OB Levels of Care and Thresholds of Viability

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Objectives

- Discuss
  - "Levels of Care"
  - Standard definitions
  - Equitable health care/geographic distribution
    - appropriate antepartum, intrapartum, postpartum care

Historical

- Timely access to risk appropriate care

Neonatal and Obstetrical Care

- March of Dimes 1976
- Report Titled
  - "Toward Improving the Outcome of Pregnancy"
    - maternal/neonatal 3 levels
    - recommended referral to three levels
      - better able to handle

State Organized Regional Perinatal Care

- Designated regional centers
- Education/transport service

1980s – Weakening/Deregulation

- Increased newborn morbidity/mortality
- Increased cesareans
- Reluctance to transfer
  - Fee for service
  - Loss of business/referral
  - No transport team
  - Lack of knowledge of interventions

1980s – Weakening/Deregulation

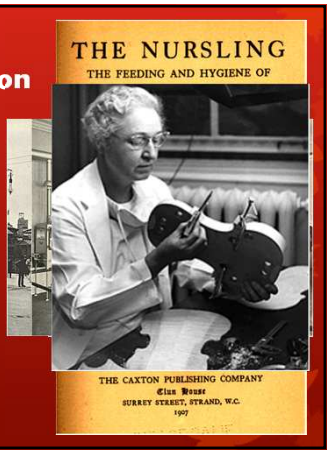
- Keep high-risk newborns
- Without maternal level of care

Risk Appropriate Maternal Transfer

- Increased mortality/morbidity VLBW in Level 1, 2 facilities
  - Only neonatologists
- 38% vs. 23%, OR 1.6

Regionalization

- Focus on neonatal care
- Increase outcome



Recent Milestones in Neonatology

- Regionalization – March of Dimes
- Surfactant Replacement Therapy
- Inhaled Nitric Oxide
- Neonatal Resuscitation Program
- Vermont-Oxford and NICHD Networks
- Family-Centered Care

Preterm Birth Outcome Calculator

NICHD Neonatal Research Network (NRN): Extremely Preterm Birth Outcome Data

Based on the following characteristics:

Gestational Age *(Best Obstetric Estimate in Completed Weeks)*: 23 weeks
Birth Weight: 500 grams
Sex: Male
Singleton Birth: Yes
Antenatal Corticosteroids: Yes

Estimated outcomes* for infants in the NRN sample are as follows:

Outcomes	Outcomes for All Infants	Outcomes for Mechanically Ventilated Infants
Survival	20%	28%
Survival Without Profound Neurodevelopmental Impairment	11%	16%
Survival Without Moderate to Severe Neurodevelopmental Impairment	5%	8%
Death	80%	72%
Death or Profound Neurodevelopmental Impairment	89%	84%
Death or Moderate to Severe Neurodevelopmental Impairment	95%	92%

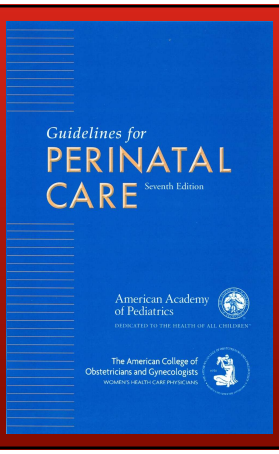
https://www.nichd.nih.gov/about/org/der/branches/ppb/programs/epbo/Pages/epbo_case.aspx

Uncertainties in Dating

- Early ultrasound
- LMP
- IVF
- Later ultrasound

Question

- At what gestational age should a mother be transferred to a higher level facility?
  - 20 weeks
  - 21 weeks
  - 22 weeks
  - 23 weeks
  - 24 weeks



Scope of Issue

- 4 million deliveries per year
- 40% deliveries @ <500 deliveries
- 20% deliveries at 500-1000
- Basic and Level 1 care

New Call – Refocus on Maternal Care

- Maternal health
- Fetal evaluation
  - Clinical systems
  - Fetal/maternal conditions

The Fetus

- Focus/define high risk and systems to manage
  - Fetal evaluation
    - rural state
    - financial pressure

Maternal Mortality Worsen Ranked 60th

- 1987 – 2009
  - 7.2 – 17.8/1000
  - 405 preventable
  - Uncommon Events
    - shock/blood loss
    - renal failing
    - PE
    - ARDS
  - Increased morbidity also

Define Increased Pregnancy Risk/Designation

- Fetal growth restriction <37 weeks
- Diabetes
  - Insulin or no insulin
- Hypertension
- 34 weeks severe preeclampsia
- Preterm Labor
  - PPROM

Define Increased Pregnancy Risk/Designation

- Vasa previa, placenta previa, repeat cesarean section, anterior placenta
- Anomalies
- Maternal
  - Cardiac
  - Renal
  - Obesity
  - Etc

Obstetrical Complications

- Generally uncommon
- Sometimes risk factors
- Hopeful thinking sometimes fails

California Study

Unmet Criteria	
Perform cesarean section in 30 minutes	64% met
Pediatrician available	56% met
Radiology within 12 hours	80% met
NICU/maternal match	35% met
52/53 Higher NICU/low MFM	

