Perinatal Mortality Review:  
An activity for quality improvement

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Northdale Hospital  
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Scope of Presentation

- Introduction
- Quality improvement cycle
- Rationale of perinatal mortality Review (PMR)
- Processes of PMR
  - The team
  - Data & Material
  - Handling meetings
  - The after meetings
- Challenges
- The Northdale experience
- Final thoughts
Introduction

- Quality of care should be everyone's preoccupation:
- Our vision and mission speak about Quality of care
- Competitive world (Private vs. Public)
- Value for money (Batho pele)
- Self fulfilment
- There is always room for improvement
Purpose of PMR

- The purpose is not about statistics

- The purpose is about
  - Improving quality of care
  - Saving more lives
  - Learning from mistake and success
Concepts of PMR

- Systematic collection and analysis of mortality and morbidity data for mothers and fetuses/infants
- Not a witch hunt
- Emphasis should be on quality of care improvement
- Could the death have been avoided?
- Was this patient mismanaged?
- What have we learned from this case?
Benefits of PMR

- Study and document the current situation
- Identify & quantify the problem
- Develop causality and solution theories
- Plan for improvement
- Team building for QIP
- Develop ownership for QIP
- Forum for QA and QC
  - Improve performance indicators
Quality improvement cycle

Set Goals
- Study & Document current situation
- Analyse the causes
- Identify improvement opportunity
- Set new goals / new standards

Plan
- Identify a team to work with
- Develop improvement theory
- Set up an action plan
- Plan for monitoring criteria
- Plan for evaluation criteria: indicators

Evaluate
- Study the results
- Evaluate the results (QC)
- Standardise the improvement
- Establish future plans

Implement / Act
- Implement improvement strategies
- Monitor implementation (QA)

Northdale Hospital

KwaZulu-Natal Department of Health
Mechanisms of Improvement

- The Pygmalion effect ★
- The Hawthorne effect ★★
- The learning process ★★★
Processes of PMR

- The team
- Meeting attendance
- Data source
- Material
- Immediate review
- Preparatory phase
- The meeting itself
- Case presentation
- The “after-meeting” period
Team

- Team comprised
  - Medical manager and/or Head of O&G
  - Head of paediatrics
  - Nursing manager and/or ADN for O&G
  - Unit managers for ANC, LW, ANW, PNW, Nursery,
  - Other stakeholders interested in perinatal care

- Team leader: Med. manager/ O&G HOD

- Members of the team should
  - Committed
  - Enthusiastic
  - Self motivated

- Clear allocation of task is essential
Meeting attendance

- PMR should be everyone’s business
- All available medical staff
- All available nursing staff
- Representative from EMRS
- Representative from support services
  - Transport, laboratory, X-Ray, etc.
- Representative from referring and referral facilities
Data source

- Maternity register
- Nursery register
- Electronic files (PIPP)

Patients records
- Doctors progress notes
- Nursing progress notes
- Lab investigations
- X-Ray, U/S, other investigations
- Postmortem report
- Etc.

Statistics
Numbers & rates
Quality of data

- Quality of data depends on what you put in (Cabbage in – cabbage out)
- About registers
  - Completeness
  - Accuracy
  - Clarity
- PPIP is a useful tool to this effect
- Medical/nursing progress notes:
  - Write legibly
  - Avoid non popular abbreviations
  - Record as many details as you can
  - Date and time essential
Review processes

- Immediate review
- Preparatory phase
- PMR meeting
- Reporting
Immediate review

- **What**
  - Summarize the case for every stillbirth and neonatal death

- **When**
  - Within 24 hours

- **Who**
  - Birth attendant (SB), on duty MO (NND)

- **Why**
  - Avoid recall bias and memory fading
Preparatory phase

- Why
  - Improve preparedness for the PMR meeting

- What
  - Check if everyone did the task allocated
  - Detailed analysis of all deaths
  - Case selection
  - Monthly stats, Data entry/export in computer

- When
  - A week before PMR Meeting

- Who
  - Team members
  - Doctor and nurse in charge of LW and Nursery
Handling of PMR meetings

- At least monthly
- Chair & Minutes taker
- Avoid confrontation
- Focus on issues and not on people
- Occlude patients/staff identification makers
- Allocate tasks to specific people
- Send summary report to stakeholders
Format of PMR meetings

- Welcome remarks
- Report on progress of allocated tasks
- Monthly statistics (numbers & rates)
- Trend (quarterly, six-monthly, annually)
- Case presentations - Discussion
- Summary of lessons learnt
- Summary of interventions agreed upon
- Tasks allocation
- closure
Case presentation

- Presentation of
  - Full history
  - Physical examination
  - Investigation results
  - Diagnosis
  - Initial management
  - Progress of care

