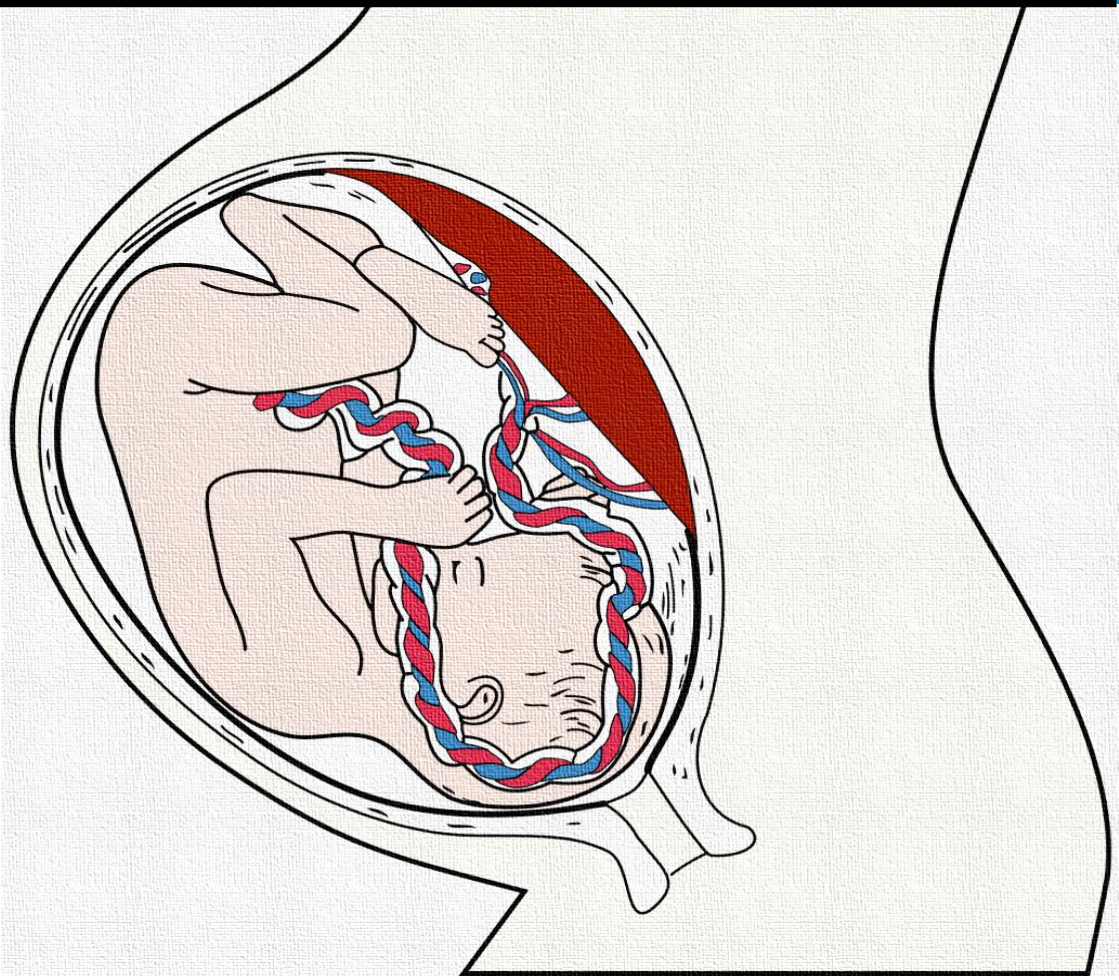
PREECLAMPSIA

Patient Information from the Norwegian Society for Gynecology and Obstetrics



Norsk gynekologisk forening
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Attachment to
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The Norwegian Society for
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WHAT IS PREECLAMPSIA AND GESTATIONAL HYPERTENSION?

Preeclampsia is a pregnancy unique complication. It is defined by new onset, persistently elevated blood pressure during pregnancy (i.e. a systolic blood pressure of at least 140 mmHg and/or a diastolic blood pressure of at least 90 mmHg) and protein in the urine (proteinuria), both occurring after pregnancy week 20.

The condition is called gestational hypertension if there is solely new onset hypertension (without proteinuria or other signs of organ affection). Some women have high blood pressure before pregnancy week 20. This is called chronic hypertension. Preeclampsia, gestational hypertension, and chronic hypertension in pregnancy, are together referred to as “hypertensive disorders of pregnancy”.

