

## DRUGS AND PREGNANCY

Drugs can have harmful effects on mother and foetus at any time during pregnancy. Use of medications during pregnancy requires a careful assessment of risks and benefits for them. During the first trimester, teratogenic effects are frequent. There is higher risk from third to eleventh weeks of gestation. During the second and third trimester, drugs may affect the growth and functional development of foetus or have toxic effect on the foetal tissues. Drugs administered shortly before term or during labour may have adverse effect on mother or on neonate. The FDA has established five categories (A, B, C, D, X) which indicate the potential of a systemically absorbed drugs causing birth defects. These categories are indicative of the level of risk to the foetus. The category X includes the drugs for which there are enough data to implicate their teratogenicity and the risk vs. benefit ratio does not support the use of the drug and hence these are contraindicated during pregnancy. A few drugs present variable risk to the foetus depending on the time and duration of their use. These drugs have been assigned double categories. The categories of risk involved are as under:

**A:** Adequate studies in pregnant women have not demonstrated a risk to the foetus in the first trimester of pregnancy and there is no evidence of risk in later trimesters.

**B:** Animal studies have not demonstrated a risk to the foetus but there are no adequate studies in pregnant women or, animal studies have shown an adverse effect, but adequate studies in pregnant women have not demonstrated a risk to the foetus during the first trimester of pregnancy and there is no evidence of risk in later trimesters.

**C:** Animal studies have shown an adverse effect on the foetus but, there are no adequate studies in humans or there are no animal reproduction studies and no adequate studies in humans; the benefits from the use of the drug in pregnant women may be acceptable despite its potential risks.

**D:** There is evidence of human foetal risk, but the potential benefits from the use of the drug in pregnant women may be acceptable despite its potential risks.

**X:** Studies in animals or humans demonstrate foetal abnormalities or adverse reaction reports indicate evidence of foetal risk; the risk of use in a pregnant woman clearly outweighs any possible benefits.

Drugs	Categories
<b>1. Anaesthetics</b>	
<i>General anaesthetics</i>	
Ether	D
Fentanyl	B/D
Halothane	A/D
Isoflurane	C
Ketamine hydrochloride	A/D
Nitrous oxide	D
Propofol	B
Sodium thiopentone	B
<i>Local anaesthetics</i>	
Bupivacaine hydrochloride	C
Lignocaine hydrochloride	A/C
Lignocaine with adrenaline	C
<i>Preoperative medication and sedation for short-term procedures</i>	
Atropine sulphate	C
Chloral hydrate	C
Diazepam	D
Midazolam	D
Morphine sulphate	B/D
Promethazine	C
<b>2. Analgesics, antipyretics and drugs for gout</b>	
Acetyl salicylic acid	C/D
Allopurinol	C
Diclofenac sodium	B
Dihydroergotamine mesylate	D
Ibuprofen	B/D
Indomethacin	B/D
Mefenamic acid	C
Morphine sulphate	B/D
Paracetamol	B
Pentazocine lactate	B/D
Pethidine hydrochloride	B/D
Probenecid	B
Tramadol	C
<i>Drugs for migraine</i>	
Dihydroergotamine	X

Drugs	Categories
<b>3. Antiallergic and drugs used in anaphylaxis</b>	
Cetirizine	B
Chlorpheniramine maleate	B
Cinnarizine	C
Dexamethasone sodium phosphate	C
Epinephrine hydrochloride	C
Hydrocortisone acetate	C
Pheniramine maleate	C
Prednisolone	B
Promethazine	C
<b>4. Antidotes and other substances used in poisoning</b>	
Activated charcoal powder	A/B
Antisnake venom	C/D
Desferrioxamine	C
Dimercaprol	D/X
Disodium calcium edetate	D
Methylene blue	C/D
Naloxone	B
PAM	C
Penicillamine	D
Sodium nitrite	D
Sodium thiosulphate	C
<b>5. Antiepileptic drugs</b>	
Carbamazepine	C
Clonazepam	C
Lamotrigine	C
Phenobarbitone	D
Phenytoin sodium	D
Sodium valproate	D
<b>6. Anti-infective drugs</b>	
<i>Intestinal anthelmintics</i>	
Albendazole	D/X
Mebendazole	C
Praziquantel	B/D
Pyrantel pamoate	C

