High risk Obstetric Unit

Concept & Establishment

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Goal – Healthy Mother/Healthy Baby

Obstetric Care

- The majority of women during their pregnancy, labor and postnatal period require care that can be met through routine obstetric care.

- A small but significant number, however, require critical care
  - Related to the pregnancy itself
  - Aggravation of a preexisting illness
  - Complications of the delivery

High Risk Pregnancy Care

- When things go wrong in obstetrics they go wrong fast - they fall off a cliff.

- One minute mother and baby are happily savoring the view from the top, and the next they are tumbling over the edge and free falling onto the rocks far below.

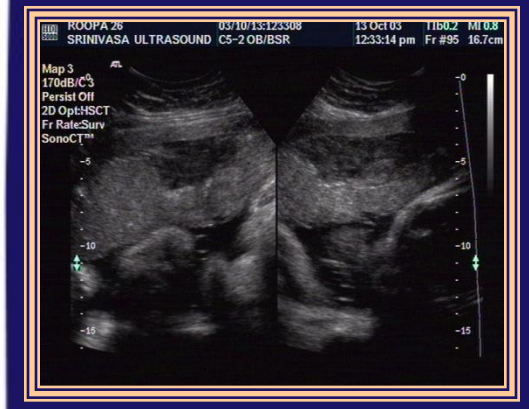
Near Miss

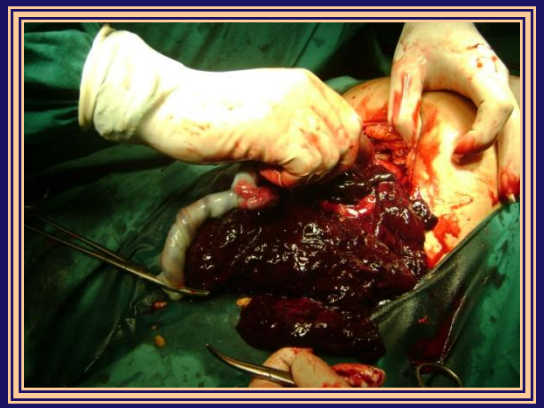
A near-miss obstetric morbidity means a woman (in pregnancy/labor/ puerperium) who almost died but survived

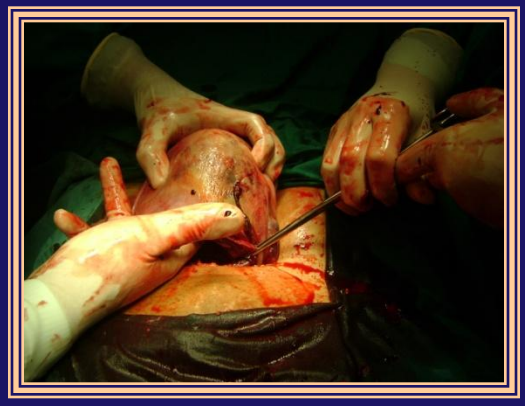
- For every maternal death that occurs, between 11 and 223 women experience a ‘near miss’ event in pregnancy

- Incidence : 0.07% to 8.23%
  Case fatality ratio 0.02% - 37%

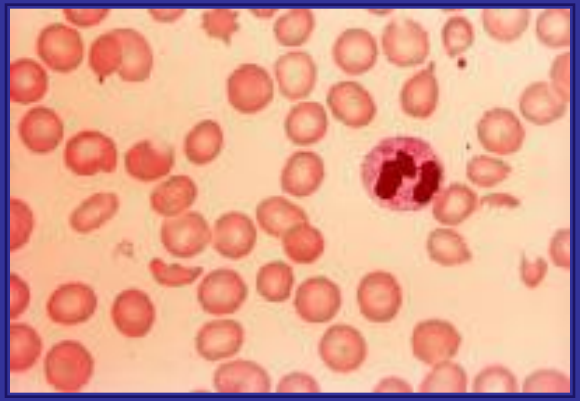
Hemorrhage/Anemia and hypertensive disorders are the 3 common contributors