Preeclampsia and gestational hypertension largely share risk factors, causes, and complications. Thus, much of the information about preeclampsia in this pamphlet is also relevant for gestational hypertension. Women with chronic hypertension have an increased risk of developing preeclampsia. This patient information may therefore also be relevant to these women.

HOW COMMON IS PREECLAMPSIA?

Preeclampsia affects approximately 3% of all pregnant women in Norway. All together 10% of pregnant women are affected by a hypertensive disorder of pregnancy.

IS PREECLAMPSIA DANGEROUS?

Preeclampsia usually occurs late in pregnancy with few or no symptoms. About 1/100 women with preeclampsia develops a more severe form of disease with complications such as eclampsia (fits), cerebral hemorrhage (bleeding in the brain), pulmonary edema (fluid collections in the lungs), kidney failure, liver damage and serious dysfunction with the blood clotting system («disseminated intravascular coagulation»). In Norway, death of a mother or child due to preeclampsia is extremely rare. Deaths and severe morbidity are more common in low-income countries with limited access to antenatal care and health care during and after labor.

About 1 in 5 women who develop gestational hypertension will later in the pregnancy progress to develop preeclampsia. Women with gestational hypertension will be closely followed up throughout the rest of the pregnancy and during delivery.

WHICH SYMPTOMS ARE ASSOCIATED TO PREECLAMPSIA?

The pregnant woman with preeclampsia usually has no symptoms at the onset of the disease. It is therefore important that she attends regular antenatal check-ups to detect elevated blood pressure or proteinuria. Women with preeclampsia may eventually develop symptoms including visual disturbances (typically flickering lights), headache, nausea, upper abdominal pain, swelling of the feet, hands and face, and malaise. Some pregnant women with preeclampsia and placental insufficiency also feel less fetal movement.

Most of these symptoms can also occur in a normal pregnancy, but if they are new to the woman or if several of the symptoms appear simultaneously, health care personnel should always be consulted. If a woman experiences reduced fetal movement after pregnancy week 20, the obstetric clinic should be contacted for further counselling. If a woman is not sure about what is meant by normal fetal movements, she can check the web resource at https://kjennliv.no/andre-sprak/ for information in several languages.

HOW CAN A WOMAN RECOGNIZE PREECLAMPSIA?

The regular way to diagnose preeclampsia is by measuring blood pressure and assessing the urine for protein. This is conducted at all check-ups in the general antenatal care program. Most women will at the time of preeclampsia diagnosis have no symptoms of preeclampsia.

If a pregnant woman experiences symptoms like serious headache, visual flickering, nausea, upper abdominal pain, rapidly increasing swellings in feet, hands and face, or malaise, and if these symptoms are new onset or occurring together, a doctor or a midwife should be rapidly contacted for an additional check-up.

WHAT IS THE CAUSE OF PREECLAMPSIA?

The full cause of preeclampsia is unknown, but the placental function is very important for its development. It is believed that inflammatory substances from the placenta circulate in the pregnant woman and affect her vessel walls, causing elevated blood pressure and leakage of protein through the vessel walls of the kidney (resulting in proteinuria). If preeclampsia develops early in pregnancy, placental insufficiency is often severe and leads to impaired fetal growth.

HOW IS PREECLAMPSIA TREATED?

As of today, the only definitive treatment of preeclampsia is to remove the placenta, which means that the baby and the placenta must be delivered. Determining the optimal timing of delivery can be difficult, as maternal health must be weighed against risks of fetal complications and premature delivery.

At term (starting at the onset of the 37th gestational week and lasting until delivery) delivery is recommended for all women with preeclampsia to avoid complications. Normally, the woman is admitted to hospital to monitor blood pressure, organ function and fetal wellbeing and the labor is induced.

Before term, women with preeclampsia are also normally admitted to hospital for further assessment. Induction of labor may be indicated also from the 34th gestational week to reduce the risk of maternal complications. The risk of immature lungs in the baby and subsequent admission to the neonatal intensive care unit is lower as gestational age increases.

If preeclampsia develops before 34th gestational week, placental function is often impaired, and it may be better for the baby outside the womb. If the fetal growth is fine and the mother's condition is stable, the pregnancy will most often continue under close surveillance until planned delivery at gestational week 34-37.