Drugs	Categories
<b>Antifilarials</b>	
Diethylcarbamazine	X
<b>Antibacterials, antivirals, antifungals, antiprotozoals</b>	
Acyclovir	C
Amikacin	C
Amoxicillin	B
Amphotericin B	B
Ampicillin	B
Carbenicillin	B
Cefotaxime	B
Ceftazidime	B
Ceftriaxone	B
Cefuroxime	B
Cephalexin	B
Chloramphenicol	C
Chloroquine phosphate	C
Cinnarizine	C
Ciprofloxacin	C
Cloxacillin	B
Diloxanide furoate	D
Doxycycline	D
Erythromycin	B
Fluconazole	C
Gentamicin	C
Griseofulvin	C
Indinavir	C
Ketoconazole	C
Lamivudine	B
Meropenem	B
Metronidazole	B
Nalidixic acid	B
Nevirapine	C
Norfloxacin	C
Ofloxacin	C
Penicillin benzathine	B
Penicillin crystalline	B
Penicillin procaine	B
Piperacillin	B
Primaquine	C

Drugs	Categories
Quinine dihydrochloride	C
Quinine sulphate	C
Roxithromycin	B
Sulfadoxine + Pyrimethamine	D
Sulfamethoxazole + Trimethoprim	C
Tetracycline	D
Tinidazole	D/X
Trimethoprim	C
Vancomycin	C
Zidovudine	C
<b>Antileprosy drugs</b>	
Clofazimine	C
Dapsone	C
<b>Antitubercular drugs</b>	
Ethambutol	B
Isoniazid	C
Pyrazinamide	C
Rifampicin	C
Streptomycin	D
<b>7. Antiparkinsonism drugs</b>	
Bromocriptine	C
Levodopa + Carbidopa	C/D
Selegiline	C
Trihexyphenidyl	C
<b>8. Drugs affecting blood</b>	
<b>Anti-anaemic drugs</b>	
Ferrous fumarate	A
Ferrous sulphate	A
Folic acid	A/C
Iron dextran	C
<b>Drugs affecting coagulation</b>	
Dalteparin	B
Enoxaparin	B
Heparin	C
Protamine sulphate	C
Streptokinase sulphate	C
Tranexamic acid	B

Drugs	Categories	Drugs	Categories
Vitamin K	C	Simvastatin	X
Warfarin	D		
<b>9. Blood products and substitutes</b>		<b>Drugs used in vascular shock and peripheral vascular diseases</b>	
Dextran-40	C	Dobutamine	C
Dextrose 5%+Sodium chloride	C	Dopamine	C
Polymer from degraded gelatin + electrolytes made isotonic solution	C	Mephentermine	C
<b>10. Cardiovascular drugs</b>		<b>11. Dermatological drugs</b>	
<b>Antianginal drugs</b>		<b>Antifungal drugs</b>	
Atenolol	C	Benzoic acid + Salicylic acid	C
Glyceryl trinitrate	C	Clotrimazole	B/C
Isosorbide dinitrate	C	Miconazole	C
Isosorbide mononitrate	C	Nystatin	B/C
Metoprolol	B	<b>Anti-infective drugs</b>	
Propranolol	C	Framycetin	C
<b>Antidysrhythmic drugs</b>		Povidone iodine	D
Adenosine	C	Silver nitrate	C
Amiodarone	C	Silver sulfadiazine	C
Diltiazem	C	<b>Scabicides and pediculocides</b>	
Disopyramide	C	Benzyl benzoate	B
Lignocaine	A/C	Gamma benzene hexachloride	B
Mexiletine	C	Permethrin	B
Procainamide	C	<b>Anti-inflammatory and antipruritic drugs</b>	
Verapamil	C	Betamethasone	C
<b>Antihypertensive drugs</b>		Clobetasol	C
Amlodipine	C	<b>Keratoplastic and keratolytic agents</b>	
Enalapril	C/D	Benzoyl peroxide	C
Felodipine	C	Coal tar	C
Hydralazine	C	Podophyllin	X
Indapamide	D	Salicylic acid	C
Methyldopa	C	<b>Ultraviolet blocking agents</b>	
Nifedipine	C	5-Methoxy psoralen	C
Sodium nitroprusside	C	Para-amino benzoic acid	C
<b>Cardiac glycosides</b>		Trimethyl psoralen	C
Digoxin	C	<b>Others</b>	
<b>Hypolipidaemic drugs</b>		Tretinoin	C
Fenofibrate	C	Triamcinolone	C