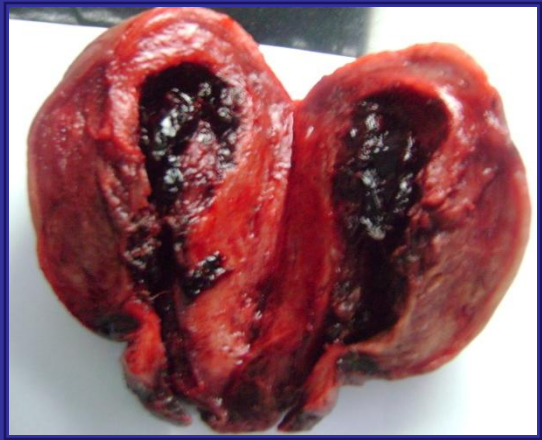




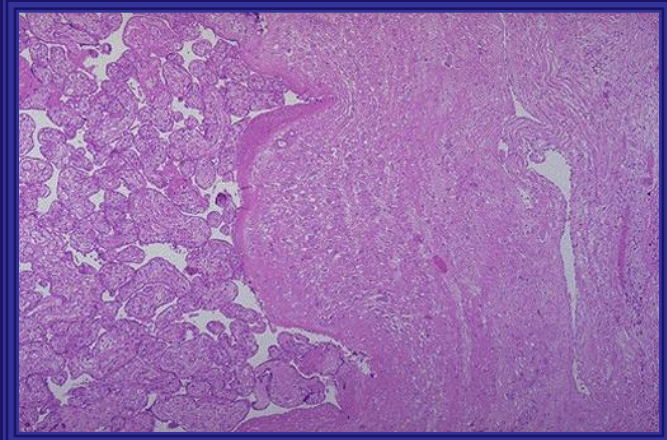
Accidental Hemorrhage- Placental abruption, couvelaire uterus



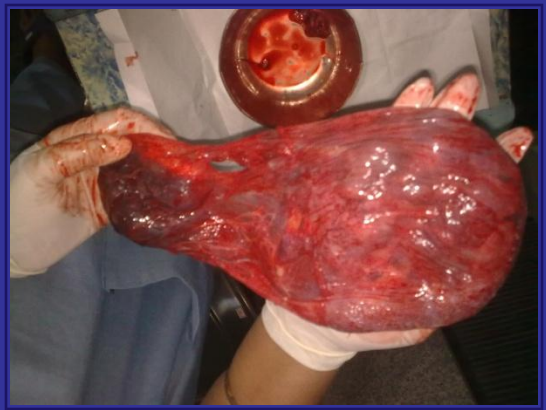
PET / DIC/ Hemolysis



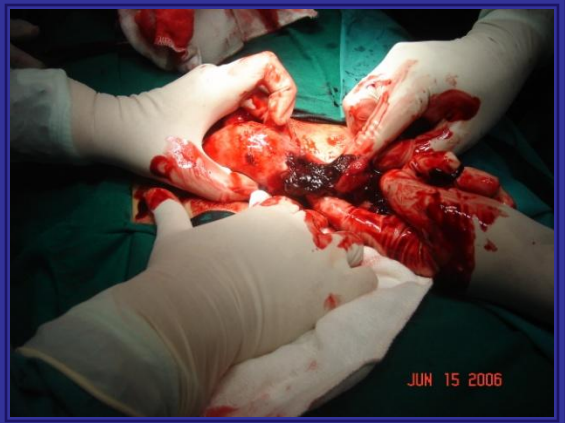
Adherent Placenta



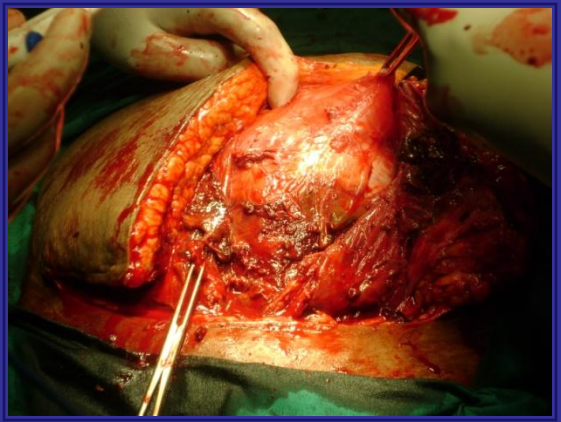
Placenta Accreta
Trophoblastic invasion into myometrium



