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THE APRN'S COMPLETE GUIDE TO

PRESCRIBING
DRUG

THERAPY

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MARI J. WIRFS



**The APRN's Complete Guide to
Prescribing Drug Therapy**

2019

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The APRN's Complete Guide to Prescribing Pediatric Drug Therapy 2018 was awarded 2nd place, “**Book of the Year 2017**” in the **Child Health Category**, by the *American Journal of Nursing (AJN)*, official publication of the American Nurses Association (ANA). The panel of judges included the founder of the nurse practitioner role and the first nurse practitioner program, Dr. Loretta C. Ford, Professor Emerita. Dr. Wirfs was the recipient of the “**2018 AANP Nurse Practitioner State Award for Excellence**” from Louisiana by the American Association of Nurse Practitioners. This prestigious award is given annually to a dedicated nurse practitioner in each state who demonstrates excellence in their area of practice.



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ABBREVIATIONS

*	single-scored tablet
**	cross-scored tablet
***	tri-scored
>	greater than
<	less than
≥	greater than or equal to
≤	less than or equal to
(I), (II), (III), (IV), (V)	Drug Enforcement Agency (DEA) controlled substance schedule
(A), (B), (C), (D), (X)	Federal Drug Agency (FDA) pregnancy categories
AAR	American Academy of Rheumatology
ABSSSI	acute bacterial skin and skin structure infection
ac	before meal
ACEI	angiotensin converting enzyme inhibitor
ACOS	asthma-COPD overlap syndrome
ADA	American Diabetes Association
AF, A-fib	atrial fibrillation
AKI	acute kidney injury
ALP	alkaline phosphatase
ALT	a liver enzyme, alanine transaminase (ALT)
AM	antemeridum, morning
AMD	age-related macular degeneration
AMI	acute myocardial infarction
APAP	acetaminophen
Apo-B	apolipoprotein B
ARB	angiotensin receptor blocker
ART	antiretroviral treatment
ASA	acetylsalicylic acid, aspirin

ASE	adverse side effect
ASIPP	American Society of Interventional Pain Physicians
AST	a liver enzyme, aspartate transaminase
AVB	atrioventricular heart block
BBW	black box warning
BCG vaccine	<i>Bacillus Calmette-Guerin</i> vaccine; tuberculosis vaccine
bid	<i>bis in die</i> , twice-a-day
BP	blood pressure
BPH	benign prostatic hyperplasia
BSA	body surface area
BUN	blood urea nitrogen
CAD	coronary artery disease
calib applicator	calibrated applicator
cap	capsule
CAP	community acquired pneumonia
CBC	complete blood count
CCB	calcium channel blocker
CFC	chlorofluorocarbon, inhaler propellant
chew tab	chewable tablet
Child-Pugh A	mild liver disease/dysfunction
Child-Pugh B	moderate liver disease/dysfunction
Child-Pugh C	severe liver disease/dysfunction
CHF	congestive heart failure
CHS	cannabinoid hyperemesis syndrome
CIC	chronic idiopathic constipation
CDAD	<i>Clostridium difficile</i> -associated diarrhea
CDC	Centers for Disease Control and Prevention
CK	creatine kinase
CKD	chronic kidney disease
cLN	childhood-onset lupus nephritis
clnsr	Cleanser

C _{max}	maximum serum concentration of a drug
CNS	central nervous system
conc	concentrate, concentration
conj estra	conjugated estrogen
cont-rel	controlled-release, continuous-release
COPD	chronic obstructive pulmonary disease
cplt	caplet
Cr	creatinine
CR	controlled-release
CrCl	creatinine clearance measured in mL/min
CRI	chronic renal insufficiency
CRF	chronic renal failure
crm	cream
CSF	cerebral spinal fluid
cSLE	childhood-onset lupus erythematosus
cUTI	complicated urinary tract infection
CVD	cardiovascular disease
CYC	cyclosporine
CYP	cytochrome p
DAA	direct-acting antiviral
DDAVP	desmopressin acetate
dL	deciliter (100 ml)
DM	diabetes mellitus
DMARD	disease modifying anti-rheumatoid drug
DMD	Duchenne muscular dystrophy
DME	diabetic macular edema
DR	diabetic retinopathy
DVT	deep vein thrombosis
ECG	electrocardiogram, EKG
ED	erectile dysfunction