Drugs	Categories
<b>12. Diagnostic agents</b>	
<i>Oral contrast agents</i>	
Calcium iopodate	D
<i>Intravascular contrast agents</i>	
Meglumine diatrizoate	D
Meglumine iothalate	D
Sodium diatrizoate and meglumine diatrizoate	D
Sodium iothalate	D
<b>13. Disinfectants and antiseptics</b>	
Acridflavin + Glycerine	C
Cetrimide + Chlorhexidine	B
Spirit	C
<b>14. Diuretics</b>	
Furosemide	C
Glycerol	C
Hydrochlorothiazide	D
Mannitol	C
Spironolactone	D
<b>15. Gastrointestinal drugs</b>	
<i>Antacids and other antiulcer drugs</i>	
Cisapride	C
Magnesium hydroxide + Aluminium hydroxide + Activated methyl polysiloxane	B
Mosapride	C
Omeprazole	C
Ranitidine	B
Sucralfate	B
<i>Antiemetic drugs</i>	
Metoclopramide	B
Desmopressin	B
<i>Antihæmorrhoidal drugs</i>	
Betamethasone valerate + Lignocaine + Phenylephrine	C

Drugs	Categories
<i>Anti-inflammatory drugs</i>	
5-Amino salicylic acid	B
Dicyclomine	B
Hyoscine butyl bromide	C
Sulfasalazine	B/D
<i>Cathartic drugs</i>	
Bisacodyl	C
Lactulose	B
<i>Drugs used in diarrhoea</i>	
Furazolidone	C
<b>16. Hormones, other endocrine drugs and contraceptives</b>	
<i>Pituitary hormone</i>	
Octreotide	B
<i>Adrenal hormones and synthetic substitutes</i>	
Prednisolone	B/C
Methylprednisolone sodium succinate	C
<i>Androgens</i>	
Nandrolone decanoate	X
<i>Contraceptives</i>	
Ethinyl oestradiol + Levonorgestrel	X
Ethinyl oestradiol + Norethisterone	X
<i>Oestrogens</i>	
Conjugated equine oestrogen	X
Ethinyl oestradiol	X
<i>Progesterogens</i>	
Danazol	X
Medroxy progesterone acetate	D
Norethisterone	X
<i>Insulin and other antidiabetic drugs</i>	
Insulin lente	B
Insulin semilente	B
Metformin	C
Tolbutamide	D

