



# Principal and Practices of Drugs Prescribing in Pregnancy and Its Clinical Pharmacokinetics

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## Abstract

Drug absorption during pregnancy may be altered by delayed emptying and vomiting. An increased gastric pH may affect absorption of acids and bases. There is now a greater appreciation of the risks of drug use in pregnancy approximately 2-3 of all live births are associated with a congenital anomaly. Physiologic changes in pregnancy induced profound alterations. During pregnancy is approximately 280 days the placenta is the organ of exchange between mother and foetus for drugs. The use of both prescription and over the counter drugs in pregnancy present a number of challenges it has been estimated that over 80% of expectant mothers take three or four drugs at some stage of pregnancy the first two weeks post conception are regarded as the pre-embryonic stage and describe the period up to impartation of the fertilised. Physiologic changes in pregnancy induce profound alterations to the pharmacokinetics properties of many medications. The changes affect distribution, absorption, metabolism, and excretion of drugs and thus may impact their pharmacodynamic properties during pregnancy. Pregnant women undergo several adaptations in many systems. Some adaptations are secondary to hormonal changes in pregnancy, while other. Occur to support the gravid women and her developing foetus, some of the changes in maternal physiology during pregnancy include, for example: - increased maternal fat and total body water, decreased plasma protein concentration, especially albumin, increased maternal blood volume, cardiac output and blood flow to the kidneys and uteroplacental unit, and decreased blood pressure.

## Keywords

Pregnancy, Pharmacokinetics, foetus.

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## INTRODUCTION:

Prescription and over the counter medications use is common in pregnancy with the average pregnant patient in the us and canda using more than two drugs during the course of their pregnancy. The purpose of this review is to summarize some of the physiologic changes during pregnancy that may affect medium pharmacokinetics.

## Principals of prescribing during Pregnancy:

- Where possible use nondrug therapy
- Prescribed drugs only when definitely needed
- As far as possible, avoid medication in the initial 10 weeks of gestation
- Use the lowest effective dose
- Use drugs for the shortest period necessary
- Selecting drugs that have been used safely for a long time

### Physiology of pregnancy: -



Fertilization and progression of pregnancy are complex resulting in survival of only approximately 50% of embryos because most losses occur early usually in the first 2 weeks after fertilization many women don't realize they were pregnant spontaneous loss of pregnancy later in gestation occurs in about 15% of pregnancies that survive the first 2 weeks after fertilization.

**Drug selection during pregnancy:** - the incidence of congenital malformation is approximately 3% to 60% and it is estimated that less than 1% of all birth defects are caused by medication exposure. Foetal exposure to a teratogen in the first 2 weeks after conception may have an "all Or nothing "effect (that is could destroy the embryo or have no ill effect ).

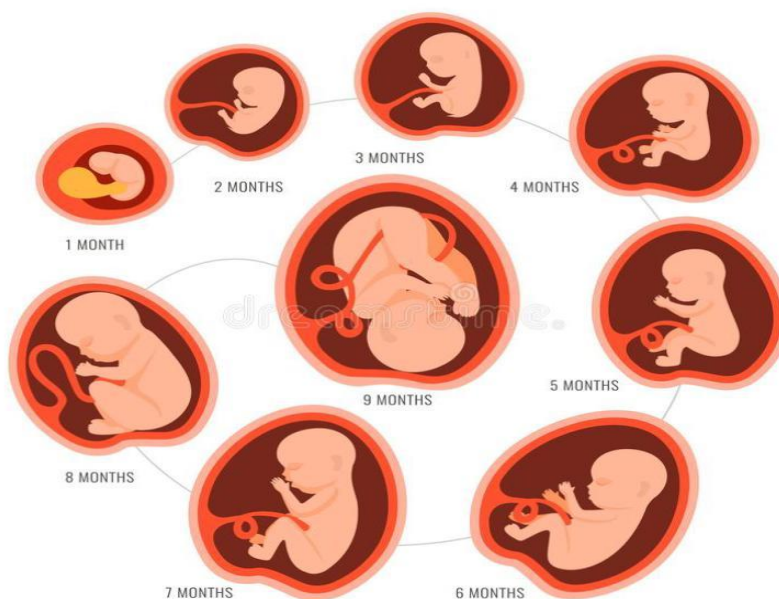
**Maternal pharmacokinetic changes in pregnancy:** -

Physiologic changes begin in the first trimester and peak during the second trimester for medications that can be monitored by blood or serum concentration measurements monitoring should occur throughout pregnancy.