In preeclampsia, the choice of delivery method (induced vaginal delivery or caesarean section) depends on maternal and fetal health, pregnancy length, maturity of the cervix, and whether the woman has previously delivered vaginally.

To prevent complications of preeclampsia, such as cerebral hemorrhage in the woman, women with a high blood pressure (e.g. ≥150/100) receive antihypertensive drugs. Some women with severe forms of preeclampsia also receive intravenous magnesium sulphate. Although these medications lower the risk of complications, they do not cure preeclampsia. Delivery of the placenta (and thereby the baby) will cure most women with preeclampsia, often within a short time.

WHO WILL DEVELOP PREECLAMPSIA?

As of today, we cannot exactly predict preeclampsia development. However, we know that the following pregnant women are at an increased risk of developing the condition:

- Women who have not given birth before
- Women with preeclampsia in a previous pregnancy
- Women pregnant with more than one child (e.g. twins, triplets)
- Women with diabetes mellitus (pre-existing or arising in pregnancy)
- Women with elevated blood pressure or chronic kidney disease before pregnancy (including women with a kidney transplant)
- Overweight women
- Women more than 40 years old
- Women with certain rare autoimmune diseases (e.g. systemic lupus erythematosus and antiphospholipid syndrome)
- Women whose last childbirth was more than 10 years ago
- In vitro fertilization with oocyte donation

Even if a woman has one or more of the risk factors listed above, she will most likely have a pregnancy without preeclampsia. In general, preeclampsia is not inheritable. If several close maternal relatives have had preeclampsia, the risk is somewhat increased.

IS PREECLAMPSIA PREVENTABLE?

The only definitive way of preventing preeclampsia is to avoid pregnancy altogether. For women wanting to become pregnant, there are however several recommendations that can help reducing the risk of preeclampsia. These recommendations are also valid for women with a previous pregnancy complicated by preeclampsia or gestational hypertension. A normal, healthy lifestyle before and during pregnancy with adequate physical activity, a healthy diet, and normal body weight are generally recommended. There is no evidence to support a special diet during pregnancy. In women whose dietary calcium intake is low, calcium supplements may lower the risk of preeclampsia

Women with chronic disease, including hypertension, should receive optimal treatment before and during pregnancy. Reducing overweight and being physically active before and throughout pregnancy probably also reduce the risk of preeclampsia.

Women deemed to a have high preeclampsia risk should be offered by their physician a daily dose of low-dose aspirin, starting at the end of first trimester, in

order to lower the risk of developing preeclampsia (link to Norwegian obstetric guidelines). Starting aspirin later than 16 weeks of pregnancy does not prevent preeclampsia.

Blood levels of certain proteins from the placenta (such as placental growth factor, PlGF) can more accurately predict which women will benefit from treatment with aspirin to prevent preeclampsia before 37 weeks of pregnancy. PlGF can be measured in a blood test from pregnant women at 11–14 weeks' gestation. It is currently (2026) under review whether this test should be offered within the public health service in Norway.

WHAT HAPPENS AFTER DELIVERY IN PREECLAMPSIA OR GESTATIONAL HYPERTENSION?

In most women with preeclampsia or gestational hypertension, blood pressure returns to normal within a few days after delivery. Blood pressure often peaks around days 3–7 after delivery, so it is recommended to check it at least once a day for the first three days. Some women will need antihypertensive medication for some time after delivery, and a few will need lifelong therapy.

In rare cases, very severe forms of preeclampsia can cause lasting health problems. Children born in Norway after preeclampsia or gestational hypertension are most often healthy, but if born extremely prematurely, the prematurity itself can lead to minor or major sequela.

MENTAL HEALTH AFTER HYPERTENSIVE DISORDERS OF PREGNANCY

Hypertensive pregnancy complications can cause mental stress during and after pregnancy. A traumatic pregnancy or birth can make it hard to cope emotionally.

Women who have had preeclampsia more often feel their pregnancy and birth were traumatic, but studies do not show an increased risk of mental illness two years after birth. Very severe forms of preeclampsia (including eclampsia) have in some studies been linked to longer-term memory problems.

Support from a partner, family, and friends are important after birth. If further support is needed, the general practitioner or the Mental Health helpline in Norway at 116 123 (Mental Helse) may be contacted.