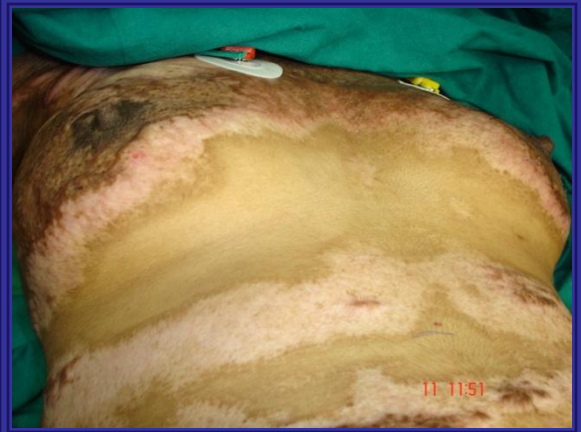
Placenta Succenturiata



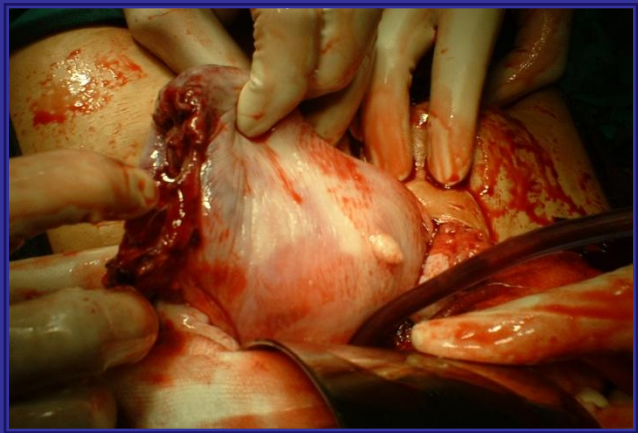
Ruptured Ectopic



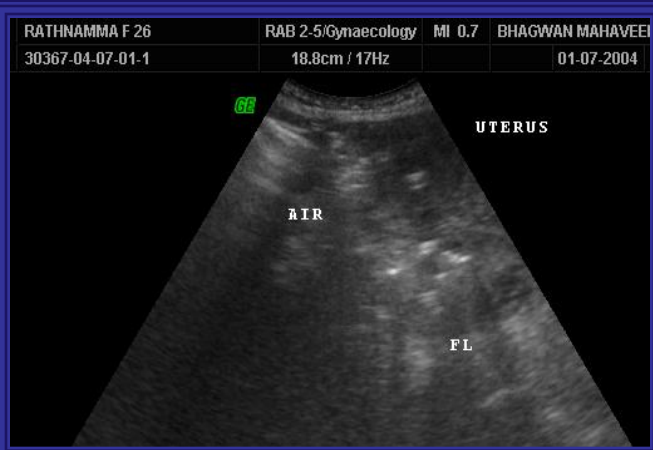
Sepsis with adhesions



Burns during pregnancy

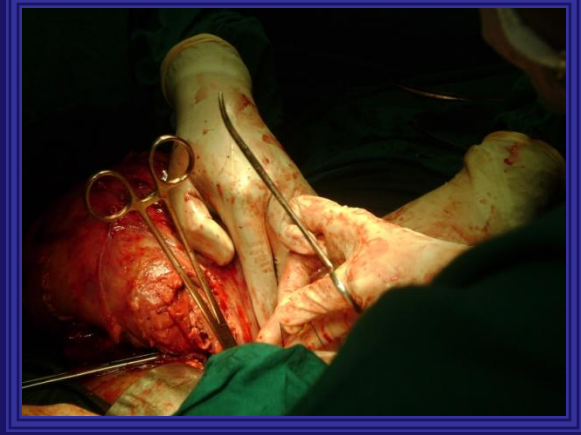


Rupture uterus

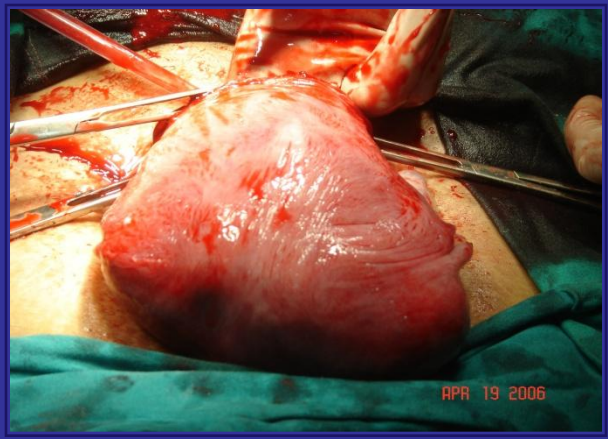


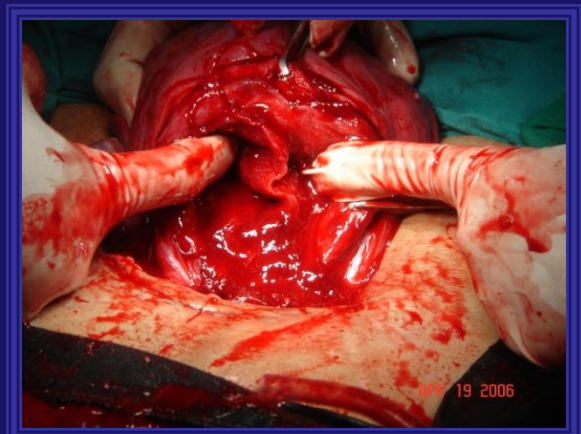
Perforation during abortion

Sepsis – Bacterial Colonization

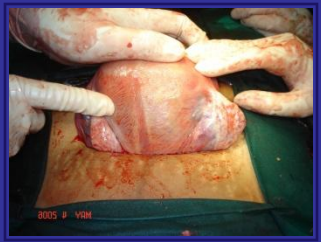


Obstetric hysterectomy in progress

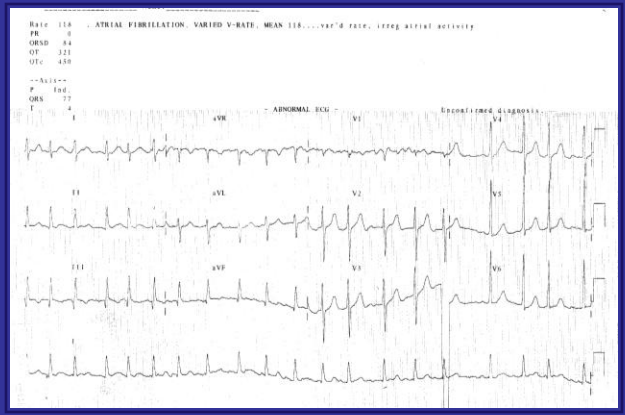




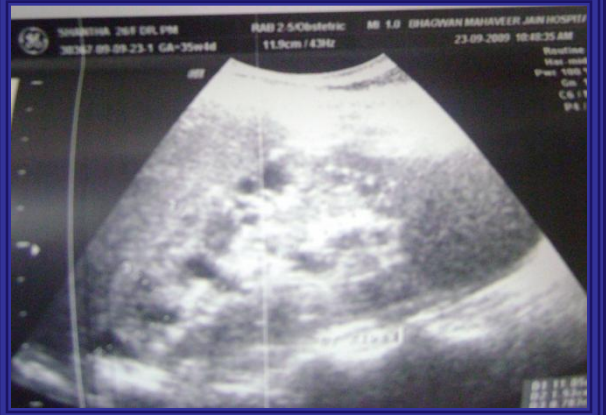
Retained placenta with uterine anomaly



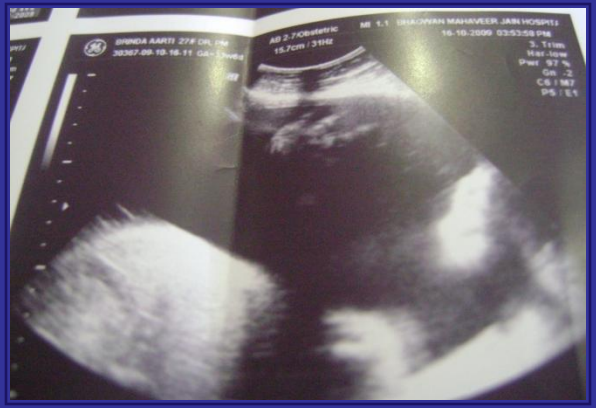
Jaundice with Pregnancy



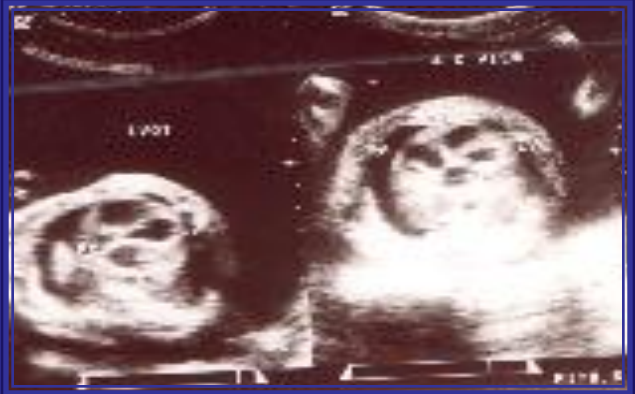
Cardiac Disease - MS with AF



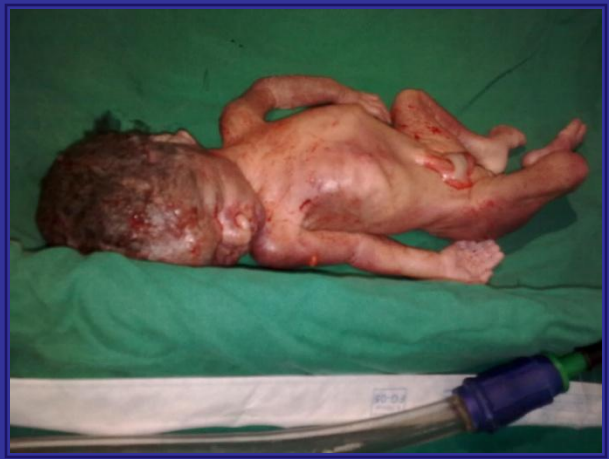
Adult Polycystic Kidney Disease



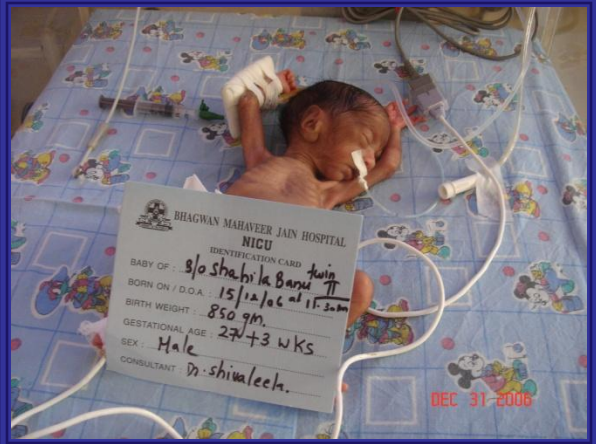
Hydramnios



Fetal Anomaly - Cardiac



IUD



Pre Term

Reaching The Unreached FOGSI 2010 INITIATIVE

Spectrum of Care

Home Care → Antenatal Care

↓

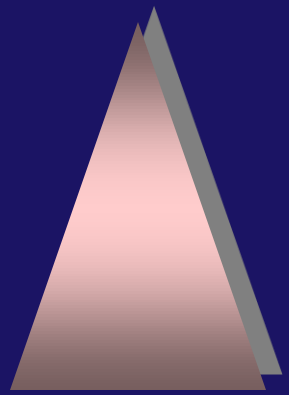
Critical Care ← Inpatient Care

