Reducing Maternal and Neonatal Mortality in Secondary level Institutions

Dr Emmanuel Srofenyoh
Consultant Obstetrician
Ridge Regional Hospital
Outline of Presentation

• Introduction
• Introduction of the institutional model for the reduction of maternal and Neonatal mortality.
• The Change package
• Outcomes at Ridge Hospital
• Challenges and the way forwards
Introduction

• Ghana has implemented a lot of interventions to promote access to maternal services (e.g., Amb services, NHIS, free maternal, scaling up of EmONc etc).
• There is now a changing landscape of greater facility utilization (e.g.). The question is what happens when the patient gets to the hospital.
• The Impact study:
• In 2007, the WHO Framework for Action identified “quality of health services” as a key component in improving outcomes.
• Ghana seems to have placed high emphasis on access without equal measure of attention to quality of care within institutions.
1. Appropriate and timely referrals
Elements of Good referral cycle

- Early detection of Compl
- Feedback systems
- Appropriate decision as to who to refer
- Appropriate transport
- Appropriate and timely pre-referral treatment
- Counseling of pts and relatives
- Good rapour
- Working relationship
- Exchange of contact numbers
- Pre-emptive feedback calls
- Timely intervention
- Further mgt in transit
Interventions to improve referrals

- Quarterly regional maternal and neonatal conferences
- Collection of relevant data for provision of feedback (data on SB, MM, referral issues)
- Training programs for medical officers from lower level institutions
- Rotational attachment of midwives from lower levels to empower and engender confidence in performing certain procedures
- Creating and sharing of referral guidelines
Small group Tutorials with FGHP official sitting in.

Demonstration of breech extraction

Quaterly confernce
2. Improved Patience Surveillance

Through investment in appropriate monitoring equipment
Examples of improved clinical Surveillance

- Morning report
- Improved Fetal monitoring (Doppler, CTG, & ultrasound)

USG Training for Midwives and doctors
1. The creation of High dependency unit with continuous electronic monitoring and 24 hr monitoring chart
2. Use of Kick chart for high risk cases (both in patient and outpatient)
3. Promoting the use of latent phase monitoring chart and the partograph initiation at triage before admittance to labour ward.
3. Protocol Driven Care

The core of our efforts to improve clinical care processes
Institutionalization of Protocol driven care

- Protocols standardize care and empowers young members of clinical teams.
- Many randomized controlled trials have demonstrated improve outcomes when protocols are implemented into clinical care decision making.
- Evidence based protocols were designed for each major clinical conditions
- Protocol hand book was developed and made available to new entrants to the dept
Protocol Discussion forum

1. Indomethacin 50mg PO every 6 hours (or)
2. Ibuprofen 600mg PO every 6 hours

Magnesium sulphate as tocolytic protocol: 6 gms mgso4 in 500mls of NS run over 1 hr; followed by 2 gms of mgso4 in 500mls of NS every 4 hours until contractions cease (Monitor RR, BP, and tendon reflexes for signs of toxicity).

Antibiotic treatments: Treat any underlying infections specifically; whilst waiting for laboratory diagnosis, broad spectrum antibiotics such as Erythromycin/Zithromax, Cefuroxime/Augmentin, or Dalacin C.

General Contraindication to tocolysis
- Fetal distress (except as part of intrauterine resuscitation)
- Preeclampsia or severe preeclampsia
- Maternal demise
- Advanced maternal maturity
- Internal Hemodynamic instability

Protocol for the Management of Septic Shock in Pregnancy

Septic shock may occur during pregnancy because of overwhelming infection caused by bacteria, viruses, or fungi. Gram-negative bacteria such as Escherichia coli, Klebsiella species, Proteus, Pseudomonas aeruginosa, and Serratia species cause most cases of septic shock.

Causes of septic shock in pregnancy are:
- Septic abortion,
- Chorioamnionitis
- Postpartum infections
- Pyelonephritis
- Respiratory tract infections

Presentation
Through the establishment of a system of triage, empowerment of staff and emergency preparedness
Obstetric Triage
Ridge Hospital Triage

• **Primary survey** – identify life-threatening problems, ABC, take vital signs, take history, make a plan.
• **Resuscitation** – deal with identified problems.
• **Secondary survey** – full pregnancy assessment, top-to-toe examination, reassess vital signs.
• **Definitive care** – specific management, carry out the formulated plan.

