

# Physicians-Nursing Interventions in Managing Preeclampsia: Impact on Maternal and Fetal Outcomes: Review

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## Abstract

**Aim:** To explore the roles of physicians and nurses in managing preeclampsia and their impact on maternal and fetal outcomes.

Preeclampsia is a hypertensive disorder of pregnancy associated with significant risks for both mother and fetus. Effective management requires a collaborative approach, with physicians diagnosing and directing treatment, including antihypertensive therapy, magnesium sulfate, and determining delivery timing. Nurses provide continuous monitoring, medication administration, patient education, and emotional support. Together, these interventions reduce complications such as eclampsia, HELLP syndrome, and fetal growth restriction, improving overall outcomes. Addressing barriers to care and leveraging emerging technologies can further enhance the management of preeclampsia in diverse healthcare settings.

## Introduction

Preeclampsia is a hypertensive disorder unique to pregnancy that poses significant risks to both maternal and fetal health. It is a leading cause of maternal and perinatal morbidity and mortality globally, affecting approximately 2–8% of pregnancies. Preeclampsia typically occurs after 20 weeks of gestation and is characterized by elevated blood pressure and evidence of end-organ damage, such as proteinuria, renal insufficiency, liver dysfunction, or neurological symptoms. The condition can progress rapidly, leading to severe complications such as eclampsia, HELLP syndrome (hemolysis, elevated liver enzymes, and low platelet count), placental abruption, and preterm delivery. For the fetus, preeclampsia increases the risk of intrauterine growth restriction, preterm birth, and stillbirth. These complications highlight the critical need for timely and effective management to mitigate adverse outcomes (1).

The pathophysiology of preeclampsia is complex and not fully understood, but it is believed to involve abnormal placental development, endothelial dysfunction, and a systemic inflammatory response. Women with preexisting risk factors, such as a history of preeclampsia, chronic hypertension, diabetes, obesity, or autoimmune disorders, are at higher risk of developing the condition. Early identification and intervention are essential to improving outcomes for both mother and fetus (2).

The management of preeclampsia requires a multidisciplinary approach, with physicians and nurses playing complementary roles. Physicians are responsible for diagnosing preeclampsia, assessing its severity, and formulating treatment plans that balance maternal health risks with fetal viability. Their expertise guides critical decisions, including the initiation of antihypertensive therapy, administration of magnesium sulfate for seizure prophylaxis, and determining the optimal timing and mode of delivery. Nurses, on the other hand, are at the forefront of patient care, providing continuous monitoring, administering medications, educating patients, and responding to signs of disease progression. This collaborative approach ensures comprehensive care that addresses both the clinical and emotional needs of patients (3).

In addition to clinical management, patient education and empowerment are key components of preeclampsia care. Many patients and their families may be unfamiliar with the condition or its potential complications, making clear communication and education vital. Nurses often play a central role in educating patients about the importance of monitoring symptoms, adhering to treatment regimens, and recognizing warning signs that require immediate medical attention.

Despite advances in understanding and managing preeclampsia, significant challenges remain. Early diagnosis can be difficult, particularly in resource-limited settings where access to diagnostic tools and specialized care may be restricted. Additionally, the rapid progression of the disease underscores the need for continuous vigilance and timely intervention. Emerging technologies, such as telemonitoring and advanced diagnostic tools, offer promising avenues for improving care delivery and outcomes in both high-resource and low-resource settings (4).

This review examines the roles of physicians and nurses in managing preeclampsia and explores how their collaborative efforts influence maternal and fetal outcomes. By understanding the complexities of this condition and the contributions of each healthcare provider, this discussion highlights the importance of a multidisciplinary approach to ensuring safe and effective care for women and their babies.

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## Review

### 1. Role of Physicians in Managing Preeclampsia

#### 1.1. Diagnosis and Risk Assessment

The diagnosis of preeclampsia is a critical step in preventing severe maternal and fetal complications. Physicians rely on clinical criteria, including persistent blood pressure elevations of  $\geq 140/90$  mmHg after 20 weeks of gestation and evidence of proteinuria ( $\geq 300$  mg/24 hours), or systemic manifestations such as thrombocytopenia, renal insufficiency, or liver dysfunction. These

criteria enable early detection, ensuring that care plans are implemented before complications arise (1).

Risk assessment is integral to the management of preeclampsia, as certain factors predispose women to the condition. These include a history of preeclampsia, chronic hypertension, diabetes, advanced maternal age, multiple gestations, and autoimmune disorders. Physicians tailor preventive strategies, such as low-dose aspirin, initiated between 12 and 28 weeks of gestation, which has been shown to reduce the risk of preeclampsia in high-risk women by up to 10–15% (2). In settings with limited resources, risk stratification becomes even more critical for directing preventive measures and monitoring efforts.

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## 1.2. Medical Management and Treatment Decisions

Effective medical management of preeclampsia depends on the severity of the condition and the gestational age of the pregnancy. Physicians aim to stabilize maternal blood pressure, prevent seizure progression, and optimize fetal outcomes while minimizing the risks associated with preterm delivery. Antihypertensive therapy is a cornerstone of treatment, with labetalol, nifedipine, and hydralazine being commonly used agents. These medications effectively lower blood pressure and reduce the risk of maternal complications such as stroke while maintaining placental perfusion to protect the fetus (3).

Severe cases of preeclampsia, characterized by blood pressure  $\geq 160/110$  mmHg, persistent headaches, or end-organ damage, often require hospitalization. Physicians administer magnesium sulfate to prevent seizures, which can escalate to life-threatening eclampsia if left untreated. In addition to managing maternal health, corticosteroids are prescribed before 34 weeks of gestation to accelerate fetal lung maturation, reducing neonatal respiratory distress and other complications associated with preterm birth (4).