Specialized Care

- Maternal morbidity and mortality can be reduced by meticulous adaptation of safe motherhood initiative
- Provision of separate ICU services for critically ill obstetrical patients and
- Early assessment and aggressive intervention through a team approach involving obstetricians, intensivists and anesthetists

High Risk Care Concept

Patient



Technology

Man Power

Prevention by Progress

The Labor Theatre

Prevention by Progress

The Operation Theatre

Fetal Surveillance

Ultrasound/ Doppler & CTG

Critical Care

- Care of critically ill patients is a unique challenge in obstetrics requiring thorough knowledge of physiology of mother and fetus.
- Pregnancy affects every system. Altered maternal physiology, the presence of a fetus and diseases specific to pregnancy pose various challenges in providing care to critically ill obstetric patients.
- Medical conditions might present risk to the pregnancy and pregnancy may modify the disease state.
- Drug therapy may be affected by altered pharmacokinetics or have impact on the developing fetus.
- Obstetric patients are generally young and healthy & recover rapidly. However, the potential for catastrophic complications is real.

The HDU Concept

A critically ill obstetric patient usually recovers rapidly after delivery with fewer specific interventions in ICU and a good overall prognosis. Hence the concept of High Dependency Unit or the HDU.

- Area for patients who require more intense observation than provided on floors
- Provides a standard of care intermediate between acute labor suite and full ICU for high risk obstetric patients & those with medical conditions
- HDU care is cheaper as compared to ICU Care.
- Provides high level of individual, medical, and psychological care, delivered by staff who understand the physiology and pathology unique to obstetric patients
- HDU would not normally accept patients requiring mechanical ventilation, but could manage those receiving invasive monitoring

PLANNING AN OBSTETRIC HDU

- Cost of initial capital expenditure
- Purchase of new technology
- Recruitment of staff
- Rolling annual cost and other indirect costs (training, consumables, IT facility etc.)