Drugs	Categories	Drugs	Categories
Glibenclamide	D	Methylergometrine maleate	D
Insulin	B	Methyl PGF <sub>2α</sub>	C
<b>Drugs affecting calcification and bone turnover</b>		Oxytocin	A
Alendronate	C	<b>21. Psychotherapeutic drugs</b>	
<b>Thyroid hormones and antithyroid drugs</b>		Alprazolam	D
Carbimazole	D	Amitriptyline	D
Iodine	D	Chlorpromazine	C
Thyroxine sodium	A	Clozapine	B
<b>17. Immunological agents</b>		Diazepam	D
Anti-rabies (vero cells)	C	Fluoxetine	B
Hepatitis	B	Fluphenazine	C
MMR (live vaccine) USP	X	Haloperidol	C
Measles IP	X	Imipramine hydrochloride	D
Meningococcal polysaccharide vaccine	C	Lithium carbonate	D
Monoclonal anti-Rh (D)-immunoglobulin	A	Lorazepam	D
Rubella (live vaccine) BP	X	Nitrazepam	D
Typhoid IP	C	Risperidone	C
BCG (freeze dried) IP	C	Thioridazine	C
DT (adsorbed) IP	C	Trazodone	C
Poliomyelitis IP	C	Trifluoperazine	C
Tetanus toxoid	A	<b>22. Drugs acting on respiratory system</b>	
<b>18. Muscle relaxant and anticholinesterase</b>		Aminophylline	C
Atracurium	C	Beclomethasone	C
Methocarbamol	X	Budesonide	C
Neostigmine	C	Etiophylline + theophylline	C
Pancuronium	C	Ipratropium bromide	B
Suxamethonium	C	Salbutamol	C
Vecuronium	C	Terbutaline	B
<b>19. Oxytocics and antioxytocics</b>		<b>Antitussives</b>	
Dinoprostone	C	Bromhexine hydrochloride	A
Isoxsuprine	C	Codeine phosphate	C/D
Magnesium sulphate	B	Diphenhydramine	B
		<b>23. Solution correcting water electrolyte</b>	
		Calcium chloride, USP	C
		Calcium gluconate	C
		Dextran	C

Drugs	Categories	Drugs	Categories
Dextrose	C	Dexamethasone + Neomycin	C
Isolyte	C	Ketorolac	C
N/2 & N/4 dextrose with normal saline	C	<b>Miotics and antiglaucoma drugs</b>	
N/6 Normal saline	C	Pilocarpine	C
Potassium chloride	C	Timolol	C
Ringer lactate	C	<b>Mydriatics</b>	
Sodium bicarbonate	C	Atropine	C
Sodium chloride	C	Cyclopentolate	C
Sodium chloride, USP	C	Homatropine	C
<b>24. Vitamins and minerals</b>		Phenylephrine	C
Calcium carbonate	A/C	Tropicamide	C
Calcium gluconate	C	<b>Others</b>	
Pyridoxine	A/C	Acetazolamide	C
Vitamin A	A/X	Fluorescein	C
Vitamin B Complex NFI	A/C	Hyaluronidase	C
Vitamin B <sub>1</sub>	A/C	Hydroxypropyl methylcellulose	C
Vitamin B <sub>12</sub>	A/C	Proparacain	C
Vitamin C	A/C	<b>27. Anticancer drugs</b>	
Vitamin D <sub>3</sub>	A/D	Asparaginase	C
<b>25. Dental preparations</b>		Bleomycin	D
Povidone iodine	D	Busulfan	D
Salicylate, Gel	C	Calcium Folinic acid	C
<b>26. Ophthalmological preparations</b>		Cisplatin	D
<b>Anti-infective agents</b>		Cyclophosphamide	D
Acyclovir	C	Cyclosporine A	D
Chloramphenicol	C	Cytosine arabinoside	D
Ciprofloxacin	C	Daunomycin	D
Framycetin	C	Doxorubicin	D
Gentamicin	C	Etoposide	D
Miconazole	C	5-fluorouracil	D
Natamycin	C	GMCSF	C
Oxytetracycline	D	Melphalan	D
Sulfacetamide	B/D	Mercaptopurine	D
Tobramycin	B	Methodretaxate	D
<b>Anti-inflammatory agents</b>		Paclitaxel	D
Dexamethasone	C	Procarbazine	D
Dexamethasone + Gentamicin	C	Tamoxifen	D
		Vincristine	D

Drugs	Categories	Drugs	Categories
<b>28. Solutions for parenteral nutrition</b>		<b>29. ENT drugs</b>	
Amino acid solution for parenteral nutrition	B	Gentamicin + betamethasone	C
Fat emulsion for parenteral nutrition	C	Chloramphenicol	C
Human normal serum albumin	B	Clotrimazole, Eardrops	B
		Gentamicin, Eardrops	C
		Glucose in glycerine	C
		Sodabcarb glycerine	C
		Xylometazoline nasal drops	C

**Note:** The table should be used as a guide; absence from the table does not imply safety.

#### References

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