Institution Economics

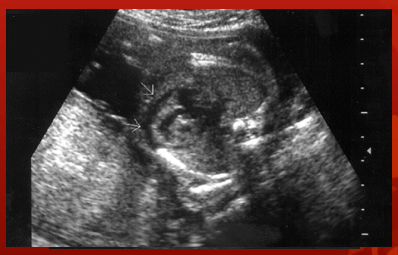
- Keep high-risk neonate
- Inadequate maternal level of care

Maternal Care

- Testing BPP
  - Fetal movement
  - Fetal tone
  - Fetal activity
  - Fetal breathing

Maternal Care

- Rule out anomalies

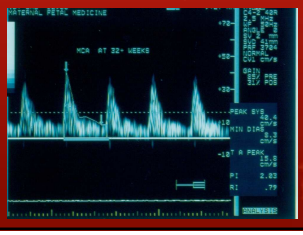


Maternal Care

- Capability of continuous monitoring

Maternal Care

- Doppler flow
  - Cord
  - Middle cerebral artery



Maternal Care

- Timing of delivery

What Are the Levels of Care?

- Birth Center
- Level 1
- Level 2
- Level 3
- Level 4

Level of Care – Birth Center

- Low-risk singleton, vertex
- Meet unexpected
- Agreements
  - Hospital
  - Physician
- Data, QI, medical consultation

Level of Care – Level 1

- Uncomplicated pregnancy
- Manage unexpected
- Perform cesarean section
- Basic
  - Imaging
  - Labs
  - Blood bank

Level of Care – Level 1

- Appropriate
  - Twins at term
  - Trial of labor
  - Cesarean section
  - Preeclampsia without severe features
- Data/QI

Level of Care – Level 2

- Appropriate high-risk antepartum
- Ultrasound imaging, CT, MRI
- Manage unexpected
- Maternal-Fetal Medicine
  - Telemedicine okay
- Anesthesia
  - OB
- Medical/surgical consultant

Level of Care – Level 2

- Appropriate
  - Some premature
  - Previa
  - Preeclampsia
  - Not accreta
- Data/QI

Level of Care – Level 3

- More complex
- Maternal-Fetal/obstetrical
- Advanced imaging
- QI/Data
- System leadership
- Medical/surgical consultation
- Maternal-Fetal Medicine
  - Telemedicine okay

Level of Care – Level 4

- Maternal-Fetal Medicine care team
- Severe complications
  - Cardiac
  - Renal
  - Pulmonary
  - Hypertension
  - Unstable
    - e.g. transplants, ECMO

Levels of Care

- RNs play a big role

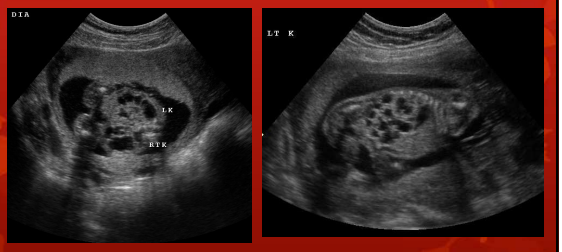
Case SB

- 25 year old Gravida 2 Para 1 being seen at a rural access hospital.
- Prenatally fetal multi cystic kidney identified along with contralateral reflux.
- Recommendation made to deliver at higher level facility.
- Obstetrician declined citing patient's desire to deliver at home hospital and lack of justification for delivery at higher level facility
- Request made that obstetrician review case with local Pediatric Support Person

Case SB

- Patient delivered at rural hospital.
- Difficult delivery secondary to enlarged fetal abdomen.
- Concern raised over neonatal renal function
- Newborn transferred to Tertiary care facility

Multicystic Kidney



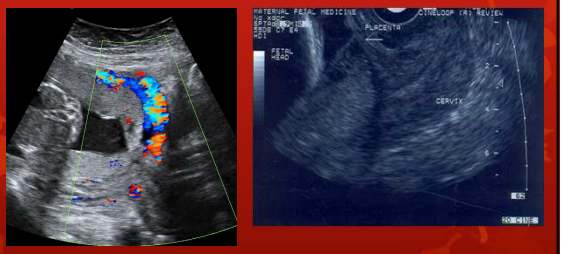
Case AT

- Placenta Previa diagnosed at 28 weeks following bleeding episode.
- Cesarean planned at a Level 1 hospital at 39 weeks.
- Patient presented with significant bleeding at 37.5 weeks.
- Emergency cesarean performed.

Case AT

- Patient had post-partum atony.
- Patient life flighted to a "Level 2" facility and underwent an emergency hysterectomy.
- IR was not available.
- Patient in ICU from hemorrhagic shock complications.