WHAT ABOUT NEXT PREGNANCY AFTER PREECLAMPSIA OR GESTATIONAL HYPERTENSION?

Women with a history of a previous hypertensive disorder of pregnancy are at increased risk of a hypertensive disorder of pregnancy in subsequent pregnancies; especially if there was early onset preeclampsia (with a preterm delivery) or the weight of the baby was low for the gestational age at delivery. Although women with previous preeclampsia have increased risk of preeclampsia in later pregnancies, most of them will not develop preeclampsia in a subsequent pregnancy.

It is crucial that women with previous hypertensive disorders of pregnancy receive thorough follow-up in a subsequent pregnancy. Regular check-ups at a general practitioner or community midwife are normally adequate. The healthcare team will assess whether a low-dose Aspirin tablet each evening to help prevent preeclampsia is recommended. If appropriate, the doctor will prescribe this. Treatment should start around 11–14 weeks of pregnancy and should not start later than 16 weeks when the aim is to prevent preeclampsia.

In the future, Norway may introduce a more precise system for assessing preeclampsia risk. This includes measuring blood flow to the uterus with ultrasound and a blood test from the pregnant woman to measure PlGF, which can provide information about placental function and the risk of early-onset preeclampsia.

WHAT ARE THE LONG-TERM EFFECTS OF PREECLAMPSIA?

Both women and offspring have a somewhat increased risk of developing cardiovascular disease later in life after a pregnancy complicated by hypertension. The flowchart below suggests guidelines for follow-up of a woman who has had gestational hypertension or preeclampsia in Norway. By identifying modifiable risk factors for cardiovascular disease at an early age, such as high blood pressure, early measures can be taken to help prevent such disease.

Primary prevention of cardiovascular disease after a hypertensive disorder of pregnancy

Pregnancy complicated by*
-preeclampsia
-gestational hypertension

6-12 weeks postpartum
-cardiovascular risk evaluation *(simple)*
-lifestyle advice
-evaluate need for drug therapy

Approx. 1 year postpartum
-cardiovascular risk evaluation *(extended)*
-llifestyle advice
-evaulate need for drug therapy

Regularly until 50 years of age
(Frequency dependent on identified risk factors. Follow-up in women without such risk factors may be combined with other screening programs, such as cervical screening)

-cardiovascular risk evaluation *(simple)*
-lifestyle advice
-evaulate need for drug therapy

50 years of age
-cardiovascular risk evaluation *(extended)*
(and a cardiovascular risk calculator)[c]
-lifestyle advice
-evaluate need for drug therapy
-further check-ups according to general guidelines[c]

- Lifestyle advice
  - Smoking cessation[a]
  - Physical activity levels according to guidelines[b]
  - Normal weight[c]
  - Healthy diet according to guidelines[b]
- Cardiovascular risk evaluation - *simple*
  - Body mass index
  - Smoking habits
  - Physical activity levels
  - Blood pressure
- Cardiovascular risk evaluation - *extended*
  As «*simple*», in addition:
  - Hereditary risk of cardiovascular disease
  - Dyslipidemia (LDL and total-cholesterol)
  - Glucose intolerance (HbA1c)
- Drug therapy
  - According to guidelines[a]

Comments:

- Women with elevated blood pressure (≥140 systolic and/or ≥90 diastolic) at discharge from hospital postpartum: follow general guidelines for treatment of hypertension. If they later on become normotensive: follow this flow chart (on the left side).
- Women who have or develop cardiovascular disease, hypertension, overweight or dyslipidemia: follow existing guidelines for these conditions. As a minimum, these women should recieve follow-up as outlined in the flow-chart (on the left side).

[a] https://helsedirektoratet.no/retningslinjer/forebygging-av-hjerte-og-karsykdom
[b] https://helsedirektoratet.no/publikasjoner/anbefalinger-om-kosthold-ernering-og-fysisk-aktivitet
[c] Forebygging av hjerte- og karsykdom - Helsedirektoratet

Based on currently available evidence, to prevent cardiovascular disease, we recommend a healthy lifestyle for women who have had preeclampsia. This advice is in line with guidelines from the Norwegian Directorate of Health:

