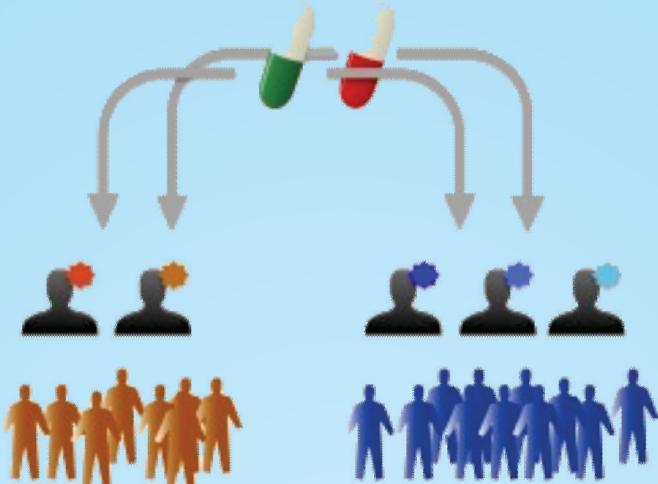




ننګهار طب پوهنځی

د درملو بدی اغیزی



پوهنوال سید قمبر علی حیدری

۱۳۹۶

پلول منع دی



۱۳۹۶
سید قمبر علی حیدری



Funded by
Kinderhilfe-Afghanistan



Nangarhar Medical Faculty

د درملو بدی اغیزی

Associate Prof Said Qumber Ali Haidary

Drug Adverse Reaction



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2017

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د درملو بدی اغیزی

پوهنواں سید قمبر علی حیدری

افغانیک
Afghanic



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Nangarhar Medical Faculty
ننگهار طب پوهنځی

Funded by
Kinderhilfe-Afghanistan

Drug Adverse Reaction

Associate Prof Said Qumber Ali Haidary

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بسم الله الرحمن الرحيم

د درملو بدی اغیزی

لومړی چاپ

پوهنواں سید قمر علی حیدری

دغه کتاب په پې ډي ایف فارمتو کې په مله سی ډي کې هم لوستلی شئ:



د کتاب نوم	د درملو بدې اغیزې
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چاپ خای	افغانستان تایمز مطبعه، کابل، افغانستان



دا کتاب د افغان ماشومانو لپاره د جرمني کمېتې، په جرمни کې د ابروس کورنۍ یوې خیریه ټولنې لخوا تمولیل شوي دي.
اداري او تخنیکي چارې یې په آلمان کې د افغانیک لخوا ترسره شوي دي.
د کتاب د محتوا او لیکنې مسؤولیت د کتاب په لیکوال او اړونده پوهنځی پوري اړه لري. مرسته کونکي او تطبیق کونکي ټولنې په دې اړه مسؤولیت نه لري.

د تدریسي کتابونو د چاپولو لپاره له مور سره اړیکه ونیسي:
د اکتر یحيی وردک، د لوړو زده کړو وزارت، کابل
تيليفون ۰۷۵۶۰۱۴۶۴۰
ایمیل textbooks@afghanic.de

د چاپ ټول حقوق له مؤلف سره خوندي دي.

ای اس بی ان ۹۷۸-۹۹۳۶-۶۳۳-۲۸-۵

د لوړو زده کړو وزارت پیغام



د بشر د تاریخ په مختلفو دورو کې کتاب د علم او پوهې په لاسته راولو، ساتلو او خپرولو کې دیر مهمه رول لوړولی دی. درسي کتاب د نصاب اساسی برخه جوروی چې د زده کړي د کیفیت په لوړولو کې مهم ارزښت لري. له همدي امله د نېټو والو پېژندل شویو معیارونو، د وخت د غونښتنو او د تولنې د اړتیاوو په نظر کې نیټولو سره باید نوي درسي مواد او کتابونه د محصلینو لپاره برابر او چاپ شي.

له بناغلو استادانو او لیکوالانو خخه د زړه له کومي مننه کوم چې دوامداره زیار بې ایستلني او د کلونو په اوردو کې بې په خپلواړوندو خانګو کې درسي کتابونه تأليف او ژیاړلي دي، خپل ملي پور بې اداء کړي دي او د پوهې موتور بې په حرکت راوستي دي. له نورو بناغلو استادانو او پوهانو خخه هم په درښت غونښته کوم تر خو په خپلواړوندو برخو کې نوي درسي کتابونه او درسي مواد برابر او چاپ کړي، چې له چاپ وروسته د گرانو محصلینو په واک کې ورکړل شي او د زده کړو د کیفیت په لوړولو او د علمي پروسې په پرمختګ کې بې نېټ ګام اخيستي وي.

د لوړو زده کړو وزارت دا خپله دنده بولی چې د گرانو محصلینو د علمي سطحي د لوړولو لپاره د علومو په مختلفو رشتو کې معیاري او نوي درسي مواد برابر او چاپ کړي. په پاي کې د افغان ماشومانو لپاره د جرمني کمبيټي او زموږ همکار داکتر يحيى وردک خخه مننه کوم چې د دی کتاب د خپرولو لپاره بې زمينه برابره کړبده.

هيله منده یم چې نوموري ګټوره پروسه دوام وکړي او پراختیا موموي تر خو په نېړدې راتلونکې کې د هر درسي مضمون لپاره لړ تر لړه یو معیاري درسي کتاب ولرو.

په درښت

داکتر عبداللطیف روشنان

د لوړو زده کړو سرپرست وزیر

کابل، ۱۳۹۶

د درسي کتابونو چاپول

قدمنو استادانو او گرانو محصلينو!

د افغانستان په پوهنتونونو کې د درسي کتابونو کموالی او نشتوالی له لوبيو ستونزو څخه ګهل کېږي. یو زيات شمير استادان او محصلين نويو معلوماتو ته لاس رسی نه لري، په زاړه میتود تدریس کوي او له هغه کتابونو او چېټرونو څخه ګته اخلي چې زاړه دي او په بازار کې په ټېټې کیفیت فوټوکاپی کېږي.

تر اوسه پوری موره د ننګههار، خوست، کندههار، هرات، بلخ، الپرورني، کابل، کابل طبی پوهنتون او کابل پولی تختنیک پوهنتون لپاره ۲۵۰ عنوانه مختلف درسي کتابونه د طب، ساینس، انجینيري، اقتصاد، ژرناлиزم او زراعت پوهنځیو ۹۶۰ طبی د آلمان د علمي همکاريyo تولني DAAD، ۱۴۰ طبی او غیر طبی د افغان ماشومانو لپاره د جرمي کمېټي Kinderhilfe-Afghanistan، ۶ کتابونه د آلماني او افغاني پوهنتونونو تولني DAUG، ۲ کتابونه په مزار شريف کې د آلمان فرال جمهوري جنزاں کنسولگري، ۱ کتاب د Afghanistan-Schulen، ۱ د صافۍ بنسټ لخوا، ۱ د سلواک اېډ او ۳ نور کتابونه د کارداد ادناور بنسټ) په مالي مرسته چاپ کړي دي.

د یادونې ورده، چې نوموري چاپ شوي کتابونه د هېواد تولو اړونده پوهنتونونو او یو زيات شمېر ادارو او مؤسساتو ته په وریا توګه وبشل شوي دي. تول چاپ شوي کتابونه له www.afghanistan-ecampus.org وېب پانې څخه داونلود کولای شي.

دا کېښې په داسي حال کې تر سره کېږي چې د افغانستان د لوړو زده کړو وزارت د (۲۰۱۴-۲۰۱۰) کلونو په ملي ستراتېژیک پلان کې راغلي دي چې:

"د لوړو زده کړو او د نبوونې د نېه کیفیت او زده کوونکوته د نویو، کره او علمي معلوماتو د برابرولو لپاره اړینه ده چې په درې او پښتو ژبود درسي کتابونو د لیکلو فرصت برابر شي د تعليمي نصاب د ريفورم لپاره له انګریزی ژبه څخه درې او پښتو ژبوده د کتابونو او درسي موادو ژبارل اړین دی، له دي امکاناتو څخه پرته د پوهنتونونو محصلين او استادان نشي کولای عصرې، نویو، تازه او کره معلوماتو ته لاس رسی پیدا کړي."

مونږ غواړو چې د درسي کتابونو په برابرولو سره د هیواد له پوهنتونونو سره مرسته وکړو او د چېټر او لکچر نوټ دوران ته د پای تکي کېږدو. دې لپاره دا اړینه ده چې د لوړو زده کړو د موسساتو لپاره هر کال څه ناخه ۱۰۰ عنوانه درسي کتابونه چاپ شي. له ټولو محترمو استادانو څخه هيله کوو، چې په خپلو مسلکي برخو کې نوي کتابونه ولیکي،

وزياري او يا هم خپل پخوانی ليکل شوي کتابونه، لکچر نوتوونه او چېټروننه ايدېټه او د چاپ لپاره تيار کري، زمونه په واک کې بې راکړي چې په نسه کيفيت چاپ او وروسته يې د اړوند پوهنځيو، استادانو او محصلينو په واک کې ورکړو. همدارنګه د یاد شویو ټکو په اړوند خپل وړاندېزونه او نظریات له مونږ سره شريک کري، تر خو په گډه پدې برخه کې اغيزمن ګامونه پورته کړو.

د مؤلفينو او خپروونکو له خواپوره زيار ايستل شوي دي، ترڅود کتابونو محتويات د نړيوالو علمي معیارونو په اساس برابر شي، خوبیا هم کیدای شي د کتاب په محتوى کې خینې تیروتنې او ستونزې ولیدل شي، نو له درنو لوستونکو خخه هيله مند یو تر خو خپل نظریات او نیوکې مؤلف او يا مونږ ته په ليکلې بنه راولېږي، تر خو په راتلونکي چاپ کې اصلاح شي. له افغان ماشومانو لپاره د جرماني کميټي او د هغې له مشر داکتر ايروس خخه ډېره مننه کوو چې د دغه کتاب د چاپ لګښت يې ورکړي دي، دوی تر دي مهاله د ننګرهار پوهنتون د ۱۴۰ عنوانه طبی او غیرطبی کتابونو د چاپ لګښت پر غاړه اخيستي دي.

په ځانګړې توګه د جې آي زيت (GIZ) له دفتر او CIM (Center for International Migration & Development) خخه، چې زما لپاره يې له ۲۰۱۰ نه تر ۲۰۱۶ پوري په افغانستان کې د کار امکانات برابر کري وو، هم د زړه له کومې مننه کوم.

د لوړو زده کړو له سرپرست وزیر داکتر عبداللطیف روشنان، علمي معین پوهنمل دېپلوم انځير عبدالتواب بالاکرزۍ، مالي او اداري معین داکتر احمد سير مهجور، مالي او اداري رئيس احمد طارق صديقي، په لوړو زده کړو وزارت کې سلاکار داکتر ګل رحيم صافي، د ننګرهار پوهنتون رئيس، د پوهنځيو ريسانو او استادانو خخه مننه کوم چې د کتابونو د چاپ لړي يې هڅولي او مرسته يې ورسه کړي ۵۰. د دغه کتاب له مؤلف خخه ډېر منندوي به او ستانيه يې کوم، چې خپل د کلونو-کلونو زيار يې په وړيا توګه ګرانو محصلينو ته وړاندې کړ.

همدارنګه دفتر له همکارانو هر يو حکمت الله عزيز، فهيم حبيبي او داکتر نيسم خوګيانې خخه هم مننه کوم چې د کتابونو د چاپ په برخه کې بې نه ستړې کیدونکې هلې څلې کړي دي. داکتر يحيى وردک، د لوړو زده کړو وزارت سلاکار

کابل، اکتوبر ۲۰۱۷

د دفتر تيليفون: ۰۷۵۶۰ ۱۴۶۴۰

ایمیل: textbooks@afghanic.de

د درملو بدی اغیزی

سیزه

ټولی دواګانی که په سیستماتیک او یا موضعی ډول تطبیق شی ھنی نا مطلوبه، ناخونی اغیزی منځ ته راپری. چې د درملو دبدو اغیزو په نامه یادیږي.

د درملو بدی اغیزی ھنی وخت د تحمل وړ وی خو په بعضو حالتونو کی دژوند تهدیدونکی بنه اختياروی. چې د درملو قطع کولو ته پکی ضرورت پیدا کیږي او د منځ ته راغلی بدی اغیزی درملنه باید اجراء شی. لکه: Insulin د تطبیق سره د Hypoglycemia راتلل.

د درملو بدی اغیزی دنتی طبات ډیره مهمه ستونزه ډه. چې بعضی وخت ناروغ تر روغتون پوری رسوی – او حتی د مرینی سبب هم گرزی پورتنیو ستونزو ته په کتو سره می تصمیم ونیوه تر خو په دی موضوع یو کتاب ولیکم. په دی کتاب کی می کوشش کړی دی چې د ډیرو مغلقو او پیچلو میخانیکیتونو څخه ډه وکړم – تر خو طبی پرسونل او حتی عوام تری هم په اسانی سره ګته پورته کړی – د کتاب شامل موضوعات می د ډیرو نوو تیکست بوکونو او معتبرو ژورنالونو څخه راتبول کړی دی – د باوری اتہرنیتی منابعو څخه می هم ګته اخیستلی ډه.

دا کتاب (پینځه) فصلونه او ۱۷۷ مخونه لري جدولونه،
ګرافونه او شکلونه ئي د فارمکولوژی د معتبرو او نوو منابعو
څخه اخيستل شوي دي .

ددی کتاب څخه د طب، فارمسی، ستوماتولوژی، نرسنگ
او وترنری پوهنځيو محصلين او هم د صحی علومو د
انسیتوتونو شاګردان ګټه اخيستلاي شی .
د پورتنيو څانګو متخصیصینو ته به ددی کتاب لوستل هم د
دلچسپی څخه خالی نه وي .

لارمه نه ګنډ چې ددی کتاب داهمیت په حقله، د کتاب د
مؤلف په حیث ډیر خه ولیکم - دا قضاوت به د کتاب لوستونکو
ته پرېړدم . د خښتن تعالی ډيرشکرونه ادا کوم چې د ډیرو
مصور فیتونو سره ئي ماته دا توان راکړ چې ددی کتاب په
ليکلو بريالي شم . په پای کې د پوهندوی بهسودوال او پوهیالي
نوری څخه دزره له کومی مننه کوم چې دارتیاپه وخت کې يې
لارمه مرسته کړي ده .

په درنښت
پوهنوال سید قمبر علی (حیدری)

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لومړي فصل

Adverse Drug Reactions (ADR)

د درم ملوبدی اغیزی دی Adverse Drug Reactions

چې د Toxic Effects او Side Effects له کبله منځ ته رائۍ .

د درم Toxic Effect و په دوزپوری اړه لري

(Dose related) او د دوا د فارمکولوژیک تاثیراتو سره ارتباط

Hypokalemia Loop Diuretic Drugs د استعمال سره لري لکه د

منځ ته رائۍ .

د دوا د هغه فارمکولوژیک تاثیراتو سره Side Effects

ارتباط لري چې Therapeutic Effects منځ ته نه راوضي . کیدای

شی چې د درم لوداډول بدء اغیزه Dose Related وی لکه د

Anticholinergic Tricyclic anti Depressant Drugs له کبله چې

اغیزی منځ ته رائۍ او یاداچی Not Dose Realated

وی لکه هغه Rash چې د اتى بیوتیکونو له کبله منځ ته

رائۍ . غوره ده چې د Toxic Effects او Side Effects په ئای د

اصطلاح وکاروو تر خود درم Adverse Effects

توں ډولونه Cover Un wanted effects کړي .

Adverse Events تولی هغه پینې چى د ناروغ لپاره

نامطلوبه وى په بر کى نىسى - ممکن چى د درملو او ناروغىو او يا طبى پروسىجر لە كبلە وى .

تاریخچە: كله چې Chloroform د بې هوشى پە موخه استعمالىدە نو ھىرى ناخاپى مړينې مینځته راغلي وى چې د خپلۇ په موخه يې (1870-1890) يوكىسون جور شو او د پلەنۇ په نتىجە کې معلومه شوه چى Chloroform د Myocard حساسوالى د Arrhythmogenic Effects د Catecholamin په مقابل کي زياتوی په 1922 کال کى د Salverson (چه دارسنيکو عضوی مشتق وه اوھغه وخت د سفلیس په درملنه کې استعمالىدە) خخە د Jaundice راپور ورکۈل شوپە 1937 کال کى د Sulfonamides elixir خخە د 107 تنو د مړينى راپور ورکۈل شوی وه د نومورى Elixir په ترکىب کى Solvent diethylene glycol شاملى وە)

په 1960 لسىزه کى د Thalidomide تطبیق خخە وروسته په گن شمير کى په ولادى بنە سوء شکله ماشومان وزىپىدل چە په تاریخ کى د درملو د ترازيدي په نامه ياديرى . په لاندى جدول کى د درملو د بدو اغيزو په ارتباط ئىينى تاریخى شواهد ورلاندى شوی دى

اول جدول

Drugs that have been withdrawn or have had their uses restricted because of adverse reactions

Drug	Year	Adverse reaction	Outcome
Sulfanilamide	1937	Liver damage due to diethylene glycol	Solvent changed; FDA established
Diiododiethyl tin	1954	Cerebral oedema	Withdrawn
Thalidomide	1961	Congenital malformations	Withdrawn; Dunlop Committee (later the CSM) established
Chloramphenicol	1966	Blood dyscrasias	Uses restricted
Chloquinol	1975	Subacute myelo-optic neuropathy	Withdrawn
Practolol	1977	Oculomucocutaneous syndrome	Uses restricted
Benoxaprofen	1982	Liver damage	Withdrawn
Etomidate	1983	Adrenal suppression	Uses restricted
Zimeldine	1983	Hypersensitivity	Withdrawn
Zomepirac	1983	Anaphylaxis	Withdrawn
Fenclofenac	1984	Lyell's syndrome	Withdrawn
Indoprofen	1984	Gastrointestinal bleeding/perforation	Withdrawn
Osmosin®	1984	Gastrointestinal ulceration/perforation	Withdrawn
Phenylbutazone	1984	Blood dyscrasias	Uses restricted
Aspirin	1986	Reye's syndrome (children)	Uses restricted
Amfebutamone (buproprion)	1986	Seizures	Not marketed in the UK*
Nomifensine	1986	Haemolytic anaemia	Withdrawn
Tocainide	1986	Neutropenia	Uses restricted
Suprofen	1987	Renal impairment	Withdrawn
Spironolactone	1988	Animal carcinomas	Uses restricted
Flecainide	1989	Cardiac arrhythmias	Uses restricted

بے بل مخ کی دوام لری

Drugs that have been withdrawn or have had their uses restricted because of adverse reactions

Drug	Year	Adverse reaction	Outcome
L-Tryptophan	1990	Eosinophilia-myalgia syndrome	Withdrawn from foodstuffs
Metipranolol 0.6% eyedrops	1990	Anterior uveitis	Withdrawn
Xamoterol	1990	Worse heart failure in some patients	Uses restricted
Noscapine	1991	Gene toxicity	Withdrawn
Terodilene	1991	Cardiac arrhythmias	Withdrawn
Triazolam	1991	Psychiatric disorders	Withdrawn
Tenafloxacin	1992	Various serious adverse effects	Withdrawn
Centoxin	1993	Increased mortality	Withdrawn
Flosequinan	1993	Increased mortality	Withdrawn
Remoxipride	1994	Aplastic anaemia	Withdrawn
Co-trimoxazole	1995	Serious allergic reactions	Uses restricted
Nafidofuryl	1995	Cardiac and neurological toxicity	Intravenous formulation withdrawn
Sotalol	1996	Cardiac arrhythmias	Uses restricted
Troglitazone	1997	Hepatic disorders	Withdrawn
Terfenadine	1997	Interactions (e.g. with grapefruit juice)	Withdrawn from OTC sale
Fenfluramine and dextfenfluramine	1997	Cardiac valve abnormalities	Withdrawn
Mibepradil	1998	Too many drug interactions	Withdrawn
Tolcapone	1998	Hepatobiliary disorders	Withdrawn
Astemizole	1998	Interactions (e.g. with grapefruit juice)	Withdrawn
Sertindole	1998	Cardiac arrhythmias	Withdrawn
Cisapride	2000	Cardiac arrhythmias	Withdrawn
Thioridaâzine	2000	Cardiac arrhythmias	Uses restricted
Cerivastatin	2001	Rhabdomyolysis, especially with fibrates	Withdrawn

په تاریخی افسانو کې هم شاهان او نور دوخت غښتلى
کسان د درملو د لور دوز چې د زهرو په بنه استعمال شوي وه
سموم او مړه شوي دي . او په دی ډول ورته پیښی خورا ډیری
دي . چې دلته يې دليکلو لپاره وخت نه لړو چې په تيرو
وختونو کې منځ ته راغلي وي .

د توکسيکولوژي علم د فارمکولوژي د یوځانګي
په بنه ظهور وکړ . چې د ساینس د پرمختګ په نتجه کې نن
د توکسيکولوژي علم ډير پراخه شوي او خپله هم په
څو خانګو ويشل شویدي دا علم د بیولوژي، طب، نرسنګ،
کيميا، او په ځانګړي توګه د فارمکولوژي سره ډير
ارتباط لري . او د Immuno Toxicology, Forensic Toxicology,
Chemical Toxicology, Medical Toxicology, Clinical Toxicology
او داسي نورو خانګو کي معلومات وړاندی کوي . بله بنه ئي
چې د محیط سره تراو لري Environmental Toxicology په نوم
ياديږي . د اخانګه اوس د توجه ورده ترڅو د محیط کړتياد
مطالعې لاندی ونيسي . او د Enviromental Protection Agency
چې مخفف ئي EPA دی يو اداره منځ ته راغلي ده دغه اداره د
امریکا په متحده ایالاتو کې US EPA په نوم فعالیت کوي .

Toxic د لفظ Poison,harmfull,unsafe,pernicious.....

سره اړیکې لري نود توکسیکولوژۍ علم په ژونديو موجوداتو د کیمیاوی موادو بدی اغیزی مطالعه کوي.

Drug Toxicity: کلے چې د دوالور غلظت په وينه کې

مشاهده شی او بدی اغیزی منخته راوري.

Pharmacovigilance: د فارمکولوژۍ هغه

خانګه ده چه د درملو بدواي گزو، Collection، Assessment او Prevention پکي د Detection، Monotoring لاندې نیول کېږي.

FDA Food and Drug Administration

متعدد ایالاتوکې دیوه لویه اداره ده چې د خپروواو درملو د محفوظوالی دنده په غاره لري.

incidence of Adverse Drug reaction: که خه هم پدی

برخه کې د کره او مکملو شواهدو وړاندی کول ستونتمن کار دی. مختلفی سرچینې بیلا بیلی سلنی او ارقام وړاندی کوي. خوبیا هم څینی بیلکې وړاندی کوو.

Organic nitrates: چه په Anti Anginal Drugs کې مطالعه

کېږي 30-60% ناورغانو ته سردردی پیدا کوي.

د تولوسترشوناروغانو 10-20% د درملو بدواي گزو خخه رنج وړی په روغتونو کې 0.24-2.9% مرینه د درملو بدواي گزو له کبله وی.

په OPD په ناروغانو کي هم ددرملود بد و اغيزي د توجهه و په دی خود قيقه احصا يه ئى ستون زمنه ده ھيني په بىرپنې پىينې هم د درملود بىدو اغيزو سره ارتياط لرى لکە Angio edema, Anaphylactic Shock او داسى نور.

Over Dosage Toxicity : یا د درملو حلد تسمم چى په قصدى ، تصادفى، جنائي او یا نورو شكلونو منخ ته رائى هم د توجهه و پدې .

ددر ملوسره رو بدي توب چه دتنى نپي ڏيره لويء ستونزه
تشكيلوی اود رو بدو كسانو شمير ورخ تريلپه زياتيدو دى.
او دى ته ورته نوري پيбинسي (چي مدارک او احصائي و راندي
كول ئى ددى كتاب دحوصلى خخه بهردى) ددى موضوع
اهميٽ خرگندوي کوي.

Classification of Advers Drug Reactions:

د درملو بدی اغیزی په لاندی ګروپونو ويشن کېږي

I:Dose Related

II: Non Dose Related

III: Long Term with Drawal Effects

IV:Delayed Effects

دوهم جدول

Classification of adverse drug reactions

1. Dose-related

- (a) Pharmaceutical variation
- (b) Pharmacokinetic variation
 - (i) Pharmacogenetic variation
 - (ii) Hepatic disease
 - (iii) Renal disease
 - (iv) Cardiac disease
 - (v) Thyroid disease
 - (vi) Drug interactions
- (c) Pharmacodynamic variation
 - (i) Hepatic disease
 - (ii) Altered fluid and electrolyte balance
 - (iii) Drug interactions

2. Non-dose-related

- (a) Immunological reactions
- (b) Pseudoallergic reactions
- (c) Pharmacogenetic variation

3. Long-term effects

- (a) Adaptive changes
- (b) Rebound phenomena
- (c) Other long-term effects

4. Delayed effects

- (a) Carcinogenesis
- (b) Effects concerned with reproduction
 - (i) Impaired fertility
 - (ii) Teratogenesis: adverse effects on the fetus during the early stages of pregnancy
 - (iii) Adverse effects on the fetus during the later stages of pregnancy
 - (iv) Drugs in breast milk

دوهم فصل

I:Dose Related Adverse Drug Reactions

ددرملودا دول بدی اغیزی ددرملود مقدار پوری اره لری تر
تولود و لونوزیاتی پیبنیدون کی اغیزی دی او د تولو بدو اغیزو
80% سلنہ تشکیلوی او په لاندی ڈولونو منخ ته رائی

1-Pharmaceutical Variation

په دوائی مستحضر کې د بدلون له کبله ددرملو بدی اغیزی
منخ ته راتلای شی لکه:

A: په 1960 لسیزه کې د Phenytoin Capsule (چې اصلاً په Calcium Sulfate دی) په جورولو کې د Antiepileptic drug خای یا عوض Lactose یا صواغ په حیث کارول شوی و ه چې نتیجه کې د Phenytoin پ_____ کې زیاتوالی راغلی و ه او د فنیتوئین Systemic Bioavailability د تسمم پیبنې زیاتی شوی وی.

B: کله چې مواد د Pyrogens intravenous formulation باکتریا او پواسطه ککریا منتن شی نونار و غانوت _____ پیدا کیری Febrile Reactions.

C: Out of Date Formulation و د نیتی د درمل

تیریدو له وجې هم خانګړی بدې اغیزی منځ ته رائۍ مثلاً
 سبب ګرځی Fanconi syndrome د out date tetracyclines
 علت ئې دادې چې په دی ډول مستحضر کی Tetracycline په
 او Anhydrotetracycline Epi androtetracyclin باندی بدليږي
 په دی سندروم کی په Renal Proximal Tubular Reabsorption
 کی بدلون منځ ته رائۍ د دی سندروم نښی عبارت دی له:
 Glucose Uria, Phosphate Uria, Amino Acid Uria, Acidosis,
 Hypokalemia, Hyperuricemia خخه .

D: Folic acid په محفوظو درملو کی رائۍ خو که چيری نوو

زېریدلوماشومانو ته نوموری دوا ذرقي لاری خخه استعمال
 شی نود Gasping syndrome سبب ګرځی په دی سندروم کی
 له کبله مرینه منځ ته رائۍ د یادونی Multiple System Failure
 وردہ چې په نوموری زرقي محلول کی د Benzyl alcohol
 موجودیت د دی سندروم سبب ګرځی .

D: درمل و هغه بدې اغیزی دی چې د

د کبله منځ ته رائۍ بیلګی ئی بيان Pharmaceutical variation
 شوی .

دیادونی ورده چې ددوائی مستحضراتو تهیه، ساتنه او توزيع خورا او برد مبحث دی - چه اغیزی ئی په درملو د مشاهدی وړ دی.

دلته په لنده ډول د درملو د ساتنی شرائیطو ته نظر اچوو . په عمومی توګه درمل د تودو خى په لاندی درجوکی ساتل کېږي .

Room Temperature –

وی او د کوتۍ د تودو خى په نامه یادېږي .

Cool Temperature –

- ځینی درمل د 8-15°C تر منځ وی . (Refrgeration)

- په استثنای ډول ځینی درمل 25-10°C ساتل کېږي

چې دی ته (Freezing Temperature) وائي .

درمل باید د لمردانګو د مستقیم تماس خخه محفوظ وساتل شی .

یا زیات رطوبت هم د درملو په ساتنه بد تاثیر لري .

2-Pharmaco Kinitic Variation

ددرملو په فارمکوکنیتیک (جذب، توزيع، استقلاب، اطراح کې بدلونونه د درملو بدي اغیزی د خپل چترلاندې راولي پوهېږو چې د درملو فارمکوکنیتیک د فارمکولوژی دهیرو

بنستیهزو موضوعاتو له جملې خخه دی - نوتاثیرات یي
ددرملوپه بدرو اغیزو هم بنستیز دی.

دلته د نمونی په توګه حینې مثالونه راورو:

Pharmacogenetic Variation:a

حینې خلک بیوشیمیکی او فزیولوژیکی ابناړملتی لری
چې د حینو درملو اغیزی پکی د نورو سره توپیر پیدا کوي.
چې په لنډه توګه ورڅخه یادونه کوو:

A: Glucose-6-Phosphate Dehydrogenase(G6PD)

Deficiency

B: Glutathion reductase Deficiency

C: Methemoglobin reductase Deficiency

D: Others

الف: خرنګه چې NH₄⁺ په حیگرکې د Acetylation د عملی په
واسطه په استقلاب رسبری چه په جنیتکی ډول په حینې
ناروغانو کې د Acetylation عملیه بطی وي. چه دی ته
Slow Acetylators وائي.

پ: Slow Acetylators کسانو کې د NH₄⁺ د Peripheral Neuropathy
پیښې زیاتی وي.

ج: هغه کسان چه په Pseudocholine esterase deficiency
اخته وي. د Succinylcholine کې ستونزې لری نو
د Apnea خطر په کې زیات وي.