- Discussion on
  - Primary cause of death
  - Final cause of death
  - Avoidable factors
Common primary causes of death

- Spontaneous preterm labor
- Intrapartum hypoxia
- Antepartum hemorrhage
- Hypertensive disorders
- Infections
- Fetal abnormalities
- Intrauterine growth restriction
- Trauma
- Maternal diseases
- Unexplained intra-uterine death
Common final causes of death

- Prematurity related causes
- Birth asphyxia
- Infections
- Congenital abnormalities
- Trauma
- Other causes
- Unknown causes
Avoidable factors

- Patient related (most common)

- Health worker related (common)
  - Antepartum factors
  - Intrapartum factors
  - Neonatal care factors

- Administration related (least common)
Patient related factors

- No/late/irregular attendance of ANC
- Inadequate response to decrease fetal movements
- Inadequate response to ROM
- Inadequate response to APH
- Delay in seeking medical attention in labour
Health worker related factors

- These factors may be divided in three subcategories:
  - Antepartum factors
  - Intrapartum factors
  - Neonatal care factors
Antepartum factors (Health worker related)

- No response to a poor obstetric history
- Over or underestimating fetal size
- No response to poor uterine growth
- No response to poor fetal movement
- No response to hypertension
- Multiple pregnancy not diagnosed
- No response to syphilis serology
- No response to glucosuria
- No response to post term pregnancy
Intrapartum factors (Health worker related)

- Partogram not used
- Fetus not adequately monitored
- Signs of F/distress not interpreted correctly or ignored
- No response to poor progress of labour
- Prolonged 2nd stage not managed correctly
- Delay in calling the doctor or referring the patient
Neonatal factors (Health worker related)

- Inadequate resuscitation
- Inadequate monitoring & Mx plan
- Delay in calling for assistance
- Delay in referring the infant to a high level of care
Administration related factors

- Transport delays
- Lack of adequate screening for
  - Syphilis
  - HIV
  - Diabetes
  - others
- Inadequate staffing level (quantity/quality)
- Inadequate facility
  - Theatre
  - Nursery
  - Equipment
The “after-meetings” period

- PMR meetings findings are data for action
- Recommendations derived from and supported by your findings
- Allocate tasks to specific people
- Follow-up implementations progress
- Examples of interventions
  - Policy
  - Equipment acquisition
  - Clinical practice
  - Education
  - New workload distribution
Challenges

- Meetings may become witch-hunt exercise
- Confrontation create apathy for meetings
- Some staff may feel threatened if they were involved in the case.
- Problems of confidentiality may occur.
- Patients who die at home after discharge are not included.
- Patient notes cannot be found or are incomplete.
- The cases and data are not prepared properly.
- Lessons learned are not used to improve care.
The Northdale experience

- Monthly meetings
- Referral hospital invited to attend but......
- Referring clinics to be invited from next year
- PPIP in use
- Poor quality of data Jan-Aug. Improving Sep-Oct
- Staff has been trained to collect data

Some findings
- Inadequate use of labour graphs at the clinics
- Delay in referring patient by clinic staff
- Delay in getting transport to refer to regional
- Inadequate staffing in LW
- Inadequate staffing in OT
- Delay in taking patient to OT due staff shortage
Monthly deliveries Jan-Oct 2006
# Total deliveries by weight

## Jan-Oct 2006

<table>
<thead>
<tr>
<th>Weight Range</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>500 - 999g</td>
<td>46</td>
<td>0.8</td>
</tr>
<tr>
<td>1000 - 1499g</td>
<td>62</td>
<td>1.1</td>
</tr>
<tr>
<td>1500 - 1999g</td>
<td>106</td>
<td>1.8</td>
</tr>
<tr>
<td>2000 - 2499g</td>
<td>370</td>
<td>6.4</td>
</tr>
<tr>
<td>≥2500g</td>
<td>5230</td>
<td>90.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>5814</td>
<td>100.1</td>
</tr>
</tbody>
</table>

- **Total Hospital**:
  - **Northdale Hospital**:
    - **Total deliveries by weight**: 5814
    - **% Total**: 100.1

*KwaZulu-Natal Department of Health*
## Perinatal Mortality Survival analysis
### Jan-Oct 2006

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Born alive</td>
<td>5722</td>
<td>98.4</td>
</tr>
<tr>
<td>Survived</td>
<td>5692</td>
<td>99.5*</td>
</tr>
<tr>
<td>Early NND</td>
<td>29</td>
<td>0.5*</td>
</tr>
<tr>
<td>Late NND</td>
<td>1</td>
<td>0.0*</td>
</tr>
<tr>
<td>Stillbirths</td>
<td>92</td>
<td>1.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>5814</td>
<td>100.0</td>
</tr>
</tbody>
</table>

