

# Drugs in pregnancy

When **using drugs during pregnancy**, it is necessary to take into account not only the indications and contraindications on the part of the mother, but also the potential **teratogenicity** of individual drugs, possibly also the indications on the part of the fetus.

## Factors of Teratogenicity

Potentially teratogenic drugs also have different effects on the fetus in different periods of pregnancy. Approximately until the end of **5. week after the last menstruation** (i.e. a week after the woman discovers that she is not menstruating) taking medicines is practically without risk to the embryo<sup>[1]</sup>. In the remaining **first trimester** (approx. until the 15th week after the last menstruation), organogenesis takes place, during which there is a risk of congenital developmental defects<sup>[1]</sup>. During the **second and third trimester**, the risk for the fetus is relatively reduced<sup>[1]</sup>; there is a certain risk of impaired growth and functional development. On the contrary, it is necessary to take into account that during **lactation** many drugs pass into the milk<sup>[1]</sup>.

**⚠ During the first trimester, there are risky drugs, e.g. some antiepileptics (phenytoin, carbamazepine, valproate), lithium, warfarin, retinoids, danazol, cytostatics. ⚠ During the second and third trimester, risky drugs are e.g. ACEIs,  $\beta$ -blockers, thyrostatics, benzodiazepines and barbiturates, NSAIDs, tetracyclines, warfarin, cytostatics.**

Another effect is the different permeability through the placenta. Low molecular weight substances pass through; high molecular weight (e.g. heparin). Sometimes it is advantageous if the substance penetrates the placenta, and this can be used for fetal therapy.

*For example, permeability of **digoxin** can be used in the treatment of fetal supraventricular tachycardia for **pharmacological cardioversion** in utero. Some **antibiotics** can be used to treat fetal infection.<sup>[1]</sup>*

## Principles of pharmacotherapy in pregnancy

It is necessary to have a responsible approach and **choose the appropriate drugs** at the **right time, adjust the dose** (often even increase) and **shorten the exposure** as much as possible.<sup>[1]</sup>

## Drug Classification

According to the FDA, drugs are divided into 5 classes based on use during pregnancy and lactation <sup>[1]</sup>:

- **A** – drugs that are tested on a group of pregnant women without established teratogenicity,
- **B** – drugs that are tested on animals without established teratogenicity,
- **C** – drugs that are teratogenic in animals, unknown in humans,
- **D** – drugs that are teratogenic in humans, but can be given in critical conditions because of their irreplaceability (*immunosuppressants, antiepileptics, cytostatics*),
- **X** – drugs for which the risk outweighs the benefit.

## Examples

Here are examples of drugs that may or may not be suitable during pregnancy:

### Analgesics

Paracetamol is suitable, ibuprofen in the first and second trimester. Combined preparations, indomethacin, acetylsalicylic acid, codeine and ibuprofen in the third trimester are not suitable.

Nonsteroidal antirheumatic drugs (e.g. ibuprofen) can cause premature constriction of the fetal ductus arteriosus<sup>[1]</sup>.

### Antiasthmatics

Most can be done without increased risk to the fetus.

### Antidepressants

They are risky, especially monoamine oxidase inhibitors.

### Antidiabetics

 For more information see *Diabetes mellitus in pregnancy*.

Conversion to insulin is appropriate. Oral antidiabetic drugs are inappropriate.

## Antidiarrheic

Animal charcoal, diosmectite (Smecta), probiotics (Lacidofil, Hylak Forte) are suitable.

## Oral antiseptics

Fusafungin (Bioparox), tridecanamine (Septisan), chlorhexidine (Septofort), saline gargle with four salts are suitable. Iodine (Jox), formaldehyde (Kutvirt), preparations with local anesthetic (Drill, Hexoraletten N, Streptfen) are unsuitable.

## Antitussives

The most data is for the administration of codeine antitussives. Dextromethorphan is suitable, but due to the risk of reduced uteroplacental perfusion only for a short time and not peripartum. There is not enough information to administer non-codeine antitussives. According to the SPC, butamirate is contraindicated in the 1st trimester, dropropizine and levodropropizine throughout pregnancy.

!!!!codeine is contraindicated! - malformation of the respiratory tract

## Hypolipidemics

Resins are suitable. Statins are inappropriate.

## Antibiotics

Penicillins and cephalosporins are suitable. Tetracyclines, quinolones and sulfonamides are not suitable.

## Antipyretics

Paracetamol is suitable; ibuprofen in the first and second trimesters. Ibuprofen is not suitable in the third trimester, as well as diclofenac, acetylsalicylic acid, naproxen.

## Antithrombotics

Low molecular weight heparins are suitable. Warfarin is inappropriate.

 **Warfarin causes birth defects in the first trimester and fetal intracerebral hemorrhage in later periods of pregnancy.**

## Nasal decongestants

Topical preparations (Sanorin, Olynth) are suitable. Oral drugs (Modafen, Paralen Plus, Nurofen, Stopgrip, Diprophos Repetabs) are not suitable.

## Medicines of the cardiovascular system

The preparation  $\alpha$ -methylDOPA is suitable. ACEIs and  $\beta$ -blockers are inappropriate.

  **$\beta$ -blockers cause intrauterine fetal growth retardation.**

## Laxatives

Regimen measures, fiber, lactulose (Duphalac, Lactulosa AL), glycerin suppositories, psyllium, sodium picosulfate (Guttalax, Laxygal) are suitable.

## Mucolytics

Ambroxol (Ambrobene, Ambrosan, Halixol, Mucosolvan) is suitable in the second and third trimester. Acetylcysteine (ACC long) and guaifenesin (Guajacuran) are inappropriate.

## Venofarma

Escin (Venitan ung., Aescin) is suitable, followed by oxerutin (Venoruton Forte) and tribenoside + lidocaine (Proctoglyvenol crm., supp.) in the second and third trimesters. Rutoside + acetylsalicylic acid (Ascorutin) is not suitable, then oxerutin (Venoruton Forte) and tribenoside + lidocaine (Proctoglyvenol crm., supp.) in the first trimester.

## Other unsuitable medicines

Relatively inappropriate drugs include **diuretics**, **hormones** and **sedatives**.

 **Thyrostatic drugs cause fetal hypothyroidism<sup>[1]</sup>.**

## Unsuitable Herbs

Sage, linden, ivy, senna leaf

# Treatment of pathological conditions during pregnancy

## Nausea

Common symptom when occurring 1-2 times a day. Non-pharmacological influence by more frequent intake of smaller portions of low-calorie cold food. Antacids (Tums, Rennie, Maalox, Anacid, etc.) should only be used intermittently, not long-term. The effect of vitamin B6 and ginger extracts (Avioplant, Ginger; max. 250 mg per day) is unconfirmed.

## Fever

During pregnancy, lowering the temperature above 38 °C is appropriate due to the risk of damage to the fetus.

## Warning

The given text is only informative and can in no way be considered as a flawless treatment guide (see Disclaimer).

## Links

### Related Articles

- Teratogens
- Fetal alcohol syndrome
- Congenital developmental defects
- Screening for birth defects

### References

1. ŽIŽKA, Zdeněk. *Pharmacology in pregnancy* [lecture for subject Gynecology and obstetrics pre-state internship, specialization General medicine, 1. medical faculty Charles University in Prague]. Prague. 2/12/2014.

### References

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