د درملو د بد او اغيزو او فارمکو جنتيئيك تر منع اريکي په
لاندی جدولونو کي بيان شوي دي
دريم جدول

Drugs that can precipitate haemolysis in subjects with G6PD deficiency

(a) Drugs with the most marked effect (b) Drugs with possible risk in some individuals

Acetanilid	Analgesics
Doxorubicin	antipyrine
Dapsone and other sulfones	Antimalarials
Furazolidone	chloroquine
Methylene blue	mepacrine
Nalidixic acid	quinidine
Niridazole	quinine
Nitrofurantoin	Sulfonamides other than those listed in (a)
Pamaquine	Others
Phenazopyridine	chloramphenicol
Primaquine	ciprofloxacin
Sulfonamides	dimercaprol
sulfafurazole	probenecid
sulfamethoxazole	vitamin K
sulfanilamide	
sulfapyridine	
sulfasalazine	

خلورم جدول : په Porphyria کي درملو استعمال

Drugs that are considered either unsafe or safe to use in individuals with porphyria (continued)

Drugs considered unsafe	Drugs considered safe
Orphenadrine	Promazine
Pancuronium	Promethazine
Pentazocine	Propantheline
Phenylbutazone	Propoxyphene
Piroxicam	Prostigmine
Pivampicillin	Quinine
Pyrazinamide	Reserpine
Ranitidine	Suxamethonium
Rifampicin	Thiazides
Succinimides (e.g. ethosuximide)	Thioureas
Sulfasalazine	Thyroxine
Sulfonamides	Trifluoperazine
Sulfonylureas (e.g. tolbutamide)	Tubocurarine
Sulthiame	Vitamins A, B, C, D, E, K
Terfenadine	
Theophylline	
Thiopentone	
Trimethadione	
Troxidone	
Verapamil	

دوام لري

Drugs considered unsafe	Drugs considered safe
Alcohol (ethanol)	Adrenaline (epinephrine)
Alphaxalone/alphadolone	Aminoglycosides
Antipyrine and related drugs	Aspirin
Barbiturates	Atropine
Carbamazepine	β -Adrenoceptor antagonists
Carisoprodol	Bromides
Chloramphenicol	Bumetanide
Chlordiazepoxide	Cephalosporins
Colistin	Chloral hydrate
Dapsone	Chlorpheniramine
Diazepam	Chlorpromazine
Dichloralphenazone	Colchicine
Diclofenac	Cyclizine
Diethylpropion	Dicoumarol
Dimenhydrinate	Diethyl ether
Diphenhydramine	Digitalis
Enalapril	Diphenhydramine
Ergot preparations	Droperidol
Erythromycin	EDTA
Eucalyptol	Flurbiprofen
Female sex hormones	Fusidic acid

دوام لری

Drugs considered unsafe	Drugs considered safe
Flucloxacillin	Guanethidine
Flufenamic acid	Heparin
Flunitrazepam	Ibuprofen
Furosemide	Indomethacin
Glutethimide	Insulin
Griseofulvin	Labetalol
Halothane	Lithium
Hydantoins (e.g. phenytoin)	Meclozine
Hyoscine butylbromide	Methadone
Imipramine	Naproxen
Isoniazid	Neostigmine
Ketoprofen	Nitrous oxide
Lisinopril	Nortriptyline
Meprobamate	Opiates
Methyldopa	Paracetamol
Methyprylon	Penicillamine
Metoclopramide	Penicillins (most)
Nalidixic acid	Pethidine
Nifedipine	Prilocaine
Nitrazepam	Primaquine
Novobiocin	Procaine
Orphenadrine	Prochlorperazine
	Promazine

هېپاتيک دیزېب: Hepatic disease:b
 استقلاب او حذف کې تاکونو نکى رول لرى - نو پدى اساس د
 ينى ناروغى د درملو پە بدو اغىزو د اهمىت وردى چې ئىنى
 مثالونە يې پە لاندى دولدى

- پـ۔ Warfarin, کـی د Cirrhosis او Sever hepatitis

او Theophylin کـلیرانس کـمیـبـرـی Phenytoin

- دـھـیـگـرـپـہ سـیـرـوـزـس کـی د Portal hypertension لـه وـجـی

او Propranolol, morphin & Other narcotic analgesics, Labetalol

کـلـرانـس کـمـیـبـرـی Chlorpromazine

- دـھـیـگـرـپـہ نـارـوـغـانـوـکـی د Heart Failure

دـکـموـالـی پـ اـسـاسـ د Morphin, propranolol, Lidocaine

او Pethidine کـلـیرـانـس کـمـیـبـرـی

پـہ لـانـدـی جـدـولـ کـی دـھـیـنـوـدـرـمـلوـ Hepatic Excretion بـنـوـدـلـ

شوـیـ دـیـ

پـینـخـمـ جـدـولـ : دـھـیـگـرـپـہ وـاسـطـہ دـرـمـلـوـ دـحـذـفـ نـسـبـتـ

Drugs of low, intermediate, and high hepatic extractior ratio

Low	Intermediate	High
Chloramphenicol	Aspirin	Clomethiazole
Diazepam	Codeine	Ergotamine*
Digitoxin	Quinidine	Glyceryl trinitrate
Isoniazid	Nortriptyline	Labetalol
Paracetamol		Lidocaine
Phenobarbital		Morphine
Phenylbutazone		Pethidine
Phenytoin		Propranolol
Procainamide		Simvastatin
Theophylline		
Tolbutamide		
Warfarin		

نوکله چې ددرملوکلیرانس کم شی دی سره ددرملود
بدواګیزو په پروفایل کی هم بدلون رائی .

- کله چې خیگر د پلازما د پروتینونو (خاستاً البومن)
د جوریدو قابلیت ونه لري او په پلازما کې د البومن سویه
کمه شی - نو هغه درمل چې د البومن سره بانه جوروی .
Drug+Albumin ⇌ Drug Protein Complex
فارمکولوژیکی اغیزی منځ ته راوري د بدنه مختلفو انساجو
ته توزیع کېږي په استقلاب رسیبې بدی اغیزی منځ ته
راوري او بدنه خخه اطراح کېږي د خینو درملومیتابولیتونه
هم بدداګیزو سبب ګرئی چې خینې بیلګی ئې په لاندی
جدول بنودل شوی دی :

شپږم جدول

Drugs	Metabolites
Ethyl alcohol	Acet Aldehyde
Methyl alcohol	Form Aldehyde Formic Acid
Paracetamol	N-Actyl-P-Benzoquinone imine (NAPQI)
Cyclophosphamide	Acrolein
Ethylene glycol	Glycolic acid Oxalic acid

هـم دـنـورـو درـمـلـو پـه کـلـيرـانـس اـغـيـزـه Hepatotoxic drugs –

کـوـی پـه ئـيـگـرـ بـانـدـي دـرـمـلـو بـدـي اـغـيـزـي پـه لـانـدـي بـينـو منـعـ تـه رـاـئـى .

- Drugs That Cause Hepatocellular Damage.
- Drugs That Cause intrahepatic Cholestasis.
- Drugs That Cause Granulomatouse hepatitis.
- Drugs Associated with an Increased risk of Gall Stones.
- The Effects of Drugs on Bilirubin Metabolism and Liver Function.

دـئـيـگـرـ پـه نـارـوـغـيـوـكـى دـرـمـلـو توـصـيـه كـولـ خـاصـى پـامـلـنـى تـه اـرـتـيا لـرـى .

اووم جدول: هفه دواکانی چى دھيگردمتضرره كىدوسبب گرئى:

Drugs that can cause liver damage

1. Acute hepatocellular damage

<i>Non-dose-related</i>	<i>Dose-related</i>
Antituberculous drugs	Alcohol
Ethionamide	Amiodarone
Isoniazid	Azathioprine
p-Aminosalicylic acid	Chlorambucil
Pyrazinamide	Hydrocarbons (e.g. glue sniffing)
Rifampicin	Iron salts (overdose)
Carbamazepine	Mercaptopurine
Dantrolene	Methotrexate
Halothane	Paracetamol (overdose)
Imidazoles (e.g. ketoconazole)	Salicylates
Ibuprofen	Tetracyclines (large i.v. doses)
Indomethacin	
Methoxyflurane	
Methyldopa	
Monoamine oxidase inhibitors	
Nitrofurantoin	
Penicillamine	
Phenobarbital	
Phenytoin	
Propylthiouracil	
Quinidine	
Sulfonamides	
Tricyclic antidepressants	
Valproate	

دوام لرى

Drugs that can cause liver damage

2. *Chronic active hepatitis*

Dantrolene

Isoniazid

Methyldopa

Nitrofurantoin

Oxyphenisatin

3. *Cirrhosis*

Alcohol

Methotrexate

4. *Hepatic tumours (benign and malignant)*

Anabolic steroids

Oestrogens (combined oral contraceptive)

5. *Intrahepatic cholestasis*

Non-dose-related

Antithyroid drugs

Carbimazole

Methimazole

Methylthiouracil

Benzodiazepines

Clavulanic acid

Dextropropoxyphene

Dose-related

Anabolic steroids

Methyltestosterone

Norethandrolone

Azathioprine

Cocaine

Ecstasy (MDMA)

Mercaptopurine

دوام لری

Drugs that can cause liver damage

Erythromycin salts	Oestrogens
Flucloxacillin	
Gold salts	
Imidazoles (e.g. ketoconazole)	
Penicillamine	
Phenothiazines	
Phenylbutazone	
Sulfonylureas	
Chlorpropamide	
Glibenclamide	
Tolbutamide	
Total parenteral nutrition	
Tricyclic antidepressants	
Amitriptyline	
Iprindole	
Imipramine	
6. Gallstones	
Clofibrate	
Oestrogens	
Octreotide	

اتم جدول : هغه دواگانی چى دھيگرپه ناروغىيو گى نه وركول كىرى او يا پە دىر احتياط سره وركول كىرى:

Drugs to be avoided or used with care in patients with liver disease

-
- (a) *Pharmacokinetics altered*
- (i) Hepatic clearance reduced
- Chloramphenicol
- Clindamycin
- Isoniazid
- Drugs with a high hepatic extraction ratio (see Table 3.5)
- (ii) Biliary clearance reduced
- Fusidic acid
- Rifampicin
- (iii) Reduced binding to plasma proteins
- Phenytoin
- Warfarin
- (b) *Pharmacodynamics altered*
- (i) Drugs that inhibit clotting factor synthesis
- Oral anticoagulants
- (ii) Drugs whose adverse effects are enhanced
- Biguanides, e.g. metformin (lactic acidosis)
- Chloramphenicol (bone-marrow suppression)
- Cimetidine (confusional states)
- Methyldopa (idiosyncratic reactions)
- Niridazole (CNS toxicity)
- Non-steroidal anti-inflammatory drugs (gastrointestinal bleeding)
- Sulfonylureas (hypoglycaemia)
-

دوام لرى

Drugs to be avoided or used with care in patients with liver disease

(c) Drugs that contribute to the pathophysiology of liver disease

(i) Hepatotoxic drugs (see Table 25.9)

(ii) Drugs that contain a lot of sodium

Some antacids

Sodium salts of penicillins

(iii) Drugs that cause sodium and water retention

Carbenoxolone

Corticosteroids

Non-steroidal anti-inflammatory drugs

(iv) Drugs that cause potassium loss

Carbenoxolone

Corticosteroids

Thiazide and loop diuretics (may also precipitate encephalopathy)

(v) Drugs that may precipitate hepatic encephalopathy

Lithium

Narcotic analgesics

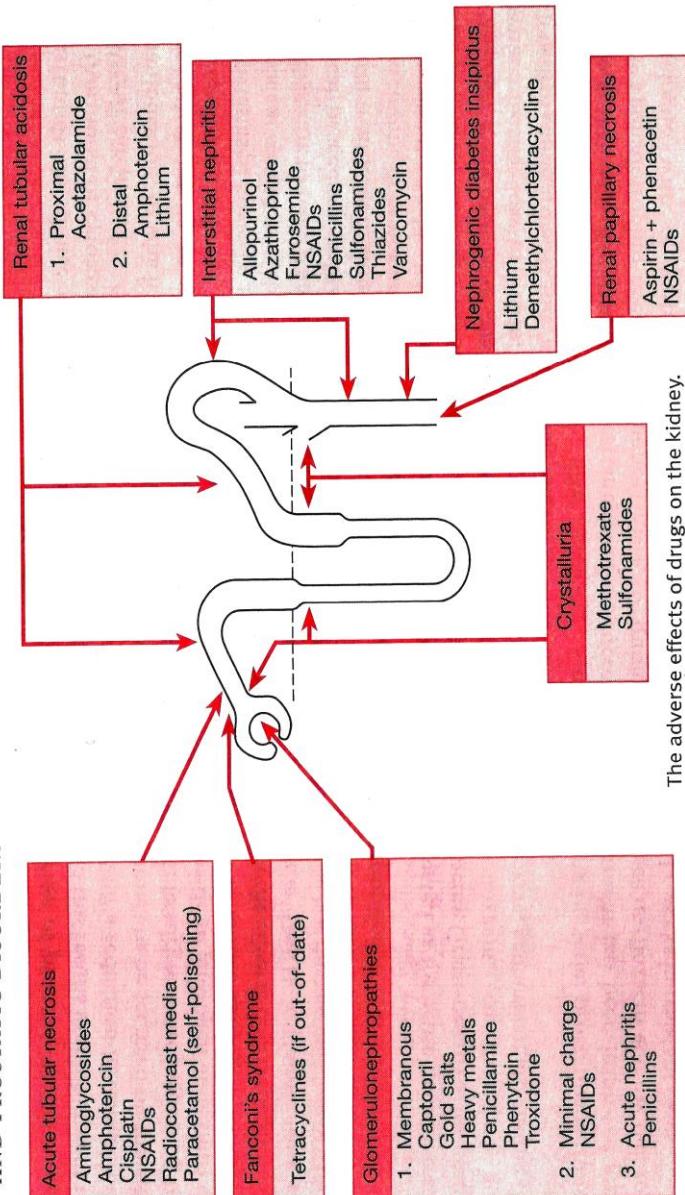
Potassium-wasting diuretics

Sedatives and hypnotics

Renal Disease :C خرنگ چې ديرمل او ياد هغه

ميتابوليتونه د Tubular secretion او Glomerular Filtration پواسطه اطراف کېږي نوکه چيرى Renal insufficiency موجوده وي - د درملو اطراف کمېږي . درمل په بدن کې تراكم کوي او Drug Toxicity منځ ته راخي له بله طرفه ئيني درمل په پښتوري ګو بدی اغيزی لري - نو ئکه د درملو په بدرو اغيزو کي پښتوري ګي تاکونکي رول لري . د کار د اسانی لپاره لاندی شيمما و ګوري :

DRUGS AND THE KIDNEY AND THE DRUG THERAPY OF RENAL, URINARY TRACT,
AND PROSTATIC DISORDERS



The adverse effects of drugs on the kidney.

اول شکل: په پنستور ګود درملو بدی اغیزی او د هغود

تاثیر خای.

Drug induced Renal damage په دوو طریقو مینځ ته راخي:
Direct Renal damage _ حیني درمل مستقيماً پښتوري گئي
متضرره کوي.

Indirect Renal damage _ غييري مستقيمي اغيزي په
Renal Blood Supply کي د بدلون له کبله مينځ ته راخي .

هغه درمل چه Direct Renal damage سبب گرخى

مثالونه ئي په لاندې ډول دي:

Acute Tubular Necrosis هغه درمل چې د سبب گرخى
Aminoglycosides,Amphotericin B,NSAIDs,cisplatin, لکه
Radiocontrast media او نور.

Fanconi syndrome هغه درمل چې د سبب گرخى
Tetracycline (out of date) لکه

Glomerulo nephronpathies هغه درمل چې د لامل
Captopril,penicillamine,Heavy metals گرخى لکه
Gold salts , Phenytoin او نور .

⇒ هغه دواگانی چې Renal Tubular Acidosis منځته او Amphotericin B ,Lithium Acetazolamide راوري لکه داسی نور درمل .

⇒ هغه دواگانی چې د interstitial nephritis لامل ګرځی لکه Allopurinol,Azathioprin,Furosemide,NSAIDs: اون سوری Penicillins,sulfonamides,Thiazides,Vancomycin دواگانی .

⇒ هغه درمل چې د Nephrogenic diabetes insipidus سبب ګرځی لکه Demethylchlortetracycline,Lithium داسی نور .

⇒ هغه درمل چې د Renal Capillary Necrosis لامل ګرځی لکه NSAIDs او نور .

⇒ هغه درمل چې د Crystal Urea لامل ګرځی لکه او خيني نوري دواگانی . Methotrexate,Sulfonamides

هغه درمل چي د In Direct Renal Damage

سبب گرئى

مثالونه ئى پەلاندى چول دى.

=> هغه درمل چي Vasculitis منخته راوري اوپنستورگى زيان من كوي لكه: Amphotericin B, پينسيليونونه او سلفاميدونه.

ديادونى ورده چي پنسيلينونه او سلفاميم دونه د لە وجى ددى پىينبى سبب گرئى Hypersensitivity.

=> هغه درمل چي intravascular hemolysis سبب گرئى اود توجه ور Hemoglobinuria منخ ته راوري او Quinine, لامل كىرى لكه Acute renal insufficiency او نور Methyl dopa, Sulfonamides.

=> ئىنى درمل د جورى دوپه Vascular Thrombosis اساس Renal insufficiency involve The Renal vessels لامل گرئى لكه:

Amino Caproic Acid, Anti Fibrinolytic Drugs .

نهم جدول: هغه درمل چي په پښتوري ګو بدی اغيزي لري او د پښتوري ګو د دندو د کموالي په صورت کي تراکم کوي

Drug	Type of renal damage (if directly nephrotoxic)	Hazards of excess accumulation	Comments
1. Antibiotics			
Aminoglycosides	Renal tubular necrosis	Ototoxicity; further renal damage	Reduce dosages; monitor plasma concentrations
Amphotericin	Renal tubular necrosis		Common; dose-related
Nitrofurantoin	Renal tubular necrosis	Peripheral neuropathy	Avoid
Penicillins	Interstitial nephritis	Convulsions, haemolytic anaemia	Reduce large dosages (normal dosages not affected)
Quinolones	Renal tubular obstruction		Due to crystalluria (rare); hydrate well
Sulfonamides	Renal tubular obstruction		Due to crystalluria (rare with modern drugs)
Tetracyclines		Toxicity causes nausea, vomiting, and diarrhoea; dehydration then causes further renal damage; increased uraemia also due to an antianabolic effect	Avoid in renal insufficiency and old people; use doxycycline instead
Vancomycin (i.v.)	Interstitial nephritis	Ototoxicity	Reduce dosages (or avoid)

دوام لري

Drugs that can cause renal damage and/or accumulate in renal insufficiency

Drug	Type of renal damage (if directly nephrotoxic)	Hazards of excess accumulation	Comments
2. Other drugs			
ACE inhibitors	Can worsen pre-existing renal insufficiency	Hyperkalaemia	Avoid all these drugs in renal insufficiency or use them in reduced dosages
Chlorpropamide		Hypoglycaemic effect cumulative and prolonged	
NSAIDs	Interstitial nephritis	Reduced GFR	
<i>p</i> -Aminosalicylic acid		Potentiates acidosis; increased risk of GI bleeding	
Phenformin		Lactic acidosis, ketosis, and hyperuricaemia	
Potassium salts		Hyperkalaemia	
Potassium-sparing diuretics		Hyperkalaemia	

Cardiac disease -d: زړه چه بدن ته دوینې د پمپ کولو

دندہ په غاره لري. نوددي حیاتی عضوی دندودنیمگرتیاو
په صورت کي د لاندی میخانیکتونویه اساس(چې) ددرملود
فارمکوکنیتیک بدلونو له کبله مینځ ته رائی د په CHF په
narouganو کي بدلونونه لیدل کېږي.

د کموالی Liver Blood Flow او Hepatic congestion ⇐

له کبله دھینودرملود استقلاب اندازه کمېږي لکه Lido cain

⇒ د CHF په narouganو کي Poor Renal Perfusion

ددرملوپه اطراح کي کموالی رائی لکه Procain amide

ددرملو په استقلاب او اطراح کي کموالی د دی لامل

گرځی چې درمل په بدن کي مستراکم او بدی اغیزی یې د

توجه وړوی. خینې لاملونه چې درمل هم پکی شامل دی د

HF سبب گرځی په لاندی جدول کي ئي وګوري.

لسم جدول :

Causes of cardiac failure

1. Reduced contractility

Chronic ischaemia

Acute myocardial infarction

Cardiomyopathies

Drugs

Negative inotropic drugs

Beta-adrenoceptor antagonists

Verapamil

Some class I antiarrhythmic drugs

Drug-induced cardiomyopathy

Doxorubicin

2. Increased afterload

Hypertension

Aortic valve disease

Hypertrophic obstructive cardiomyopathy

3. Increased output

Mitral incompetence

Cardiac arrhythmias

Anaemia

Hyperthyroidism

Peripheral shunts (e.g. arteriovenous shunts, Paget's disease)

4. Pulmonary heart disease (*cor pulmonale*)

Chronic airways obstruction

Recurrent pulmonary embolism

Thyroid disease -e: ددی غدی دفعالیت زیاتوالی او کم والی په پلازما کې د درملو غلظت اغیزمن کوي د بی لکگی په توګه په Hypothyroidism کي د Digoxin سویه

په پلازماکی لورېږي په داسی حال کې چې په
کي تې تې تې تې hyper thyroidism
باندی د درملو اغیزی . لاندی جدول و گوري
يوولسم جدول

The effects of drugs on thyroid function tests and on thyroid function

1. Drugs that interfere with thyroid function tests

Category of effect	Effect on				
	T ₄	T ₃	FT ₄	FT ₃	rT ₃
Increased thyroid-binding globulin	↑	↑	↔↑	↔↑	↔
Clofibrate					
Fluorouracil					
Oestrogens and oral contraceptives					
Opiate analgesics					
Decreased thyroid-binding globulin	↓	↓	↔	↔	↔
Androgens					
Asparaginase					
Danazol					
Glucocorticoids					
Inhibition of binding to transport proteins	↓	↓	↑↓	↑↓	↔↓
Chloral hydrate					
Diazepam					
Fenclofenac					
Furosemide					
Heparin					
Phenylbutazone					
Phenytoin					
Salicylates					
Sulfonylureas					

دوام لري

The effects of drugs on thyroid function tests and on thyroid function

1. Drugs that interfere with thyroid function tests

Category of effect	Effect on	T_4	T_3	FT_4	FT_3	rT_3	TSH
Inhibition of conversion of T_4 to T_3		↑	↓	↑		↑	↔↑
Amiodarone							
Glucocorticoids							
Iopanoic acid							
Iopodic acid							
Propranolol							
Propylthiouracil							
2. Drugs that can cause hypothyroidism							
Aminoglutethimide							
Amiodarone							
Antithyroid drugs							
Lithium							
Phenylbutazone							
Sulfonamides							
3. Drugs that can cause hyperthyroidism							
Amiodarone							
Iodides							
Thyroxine							

د درملوونه په Pharmacodynamic Variation-3

فارمکودینامیک کی بدلون هم ددرملوون بدرو اغیزو په منځ ته راتګ کی روول لری.

Hepatic Disease:A

سره د درملوونه اغیزو کې خپل اثر لری چې عبارت دی له:
د ئیجگر په سیرووزس او حاد

التهاب په صورت کې دخونزی خطر منځ ته راخي نو
درملوونه د ئیجگر په سیرووزس او Anti coagulants Bleeding NSAIDs

زیاتیری چه په تطبيق کې د احتیاط څخه کار و اخلو.
— په Hepatic Encephalopathy کې د ناروغ د ماغ د
په مقابله دیرحساس وی نوپدی ناروغانو Sedative Drugs
کې د Barbiturates او د narcotic Analgesic استعمال په زیاتره
پیمانه د CNS د ستونترو سبب گرئي او د استعمال څخه یې
د ډډه وشی .

د شدت سبب Hepatic Encephalopathy د Diuretic Drugs

گرخی، خکه دادرمل منع ته راوري .
چې له کبله يې Amonia synthesis زياتيرې چې دامونياتجوم
د هيپاتيک انسفالوپيتي سره ترلى فكتوردي .

Sodium and water retention –
خيني درملو په واسطه دسوديم او او بودوباره جذب زياتيرې او
دنومور و توکود تجمع پوري اړونده پيښې منع ته راهي . دا
درمل عبارت دی له :

او NSAIDs, carbamazepine, corticosteroids, Carbenoxolone
هغه دوائي مستحضرات چې دسوديم دمالګوپه شکل
اس تعماليرې او د سوديم مقدار په کې زيات وي لکه د
پنسلينو د سوديم مالګي .

B:Altered Fluid and water retention

چه مثالونه ئې عبارت دی له :
 \Leftarrow دقلبي ګلايکوسايدونوسمي اغيزى د Hypokalemia او Hypercalcemia سره زياتيرې .
هغه عوامل چې د Hypokalemia سبب گرخی .

دولسم جدول

Causes of potassium depletion and hypokalaemia

1. Drug-induced

Carbenoxolone

Corticosteroids

Diuretics

Insulin in diabetic ketoacidosis

Laxatives (chronic abuse)

2. Gastrointestinal loss

Vomiting

Diarrhoea

Malabsorption (e.g. coeliac disease)

3. Renal loss

Tubular damage (e.g. during the diuretic phase of acute tubular necrosis)

4. Increased adrenal gland activity

Cushing's syndrome

Primary and secondary hyperaldosteronism

5. Old age

Usually there are several factors in elderly people who present with potassium depletion: malnutrition, poor dietary potassium intake, vomiting, diarrhoea, and drugs are common causes

لکھ Class I Anti arrhythmic Drugs ←

Hypokalemia په Disopyramide او Quinidine, Procainamide

موجودیت کی د Arrhythmogenic تاثیرات مینځ ته را پری.

(Tubocurarine) لکھ Skeletal muscle Relaxant Drugs ←

اغیزی د Hypocalcemia په موجودیت کی او پدېږي.

دیار لسم جدول

Causes of disorders of calcium metabolism

1. Hypocalcaemia

Hypoparathyroidism

Vitamin D deficiency

Renal osteodystrophy (see Chapter 26)

Congenital rickets

X-linked dominant (vitamin D-resistant)

Autosomal recessive ($1\alpha,25$ -dihydroxycholecalciferol responsive)

Autosomal recessive ($1\alpha,25$ -dihydroxycholecalciferol resistant)

Acute pancreatitis

Magnesium deficiency

2. Hypercalcaemia

Endocrine

Hyperparathyroidism*

Hyperthyroidism

Adrenocortical insufficiency

Phaeochromocytoma

Malignancy*

Multiple myeloma

Metastatic bone disease

Non-metastatic hormone-secreting tumours

Drugs

Calcium salts

Thiazide diuretics

Vitamin A analogues

Vitamin D analogues

Others

Sarcoidosis

Tuberculosis

Immobilization (e.g. in Paget's disease)

Acute renal failure

Familial hypocalciuric hypercalcaemia

و ACE-inhibitors د درملا Fluid depletion ⇐
زیاتوی Hypotensive effects

II-Non Dose Related adverse drug Reaction Immunological Reactions

(Drug-Allergy or hypersensitivity reactions)

د درملو دا ډول تعاملات لاندی خانګړتیاوی لري:
⇒ د درملو د فارمکولوژیک تاثیرات تو پوری اړه نه لري.
⇒ د درملو دوز سره تراوونه لري.
⇒ کله چې د درملو د لوړنۍ دوز تطبيق شی نو

په بطی ډول مینځ ته رائخي Subsequent Adverse Reactions

⇒ کله چې الرژی مینځ ته راشی د دوا کم مقدار د
پاریدنی سبب گرځی.

⇒ کله چې درمل قطع شی الرژی هم له مینځه ئې.

⇒ لاندی ګیلی اوښبې په کې لیدل کېږي:

Skin Rash, Urticaria, Runny nose, Fever,
Angio edema, Asthma, Anaphylaxis...

الرژی د هری دوا پـه مقابل کـی منـع تـه راتـلـای شـی خـو
اتـی بـیـوتـیـکـونـه لـکـه پـینـسـیـلـینـ، لـکـه NSAIDs،
ـلـکـه Sulfa Druds Aspirin, Ibuprofen ,Naproxen
ـلـکـه سـلـفـامـیدـوـنـه پـه زـیـاتـه پـیـمـانـه دـ الرـژـیـ سـبـبـ گـرـحـیـ .
ـلـکـه هـمـدـارـنـگـه دـ Anti Epilitic درـمـلـوـ لـه جـمـلـیـ خـخـهـ حـئـینـیـ ئـیـ دـ خـپـلـ .
ـلـکـه گـرـوـپـ دـ نـورـوـ درـمـلـوـ پـه پـرـتـلـهـ زـیـاتـ دـ الرـژـیـ سـبـبـ گـرـحـیـ .
ـلـکـه هـغـهـ فـکـتـورـوـنـهـ چـیـ دـ درـمـلـوـ پـهـ الرـژـیـ کـیـ روـلـ لـرـیـ :
ـلـکـه پـهـ نـارـوـغـ اوـ درـمـلـوـ پـورـیـ اـرـهـ لـرـیـ .

Vaccine, Insulin, Macromolecules :The Drugs -a
ـلـکـه Dextran اوـ streptokinase پـهـ خـپـلـهـ .
ـلـکـه وـارـهـ مـالـیـکـولـونـهـ دـ Haptens پـهـ بـنـهـ عملـ کـوـیـ Haptens وـرـوـکـیـ .
ـلـکـه مـالـیـکـولـ دـیـ چـیـ دـلـوـیـونـقـلـ کـونـکـومـالـیـکـولـونـلـکـهـ پـروـتـینـ سـرـهـ .
ـلـکـه یـوـخـائـیـ کـیـرـیـ Haptens-Carrier Complex دـاـنـتـیـ بـادـیـ گـانـوـ .
ـلـکـه جـوـرـولـ تـبـهـ کـوـیـ اوـ دـ Immune Response سـبـبـ گـرـحـیـ . ـیـعنـیـ
ـلـکـه دـبـدـنـ دـ پـورـتـینـونـوـ سـرـهـ یـوـخـائـیـ کـیـرـیـ اوـ اـتـیـ جـیـنـونـهـ جـوـرـوـیـ .

The Patient-b : دـھـینـیـ جـیـنـتـیـکـیـ فـکـتـورـوـنـوـمـوـجـوـدـیـتـ
ـلـکـه دـدـیـ سـبـبـ گـرـحـیـ چـیـ بـعـضـیـ خـلـکـ دـنـورـوـپـهـ مـقـاـیـسـهـ زـیـاتـ
ـلـکـه Allergic drug reactions وـبـسـایـیـ . ـچـیـ ڏـیرـخـانـگـرـیـ بـحـثـ دـیـ

چې پوره تفصیل یې ارونده اختصاصی موضوع ګانوکې
کتلی شو دلته د نمونې په توګه یادونه کوو.

له هغه ناروغان چې Atopic Disease لک

Hereditary angio-edema او Asthma,Eczema or hay Fever

تاریخچه ولري. د نورو په پرتله په زیاته پیمانه د درملو په
مقابل کې الرژیک تعاملات بنائي.

الرژیک تعاملات لاندی ډولونه لري.

