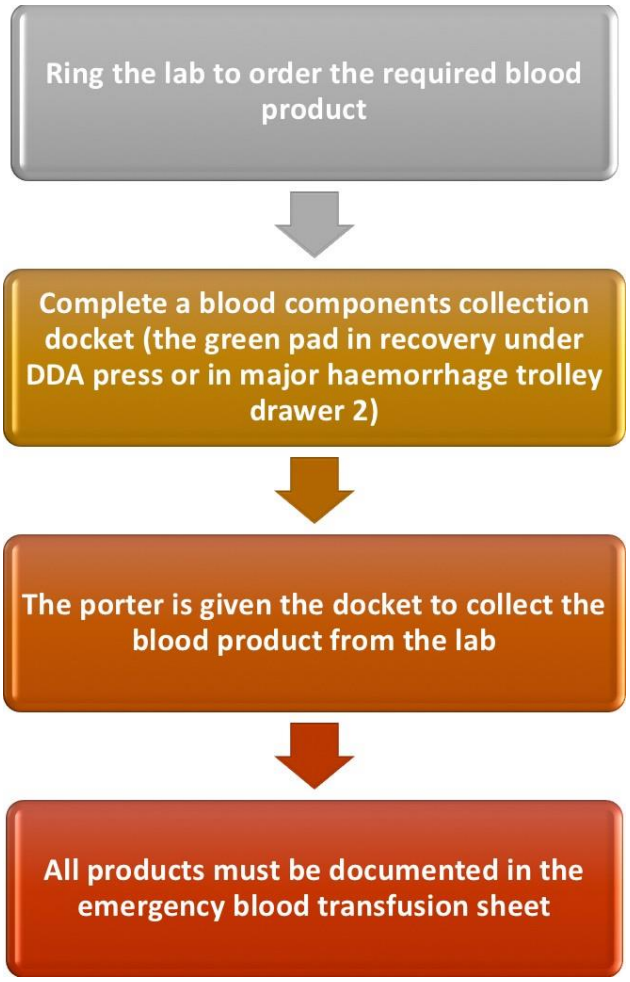
If major bleeding does occur a **Code Red** will be called.

The number of the haematology lab is extension **1463** or bleep **538.**

The Anaesthetist will request the required products with the Anaesthetic Nurse.

Clear communication with our Laboratory colleagues is paramount

The process is as follows:



HOW TO PREPARE FIBRINOGEN FOR ADMINISTRATION

Using aseptic technique

1. Remove cap from the product vial and sterile water bottle.

2. Clean the rubber stopper with Clinell wipe.

3. Using Rowespike and 50ml Leurlock syringe transfer 50mls of sterile water into the product vial.

4. Gently stir the water in the vial till the product is dissolved and you have a clear solution. **DO NOT SHAKE** the vial.

5. Transfer back into the 50ml Leurlock syringe and give to the anaesthetist to administer to the patient.

RAPID INFUSER

If persistent major bleeding does occur the rapid infuser may be required.

HOW TO SET UP RAPID INFUSER

1. Connect to the power supply.
2. Switch on.
3. Wait 4 seconds for the self-test.
4. Insert the plate once the sign shows up on the screen.
5. Spike the fluids in the chamber and prime the set.
6. Make sure one chamber is used at a time.
7. Place the de aeration chamber in the air guard and with a 20ml syringe remove the air and close the chamber.
8. When the loading of the set is done. Switch the + sign in the pressure chamber to be used. The - sign on the chamber that is not in use.
9. Open the clamps on the set except the chamber that is not in use. Switch on the air guard.
10. The infuser will then start operating without any alarm. The flow will be from 20-750mls per min.
11. Once the fluid or blood is finished use alternative chambers and keep hanging products as required.
12. Keep a record of all fluids administered.

OPERATING EQUIPMENT PREPARATION

PREPARATION IS KEY

- All equipment **Open and Checked** *PRIOR* to GA
- Catheter insertion
- Stirrups in place
- *ON/PRIOR to* GA immediately place diathermy pad and check settings
- Cell salvage machine must be ready
- Clean and drape immediately following GA

THE SETS

CAESAREAN HYSTERECTOMY SET

The standard abdominal hysterectomy set, has been reviewed and extra items have been combined to create an optimal PAS set called caesarean hysterectomy set. Along with this the deep pelvic set, Zeplin clamps set, a standard caesarean section set and Book-Walter 1 and 2 is required.

