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Comprehensive midwifery care for a 30-day-old premature neonate with anemia, respiratory distress, and congenital anomalies: A case study

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Abstract:

Premature neonates are prone to breathing problems, anemia, and temperature instability, and congenital anomalies make their care more complex. This study describes comprehensive midwifery care for a 30-day-old premature neonate with anemia, respiratory distress, and congenital anomalies at Gambiran Regional Hospital, Kediri City, Indonesia. A descriptive single-case study was conducted from 16 to 28 June 2025 using Varney's seven-step midwifery management, SOAP notes, observation, interviews, and medical record review. The case follows the CARE guideline. The infant was born at 32 weeks of gestation and weighed 1,480 g. The infant was weak, with a temperature of 35.2 °C, capillary refill time of 4 seconds, chest retractions, irregular breathing, and a hemoglobin level of 8 g/dL. The chest X-ray showed bilateral infiltrates, interpreted as pneumonia. Atrial septal defect, ventricular septal defect, and polydactyly were recorded. Care included oxygen by nasal cannula, packed red cell transfusion, drug therapy with pediatric specialists, orogastric tube feeding, and intensive monitoring. The infant's condition improved and vital signs became stable. Structured, collaborative midwifery care can support recovery in a premature neonate with several problems, but key clinical data should be recorded in full.

Keywords:
midwifery care; premature neonate; anemia; respiratory distress; congenital anomalies; case study

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INTRODUCTION

Preterm birth, defined as birth before 37 weeks of gestation, affects about 1 in 10 babies. In 2020 an estimated 13.4 million babies were born preterm, and rates have hardly changed over the past decade (Ohuma et al., 2023). Complications of preterm birth are a leading cause of death in children under five years of age (Liu et al., 2015). Many preterm babies survive, but they remain vulnerable to breathing problems, infection, unstable body temperature, feeding difficulties, and anemia (Blencowe et al., 2012; World Health Organization, 2022).

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Breathing problems are the most common emergency in these babies. Their lungs, airways, and respiratory control are still immature. Respiratory distress syndrome, caused by a lack of surfactant, is the classic example and is treated with oxygen, respiratory support, and, when needed, surfactant (Polin & Carlo, 2014; Sweet et al., 2023). Pneumonia and sepsis can look very similar in a newborn, so careful assessment is needed (Duke, 2005; Shane et al., 2017). Apnea of prematurity, a pause in breathing caused by immature respiratory control, is also common and usually improves as the baby matures (Eichenwald, 2016).

Anemia is another frequent problem. Preterm infants are born with low iron stores, have a shorter red cell lifespan, and lose blood through repeated sampling. Their hemoglobin falls lower and earlier than in term infants (Strauss, 2010). When anemia is combined with lung disease, the baby's tissues may receive too little oxygen, and a transfusion may be needed.

Congenital anomalies add another layer of risk. Congenital heart disease occurs in about 1 in 100 births, and ventricular septal defect (VSD) and atrial septal defect (ASD) are among the most common types (Hoffman & Kaplan, 2002; Liu et al., 2019). Heart defects can increase blood flow to the lungs and worsen breathing difficulty in a premature baby. Polydactyly, the presence of extra fingers or toes, may appear alone or together with other anomalies, so a careful search for associated findings is advised (Umair et al., 2018).

The causes of preterm birth are many. Maternal infection, poor nutrition, adolescent pregnancy, and pre-eclampsia are all linked with it (Ohuma et al., 2023). Environmental factors may also play a role. For example, pesticide exposure in agricultural communities has been linked with low birth weight and with poor reproductive health in women (Faza et al., 2025; Kurniyawan et al., 2024). These factors show why a complete pregnancy and birth history is part of newborn assessment.