Type I reactions

(immediate hyper sensitivity Anaphylaxis)

چې په ناروغ کې Urticaria,Rhinitis,Bronchial Asthma

،Lidell کېږي،Angioedema and Anaphylaxis

Type II reaction(Cytotoxic reaction)

دادهول تعاملات معه ولاد

Drug Induced Hemotologic disorder په بنې دی

بیلګئی ئې عبارت دی له:

- Drug induced aplastic anemia
- Drug induced Thrombocytopenia
- Drug induced Hemolytic anemia

هغه دواګانی چې د Immune Hemolytic Anemia سبب گړئي عبارت دی له :

- Cephalosporins
(Ex:Cefotetan,Ceftrixone.....)
- Penicillins
(Ex:Piperacillin)
- Purine Nucleoside analog
(Ex:Cladribin, Fludarabine)
- NSAIDs
(Ex:Diclofenac,Ibuprofen)
- Sulfonamides
(Ex:Sulfamethoxazole)
- Quinidine,Quinine,Rifampin

Type III reactions(immune complex reactions)

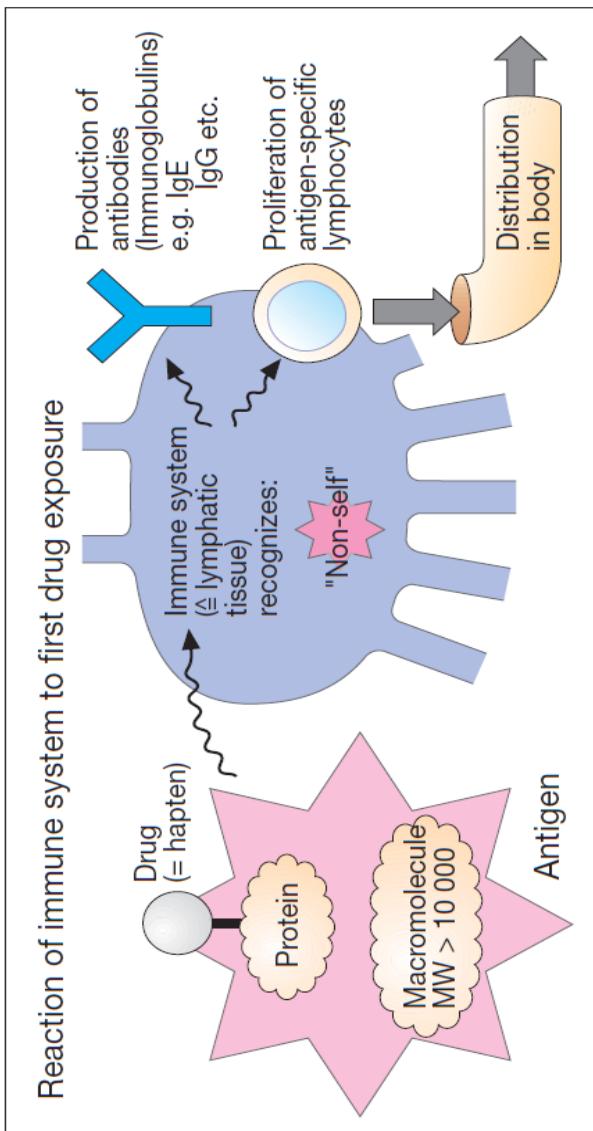
ددی تعاملاتونه بیلګه ده چه په ناروغ Serum sickness
Fever urticaria..... Arthritis,enlarged lymphnodes کې لیدل کېږي.

Type IV reactions

(Cell- mediated or delayed hypersensitivity reactions)
ددی تعاملاتو بنسه مثال د contact dermatitis خخه عبارت
دي چه دلوکل انستیتکونو،انتى بیوتیکونواواتنى فنګل
درملو د موضعی تطبيق خخه منځ ته رائی:

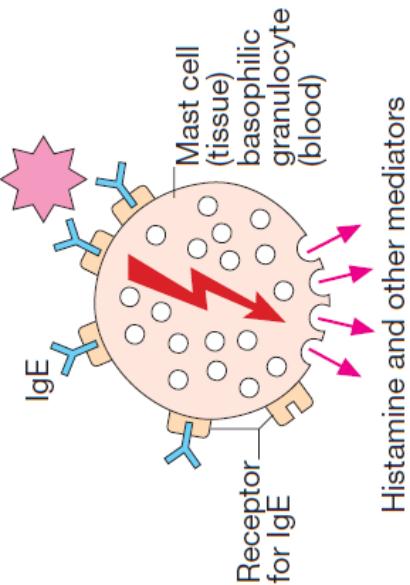
د درملو په مقابل کې د الرژی د مختلفو ډولونو انځورونه

په لاندی ډول دي:

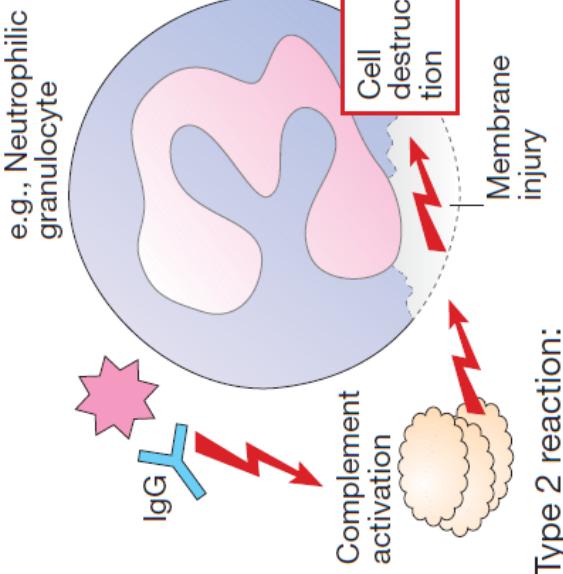


دو هم شکل:

Immune reaction with repeated drug exposure

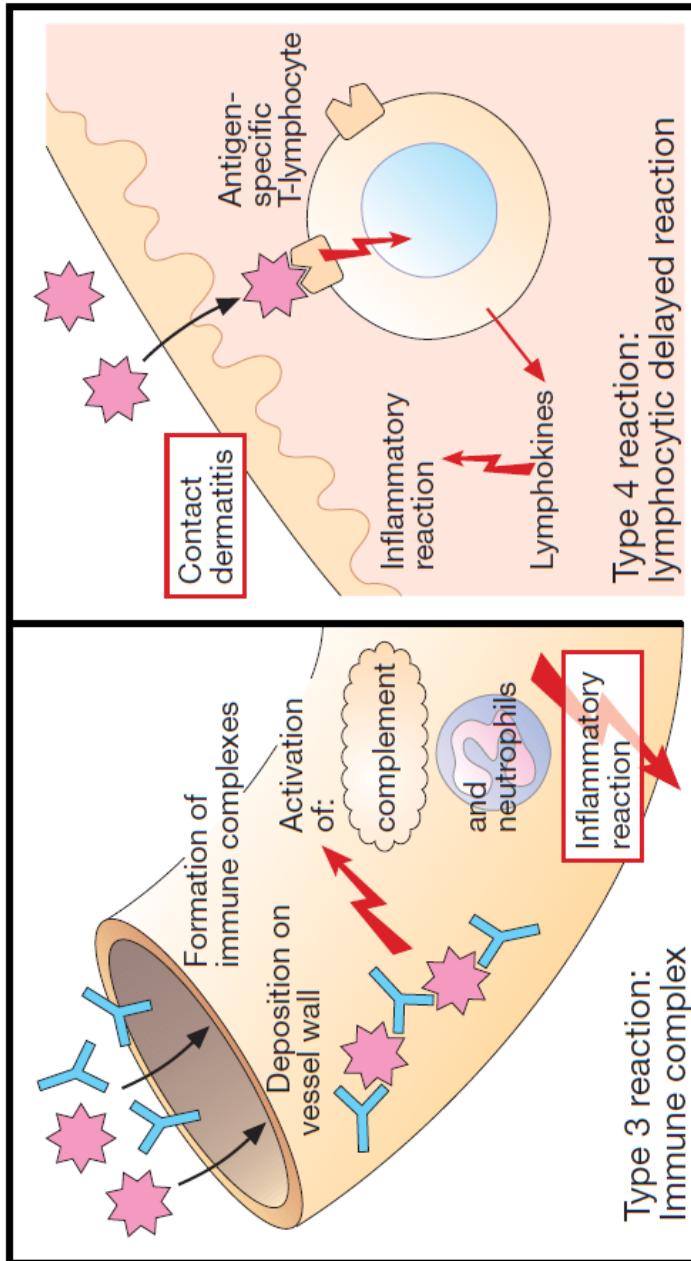


Type 1 reaction:
acute anaphylactic reaction



Type 2 reaction:
cytotoxic reaction

دین شکری



شكل خلورم

Pseudo allergic reactions: پدی تعاملاتو کې کلینیکی

تظاهرات دالرژیک تعاملاتو———ره مشابه وی، خو
immunological basis نه لرى چې ځینی مثالونه ئى عبارت
دی له:

— په اسماتیک ناروغانو کې د Aspirin د تطبیق څخه وروسته
د استما حملات شدت پیدا کوي.

— د Vancomycin د تطبیق څخه وروسته
د Red man syndrome منخته راخي.

Pharmacogenetic variation causing non dose related —
په دی ډول تعاملاتو کې جنیتکی توپیرونې رول لرى reactions
مثلاً ګه کسان چې Glucose-6-phosphate dehydrogenase deficiency لرى د پرمایکین د تطبیق سره ورته hemolysis پیدا
کېږي — د کره معلوماتو لپاره دریم جدول کتلای شي.
همدارنگه په porphyria کې ده ګه اترایمونوبانار ملیتی
موجوده وی کوم چې د heme biosynthesis کې رول لرى د پوره
معلوماتو لپاره خلورم جدول وګوري:

هـ: حیني درمل لکـ: Malignant hyperthermia –

دددي پيښي سبب Methoxyflurane, succinylcholin, Halothan
گرخى چې د بدن د تودوخي درجه $40-41^{\circ}\text{C}$ ساتتى گرادته
لوريږي.

او Tachycardia, Muscle stiffness ,cyanosis,sweating

هم په ناروغانو کې ليدل کيربى Tachypnoea

هـ: کله چې د ادرمل دسترهکى Corticosteroid glaucoma

دقطري په شکل استعمال شى نو سترهکي د داخلې فشار د
لوري دو له کبله د Glaucoma خطر زياتري.

په هـ ناروغانو کې چې په جنیتیکی ډول د :

ابنارمیلتی ولري حیني انتی اریتمیک Potassium Channel

درمل منځته را پړی Arrhythmogenic effects

III: Long term and withdrawal Effects causing adverse drug reactions

ددرملو دا ډول بدی اغیزی د درملنی دمودی او دوز پوری اړه لری ئینې مثالونه یې په لاندې ډول دي.

لکه: دنارکوتیک انلجزیکوپه مقابل Adaptive change ← کي تحمل او د Physical dependence منخته راتلل.

← هغه ناروغان چې د Schizophrenia د درملنی لپاره
د Neuroleptic Drugs په موخه Long Term Drug Therapy
استعمالوي Tardive Dyskinesia ورته پیدا کېږي.

ددوامداره Rebound and withdrawal Phenomena ←
درملنی خخه وروسته د ھینودرملودناخاپې قطع په صورت
کې Rebound reaction من خ ته رائي. لکه دالکولو،
باربیتوراتونو، مورفین، بیتابلاکر او یو شمیر نورو درملود
ناخاپې قطع په صورت کې دا تعامل منځ ته رائي. چه دهري
دوا دقتع د سندروم اعراض بیل وي.

مثالکه بیتابلاکر دواګانی په ناخاپې تسوګه قطع شی د
Rebound Tachy cardia سبب گرځی.

:Other Rebound effects ⇐

– چه Melanine ته خاص تمایل لری د دوامداره استعمال په صورت کې په Corneal epithelium کی د متراکم کېږي او د Keratopathy سبب ګرځی ممکن چې د رنديدو سبب هم و ګرځی.

– دانلچيزیکونود ګډ استعمال (خصوصاً Phenacetin) سره د دوامداره کارونی له وجھې Renal tubular atrophy ته زمينه برابرو.

IV: Delayed effects causing adverse drug reactions

ددرمل سودوامداره استعمال او سرطان ترمینځ اړیکې موجودی دی . چې بیلګی یې عبارت دی له:

کچیری حامله بنځۍ د Stilboesterol د مخنيوی لپاره Abortion استعمال کړي او جنین بنځینه جنس وی نو په لورگانو (لونيو) کې د خطر زیات وی Vaginal adenocarcinoma.

که دپنخوکلونولپاره Hormone Replacement Therapy په موخه ایستروجن استعمال شی او یاداچې Oral Contraceptive په دوامداره توګه استعمال شی د خطر زیاتیری breast cancer.

هغه ناروغان چې Alkylating agents لک Chlorambucil او Cyclophosphamide طبیقوی د پینپی پکی لیدل شوی دی.

Effects concerned with reproduction :B

I-Impaired fertility

حئینی درمل په بسخوازناوکی د القاح قدرت کموی هغه بسخی چې د Cytotoxic drugs Amenorrhea او ورته پیدا کیږي او Female infertility منځ ته راخی.

په نرانوکې هم د سپرم د جوړید و د تنقیض له امل کمیرې Male fertility.

لاندې درمل د نرانو د القاح کولو قدرت کموي Monoaminoxidase inhibitors, Nitrofurantoin, sulfasalazine chlorambucil او cyclophosphamide.

حئینی درمل که حامله بسخو ته تطبیق شی نو په جنین کې ولادی سو تشکیلات منځ ته راوبری د حاملگی په 3-8 هفتونو کې چې Organogenesis مرحله ده او

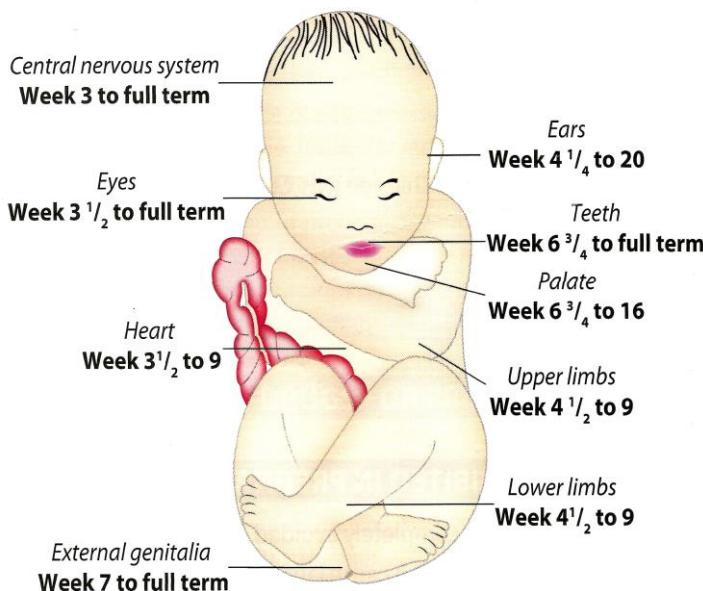
په نوم یادېږي د تیراتوجنیک درملو
اغیزې زیاتې مشاهده کېږي . خود دریو هفتو څخه مخکی
دا اغیزه نه لیدل کېږي خود دریم هفتی نه وروسته د جنین
دندي او نمو اغیزمنه کېږي .

TERATOGENIC EFFECTS OF DRUGS IN PREGNANCY

TERATOGENS

Substances or environmental agents which can cause the development of abnormal cell masses during fetal growth resulting in physical defects in the *fetus*, are called teratogens.

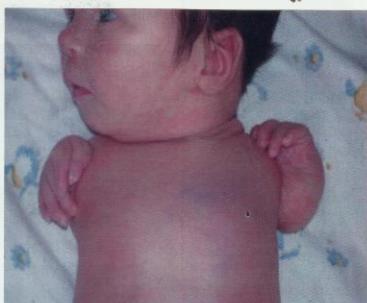
- Most susceptible period is between 3 and 8 weeks i.e. embryonic period → organogenesis
- If exposed to teratogens before third week → all or no effect
- If exposed to teratogens after eighth week → affects growth and function



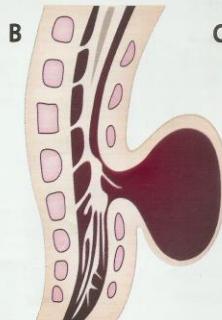
پېنځم شکل



Cleft palate abnormality caused by phenytoin and carbamazepine

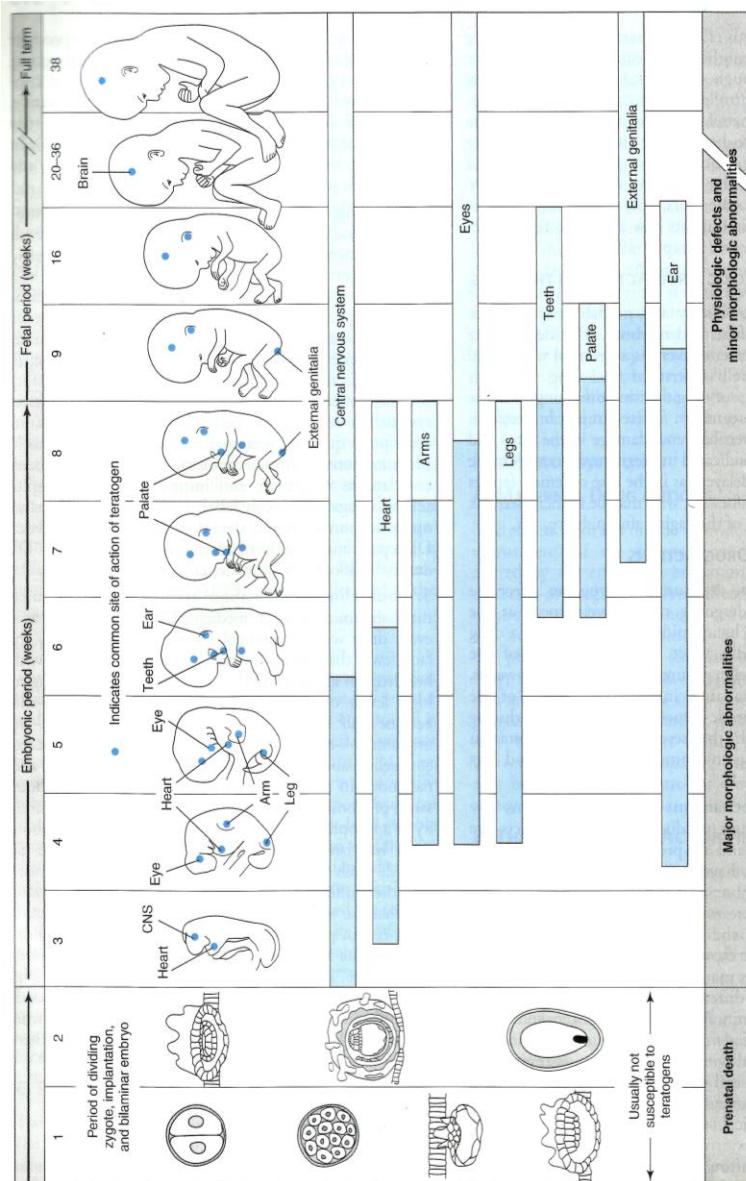


"Flipper limbs" abnormality caused by thalidomide



Neural tube defect caused by folic acid deficiency A=spina bifida B=meningocele C=meningomyelocele

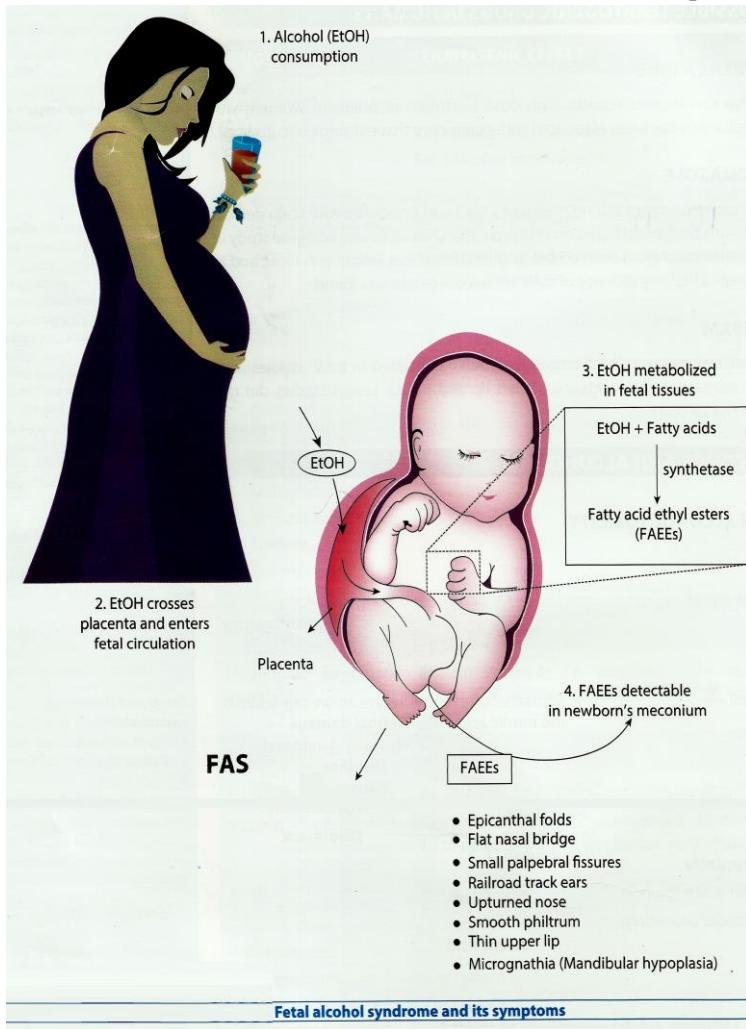
شپرم شکل: د تیراتوجنیسیز بیلگی در مل یو شان
تیراتوجنیکی اغیزی نه لری مختلف در مل د جنین د مختلفو
بر خود سوئی تشکلاتو سبب گرئی.



Schematic diagram of critical periods of human development.

اووم شکل: مختلف درمل د حاملگی په بیلا بیلو پړ اوونو کې د مختلفو ارګانونو د سوئي تشكلا نو سبب گرخی چې په پورتنۍ شکل کې ئې کتلاي شو:

په 1960لسیزه کي Thalidomide د حاملگي د کانگود مخنيوي لپاره په پراخه پیمانه استعمال شوي وه چى له گبله ئى تقریباً لس زره بىخوسوئي شكله ماشومان وزېرول چى دادرملوپه تاریخ کي د تیراتوجنیسیز بدە پیننه ده



اتم شکل : په حامله بىخو کي د الكولو دوامداره استعمال او په جنین ئى اخیزى

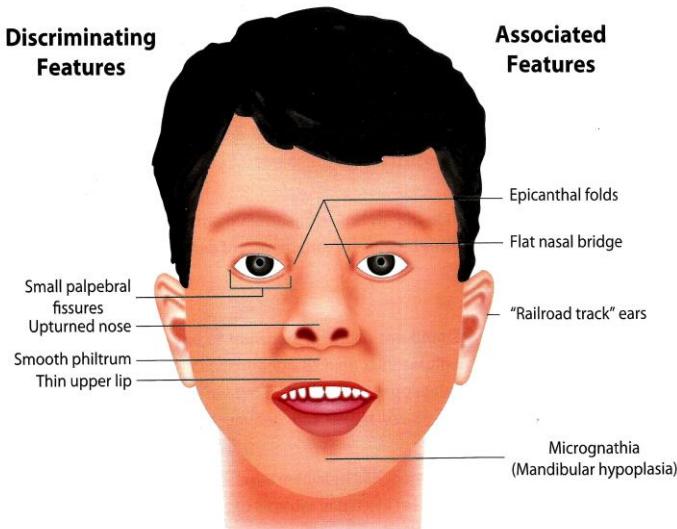
FETAL ALCOHOL SYNDROME (FAS)

If the mother is taking significant amounts of alcohol during pregnancy, then there is a high incidence of following congenital anomalies:

- Mental retardation (MR) which could be pre or post-natal
- Holoprosencephaly → cerebral hemispheres do not divide i.e. the whole brain appears to be one.
- Microcephaly
- Facial abnormalities → long philtrum of *upper lips* + short palpebral fissure of eyes
- Lung and heart fistulas (VSD)
- Limb dislocation

MECHANISM BEHIND INJURY

Inhibition of cell migration



Facial features of fetal alcohol syndrome

نهم شکل په دوام
په حامله بسخو کي د درملو استعمال خاصي پا ملنۍ ته اړتیا
لري ئکه چې:

- ټینۍ درمل په مور بدی اغیزی کوي .
- د تیراتوجنیسیز سبب ګرځی .
- د زیان (Abortion) سبب ګرځی .

خوار لسم جدول

Drugs to avoid during early pregnancy

1. Drugs with a high risk of causing abnormalities (known teratogens) or of inducing abortion

Drug	Effect
Alcohol	Fetal alcohol syndrome
Androgens	Virilization; multiple congenital defects
Antineoplastic agents, (e.g. methotrexate)	Multiple congenital defects
Carbamazole	Aplasia cutis
Corticosteroids (high dosages)	Cleft palate
Cyproterone	Feminization of male fetus
Dienethestilbestrol	Vaginal adenosis and adenocarcinoma in daughters
Distigmine	Increases uterine tone
Ergotamine	Increases uterine tone
Misoprostol	Increases uterine tone
Fibrinolytic drugs (e.g. streptokinase)	Placental separation
Tetracyclines	Yellow discoloration of teeth, inhibition of bone growth
Valproate	Neural tube defects
Vitamin A analogues (etretinate etc.)	Congenital defects
Warfarin	Multiple congenital defects

بل منځ کي دوام لري

2. Drugs under strong suspicion of producing abnormalities (slightly increased risk)

Drug	Effect
Amiodarone	Gothyre
Chloroquine	Deafness (do not withhold in acute malaria)
Phenytoin	Multiple congenital defects (do not withhold if absolutely necessary for control of epilepsy)

3. Other drugs to avoid (theoretical risk from animal and other studies)

ACE inhibitors	Quinolone antibiotics
Auranofin	Rifampicin
Chenodeoxycholic acid	Simvastatin
Deferoxamine	Spirohalactone
Diltiazem and dihydropyridine calcium antagonists	Sulfonylureas
Fibrates (clofibrate etc.)	Thiabendazole
Griseofulvin	Tocainide
Iodoxuridine	Trimethoprim (and co-trimoxazole)
Ketoconazole	Vaccines (live)
Mebendazole	Vigabatrin
Mefloquine	Xamoterol
omeprazole	

دوام لرى

Antibiotics to be avoided in pregnancy unless absolutely necessary

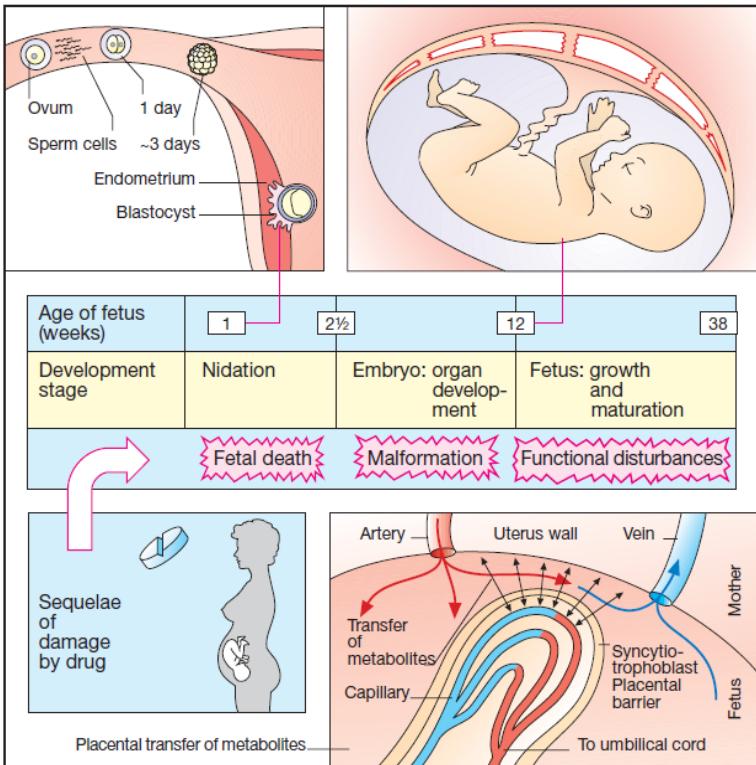
Antibiotic	Risk to fetus or neonate
Aminoglycosides	Ototoxicity
Chloramphenicol	Infant 'grey syndrome' (see text)
Co-trimoxazole	Kernicterus (sulfonamide); folate antagonist (?significant); teratogenesis
Quinolones	Arthropathy (animal studies)
Rifampicin	Possible teratogenicity; neonatal bleeding
Sulfonamides	Kernicterus
Tetracyclines	Tooth discolouration (acute hepatic toxicity in mother)

پینچسلس جدول

FDA teratogenic risk categories.

Category	Description
A	Controlled studies in women fail to demonstrate a risk to the fetus in the first trimester (and there is no evidence of a risk in late trimesters), and the possibility of fetal harm appears remote.
B	Either animal-reproduction studies have not demonstrated a fetal risk, but there are no controlled studies in pregnant women, or animal-reproduction studies have shown an adverse effect (other than a decrease in fertility) that was not confirmed in controlled studies in women in the first trimester (and there is no evidence of a risk in later trimesters).
C	Either studies in animals have revealed adverse effects on the fetus (teratogenic or embryocidal or other) and there are no controlled studies in women or studies in women and animals are not available. Drugs should be given only if the potential benefit justifies the potential risk to the fetus.
D	There is positive evidence of human fetal risk, but the benefits from use in pregnant women may be acceptable despite the risk (eg, if the drug is needed in a life-threatening situation or for a serious disease for which safer drugs cannot be used or are ineffective).
X	Studies in animals or human beings have demonstrated fetal abnormalities or there is evidence of fetal risk based on human experience or both, and the risk of the use of the drug in pregnant women clearly outweighs any possible benefit. The drug is contraindicated in women who are or may become pregnant.

Pregnancy: fetal damage due to drugs



لسم شکل

C: Adverse Reaction to Drugs in breast Milk

خینې درمل دمور په شیدو کې اطراف کېږي چې
د infant د متضرره کيدو سبب گرئي - د همدي علت له مخي
نومورۍ درمل د Lactation په وخت کې نه استعمالیږي . اویا
په ډیر احتیاط سره میاندو ته ورکول کېږي . چې لاندی
فکتورونه پکی رول لري:
- په شیدو کې د اطراف شو درملو غلظت .

- هغه مقدار شیدی چې د ماشوم پواسطه رو دل کېږي .

- په انفانتي کې د درملو فارمکوکنیتیک .

