

Principles of Drug Use in Pregnancy

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Distribution of drugs to fetus

- Clinical trials in pregnant is almost always unethical, thus our experience on the use of drugs in pregnancy is limited.
- Most of the drugs and their metabolites distribute in fetus.
- Single dosage of drugs with following properties may be harmless because the steady state between fetus and mother takes a long time:
 - Big molecules
 - Poorly soluble in fat
 - Highly ionized
 - High proportion of protein binding
- However this is not the case for chronic treatment. When concentrations of drugs is high in mother's plasma the risk to reach to fetus and having toxicity is also high.

United States FDA Pharmaceutical Pregnancy Categories

- In 1979, the United States Food and Drug Administration (FDA) introduced a classification of fetal risks due to pharmaceuticals.
- Drugs are classified in 5 categories, from A to X.

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Pregnancy Category A

- Adequate and well-controlled human studies have failed to demonstrate a risk to the fetus in the first trimester of pregnancy (and there is no evidence of risk in later trimesters).
- This category is the safest for using in pregnancy.

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Drugs in category A

- Demir sülfat
- Folik asit
- Levotiroksin
- Liotironin
- Liotriks
- Multivitaminler
- Piridoksin
- Potasyum glukonat
- Potasyum klorür
- Potasyum sitrat
- Tiamin
- Tiroglobulin

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Pregnancy Category B

- Animal reproduction studies have failed to demonstrate a risk to the fetus and there are no adequate and well-controlled studies in pregnant women
- OR
- Animal studies have shown an adverse effect, but adequate and well-controlled studies in pregnant women have failed to demonstrate a risk to the fetus in any trimester.
 - These drugs can safely be used in pregnancy when indicated.

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Sample of drugs in category B

- Azot protoksit
- Aluminyum hidroksit
- Amfoterisin B
- Amilorid
- Amoksisilin
- Ampisilin
- Aprotinin
- Asebutolol
- Asetilsistein
- Azatadin
- Azidosilin
- Azitromisin
- Aztreonam
- Bakampisilin
- Benzalkonyum
- Benzatin penisilin G...

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Pregnancy Category C

- Animal reproduction studies have shown an adverse effect on the fetus and there are no adequate and well-controlled studies in humans, but potential benefits may warrant use of the drug in pregnant women despite potential risks.
- Shortly: **Unknown**
- Drugs in category C, can be used in pregnancy when clinician believes that potential risk for fetus is much less than benefit for mother.

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Sample of drugs in category C

- ACTH
- Adrenalin
- Albendazol
- Albuterol
- Alendronat
- Alfentanil
- Allopurinol
- Amantadin
- Aminofilin
- Aminokaproik asit
- Amlodipin
- Amoksapin
- Cis-atraküryum
- Daktinomisin
- Deferoksamin
- Deksametazon
- Dekstrometorfan
- Difenoksilat
- Difilin
- Diflunisal
- Digital
- Disülfiram
- Dobutamin
- Doksazosin...

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Pregnancy Category D

- There is positive evidence of human fetal risk based on adverse reaction data from investigational or marketing experience or studies in humans, but **potential benefits may warrant use** of the drug in pregnant women despite potential risks.
- Shortly: There is a high possibility for fetal toxicity.

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Sample of drugs in category C

- Alprazolam
- Amikasin
- Aminoglutetimit
- Amiodaron
- Amitriptilin
- Amobarbital
- Asetilsalisilik asit
- Atenolol
- Azatiyoprin
- Bizmut tuzları
- Bleomisin
- Bromürler
- Busülfan
- Kanamisin
- Karbimazol
- Karboplatin
- Klomipramin
- Klonazepam
- Klorambusil
- Klorazepat
- Klorotiazit
- Klortetrasiklin
- Kortizon
- Kumarin derivelere
- Lityum
- Medroksiprogesteron...

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Pregnancy Category X

- Studies in animals or humans have demonstrated fetal abnormalities and/or there is positive evidence of human fetal risk based on adverse reaction data from investigational or marketing experience, and the risks involved in use of the drug in pregnant women clearly outweigh potential benefits.
- These drugs are contraindicated and can never be used in pregnant or woman that have possibility to become pregnant.

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Sample of drugs in category X

- A vitamini
- Alprostadil
- Aminopterin
- Atorvastatin
- Çiçek aşısı
- Danazol
- Desogestrel
- Dienöströl
- Dietilstilbestrol
- Ergotamin
- Etilen oksit
- Etilil östradiol
- Finasterid
- Fluvastatin
- Follitropin
- Goserelin
- ¹²⁵I, ¹³¹I
- İloprost
- İnterferon a-2b
- Kabakulak aşısı
- Kızamık, kızamıkçık aşısı
- Klomifen
- Koryonik gonadotropin
- L-Norgestrel..

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Drugs in more than one category

- NSAID's such as diclofenac, fenoprofen, flurbiprofen, ibuprofen, indometasin, meclofenamate, naproxen, piroxicam ve sulindak are in category B in the 1st and 2nd trimesters but in category D in the 3rd trimester.
- NSAID's such as etodolac, meloxicam, nabumeton, rofecoxib ve celecoxib are in category C in the 1st and 2nd trimesters but in category D in the 3rd trimester.

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Birden fazla gebelik kategorisine giren ilaçlar II

- ACE inhibitors or ARB's such as, benazepril, enalapril, irbesartan, captopril, quinapril, lisinopril, losartan, perindopril, silazapril, telmisartan, trandolapril ve valsartan are in category C in the 1st trimester but in category D in the 2nd and 3rd trimester.
- Vitamin E is in category A when used less than 15 days but in C in prolonged use.
- Dihydrotestosterone is in category A, however is in category C in high/toxic dosage..

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Drugs that can be used in pregnancy

- Further reading required...

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Thank you

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