**Pharmacodynamics and kinetic during pregnancy:** -

- Introduction pregnancy, child birth and lactation pose unique challenges in terms of during therapy, the pregnant mother and her unborn child are exceptionally vulnerable from a Physiological, clinical and ethical point of view. (Normal physiologic changes that occur during pregnancy may alter medications effects, resulting in the need to more closely monitor and sometimes adjust therapy.

### Choice of drugs for common problems during pregnancy



Drug class (condition)	Safety uncertain /unsafe	Safer alternative
1. Anti-emetics (morning sickness, other type of vomiting)	Domperidone(x) ondansetron	Promethazine, doxylamine, dicyclomine prochlorperazine metoclopramide
2.drugs for peptic ulcer and GERD	Cimetidine lansoprazole cisapride(x) mosapride	Ranitidine, famotidine omeprazole pantoprazole
3.Cold -cough remedies	Codeine, dextromethorphan bromhexine, expectorants	Xylometazoline oxymetazoline budesonide
4. Anti-tubercular	Pyrazinamide, streptomycin	Isoniazid, rifampicia, ethambutal
5. Anti-diabetic	Sulfonylureas metformin pioglitazone pepaglinide,nateglinide,acarbose	Insulin (preferably human insulin)

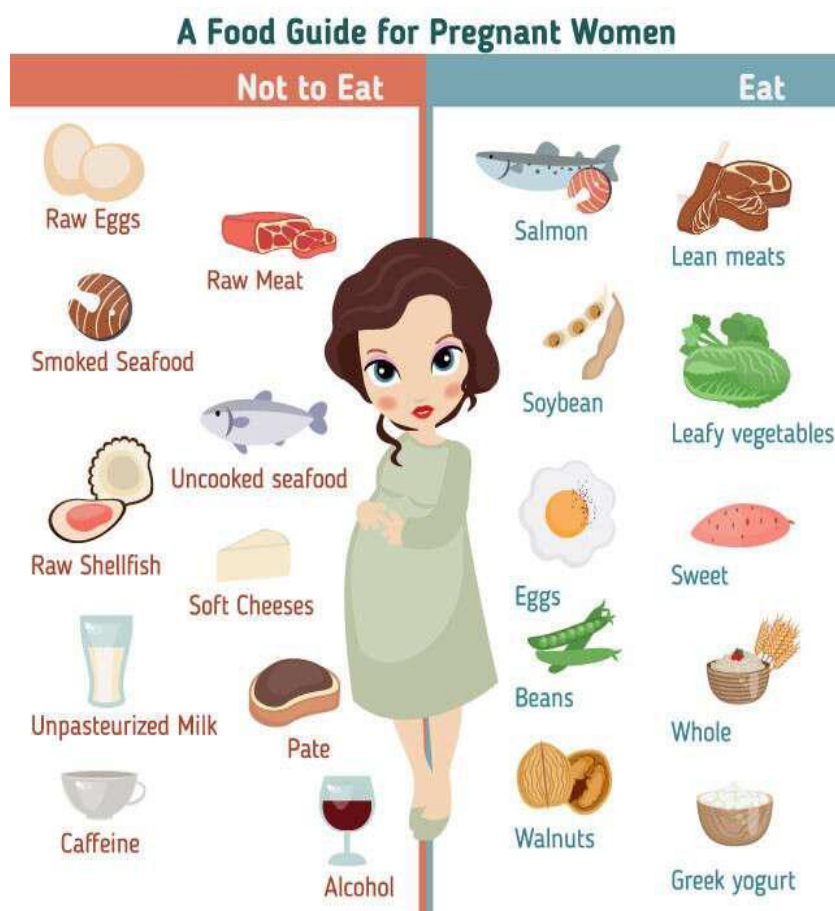
### General recommendations for optimizing use of medications in pregnancy: -

- Medications are necessary during pregnancy for treatment of acute and chronic conditions
- Identifying patterns of medication use before conception eliminating non-essential medications and discouraging self-medication, minimizing exposure to medications known to be harmful, and adjusting medication doses are all strategies to optimize the health of the mother while minimizing the risk to the fetus

### Acute care issues in pregnancy: -

In some cases, the risks associated with the acute illness are magnified during pregnancy and early screening and treatment become critical in other cases such as during treatment of certain sexually transmitted diseases the pregnancy regarding treatment comes from an increased likelihood of infection leading to preterm lab or occasionally common acute care issues such as migraine headache improve during pregnancy.