شپا پرم جدول

Drugs and breast feeding

1. Some drugs to be avoided in breast-feeding mothers

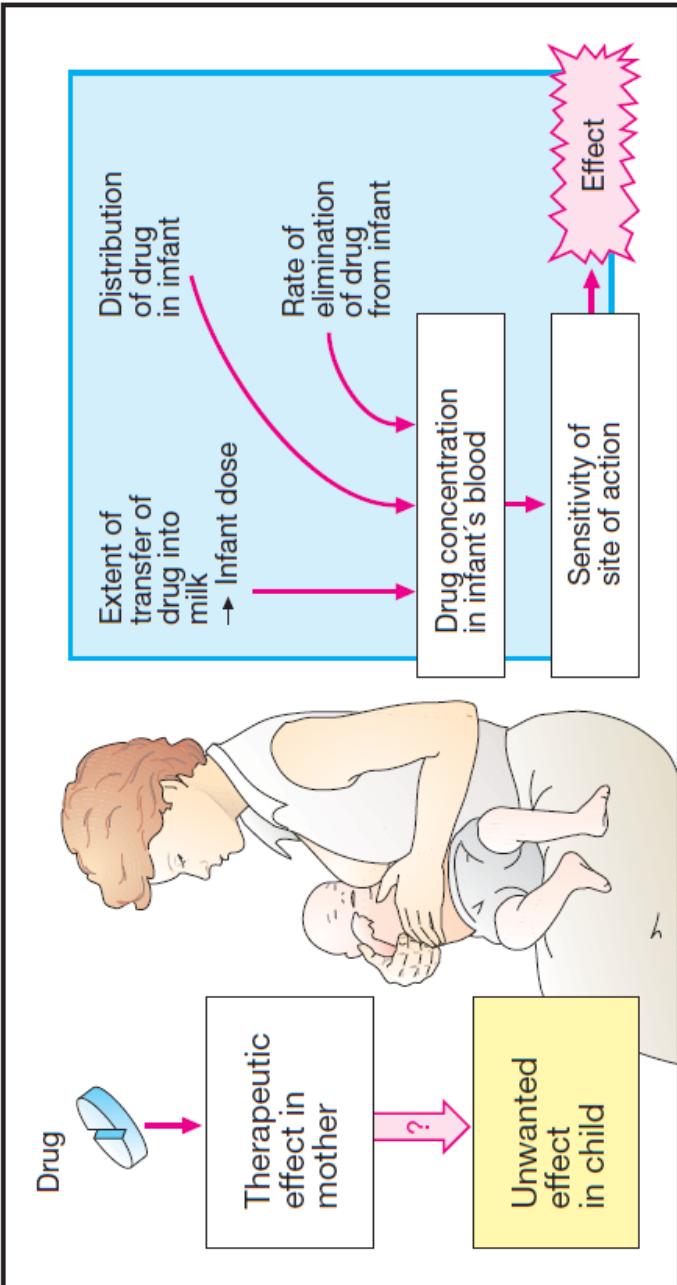
Amiodarone	Co-trimoxazole	Oral contraceptives
Ampphetamines	Ciclosporin	Oral hypoglycaemics
Androgens	Diltiazem	Pamidronate
Anthraquinones (e.g. cascara)	Doxazosin	Penicillins (safe except in hypersensitivity)
Antineoplastic drugs	Ergot alkaloids	Phenindione
Antipsychotic drugs	Erythromycin	Phenobarbital
Antithyroid drugs	Ethosuximide	Phenytoin
Aspirin	Fluoxetine	Radioactive iodine
Atropine	Immunosuppressive drugs	Statins
Barbiturates	Indometacin	Streptomycin
Benzodiazepines	Isoniazid	Sulfonamides
Bromocriptine	Lithium	Tetracyclines
Chloral derivatives	Meprobamate	Trimethoprim
Chloramphenicol	Methysergide	Vitamin A analogues
Ciprofloxacin	Metronidazole	Vitamin D (high dosages)
Colchicine	Nalidixic acid	Xanthines
Corticosteroids (high dosages)	Nitrofurantoin	

دوام لري

2. Some drugs that appear to be safe

ACE inhibitors	Clavulanic acid	Nifedipine
Acetazolamide	Clofemethiazole	Notriptyline
ACTH (corticotropin)	Codeine	NSAIDs
Adrenaline	Digoxin	Pyrazinamide
Antiasthmatic drugs (inhalations)	Disopyramide	Pyridostigmine
	Ethambutol	Rifampicin
Antihistamines	Furosemide	Terbutaline
(H ₁ antagonists)	Heparin	Thyroid hormones (but may alter screening tests for thyroid disease)
Baclofen	Hydralazine	Tricyclic antidepressants (except doxepin)
Beta-adrenoceptor antagonists (but monitor neonate for bradycardia and hypoglycaemia)	Insulin	Valproate
Carbamazepine	Methyldopa	Verapamil
Chloroquine	Mexiletine	Warfarin
		Neuroleptic drugs in moderate dosages (e.g. chlorpromazine, haloperidol)

Lactation: maternal intake of drug



شكل یوں

دریم فصل

: Drug interactions

کله چې دوه دواګانی یوځای استعمال شي نو شونې ده چه یودوادبلی دوا په اغیزو کې بدلون راولی ، چې دی ته د درملو متقابل عمل او یاد درملو ترمینځ خپل منځی اړیکی وائی چې له کبله یې د درملو په اغیزو کې زیاتوالی یا کموالی راتلای شی مثلاً Cytochrome P450 د Amiodarone د Isoenzyme Cyp2c9 دنهی له کبله د warfarin په استقلاب کې کموالی راولی او د warfarin اتى کواګولات اغیزی زیاتوی په داسې حال کې چې Carbamazepine دنوموری ازایم دنبیه له کبله د warfarin استقلاب په ځیگر کې زیاتوی او د warfarin انتى کواګولات تاثیرات کموی Isoenzyme P450 مختلف Cytochrome چې د موجود دی چې هر iso enzyme ځانګړی درمل په استقلاب رسوی .

Some drugs that are metabolized by different isoenzymes of cytochrome P₄₅₀ (note that some drugs appear in more than one column)

CYP1A2	CYP2C19	CYP2D6	CYP3A
Tricyclic antidepressants	Barbiturates (some)	Antiangular drugs	Antiarhythmic drugs
Amitriptyline	Citalopram	Diltiazem	Lidocaine
Clomipramine	Diazepam	Perhexilene	Propafenone
Imipramine	Imipramine	Antiarrhythmic drugs	Quinidine
Xanthines	Lansoprazole	Encainide	Benzodiazepines
Caffeine	Omeprazole	Flecainide	Alprazolam
Theophylline	Phenytoin	Mexiletine	Bromazepam
Others	Proguanil	Propafenone	Midazolam
Paracetamol	Propranolol	Quinidine	Triazolam
Propranolol	Tolbutamide	Beta-blockers	Calcium channel blockers
		Alprenolol	Diltiazem
		Metoprolol	Felodipine
		Propranolol	Nifedipine
		Timolol	Verapamil
			Others
			Neuroleptic drugs

دوام لرى

Some drugs that are metabolized by different isoenzymes of cytochrome P₄₅₀ (note that some drugs appear in more than one column)

CYP1A2	CYP2C19	CYP2D6	CYP3A4
		Haloperidol Thioridazine Zuclopentixol Narcotic analgesics Codeine Dextromethorphan Oral hypoglycaemic drugs Chlorpropamide Phenformin	Carbamazepine Ciclosporin Erythromycin Ethynodiol Hydrocortisone Tamoxifen
			Tricyclic antidepressants Amitriptyline Clomipramine Desipramine Imipramine Nortriptyline Trimipramine
		Fluoxetine Paroxetine	

دړګ اتېرکشن ځینی وخت ددرملوبد واغیزو سبب ګرځی او ځینی وخت ګټوری اغیزی هم منځته راوړي. دړګ اتېرکشن په درې ډوله دی

- I-Pharmaceutical interactions
- II-Pharmaco Kinitic interactions
- III-Pharmacodynamic interactions

د نمونی په توګه د خینو درملو ترمینځ ډرګ اتېرکشن
په لاندی جدول کي وګوري

اتلسیم جدول

Precipitant drug(s)	Object drug(s)	Result
1. Direct		
Aminoglycosides, quinidine, quinine	Depolarizing muscle relaxants	Enhanced skeletal muscle relaxation
Centrally-acting drugs	Centrally-acting drugs	Potentiation
Beta-adrenoceptor antagonists	Verapamil	Arrhythmias, asystole, heart failure
Class I antiarrhythmic drugs and amiodarone	Class I antiarrhythmic drugs and amiodarone	Increased risk of cardiac arrhythmias
Halofantrine	Antiarrhythmic drugs that prolong the QT interval	Increased risk of cardiac arrhythmias
Lithium, MAO inhibitors	SSRIs	Serotonin syndrome
Opioid antagonists (e.g. naloxone)	Opiate analgesics	Reversal of opiate effects
Physostigmine	Tricyclic antidepressants	Reversal of anticholinergic effects
Vitamin K ₁	Coumarin anticoagulants	Reduced anticoagulation
Anabolic steroids	Warfarin	Increased anticoagulation
Clofibrate	Warfarin	Increased anticoagulation
Corticosteroids	Warfarin	Increased anticoagulation

دوام لري

Pharmacodynamic drug interactions

Precipitant drug(s)	Object drug(s)	Result
Oestrogens	Warfarin	Increased anticoagulation
Paracetamol (long term)	Warfarin	Increased anticoagulation
Tetracyclines	Warfarin	Increased anticoagulation
2. Indirect		
Drugs affecting platelet adhesiveness*	Anticoagulants	Impaired haemostasis
Drugs causing gastrointestinal ulceration*	Anticoagulants	Increased chance of bleeding
Drugs causing fibrinolysis*	Anticoagulants	Impaired haemostasis
Drugs causing potassium loss*	Cardiac glycosides	Increased effects
Drugs causing potassium loss*	Antiarrhythmic drugs	Increased risk of arrhythmias
Drugs causing potassium loss*	Sulfonylureas	Reduced hypoglycaemic effects
Drugs causing hypercalcaemia (e.g. calcium salts, vitamin D)	Cardiac glycosides	Increased effects
Drugs causing fluid retention*	Diuretics	Reduced diuretic effects
Vasodilators	Beta-adrenoceptor antagonists	Improved control of hypertension or angina

* See text for examples

اتی بیوتیکونه چی په ورخنی طابت کی ڈیر کارول کېږي
هم د نورو درملو سره Drug Interaction بنائي چی د نمونی په

تو گه تری په لاندی جدول کی یادونه کوو
نولسم جدول

Drug interactions with antibiotics			
Antibiotic	Interacting drug	Mechanism	Effect
Gentamicin	Furosemide	Additive	Ototoxicity
Gentamicin	Ethacrynic acid	Additive	Ototoxicity
Chloramphenicol	Warfarin	Inhibition of metabolism	Potentiation of anticoagulation
Quinolones	Theophylline	Inhibition of metabolism	Reduced clearance of theophylline
Isoniazid	Phenytoin (slow acetylators)	Inhibition of phenytoin metabolism	Toxicity
Metronidazole	Warfarin	Inhibition of metabolism	Potentiation of anticoagulation
Metronidazole	Alcohol	Inhibition of aldehyde dehydrogenase	'Disulfiram reaction'
Rifampicin	Warfarin	Induction of metabolism	Diminished effect of warfarin
Rifampicin	Oestrogens (oral contraceptives)	Induction of metabolism	Reduced contraceptive effect
Tetracycline	Antacids	Chelation	Reduced effect of tetracycline
Tetracycline	Warfarin	Altered clotting factor activity	Potentiation of anticoagulation

څلورم فصل

Drug incompatibility

کله چې دوه یا خودواګانی د کوم علت له مخی یوځای توصیه کولای نشو د درملو د شریکیدو د قابلیت د نشتوالی او یاد درملو د عدم قابلیت امتزاجیه (Drug incompatibility) په نامه یادیږي .

کله چه درمل د IV infusion په طریقه تطبیقیږی - نو د هیرو درملو د ګډولو یا یو ځای کولو خخه باید ډډه وشي - ئکه چې د درملو ترمینځ د شریکیدو قابلیت نشتوالی موجود وي .

مثالاً: Penicillins او Aminoglycosides که خه هم سینرجیک تاثیرات لري - خو هیڅکله باید په یو او یا یو سرنج کی ګډ استعمال نه شی . همدارنګه د Dobutamin سره باید sodium bicarbonate infusion یو ځای نه شی - ئکه چې ددوی ترمینځ incompatibility موجوده ده . لزمه ده چې د درملو د تطبیق دی اړخ ته هم توجه وکړو .

د نمونی په توګه لاندی جدول و گوري: شلم جدول

Stability of drugs in saline and dextrose solutions

1. Unstable: infuse within 2–4 h

Ampicillin (dextrose only; stable in saline for 12 h)

Erythromycin

2. Stable for 6–8 h

Benzylpenicillin

Dacarbazine

Diazepam

Furosemide (use only in saline)

Tetracosactrin

3. Stable for 12 h

Flucloxacillin

Oxytetracycline

Tetracycline

4. Photosensitive drugs

Amphotericin

Dacarbazine

Sodium nitroprusside

5. Drugs that must not be infused after 6 h in solution

Cephaloridine

Colistin

د موضوع د اهمیت په نظر کي نیولو سره د نمونی په توګه

د ئینو درملود عدم قابلیت امتزاجیه خخه یادونه کوو:

Benzyl Penicillin — د لاندی درملو سره عدم قابلیت

امتزاجیه لری لکه:

Gentamicin, Streptomycin, Amphotericin B, Vancomycin

Ceftriaxone — د لاندی درملو سره عدم قابلیت امتزاجیه

لری لکه:

کلسیم لرونکی محلولونه، Labetalol، امینوگلایکوسایدونه،

Vancomycin او داسی نور.

Clindamycin — د لاندی درملو سره عدم قابلیت

امتزاجیه لری لکه:

امپیسیلین، امینوفیلین، باربیتوراتونه، کلسیم گلوکونات،

سیفترياگزون، ساپروفلوگزاسین، د مکنیزیم مالگی،

فینوتوبین او رانی تیدین.

Gentamicin — د لاندی درملو سره عدم قابلیت امتزاجیه

لری لکه:

پینسیلینونه، سیفالوسپورینونه، هیپارین، سودیم بای

کاربونات، Furosemide او داسی نور.

Vancomycin – هایدروکلوراید اسیدی PH لری نتوочع

کیرپی چی د القلی مستحضرات او هغو در ملو سره چی په تیت
PH کی ثابت نه دی عدم قابلیت امتزاجیه لری .

Amidarone – د لاندی در ملو سره عدم قابلیت امتزاجیه

لری لکه :

Fluoxacilline, Ampicillin-Sulbactam,Ceftazidime Sodium,
Imipenem-Cilastatin,Pipracillin Sodium ,Aminophyllin,
Heparin,Furosemide ،سودیم بای کاربونات، مگنیزیم

سلفیت او داسی نور .

Metoclopramide – د لاندی در ملو سره عدم قابلیت

امتزاجیه لری لکه :

سیفالوسپورینونه، کلورامفینیکول او سودیم بای کاربونات

Ketamin – د لاندی در ملو سره عدم قابلیت امتزاجیه

لری لکه: ڈیازیپام او منحل باربیتوراتونه .

Verapamil – د لاندی در ملو سره عدم قابلیت امتزاجیه

لری لکه: امینوفیلین، نفلین، سودیم بای کاربونات، او
داسی نور .

د درملود عدم قابلیت امتزاجیه پوری مربوط هنی انحصارونه
په لاندی ډول دی:



Fig. 1a: Chemical precipitation of Midazolam (turbidity) and Ketamin (particle formation) [Riemann et al. 2005].



Fig. 1b: Physical precipitation of Midazolam as a result of an unfavorable pH medium [Riemann et al. 2005].

دولسم شکل



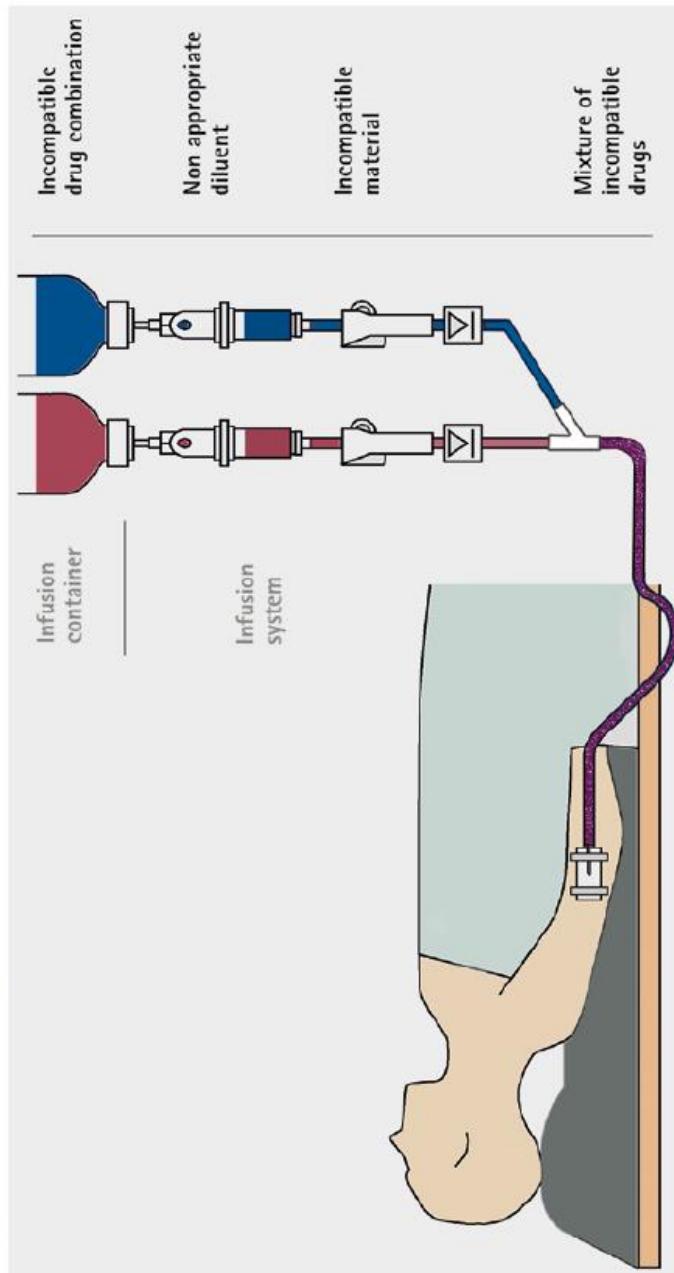
دیارلسم شکل



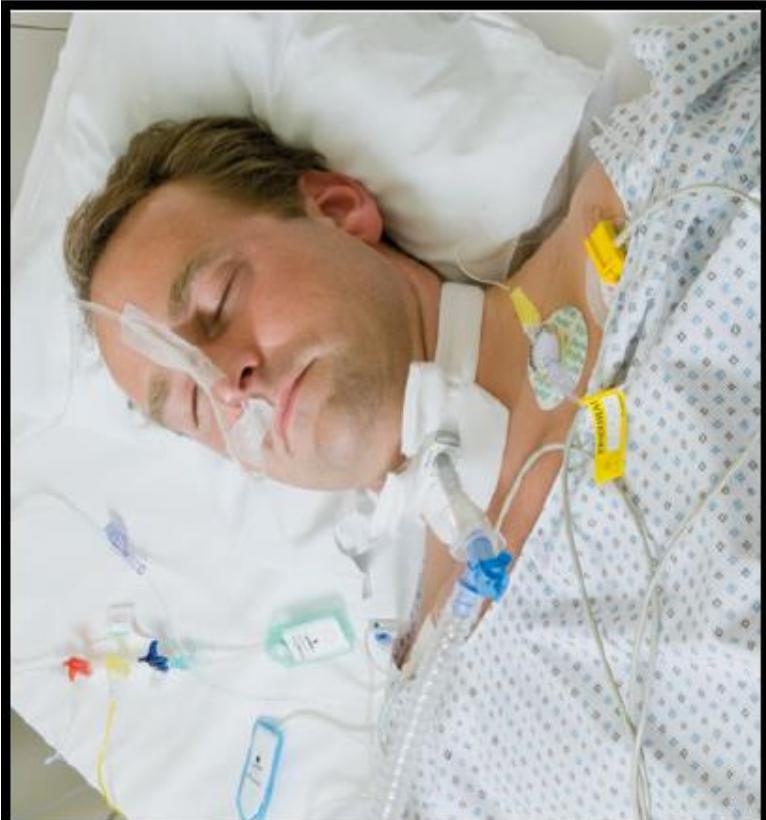
Fig. 2a: Physical incompatibilities of Diazepam. Picture by courtesy of F. Schröder, Pharmacist Bremen, Germany.

خوار لسم شکل

Fig. 3: Main causes of incompatibilities in standard IV therapy.



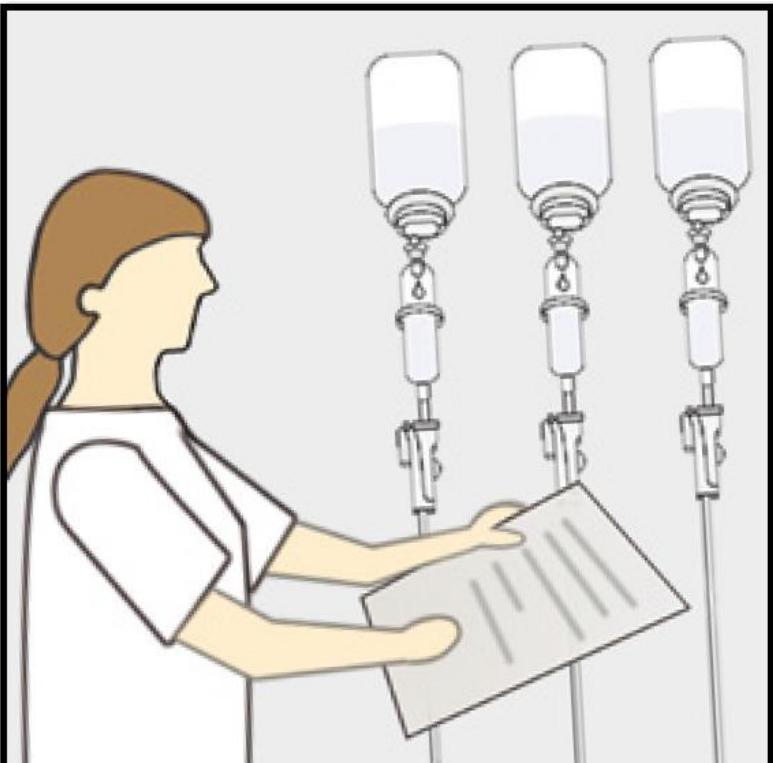
پنخلسم شکل



Consequences for the patient

- damage from toxic products
- particulate emboli from crystallization and separation
- tissue irritation due to major pH changes
- therapeutic failure

شپارسم شکل



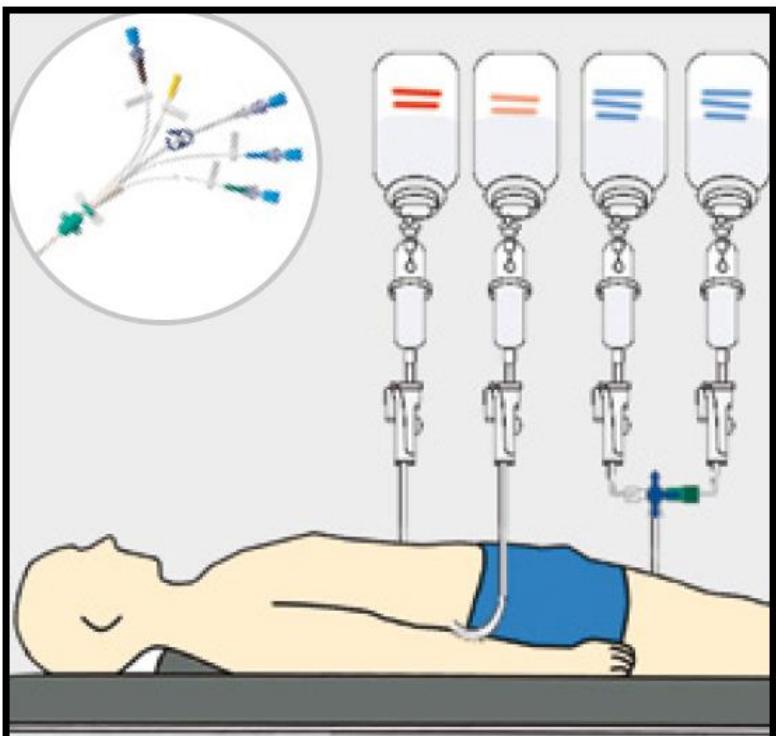
Assessment and planning
of regimes to avoid
mixing of drugs, which
have to be administered
separately.

اولسیم شکل



Compatibility checking
using available litera-
ture, databases, services
and information
material.

اتلسم شكل



Color coding and drug separation to prevent drug incompatibilities through a clear indication of the drug.

نولسم شكل



شلم شکل

Food and drug interaction

دیادونی ورده چې درمل د خورو سره هم متقابله اړیکې
بنائي چې د خ______ورو او درملو د متقابله اړیکو یا
(Food and drug interaction) په نوم یادېږي.

⇒ مثلاً که هوره d Anticoagulant drugs لکه Heparin سره یو ئای استعمال شی ۰ د خونریزی خطر زیاتیرې.

⇒ که قهوه یا چای د Methyle xanthine د مشتقاتو لکه CNS او سره یو ئای استعمال شی نو په Caffein باندی د میتايل اکزاتین د مشتقاتو تنبیه کوونکی اغیزی زیاتیری او شونی ده چې ناروغ ته Tremor او یا د CNS د تنبه نوری اغیزی پیدا شی.

⇒ که الکول د CNS د انحطاطی درملو لکه Barbiturates سره یو ئای استعمال شی نو د CNS دهیرانحطاط له وجی د باربیتوراتونو په انحطاطی اغیزو کی زیاتوالی را خی.
⇒ په معده کې د خورونشتوالی له یوی خوا د درملو جذب سریع کوي له بله طرفه د مخرشو درملو تخریشونکی اغیزی د معده جدار زیاتوی لکه Aspirin او نور NSAIDs

⇒ که Selegiline,Rasagiline درمل لکه MAO inhibitors سره یو ئای استعمال شی د Tyramin containing foods لکه پنیر، دچرگانو خیگراو Beer سریع کوي له بله طرفه د مخرشو درملو تخریشونکی اغیزی د معده جدار زیاتوی لکه Hypertensive crisis سبب گرئي.

Herb Drug Interaction

خرنګه چې طبی نباتات په مختلفو شکلونو د مختلفو ناروغيو د درملنی لپاره استعمالیږي - که چيری د دوى سره یو ئای درمل استعمال شی نو شونی ده چې متقابله اړیکې وښائي او د درملو د بدرو اغیزو سبب شی . خو دلته د بیلکې

په توګه د خخه لنډه یادونه Potential Herb- Drug interactions¹

کوو:

يو ويستم جدول

Herb/Conventional Drug Interactions ¹			
Medications/ Therapeutic Class	Potential Herbal Interactions	Central Nervous System	Possible Adverse Effects
Analgesics	Herbal-containing principles with diuretic activity (eg, corn silk, dandelion, juniper, uva ursi) Herbs containing agents with corticosteroid activity (eg, licorice, bayberry)	Herbal-containing principles with diuretic activity (eg, corn silk, dandelion, juniper, uva ursi) Herbs containing agents with corticosteroid activity (eg, licorice, bayberry)	These may pose an increased risk of toxicity with the anti-inflammatory analgesic drugs. These may induce reduction in plasma-salicylate concentration.
Anticonvulsants	Herbs containing agents with sedative properties (eg, calamus, nettle) Herbs with active principles which have sedative effects (eg, calamus, nettle, ground ivy, sage, borage) Herbs with salicylates (eg, poplar, willow)	Herbs with active principles which have sedative effects (eg, calamus, nettle, ground ivy, sage, borage) Herbs with salicylates (eg, poplar, willow)	Possible increase in sedative side effects. May increase risk of seizure. May cause transient potentiation of phenytoin therapy.
Ayurvedic	Shankapushpi ²		May shorten phenytoin's half-life and diminish its effectiveness.
Antidepressants	Herbs containing sympathomimetic amines (eg, agnus castus alkaloids, calamus amines, cola alkaloids, broom alkaloids, licorice) ² Ginkgo biloba	Herbs containing sympathomimetic amines (eg, agnus castus alkaloids, calamus amines, cola alkaloids, broom alkaloids, licorice) ² Ginkgo biloba	Increased risk of hypertensive crisis with MAO inhibitors. May potentiate sedative side effects. Use with tricyclic antidepressants or other medications known to decrease the seizure threshold is not advised.
Antiemetic and antivertigo drugs	Herbs containing sedative principles (eg, calamus, nettle, ground ivy, sage, borage)		May increase activity of sedative side effects.
Antiparkinsonism agents	Herbs containing anticholinergic principles	Herbs containing anticholinergic principles	May be antagonistic. Possible potentiation and increased risk of side effects. Possible antagonism.

دوام لري

Herb/Conventional Drug Interactions ¹		
Medications/ Therapeutic Class	Potential Herbal Interactions	Possible Adverse Effects
Antipsychotics	<p>Herbs containing diuretic principles (eg, corn silk, dandelion, juniper)</p> <p>Herbs with anticholinergic principles (eg, corkwood tree)</p> <p>Ginseng, yohimbine, and ephedra²</p>	<p>Possible potentiation of lithium action; increased risk of toxicity.</p> <p>May reduce plasma levels of phenothiazines; possible increased risk of seizures.</p> <p>Concomitant use with phenelzine and other MAO inhibitors may result in insomnia, headache, and tremulousness.</p>
Anxiolytics/hypnotics (eg, alprazolam)	Several herbs with claimed sedative properties (eg, calamus, kava, nettle, ground ivy, sage, borage)	Potentiation.
Phenobarbital ²	Thujone-containing herbs (eg, wormwood, sage) and gamma-linolenic acid-containing herbs (eg, evening primrose oil, borage)	May lower seizure threshold.
Nonsteroidal anti-inflammatory drugs (NSAIDs) ²	Feverfew	NSAIDs may reduce the effectiveness of feverfew perhaps mediated by its prostaglandin inhibition effects.
Stimulants	<p>Herbs with antiplatelet activity (eg, ginkgo biloba, ginger, ginseng, garlic)</p> <p>Ginseng (<i>Panax</i> spp.)</p>	<p>May increase the risk of bleeding due to gastric irritation.</p> <p>Increased risk of side effects.</p>
Antiarrhythmic	Herbs with cardioactive principles	Antagonize or affect efficiency of therapy.
Anticoagulants	<p>Herbs with diuretic properties (eg, corn silk, dandelion, juniper, uva ursi)</p> <p>Herbs containing coagulant or anticoagulant principles (coumarins; eg, alfalfa, red clover, chamomile, ginkgo biloba)</p> <p>Garlic²</p> <p>Ginger²</p>	<p>If hypokalemia occurs, may be antagonistic.</p> <p>Possible risk of antagonism or potentiation.</p> <p>May decrease platelet aggregation.</p> <p>Inhibits thromboxane synthetase, prolonging bleeding time.</p>
Antihyperlipidemic drugs	<p>Herbs with high salicylate content (eg, meadow-sweet, poplar)</p> <p>Herbs containing hypolipidemic principles (eg, black cohosh, fenugreek, garlic, plan-tain)</p>	Possible risk of potentiation.
		Possible additive effects.