Delivery is the only definitive cure for preeclampsia, but the timing requires careful consideration. Physicians balance the risks of maternal deterioration against the consequences of preterm delivery. In cases where preeclampsia is severe, delivery is typically recommended at 34 weeks or earlier if maternal or fetal compromise is detected. For mild cases, expectant management with close monitoring may be pursued until 37 weeks to optimize fetal maturity (5).

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## 2. Role of Nurses in Managing Preeclampsia

### 2.1. Monitoring and Early Intervention

Nurses are the frontline caregivers in managing preeclampsia, providing continuous assessment and identifying early signs of complications. Regular blood pressure monitoring, assessment of urine output, and observation for symptoms such as severe headaches, visual disturbances, and epigastric pain are integral to early intervention. By maintaining detailed records and recognizing subtle changes in clinical status, nurses play a crucial role in escalating care to physicians when necessary (6).

Fetal well-being is another critical focus for nurses managing preeclampsia. Continuous electronic fetal monitoring (EFM) and non-stress tests (NSTs) allow for the early detection of signs of placental insufficiency or fetal compromise, such as late decelerations or reduced variability in fetal heart rate. Nurses interpret these findings and collaborate with physicians to determine the need for immediate intervention, including expedited delivery.

In addition to physical monitoring, nurses assess laboratory parameters such as platelet counts, liver enzymes, and serum creatinine levels. Worsening laboratory results may indicate the progression to HELLP syndrome (hemolysis, elevated liver enzymes, low platelets) or other severe complications, prompting immediate escalation of care (7).

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## **2.2. Medication Administration and Observation**

Nurses play a vital role in administering medications prescribed for preeclampsia and monitoring their effects. For example, during magnesium sulfate therapy, nurses monitor for signs of toxicity, including respiratory depression, diminished reflexes, and decreased urine output. By closely observing the patient and ensuring therapeutic magnesium levels, nurses help prevent complications associated with the treatment itself.

Similarly, antihypertensive medications are administered under nursing supervision, with nurses monitoring blood pressure trends and identifying any adverse effects such as hypotension or dizziness. By ensuring timely and accurate medication administration, nurses contribute to stabilizing the patient's condition and preventing severe complications.

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## **2.3. Patient Education and Support**

Patient education is a cornerstone of nursing care for preeclampsia. Nurses provide clear and concise explanations about the condition, emphasizing the importance of monitoring symptoms, adhering to medication regimens, and attending follow-up appointments. Education empowers patients to take an active role in their care and recognize warning signs that require immediate medical attention, such as severe headaches, blurred vision, or reduced fetal movement (8).

In addition to physical care, nurses offer emotional support to patients and their families. The diagnosis of preeclampsia can be overwhelming, particularly if hospitalization or preterm delivery becomes necessary. Nurses provide reassurance, address concerns, and facilitate communication between the patient and the healthcare team, creating a supportive and collaborative care environment.

### **3. Collaborative Interventions and Impact on Outcomes**

#### **3.1. Early Detection and Prevention of Complications**

Collaboration between physicians and nurses is essential in the early detection and management of preeclampsia. Nurses' frequent interactions with patients enable them to identify subtle changes in clinical status, which they communicate to physicians for prompt action. For instance, the early recognition of rising blood pressure or reduced urine output can lead to timely interventions, such as adjusting antihypertensive therapy or initiating magnesium sulfate to prevent seizures (9).

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#### **3.2. Improved Maternal Outcomes**

Effective collaboration between nurses and physicians has a significant impact on maternal outcomes. Timely administration of antihypertensive medications reduces the risk of stroke, while magnesium sulfate therapy prevents eclampsia. The coordinated monitoring of maternal and fetal status enables healthcare teams to intervene quickly, preventing severe complications such as HELLP syndrome or organ failure. Studies have shown that multidisciplinary care reduces maternal mortality rates and improves the overall safety of care for women with preeclampsia (10).

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#### **3.3. Enhanced Fetal Outcomes**

Collaborative care also leads to improved fetal outcomes. Continuous fetal monitoring and timely interventions, such as corticosteroid administration and delivery, reduce the risks associated with preterm birth and placental insufficiency. Neonates born to mothers with well-managed preeclampsia experience lower rates of respiratory distress syndrome, intraventricular hemorrhage, and neonatal mortality. Additionally, nurse-led education on breastfeeding and neonatal care helps ensure optimal postnatal outcomes for these infants (11).

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### **4. Challenges and Future Directions**

#### **4.1. Barriers to Optimal Care**

Barriers such as limited access to healthcare resources, delayed diagnosis, and variability in care protocols can hinder the management of preeclampsia, particularly in low-resource settings. Addressing these challenges requires increased training for healthcare providers, standardized care guidelines, and improved access to diagnostic tools.

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#### **4.2. Innovations in Care Delivery**

Emerging technologies, including telemonitoring and mobile health applications, offer opportunities to improve the management of preeclampsia. These tools allow for remote blood

pressure monitoring, patient education, and real-time communication between patients and healthcare teams, enabling early detection and intervention.

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## Conclusion

The collaborative efforts of physicians and nurses are pivotal in managing preeclampsia and improving maternal and fetal outcomes. Physicians provide diagnostic expertise, medical management, and decision-making regarding delivery, while nurses deliver continuous monitoring, medication administration, patient education, and emotional support. This multidisciplinary approach ensures timely and effective interventions, reducing the risks of complications and improving both maternal and neonatal health.

Despite challenges such as resource constraints and systemic barriers, advancements in technology and care delivery have the potential to further enhance outcomes for women with preeclampsia. By prioritizing collaboration, education, and innovation, healthcare teams can ensure that every woman with preeclampsia receives the comprehensive care necessary for a safe and healthy pregnancy.

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