ec	enteric-coat
EDTA	edatate calcium disodium
EE	ethinyl estradiol
eGFR	estimated glomerular filtration rate
EKG	electrocardiogram, ECG
EIA	exercise-induced asthma
EIAED	enzyme-inducing antiepileptic drug
EIB	exercise-induced bronchospasm
ELAR	European League Against Rheumatism
elix	elixir
emol, emol crm	emollient, emollient cream
ent-coat	enteric-coat
EPS	extrapyramidal side effect
ER	extended-release, ext-rel
ESA	erythropoiesis stimulating agent
ESR	erythrocyte sedimentation rate
ESRD	end stage renal disease
est	estradiol
EX, ext-rel	extended-release
FBS	fasting blood sugar
FDA	Federal Drug Administration
film-coat	film-coated
(G)	generic, generic availability
G6PD	glucose-6-phosphate dehydrogenase
GABHS	group a beta-hemolytic streptococcus
GAD	generalized anxiety disorder
GER	gastroesophageal reflux
GERD	gastroesophageal reflux disease
GFR	glomerular filtration rate
GI	gastrointestinal
GLP-1	glucagon peptide-1
gm	gram

gtt, gtts	drop, drops
GU	genitourinary
H ₂ O ₂	hydrogen peroxide
HAART	highly active antiretroviral treatment
HAV	hepatitis A virus
HBV	hepatitis C virus
HCQ	hydroxychloroquine
HCT	hematocrit
HCT, HCTZ	hydrochlorothiazide
HCV	hepatitis C virus
HCQ	hydroxychloroquine
HDL, HDL-C	high density lipoprotein cholesterol
HeFH	heterozygous familial hypercholesterolemia
HF	heart failure
HFA	hydrofluoroalkane (inhaler propellant phasing in)
Hgb	Hemoglobin
HgbA1c	hemoglobin A1c, the standard POC diagnostic test for diabetes
hgc	hard-gel capsule
Hib	<i>Haemophilus influenzae type b</i>
HIV	human immunodeficiency virus
HoFH	homozygous familial hypercholesterolemia
HPV	human papillomavirus
Hr	hour
HR	heart rate in beats per minute
HRT	hormone replacement therapy
HS	hour of sleep, bedtime
HSV	herpes simplex virus
HTN	hypertension
Hx	history
HZO	herpes zoster ophthalmicus
IBS-C	irritable bowel syndrome with constipation

IBS-D	irritable bowel syndrome with diarrhea
ID	intra dermal
ILD	interstitial lung disease
IM	intramuscular
immed-rel	immediate-release
inhal	inhalation
inj	injection
INR	international normalized ratio
IOP	intraocular pressure
IU	international unit
IUD	intrauterine device
IV	intravenous
JIA	juvenile idiopathic arthritis
JRA	juvenile rheumatoid arthritis
K ⁺	potassium
kg	kilogram
L	liter (1000 ml)
LAA	long-acting anticholinergic
LABA	long-acting beta agonist
LAR	long-acting release
lb	pound
LDL, LDL-C	low density lipoprotein cholesterol
LFT	liver function test
Liq	liquid
lotn	lotion
LR	lactated ringers IV solution
LVD	left ventricular dysfunction
LVF	left ventricular failure
MAOI	monoamine oxidase inhibitor
max	maximum

mcg	microgram
mCNY	myopic choroidal neovascularization
MDD	major depressive disorder
MDI	metered dose inhaler
MDR-TB	multi-drug resistant tuberculosis
mfr pkg insert	manufacturer package insert
mg	milligram
mg/dL	milligrams per deciliter
mg/kg/day	milligrams per kilogram per day
min	minute
ml, mL	milliliter
MMF	<i>mycophenolate mofetil</i>
M-M-R	mumps-measles-rubella
MRSA	methicillin-resistant <i>Staphylococcus aureus</i>
MS	multiple sclerosis
MTX	methotrexate
Na ⁺	Sodium
NaCl	sodium chloride
NaHCO ₃	sodium bicarbonate
NAMS	North American Menopause Society
NAT	nucleic acid testing
ng	nanogram
ng/dL	nanogram per deciliter
NGU	non-gonococcal urethritis
NMDA	n-methyl-d-aspartate receptor antagonist
NMS	neuroleptic malignant syndrome
NNRTI	nonnucleoside reverse transcriptase inhibitor
NOH	neurogenic orthostatic hypotension
non-HDL-C	non-high density lipoprotein cholesterol
norgest	norgestimate

NOWS	neonatal opioid withdrawal syndrome
nPEP	non-occupational post-exposure prophylaxis
NRTI	nucleoside reverse transcriptase inhibitor
NS	nasal spray; normal saline
NSAID	nonsteroidal anti-inflammatory drug
NTG	nitroglycerine; normal tension glaucoma
N/V	nausea/vomiting
N/V/D	nausea/vomiting/diarrhea
OA	Osteoarthritis
OCD	obsessive compulsive disorder
OCP	oral contraceptive pill
ODT	orally-disintegrating tablet
Oint	ointment
OIT	oral immunotherapy
ophth	ophthalmic, pertaining to the eye
orally-disint	orally-disintegrating
OSAHS	obstructive sleep apnea hypopnea syndrome
OTC	over-the-counter
Otic	pertaining to the ear
OTRP	organ transplant rejection prophylaxis
oz	ounce, 30 ml
PAH	pulmonary arterial hypertension
PBA	pseudobulbar affect
PBC	primary biliary atresia
pc	after meals
PCOS	polycystic ovarian syndrome; Stein-Leventhal disease
PD	Parkinson's disease
PDE5	phosphodiesterase type 5 inhibitor
PE	pulmonary embolus/embolism
PEG	polyethylene glycol