دوام لری

Herb/Conventional Drug Interactions ¹		
Medications/ Therapeutic Class	Potential Herbal Interactions	Possible Adverse Effects
Antihypertensives	Herbs containing hypertensive ingredients (eg, blue cohosh, cola, ginger)	May be antagonistic.
	Herbs containing principles with mineralocorticoid action (eg, licorice, bayberry)	
	Herbs containing hypotensive principles (eg, black cohosh, devil's claw, hawthorn)	Possible potentiation.
	Herbs containing high levels of amine compounds or sympathomimetic action (eg, Agnus castus, black cohosh, cola, maté, St. John's wort)	May be antagonistic.
	Herbs containing diuretic ingredients (eg, corn silk, dandelion, juniper, uva ursi)	Possible risk of potentiation.
Beta-adrenergic blocking agents	Herbs containing cardioactive principles (cardiac glycosides)	Possible antagonism.
	Herbs with high levels of amines or sympathomimetic action (eg, Agnus castus, black cohosh, cola, maté, St. John's wort)	Possible risk of severe hypertension.
Cardenolides (cardiac glycosides)	Herbs with cardioactive constituents (eg, mistletoe [viscotoxin, negative inotropic properties], cola nut [caffeine], figwort [cardioactive glycosides])	Decreased effectiveness or potentiation; increased potential for side effects.
	Hawthorn, Siberian ginseng, Kyushin, and uzara root ²	May increase the risk of bleeding.
Diuretics	Herbs containing diuretic properties (eg, corn silk, dandelion, gossypol, juniper, uva ursi)	Increased risk of hypokalemia.
	Herbals having hypotensive properties (eg, agrimony, black cohosh, devil's claw, mistletoe)	May cause difficulty in controlling diuresis.
Nitrates and calcium-channel blocking agents	Herbs with cardioactive constituents (eg, broom, squill)	Interferes with therapy (eg, broom may slow heart rate, cause arrhythmias).
	Herbs containing hypertensive principles (eg, bayberry, blue cohosh, cola)	Antagonistic effects.
	Herbs containing anticholinergic principles	Possible reduced buccal absorption of nitroglycerin.
Sympathomimetics	Herbs containing sympathomimetic amines (eg, aniseed, capsicum, parsley, vervain)	Possible increased risk of hypertension.
	Herb principles having hypertensive action (eg, bayberry, broom, blue cohosh, licorice)	
	Herb principles with hypotensive action (eg, agrimony, celery, ginger, hawthorn)	Antagonistic effects.

دوام لرى

Herb/Conventional Drug Interactions ¹		
Medications/ Therapeutic Class	Potential Herbal Interactions	Possible Adverse Effects
Anti-infective agents		
Antifungals	Herbs containing anticholinergic agents (eg, corkwood tree)	Possible decreased absorption of ketoconazole.
Endocrine System		
Antidiabetic drugs	Herbs containing hypo- or hyperglycemic principles (eg, alfalfa, fenugreek, ginseng)	Possible antagonism or potentiation of action.
	Herbs containing diuretic principles (eg, broom, buchu, corn silk, juniper)	Antagonistic effects.
	Chromium, karela ²	May affect blood glucose levels, complicating insulin and chlorpropamide requirements, respectively.
Corticosteroids	Herbs containing diuretic principles (eg, broom, buchu, corn silk, juniper)	Possible risk of increased potassium loss.
	Herbs containing corticosteroid principles or action (eg, bayberry)	Increased risk of side effects (eg, sodium retention).
	Herbs, vitamins, and minerals with immunostimulating effects (eg, echinacea, astragalus, licorice, alfalfa sprouts, vitamin E, zinc)	May offset the immunosuppressive effects of corticosteroids.
Sex hormones	Herbs containing hormonal principles (eg, alfalfa, bayberry, black cohosh, licorice)	Potential interactions with existing therapy (eg, black cohosh may decrease the response to estrogens).
Drugs used to treat hyper- and hypothyroidism	Herbs containing high levels of iodine	Interferes with therapy.
	Horseradish (eg, goitrogenic myrrh) and kelp ²	
Drugs Used in Obstetrics and Gynecology		
Estrogens ²	Herbs containing phytoestrogens (eg, dong quai, red clover, alfalfa, licorice, black cohosh, soybeans)	Concomitant use may result in symptoms of estrogen excess such as nausea, bloating, hypotension, breast fullness or tenderness, migraine, or edema.
Oral contraceptives	Herbs containing principles with hormonal action (eg, black cohosh, licorice)	Possible interactions with existing drugs; may also reduce effectiveness of oral contraception.
Antineoplastics Drugs/Drugs with Immunosuppressive Activity		
Methotrexate	Herbs containing sufficient levels of salicylates (eg, willow, poplar, meadowsweet)	Possible increased risk of toxicity.
Immune-system affecting drugs	Herbs containing immunostimulant principles (eg, boneset, echinacea, mistletoe)	Possible antagonism or potentiation.
Drugs for Joint and Musculoskeletal Disorders		
Probenecid	Herbs containing sufficient levels of salicylates (eg, meadowsweet, poplar, willow)	Possible inhibition of uricosuric effect of probenecid.

دوام لری

Herb/Conventional Drug Interactions ¹			
Medications/ Therapeutic Class	Potential Herbal Interactions	Possible Adverse Effects	
		Diuretics	
Acetazolamide	Herbs containing sufficient levels of sallylates (eg, meadowsweet, poplar, willow)		Increased potential for toxicity.
		Anesthetics	
General anesthetics	Herbs containing hypotensive principles (eg, black cohosh, goldenseal, hawthorn)	Potentiation of hypotensive action.	
Muscle relaxants	Herbs containing diuretic principles (eg, broom, buchu, corn silk)	Possible potentiation if hypokalemia occurs.	
Depolarizing muscle relaxants	Herbs containing cardioactive principles (eg, cola, figwort, hawthorn)	Possible risk of arrhythmias.	

پینځم فصل

Advers Events Following Immunization

که څه هم د واکسینو تطبیق یوه محفوظه پروسه تلقی
کی——بې خوپه یاد باید ولرو چې د واکسینوله کبله هم
بـدـی اغیزـی منـخـتـه رـاـئـیـ لـکـهـ : پـهـ تـطـبـیـقـ شـوـیـ سـاـحـهـ کـیـ
Sterilabscess او Local Reactions,Inflamation,Lymphangitis
د منـخـتـه رـاـتلـلـوـ خـخـهـ یـادـوـنـهـ کـوـلـاـیـ شـوـ .
همدارنګه د واکسین د تطبیق خخه خو ساعته وروسته
تبه، سردردی او ناراحتی منـخـتـه رـاـئـیـ چـېـ 1-2 وـرـخـیـ دـوـامـ
کـوـیـ .

هم واقع کـیـبـیـ خـودـ Hypersensitivity Reactions
انافلکسیـیـ وـاقـعـاتـ چـیرـ کـمـ اوـ نـادـرـ دـیـ .

هم Febrile Reactions,Post Vaccinal Neuropathies
د واکسینو د بدـوـ اـغـیـزـوـ لـهـ جـمـلـیـ خـخـهـ دـیـ .

دوہ ویشم جدول

Summary of common minor vaccine reactions

Vaccine	Possible minor adverse reaction	Expected frequency
BCG	Local reaction (pain, swelling, redness)	Common
Cholera	Oral presentation–none	
DTP	Local reaction (pain, swelling, redness) Fever	Upto 50% ^a Upto 50%
Hepatitis A	Local reaction (pain, swelling, redness)	Upto 50%
Hepatitis B	Local reaction (pain, swelling, redness) Fever	Adults up to 30%, Children upto 5% 1-6%
Hib	Local reaction (pain, swelling, redness) Fever	5-15% 2-10%
Japanese encephalitis	Local reaction, low-grade fever, myalgia, gastrointestinal upset	Upto 20%
Measles/ MMR	Local reaction (pain, swelling, redness) Irritability, malaise and non-specific symptoms, fever	Upto 10% Upto 5%
Pneumococcal	Local reaction (pain, swelling, redness)	30-50%
Poliomyelitis (OPV)	None	
Poliomyelitis (IPV)	None	
Rabies	Local and/or general reaction depending on type of vaccine (see product information)	15-25%
Meningococcal disease	Mild local reactions	Upto 71%
Tetanus/Td	Local reaction (pain, swelling, redness) ^b Malaise and non-specific symptoms	Upto 10% Upto 25%
Tick-borne encephalitis	Local reaction (pain, swelling, redness)	Upto 10%
Typhoid fever	Depends on type of vaccine use (see product information)	-
Yellow fever	Headache Influenza-like symptoms Local reaction (pain, swelling, redness)	10% 22% 5%

^a With whole-cell pertussis vaccine. Rates for acellular pertussis vaccine are lower.

^b Rate of local reactions likely to increase with booster doses, up to 50-85%.

د Disinfectants Insecticides,Pesticides and Repellents

پورتنيو درملود جملی خخه ئينى ئي په زراعت کى استعمالىي چى له يو خوا د مستقيم تماس له وجى او له بله طرفه د Enviromental effects په اساس د بدوانىزو سبب گرئى چى په پورتنيو گروپونو کى گن شمير درمل شامل دى . لکه :

Carbonate Pesticides, Chlorinated Pesticides, Pyrethroid,
ParaThion او Organosphasphate Pesticides, Malathion

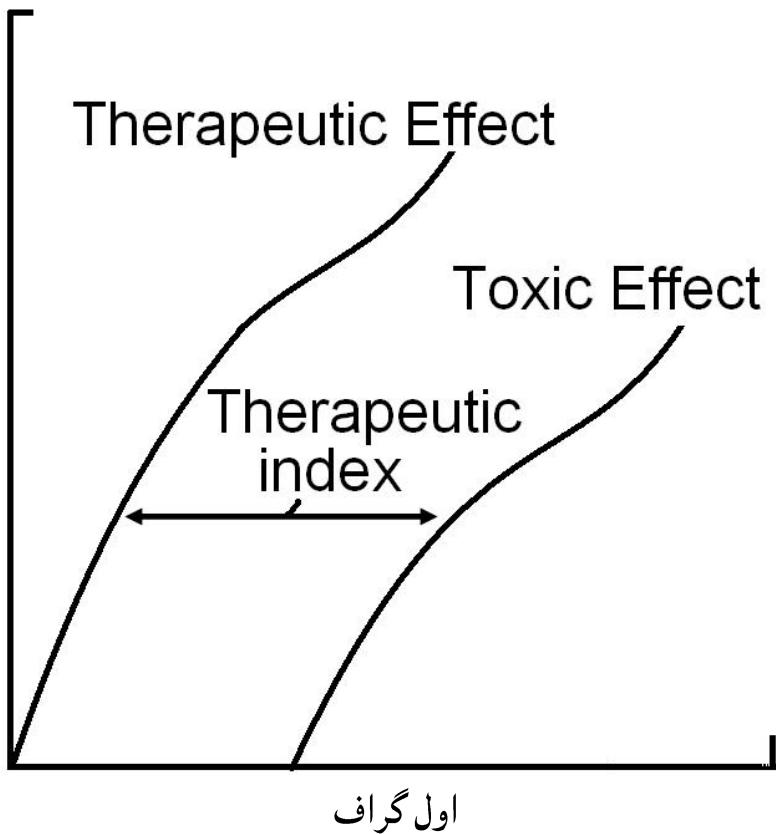
حشره وژونکى درمل د Organosphasphate Pesticides پورى اره لرى چى زمونې پ———ه مملكت کى په كورونو کى استعمالىي . او د تسمماتو سبب گرئى . ددى درملود تسمم اعراض د پارا سمپاتيك سىستم د تنبه په شان وى .

Narrow Therapeutic Index

تیراپیوتیک انھیکس د $\frac{LD_{50}}{ED_{50}}$ خخه عبارت دی چی :

LD₅₀ = Median Lethal Dose

ED₅₀ = Median Effective Dose



هر خومره چى د دوا تيراپيوتىك اينديكىس كوجنى وي
 دوا سمى خـو بر عـكـس هـر خـومـرـه چـى دـيـوى دـوا
 تـيرـاـپـيـوتـيـكـ اـيـنـدـيـكـسـ لـوىـ ويـ دـواـ مـحـفـوظـهـ وـىـ .

Complication of Antibiotic Therapy

كه خـهـ هـمـ ضدـ مـكـروـبـىـ درـمـلـ پـهـ مـرـضـىـ اـورـگـانـيـزـمـ
 سـمـىـ تـاـثـيرـ كـوـىـ خـوـ دـ مـيـزـبـانـ پـهـ بـدـنـ هـمـ بـدـىـ اـغـيـزـىـ لـرىـ .ـ چـىـ
 پـهـ لـانـدـىـ شـكـلـونـوـ منـخـ تـهـ رـائـىـ :

- Hypersensitivity
- Direct Toxicity
- Super infection

Super infection : كـلـهـ چـىـ وـسـيـعـ السـاحـهـ اـنتـيـ بـيـوتـيـكـ

يادـ دـمـكـروـبـىـ درـمـلـوـ كـمـبـاـيـنـيـشـنـ تـطـبـيقـ شـىـ نـوـدـپـورـتـنـىـ
 تنـفـسـىـ سـسـتـمـ،ـ خـولـىـ،ـ كـولـمـوـ اوـ بـولـىـ تـنـاسـلـىـ سـسـتـمـ پـهـ
 نـورـمـالـ فـلـورـاـكـىـ بـدـلـونـ منـخـ تـهـ رـاـوـرـىـ چـىـ لـهـ كـبـلـهـ ئـىـ
 نـمـوـصـورـتـ نـيـسـىـ اوـ دـوـيـمـىـ اـتـتـانـاتـ Opportunistic Organisms
 منـخـ تـهـ رـاـوـرـىـ چـىـ بـيـلىـ دـرـمـلـنـىـ تـهـ اـرـتـياـ لـرىـ اوـ پـهـ مشـكـلـهـ سـرـهـ

تداوى کېرىد Super infection عامل معمولاً مقاومى باكترياوي او فنگسونه وي د مثال په توګه د تتراسيكلين د طبیق سره Candida albicans داتتان له وچى ناروغ ته منح ته راھى . Oral Candidiasis,Vulvovaginitis,Pruritus ani Pseudomonas Species, لکه Coliform Organisms ناروغ ته اسهال پيدا كوي . Protus Species Enterocolitis له كبله Resistance Staphylococci منح ته راتلای شى .

همدارنگ Clostidium difficile د پواسطه د Pseudomembranous Colitis راپور ورکړل شوی دي . چې د نومورو باكترياوو د Over Growth له كبله منح ته راھى .

د سرطان کنه هر ټلو بدی اغیزې

د سرطان ضد دواګانی چې د Druds Cytotoxicity په نوم هم یادیږي د زیاتوبو اغیزو سبب گرځی او عبارت دی له:
اټول: د هډو کود مغز انحطاط (Bone Marrow Depression) چې له کبله ئې RBC, WBC, Platelets کمیږي او د معافیتی سستم تیتووالی او کم خونی منځ ته راځي.

څوھک: د هضمی سستم ستونتی: لکه زخمونه او نس ناسته.

څویمه: په Gonads باندی د بد و اغیزو له کبله د میاشتنی عادت غیر منظموالی د اولاد زیبونی د توان کموالی، د سپرمو په جوریدو کې نیمگړ تیاو او شنډ توب منځ ته راځي.

څلورم: Hyper Uricemia د سرطانی حجراتو د تیز تحریب له وجى هستوی اسیدونه ازاد یېږي چې له کبله ئې یوریک اسید په پښتوري ګو کې متراکم او د Hyper Uricemia نښی په ناروغ کې لیدل کېږي.

پینهشم: Alopecia: یا د بدن د ویبتانو تویدل چې په زیاته پیمانه په سر او دیره او هم د بدن په نورو برخو کی لیدل کېږي .

شنبهم: حینی د سرطان ضد درملونه تیراتوجنیک تاثیر لری .

اووهم په کوچنیانو کی د ودی ورووالی .
اقه: زړه بدوالی او کانګی چې په ډیرو ناروغانو کی لیدل کېږي نو خکه د سرطانی ضد درملو سره د کانګو ضد دواګانی ناروغانو ته ورکول کېږي .

نهم: که سرطان ضد درمل په دوامداره توګه استعمال شی نود کارسینوجینوسیتی ، mutagenicity سبب گرځی .
د یادونی وړ ده چې هر Cytotoxic دوا ځانګړی بدی اغیزی لری چې د ځینو مهمو درملو بدی اغیزی په لاندی جدولونو کی کتلاي شي :

درویشتم جدول

DRUG	SIDE EFFECTS
Cyclophosphamide	BMS, hemorrhagic cystitis (mesna, traps acrolein and is protective)
Cisplatin	Nephrotoxicity (use amifostine); neurotoxicity (deafness)
Procarbazine	BMS, leukemogenic
Doxorubicin	BMS, delayed CHF (dexrazoxane is an iron-chelating agent preventing the formation of free radicals; it is not a free radical "trapper")
Methotrexate (CCS)	BMS, leucovorin (folic acid rescue)
5-Fluorouracil (CCS)	BMS
6-Mercaptopurine (CCS)	BMS
Bleomycin (CCS)	Pneumonitis, pulmonary fibrosis
Vinblastine (CCS)	BMS
Vincristine	Neurotoxicity

BMS: Bone marrow suppression, DHF: Dihydrofolate

څلورویشتم جدول

TOXICITY	DRUG(S)
Renal	Cisplatin, methotrexate
Pulmonary	Bleomycin, busulfan, procarbazine
Cardiac	Doxorubicin, daunorubicin
Neurologic	Vincristine, cisplatin
Immunosuppressive	Cyclophosphamide, methotrexate
Other	Cyclophosphamide (hemorrhagic cystitis); procarbazine (leukemia); asparaginase (pancreatitis)

څرنګه چې په دی اخرو وختونو کې د حاد تسمم پیښی چې
د درملو دلور روز د تطبیق له کبله منځ ته راھي زیاتی شوی
دی نو په دی اساس مو د ئینو درملو د حاد تسمم او د هغوي
د درملنی لپاره د Antidote د استعمال په حقله په لاندی
جدولونو کې کافی معلومات ئای په ئای شوی دی .

پینځه وي شتم جدول

Agents used in reducing the absorption of ingested poisons

Poison	Additions to lavage fluid (warm water or saline)	Agent(s) to be left in the stomach after lavage or to be given orally
Cyanide	Sodium thiosulfate 5%	Sodium thiosulfate 25%, 300 mL
Digitoxin		Colestipol or cholestyramine; activated charcoal
Hydrofluoric acid		Calcium gluconate 10%, 300 mL
Iron	Deferoxamine (see text)	Deferoxamine (see text)
Opiates	Potassium permanganate (one tablet BPC in 3.5 L)	Wash all permanganate out of the stomach
Oxalic acid (e.g. in bleach)	Calcium gluconate 1%	Calcium gluconate 1%, 300 mL
Parquat	Fuller's earth, 150 g/L	Fuller's earth, 150 g/L (see text)
Phenol, cresol, lysol	Castor oil in water, 1:2	Castor oil, 50 mL (or another oil, such as arachis oil or olive oil)
Phosphorus	Copper sulfate 0.1%	Copper sulfate 0.1%, 50 mL
Sodium hypochlorite (e.g. in bleach)	Sodium thiosulfate 5%, or milk, or milk of magnesia (magnesium hydroxide 8.5%)	Copper sulfate 0.1%, 100 mL
Various (see text)		Activated charcoal

خيني وخت يو گروپ درمل د نورو درملو
 فارمکولوژیک تاثیرات معکوس کوي لکه په لاندی جدول
 کي چي يوشمير درمل د Anti Hyper Tensive Drugs اغیزی
 سرچپه کوي او ياد هایپرتینشن د Exacerbation سبب
 گرځی.

شپږویشتمن جدول

Drugs that can commonly cause or exacerbate hypertension or oppose the effects of antihypertensive drugs

1. By sodium and water retention

Sodium salts of drugs (e.g., sodium penicillin, sodium-containing antacids)

Steroids

Glucocorticoids

Mineralocorticoids

Oestrogens and progestogens (e.g. oral contraceptives)

Non-steroidal anti-inflammatory drugs (e.g. indomethacin, diclofenac)

2. By vasoconstriction

Sympathomimetics (e.g. adrenaline, noradrenaline)

Monoamine oxidase (MAO) inhibitors (in interaction with vasoactive amines, such as dietary tyramine: the cheese reaction)

3. After withdrawal of antihypertensive drugs (rebound hypertension)

Clonidine (potentially dangerous)

Methyldopa

Beta-adrenoceptor antagonists

شونی ده چې د درملو ئینى بدی اغیزی د هغوي د اساسی تاثیراتو سره توپیر ولرى مثلاً قلبى بىنظامىو ضد دواگانى يوشمى———ر بدی اغیزی منځ ته راپړي چې د non Cardiac adverse Effects په نامه سره يادېږي چې په لاندی جدول کې بسodel شوی دی:

اوہ ویشتم جدول

Important non-cardiac adverse effects of antiarrhythmic drugs

Drug	Class	Important non-cardiac adverse effects
Adenosine	—	Flushing, chest pain, dyspnoea, nausea
Atropine	—	Anticholinergic effects
Quinidine	Ia	Cinchonism Anticholinergic effects Hypersensitivity reactions (including thrombocytopenia)
Procainamide	Ia	Lupus-like syndrome Hypersensitivity reactions Neutropenia (especially modified-release formulations)
Disopyramide	Ia	Anticholinergic effects
Lidocaine	Ib	Central nervous toxicity
Mexiletine	Ib	Central nervous toxicity
Phenytoin	Ib	Central nervous toxicity Long-term effects (see Pharmacopoeia)
Tocainide	Ib	Central nervous toxicity Neutropenia
Flecainide	Ic	Central nervous toxicity
Propafenone	Ic/II	Central nervous toxicity
β-Blockers	II	Bronchoconstriction
Amiodarone	III	Peripheral vasoconstriction Corneal opacities Skin pigmentation and photosensitivity Thyroid dysfunction Fibrosing alveolitis Peripheral neuropathy Liver damage
Verapamil	IV	Headache (uncommon)

Drugs of Abuse

لکه چې مخکی هم ورته اشاره شوی ده درملو سره
 رو بدیتوب په توله نړی او خاصتاً زمونږ په مُملکت کې ډیره
 لويه ستونته جوره کړي ده د کار د اسانی لپاره د درملو نوم
 د قطعی اعراض، پسيکوفارمکولوژۍ، لنده
 درملنه او Helpfuleassociations په لاندی جدولونو کې کتلای
 شی.

اته ويشتمن جدول

Summary of drugs of abuse					
Substance	Intoxication	Withdrawal	Psycho-pharmacology	Treatment	Helpful Associations
Amphetamines (release DA)	Euphoria Hypervigilance Anxiety Stereotyped behavior Grandiosity Paranoia Tachycardia Pupillary dilation	Depression Fatigue Increased appetite Unpleasant dreams (nightmares)	Noradrenaline system NAC pathway (dopaminergic)	Antipsychotics or benzodiazepines Bromocriptine Amantadine Desipramine	Increased use among white professionals Cardiac arrhythmias
Cocaine (prevent re-uptake of DA)					

دوام لري

Substance	Intoxication	Withdrawal	Psycho-pharmacology	Treatment	Helpful Associations
Sedative hypnotics (barbiturates, benzodiazepines)	Impaired judgment Slurred speech Impaired coordination Unsteady gait Stupor or coma	Autonomic hyperactivity Tremors Hyperactivity Hallucinations Anxiety, Grand-mal seizures	GABA. Cross-tolerance	Barbiturates: Pentobarbital challenge test Benzodiazepines: Slowly taper dose	Decrease in cognitive performance Overdose danger or Withdrawal danger Elderly → hip fracture

دوام لري

SUBSTANCE	INTOXICATION	WITHDRAWAL	PSYCHO-PHARMACOLOGY	TREATMENT	HELPFUL ASSOCIATIONS
Caffeine	Restlessness Agitation Insomnia Diuresis GI disturbances Excitement	Headache Fatigue Drowsiness Nausea or vomiting	Antagonist of adenosine receptors Increases cAMP in neurons that have adenosine receptors	Avoid caffeine, analgesics	Average adult consumes about 200 mg per day. A cup of coffee contains 100–150 mg of caffeine, tea has 1/3 as much.
Cannabis (e.g. marijuana, hashish)	Impaired Motor Coordination Anxiety Slowed Reaction Time, Impaired Judgment Conjunctival Injection Dry Mouth Increased Appetite	None	Inhibitory G-protein Increased serotonin lower levels of NAC activation	Abstinence and support	Respiratory effects Amotivational syndrome Increased incidence of mental illness
Hallucinogens (e.g. LSD, mescaline)	Hallucinations Illusions Anxiety Idea of reference Depersonalization Pupillary dilation Tremors Impaired coordination	None	Partial agonist at postsynaptic 5-HT (serotonin) receptors	Supportive counseling, talking down, Antipsychotics Benzodiazepines	Perceptual impairment Flashbacks Synesthesias (hearing a smell) Convulsions
Inhalants (Glue, paint, thinner)	Belligerence Impaired judgment Nystagmus impaired coordination Lethargy Impaired steady gait Crusting around nose/mouth	None	GABA, Cross-tolerance Cerebellum (versus basal ganglia for Parkinson's)	Education Counseling	More likely in poor, young and, not drug sophisticated

دوم لری

SUBSTANCE	INTOXICATION	WITHDRAWAL	PSYCHO-PHARMACOLOGY	TREATMENT	HELPFUL ASSOCIATIONS
Nicotine	Depression, impotency, traffic accidents	Irritability Depressed mood and heart rate Increased appetite, Insomnia, anxiety. <i>The most addictive substance</i>	Agonist at ACh receptors, Activates dopaminergic pathway (positive reinforce) Flow of glutamate	Nicotine patch Education Bupropion	24% of population are smokers Increased use in women, blacks, teenagers and those with low socioeconomic status
Opiates (heroin, codeine, oxycodone)	Pupillary constriction Constipation Slurred speech Respiratory depression Bradycardia Coma Death. Infections because of use of needles (TB, AIDS, pneumonia, hepatitis, pulmonary hypertension, liver abscess)	'Flu-like' muscle aches (worst influenza you have ever had) Nausea or vomiting Yawning Piloerection Lacrimation Rhinorrhea Fever Insomnia Pupillary dilation	Opiate receptors Locus coeruleus pathway (Noradrenergic) NAC pathway	Naloxone (short half-life) Naltrexone (longer half-life) Clonidine (ease of withdrawal) Methadone LAMM (Levo-ac-aretyl-methadol): Substitute addiction, longer withdrawal period, Buprenorphine (detox)	Males > Females TB AIDS, Hepatitis, Pulmonary hypertension Pneumonia
Phencyclidine (PCP, angel dust)	Assaultive Combative Impulsive Agitated Nystagmus Ataxia Hypersalivation Muscle rigidity Decreased response to pain Hyperacusis Paranoia Unpredictable violence, Psychosis	None	Antagonist of <i>N</i> -methyl-D-aspartate glutamate receptors Prevents influx of calcium ions activates dopaminergic neurons	Non stimulating environment Restraints Vitamin C Benzodiazepines or antipsychotics	Men in minority groups, aged 20–40 years Mixed with cannabis or opiates

خینی و خت درملو بـدی اغیزی د سستمونو په
اساس مطالعه کـیری لـکه:
دـمرکـزـی عـصـبـی سـسـتم، قـلـبـی وـعـائـی سـسـتم،
تنـفـسـی سـسـتم، هـضـمـی سـسـتم، هـیـپـاـتـوـکـسـیـسـیـتـیـ،
بـولـی تـنـاـسـلـی سـسـتم او اـنـدـوـکـرـایـنـ سـسـتم
ستـوـنـزـی ·

همدارنگه خینی Hematological Disorders هـمـدـارـنـگـهـ خـینـیـ هـمـ دـرـمـلـوـ لـهـ ·
کـبـلـهـ منـحـ تـهـ رـأـخـیـ ·

دـبـیـلـگـیـ پـهـ توـگـهـ پـهـ لـانـدـیـ جـدـوـلـوـنـوـ کـیـ
ظـرـهـ لـهـ نـ Drug Induced Respiratory Disorders دـرـمـلـوـ لـهـ نـ

تـیـرـوـوـ:

نهه ويشتم جدول: هغه تنفسی ستونزی چې د درملو په واسطه پارېږي:

Drug-induced respiratory disorders

Type of disorder	Drugs commonly involved
Cough	ACE inhibitors
Asthma	Anaphylaxis (any drug) Beta-adrenoceptor antagonists Cholinergic drugs (e.g. carbachol, pilocarpine, pyridostigmine) Pentamidine, nebulized Propafenone Prostaglandin F _{2α} Salicylates Tartrazine (E102)
Acute pulmonary oedema/adult respiratory distress syndrome	Beta-adrenoceptor agonists intravenously Cytosine arabinoside Hydrochlorothiazide Naloxone Narcotic analgesics (overdose) Salicylates (overdose) Thrombolytics
Interstitial pneumonia and fibrosis	Amiodarone Cytotoxic/immunosuppressive drugs Azathioprine Bleomycin Busulfan Carmustine Chlorambucil Cyclophosphamide Cytosine arabinoside Lomustine Melphalan Mercaptopurine Methotrexate Mitomycin Flecainide Nitrofurantoin

دوام لری

Drug-induced respiratory disorders (continued)

Type of disorder	Drugs commonly involved
Chronic eosinophilic infiltration	Aspirin Bleomycin Carbamazepine Chlorpromazine Chlorpropamide Dothiepin Gold salts Imipramine Maloprim® Methotrexate Nalidixic acid Naproxen Penicillamine Penicillins Phenytoin Procarbazine Sulfasalazine Sulfonamides Tetracyclines
Acute infiltration and eosinophilia	Nitrofurantoin
Pleural effusions and fibrosis	Bromocriptine Dantrolene Methotrexate Methysergide
Lupus-like syndrome	Hydralazine Phenytoin Procainamide
Pulmonary embolism	Oral contraceptives
Respiratory depression	Alcohol Antidepressants Antihistamines Benzodiazepines Chloral derivatives Narcotic analgesics

ددرملوئینی بدی اغیزی چی د مختلفو عواملو له مخی
په مخکنیو طبقه بندیو کی نه دی شاملی شوی دلته تری
یادونه کوو:

که اندروجنونه بنخو ته تطبیق شی نو د Virilization سبب
گرئی . چی د Clitoris غتیوالی، Hirsutism او د غربیا او اواز
د لامل کیری . او میاشتنی عادت هم غیر منظم
کیری . او که چیری بنخه حامله وی او جنین ئی موئث وی نو د
Virilization Fetus external genitalia سبب کیری .
د اندروجنونو لوړ مقدار په نرانو کی د Feminization لامل
گرئی . چی نرانو ته Gynecomastia, Infertility او
Shrinkage پیدا کیری .

خینی درمل د پانکراس د التهاب سبب گرئی چی
عبارت دی له: Didanosin, Azathioprin, Valproic acid,
Pentamidin, Mercaptopurine, Estrogens, Sitagliptin, Saxagliptin
او Opiates

يو شمير درمل د زړه د عدم کفائي Exacerbation منځ ته
راوری . لکه NSAIDs, Calcium Chanel Blockers او هغه
دواګانی چی د زړه د بی نظميو په درملنه کی استعمالېږي .
الکول هم د پورتنی پیښی لامل کیدای شی .