Pooling of cases and / or early proper referrals makes it a viable unit

Setting Up of HDU

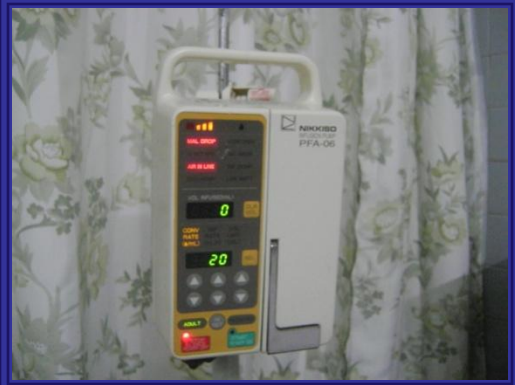
- Space
- Equipments
- Personnel
- Protocols
- Audit
- Education & Training

Space

- Adequate space per bed as part of labor suite/floor
  near ICU or OT
- There should be at least one fully equipped obstetric theatre within the delivery suite.
  Where this is not possible, a lift, which can be commandeered for the rapid transfer of women
  to theatre must be available
- Blood bank facility

Equipments

Equipment Name	Manufacturer	Approximate cost
Infusion Pump	B. Braun, JMS, Fresinius	Rs 50 – 75,000/-
Syringe Pump	Baxter, B. Braun, JMS	Rs 38- 50,000/-

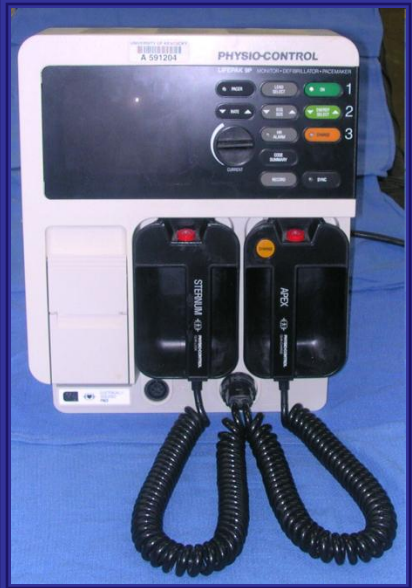


Equipments

Equipment Name	Manufacturer	Approximate cost
Wall Suction	Global Medical system D&N Medical system	Rs 2,000 –3,000/-
Intubation set	Anesthests	Rs 2,000 – 6000/-

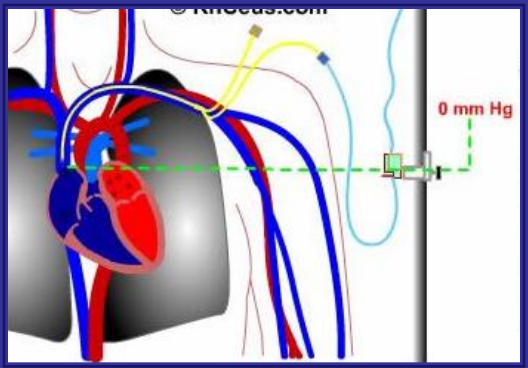
Equipments

Equipment Name	Manufacturer	Approximate cost
Defibrillator	BPL, Philips, L&T	Rs 2– 5 lakhs
Ventilators	GE, Drager, Siemens, Eragadi, Raphel Phoenix,	Rs 6 – 15 lakhs.



Equipments

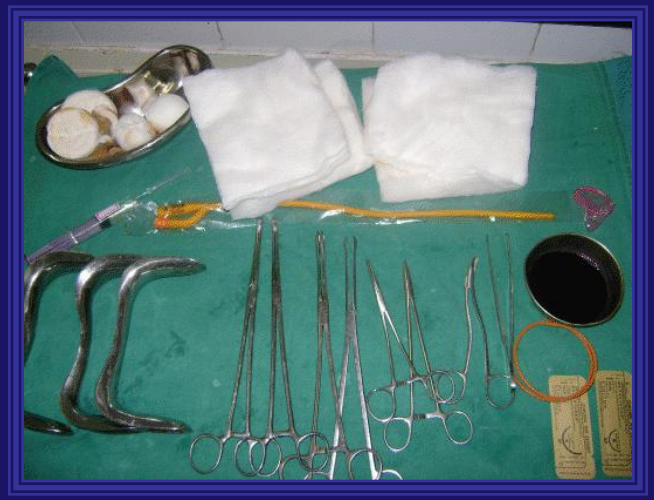
Equipment Name	Manufacturer	Approximate cost
BP Apparatus	Diamond, Dr. Morepen	Rs 800-3,000/-
Glucometer	Accucheck, optium	Rs 2– 4,000/-
3 /5 parameter cardiac monitor with CVP monitor	Philips, GE, BPL, L&T	Rs 2 – 4 lakhs