PEP	post-exposure prophylaxis
PID	pelvic inflammatory disease
PIM	potentially inappropriate medication
PJIA	polyarticular juvenile idiopathic arthritis
PLLR	FDA pregnancy and lactation labeling final rule
PLT	platelet
PM	post-meridiem, evening
PMDD	premenstrual Dysphoric Disorder
PMHx	past medical history
PO	per os, per oral, by mouth
PO ₄ ³⁻	phosphate
POC	point of care
Post-op	post-operative
PPI	proton pump inhibitor
PR	per rectum
PrEP	pre-exposure prophylaxis
PRN	<i>pro re nata</i> , as needed, as required
PSA	prostate-specific antigen
PT	prothrombin time
PTSD	post-traumatic stress disorder
PTT	partial thromboplastin time
PUD	peptic ulcer disease
PVC	premature ventricular contraction
PVD	peripheral vascular disease
PVOD	pulmonary veno-occlusive disease
pwdr	powder
pwdr w. diluent	powder with diluent
q	per, every
qd	once daily
qHS	at hour of sleep, at bedtime

qid	<i>quater in die</i> , four times-a-day
RA	rheumatoid arthritis
RAI	reversible anticholinesterase inhibitor
RBC	red blood cell
RDA	recommended daily allowance
RSV	respiratory syncytial virus
RVO	retinal vein occlusion
SC	Subcutaneous
SCII	subcutaneous insulin infusion
sgc	soft-gel capsule
SGOT	serum glutamic-oxaloacetic transaminase
SGPT	serum glutamic-pyruvic transaminase
SL	sublingual, under the tongue
SLE	systemic lupus erythematosus
SMA	spinal muscular atrophy
SNRI	selective serotonin and norepinephrine reuptake inhibitor
soln	solution
SR	sustained-release
SSRI	selective serotonin reuptake inhibitor
STD/STI	sexually transmitted disease/infection
sUA	serum uric acid
supp	suppository
susp	suspension
sust-rel	sustained release
SWSD	shift work sleep disorder
syr	syrup
T1DM	type 1 diabetes mellitus
T2DM	type 2 diabetes mellitus
T3	triiodothyronine
T4	thyroxin, tetraiodothyronine

tab	tablet
tbsp	tablespoon
TCA	tricyclic antidepressant
TG, TRG	triglyceride
TIA	transient ischemic attack
tid	<i>ter in die</i> , three times-a-day
TMP/SMX	trimethoprim-sulfamethoxazole
TNF	tumor necrosis factor
trans-sys	transdermal system
TRD	treatment-resistant depression
TSH	thyroid-stimulating hormone
tsp	teaspoon, 4-5 ml
TSSRI	thienobenzodiazepine-selective serotonin reuptake inhibitor
UDT	urine drug test/screen
ULN	upper limit of normal
URI	upper respiratory infection
USPSTF	U.S. Preventive Services Task Force
UTI	urinary tract infection
VLDL	very-low-density-lipoprotein
VMAT2	vesicular monoamine transporter-2
VREF	vancomycin-resistant <i>Enterococcus faecium</i>
VRSA	vancomycin-resistant <i>Staphylococcus aureus</i>
VVC	vulvovaginal candidiasis
w.	with
WBC	white blood cell (leukocyte)
WHO	World Health Organization
XL	extra-long-acting
XOI	xanthine oxidase inhibitor
XR	ext-rel, extended-release



The APRN's Complete Guide to Prescribing Drug Therapy 2018 is a prescribing reference intended for use by health care providers in all clinical practice settings who are involved in the primary care management of patients with acute, episodic, and chronic health problems. It is organized in a concise and easy-to-read format. Comments are interspersed throughout, including such clinically useful information as laboratory values to be monitored, patient teaching points, and safety information.