Placenta Previa



Case MB

- 30 year old, Gravida 4 Para 3 status post three prior cesareans.
- Patient with known previa possible accreta diagnosed at outlying institution.
- Admission planned at higher level facility with delivery at 35 weeks.
- Experienced Surgeons
- IR team
- Large Blood Bank
- Obstetrical Massive hemorrhage protocol activated

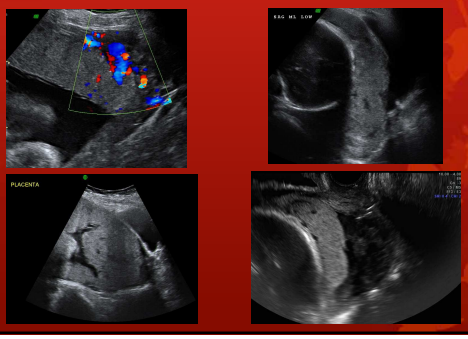
Case MB

- Patient presented to a Level 1 facility at 24 weeks in with increasing pressure.
- Found to be 5 to 6 cm dilated and "contracting".
- Diagnose of preterm labor was made.
- Patient felt to be nonviable.
- After several hours and no change in cervix oxytocin was begun and membranes were ruptured.
- After several more hours MFM was contacted.

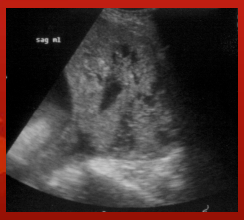
Case MB

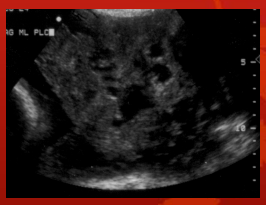
- Patient was transferred to higher level of care facility.
- Patient received antibiotics (GBS status unknown), magnesium sulfate for neuroprotection, betamethasone for prematurity.
- NICU consulted and advised patient.
- Patient remained pregnant for three more weeks and was eventually delivered at 27 to 28 weeks following spontaneous onset of labor .

Placenta Accreta



Placenta Percreta





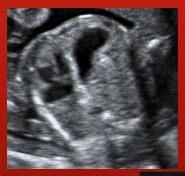
Case JM

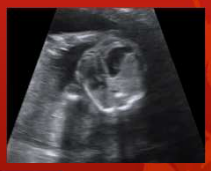
- 35 year old Gravida 2 Para 1 with relatively uncomplicated pregnancy admitted to "Level 2" facility for preterm labor at 34 weeks of gestation.
- Recent ultrasounds notable for mild polyhydramnios.
- Over the course of a few days the patient eventually delivered a fetus at 34 to 35 weeks gestation.

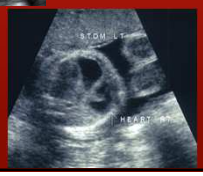
Case JM

- Newborn had immediate respiratory issues.
- Upon further evaluation was found to have a diaphragmatic hernia.
- Infant was life flighted to Boston for ECMO.
- Review of films revealed undiagnosed diaphragmatic hernia

Diaphragmatic Hernia



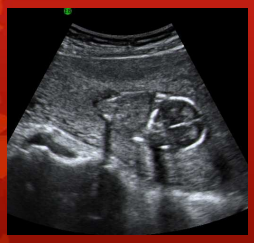


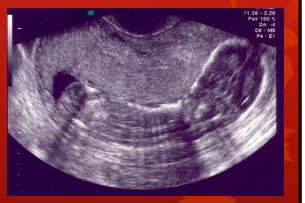


Case CD

- Patient presented to "level 2 Facility" for PPROM at 32 weeks.
- After confirmation of PPROM patient was followed expectantly.
- Given the weekend, NSTs were performed.
- No BPP was obtained.
- Late in the weekend, the patient developed a fever and chorioamnionitis was diagnosed.
- An attempt at induction was made however the patient required a primary cesarean for fetal intolerance of labor.
- A septic newborn was delivered.

Oligohydramnios

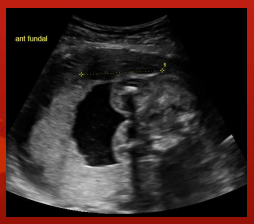


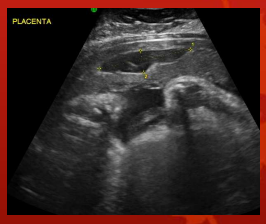


Case RH

- 39 year old Gravida 2 Para 1 presented to local hospital with bleeding.
- A clinical abruption was diagnosed.
- Phone call made to MFM.
- Given bleeding and questionable tracing, either immediate delivery at local hospital or further close observation at local institution was recommended.
- Follow up phone call after 1 hour was requested.
- Within 10 minutes of phone conversation mother was in ambulance on way to higher level facility.
- Upon arrival 34 week stillbirth was diagnosed in an actively bleeding mother.

Abruption





Maine

- Birth Centers
- Level 1/rural access
- Level 2
- Level 3/4

Summary

- Integrated system
- Maternal levels of care
- Education
- Transport
- Telemedicine

Best Outcome Closest to Home