Well Equipped Laboratory

Equipments

BIPAP
Crash carts (fully loaded with BCLS medication)
Baby resuscitation cart
Special cot (Maternity)



Ut. Packing Set

Personnel

- An HDU working party consists of obstetricians, physicians, midwives, anesthetists, neonatologists

- With a nursing care of specifically trained nurses per bed, an HDU provides continuous observation- including accurate recording of fluid intake and output, blood pressure (via arterial line in some cases), central venous pressure (25-30% of patients) and pulse-oxymetry in up to 90% of patients

Guidelines & Protocols

As HDU care involves management of critically ill obstetric patients, guidelines and protocols should be in place to encourage appropriate responses to these critical situations and justify actions that are sufficient and efficient, neither excessive nor deficient

Triaging policy also needs to be in place

Protocols

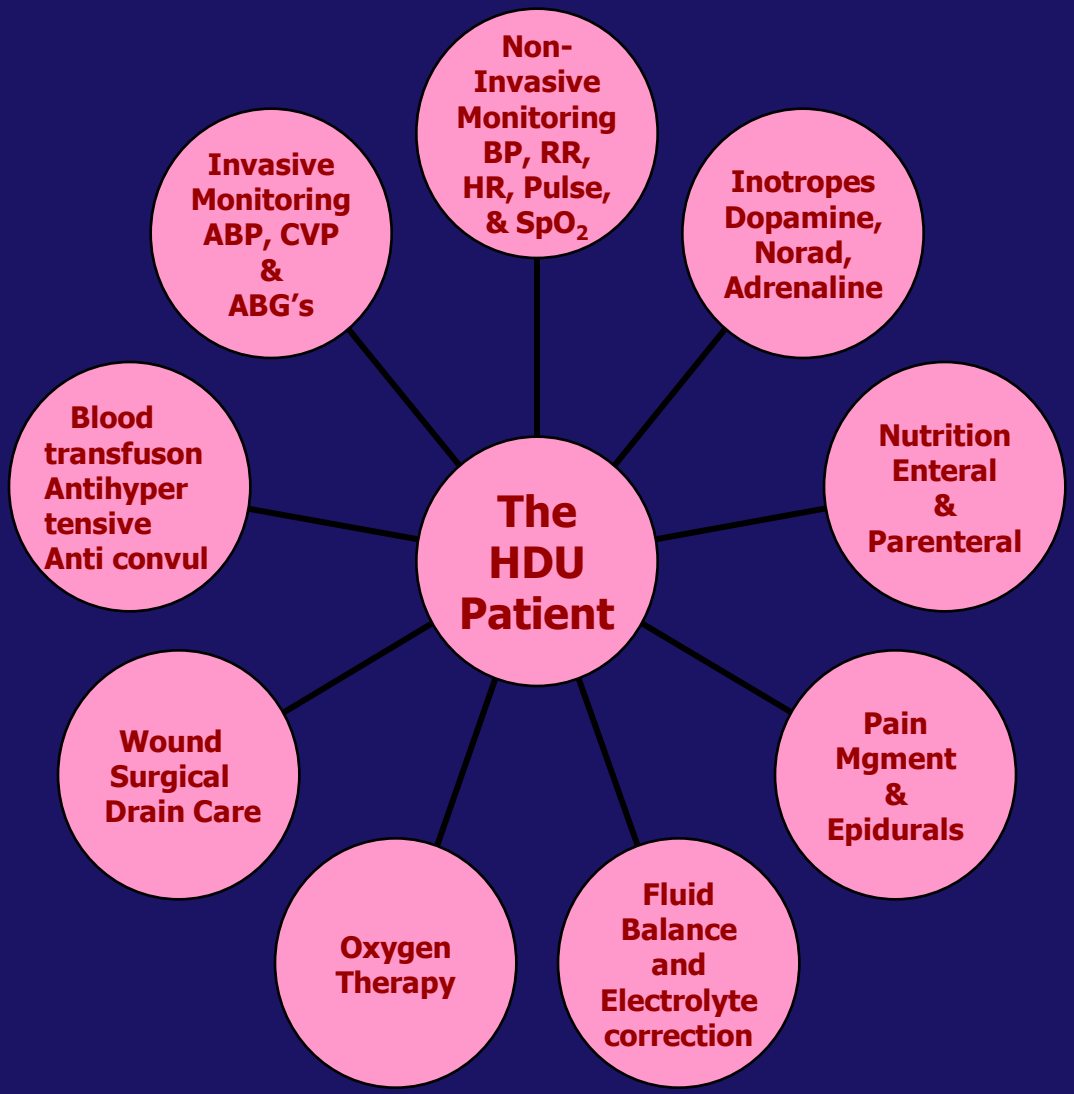
- Management of major hemorrhage
- Management of pre-eclampsia and eclampsia
- Management of failed/difficult intubation
- Management of regional anesthesia including: regional block for analgesia/ regional blocks for surgery/inadequate regional block
- Management of postdural puncture headache
- Severe hypotension/hypertension
- Admission and discharge criteria to/from HDU
- Management of regional techniques in patients on thrombo-prophylaxis
- Antacid prophylaxis and fasting policies for labor and delivery
- Oral intake during labor
- Management of postoperative pain
- Resuscitation of the pregnant patient