This reference is divided into two major sections that are organized in a concise and easy-to-read format. **Section I** presents drug treatment regimens for over 500 clinical diagnoses. Each drug is listed alphabetically by generic name, whether the drug is available over the counter (OTC), DEA schedule (I, II, III, IV, V), generic availability (G), adult and pediatric dosing regimens, available dose forms, whether tablets, caplets, or chew tabs are scored (*), cross-scored (**), or tri-scored (***), flavors of chewable, sublingual, buccal, and liquid forms, and information regarding additives (e.g., dye-free, sugar-free, preservative-free or preservative type, and alcohol-free or alcohol content). For drugs initially FDA-approved *prior to June 30, 2015*, the former traditional FDA pregnancy categories still apply (A, B, C, D, or X). Non-pharmaceutical products, and drugs that received *initial FDA-approval on or after June 30, 2015* do not have an FDA pregnancy designation. For information regarding special populations, including pregnant and breastfeeding females, refer to the manufacturer's package insert or visit <https://www.accessdata.fda.gov/scripts/cder/daf/> to view the product label online. Visit <https://www.drugs.com/pregnancy-categories.html> to view the **FDA Pregnancy and Lactation Labeling Final Rule (PLLR)** and new label format.

Section II presents clinically useful information in convenient table format, including: the JNC-8 recommendations for hypertension management, the U.S. schedule of controlled substances and the FDA pregnancy categories, measurement conversions, childhood and adult immunization recommendations, brand-name drugs (with contents) for the management of common respiratory symptoms, anti-infectives by classification, pediatric dosing by weight for liquid forms, glucocorticosteroids by potency and route of administration, and contraceptives by route of administration and estrogen and/or progesterone content. An alphabetical index of drugs by generic and brand name, with FDA pregnancy category and controlled drug schedule, facilitates quick identification of drugs by alternate names, relative safety during pregnancy, and DEA schedule.

Selected diagnoses (e.g., angina, ADHD, growth failure, glaucoma, Parkinson's disease, CMV retinitis, multiple sclerosis, cystic fibrosis) and selected drugs (e.g., anti-neoplastics, antipsychotics, anti-arrhythmics, anti-HIV drugs, and anticoagulants) are included as patients are often referred by surgeons and emergency and urgent care providers to the primary care provider for follow-up monitoring and management.

Safe, efficacious, prescribing and monitoring of drug therapy regimens require adequate knowledge about (a) the pharmacodynamics and pharmacokinetics of drugs, (b) concomitant therapies, and (c) individual characteristics of the patient (e.g., current and past medical history, physical examination findings, hepatic and renal function, and co-morbidities). Users of this clinical guide are encouraged to utilize the manufacturer's

package insert, recommendations and guidance of specialists, standard of practice protocols, and the current research literature for more comprehensive information about specific drugs (e.g., special precautions, drug-drug and drug-food interactions, risk versus benefit, age-related considerations, adverse reactions) and appropriate use with individual patients.



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This publication, which we consider to be a “must have” for students, academicians, and practicing clinicians with prescriptive authority, represents the culmination of Springer Publishing Company’s collaborative team effort. Margaret Zuccarini, Publisher, Nursing, and the Editorial Committee, shared my vision for a handy pocket prescribing reference for new and experienced prescribers in primary care. Joanne Jay, Vice President, Production and Manufacturing, designed the contents for ease and efficiency of user navigation. The production team at Exeter Premedia Services, on behalf of Springer Publishing Company, understood the critical nature of exactness in this prescribing resource, and faithfully managed the complex files as content was updated and cross-paginated for the final product. The work of the reviewers from academia and clinical practice was essential to the process and their contributions are greatly appreciated. I am proud of my association with these dedicated professionals and I thank them on behalf of the medical and advanced practice nursing community worldwide, for supporting the end goal of quality health care for all.



QUICK CHECK PRESCRIBING REMINDERS

ACE-Is and ARBs are contraindicated in the 2nd and 3rd trimesters of pregnancy. Addition of a daily ACE-I or ARB is strongly recommended for renal protection in patients with hypertension and/or diabetes. The “ACE inhibitor cough,” a dry cough, is an adverse side effect produced by an accumulation of bradykinins that occurs in 5-10% of the population and resolves within days of discontinuing the drug.

Alcohol is contraindicated with concomitant **narcotic analgesics, benzodiazepines, SSRIs, antihistamines, TCAs,** and other sedating agents due to risk of over-sedation.

Alpha-1 blockers have a potential adverse side effect of sudden hypotension, especially with first dose. Alert the patient regarding this “first-dose effect” and recommend the patient sit or lie down to take the first dose. Usually start at lowest dose and titrate upward.

Antidepressant monotherapy should be avoided until any presence of (hypo) mania or positive family history for bipolar spectrum disorder has been ruled out as antidepressant monotherapy can induce mania in the bipolar patient.

For patients 65 years-of-age and older, consult the **May 2017 Beers Criteria** for Potentially Inappropriate Medication (PIM) Use in Older Adults, to help improve the safety of prescribing medications for older adults, presented in table format at: [https://www.priorityhealth.com/provider/clinical-resources/medication-resources/~media/documents/pharmacy/cms-high-risk-medications.pdf](https://www.priorityhealth.com/provider/clinical-resources/medication-resources/~/media/documents/pharmacy/cms-high-risk-medications.pdf)

Aspirin is contraindicated in children and adolescents with *Varicella* or other viral illness, and 3rd trimester of pregnancy.