که بیتا بلاکر دواګانی په لور دوز استعمال شی د HF د
خطر پیدا کوي · Exacerbation

هغه دواګانی چې د Priapism سبب گرئي :

Alprostadil,Papaverin,Phentolanin,Heparin
حیني درمل د Dream anxiety Disorders یا Night mare
(خپسی) سبب گرئي لکه پروپرانولول، حیني اتنی د ډیپریزانت
او نارکوتیک انلجنیزیکونه ·

يوشمیر دواګانی د Esophageal damage یا د مری د
ستوترو سبب گرئي لکه اسپرین، تراسیکلین، کینیدین،
پوتاشیم کلوراید، ویتامین سی ·

د مری د التهاب او زخم سبب گرئي · Alendronate
يوشمیر درمل د Paragusia یا Dysgeusia سبب گرئي
عبارت دی لـ : Clarithromycin,Captopril,Cisplatin,
Cyclophosphamide,Carboplatin,Dactinomycin,
Doxorubicin ,Griseofulvine,Nethazolamide,Metronidazole,
او نور · Methotrexate,Paclitaxil,Vincristine

او Agusia(Complete Lack of Taste) د Dysgeusia
په ډولونو سره موندل کېږي · Hypogeusia

شونی ده چى د بعضو درملود استعمال سره د پوستکى
په رنگ کي تغیر راشى (Skin discoloration) لکه Amiodarone, Clofazimin, Psoralin, او ئينى سايتوتوكسيك درمل .
دھينو درملود استعمال سره د تشو ميتيازو په رنگ کي
بدلون راھى چى معمولاً نارنجى اختياروی لکه ريفامپين،
سلفاسلازين، نايتروفوراتتوين، ميترونيدازول، پريماکين او
ئينى د سرطان ضد درملونه .
دې کو ميتيازورنگ هم دھينو درملود استعمال سره بدلون
مومى د بيلگى په توګه: Compounds Bismuth, Rifampine
همدارنگه د اوسپنى مختلف مستحضرات لکه
• Ferrous sulfate, Ferrous fumurate, Ferrous glucante
ليدل شوي دى چى دھينو درملود استعمال سره د
غانبونو په رنگ کي بدلون راھى مثلاً هغه ماشومان چى عمر
ئي له اتو 8 كالو خخه کم وى د تترا سيكلينو د تطبيق سره
پکى دا پينه منځ ته راھى . همدارنگه د خولي د غړغرۍ او د
خولي د مينځلو هغه محلولونه چى په ترکيب کي
• Cetylpyridinium او Chlorhexidine

حینی درمل منج ته راوری لکه د Alopecia(Hairloss) سرطان ضد درملونه، هیپارین، وارفرین، Rivaroxaban، حینی درمل Hirsutism سبب گرخی Dabegatran,Apixaban لکه انابولیک ستیرویدونه، تیستوس تیرون، گلوکورتیکوس تیرویدونه،
• Minoxidil,Cyclosporin,Danazol

د ویبستانو د رنگ د بدلون سبب Dithranol triacetate گرخی . Ibuprofen سبب گرخی Hair Thining د Isotretinoin . د په تطبيق کی Hair Thining او د ویبستانو تویدل منج ته راخی . لیدل شوی دی چی یوشمیردواگانی د دوامداره استعمال په وجه د Orgasm د بدلون سبب گرخی لکه • Fluoxetine,Paroxetin,Sertraline کیدای شی درمل په یو یا Drug induced nail changes خواحتا ټولونوکانو کی تغیر راولی د بیلگی په توګه او Psoralens,Retinoids,Zidovudin,Tetracyclin,Dapson

حینی د سرطان ضد درمل لکه : Doxorubicin,Vincristin, هم دغه اغیزه منج Taxanes,Adriamycin,Cyclophosphamide ته راوری .

د ارسنيکو په تسمم کي هم د نوكانو تشوشتاپه بطى ډول
منځ ته رائي .

Onycholysis او Doxycyclin سبب گرئي .
Leukonychia یا د white Nails or Milk spots هغه وخت
واقع کيرې چي دوا Keratiniztion متأثره کړي .

د يادونې وړ ده چي د درملو تطبيق شوي مقدار د ھينو
لبراتواري کتنو په پايلو کي بدلون منځ ته راوري څرنګه چي
لبراتواري پايلې د ناروغيو په تشخيص کي مهم رول لري نو
په دې اساس ضرور ده چي دې برخى ته هم توجه وشي . چي
ددې برخى مطالعه یو خانګړي بحث جوروی نو دلته ئې د
ليکلو خخه صرف نظر شوم . خود موضوع د اهميت په نظر
کي نيلو سره لارمه ده چي د ھينو لبراتواري پايلو نورمالې
اندازې د جدولونو په بنې لوستونکو ته وړاندې کرم .

د ئىنې مەھمۇ لابراتوارى كىتنو نورمالى اندازى

دېرىشىم جدول

Reference intervals for commonly used tests.^{1,2}

Test	Specimen	Conventional Metric Units
Acetaminophen	Serum	10–20 mcg/mL Panic: > 50 mcg/mL
Acetoacetate	Serum or urine	Negative (0 mg/dL)
Activated clotting time (ACT)	Whole blood	70–180 seconds (method-specific)
Adrenocorticotrophic hormone (ACTH)	Plasma	9–52 pg/mL (laboratory-specific)
Alanine aminotransferase (ALT, SGPT, GPT)	Serum or plasma	0–35 units/L (laboratory-specific)
Albumin	Serum or plasma	3.4–4.7 g/dL

دۇام لىرى

Reference intervals for commonly used tests.^{1,2} (continued)

Test	Specimen	Conventional Metric Units
Aldosterone	Serum	Salt-loaded (120 mEq Na ⁺ /d for 3–4 days): Supine: 3–10 ng/dL Upright: 5–30 ng/dL
	Urine	Salt-depleted (20 mEq Na ⁺ /d for 3–4 days): Supine: 12–36 ng/dL Upright: 17–137 ng/dL
		Salt-loaded (120 mEq Na ⁺ /d for 3–4 days): 1.5–12.5 mcg/24 h
		Salt-depleted (20 mEq Na ⁺ /d for 3–4 days): 18–85 mcg/24 h
Alkaline phosphatase	Serum or plasma	41–133 units/L(method- and age-dependent)
Alpha-fetoprotein (AFP)	Serum	0–15 ng/mL (age-dependent)

دوات لری

Reference intervals for commonly used tests.^{1,2} (continued)

Test	Specimen	Conventional Metric Units
Ammonia (NH_3)	Plasma	18–60 mcg/dL
Amylase	Serum or plasma	20–110 units/L (laboratory-specific)
Angiotensin-converting enzyme (ACE)	Serum	12–35 units/L (method-dependent)
Antithrombin (AT)	Plasma	84–123% (qualitative/activity) 80–130% (quantitative/antigen)
Alpha-1-antitrypsin, Alpha-1-antiprotease	Serum or plasma	110–270 mg/dL
Aspartate amino-transferase (AST, SGOT, GOT)	Serum or plasma	0–35 units/L (laboratory-specific)
Basophil count	Whole blood	0.01–0.12 × 10 ³ /mCL
bcr/abl, t (9;22) translocation by reverse-transcriptase polymerase chain reaction (RT-PCR), qualitative	Whole blood	Negative (Positive: chronic myeloid leukemia, some acute B-lymphoblastic leukemia)
Beta-hCG	Serum	Males and nonpregnant females: undetectable or < 5 milli-international units/mL
Beta-2-microglobulin	Serum or plasma	< 0.2 mg/dL

دوام لری

Reference intervals for commonly used tests.^{1,2} (continued)

Test	Specimen	Conventional Metric Units
Bilirubin	Serum or plasma	Total: 0.1–1.2 mg/dL Direct (conjugated to glucuronide): 0.1–0.5 mg/dL Indirect (unconjugated): 0.1–0.7 mg/dL
Blood urea nitrogen (BUN)	Serum or plasma	8–20 mg/dL
B-type natriuretic peptide (BNP)	Plasma	< 100 pg/mL
C-peptide	Serum or plasma	0.8–4.0 ng/mL
C-reactive protein, high sensitivity (hs-CRP)	Serum or plasma	Normal: < 0.8 mg/L Low risk: < 1.0 mg/L Average risk: 1.0–3.0 mg/L High risk: > 3.0 mg/L
C-telopeptide, beta-cross-linked (CTX)	Serum	Male: 60–850 pg/mL Female: premenopausal 60–650 pg/mL, postmenopausal 100–1000 pg/mL (age- and laboratory-specific)
Calcitonin	Plasma or serum	Male: 0–11.5 pg/mL Female: 0–4.6 pg/mL

دوام لرى

Reference intervals for commonly used tests.^{1,2} (continued)

Test	Specimen	Conventional Metric Units
Calcium (Ca^{2+})	Serum or plasma	8.5–10.5 mg/dL Panic: < 6.5 or > 13.5 mg/dL
Calcium (ionized)	Serum or whole blood	4.6–5.3 mg/dL Panic: < 3 or > 6.2 mg/dL
Calcium (U_{Ca})	Urine	100–300 mg/24 h
Calreticulin gene (CALR) mutations	Whole blood	Negative (Positive: essential thrombocythemia [~20%], primary myelofibrosis [~35%], and refractory anemia with ring sideroblasts and thrombocytosis RARS-T [~15%])
Carbon dioxide, partial pressure (Pco_2)	Whole blood	32–48 mm Hg
Carbon dioxide (CO_2), total (bicarbonate)	Serum or plasma	22–32 mEq/L Panic: < 15 or > 40 mEq/L
Carboxyhemoglobin (HbCO)	Whole blood	< 9% of total hemoglobin (Hb)
Carcinoembryonic antigen (CEA)	Serum	0–5 ng/mL

دوام لری

Reference intervals for commonly used tests.^{1,2} (continued)

Test	Specimen	Conventional Metric Units
Catecholamines	Urine	Norepinephrine: 15–80 mcg/ 24 h Epinephrine: 0–20 mcg/24 h Dopamine: 65–400 mcg/24 h
CD4 T-cell count	Whole blood	0.36–1.73 × 10 ³ /mCL
Ceruloplasmin	Serum or plasma	20–60 mg/dL (laboratory-specific)
Chloride (Cl ⁻)	Serum or plasma	101–112 mEq/L
Cholesterol, total	Serum or plasma	Desirable: < 200 mg/dL Borderline: 200–240 mg/dL High risk: > 240 mg/dL
Complement C3	Serum	64–166 mg/dL
Complement C4	Serum	15–45 mg/dL
Complement CH50	Serum	(Laboratory-specific)
Cortisol	Serum or plasma	8:00 a.m.: 5–20 mcg/dL
Cortisol (urinary free)	Urine	10–110 mcg/24 h

دوام لرى

Reference intervals for commonly used tests.^{1,2} (continued)

Test	Specimen	Conventional Metric Units
Creatine kinase (CK)	Serum or plasma	32–267 units/L (method-dependent)
Creatine kinase MB (CKMB)	Serum or plasma	< 16 units/L or < 4% of total CK (laboratory-specific) Mass units: 0–7 mcg/L
Creatinine (Cr)	Serum or plasma	0.6–1.2 mg/dL
Creatinine clearance (Cl_{G})	See Collection column	Adults: 90–140 mL/min/1.73 m ² body surface area (BSA)
Cryoglobulins	Serum	Negative
Cystatin C	Serum or plasma	0.5–1.3 mg/L
D-dimer, quantitative	Plasma	< 500 ng/mL (age-dependent)
Dehydroepiandrosterone sulfate (DHEA-S)	Serum or plasma	Male: 40–500 mcg/dL Female: 20–320 mcg/dL
Eosinophil count	Whole blood	0.04–0.5 × 10 ³ /mcL
Erythrocyte count (RBC count)	Whole blood	4.7–6.1 × 10 ⁶ /mcL
Erythrocyte sedimentation rate	Whole blood	Male: < 10 mm/h Female: < 15 mm/h (laboratory-specific)

دوام لرى

Reference intervals for commonly used tests.^{1,2} (continued)

Test	Specimen	Conventional Metric Units
Erythropoietin (EPO)	Serum	5–30 milli-units/mL
Estradiol	Serum	Early follicular: 30–100 pg/mL Late follicular: 100–400 pg/mL Luteal: 50–150 pg/mL Postmenopausal: 2–21 pg/mL
Estrogens, total	Serum	Follicular: 60–200 pg/mL Luteal: 160–400 pg/mL Postmenopausal: < 130 pg/mL
Ethanol	Serum or plasma	0 mg/dL Legal ‘driving under the influence’ in many states is defined as a blood alcohol level of > 80 mg/dL (> 17 mmol/L); serum levels are 10–35% higher than whole blood alcohol levels

دوان لرى

Reference intervals for commonly used tests.^{1,2} (continued)

Test	Specimen	Conventional Metric Units
Factor VIII assay	Plasma	50–150% of normal (varies with age)
Fecal fat	Stool	Random: < 60 droplets of fat per high-power field 72-hour: < 7 g/24 h
Ferritin	Serum or plasma	Male: 16–300 ng/mL Female: 4–161 ng/mL
Fibrinogen (functional)	Plasma	175–433 mg/dL Panic: < 75 mg/dL
Follicle-stimulating hormone (FSH)	Serum or plasma	Female: Follicular phase 4–13 milli-units/mL Luteal phase 2–13 milli-units/mL Midcycle 5–22 milli-units/mL Postmenopausal 30–138 milli-units/mL Male: 1–10 milli-units/mL (laboratory-specific)
Free erythrocyte protoporphyrin (FEP)	Whole blood	< 35 mcg/dL (method-dependent)
Fructosamine	Serum or plasma	190–270 mcmol/L

دوام لری

Reference intervals for commonly used tests.^{1,2} (continued)

Test	Specimen	Conventional Metric Units
Galectin-3 (Gal-3)	Serum	< 22 ng/mL (laboratory-specific) Patients with HF: Low risk: < 17.8 ng/mL; Intermediate risk: 17.9–25.9 ng/mL; High risk: > 25.9 ng/mL
Gamma-glutamyl transpeptidase (GGT)	Serum or plasma	9–85 units/L (laboratory-specific)
Gastrin	Serum	< 100 pg/mL (laboratory-specific)
Glomerular filtration rate, estimated (eGFR)	Serum or plasma	> 60 mL/min/1.73 m ² (calculated based on creatinine or cystatin C level)
Glucagon	Plasma	20–100 pg/mL
Glucose	Serum or plasma	60–110 mg/dL Panic: < 40 or > 500 mg/dL

دوام لرى

Reference intervals for commonly used tests.^{1,2} (continued)

Test	Specimen	Conventional Metric Units
Glucose-6-phosphate dehydrogenase (G6PD) screen	Whole blood	5–14 units/g Hb
Glutamine	Cerebrospinal fluid (CSF)	6–15 mg/dL Panic: > 40 mg/dL
Glycated (glycosylated) hemoglobin (HbA _{1c})	Whole blood	3.9–5.6% (method-dependent)
Growth hormone (GH)	Serum or plasma	0–5 ng/mL
Haptoglobin	Serum or plasma	46–316 mg/dL
HDLcholesterol	Serum or plasma	Male: 27–67 mg/dL Female: 34–88 mg/dL (HDLcholesterol > 60 mg/dL is thought to lower risk of coronary heart disease)
Hematocrit (Hct)	Whole blood	Male: 39–49% Female: 35–45% (age-dependent)
Hemoglobin A _{1c} (See Glycated hemoglobin)	Whole blood	3.9–5.6% (method-dependent)
Hemoglobin A ₂ (HbA ₂)	Whole blood	1.5–3.5% of total hemoglobin

دوام لرى

Reference intervals for commonly used tests.^{1,2} (continued)

Test	Specimen	Conventional Metric Units
Hemoglobin electrophoresis	Whole blood	HbA > 95% HbA ₂ : 1.5–3.5% HbF < 2% (age-dependent)
Hemoglobin, total (Hb)	Whole blood	Male: 13.6–17.5 g/dL Female: 12.0–15.5 g/dL (age-dependent) Panic: ≤ 7 g/dL
Heparin-associated antibody (heparin-induced thrombocytopenia)	Serum	Negative
HIV antibody	Serum or plasma	ELA: Negative Western blot: Nonreactive
HIV RNA, quantitative (viral load)	Plasma	Negative (or < 75 copies/mL, assay-specific)
Homocysteine	Serum or plasma	4.5–12 mg/dL (method- and age-dependent)
5-Hydroxyindoleacetic acid (5-HIAA)	Urine	2–8 mg/24 h

دوام لری

Reference intervals for commonly used tests.^{1,2} (continued)

Test	Specimen	Conventional Metric Units
IgG index	Serum and CSF	0.29–0.59 ratio (CSF: serum ratio)
Immunoglobulins (Ig)	Serum	IgA: 78–367 mg/dL IgG: 583–1761 mg/dL IgM: 52–335 mg/dL
Insulin, immunoreactive	Serum or plasma	6–35 micro-units/mL
Insulin-like growth factor-1	Plasma	123–463 ng/mL (age- and sex-dependent)
Iron (Fe)	Serum or plasma	50–175 mcg/dL
Iron-binding capacity, total (TIBC)	Serum or plasma	250–460 mcg/dL
JAK2 mutations (V617F or exon 12/13 mutation), qualitative	Whole blood	Negative (Positive: myeloproliferative neoplasms, ie, polycythemia vera [95%], essential thrombocythemia [70%], and primary myelofibrosis [60%])
Kappa and lambda free light chains, quantitative	Serum	Free kappa: 0.57–2.63 mg/dL Free lambda: 0.33–1.94 mg/dL Free kappa/lambda ratio: 0.26–1.65

دوام لری

Reference intervals for commonly used tests.^{1,2} (continued)

Test	Specimen	Conventional Metric Units
Ketone bodies	Serum or plasma	Qualitative: Negative Quantitative: <10 mg/dL
Lactate dehydrogenase (LDH)	Serum or plasma	88–230 units/L (laboratory-specific)
Lactic acid (lactate)	Venous blood	0.5–2.0 mEq/L
LDLcholesterol (calculated or direct)	Serum or plasma	Desirable: < 130 mg/dL (< 99 mg/dL for patients with CHD) Borderline: 130–159 mg/dL High risk: ≥ 160 mg/dL
Lead (Pb)	Whole blood	Child: < 25 mcg/dL Adult: < 40 mcg/dL
Leukocyte (white blood cell) count, total (WBC count)	Whole blood	4.8–10.8 × 10 ³ /mcL Panic: < 1.5 × 10 ³ /mcL
Lipase	Serum	0–160 units/L (laboratory-specific)

دوان لرى

Reference intervals for commonly used tests.^{1,2} (continued)

Test	Specimen	Conventional Metric Units
Luteinizing hormone (LH)	Serum or plasma	Female: Follicular phase 1–18 milli-units/mL Luteal phase 0.4–20 milli-units/mL Midcycle 24–105 milli-units/mL Postmenopausal 15–62 milli-units/mL Male: 1–10 milli-units/mL (laboratory-specific)
Lymphocyte count	Whole blood	$0.8\text{--}3.5 \times 10^3/\mu\text{L}$
Magnesium (Mg^{2+})	Serum or plasma	1.8–3.0 mg/dL Panic: < 0.5 or > 4.5 mg/dL
Mean corpuscular hemoglobin (MCH)	Whole blood	27–34 pg
Mean corpuscular hemoglobin concentration (MCHC)	Whole blood	31–36 g/dL
Mean corpuscular volume (MCV)	Whole blood	80–100 fL
Metanephries, free	Plasma	Normetanephrine: < 0.9 nmol/L Metanephrine: < 0.5 nmol/L
Metanephries	Urine	0.3–0.9 mg/24 h

دوام لری

Reference intervals for commonly used tests.^{1,2} (continued)

Test	Specimen	Conventional Metric Units
Methemoglobin (MetHb)	Whole blood	< 1% of total hemoglobin
Methylmalonic acid	Serum or plasma	0–0.05 mg/L
Monocyte count	Whole blood	0.2–0.8 × 10 ³ /mCL
Neutrophil count	Whole blood	2.2–8.6 × 10 ³ /mCL
Osmolality	Serum or plasma	275–293 mOsm/kg H ₂ O Panic: < 240 or > 320 mOsm/kg H ₂ O
	Urine	Random: 100–900 mOsm/kg H ₂ O
Osteocalcin	Serum or plasma	Child or adolescent (age 7–17 years): 25–300 ng/mL Adult: 10–15 ng/mL
Oxygen, partial pressure (Po ₂)	Whole blood	83–108 mm Hg
Pancreatic elastase, fecal	Formed stool	> 200 mcg/g
Pancreatic polypeptide	Serum or plasma	< 430 pg/mL (age-dependent and laboratory-specific)

دوام لرى

Reference intervals for commonly used tests.^{1,2} (continued)

Test	Specimen	Conventional Metric Units
Parathyroid hormone (PTH), intact	Serum or plasma	Intact PTH 11–54 pg/mL (laboratory-specific)
Partial thromboplastin time, activated (PTT)	Plasma	25–35 seconds (reference interval varies) Panic: ≥ 60 seconds, or > 100 seconds for unfractionated heparin monitoring
pH	Whole blood	Arterial: 7.35–7.45 Venous: 7.31–7.41
Phosphorus	Serum or plasma	2.5–4.5 mg/dL Panic: < 1.0 mg/dL
Plasminogen	Plasma	70–113% (activity)
Platelet count (Plt)	Whole blood	150–450 × 10 ³ /mCL Panic: < 25 × 10 ³ /mCL
Platelet-associated IgG	Plasma or serum	Negative
Platelet function test (PFA-100 closure time) (CEPI: collagen/epinephrine cartridge; CADP: collagen/ADP cartridge)	Whole blood	CEPI: 70–170 seconds (laboratory-specific) CADP: 50–110 seconds (laboratory-specific)
Porphobilinogen (PBG)	Urine	Negative

دوام لری

Reference intervals for commonly used tests.^{1,2} (continued)

Test	Specimen	Conventional Metric Units
Potassium (K ⁺)	Serum or plasma	3.5–5.0 mEq/L Panic: < 3.0 or > 6.0 mEq/L
Procalcitonin	Serum or plasma	< 0.10 ng/mL
Procollagen type 1 intact N-terminal propeptide (PINP)	Serum	16–105 ng/mL (age- and sex-dependent)
Prolactin (PRL)	Serum or plasma	< 20 ng/mL
Prostate-specific antigen (PSA)	Serum or plasma	0–4 ng/mL
Protein C	Plasma	71–176% (functional) 60–150% (antigenic)
Protein electrophoresis	Serum	Adult: Albumin: 3.3–4.7 g/dL α_1 : 0.1–0.4 g/dL α_2 : 0.3–0.9 g/dL β_2 : 0.7–1.5 g/dL γ : 0.5–1.4 g/dL (polyclonal)

دراهم لری

Reference intervals for commonly used tests.^{1,2} (continued)

Test	Specimen	Conventional Metric Units
Protein S (antigen)	Plasma	76–178%
Protein, total	Serum or plasma	6.0–8.0 g/dL
Prothrombin time (PT)	Plasma	11–15 seconds Panic: ≥ 30 seconds (laboratory-specific)
Red blood cell count	Whole blood	Male: $4.7\text{--}6.1 \times 10^6/\text{mCL}$ Female: $3.5\text{--}5.5 \times 10^6/\text{mCL}$
Renin activity	Plasma	High-sodium diet (75–150 mEq Na ⁺ /d): Supine: 0.2–2.3 ng/mL/h Standing: 1.3–4.0 ng/mL/h Low-sodium diet (30–75 mEq Na ⁺ /day): Standing: 4.0–7.7 ng/mL/h
Reticulocyte count	Whole blood	$33\text{--}137 \times 10^3/\text{mCL}$
Russell viper venom clotting time (dilute) (RVVT)	Plasma	24–37 seconds
Salicylate (aspirin)	Serum	200–300 mg/L Panic: > 350 mg/L
Sodium (Na ⁺)	Serum or plasma	135–145 mEq/L Panic: < 125 or > 155 mEq/L
Somatostatin	Plasma	< 25 pg/mL (laboratory-specific)
Testosterone	Serum or plasma	Male: 175–781 ng/dL Female: 10–75 ng/dL

دوان امری

Reference intervals for commonly used tests.^{1,2} (continued)

Test	Specimen	Conventional Metric Units
Thyroglobulin	Serum or plasma	3–42 ng/mL
Thyroid-stimulating hormone (TSH)	Serum or plasma	0.4–4 micro-units/mL Panic: > 50 micro-units/mL
Thyroid-stimulating antibody, Thyroid stimulating hormone receptor antibody (TSH-R Ab [stim])	Serum	< 130% of basal activity; based on cAMP generation in thyroid cell tissue culture
Thyroxine, free (FT ₄)	Serum or plasma	0.7–1.86 ng/dL
Thyroxine (T ₄), total	Serum or plasma	5–11 mcg/dL
Transferrin	Serum or plasma	190–375 mg/dL
Transferrin, carbohydrate-deficient (CDT)	Serum	< 1.3% method-dependent
Transferrin receptor, soluble (sTFR)	Serum or plasma	2.2–5 mg/L(male) 1.9–4.4 mg/L(female) (laboratory-specific)

دوانم لری

Reference intervals for commonly used tests.^{1,2} (continued)

Test	Specimen	Conventional Metric Units
Triglycerides	Serum or plasma	< 165 mg/dL
Triiodothyronine (T ₃), total	Serum	95–190 ng/dL
Troponin-I (cTnI)	Plasma	< 0.1 ng/mL (method-dependent)
Uric acid	Serum or plasma	Male: 2.4–7.4 mg/dL Female: 1.4–5.8 mg/dL
Vanillylmandelic acid (VMA)	Urine	2–7 mg/24 h
Vitamin B ₁₂	Serum or plasma	170–820 pg/mL
Vitamin D, 25-hydroxy (25[OH]D)	Serum or plasma	20–50 ng/mL
Vitamin D, 1,25-dihydroxy (1,25[OH] ₂ D)	Serum or plasma	20–76 pg/mL
von Willebrand factor (vWF)	Plasma	50–180% (activity and antigen)
White blood cell count	Whole blood	4.8–10.8 × 10 ³ /mCL Panic: < 1.5 × 10 ³ /mCL

لیدل شوی دی چې د مطالعې په وخت کې لوستونکې د ئىنبو طبی مخفاټو سره مخامنځ کېږي چې په هماغه ئهای کې توضیح شوی نه وی نو لوستونکې مجبوریې چې بل کوم ريفرينس ته مراجعه وکړي چې دا کار لاهه یوی خوا د لوستونکې وخت ضایع کوي او له بله طرفه د اصلی موضوع

سره ئی ارتباٹ کمیری د دی ستونزی د رفع لپاره په زیات
 شمیر کی COCOMMON MEDICAL ABBREVIATION د
 کتاب په پای کی خای په خای کړی دی ۰

COCOMMON MEDICAL ABBREVIATION

α alpha: Bunsen solubility coefficient; first in a series; specific rotation term; heavy chain class corresponding to IgA
α-h the right handed helical form assumed by many proteins
α-T α tocopherol
a (specific) absorption (coefficient) (USUALLY ITALIC); (total) acidity; area; (systemic) arterial (blood) (SUBSCRIPT); asymmetric; atto
A absorbance
A adenosine (or adenylic acid); alveolar gas (SUBSCRIPT); ampere
Å angstrom; Ångström unit
aa [G.] ana of each (USED in prescriptions)
AA amino acid; aminoacyl
a.c. [L.] ante cibum, before a meal
A:G R albumin globulin ratio
Ab antibody
AB abortion
ABG arterial blood gas
ABI ankle-brachial index
abl Abelson murine leukemia virus

ACh, Ach acetylcholine
aCL anticardiolipin (antibody)
ACP acyl carrier protein
ACTH adrenocorticotrophic hormone (corticotropin)
AD Alzheimer disease
QAD [L.] *auris dextra*, right ear
ADD attention deficit disorder
ad lib. [L.] ad libitum, freely, as desired
Ade adenine
ADH antidiuretic hormone
ADHD attention deficit hyperactivity disorder
ADLs activities of daily living
Ado adenosine
ADP adenosine 5' diphosphate
ADR adverse drug reaction
A-E above the elbow (amputation)
AECB acute exacerbation of chronic bronchitis
AED automated external defibrillator
AFB acid fast bacillus
AFORMED alternating failure of response, mechanical, to electrical depolarization

ABL B alternate binaural loudness balance (test)	AFP α -fetoprotein
ABO blood group system	Ag antigen; [L.] argentum, silver
ABR abortus Bang ring (test); auditory brainstem response (audiometry)	AHF antihemophilic factor
γ-Abu- γ aminobutyric acid	AHG antihemophilic globulin
ABVD Adriamycin (doxorubicin), bleomycin, vinblastine, and dacarbazine	AID artificial insemination donor
ac acetyl	AIDS acquired immunodeficiency syndrome
a.c. [L.] ante cibum, before a meal	AIH artificial insemination by husband; artificial insemination, homologous
aC arabinosylcytosine	A-K above the knee (amputation)
Ac acetyl; actinium	Al aluminum
AC acetate; acromioclavicular; air conduction; alternating current; atriocarotid	Ala alanine (or its monoradical or diradical)
AC:A accommodation convergence accommodation (ratio)	ALA δ -aminolevulinic acid
ACE angiotension converting enzyme	ALD adrenoleukodystrophy
ACEI angiotensin converting enzyme inhibitor	ALL acute lymphocytic leukemia
AcG accelerator globulin	ALS advanced life support; amyotrophic lateral sclerosis; antilymphocyte serum
ac-g accelerator globulin	ALT alanine aminotransferase
	Am americium
	AML acute myelogenous leukemia

AMP adenosine monophosphate (adenylic acid)	ATPase adenosine triphosphatase
amu atomic mass unit	ATPD ambient temperature and pressure, dry
ANA antinuclear antibody	ATPS ambient temperature and pressure, saturated (with water vapor)
ANF antinuclear factor	QAU [L.] <i>auris utraque</i> , each ear, both ears
ANOVA analysis of variance	Au [L.] <i>aurum</i> , gold
ANS autonomic nervous system	AUC area under the curve
ANUG acute necrotizing ulcerative gingivitis	AV arteriovenous
AP anteroposterior	A-V arteriovenous; atrioventricular
APA antipernicious anemia (factor)	AVM arteriovenous malformation
APAP acetaminophen	AVN atrioventricular node
A-P-C adenoidal pharyngeal conjunctival (virus)	AVP antiviral protein
APC antigen presenting cell	AW atomic weight
aPS antiphospholipid antibody syndrome	ax. axis
APTT activated partial thromboplastin time	AZT azidothymidine (zidovudine)
Ar argon	B barometric (pressure) (SUBSCRIPT); boron
araC arabinosylcytosine (cytarabine)	b blood (SUBSCRIPT)
ARDS adult <i>or</i> acute respiratory distress syndrome	β second in a series
ARF acute renal failure; acute rheumatic fever	Ba barium
Arg arginine (or its monoradical or diradical)	BADLs basic activities of daily living
AROM active range of motion	BAER brainstem auditory evoked response