Particular items to check pre op include:

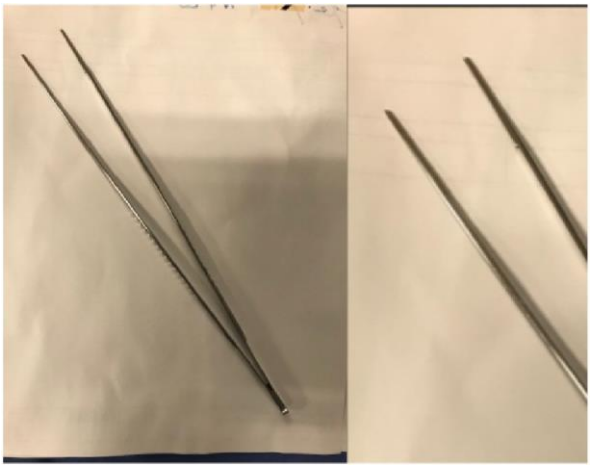
- Hysterectomy clamps: straight, slightly curved and curved
- Forceps: Russians and Debakey's
- Scissors: fine Metz
- Right angles

Hysterectomy Clamps

STRAIGHT SLIGHTLY CURVED CURVED VERY CURVED

Forceps

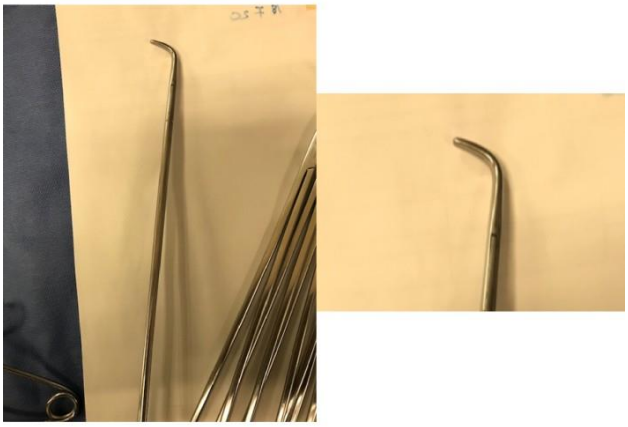
RUSSIANS



DE BAKEY'S

Scissors & Right Angles

METZENBAUM SCISSORS



MOST IMPORTANT INSTRUMENT EVER!

Place the caesarean section set on to a smaller separate table. Once baby is delivered this can be removed.