Beta-blockers, by all routes of administration, are generally contraindicated in severe COPD, history of or current bronchial asthma, sinus bradycardia, and 2nd or 3rd degree AV block. Use a cardio-specific beta blocker where appropriate in these cases.

Biosimilar means the biological product is FDA-approved based on data demonstrating that it is highly similar to an FDA-approved biological product, known as a reference product, and that there are no clinically meaningful differences between the biosimilar product and the reference product (e.g., *Cyltezo (adalimumab-adbm)* is biosimilar to *Humira (ada-limumab)*).

Calcium channel blockers may cause the adverse side effect of pedal edema (feet, ankles, lower legs) that resolves with discontinuation of the drug.

Codeine is known to be excreted in breast milk. <12 years: not recommended; 12-<18: use extreme caution; not recommended for children and adolescents with asthma or other chronic breathing problem. The FDA and the European Medicines Agency (EMA)

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are investigating the safety of using **codeine**-containing medications to treat pain, cough, and colds in children 12-<18 years because of the potential for serious side effects, including slowed or difficult breathing.

Corticosteroids increases blood sugar in patients with diabetes and decreases immunity; therefore, consider risk vs benefit in susceptible patients, use lowest effective dose, and taper gradually to discontinue.

Check **drug interactions** at https://www.drugs.com/drug_interactions.php

Erythromycin may increase INR with concomitant warfarin, as well as increase serum level of digoxin, benzodiazepines, and statins.

Contraceptives that are estrogen-progesterone combinations and **progesterone-only** are contraindicated in pregnancy (pregnancy category X)

Finasteride, a 5-alpha reductase inhibitor, is associated with low but increased risk of high-grade prostate cancer. Pregnant females should not touch broken tablets.

Fluoroquinolones and **quinolones** are contraindicated <18 years-of-age, pregnancy, and breastfeeding. *Exception:* in the case of anthrax, **ciprofloxacin** is indicated for patients <18 years-of-age and dosed based on mg/kg body weight. Risk of tendonitis or tendon rupture (ex: **ciprofloxacin**, **gemifloxacin**, **levofloxacin**, **moxifloxacin**, **norfloxacin**, **ofloxacin**).

The U.S. Preventive Services Task Force (USPSTF) recommends against using **hormone replacement therapy (HRT)** for primary prevention of chronic conditions among postmenopausal women. The harms associated with combined use of estrogen and a progestin, such as increased risks of invasive breast cancer, venous thromboembolism, and coronary heart disease, far outweigh the benefits.

Ibuprofen is contraindicated in children <6 months of age and in the 3rd trimester of pregnancy.

Live vaccines are contraindicated in patients who are immunosuppressed or receiving immunosuppressive therapy, including immunosuppressive levels of corticosteroid therapy.

Metronidazole and **tinidazole** are contraindicated in the 1st trimester of pregnancy. Alcohol is contraindicated during treatment with oral forms and for 72 hours after therapy due to a possible **disulfiram**-like reaction (nausea, vomiting, flushing, headache).

When prescribing **opioid analgesics**, presumptive urine **drug testing (UDT)** should be performed when opioid therapy for chronic pain is initiated, along with subsequent use as adherence monitoring, using in-office point of service testing, to identify patients who are non-compliant or abusing prescription drugs or illicit drugs. American Society of Interventional Pain Physicians (ASIPP)

Oral PDE5 inhibitors are contraindicated in patients taking nitrates due to risk of hypotension or syncope (ex: *avanafil, sildenafil, tadalafil, vardenafil*).

Proton pump inhibitors (PPIs) should be discontinued, and should not be initiated, in patients with acute kidney injury (AKI) and chronic kidney disease (CKD).

Statins are strongly recommended as adjunctive therapy for patients with diabetes, with or without abnormal lipids.

Sulfonamides are not recommended in pregnancy or lactation. CrCl 15-30 mL/min: reduce dose by 1/2; CrCl <15 mL/min: not recommended (ex: *sulfamethoxazole, trimethoprim*). Contraindicated with G6PD deficiency. A high fluid intake is indicated during sulfonamide therapy to avoid crystallization in the kidneys.

Tetracyclines are contraindicated in children <8 years-of-age, pregnancy, and breastfeeding (discolors developing tooth enamel). A side effect may be photo-sensitivity (photophobia). Do not take with antacids, calcium supplements, milk or other dairy, or 2 hours of taking another drug (ex: *doxycycline, minocycline, tetracycline*).