QAS [L.] <i>auris sinistra</i> , left ear	
As arsenic	
ASA acetylsalicylic acid (aspirin)	
ASCP American Society of Clinical Pathologists	
ASC-US atypical squamous cells of undetermined significance	
ASHD arteriosclerotic heart disease	
Asn asparagine (or its mono or diradical)	
ASO antistreptolysin O	
Asp aspartic acid (or its radical forms)	
AST aspartate aminotransferase	
At astatine	
at. wt. atomic weight	
ATFL anterior talofibular ligament	
ATL adult T cell leukemia; adult T cell lymphoma	
atm (standard) atmosphere	
ATP adenosine 5' triphosphate	
BAL British anti-Lewisite (dimercaprol); bronchoalveolar lavage	
BALB binaural alternate loudness balance (test)	
BBB blood brain barrier; bundle branch block	
BBT basal body temperature	
BCG bacille bilié de Calmette Guérin (vaccine)	
BE barium enema	
B-E below the elbow (amputation)	
Be beryllium	
Bi bismuth	
b.i.d. [L.] <i>bis in die</i> , twice a day	
BIDS brittle hair, impaired intelligence, decreased fertility, and short stature (syndrome)	
BIPAP bilevel positive airway pressure	
Bk berkelium	
BM bowel movement	
BMD bone mineral density	
BMI body mass index	
BNEd Bachelor of Nursing Education	

BNP brain natriuretic peptide	CAD coronary artery disease
BNSc Bachelor of Nursing Science	cal calorie (small)
bp base pair	Cal calorie (large)
BP blood pressure; boiling point; <i>British Pharmacopoeia</i>	CAM complementary and alternative medicine
BPF bronchopleural fistula	cAMP cyclic adenosine monophosphate
BPH Bachelor of Public Health	CAO conscious, alert, oriented
BPH benign prostatic hyperplasia	cap capsule
Bq becquerel (SI unit of radionuclide activity)	CAP catabolite (gene) activator protein; community-acquired pneumonia
Br bromine	CAPD continuous ambulatory peritoneal dialysis
BRAT (diet) banana, rice cereal, applesauce, toast	CAT computerized axial tomography (obsolete)
BS, BSc Bachelor of Science (Baccalaureus Scientiae)	CBC complete blood (cell) count
BSA body surface area	CBG corticosteroid binding globulin
BSE breast self-examination	CBT cognitive-behavioral therapy
BSER brainstem evoked response (audiometry)	Cbz carbobenzoxy (chloride)
BSN Bachelor of Science in Nursing	Qcc, e.c. cubic centimeter
BSO bilateral salpingo-oophorectomy	CCK cholecystokinin
BT bleeding time	CCNU chloroethylcyclohexylnitrosourea (lomustine)
BTPS body temperature, ambient pressure, saturated (with water vapor)	CCU coronary care unit; critical care unit
BTU British thermal unit	cd candela
	Cd cadmium

BTX botulinum toxin	CD compact disc
BUN blood urea nitrogen	CDA Certified Dental Assistant
BUS Bartholin glands, urethra, Skene glands	CDC (U.S) Centers for Disease Control and Prevention
BVMS Bachelor of Veterinary Medicine and Surgery	cDNA complementary DNA
Bx biopsy	CDP cytidine 5' diphosphate
c calorie (small); capillary (blood); centi	Ce cerium
C calorie (large); carbon; Celsius; centigrade; clearance (rate, renal) <i>c</i> ; compliance; concentration; cylindric(lens); cytidine	CEA carcinoembryonic antigen; carotid endarterectomy
c [L.] <i>cum</i> , with	CELO chicken embryo lethal orphan (virus)
C&S culture and sensitivity	CEP congenital erythropoietic porphyria
C.C. chief complaint	CEU continuing education unit
c/o complains of	Cf californium
ca. [L.] <i>circa</i> , about, approximately	CF complement fixation; cystic fibrosis; coupling factor
c-a cardioarterial	CG chorionic gonadotropin
Ca calcium; cathodal; cathode	CGA catabolite gene activator
CA cancer; carcinoma; cardiac arrest; chronologic age; contrast angiography; croup associated (virus); cytosine arabinoside	cGMP cyclic guanosine monophosphate
CABG coronary artery bypass graft	cgs, CGS centimeter-gram-second (system, unit)
	Ch¹ Christchurch (chromosome)
	ChB Bachelor of Surgery (Chirurgiae Baccalaureus)

cm centimeter	CRNA Certified Registered Nurse Anesthetist
cM centimorgan	
Cm curium	CRNP Certified Registered Nurse Practitioner
CMA Certified Medical Assistant	CRP cross reacting protein
CMC carpometacarpal	CRST calcinosis cutis, Raynaud phenomenon, sclerodactyly, and telangiectasia (syndrome)
CME continuing medical education	CRT Certified Respiratory Therapist
CMI cell mediated immunity	Cs cesium
CML chronic myelogenous leukemia	CS cesarean section; Chief of Staff
CMO Chief Medical Officer	CSD catscratch disease
CMP cytidine 5' phosphate (or any cytidine monophosphate)	CSF cerebrospinal fluid; colony-stimulating factor
CMT Certified Medical Transcriptionist	CT computed tomography
CMV controlled mechanical ventilation; cytomegalovirus	CTP cytidine 5' triphosphate
CNM Certified Nurse-Midwife	CTR cardiothoracic ratio
CNP Community Nurse Practitioner	Cu [L.] cuprum, copper
CNS central nervous system	CV cardiovascular
Co cobalt	CVA cerebral vascular (cerebrovascular) accident, costovertebral angle
CoA coenzyme A	CVP central venous pressure
COG center of gravity	CVS cardiovascular system; chorionic villus sampling
conA concanavalin A	CXR chest x-ray
	Cyd cytidine

ChD, Chir Doct Doctor of Surgery (Chirurgiae Doctor)	COPD chronic obstructive pulmonary disease
CHF congestive heart failure	COS Chief of Staff
ChM Master of Surgery (Chirurgiae Magister)	CP cerebral palsy; costophrenic
CHO carbohydrate	CPAP continuous (or constant) positive airway pressure
Ci curie	CPD cephalopelvic disproportion
CI color index; <i>Colour Index</i> ; confidence interval	CPK creatine phosphokinase
CIE counterimmunoelectrophoresis	CPM continuous passive motility
CIN cervical intraepithelial neoplasia	CPPB continuous (or constant) positive pressure breathing
CIQ cognitive laterality quotient	CPPV continuous positive pressure ventilation
CIU chronic idiopathic urticaria	CPR cardiopulmonary resuscitation
CJD Creutzfeldt-Jakob disease	cps cycles per second
CK creatine kinase	CPT <i>Current Procedural Terminology</i>
CK-MB creatine kinase MB isoenzyme	Cr chromium; creatinine
Cl chlorine	CR Chief Resident; conditioned reflex; crown rump (length)
CL cardiolipin	CRD chronic respiratory disease
CLA(ASCP) Clinical Laboratory Assistant (American Society of Clinical Pathologists)	CRH corticotropin releasing hormone
CLIA Clinical Laboratory Improvement Amendments	CRL crown rump length
CLL chronic lymphocytic leukemia	

cyl cylinder; cylindric (lens)	DF decayed and filled (permanent teeth)
CYP cytochrome P-450 (enzyme)	Df deficiency (absence or inactivation of a gene)
Cys cysteine	dGMP deoxyguanosine monophosphate (deoxyguanylic acid)
Cyt cytosine	DH Dental Hygienist
Δ delta; change; heat	DHEA dehydro-3-epiandrosterone
δ delta; heavy chain class corresponding to IgD	DIC disseminated intravascular coagulation
D & C dilatation and curettage	DIF direct immunofluorescence
D & E dilatation and evacuation	DIP desquamative interstitial pneumonia; distal interphalangeal (joint)
D Dalton, dead (space gas) (SUBSCRIPT); deciduous; deuterium; diffusing (capacity); dihydrouridine (in nucleic acids); diopter; [L.] dexter, right (opposite of left); vitamin D potency of cod liver oil	DJD degenerative joint disease
d deci-; day	dk deca-, deka-
d deuterium	DKA diabetic ketoacidosis
d dextrorotatory	dL deciliter
D- prefix indicating that a molecule is sterically analogous to D glyceraldehyde	dM decimorgan
da deca	DM diabetes mellitus
dA deoxyadenosine	DMARD disease-modifying antirheumatic drug
Da dalton	DMD Doctor of Dental Medicine; Duchenne muscular dystrophy
DA developmental age	DME Director of Medical Education
dAdo deoxyadenosine	

dAMP deoxyadenylic acid	dmf decayed, missing, or filled (deciduous teeth)
DANS 1-dimethylaminonaphthalene 5 sulfonic acid	DMF decayed, missing, or filled (permanent teeth)
db decibel	DMSO dimethyl sulfoxide
dB decibel	DMT <i>N,N</i> dimethyltryptamine
DC Dental Corps; Doctor of Chiropractic; direct current	DMV Doctor of Veterinary Medicine
QD/C discharge; discontinue	DN dibucaine number
DCG dacryocystography	DNA deoxyribonucleic acid
DCh Doctor of Surgery (Doctor Chirurgiae)	DNB Diplomate of the National Board (of Medical Examiners)
DCI dichloroisoproterenol	DNE Director of Nursing Education; Doctor of Nursing Education
dCMP deoxycytidylic acid	DNP deoxyribonucleoprotein; 2,4 dinitrophenol
DDS Doctor of Dental Surgery	DNR do not resuscitate
DDT dichlorodiphenyl trichloroethane (chlorophenothane)	DNS Director of Nursing Service(s)
def decayed, extracted, or filled (deciduous teeth)	DO Doctor of Osteopathy
DEF decayed, extracted, or filled (permanent teeth)	DOA dead on arrival
DES diethylstilbestrol	DOB date of birth
DET diethyltryptamine	DOC deoxycholic acid; deoxycorticosterone
DEV duck embryo vaccine; duck embryo virus	DOE dyspnea on exertion
DEXA dual energy x-ray absorptiometry	DOM 2,5-dimethoxy-4-methylamphetamine
df decayed and filled (deciduous teeth)	

DON Director of Nursing	DVM Doctor of Veterinary Medicine
DOT directly observed therapy	
DP Doctor of Pharmacy; Doctor of Podiatry	DVT deep vein thrombosis
Dp duplication of a gene or chromosomal segment	Dx diagnosis
2,3 DPG 2,3 diphosphoglycerate	Dy dysprosium
DPH Doctor of Public Health; Doctor of Public Hygiene	ε epsilon; molar absorption coefficient; heavy chain class corresponding to IgE
DPharm Doctor of Pharmacy	E exa ; extraction (ratio)
DPI dry powder inhaler	EB Epstein Barr (virus)
DPM Doctor of Physical Medicine; Doctor of Podiatric Medicine	EBV Epstein Barr virus
DPN diphosphopyridine nucleotide	ECF extended care facility; extracellular fluid
DPT dipropyltryptamine; diphtheria, pertussis, and tetanus (vaccines)	ECF-A eosinophilic chemotactic factor of anaphylaxis
dr dram	ECG electrocardiogram
DR degeneration reaction, reaction of degeneration	ECHO enterocytopathogenic human orphan (virus)
Dr Med Doctor of Medicine	ECM erythema chronicum migrans
DRE digital rectal examination	ECMO extracorporeal membrane oxygenation
DRG diagnosis-related group	ECS electrocerebral silence
DrPH Doctor of Public Health; Doctor of Public Hygiene	ECT electroconvulsive therapy
DRVVT dilute Russell viper venom test	ED eating disorder; effective dose; emergency department; erectile dysfunction
D-S Doerfler Stewart (test)	EDC expected date of confinement recipe, (the first word on a prescription), take; prescription; treatment

DSA digital subtraction angiography	EDTA ethylenediamine-tetraacetic acid (edathamil, edetic acid)
DSc Doctor of Science	EEG electroencephalogram
DSD dry sterile dressing	EENT eye, ear, nose, and throat
dsDNA double-stranded DNA	EIA enzyme immunoassay
DSM <i>Diagnostic and Statistical Manual of Mental Disorders of the American Psychiatric Association</i>	EKG [German] <i>Elektrokardiogramme</i> , electrocardiogram
dT deoxythymidine	EKY electrokymogram
DT delirium tremens; duration of tetany	ELISA enzyme-linked immunosorbent assay
dTDP deoxythymidine 5' diphosphate	EMC encephalomyocarditis (virus)
dThd thymidine	EMF electromotive force
DTIC dimethyltrizenoimidazole carboxamide (dacarbazine)	EMG electromyogram; exomphalos, macroglossia, and gigantism (syndrome)
dTMP deoxythymidylic acid	EMS eosinophilia-myalgia syndrome
DTP diphtheria and tetanus toxoids and pertussis vaccine; distal tingling on percussion (Tinel sign)	EMT Emergency Medical Technician
DTPA diethylenetriamine pentaacetic acid	ENG electronystagmography
DTR deep tendon reflex	ENT ear, nose, and throat
dTTP deoxythymidine 5' triphosphate	EOG electrooculography
	EOM extraocular muscle(s)
	EPAP expiratory positive airway pressure

EPO erythropoietin
ER endoplasmic reticulum; emergency room
Er erbium
ERBF effective renal blood flow
ERCP endoscopic retrograde cholangiopancreatography
ERG electroretinogram
ERPF effective renal plasma flow
ERT estrogen replacement therapy
ERV expiratory reserve volume
Es einsteinium
ESEP extreme somatosensory evoked potential
ESP extrasensory perception
ESR electron spin resonance; erythrocyte sedimentation rate
ESRD end stage renal disease
ESWL extracorporeal shock-wave lithotripsy
EtOH ethyl alcohol
Eu europium
ev electron volt
eV electron volt

FACO Fellow of the American College of Otolaryngology
FACOG Fellow of the American College of Obstetricians and Gynecologists
FACOS Fellow of the American College of Orthopaedic Surgeons
FACP Fellow of the American College of Physicians
FACR Fellow of the American College of Radiology
FACS Fellow of the American College of Surgeons
FAD flavin(e) adenine dinucleotide; familial Alzheimer disease
FAMA Fellow of the American Medical Association
FANA fluorescent antinuclear antibody (test)
FAP familial adenomatous polyposis

F Fahrenheit; faraday (constant); fertility (factor); field (of vision); fluorine; force; fractional (concentration); free (energy)	FB foreign body
f femto-; (respiratory) frequency	FBS fasting blood sugar
F₁ first filial generation	Fc constant fragment of an antibody molecule
F1.2 (prothrombin) fragment 1.2	FDA (U.S.) Food and Drug Administration
FAAN Fellow of the American Academy of Nursing	Fe [L.] ferrum, iron
FAAP Fellow of the American Academy of Pediatrics	FEF forced expiratory flow
Fab fragment of antibody molecule involved in antigen binding	FET forced expiratory time
FACA Fellow of the American College of Anesthesiology	FEV forced expiratory volume
FACAL Fellow of the American College of Allergy	FF filtration fraction
FACC Fellow of the American College of Cardiologists	FFD focus film distance
FACD Fellow of the American College of Dentists	FHR fetal heart rate
FACFP Fellow of the American College of Family Physicians	FHT fetal heart tones
	FIA fluorescent immunoassay
	FIGLU formiminoglutamic (acid)
	FISH fluorescent in situ hybridization
	Fm fermium
	FMN flavin(e) mononucleotide
	FNA fine-needle aspiration
	fps, FPS foot pound second (system, unit)
	Fr francium; French (gauge, scale)
	FRC functional residual capacity (of lungs)
	French (catheter gauge)
	FRF follicle stimulating hormone releasing factor
	FRS first rank symptom
	Fru fructose

FSH follicle stimulating hormone	Glu glutamic acid; glutamyl
FSH-RF follicle stimulating hormone releasing factor	Gly glycine; glycyl
FSH-RH follicle stimulating hormone releasing hormone	GMO General Medical Officer
FTA-ABS fluorescent treponemal antibody absorption (test)	GMP guanosine monophosphate (guanylic acid)
FU fluorouracil	GMS Gomori (or Grocott) methenamine silver (stain)
F/U follow-up	GN Graduate Nurse
FUO fever of unknown origin	GnRH gonadotropin releasing hormone
FVC forced vital capacity	GOT glutamic oxaloacetic transaminase (aspartate aminotransferase)
Fw F wave (fibrillary wave, flutter wave)	GPI Gingival Periodontal Index
Fx fracture	GPT glutamic pyruvic transaminase (alanine aminotransferase)
γ gamma; Ostwald solubility coefficient; the third in a series; heavy chain class corresponding to IgG	gr grain
G 1 gap 1	GSH reduced glutathione
G 2 gap 2	GSR galvanic skin response
G giga ; glucose; gravitation (newtonian constant of); guanosine (or guanylic acid) residues in polynucleotides; gravida (obstetric history)	GSSG oxidized glutathione
g gram	GSW gunshot wound
G6P glucose 6 phosphate	gt. [L.] <i>gutta</i> , a drop
Ga gallium	GTP guanosine 5' triphosphate
	gtt. [L.] <i>guttæ</i> , drops
	GTT glucose tolerance test
	GU genitourinary
	Guo guanosine

GABA γ -aminobutyric acid	
GABHS group-A β -hemolytic	GVHD graft versus host disease
<i>Streptococcus</i>	Gy gray (unit of absorbed dose of ionizing radiation)
Gal galactose	GYN gynecology
GC gonococcus, gonorrhea	h hecto
GCS Glasgow coma scale	¹H hydrogen-1 (protium, light hydrogen)
Gd gadolinium	²H hydrogen-2 (deuterium, heavy hydrogen)
GDP mannose 1 phosphate guanylyltransferase	³H hydrogen-3 (tritium, radioactive hydrogen)
Ge germanium	H henry; hydrogen; hyperopia; hyperopic
GERD gastroesophageal reflux disease	<i>h</i> Planck constant
GFR glomerular filtration rate	H & E hematoxylin and eosin
GGT γ -glutamyl transferase	H & H hematocrit and hemoglobin
GH glenohumeral; growth hormone	H⁺ hydrogen ion
GHB γ -hydroxybutyrate	Ha hahnium
GHRF growth hormone releasing factor	HA hyaluronic acid; hemagglutinin
GH-RF growth hormone releasing factor	HAART highly active anti-retroviral therapy
GHRH growth hormone releasing hormone	HAV hepatitis A virus
GH-RH growth hormone releasing hormone	Hb hemoglobin
GI gastrointestinal; Gingival Index	HbA adult hemoglobin
GIP gastric inhibitory polypeptide	HbA₁ major component of adult hemoglobin
GLC gas liquid chromatography	HbA₂ minor fraction of adult hemoglobin
Gln glutamine; glutaminyl	

HbAS heterozygosity for hemoglobin A and hemoglobin S (sickle cell trait)	HI hemagglutination inhibition (test, titer)
HB_cAg Hepatitis B core antigen	5-HIAA 5-hydroxyindoleacetic acid
HbCO carboxyhemoglobin	HIDA hepatobiliary iminodiacetic acid (scan)
HB_e Hepatitis B early antigen	HIPAA Health Insurance Portability and Accountability Act
HB_eAb Hepatitis B early antibody	His histidine -His histidino
Hb_eAg Hepatitis B early antigen	His- histidyl
HbF fetal hemoglobin	HIV human immunodeficiency virus
Hbg hemoglobin	HI hyperopia, latent
HBIG hepatitis B immune globulin	HLA human lymphocyte antigen, human leukocyte antigen
HBO hyperbaric oxygen	Hm hyperopia, manifest (hypermetropia)
HbO₂ oxyhemoglobin, oxygenated hemoglobin	HME human monocytic ehrlichiosis
HbS sickle cell hemoglobin	HMG CoA 3 hydroxy 3 methylglutaryl coenzyme A
HB_sAb hepatitis B surface antibody	HMG human menopausal gonadotropin
HB_sAg hepatitis B surface antigen	HMO Health Maintenance Organization
HBV hepatitis B virus	HMWK high molecular weight kininogen (Fletcher factor)
HCFA Health Care Financing Administration	Ho holmium
HCG human chorionic gonadotropin	h/o history of
HCl hydrochloric acid; hydrochloride	
HCS human chorionic somatomammotropin (human placental lactogen)	

Hct hematocrit	HPF high power field
HCV Hepatitis C virus	HPI history of present illness
h. d. [L.] <i>hora decubitus</i> , at bedtime	HPL human placental lactogen
HDL high-density lipoprotein	HPLC high performance liquid chromatography
HDRV human diploid (cell strain) rabies vaccine	HPV human papillomavirus
He helium	HRCT high-resolution computed tomography
HEMPAS hereditary erythroblastic multinuclearity associated with positive acidified serum	Qh. s., HS [L.] hora somni, at bedtime
Hf hafnium	HSV herpes simplex virus
HFJV high frequency jet ventilation	5-HT 5-hydroxytryptamine (serotonin)
HFOV high frequency oscillatory ventilation	Ht hyperopia, total
HFPPV high frequency positive pressure ventilation	HTLV human T cell lymphocytotropic virus; human T cell lymphoma/leukemia virus
HFV high frequency ventilation	HTN hypertension
Hg [L.] <i>hydrargyrum</i> , mercury	HVL half value layer
Hgb hemoglobin	Hx (medical) history
HGE human granulocytic ehrlichiosis	Hyp hydroxyproline
HGH human (pituitary) growth hormone	Hz hertz
HGSIL high-grade squamous intraepithelial lesion	¹²⁵I iodine 125
	¹³¹I iodine 131
	¹²³I iodine 123 (radioisotope)
	I inspired (gas) (SUBSCRIPT); iodine
	I & D incision and drainage

I & O (fluid) intake and output	IRB institutional review board
IADLs instrumental activities of daily living	IRV inspiratory reserve volume
IAP intermittent acute porphyria	ISI International Sensitivity Index
IBD inflammatory bowel disease	ITP idiopathic thrombocytopenic purpura; inosine 5' triphosphate
IBS irritable bowel syndrome	IU International Unit
IBW ideal body weight	IUCD intrauterine contraceptive device
ICA internal carotid artery	IUD intrauterine device
ICD International <i>Classification of Diseases of the World Health Organization</i> ; implantable cardioverter-defibrillator	IV intravenous, intravenously; intraventricular
ICDA International <i>Classification of Diseases, Adapted for Use in the United States</i>	IVDA intravenous drug abuse(r)
ICF intracellular fluid	IVF in vitro fertilization
ICP intracranial pressure	IVP intravenous pyelogram
ICSH interstitial cell stimulating hormone	J flux (density)
ICU intensive care unit	J joule
ID infective dose	JMS Junior Medical Student
IDU idoxuridine; injecting/injection drug user	JVD jugular venous distension
IF initiation factor; intrinsic factor	K [Mod. L.] <i>kalium</i> , potassium; kelvin
IFN interferon	k kilo
Ig immunoglobulin	kat katal
	kb kilobase
	kc kilocycle
	keal kilocalorie
	KCT kaolin clotting time

IGF insulinlike growth factor	
IL interleukin	
ILA insulinlike activity	
Ile isoleucine	
IM internal medicine; intra-muscular(ly); infectious mononucleosis	
IMP inosine monophosphate (inosinic acid)	
IMS Indian Medical Service	
IMV intermittent mandatory ventilation	
In indium	
IND investigational new drug	
Ino inosine	
INR international normalized ratio	
IOML infraorbitomeatal line	
IP interphalangeal; intraperitoneal(ly)	
IPAP inspiratory positive airway pressure	
IPPB intermittent positive pressure breathing	
IPPV intermittent positive pressure ventilation	
IPV inactivated poliovirus vaccine	
IQ intelligence quotient	
Ir iridium	
kDa kilodalton	
kg kilogram	
KJ knee jerk	
K_M Michaelis constant	
KOH potassium hydroxide	
KP keratic precipitate	
Kr krypton	
17-KS 17-ketosteroid	
KS Kaposi sarcoma	
KUB kidneys, ureters, bladder	
kv kilovolt	
kVp kilovolt peak	
KW Kimmelstiel Wilson (disease); Keith Wagener (retinal changes)	
l liter (use of CAPITAL letter preferred)	
L inductance; left; [L.] limes, boundary, limit; liter	
L- prefix indicating that a molecule is sterically analogous to L-glyceraldehyde	
L:S R lecithin:sphingomyelin ratio	
La lanthanum	
LA lupus anticoagulant	
LAD left anterior descending (coronary artery)	
LAO left anterior oblique (coronary artery)	
LAP leucine aminopeptidase	

LATS long acting thyroid stimulator	LP lumbar puncture
LBT lupus band test	LPF low power field
LBW low birth weight	LPH lipotropic pituitary hormone (lipotropin)
LC lethal concentration	LPN Licensed Practical Nurse
LCA left coronary artery	Lr lawrencium
LCAT lecithin cholesterol acyltransferase	LRCP Licentiate of the Royal College of Physicians
LCM left costal margin; lymphocytic choriomeningitis (virus)	LRCS Licentiate of the Royal College of Surgeons
LD lethal dose	LRH luteinizing hormone releasing hormone
LDH lactate dehydrogenase	LSA left sacroanterior (fetal position)
LDL low-density lipoprotein	LSD lysergic acid diethylamide
LE left eye; lupus erythematosus	LSP left sacroposterior (fetal position)
LEEP loop electrosurgical excision procedure	LST left sacrotransverse (fetal position)
LES lower esophageal sphincter	LTH luteotropic hormone
LETS large external transformation sensitive (fibronectin)	LTM long-term memory
Leu leucine	LTR long terminal repeat
LFA left frontoanterior (fetal position)	Lu lutetium
LFP left frontoposterior (fetal position)	LUQ left upper quadrant
LFT left frontotransverse (fetal position); liver function test	LV left ventricle
	LVEF left ventricular ejection fraction
	LVET left ventricular ejection time
	LVH left ventricular hypertrophy

LGSIL low grade squamous intraepithelial lesion	
LGV lymphogranuloma venereum	LVN Licensed Visiting Nurse; Licensed Vocational Nurse
LH luteinizing hormone	Lw (former symbol for lawrencium (now Lr)
LH/FSH-RF luteinizing hormone/follicle stimulating hormone releasing factor	Lys lysine (or its radicals in peptides)
LH-RF luteinizing hormone releasing factor	$\text{Q}\mu\text{m}$ mu; micro ; heavy chain class corresponding to IgM
LH-RH luteinizing hormone releasing hormone	$\text{Q}\mu\text{Ci}$ microcurie
Li lithium	$\text{Q}\mu\text{g}$ microgram
LLQ left lower quadrant	$\text{Q}\mu\text{l}$, μL microliter
LM Licentiate in Midwifery	$\text{Q}\mu\text{m}$ micrometer
LMA left mentoanterior (fetal position)	$\text{Q}\mu\mu\mu$ micromicro
LMP last menstrual period; left mentoposterior (fetal position)	M + Am compound myopic astigmatism
LMT left mentotransverse (fetal position)	m mass; meter; milliminim; molar
LNPF lymph node permeability factor	m- meta
LOA left occipitoanterior (fetal position)	M mega , meg ; molar; moles (per liter); morgan; myopic; myopia
LOC level of consciousness; loss of consciousness	M molar; moles (per liter)
LOP left occipitoposterior (fetal position)	m moles (per liter)
LOT left occipitotransverse (fetal position)	mA milliampere
	MA Master of Arts (Magister Artium); Medical Assistant; mental age
	MAA macroaggregated albumin
	MAb monoclonal antibody

MAC <i>Mycobacterium avium</i> complex	MI mitral insufficiency; myocardial infarction
MAI <i>Mycobacterium avium-intracellulare</i>	MID minimal infecting dose
MAO monoamine oxidase	MIP maximum inspiratory pressure
MAOI monoamine oxidase inhibitor	MK menaquinone (vitamin K2)
MAP morning after pill	mks, MKS meter kilogram second (system, unit)
mA-S milliampere second	ml, mL milliliter
MAST military antishock trousers	MLC mixed lymphocyte culture (test)
Mb myoglobin	MLD minimal lethal dose
MBC maximum breathing capacity	mm millimeter
MbCO carbon monoxidized myoglobin	mmHg millimeters of mercury (torr)
MbO₂ oxymyoglobin	mmol millimole
MC Medical Corps	MMPI Minnesota Multiphasic Personality Inventory (test)
MCH mean corpuscular hemoglobin	MMR measles-mumps-rubella (vaccine)
MCHC mean corpuscular hemoglobin concentration	MMSE Mini-Mental State Examination
mCi millicurie	Mn manganese
MCL midclavicular line	Mo molybdenum
mem millimicron	MO Medical Officer; mineral oil
MCP metacarpophalangeal	MOC Medical Officer on Call
MCV mean corpuscular volume	MOD Medical Officer of the Day
MD Doctor of Medicine (Medicinae Doctor)	
MD [L.] Medicinae Doctor, Doctor of Medicine	

MD [L.] <i>Medicinae Doctor</i> , Doctor of Medicine	MOD Medical Officer of the Day
Md mendelevium	mol mole
MDF myocardial depressant factor	mol wt molecular weight
MDI metered dose inhaler	MOM Milk of Magnesia
MDR multidrug-resistant	MOPP Mustargen
ME Medical Examiner	(mechlorethamine hydrochloride), Oncovin (vinristine sulfate), procarbazine hydrochloride, and prednisone
Me methyl	
Med Tech Medical Technician; Medical Technologist	MPD maximal permissible dose
MEDLARS Medical Literature Analysis and Retrieval System	MPH Master of Public Health
MEP maximal expiratory pressure	MPS mononuclear phagocyte system
meq, mEq milliequivalent	MR milk ring (test); mitral regurgitation
MeSH Medical Subject Headings	M_r molecular (weight) ratio
Met methionine	MRA magnetic resonance angiography
MET metabolic equivalent of task	MRCP Member of the Royal College of Physicians
metHb methemoglobin	MRCS Member of the Royal College of Surgeons
metMb metmyoglobin	mrd, MRD minimal reacting dose
MEV million electron volts (10^6 ev)	MRI magnetic resonance imaging
mg milligram	mRNA messenger RNA
Mg magnesium	MRSA methicillin-resistant <i>Staphylococcus aureus</i>
MHC major histocompatibility complex	MS Master of Science
mho siemens unit	
MHz megahertz	

MS I, II, III, IV medical student: first, second, third, and fourth year	
QM multiple sclerosis; magnesium sulfate; morphine sulfate	NCV nerve conduction velocity
msec millisecond	Nd neodymium
m/sec meters per second	Nd:YAG neodymium:yttrium-aluminum-garnet [laser]
MSG monosodium glutamate	NDA New Drug Application
MSH melanocyte stimulating hormone	Ne neon
MSM men who have sex with men	NE norepinephrine; not examined
MSN Master of Science in Nursing	NEEP negative end expiratory pressure
MT Medical Technologist; Medical Transcriptionist; Monitor Technician	NF National Formulary
mtDNA mitochondrial DNA	ng nanogram
MTP metatarsophalangeal (joint)	NGF nerve growth factor (antigen)
Mu Mache unit	Ni nickel
MUGA multiple gated acquisition (imaging)	NIH National Institutes of Health
mV millivolt	NK natural killer (cell)
Mv mendelevium	NKA no known allergies
MVA motor vehicle accident	NLM National Library of Medicine
MVE Murray Valley encephalitis (virus)	nm nanometer
MVV maximal voluntary ventilation	NMN nicotinamide mononucleotide
MW molecular weight	No nobelium
	NP Nurse Practitioner
	Np neptunium
	NPO [L.] <i>nihil per os</i> , nothing by mouth
	NREM nonrapid eye movement (sleep)
	nRNA nuclear RNA