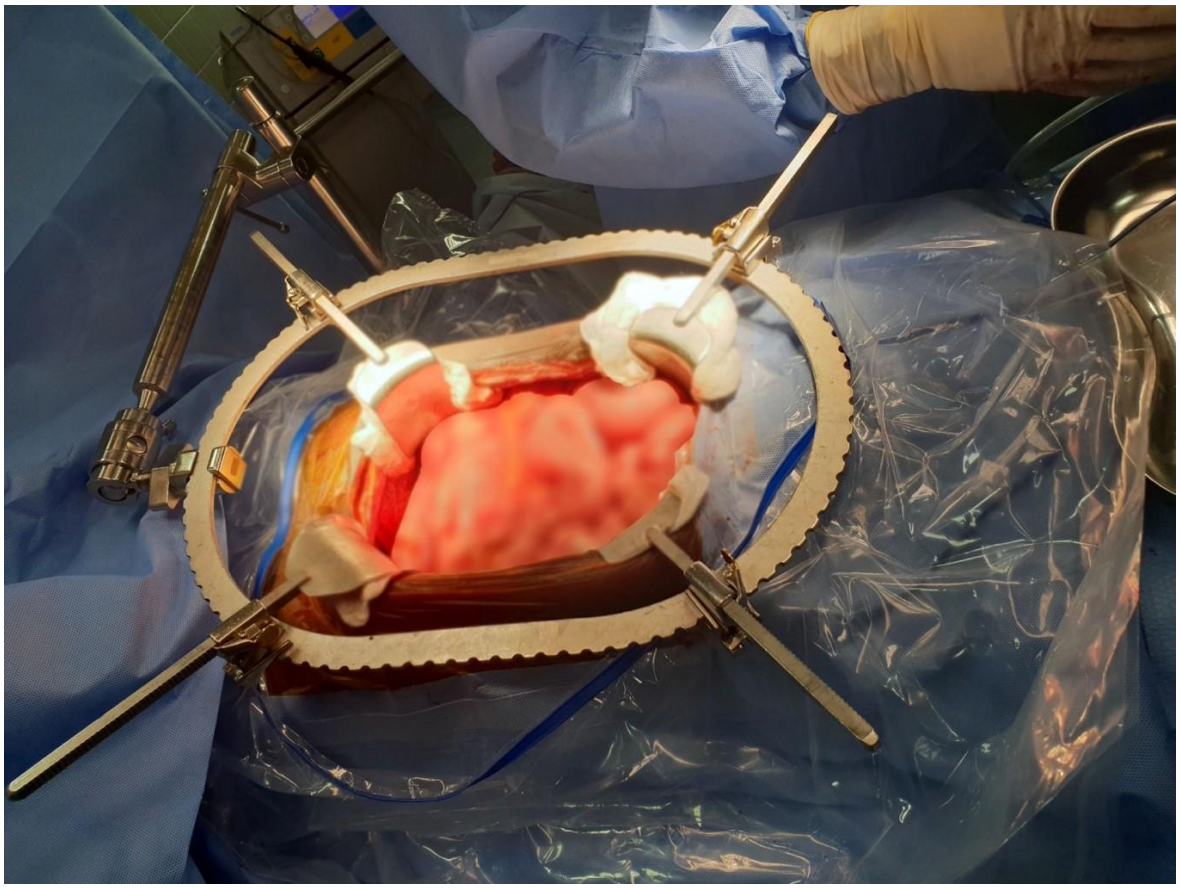
BOOK-WALTER SET

The Book-Walter is an invaluable retractor in these difficult cases. The set should be placed on a separate table behind the main surgeon who will assemble it.

Check all elements present prior to GA

- including the tightening leavers on both the table bar and cross bar are moveable
- the screw to attach the Book-Walter ring opens and closes
- the clamps to hold blades in place open and lock close
- that all 4 screws are present

Assembly will look as follows:



ADDITIONAL EQUIPMENT THAT SHOULD BE OPENED AS STANDARD

DRAPES, BOWEL STAPLER, ENERGY DEVICES & SUTURES

DRAPES

Square drapes from an abdominal hysterectomy pack along with leggings should always be used for these cases. **NOT** a standard C/Section drape.

Important to place under buttock drape with collection sheath in order to monitor for heavy PV Bleeding. Urinary catheter should be placed prior to GA.

Everything should be in place prior to GA with abdominal prep and drape performed as quickly as possible .

BOWEL STAPLER & CLIPS

GIA 60/3.8 is device used and must be opened as standard at start of set up.

One handpiece and 4 refill clips required for each case.

All cases require Ligaclip Medium to be opened.

ENERGY DEVICES

Diathermy with extension tip. Settings: 30 Cut and 30 Coag.

Please place diathermy pad prior to GA if possible and ensure settings correct.

Ligaure Impact should always be opened and in place.

SUTURES

The following sutures will be required and should be at least 2-3 open at all times so ready in the event of major haemorrhage:

- 1 Vicryl
- 2.0 Vicryl
- 3.0 PDS
- 1 & 2.0 Vicryl ties
- Loop PDS for closure
- Monocryl 3.0 on straight needle for closure

CAESAREAN HYSTERECTOMY PROCEDURE

- Clean & Drape including under buttock drape
- Set up Diathermy & Ligasure impact immediately
- Midline Incision
- Book-Walter set up
- Bladder mobilised before delivery
- Bilateral salphingectomy performed (ovaries conserved if normal)
- Fundal uterine incision with apllication of GIA staplers & relaods
- Delivery of baby (it make take some time before this - operating time to prepare first is key to reducing blood loss)
- Initiate cell salvage if not already
- Do NOT attempt to deliver placenta
- Proceed to hysterectomy
- Robinson's Drain
- Closure with Loop PDS & Monocryl on straight needle
- Be aware of need for cystscopy and ureteric stents if there has been bladder involvement
- Careful estimation of EBL and record transfusion type and amount