Care for such a baby depends on teamwork. Pediatricians prescribe treatment, radiologists and laboratory staff provide diagnostic information, and midwives and nurses give round-the-clock observation and supportive care. Midwives also help families understand what is happening and take part in decisions (Lawn et al., 2014; Roué et al., 2017). Structured frameworks such as Varney's seven-step management and SOAP notes help clarify clinical reasoning (Varney et al., 2004). However, there are few reports describing how this care is provided to a premature neonate with multiple concurrent problems.

This case study therefore describes comprehensive midwifery care for a 30-day-old premature neonate with anemia, respiratory distress, and congenital anomalies. It also discusses how the findings, treatment, and midwifery actions fit together, and it points out what information should be recorded in future reports. The case is reported in accordance with the CARE guidelines (Riley et al., 2017).

METHODS

This study used a descriptive single-case design with a comprehensive midwifery care approach. This design suits a complex clinical situation because it allows an in-depth look at the care process in its real setting. The case is reported in accordance with the CARE guidelines (Riley

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et al., 2017). The study took place in the Neonatal Care Unit (Panji Ward) of Gambiran Regional Hospital (RSUD Gambiran), Kediri City, Indonesia, from 16 to 28 June 2025.

The subject was the 30-day-old baby of Mrs. I., who was diagnosed with prematurity, anemia, respiratory distress, and congenital anomalies. The study focused on the midwifery care process provided to the baby. The case was chosen because several serious problems occurred together and were managed by a multidisciplinary team. Data were collected from four sources to allow triangulation: (1) direct observation of the baby's condition; (2) interviews with the mother and with health professionals; (3) review of the medical record, including the chest X-ray report; and (4) a literature review to support the clinical reasoning. The instruments were maternal and neonatal assessment forms, a midwifery management form based on Varney's seven steps (data collection, interpretation, potential diagnoses and problems, immediate need for action or collaboration, planning, implementation, and evaluation), and progress notes using the SOAP (Subjective, Objective, Assessment, Plan) approach.

Preterm birth was defined as birth before 37 weeks of gestation, and very low weight was defined as a weight below 1,500 g (World Health Organization, 2022). Normal axillary temperature was taken as 36.5–37.5 °C, and a capillary refill time longer than 2 seconds was considered prolonged. The Apgar score was interpreted according to the American Academy of Pediatrics statement (American Academy of Pediatrics Committee on Fetus and Newborn & American College of Obstetricians and Gynecologists Committee on Obstetric Practice, 2015). Packed red cell (PRC) transfusion refers to transfusion of concentrated red blood cells.

Data were analyzed with a qualitative descriptive approach. The findings of each Varney step were written out in order: assessment, diagnosis, planning, implementation, and evaluation. They were then summarized in tables and compared with current literature and with midwifery practice standards. The parents gave written informed consent to the use of the care record and the publication of this report, and the hospital granted permission for data collection. The baby and mother are identified only by initials.

RESULTS

The case was assessed and managed in accordance with Varney's seven steps, from data collection to evaluation. Baby I, a 30-day-old infant born at 32 weeks of gestation, was diagnosed with prematurity, anemia, respiratory distress, and congenital anomalies (ASD, VSD, and polydactyly). Table 1 summarizes the main clinical findings.

Subjective data from the mother showed that the baby was crying and had shortness of breath. On examination, the infant was weak. The temperature was low (35.2 °C), and the capillary refill time was prolonged (4 seconds), suggesting cold stress and reduced peripheral perfusion. The pulse rate was 146 beats/min. The baby showed chest wall retractions and irregular breathing. The current weight was 1,480 g, which is in the very low weight category. The hemoglobin level was 8 g/dL. The chest X-ray showed normal heart size, infiltrates in both lung fields, and sharp costophrenic angles; the radiologic conclusion was pneumonia. An Apgar score of 3–5 was documented in the record, but the time of this assessment was not stated.