My myopia	NS normal saline
v nu; kinematic viscosity	NSAID nonsteroidal antiinflammatory drug
n index of refraction; nano	NSR normal sinus rhythm
N newton; nitrogen; normal (concentration)	NUG necrotizing ulcerative gingivitis
N normal (SMALL caps)	Ω omega; ohm
Na [Modern L.] <i>natrium</i> , sodium	o-ortho
NA <i>Nomina Anatomica</i>	O [L.] <i>oculus</i> , eye; opening (in formulas for electrical reactions); oxygen
NAD nicotinamide adenine dinucleotide; no apparent (or acute) distress	O & P ova and parasites
NAD⁺ nicotinamide adenine dinucleotide (oxidized form)	OAV oculoauriculovertebral (dysplasia, syndrome)
NADH nicotinamide adenine dinucleotide (reduced form)	OB obstetrics
NADP nicotinamide adenine dinucleotide phosphate	OB/GYN obstetrics (and) gynecology
NADP⁺ nicotinamide adenine dinucleotide phosphate (oxidized form)	OBS organic brain syndrome
NADPH nicotinamide adenine dinucleotide phosphate (reduced form)	OC oral contraceptive
NAME nevi, atrial myxoma, myxoid neurofibromas, and ephelides (syndrome)	OCD obsessive compulsive disorder
NANDA North American Nursing Diagnosis Association	OD Doctor of Optometry; Officer of the Day; overdose
Nb niobium	QOD [L.] <i>oculus dexter</i> , right eye
	ODD oculodentodigital (dysplasia, syndrome)
	Oe oersted (centimeter gram second unit of magnetic field strength)

OFD orofaciodigital (dysostosis, syndrome)	Pb [L.] <i>plumbum</i> , lead
OKT Ortho-Kung T (cell)	PBG porphobilinogen
OML orbitomeatal line	p.c. [L.] <i>post cibum</i> , after a meal
OMM ophthalmomandibulomelic (dysplasia, syndrome)	PCB polychlorinated biphenyl
OMS organic mental syndrome	Pco₂ partial pressure of carbon dioxide
OP osmotic pressure; outpatient	PCP phencyclidine; plasma cell pneumonia (<i>Pneumocystic carinii pneumonia</i>), primary care provider
OPV oral poliovirus vaccine	PCR polymerase chain reaction
OR operating room	PCT percutaneous transhepatic cholangiography
ORD optical rotatory dispersion	PCWP pulmonary capillary wedge pressure
ORIF open reduction and internal fixation	Pd palladium
Orn ornithine (or its radical)	PD prism diopter
Oro orotate; orotic acid	PDA patent ductus arteriosus; posterior descending artery
Os osmium	PDGF platelet derived growth factor
QOS [L.] <i>oculus sinister</i> , left eye	PDLL poorly differentiated lymphocytic lymphoma
OSA obstructive sleep apnea	PDR <i>Physicians' Desk Reference</i>
OSHA Occupational Safety and Health Administration	PEEP positive end expiratory pressure
OT occupational therapy; Koch old tuberculin	PEG polyethylene glycol
OTC over the counter (non-prescription) drug	PET positron emission tomography
QOU [L.] <i>oculus uterque</i> , each eye (both eyes)	PF₄ platelet factor 4
OXT oxytocin	
oz ounce	

p pico; pupil	PFT pulmonary function test
p- para	pg picogram
P partial (pressure); peta ; phosphorus, phosphoric (residue); plasma (concentration); pressure; para (obstetric history)	PG prostaglandin
³²P phosphorus-32	PGA prostaglandin A
P₁ first parental generation	PGB prostaglandin B
PA Physician Assistant; posteroanterior	PGE prostaglandin E
Pa pascal; protactinium	PGF prostaglandin F
PA Physician's Assistant; posteroanterior; pulmonary artery	pH hydrogen ion concentration; p (power) of $[H^+]_{10}$
PABA para-aminobenzoic acid	Ph phenyl
PAF platelet-aggregating (or platelet-activating) factor	Ph¹ Philadelphia (chromosome)
PAH paraaminohippuric acid)	PHA phytohemagglutinin (antigen)
PAo₂ partial pressure of arterial oxygen	Pharm D Doctor of Pharmacy (Pharmaciae Doctor)
PAS para aminosalicylic (acid), periodic acid Schiff (reagent)	PhD Doctor of Philosophy (Philosophiae Doctor)
PASA para aminosalicylic acid	PhD [L.] Philosophiae Doctor , Doctor of Philosophy
PAT paroxysmal atrial tachycardia	Phe phenylalanine (or its radical)
	PhG [L.] Pharmacopoeia Germanica , German Pharmacopeia
	PhG Graduate in Pharmacy
	PHN Public Health Nurse; postherpetic neuralgia

PICC peripherally inserted central catheter	PRA plasma renin activity
PID pelvic inflammatory disease	PRF prolactin releasing factor
PIF prolactin inhibiting factor	PRL prolactin
PIP proximal interphalangeal (joint)	p.r.n. PRN , [L.] <i>pro re nata</i> , as needed
pK negative logarithm of the ionization constant (K_a) of an acid	Pro proline (or its radicals)
PK pyruvate kinase	PROM passive range of motion; premature rupture of membranes
PKU phenylketonuria	psi pounds per square inch
pm picometer	PSV pressure-supported ventilation
Pm promethium	PT physical therapy; pro-thrombin time
PM post mortem	Pt platinum
PMI point of maximum intensity	PTA plasma thromboplastin antecedent; phosphotungstic acid; prior to admission
PMN polymorphonuclear (leukocyte)	PTAH phosphotungstic acid hematoxylin
PMS premenstrual syndrome	PTCA percutaneous transluminal coronary angioplasty
PN Practical Nurse	PTH parathyroid hormone
PND paroxysmal nocturnal dyspnea; postnasal drip	PTT partial thromboplastin time
PNP platelet neutralization procedure	PTU prophylthiouracil
PNPB positive negative pressure breathing	Pu plutonium
PNS peripheral nervous system	PUO pyrexia of unknown origin
Po polonium	PUPPP pruritic urticarial papules and plaques of pregnancy
PO [L.] per os, by mouth	
PO₂, Po₂ partial pressure of oxygen	

POEMS polyneuropathy, organomegaly, endocrinopathy, monoclonal protein, and skin changes (syndrome)	PUVA (oral administration of) psoralen (and subsequent exposure to) ultraviolet light of A wavelength (UV A)
POMP prednisone, Oncovin (vincristine sulfate), methotrexate, and Purinethol (6-mercaptopurine)	PVC polyvinyl chloride; premature ventricular contraction
POR problem-oriented (medical) record	PVL plasma viral load
PP pyrophosphate	PVP polyvinylpyrrolidone (povidone)
PPCA proserum prothrombin conversion accelerator	q [L.] <i>quisque</i> , every
PPD purified protein derivative (of tuberculin)	Q coulomb; volume of blood flow
PPLO pleuropneumonia like organism	Qco₂ microliters CO ₂ given off per milligram of dry-weight of tissue per hour
ppm parts per million	Qq.d. [L.] <i>quaque die</i> , every day
PPO 2,5-diphenyloxazole	q.i.d. [L.] <i>quater in die</i> , four times a day
PPPPP pain, pallor, pulselessness, paresthesia, paralysis	QNS quantity not sufficient
PPPPPP pain, pallor, pulselessness, paresthesia, paralysis, prostration	Qo oxygen consumption
PPV positive pressure ventilation	Qo₂ oxygen consumption
Pr praseodymium; presbyopia	Qq.o.d. every other day
PR per rectum	q. s. [L.] <i>quantum satis</i> , as much as is enough; [L.] <i>quantum sufficiat</i> , as much as may suffice; quantity sufficient

r racemic; roentgen	
R gas constant (8.315 joules); (organic) radical; Réamur (scale); [L.] recipe, take; resistance determinant (plasmid); resistance (electrical); resistance (unit) (in the cardiovascular system); resolution; respiration; respiratory (exchange ratio); roentgen	
Ra radium	RLQ right lower quadrant
RA rheumatoid arthritis	RMA right mentoanterior (fetal position)
rad radian	RML right middle lobe
RAD reactive airways disease	RMP right mentoposterior (fetal position)
RAS reticular activating system	RMT right mentotransverse (fetal position)
RAST radioallergosorbent test	Rn radon
RAV Rous-associated virus	RN Registered Nurse
RAW resistance, airway	RNA Registered Nurse Anesthetist; ribonucleic acid
Rb rubidium	RNase ribonuclease
rbc red blood cell; red blood (cell) count	RNC Registered Nurse, Certified
RBC red blood cell; red blood (cell) count	RNP Registered Nurse Practitioner
RBF renal blood flow	RNP ribonucleoprotein
RCM right costal margin	R/O rule out
RD reaction of degeneration; reaction of denervation; Registered Dietitian	ROA right occipitoanterior (fetal position)
RDA recommended daily allowance	ROM range of motion
	ROP right occipitoposterior (fetal position)
	ROS review of systems
	ROT right occipitotransverse (fetal position)
	RP retinitis pigmentosa
	RP Registered Pharmacist
	RPF renal plasma flow
	RPh Registered Pharmacist

RDH Registered Dental Hygienist	rpm revolutions per minute
rDNA ribosomal DNA	RPR rapid plasma reagin (test)
RDS respiratory distress syndrome	RQ respiratory quotient
RDW red (blood cell) diameter (or distribution) width	rRNA ribosomal RNA
Re rhenium	RR relative risk
RE right ear; right eye	RRR relative risk reduction
rem roentgen equivalent, man	Rs resolution
REM rapid eye movement (sleep); reticular erythematous mucinosis	RS respiratory syncytial (virus)
rep roentgen equivalent, physical	RSA right sacroanterior (fetal position)
RF release factor; rheumatoid factor	RSD reflex sympathetic dystrophy
RFA right frontoanterior (fetal position)	RSP right sacroposterior (fetal position)
RFLP restriction fragment length polymorphism	RST right sacrotransverse (fetal position)
RFP right frontoposterior (fetal position)	RSV Rous sarcoma virus; respiratory syncytial virus
RFT right frontotransverse (fetal position)	RT Radiologic Technologist; Registered Technologist; Respiratory Therapist
Rh Rhesus (Rh blood group); rhodium	RTE renal tubular epithelium
RH releasing hormone	rTMP ribothymidylic acid
RIA radioimmunoassay	Ru ruthenium
Rib ribose	RUL right upper lobe
RLL right lower lobe	RUQ right upper quadrant
	RV residual volume; right ventricle

RVEF right ventricular ejection fraction	SIDS sudden infant death syndrome
RVH right ventricular hypertrophy	sig. [L.] <i>signa</i> , affix a label, inscribe
σ sigma; reflection coefficient; standard deviation; 1 millisecond (0.001 sec)	SIMV spontaneous intermittent mandatory ventilation; synchronized intermittent mandatory ventilation
s [L.] <i>semis</i> , half; steady state (SUBSCRIPT); [L.] sinister, left	SIRD source-to-image-receptor distance
s sine, without	SISI small increment (or short increment) sensitivity index (test)
s/s signs and symptoms	SK streptokinase
S [L.] <i>sinister</i> , left; saturation of hemoglobin (percentage of) (followed by subscript O_2 or CO_2); siemens; spheric; spheric (lens); sulfur; Svedberg (unit)	SL sublingual(ly)
S₁ first selfing generation	SLE systemic lupus erythematosus
SA sinuatrial	SLR straight leg raising
S-A sinuatrial	Sm samarium
SAD seasonal affective disorder	SMS Senior Medical Student
Sa_{O2} oxygen saturation (of) arterial (oxyhemoglobin)	Sn [L.] <i>stannum</i> , tin
SARS severe acute respiratory syndrome	SN Student Nurse
Sb [L.] <i>stibium</i> , antimony	SOAP subjective data, objective data, assessment, and plan (problem oriented medical record)
SBE subacute bacterial endocarditis	SOB short(ness) of breath
sc subcutaneous(ly)	sol. solution
	soln. solution
	SP Speech Pathologist

Sc scandium	S/P status post
SC sternoclavicular; subcutaneous(ly)	sp. gr. specific gravity
ScD Doctor of Science	sp. species
SCID severe combined immunodeficiency	SPA single proton absorption
SD standard deviation; streptodornase	metry
SDA specific dynamic action	SPCA serum prothrombin conversion accelerator (factor VII)
Se selenium	SPECT single photon emission computed tomography
Ser serine	SPF sun protection (or protective) factor
SERM selective estrogen receptor modulator	sph spheric (lens)
Sf Svedberg flotation (constant, unit)	spm suppression and mutation
SGA small for gestational age	spp. species (plural)
SGOT serum glutamic-oxaloacetic transaminase (aspartate aminotransferase)	SQ subcutaneous
SGPT serum glutamic-pyruvic transaminase (alanine aminotransferase)	Sr strontium
SH serum hepatitis	SRF somatotropin releasing factor
SI [French] Système International d'Unités; International System of Units	SRF-A slow reacting factor of anaphylaxis
Si silicon	SRIF somatotropin-release-inhibiting factor
SID source-to-image (-receptor) distance	sRNA soluble RNA
	SRS slow-reacting substance (of anaphylaxis)
	SRS-A slow-reacting substance of anaphylaxis
	ssDNA single stranded DNA
	ssp. subspecies

SSRI selective serotonin reuptake inhibitor
ST scapulothoracic stat; **STAT** [L.] *statim*, immediately, at once
STD sexually transmitted disease
STEL short term exposure limit
STH somatotrophic hormone
STI sexually transmitted infection
STM short-term memory
STPD standard temperature (0° C) and pressure (760 mmHg absolute), dry
STS serologic test for syphilis
Sv sievert (unit)
SV sievert (unit)
SVT supraventricular tachycardia
Sz seizure
t metric ton
t temperature (Celsius); tritium
T temperature, absolute (Kelvin); tension (intraocular); tera ; tesla; tetanus (toxoid); tidal (volume); (SUBSCRIPT); tocopherol; transverse (tubule); tritium; tumor (antigen)

TBP thyroxine-binding protein
TBV total blood volume
Tc technetium
^{99m}Tc technetium 99m
TCA tricarboxylic acid; trichloracetic acid
TCN talocalcaneonavicular (joint)
Td tetanus-diphtheria (toxoids, adult type)
TDP ribothymidine 5' diphosphate
Te tellurium
TEDD total end-diastolic diameter
TEN toxic epidermal necrolysis
TESD total end-systolic diameter
TFCI transient focal cerebral ischemia
Th thorium
THC tetrahydrocannabinol
Thr threonine (or its radicals)
Ti titanium
t/t_{tot} duty cycle
TIA transient ischemic attack
TIBC total iron-binding capacity
t.i.d. [L.] *ter in die*, three times a day

T absolute temperature (Kelvin)	tinct. tincture
T! decreased tension (pressure)	TITh 3,5,3' triiodothyronine
T+ increased tension (pressure)	Qt.i.w. three times a week
T₃ 3,5,5' triiodothyronine	TKO to keep (venous infusion line) open
T₄ tetraiodothyronine (thyroxine)	Tl thallium
T & A tonsillectomy and adenoidectomy	TLC thin layer chromatography; total lung capacity; tender, loving care
T & C type and crossmatch	TLV threshold-limit value
Ta tantalum	t_m temperature midpoint (Celsius)
TA <i>Terminologia Anatomica</i>	T_m temperature midpoint (Kelvin)
tab tablet	Tm thulium; tubular maximal (excretory capacity of kidneys)
TAC transient aplastic crisis	TM transport maximum
TAD transient acantholytic dermatosis	TMJ temporomandibular joint
TAF tumor angiogenesis factor	TMP ribothymidine 5' monophosphate
TAH total abdominal hysterectomy	TMT tarsometatarsal
TAR thrombocytopenia with absent radii (syndrome)	TMV tobacco mosaic virus
TAT thematic apperception test	Tn (ocular) tension; (intraocular) tension normal
Tb terbium	TNF tumor necrosis factor
TB tuberculosis	TNM tumor, node, metastasis (tumor staging)
TBG thyroid-binding globulin	

TORCH toxoplasmosis, other, rubella, cytomegalovirus, and herpes simplex (maternal infections)	UA urinalysis
t-PA , TPA tissue plasminogen activator	UDP uridine diphosphate
TPHA <i>Treponema pallidum</i> hemagglutination (test)	UDPG uridine diphosphate glucose
TPI <i>Treponema pallidum</i> immobilization (test)	UGIS upper gastrointestinal series
TPN total parenteral nutrition	UMP uridine monophosphate (uridylic acid)
TPR temperature, pulse, and respirations	u-PA urokinase
tr. tincture	UPJ ureteropelvic junction
TRH thyrotropin releasing hormone (stimulation test)	Urd uridine
TRIC trachoma inclusion conjunctivitis (organism)	URI upper respiratory infection
tRNA transfer RNA	US ultrasound
Trp tryptophan (and its radicals)	USAN United States Adopted Names (Council)
TSH thyroid stimulating hormone	USP <i>United States Pharmacopeia</i>
TSS toxic shock syndrome	USPHS United States Public Health Service
TSTA tumor-specific transplantation antigen	UTI urinary tract infection
TTP thrombotic thrombocytopenic purpura	UTP uridine triphosphate
TU toxic unit, toxin unit	UV ultraviolet
TUR transurethral resection	UVB ultraviolet B
TVUS transvaginal ultrasound	UVJ ureterovesical junction
Tx treatment	v venous (blood); volt
Tyr tyrosine (and its radicals)	V vanadium; vision; visual (acuity); volt; volume (frequently with subscripts denoting location, chemical species, and conditions)
U uranium; uridine (in polymers); urinary (concentration)	V̄ ventilation; gas flow (frequently with subscripts indicating location and chemical species); ventilation;
Q U unit	V_A alveolar ventilation

V _a /Q ventilation/perfusion ratio	V _T tidal volume
V ₁ CV ₆ unipolar precordial electrocardiogram chest leads	VZIG varicella-zoster immune globulin
VA viral antigen	W watt; [German] <i>Wolfram</i> , tungsten
V-A ventriculoatrial	Wb weber
Val valine (and its radicals)	WBC white blood cell; white blood (cell) count
VATER vertebral defects, imperforate anus, tracheoesophageal fistula with esophageal atresia, and radial and renal dysplasia (complex)	WC Ward Clerk
VBAC vaginal birth after cesarean	WD well-developed
VC vision, color; vital capacity	WDLL well-differentiated lymphocytic (or lymphatic) lymphoma
VCE vagina, (ecto)cervix, endocervical canal	WEE western equine encephalomyelitis
V _D (physiologic) dead space	WHO World Health Organization
VDRL Venereal Disease Research Laboratory (test)	WN well nourished
VHDL very high density lipoprotein	WNV West Nile virus
VIP vasoactive intestinal polypeptide	X xanthosine
VLDL very low density lipoprotein	Xao xanthosine
VMA vanillylmandelic acid (test)	Xe xenon
V _{max} maximal velocity	¹³³ Xe xenon 133
VN Visiting Nurse, Vocational Nurse	XU excretory urogram
VO vocal order	Y yttrium
VP vasopressin	YAG yttrium-aluminum-garnet (laser)
VR vocal resonance	Yb ytterbium
VS vital signs; volumetric solution	Z carbobenzoxy (chloride)
	ZEPP zero end-expiratory pressure
	ZES Zollinger Ellison syndrome
	Zn zinc
	⁶⁵ Zn zinc 65
	Zr zirconium
	ZSR zeta sedimentation ratio

The forbidden symbol (m) appears opposite abbreviations prohibited by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO).

An explanation of each prohibition is given in the usage notes of the A to Z entries for the relevant abbreviations.

TABLE OF ELEMENTS AND THEIR ATOMIC WEIGHTS

Atomic Number	Element	Symbol	Atomic Weight
1	Hydrogen	H	1.00794
2	Helium	He	4.002602
3	Lithium	Li	6.941
4	Beryllium	Be	9.012182
5	Boron	B	10.811
6	Carbon	C	12.011
7	Nitrogen	N	14.00674
8	Oxygen	O	15.9994
9	Fluorine	F	18.9984032
10	Neon	Ne	20.1797
11	Sodium	Na	22.989768
12	Magnesium	Mg	24.3050
13	Aluminum	Al	26.981539
14	Silicon	Si	28.0855
15	Phosphorus	P	30.973762
16	Sulfur	S	32.066
17	Chlorine	Cl	35.4527
18	Argon	Ar	39.948
19	Potassium	K	39.0983
20	Calcium	Ca	40.078
21	Scandium	Sc	44.955910
22	Titanium	Ti	47.867
23	Vanadium	V	50.9415
24	Chromium	Cr	51.9961
25	Manganese	Mn	54.93805
26	Iron	Fe	55.845
27	Cobalt	Co	58.93320

Atomic Number	Element	Symbol	Atomic Weight
28	Nickel	Ni	58.6934
29	Copper	Cu	63.546
30	Zinc	Zn	65.39
31	Gallium	Ga	69.723
32	Germanium	Ge	72.61
33	Arsenic	As	74.92159
34	Selenium	Se	78.96
35	Bromine	Br	79.904
36	Krypton	Kr	83.80
37	Rubidium	Rb	85.4678
38	Strontium	Sr	87.62
39	Yttrium	Y	88.90585
40	Zirconium	Zr	91.224
41	Niobium	Nb	92.90638
42	Molybdenum	Mo	95.94
43	Technetium	Te	97.9072*
44	Ruthenium	Ru	101.07
45	Rhodium	Rh	102.90550
46	Palladium	Pd	106.42
47	Silver	Ag	107.8682
48	Cadmium	Cd	112.411
49	Indium	In	114.818
50	Tin	Sn	118.710
51	Antimony	Sb	121.760
52	Tellurium	Te	127.60
53	Iodine	I	126.90447
54	Xenon	Xe	131.29

Atomic Number	Element	Symbol	Atomic Weight
55	Cesium	Cs	132.90543
56	Barium	Ba	137.327
57	Lanthanum	La	138.9055
58	Cerium	Ce	140.115
59	Praseodymium	Pr	140.90765
60	Neodymium	Nd	144.24
61	Promethium	Pm	144.9127*
62	Samarium	Sm	150.36
63	Europium	Eu	151.965
64	Gadolinium	Gd	157.25
65	Terbium	Tb	158.92534
66	Dysprosium	Dy	162.50
67	Holmium	Ho	164.93032
68	Erbium	Er	167.26
69	Thulium	Tm	168.93421
70	Ytterbium	Yb	173.04
71	Lutetium	Lu	174.967
72	Hafnium	Hf	178.49
73	Tantalum	Ta	180.9479
74	Tungsten	W	183.84
75	Rhenium	Re	186.207
76	Osmium	Os	190.23
77	Iridium	Ir	192.217
78	Platinum	Pt	195.08
79	Gold	Au	196.96654
80	Mercury	Hg	200.59
81	Thallium	Tl	204.3833

Atomic Number	Element	Symbol	Atomic Weight
82	Lead	Pb	207.2
83	Bismuth	Bi	208.98037
84	Polonium	Po	208.9824*
85	Astatine	At	209.9871*
86	Radon	Rn	222.0176*
87	Francium	Fr	223.0197*
88	Radium	Ra	226.0254*
89	Actinium	Ac	227.0278*
90	Thorium	Th	232.0381*
91	Protactinium	Pa	231.0388*
92	Uranium	U	238.0289
93	Neptunium	Np	237.0482*
94	Plutonium	Pu	244.0642*
95	Americium	Am	243.0614*
96	Curium	Cm	247.0703*
97	Berkelium	Bk	247.0703*
98	Californium	Cf	251.0796*
99	Einsteinium	Es	252.083*
100	Fermium	Fm	257.0951*
101	Mendelevium	Md	258.10*
102	Nobelium	No	259.1009*
103	Lawrencium	Lr	262.11*
104	Unnilquadium	Unq	261.11*
105	Unnilpentium	Unp	262.114*
106	Unnilhexium	Unh	263.118*
107	Unnilseptium	Uns	262.12*

Based on 1993 IUPAC Table of Standard Atomic Weights of the Elements.

* Relative atomic mass of the isotope of that element with the longest known half-life.

పర్మిటెంషన్లు |

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د مؤلف لنهه پېزندنه



پوهنواں سید قمبر علی حیدری د
سید محمد حیدر زوی د سید عبد الله
لمسی په هش کال کی دکونې
ولایت د پشیدپه تاریخی کلی کی د ساداتو
په کورنی کی زیر پیدلی دی .

ابتدائی زده کړی ئی د پشیدپه بنونځی
، شانوی زده کړی ئی د نرنګ په لیسه

او لوړی زده کړی ئی د کابل په پوهنتون کی سرته رسولی دی . په
هش کال کی د تګر هار طب د پوهنځی د فارمکولوژی په
خانګه کی د استاد په حیث مقرر او تراو سه پوری ئی د استادی مقدسی
دندي ته دواړ ورکړ .
نوموری په دی موده کی لاندی علمی اثار ټولنی ته وړاندی کړی
دی .

دیوح جروی پرازیتونو او چینجوضد د واکانی ترجمه
داوتونوم سستم د واکانی ترجمه
ددرملو تیراتوجنیکی اغیزی .
د درملو په ځای کارونه
ماکرولایدونه او د هغونوی مُستحضرات .

په او بو کی د ایودین مقدار او د اینډیمیک جاغور سره ئی
اړیکی .

په ماشومانو کی د درملو اغیزی .
د پیازو فارمکولوژیکی اغیزی .

د هوبرى فارمکولوژيکى اغىزى .

دزيتون فارمکولوژيکى اغىزى .

د بيتالكتام اتى بيوتيكىوناود بيتالكتماز نهى كونكۇ درملۇ

تر منئ سنجىزىم .

كيموتراپى .

فارمکولوژى دوھم تۈك .

فارمکولوژى دريم تۈك .

د توكسوپلازموزيس ضد دواگانى .

د جراحى وقايوى اتى بيوتيكىوند معيارى درملنى لاربىسۇد .

د كارونە .

پە وينە كى د پوتاشىم پە سوېد د درملۇ اغىزى .

د اتى سىپتىكىوند ارخىزو اغىزۇ خىرەنە .

پە يىنە ئىيگەر باندى د رملۇد ارخىزو اغىزۇ خىرەنە .

د درملۇ خخە درامنئ تە شوی هايپونايتريمىيا د پىينبو خىرەنە .

د درملۇ بدى اغىزى همدا اثر

Publishing Textbooks

Honorable lecturers and dear students!

The lack of quality textbooks in the universities of Afghanistan is a serious issue, which is repeatedly challenging students and teachers alike. To tackle this issue, we have initiated the process of providing textbooks to the students of medicine. For this reason, we have published 250 different textbooks of Medicine, Engineering, Science, Economics, Journalism and Agriculture (96 medical textbooks funded by German Academic Exchange Service, 140 medical and non-medical textbooks funded by German Aid for Afghan Children, 6 textbooks funded by German-Afghan University Society, 2 textbooks funded by Consulate General of the Federal Republic of Germany, Mazar-e Sharif, 1 textbook funded by Afghanistan-Schulen, 1 textbook funded by SlovakAid, 1 textbook funded by SAFI Foundation and 3 textbooks funded by Konrad Adenauer Stiftung) from Nangarhar, Khost, Kandahar, Herat, Balkh, Al-Beroni, Kabul, Kabul Polytechnic and Kabul Medical universities. The book you are holding in your hands is a sample of a printed textbook. It should be mentioned that all these books have been distributed among all Afghan universities and many other institutions and organizations for free. All the published textbooks can be downloaded from www.ecampus-afghanistan.org.

The Afghan National Higher Education Strategy (2010-2014) states:

"Funds will be made available to encourage the writing and publication of textbooks in Dari and Pashto. Especially in priority areas, to improve the quality of teaching and learning and give students access to state-of-the-art information. In the meantime, translation of English language textbooks and journals into Dari and Pashto is a major challenge for curriculum reform. Without this facility it would not be possible for university students and faculty to access modern developments as knowledge in all disciplines accumulates at a rapid and exponential pace, in particular this is a huge obstacle for establishing a research culture. The Ministry of Higher Education together with the universities will examine strategies to overcome this deficit".

We would like to continue this project and to end the method of manual notes and papers. Based on the request of higher education institutions, there is the need to publish about 100 different textbooks each year.

I would like to ask all the lecturers to write new textbooks, translate or revise their lecture notes or written books and share them with us to be published. We will ensure quality composition, printing and distribution to Afghan universities free of charge. I would like the students to encourage and assist their lecturers in this regard. We welcome any recommendations and suggestions for improvement.

It is worth mentioning that the authors and publishers tried to prepare the books according to the international standards, but if there is any problem in the book, we kindly request the readers to send their comments to us or the authors in order to be corrected for future revised editions.

We are very thankful to Kinderhilfe-Afghanistan (German Aid for Afghan Children) and its director Dr. Eroes, who has provided fund for this book. We would also like to mention that he has provided funds for 140 medical and non-medical textbooks so far.

I am especially grateful to GIZ (German Society for International Cooperation) and CIM (Centre for International Migration & Development) for providing working opportunities for me from 2010 to 2016 in Afghanistan.

In our ministry, I would like to cordially thank Acting Minister of Higher Education Dr. Abdul Latif Roshan, Academic Deputy Minister Prof Abdul Tawab Balakarzai, Administrative & Financial Deputy Minister Prof Dr. Ahmad Seyer Mahjoor (Phd), Administrative & Financial Director Ahmad Tariq Sediqi, Advisor at Ministry of Higher Education Dr. Gul Rahim Safi, Chancellor of Nangarhar University, Deans of faculties, and lecturers for their continuous cooperation and support for this project .

I am also thankful to all those lecturers who encouraged us and gave us all these books to be published and distributed all over Afghanistan. Finally I would like to express my appreciation for the efforts of my colleagues Hekmatullah Aziz, Fahim Habibi and Dr. Nasim Khogiani in the office for publishing books.

Dr Yahya Wardak
Advisor at the Ministry of Higher Education
Kabul, Afghanistan, October, 2017
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Message from the Ministry of Higher Education

In history, books have played a very important role in gaining, keeping and spreading knowledge and science, and they are the fundamental units of educational curriculum which can also play an effective role in improving the quality of higher education. Therefore, keeping in mind the needs of the society and today's requirements and based on educational standards, new learning materials and textbooks should be provided and published for the students.



I appreciate the efforts of the lecturers and authors, and I am very thankful to those who have worked for many years and have written or translated textbooks in their fields. They have offered their national duty, and they have motivated the motor of improvement.

I also warmly welcome more lecturers to prepare and publish textbooks in their respective fields so that, after publication, they should be distributed among the students to take full advantage of them. This will be a good step in the improvement of the quality of higher education and educational process.

The Ministry of Higher Education has the responsibility to make available new and standard learning materials in different fields in order to better educate our students.

Finally I am very grateful to German Aid for Afghan Children and our colleague Dr. Yahya Wardak that have provided opportunities for publishing this book.

I am hopeful that this project should be continued and increased in order to have at least one standard textbook for each subject, in the near future.

Sincerely,
Dr. Abdul Latif Roshan
Acting Minister of Higher Education
Kabul, 2017

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