Triage is useful in Units with high case load, enables prompt care for the seriously ill, and provides fair and equal chance of survival for all
<table>
<thead>
<tr>
<th><strong>RED</strong></th>
<th><strong>YELLOW</strong></th>
<th><strong>GREEN</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Eclampsia/seizure</td>
<td>Sickle cell not in crisis</td>
<td>Generalized complaints</td>
</tr>
<tr>
<td>Hemorrhage/heavy vaginal bleeding</td>
<td>Decreased or no fetal movement</td>
<td>Normal labor</td>
</tr>
<tr>
<td>Antepartum/postpartum hemorrhage</td>
<td>Multiple pregnancy in labor</td>
<td></td>
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<tr>
<td>Coma/unconscious</td>
<td>Preterm labor</td>
<td></td>
</tr>
<tr>
<td>Abnormal vital signs</td>
<td>Preterm rupture of membranes</td>
<td></td>
</tr>
<tr>
<td>Sickle cell crisis</td>
<td>Stable/managed hypertension</td>
<td></td>
</tr>
<tr>
<td>2 or more previous c/s in active labor</td>
<td>Previous c/s</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Diabetic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>HIV Positive</td>
<td></td>
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</tbody>
</table>

**THIS IS NOT A COMPREHENSIVE LIST**

**ASSESSMENT OF THE INDIVIDUAL WOMAN IS ESSENTIAL**
Advances in Triage at Ridge ANC triage Point

Emergency Stabilization unit

Labour triage Waiting Area

Labour Triage Nurse
Achieving A State of Emergency Preparedness

• Staff Empowerment
• Ensuring Sustainable Availability of Emergency drugs
• 24 hr dedicated emergency staff
• A system to facilitate reception of emergencies
• Establishment of trigger systems for call up of seniors.
• Linkage of teams on WhatsApp Platform for rapid communication during emergencies
5. Promoting Responsive Service

That aspect of service that responds to non-medical needs of all clients is the main factor that provides satisfaction to clients.
Operational Capacity Building

• **Leadership Development** (Coaching skills, promoting accountability and compassionate care), Creation of leadership Ambassadors, Perinatal Leadership Forum and clinical Champions

• **Quality Improvement** (trained 2 senior members as QI leaders, QI training for Clinical Champions, establishment of QI projects throughout maternal neonatal units of the hospital)

• **Monitoring and Evaluation** (establishment of maternal and neonatal data base)
Examples of QI projects running in the Maternal/Neonatal units

• Improving decision to incision time of CS by improving prioritization of emergencies
• Reducing infectious complications in NICU through hand hygiene
• Reducing infectious complications of labour and delivery
• Project to improve steroid administration for preterm labours
• Successful introduction CPAP in NICU for Respiratory Support (initiated at ridge since 2024)
Improved IPC processes in order to reduce infectious complications associated with labour and delivery.

**AIM**

**DRIVERS**

- Clean Delivery: Hand Washing
- Clean Delivery: Clean Surfaces
- Clean Delivery: Clean Cord Cutting
- Clean Delivery: Clean Perineum
- Appropriate/Timely Antibiotics Prophylaxis
- IPC Processes Around Newborns
- IPC Processes in Theater
- Proper Wound Care
- Education of Family on Home IPC care

**INTERVENTIONS**

- Ensure availability of Hand sanitizing agents in LW
  Discuss hand washing behaviour survey outcome with staff
  Ensure all clients coming up to LW has bed mats and clean and ironed cot sheets.

- Ensure availability of sterile cord scissors or surgical blades at all times. Promote swabbing of vulva with chlohexidine at least 3 times before each vaginal examination and delivery
  Frequent ward discussion on indications for antibiotics prophylaxis in L/D
  Prudent mgt of LW emergency stock of antibiotics
  All patients reporting in LW to have at least 1 vial of parenteral ABT in their packs

- Hand washing/hand sanitizer use/use of sterile gloves to handle newborns
- Eye care/cord care
  Resuscitation surface cleaned after each use

- Skin preparation/timely prophylactic antibiotics use

- Education of mother on home care (hand hygiene, baby bathing, cord care)
Reduced incidence of infection in NICU

**AIM**

**DRIVERS**

- Proper Hand Hygiene
- Proper Diaper Change
- Adherence to Visiting Parent Protocol
- Sanitary Suction Machine
- Sanitary/Proper Access of IV Cannula
- Proper Storage of Breast Milk
- Sanitary Bag and Mask
- Minimal and Sanitary Sharing of Cots and Incubators