Patient Information

- Detailed, unbiased explanation about the condition of the patient including the risks and complications and even mortality
- The patient /attenders are entitled to receive an explanation of the proposed procedure in appropriate language. The explanation should include the nature and purpose of the proposed procedure, as well as any material risks attached
- Opportunity to ask any questions/doubts. All explanations given to the patient should be clearly documented

Management

- Initial assessment and resuscitation
- Maternal observation: Monitor organ function- cardiovascular, renal, pulmonary, hepatic , cerebral.
- Initiate baseline and specific investigations as indicated
- Treat primary condition (severe preeclampsia, hemorrhage, sepsis)
- Check fetal condition : CTG
- Fluid therapy : Crystalloid /Colloid/Blood
- Monitor CVP / hourly UOP / lungs
- Maintain utero-placental oxygen delivery
- Involve appropriate clinicians from relevant specialties


Non-Invasive Monitoring BP, RR, HR, Pulse, & SpO_2
Invasive Monitoring ABP, CVP & ABG's
Inotropes Dopamine, Norad, Adrenaline
Blood transfuson Antihyper tensive Anti convul
The HDU Patient
Nutrition Enteral & Parenteral
Wound Surgical Drain Care
Pain Mgment & Epidurals
Oxygen Therapy
Fluid Balance and Electrolyte correction

Transfer to ICU

- Respiratory rate outside the range 5 to 35 breaths per minute
- Pulse rate outside the range 40 to 140 beats per minute
- Systemic arterial pressure less than 80 mm Hg, or 30 mm Hg below patient's usual pressure
- Urine output less than 400 mL in 24 hours, or less than 160 mL in 8 hours unresponsive to simple measures
- GCS less than 8 in the context of non-traumatic coma
- Any unarousable patient
- Serum sodium outside the range 110 to 160 mmol L
- Serum potassium outside the range 2.0 to 7.0 mmol L
- pH outside the range 7.1 to 7.7
- PaO2 less than 6.6 kPa and or PaCO2 more than 8.0 kPa
- SaO2 less than 90% on supplemental oxygen

Management

Depends
on the
underlying
Clinical Condition

Individualized Treatment

Advantage HDU

- A dedicated obstetric HDU with the knowledge, familiarity, experience and expertise of an obstetrician and a specialist team would be the best place to monitor and treat the critically ill obstetric patients
- Allows continuity of antenatal, intra-partum and postnatal care can be provided by the same team and the delivery of the baby takes place in a more familiar and better-equipped environment with minimal disruption of mother-to-baby bonding
- Care in an obstetric HDU may avoid exposure of the critically ill pregnant mother with her altered cell-mediated immunity and high levels of circulating corticosteroids to a potentially hazardous ICU environment with the risk of hospital-acquired infection
- Patient satisfaction may be increased since it is less noisy and may have more liberal family visitation policies
- Obstetric HDU allows Lactation Support


HIGH DEPENDENCY
UNIT