Tramadol is known to be excreted in breast milk. The FDA and the European Medicines Agency (EMA) are investigating the safety of using *tramadol*-containing medications to treat pain in children 12-18 years because of the potential for serious side effects, including slowed or difficult breathing.

The **Transmucosal Immediate Release Fentanyl (TIRF) Risk Evaluation and Mitigation Strategy (REMS)** program is an FDA-required program designed to ensure informed risk-benefit decisions before initiating treatment, and while patients are treated to ensure appropriate use of TIRF medicines. The purpose of the TIRF REMS Access program is to mitigate the risk of misuse, abuse, addiction, overdose, and serious complications due to medication errors with the use of TIRF medicines. You must enroll in the TIRF REMS Access program to prescribe, dispense, or distribute TIRF medicines. To register, call the TIRF REMS Access program at 1-866-822-1483 or register online at <https://www.tirfremaccess.com/TirfUI/remshome.action>



**The APRN's Complete Guide to
Prescribing Drug Therapy**

2019



SECTION I

DRUG THERAPY BY CLINICAL DIAGNOSIS

ACETAMINOPHEN OVERDOSE

ANTIDOTE/CHELATING AGENT

- ▶ **acetylcysteine** (B)(G) *Loading Dose:* 150 mg/kg administered over 15 minutes; *Maintenance:* 50 mg/kg administered over 4 hours; then 100 mg/kg administered over 16 hours
Pediatric: same as adult

Acetadote Vial: *soln for IV infusion after dilution:* 200 mg/ml (30 ml; dilute in D₅W (preservative-free)

Comment: **acetaminophen** overdose is a medical emergency due to the risk of irreversible hepatic injury. An IV infusion of **acetylcysteine** should be started as soon as possible and within 24 hours if the exact time of ingestion is unknown. Use a serum **acetaminophen** nomogram to determine need for treatment. Extreme caution is needed if used with concomitant hepatotoxic drugs.

ACNE ROSACEA

Comment: All acne rosacea products should be applied sparingly to clean, dry skin as directed. Avoid use of topical corticosteroids.

- ▶ **ivermectin** (C) apply bid
Soolantra Crm: 1% (30 gm)

Comment: **Soolantra** is a macrocyclic lactone. Exactly how it works to treat rosacea is unknown.

TOPICAL ALPHA-1A ADRENOCEPTOR AGONIST

- ▶ **oxymetazoline hcl** (B) <18 years: not recommended; ≥18 years: apply a pea-sized amount once daily in a thin layer covering the entire face (forehead, nose, cheeks, and chin) avoiding the eyes and lips; wash hands immediately
Rhofade Crm 1% (30 gm tube)

Comment: **Rhofade** acts as a vasoconstrictor. Use with caution in patients with cerebral or coronary insufficiency, Raynaud's phenomenon, thromboangiitis obliterans, scleroderma, or Sjögren's syndrome. **Rhofade** may increase the risk of angle closure glaucoma in patients with narrow-angle glaucoma. Advise patients to seek immediate medical care if signs and symptoms of potentiation of vascular insufficiency or acute angle closure glaucoma develop.

TOPICAL ALPHA-2 AGONIST

- ▶ **brimonidine** (B) apply to affected area once daily
Pediatric: <18 years: not recommended; >18 years: same as adult
Mirvaso

Gel: 0.33% (30, 45 gm tube; 30 gm pump)

Comment: **Mirvaso** is indicated for persistent erythema; **brimonidine** constricts dilated facial blood vessels to reduce redness.

TOPICAL ANTIMICROBIALS

- ▶ **azelaic acid** (B) apply to affected area bid
Azelex Crm: 20% (30, 50 gm)
Finacea Gel: 15% (30 gm); **Foam:** 15% (50 gm)
- ▶ **metronidazole** (B) apply to clean dry skin
MetroCream apply bid
Emol crm: 0.75% (45 gm)
MetroGel apply once daily
Gel: 1% (60 gm tube; 55 gm pump)

4 ■ Acne Rosacea

MetroLotion apply bid

Lotn: 0.75% (2 oz)

▶ **sodium sulfacetamide (C)(G)** apply 1-3 x daily

Klaron *Lotn:* 10% (2 oz)

▶ **sodium sulfacetamide+sulfur (C)**

Clenia Emollient Cream apply 1-3 x daily

Wash: sod sulfa 10%+sulfur 5% (10 oz)

Clenia Foaming Wash wash affected area once or twice daily

Wash: sod sulfa 10%+sulfur 5% (6, 12 oz)

Rosula Gel apply 1-3 x daily

Gel: sod sulfa 10%+sulfur 5% (45 ml)

Rosula Lotion apply tid

Lotn: sod sulfa 10%+sulfur 5% (45 ml) (alcohol-free)

Rosula Wash wash bid

Clnsr: sod sulfa 10%+sulfur 5% (335 ml)