**INTERVENTIONS**

**SANITATION EDUCATION OF NICU STAFF**
- Any Ridge employee (every house officer, new staff member of NICU, etc.) who will be working in NICU is required to complete a sanitation training using curriculum developed specific to Ridge NICU
- Infection control reinforcement reminder at each Tuesday all staff meeting
- Visual reminders placed around NICU for infection control measures

**ADHERENCE TO CLEANING PROTOCOLS**
- Create cleaning protocols for (1) hand washing, (2) suction machinery, (3) feeding equipment, (4) bag and mask
- Train all NICU staff on proper cleaning protocols

**ADHERENCE TO CLINICAL CARE PROTOCOLS**
- Create clinical care protocols for (1) IV cannula usage/access, (2) breast milk storage, (3) cot sharing, (4) changing of diapers, (5) changing of sheets
- Train all NICU staff on proper clinical care protocols

**FUNCTIONING EQUIPMENT**
- Repair (1) second suction machine in isolation NICU, (2) sink in sluice room
- Purchase (1) replacement refrigerator for breast milk storage (2) replacement tubing for suction machine, (3) additional hand towels, (4) dryer for after hand washing, (5) additional gowns for visiting parents, (6) washing machine for NICU use

**ROUTINE AND UNBIASED MONITORING**
- Create appropriate processes for monitoring each of these change packages that (1) do NOT over burden staff and (2) that allow for continuous checks (random audits) for compliance with protocols relating to identified infection drivers
### Pre-training Activities

**Operational Capacity Building**
- Leadership Development
- Quality Improvement
- Monitoring & Evaluation

<table>
<thead>
<tr>
<th>Pre-training Activities</th>
<th>Clinical Capacity Building</th>
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<tbody>
<tr>
<td><strong>YEAR 1</strong></td>
<td><strong>YEAR 2</strong></td>
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<tr>
<td>Triage</td>
<td>Labor &amp; Delivery and Immediate Newborn Care</td>
</tr>
<tr>
<td>Neonatal Resuscitation</td>
<td>Neonatal Intensive Care Unit</td>
</tr>
<tr>
<td><strong>YEAR 3</strong></td>
<td><strong>YEAR 3</strong></td>
</tr>
<tr>
<td></td>
<td>Theatre and Recovery Room</td>
</tr>
<tr>
<td></td>
<td>High Dependency Unit</td>
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<tr>
<td></td>
<td>Obstetric Ultrasound</td>
</tr>
</tbody>
</table>

**Post-training Activities**
- Real time coaching / mentoring
- Clinical champions integrated into training teams
- Clinical assessment based on performance indicators
- Data collection to assess impact

**Clinical Care Modules**
- Triage
- Neonatal Resuscitation
- Labor & Delivery and Immediate Newborn Care
- Neonatal Intensive Care Unit
- Theatre and Recovery Room
- High Dependency Unit
- Obstetric Ultrasound

**Determinants of key performance indicators/clinical champions**
- Baseline data collection – Needs assessment
- Baseline observations of clinical care / operations
- Design of module content / training materials

**Kybele – Ridge Change Package**

**Clinical Capacity Building**

**Operational Capacity Building**

**Clinical Care Modules**

**Post-training Activities**
Outcomes
### Results: Case Fatality Rates

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Deliveries</th>
<th>Prevalence (%)</th>
<th>Pre-eclampsia Case Fatality Rate (%)</th>
<th>Hemorrhage Prevalence (%)</th>
<th>Hemorrhage Case Fatality Rate (%)</th>
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</thead>
<tbody>
<tr>
<td>2007</td>
<td>6049</td>
<td>5.3</td>
<td>3.1</td>
<td>0.8</td>
<td>14.8</td>
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<tr>
<td>2008</td>
<td>7465</td>
<td>7.9</td>
<td>1.3</td>
<td>1.3</td>
<td>5.1</td>
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<tr>
<td>2009</td>
<td>8230</td>
<td>12.1</td>
<td>1.1</td>
<td>3.9</td>
<td>1.9</td>
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<tr>
<td>2010</td>
<td>8133</td>
<td>12.8</td>
<td>1.1</td>
<td>4.2</td>
<td>2.0</td>
</tr>
<tr>
<td>2011</td>
<td>9357</td>
<td>14.5</td>
<td>1.1*</td>
<td>5.2</td>
<td>1.6#</td>
</tr>
<tr>
<td>2012</td>
<td>11032</td>
<td>16.3</td>
<td>1.0</td>
<td>7.2</td>
<td>1.9</td>
</tr>
<tr>
<td>2013</td>
<td>7591</td>
<td>16.1</td>
<td>0.6</td>
<td>5.5</td>
<td>2.1</td>
</tr>
<tr>
<td>2014</td>
<td>9113</td>
<td>15.5</td>
<td>1.2</td>
<td>6.0</td>
<td>1.8</td>
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</table>