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The midwifery diagnosis was a 30-day-old premature infant with respiratory failure and inability to breathe spontaneously. The needs were oxygen, vital-sign monitoring, and collaboration with a pediatrician. The potential diagnosis was severe asphyxia, which could lead to death if the condition worsened. Anticipatory action was taken through collaboration with a pediatrician for drug therapy and with a radiologist for further diagnostic examinations. Table 2 summarizes the midwifery management in each step.

Table 1. Clinical findings of the neonate at assessment

Parameter	Finding	Usual reference	Interpretation
Age; gestational age	30 days; 32 weeks of gestation	Term: 37 weeks or more	Premature
Weight	1,480 g (current)	Very low weight: below 1,500 g	Very low weight; birth weight not reported
Length; head and chest circumference	46 cm; 28 cm; 25 cm	Compare with a growth chart for age	Recorded; percentiles not reported
Temperature	35.2 °C	36.5–37.5 °C	Hypothermia
Pulse rate	146 beats/min	About 100–160 beats/min	Within the usual range
Capillary refill time	4 seconds	2 seconds or less	Prolonged; reduced perfusion
Respiratory status	Chest retractions; irregular breathing	Regular, unlabored breathing	Respiratory distress
General condition	Weak; crying; shortness of breath (mother's report)	Active, vigorous	Unwell
Apgar score	3–5 (as documented; time not stated)	7–10 is considered reassuring at 1 and 5 minutes after birth	Low; cannot be interpreted without the time of scoring
Hemoglobin	8 g/dL	Lowest levels in preterm infants occur at 4–8 weeks of age	Anemia
Chest X-ray	Normal heart size; bilateral lung infiltrates; sharp costophrenic angles	No infiltrates	Radiologic conclusion: pneumonia
Congenital anomalies	ASD, VSD, polydactyly	None	Recorded in the diagnosis; details not reported

Note. ASD = atrial septal defect; VSD = ventricular septal defect. Reference values are commonly used ranges (American Academy of Pediatrics Committee on Fetus and Newborn & American College of Obstetricians and Gynecologists Committee on Obstetric Practice, 2015; Strauss, 2010; World Health Organization, 2022).

The care plan included informing the family of the examination results, obtaining informed consent for any further procedures, coordinating with the pediatrician on medication therapy, monitoring vital signs, providing emotional support to the family during visits, and documenting all interventions and observations. All planned actions were carried out as intended. They included oxygen therapy via nasal cannula, PRC transfusion, pharmacotherapy, nutrition via orogastric tube (OGT), and intensive monitoring of vital signs.

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On evaluation, the baby's general condition improved. Vital signs stabilized, and the infant responded positively to the care provided. The summarized record did not include numerical follow-up values, such as oxygen saturation, post-transfusion hemoglobin, or weight gain.

Table 2. Midwifery management according to Varney's seven steps

Step	Findings and actions
1. Data collection	Interview with the mother; physical examination; chest X-ray; hemoglobin level
2. Interpretation	Diagnosis: 30-day-old premature infant. Problems: respiratory failure and inability to breathe spontaneously. Needs: oxygen, monitoring of vital signs, and collaboration with a pediatrician
3. Potential diagnosis	Severe asphyxia, which could lead to death if the condition worsened
4. Immediate action and collaboration	Pediatrician for drug therapy; radiologist for further diagnostic examinations
5. Planning	Inform the family of results; obtain informed consent; drug therapy with the pediatrician; monitor vital signs; give emotional support; document all actions
6. Implementation	Oxygen by nasal cannula; PRC transfusion; drug therapy; OGT feeding; intensive monitoring of vital signs; all planned actions carried out
7. Evaluation	General condition improved; vital signs stable; positive response to care

Note. PRC = packed red cells; OGT = orogastric tube. Doses, transfusion volume, and drug names were not available in the summarized record.