### What to eat while pregnant: -

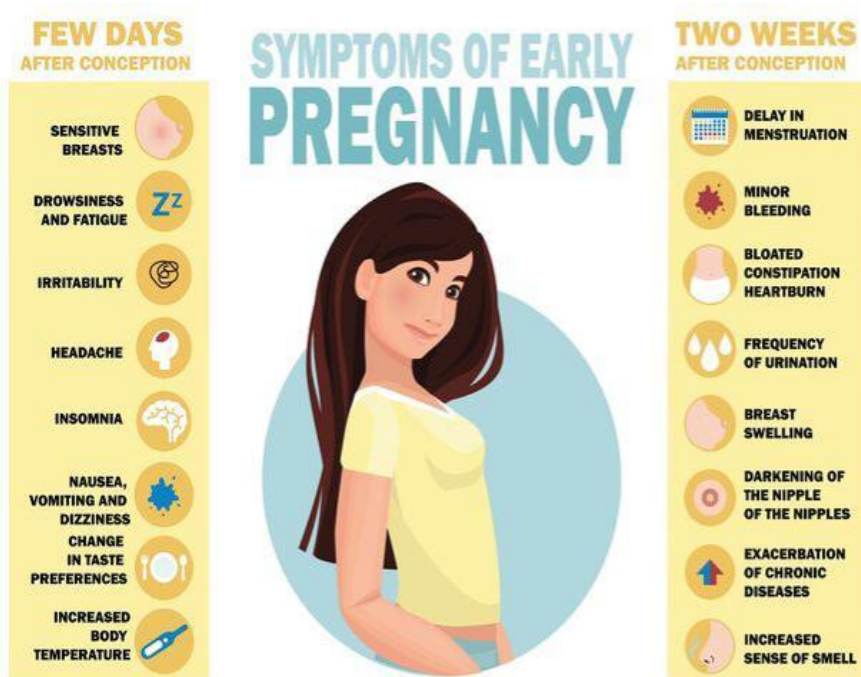


**Pregnancy dating: -**

Pregnancy lasts approximately 280 days (about 40 weeks or 9 months) the time period is measured from the first day of the last menstrual period to birth.

**Pregnancy signs and symptoms: -**

Early symptoms of pregnancy include fatigue and increased frequency of urination, at approximately 6 weeks gestation nausea and vomiting can occur while commonly called morning sickness happen at any time of the day.

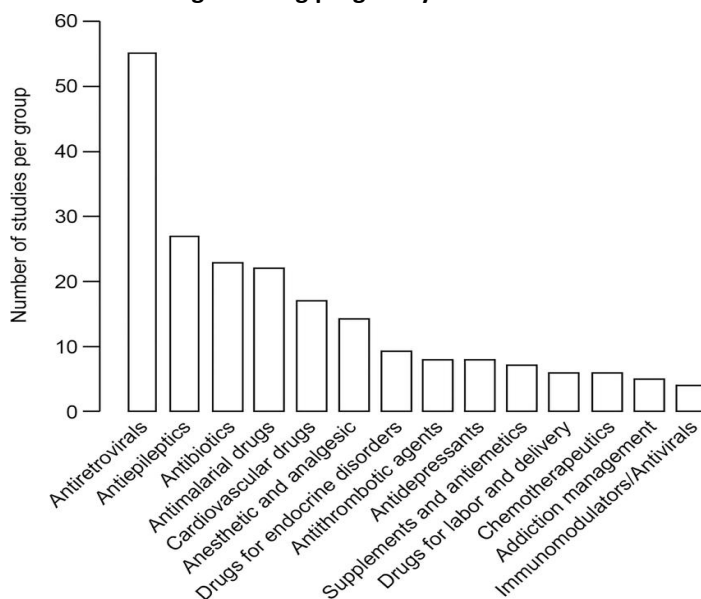


**Methods of determining drug safety in pregnancy: -**

When assessing the safety of using medications during pregnancy, an important consideration for the clinician is how to evaluate the quality of the

evidence. Ideally, safety data from randomized, controlled trials is most desirable, but pregnant women are not eligible for participation in clinical trials.