ORAL ANTIMICROBIALS

▶ **doxycycline (D)(G)** 40-100 mg bid

Pediatric: <8 years: not recommended; ≥8 years, <100 lb: 2 mg/lb on first day in 2 divided doses, followed by 1 mg/lb/day in 1-2 divided doses; ≥8 years, ≥100 lb: same as adult; *see page 633 for dose by weight*

Acticlate *Tab:* 75, 150**mg

Adoxa *Tab:* 50, 75, 100, 150 mg ent-coat

Doryx *Tab:* 50, 75, 100, 150, 200 mg del-rel

Doxteric *Tab:* 50 mg del-rel

Monodox *Cap:* 50, 75, 100 mg

Oracea *Cap:* 40 mg del-rel

Vibramycin *Tab:* 100 mg; *Cap:* 50, 100 mg; *Syr:* 50 mg/5 ml (raspberry-apple)

(sulfites); *Oral susp:* 25 mg/5 ml (raspberry)

Vibra-Tab *Tab:* 100 mg film-coat

▶ **minocycline (D)(G)** 200 mg on first day; then 100 mg q 12 hours x 9 more days

Pediatric: <8 years: not recommended; ≥8 years, <100 lb: 2 mg/lb on first day in 2 divided doses, followed by 1 mg/lb q 12 hours x 9 more days; ≥8 years, ≥100 lb: same as adult

Dynacin *Cap:* 50, 100 mg

Minocin *Cap:* 50, 75, 100 mg; *Oral susp:* 50 mg/5 ml (60 ml) (custard) (sulfites, alcohol 5%)



ACNE VULGARIS

ORAL CONTRACEPTIVES

see Combined Oral Contraceptives page 539

see Progesterone-only Contraceptives (Mini-Pill) page 550

Comment: In their 2016 published report, researchers concluded different hormonal contraceptives have significantly varied effects on acne. Women (n=2,147) who were using a hormonal contraceptive at the time of their first consultation for acne comprised the study sample. Participants completed an assessment at baseline to report how the contraceptive affected their acne. Then the researchers used the Kruskal-Wallis test and logistic regression analysis to compare the outcomes by contraceptive type. On average, the vaginal ring and combined oral contraceptives (COCs) improved acne, whereas depot injections, subdermal implants, and hormonal intrauterine devices worsened

acne. In the COC categories, *drospirenone* was the most helpful in improving acne, followed by *norgestimate* and *desogestrel*, and then *levonorgestrel* and *norethindrone*. Although triphasic progestin dosage had a positive effect on acne, estrogen dosage did not.

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TOPICAL ANTIMICROBIALS

Comment: All topical antimicrobials should be applied sparingly to clean, dry skin.

▶ **azelaic acid (B)** apply to affected area bid

Azelex Crm: 20% (30, 50 gm)

Finacea Gel: 15% (30 gm); *Foam:* 15% (50 gm)

▶ **benzoyl peroxide (C)(G)**

Comment: *benzoyl peroxide* may discolor clothing and linens.

Benzac-W initially apply to affected area once daily; increase to bid-tid as tolerated

Gel: 2.5, 5, 10% (60 gm)

Benzac-W Wash wash affected area bid

Wash: 5% (4, 8 oz); 10% (8 oz)

Benzagel apply to affected area one or more x/day

Gel: 5, 10% (1.5, 3 oz) (alcohol 14%)

Benzagel Wash wash affected area bid

Gel: 10% (6 oz)

Desquam X⁵ wash affected area bid

Wash: 5% (5 oz)

Desquam X¹⁰ wash affected area bid

Wash: 10% (5 oz)

Triaz apply to affected area daily bid

Lotn: 3, 6, 9% (bottle), 3% (tube); *Pads:* 3, 6, 9% (jar)

ZoDerm apply once or twice daily

Gel: 4.5, 6.5, 8.5% (125 ml); *Crn:* 4.5, 6.5, 8.5% (125 ml); *Clns:* 4.5, 6.5, 8.5% (400 ml)

▶ **clindamycin topical (B)** apply to affected area bid

Pediatric: <12 years: not recommended; ≥12 years: same as adult

Cleocin T Pad: 1% (60/pck; alcohol 50%); *Lotn:* 1% (60 ml); *Gel:* 1% (30, 60 gm);

Soln w. applicator: 1% (30, 60 ml) (alcohol 50%)

Clindagel Gel: 1% (42, 77 gm)

Evoclin Foam: 1% (50, 100 gm) (alcohol)

▶ **clindamycin+benzoyl peroxide topical (C)** apply to affected area once daily

Pediatric: <12 years: not recommended; ≥12 years: same as adult

Acanya (G) apply to affected area once daily-bid

Gel: clin 1.2%+benz 2.5% (50 gm)