POST OP CARE

Post operative care is also extremely important in these cases. Patients may develop complications in the immediate post op period and therefore close monitoring is essential and a clear hand over from theatre to HDU/Ward staff

Theatre time out at end of procedure should therefore include:

- Summary of operative procedure
- Clarification of estimated blood loss
- Scanning of all documentation including blood transfusion record, scribe note, count sheet, etc
- HDU level care and specific concerns addressed
- VTE prophylaxis & Physiotherapy
- Assess if further antibiotics required & charted
- Laxatives
- Analgesia
- Should have an appointment on discharge for a gynae clinic in 6-8 weeks
- All post op cases will also be discussed at the PAS MDT

FINAL COMMENT

These complex and challenging cases are continuing to increase. The MDT which cares for these patients includes all of us. Together with teamwork, good communication and training, the Rotunda Staff will continue to offer the best care possible to our patients.

Anaesthetic Nurse Quick Checklist for PAS

Patient Details	**Anaesthetic Nurse**
Consultant Anaesthetist	

Equipment Set	Confirm	Comment
SPINAL/COMBINED SPINAL-EPIDURAL • Standard equipment for spinal • CSE kit and NaCl if required	[ ]	
AIRWAY & BREATHING • Standard equipment for GA • SpO2 monitor	[ ]	
CIRCULATION • Standard 3 lead ECG • BP Cuff (appropriate size) • 2 cables for Art Line & CVP • Double cable Art Line set flushed through 1 litre NaCl in pressure bag • Syringe driver x 2 • Rapid infuser and Giving's set • Compression stockings and pump	[ ]	
ARTERIAL LINE • Bag of Gelofusion wrapped in inco sheet • Tape to secure hand • Arterial Line pack • Chloraprep applicator • 1% Lidocaine • ABG syringe (for pre op ABG)	[ ]	
CENTRAL LINE • Inco sheet under neck/shoulder right side • CVP Pack • Chloraprep applicator • 1% Lidocaine • Tegraderm dressing (for patch)	[ ]	
CELL SALVAGE • Machine & suction set for cell salvage • Yankauer tip • 30,000 units Heparin pack • 1 litre NaCl • Transfusion Kit	[ ]	

EXTRAS • Bair Hugger • 2nd Armband and Stickers • 3 pressure bags • Blood collection book	**[ ]**	
FLUID AND BLOOD PRODUCTS • Hartman's Solution 1 litre x 4 • Gelofusion x 4 • 100mls NaCl bags x 4 • 5% Glucose x 1 (to make up noradrenaline) • Cross matched blood products (red cells, Octoplase, fibrinogen, platelets) • Blood Transfusion sets x 2 • Rowespikes x 1 box • 60ml Leur lock syringes x 1 box • 100mls water bottles x 2 boxes	**[ ]**	
Check Patient ID & Consent	**[ ]**	
Check Patient Hb	**[ ]**	
Check Patient Coag	**[ ]**	

Scrub Nurse Quick Checklist for PAS

Patient Details	**Scrub Nurse**
Consultant Gynae Oncologist	**Consultant Obstetrician**

Equipment Set	Confirm	Comment
Drapes • Abdominal hysterectomy pack • Lithotomy leggings • Under buttock drape with pouch	[ ]	
SETS • Caesarean Hysterectomy set • Deep pelvic set • C/Section set • Book-Walter (set 1 & 2) • Zeplin clamps set • Cystoscope (standby)	[ ]	
KEY INSTRUMENTS • Hysterectomy/Zeplin clamps • Scissors inc Metz • Forceps • Right Angles	[ ]	
ENERGY • Standard diathermy (in pack) • Extension tip • Ligasure Impact LF4418	[ ]	
EXTRAS • Cell salvage in place • Normal Suction • Cord clamp • Ligaclips Medium (open) and large • GIA 60/3.8 Hand set blue Ref: 6038S • 4 x GIA reloads Ref 6038L • Cloraprep applicator for abdominal prep • Betadine/Saline for prep	[ ]	
SUTURES • 2.0 & 0 Vicryl ties • 1 Vicryl on needle • 2.0 Vicryl on needle • 3.0 PDS • 1 Loop PDS x 2 • Monocryl on straight needle 2.0/3.0	[ ]	