DISCUSSION

This case shows how prematurity can bring many problems together. Preterm birth remains common worldwide and is a leading cause of death in young children (Liu et al., 2015; Ohuma et al., 2023). The infant here had breathing difficulty, a low temperature, poor perfusion, anemia, and congenital anomalies at the same time. Each problem makes the others harder to manage. For example, a cold baby uses more oxygen, anemia reduces oxygen delivery to tissues, and lung disease reduces the oxygen entering the blood. A team that looks at all these problems together, as Varney's steps encourage, is more likely to prevent a downward spiral.

The pregnancy history may also hold clues. Preterm birth and low birth weight have several maternal causes, including infection, poor nutrition, and pre-eclampsia (Ohuma et al., 2023). Environmental exposure during pregnancy, such as pesticides in farming communities, has been linked with low birth weight and with adverse reproductive health in women (Faza et al., 2025; Kurniyawan et al., 2024). The summarized record did not describe the mother's age, occupation, antenatal care, or infections in pregnancy. Recording these items is simple and may help identify the cause and plan prevention for future pregnancies.

The respiratory picture in this baby needs careful reading. The baby showed chest retractions and irregular breathing, and the chest X-ray showed infiltrates in both lungs, which the radiologist read as pneumonia. In a preterm infant, several conditions can cause this picture. Respiratory distress syndrome typically occurs in the first days of life, and by 30 days it is less likely to be the primary cause, although chronic lung problems may follow (Sweet et al., 2023). Pneumonia and sepsis can present similarly to other causes of respiratory distress, so the team should consider infection and order blood tests and cultures when available (Duke, 2005; Shane et al., 2017).

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Irregular breathing may also point to apnea of prematurity, which is related to immature respiratory control (Eichenwald, 2016). Caffeine is widely used for this problem, and it has been shown to reduce apnea in preterm infants (Schmidt et al., 2006). The drugs given in this case were not named in the record, so we cannot say which were used.

Heart defects should also be considered. A VSD or ASD can allow extra blood to flow to the lungs, and in a premature baby this may increase breathing effort and the risk of heart failure (Hoffman & Kaplan, 2002). The echocardiographic details of the defects, such as their size and flow direction, were not reported. This information is important because it tells the team whether the heart defects contribute to the breathing problem or are incidental findings. Polydactyly is often isolated, but it can be a sign of a syndrome, so a full examination for other anomalies is advised (Umair et al., 2018).

The record gave an Apgar score of 3–5 and a potential diagnosis of severe asphyxia. The Apgar score describes how a baby is doing at 1 and 5 minutes after birth and is not a tool for diagnosing asphyxia on its own (American Academy of Pediatrics Committee on Fetus and Newborn & American College of Obstetricians and Gynecologists Committee on Obstetric Practice, 2015). For a 30-day-old infant, the score should be linked to the time of birth, and the current condition should be described with current findings: breathing pattern, oxygen saturation, perfusion, and tone. In this report, we kept the documented score but did not use it to label the present condition. Future reports should state when the score was taken and should describe the infant's present state with objective values.

Oxygen therapy by nasal cannula was a key step. Oxygen needs to be given with a target, because too little oxygen is harmful and too much can damage the eyes and lungs of preterm infants. The American Academy of Pediatrics recommends targeting a saturation of about 90–95% in very preterm infants (Cummings & Polin, 2016), and a large meta-analysis found that lower targets were linked with higher mortality (Askie et al., 2018). Oxygen saturation values were not reported in this case. Recording the saturation, the flow, and the baby's response would make the effect of oxygen clear and help to decide when it can be reduced.

The temperature of 35.2 °C was below the normal range, indicating that thermal protection was an important part of care. Cold stress increases oxygen use and can worsen breathing problems. WHO recommends keeping preterm and low-birth-weight babies warm and supports kangaroo mother care once the baby is stable (World Health Organization, 2022). A Cochrane review found that kangaroo mother care reduces mortality, infections, and hypothermia in low-birth-weight infants (Conde-Agudelo & Díaz-Rossello, 2016). Rewarming steps and the temperature after rewarming were not documented, and these should be recorded in future reports.