- Adults should be physically active for at least 150–300 minutes per week at moderate intensity, or at least 75–150 minutes per week at vigorous intensity (causing breathlessness), or a combination of moderate and vigorous activity.
- Reduce time spent sitting (sedentary activity)
- Choose a varied, balanced diet with increased amounts of:
    - plant-based foods that provide unsaturated fats, including plant oils such as olive oil and rapeseed (canola) oil, and nuts, and less foods high in saturated fat from meat
    - vegetables, salad, legumes and fruit, and whole grain products, with a reduction in refined grain products such as white-flour baked goods and sugary breakfast cereals
    - white meat (chicken, turkey), fish and shellfish instead of red meat

- Limit intake of salt, butter, sugar, foods and drinks high in sugar, and processed meats
- A predominantly vegetarian diet may be beneficial for lowering heart and vascular risk
- Healthy people who eat a varied diet have no proven benefit from dietary supplements (vitamins, antioxidants, etc.)
- Maintain a healthy weight (body mass index 18.5–24.9 kg/m^2)
- Avoid smoking
- Limit alcohol intake

The check-ups at the general practitioner's after preeclampsia should include an assessment of total cardiovascular disease risk, please see flow chart above:

- family history: close relatives with a history of cardiovascular disease or diabetes
- physical activity levels
- diet
- smoking habits
- concurrent diseases (e.g. diabetes)
- body mass index (BMI) and hip/waist-ratio
- blood lipids
- fasting blood sugar or HbA1c (to look for signs of diabetes development)
- blood pressure

Recommendations for further follow-up with your GP after the one-year check after birth, and up to about age 50, depend on whether any cardiovascular risk factors are identified (for example high blood pressure or high blood lipids). Some women will be advised by their GP to have annual blood pressure and health checks, while others with low cardiovascular risk (for example normal BMI, adequate physical activity levels, normal blood lipids and HbA1c, and no family history of cardiovascular disease) may be offered less frequent cehck-ups.

We still recommend that all women who have had preeclampsia or gestational hypertension, even if no other risk factors are found, have their blood pressure checked at least every five years — and preferably more often if they see their doctor for other reasons. This is because treating high blood pressure is important to reduce the risk of serious cardiovascular disease.

Women with additional risk factors beyond pregnancy-related high blood pressure should receive follow-up in consultation with their GP and, if needed, specialists.

Women with chronic conditions that may affect their heart or kidney health should continue their follow-up with a GP or specialist when planning future pregnancies and for their long-term health.

Healthy women who had preeclampsia or gestational hypertension, and who still have high blood pressure when discharged from the maternity ward, should be offered a blood pressure monitoring plan (usually outside the hospital) until their blood pressure is normal.

Women who continue to have proteinuria after birth should be monitored to rule out kidney disease. Women who had gestational diabetes are advised to have their long-term blood sugar (HbA1c) checked by their GP about 4 months after delivery, because some of these women develop diabetes, and then annually.

Women with known heart disease or kidney disease before pregnancy should continue to receive follow-up after pregnancy, regardless of whether they developed preeclampsia.

MORE INFORMATION

Guidelines for treatment for and follow-up after preeclampsia: The Norwegian Society for Gynecology and Obstetrics (in Norwegian) and National Institute for Health and Care Excellence (NICE) guideline.

International **patient societies**: Preeclampsia Foundation and Action on Pre-Eclampsia

FOLLOW-UP OPPORTUNITY: IN COLLABORATION WITH YOUR GENERAL PRACTITIONER, AFTER HYPERTENSIVE DISORDERS OF PREGNANCY

Before pregnancy	At birth	3-4 months after birth	1 year after birth
Height (cm): Weight (kg): BMI (kg/m^2):	Weight: BMI:	Weight: BMI: BP (blood pressure): HbA1c:	Weight: BMI: BP: HbA1c:

Recommended tests	Date:	Date:	Date:	Date:	Date:	Date:
BP (mmHg)						
Weight (kg)						
BMI (kg/m^2)						
HbA1c (mmol/L)						
LDL-cholesterol (mmol/L)						
HDL-cholesterol (mmol/L)						
Total cholesterol (mmol/L)						
Triglycerides (mmol/L)						

Norsk gynekologisk forening

DEN NORSKE LEGEFORENING

The Norwegian Society for Gynecology and Obstetrics: Hypertensive Disorders of Pregnancy:

Norsk gynekologisk forenings Veileder i Fødselshjelp: Hypertensive svangerskapskomplikasjoner

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