**Summary of cardiovascular changes during pregnancy: -**



The major pregnancy related hemodynamic changes include increased cardiac output. Expanded blood volume and reduced systemic vascular resistance and blood pressure. These changes contribute to

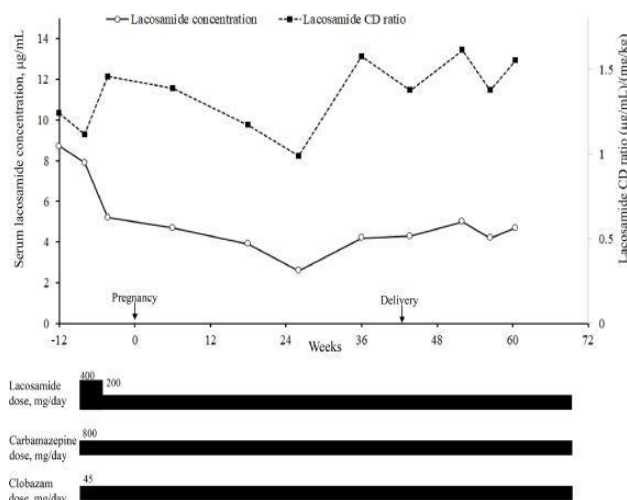
optimal growth and development of the fetus and help to protect the mother from the risks of delivery such as haemorrhage.

Parameter	Percentage of change	
Cardiac output	40–50%	Increase
Stroke volume	30%	Increase
Heart rate	15–25%	Increase
Intravascular volume	45%	Increase
Systemic vascular resistance	20%	Decrease
Systolic BP		Minimal
Diastolic BP	20%	Decrease at mid-pregnancy Pre-pregnant values at term
CVP		Unchanged
O <sub>2</sub> consumption	30–40%	Increase

**Pregnancy influenced issues: -**

Pregnancy causes or exacerbates conditions that pregnant women commonly experience, including constipation, gastroesophageal reflux, haemorrhoids and nausea and vomiting, gestational diabetes,

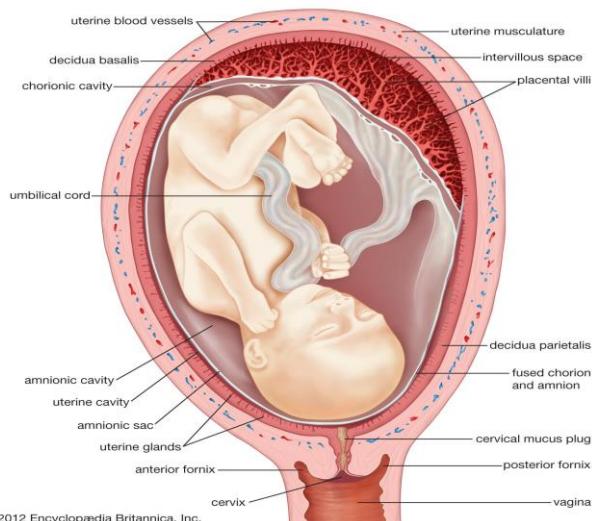
gestational hyper tension, and venous thromboembolism have the potential to cause adverse pregnancy consequences, gestational thyroxicosis is usually self-limiting.



**Special consideration: -**

**Pregnancy:** - either the occurrence or consideration of pregnancy may cause significant concerns for the patient with IBD. Patients with IBD have similar infertility rates as the general female population,

thus the rate of normal child birth is similar to that for healthy populations some studies have noted a greater risk of spontaneous absorptions for the patients with IBD.



**CONCLUSION:**

Profound physiologic and anatomic changes occur in virtually every organ system during pregnancy, these have significant consequences on pharmacokinetic and pharmacodynamic properties of various medications when used by pregnant women. Data are lacking on the implications of these changes on variety of therapeutic agents, and future research is desperately needed.

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