A hemoglobin level of 8 g/dL was classified as anemia, and a PRC transfusion was administered. Hemoglobin levels in preterm infants fall lower and earlier than in term infants, a condition known as anemia of prematurity (Strauss, 2010). Transfusion decisions depend on the infant's age, the need for respiratory support, and symptoms. Two large trials in extremely preterm infants found that restrictive and liberal transfusion thresholds gave similar results for survival and neurodevelopment (Franz et al., 2020; Kirpalani et al., 2020). These trials enrolled smaller babies than the infant in this case, so their results apply only in part. In an infant who is symptomatic, with respiratory distress and prolonged capillary refill, transfusion is a reasonable choice, and the

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midwife's role is to prepare the infant, check identity and blood products with the team, and monitor closely for reactions. The volume, the rate, and the post-transfusion hemoglobin were not recorded.

OGT nutrition allowed the baby to be fed safely while breathing was unstable. European guidance recommends mother's own milk as the first choice for preterm infants, with fortification or donor milk when needed, and careful advancement of feeds (Embleton et al., 2023). Infants with respiratory distress or heart defects need close observation for feeding intolerance, so feeding volume and tolerance should be recorded.

Teamwork was central to this case. The midwife observed the baby, provided planned care, and helped link the pediatrician, the radiologist, and the family. Quality newborn care depends on coordinated work among health professionals (Lawn et al., 2014). Family-centered care is also part of good practice. Parents need clear information, a chance to take part in decisions, and emotional support (Roué et al., 2017). In this case, the plan included informing the family, obtaining informed consent, and providing emotional support during visits, all of which fit these principles. After discharge, parents of premature infants need teaching on danger signs, warmth, feeding, and follow-up of the heart defects.

Another important consideration is discharge planning and long-term follow-up. Premature infants with respiratory problems, anemia, and congenital heart defects may remain at risk of feeding difficulties, poor growth, recurrent respiratory problems, and developmental delays. Before discharge, the healthcare team should assess feeding ability, temperature stability, respiratory status, and weight gain, while ensuring that the family understands medication instructions and warning signs. Follow-up should include growth and developmental monitoring and evaluation of the congenital heart defects. Clear communication between the hospital team, primary healthcare providers, and family can support continuity of care and the early identification of complications (Roué et al., 2017; World Health Organization, 2022).

A strength of this report is the structured use of Varney's steps and SOAP notes, the use of several data sources, and the clear link between findings and actions. There are also limitations. This is a single case, so the findings cannot be generalized. The record did not include birth weight, oxygen saturation, blood gas results, infection markers, echocardiographic details, drug names and doses, transfusion volume, or length of stay. The time of the Apgar score was not stated. Improvement was described as better general condition and stable vital signs, not as objective values, so this report describes care and cannot show that the interventions caused the recovery.

Four lessons follow for practice. First, a premature infant with respiratory distress should be assessed for temperature, perfusion, hemoglobin, infection, and heart disease together. Second, clinical labels such as asphyxia should be tied to clear criteria and to the time of assessment. Third, key numbers, such as oxygen saturation, rewarming temperature, transfusion details, and feed tolerance, should be recorded so that care can be reviewed and compared. Fourth, families should be involved from the beginning and prepared for discharge. Future studies should audit or follow similar infants through discharge and later development.

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CONCLUSION

This case study describes comprehensive midwifery care for a 30-day-old premature neonate with anemia, respiratory distress, and congenital anomalies. Using Varney's seven steps, the midwife and the team gave oxygen, a packed red cell transfusion, drug therapy, orogastric feeding, and close monitoring. The infant's general condition improved, and vital signs became stable. The case shows that structured, collaborative, and family-centered midwifery care can support the care of a premature infant with several problems. Future reports should include objective values, such as oxygen saturation, temperature, and transfusion details, and should state clearly when clinical scores were taken.

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CONFLICT OF INTEREST

The authors declare no conflict of interest in this article.

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