* Denominator used: 5722
Monthly PNMR Jan-Oct 2006

Increase in Sep and Oct is attributed to better reporting
## Primary cause of Perinatal deaths
### Jan-Oct 2006

<table>
<thead>
<tr>
<th>Description</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrapartum asphyxia</td>
<td>12</td>
<td>36.4</td>
</tr>
<tr>
<td>Spontaneous preterm labour</td>
<td>9</td>
<td>27.3</td>
</tr>
<tr>
<td>Intrauterine death</td>
<td>4</td>
<td>12.1</td>
</tr>
<tr>
<td>Antepartum haemorrhage</td>
<td>3</td>
<td>9.1</td>
</tr>
<tr>
<td>No obstetric cause / Not applicable</td>
<td>3</td>
<td>9.1</td>
</tr>
<tr>
<td>Maternal disease</td>
<td>2</td>
<td>6.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>33</strong></td>
<td><strong>100.1</strong></td>
</tr>
</tbody>
</table>
## Final cause of Perinatal deaths
### Jan-Oct 2006

<table>
<thead>
<tr>
<th>Description</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypoxia</td>
<td>9</td>
<td>39.13</td>
</tr>
<tr>
<td>Hypoxic ischaemic encephalopathy</td>
<td>5</td>
<td>21.74</td>
</tr>
<tr>
<td>Meconium aspiration</td>
<td>1</td>
<td>4.35</td>
</tr>
<tr>
<td>Immaturity related</td>
<td>8</td>
<td>34.78</td>
</tr>
<tr>
<td>Infection</td>
<td>2</td>
<td>8.70</td>
</tr>
<tr>
<td>Septicaemia</td>
<td>2</td>
<td>8.70</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>8.70</td>
</tr>
<tr>
<td>Aspiration pneumonia</td>
<td>1</td>
<td>4.35</td>
</tr>
<tr>
<td>Hypothermia</td>
<td>1</td>
<td>4.35</td>
</tr>
<tr>
<td>Unknown cause of death</td>
<td>2</td>
<td>8.70</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>23</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>
### Avoidable factors for perinatal deaths

<table>
<thead>
<tr>
<th>Factor</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient associated</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>Medical personnel associated</td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td>Administrative problems</td>
<td>11</td>
<td>22</td>
</tr>
<tr>
<td>Insufficient notes to comment</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>Description</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>-------------------------------------------------------</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td><strong>Patient associated</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delay in seeking medical attention during labour</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Infrequent visits to antenatal clinic</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td><strong>Booked late in pregnancy</strong></td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Inappropriate response to antepartum haemorrhage</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Inappropriate response to poor fetal movements</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Never initiated antenatal care</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Assault</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Failed to return on prescribed date</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>Medical personnel associated</strong></td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td>Fetal distress not detected intrapartum; fetus monitored</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Delay in medical personnel calling for expert assistance</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>F/distress not detected intrapartum; fetus not monitored</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Inadequate / No advice given to mother</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Incorrect management of antepartum haemorrhage</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Management of 2nd stage: prolonged with no intervention</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Multiple pregnancy not diagnosed intrapartum</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Neonatal care: inadequate monitoring</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>Administrative problems</strong></td>
<td>11</td>
<td>22</td>
</tr>
<tr>
<td>Insufficient nurses on duty to manage patient adequately</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Personnel not sufficiently trained to manage the patient</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Personnel too junior to manage the patient</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Anaesthetic delay</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>No accessible neonatal ICU bed with ventilator</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Staff rotation too rapid</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>Insufficient notes to comment</strong></td>
<td>6</td>
<td>12</td>
</tr>
</tbody>
</table>
## Maternal deaths

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of maternal deaths</td>
<td>13</td>
</tr>
<tr>
<td>Maternal Mortality Ratio (Live births)</td>
<td>206/100000</td>
</tr>
<tr>
<td>Maternal Mortality Ratio (All births)</td>
<td>209/100000</td>
</tr>
</tbody>
</table>
## Primary causes of maternal deaths

<table>
<thead>
<tr>
<th>Cause</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>No obstetrical cause</td>
<td>7</td>
<td>53.85</td>
</tr>
<tr>
<td>Septic abortion</td>
<td>2</td>
<td>15.38</td>
</tr>
<tr>
<td>Proteinuric hypertension</td>
<td>1</td>
<td>7.69</td>
</tr>
<tr>
<td>Pre-existing maternal disease (resp)</td>
<td>1</td>
<td>7.69</td>
</tr>
<tr>
<td>Pregnancy related infection</td>
<td>1</td>
<td>7.69</td>
</tr>
<tr>
<td>Anesthetic complications</td>
<td>1</td>
<td>7.69</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>13</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>
Final thoughts

- PMR require resources
- PMR pay back
- PMR is everyone’s business