89% ↓ in hemorrhage mortality; 65% ↓ in pre-eclampsia mortality

#P < 0.05 for 2011 compared to 2007 using Fisher’s exact test

<table>
<thead>
<tr>
<th>Type</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
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<tbody>
<tr>
<td>Imminent Eclampsia</td>
<td>92</td>
<td>114</td>
<td>196</td>
<td>141</td>
<td>235</td>
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<tr>
<td>Eclampsia</td>
<td>175</td>
<td>223</td>
<td>205</td>
<td>113</td>
<td>124</td>
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<tr>
<td></td>
<td>(17%)</td>
<td>(16.4%)</td>
<td>(11.4%)</td>
<td>(9.3%)</td>
<td>8.9%</td>
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<tr>
<td>Pre-eclampsia</td>
<td>520</td>
<td>594</td>
<td>836</td>
<td>632</td>
<td>541</td>
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<tr>
<td>Pre-existing HPT</td>
<td>59</td>
<td>87</td>
<td>75</td>
<td>71</td>
<td>75</td>
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<tr>
<td>PIH</td>
<td>185</td>
<td>342</td>
<td>484</td>
<td>264</td>
<td>414</td>
</tr>
<tr>
<td>Total</td>
<td>1031</td>
<td>1360</td>
<td>1796</td>
<td>1221</td>
<td>1389</td>
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</tbody>
</table>

Eclampsia prevalence continue to decline (implies early diagnosis and better mgt of pre-eclampsias)
### Comparative analysis of RRH SBs

<table>
<thead>
<tr>
<th>year</th>
<th>Total del</th>
<th>Ridge Hosp SB</th>
<th>SBR</th>
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<tbody>
<tr>
<td>2012</td>
<td>11032</td>
<td>130</td>
<td>1.2%</td>
</tr>
<tr>
<td>2013</td>
<td>7591</td>
<td>72</td>
<td>0.95%</td>
</tr>
<tr>
<td>2014</td>
<td>9113</td>
<td>71</td>
<td>0.78%</td>
</tr>
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</table>

### Comparative full yr Analysis of cases referred with no FH (as IUFD)

<table>
<thead>
<tr>
<th>year</th>
<th>Total del</th>
<th>IUFD</th>
<th>SBR</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>11032</td>
<td>412</td>
<td>3.7%</td>
</tr>
<tr>
<td>2013</td>
<td>7591</td>
<td>272</td>
<td>3.6%</td>
</tr>
<tr>
<td>2014</td>
<td>9113</td>
<td>340</td>
<td>3.7%</td>
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</table>
## Overall NICU Mortality rate

<table>
<thead>
<tr>
<th>YEARS</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL DEATH</td>
<td>389</td>
<td>228</td>
<td>202</td>
</tr>
<tr>
<td>TOTAL ADMISSION</td>
<td>1412</td>
<td>1102</td>
<td>1305</td>
</tr>
<tr>
<td>Crude Mortality Rate</td>
<td>27.5</td>
<td>20.7</td>
<td>15.5</td>
</tr>
</tbody>
</table>

**GRAPHICAL REPRESENTATION OF 3 YEARS COMPARISON MORTALITIES 2012-2014**

- DEATH (%)
  - YR 2012: 27.5
  - YR 2013: 20.7
  - YR 2014: 15.5
Challenges and Way forwards

• Seasonality of delivery Volume/congestions
• Late referrals E.g. very high no. of cases referred late in the night.
• Inadequate staffing (DOCTORS and Midwives)
• Challenges in the management of emergency drug stocks
• Blood and blood products
Maternal Mortality: UK 1840–1960

- Improvements in nutrition, sanitation
- Antenatal care
- Antibiotics, banked blood, surgical improvements

Maine 1999.

Current Approach to Reduction of Maternal Mortality
Summary and conclusion

• Maternal and Neonatal Morbidity and Mortality can be reduced by A new theory of Change Management that is comprehensive and encompasses clinical, Operational and leadership capacity building in Emergency Obstetric care

• There is the need to replicate this approach in all regional and sub-regional centres across the country
Thank You