BenzaClin (G) apply to affected area bid

Gel: clin 1%+benz 5% (25, 50 gm)

Duac apply daily in the evening

Gel: clin 1%+benz 5% (45 gm)

Onexton Gel apply to affected area once daily

Gel: clin 1.2%+benz 3.75% (50 gm pump) (alcohol-free) (preservative-free)

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- ▶ **dapsone** topical (C)(G) apply to affected area bid
Pediatric: <12 years: not recommended; ≥12 years: same as adult
Aczone Gel: 5, 7.5% (30, 60, 90 gm pump)
- ▶ **erythromycin+benzoyl peroxide** (C) initially apply to affected area once daily; increase to bid as tolerated
Benzamycin Topical Gel Gel: eryth 3%+benz 5% (46.6 gm/jar)
- ▶ **sodium sulfacetamide** (C)(G) apply tid
Klaron Lotn: 10% (2 oz)

ORAL ANTIMICROBIALS

- ▶ **doxycycline** (D)(G) 100 mg bid
Pediatric: <8 years: not recommended; ≥8 years, <100 lb: 2 mg/lb on first day in 2 divided doses, followed by 1 mg/lb/day in 1-2 divided doses; ≥8 years, ≥100 lb: same as adult; *see page 633 for dose by weight*
Acticlate Tab: 75, 150**mg
Adoxa Tab: 50, 75, 100, 150 mg ent-coat
Doryx Tab: 50, 75, 100, 150, 200 mg del-rel
Doxteric Tab: 50 mg del-rel
Monodox Cap: 50, 75, 100 mg
Oracea Cap: 40 mg del-rel
Vibramycin Tab: 100 mg; *Cap:* 50, 100 mg; *Syr:* 50 mg/5 ml (raspberry-apple) (sulfites); *Oral susp:* 25 mg/5 ml (raspberry)
Vibra-Tab Tab: 100 mg film coat
- ▶ **erythromycin base** (B)(G) 250 mg qid, 333 mg tid or 500 mg bid x 7-10 days; then taper to lowest effective dose
Pediatric: <45 kg: 30-50 mg in 2-4 divided doses x 7-10 days; ≥45 kg: same as adult
Ery-Tab Tab: 250, 333, 500 mg ent-coat
PCE Tab: 333, 500 mg

Comment: *erythromycin* may increase INR with concomitant *warfarin*, as well as increase serum level of *digoxin*, *benzodiazepines*, and *statins*.

- ▶ **erythromycin ethylsuccinate** (B)(G) 400 mg qid x 7-10 days
Pediatric: 30-50 mg/kg/day in 4 divided doses x 7-10 days; may double dose with severe infection; max 100 mg/kg/day; *see page 635 for dose by weight*
EryPed Oral susp: 200 mg/5 ml (100, 200 ml) (fruit); 400 mg/5 ml (60, 100, 200 ml) (banana); *Oral drops:* 200, 400 mg/5 ml (50 ml) (fruit); *Chew tab:* 200 mg wafer (fruit)
E.E.S. Oral susp: 200, 400 mg/5 ml (100 ml) (fruit)
E.E.S. Granules Oral susp: 200 mg/5 ml (100, 200 ml) (cherry)
E.E.S. 400 Tablets Tab: 400 mg

Comment: *erythromycin* may increase INR with concomitant *warfarin*, as well as increase serum level of *digoxin*, *benzodiazepines*, and *statins*.

- ▶ **minocycline** (D)(G) initially 50-200 mg/day in 2 divided doses; reduce dose to once daily after improvement
Pediatric: <8 years: not recommended; ≥8 years: same as adult
Dynacin Cap: 50, 100 mg
Minocin Cap: 50, 75, 100 mg; *Oral susp:* 50 mg/5 ml (60 ml) (custard) (sulfites, alcohol 5%)
Minolira Tab: 105, 135 mg ext-rel
Solodyn Tab: 55, 65, 80, 105, 115 mg ext-rel

Comment: Once-daily dosing of **Minolira** or **Solodyn**, extended-release *minocyclines*, is approved for inflammatory lesions of non-nodular moderate-to-severe acne vulgaris for patients ≥12 years-of-age. The recommended dose of **Solodyn** is 1 mg/kg once daily x 12 weeks.

- ▶ **tetracycline (D)(G)** initially 1 gm/day in 2-4 divided doses; after improvement, 125-500 mg daily
Pediatric: <8 years: not recommended; ≥8 years, <100 lb: 25-50 mg/kg/day in 2-4 divided doses; ≥8 years, ≥100 lb: same as adult; *see page 646 for dose by weight*
Achromycin V *Cap:* 250, 500 mg
Sumycin *Tab:* 250, 500 mg; *Cap:* 250, 500 mg; *Oral susp:* 125 mg/5 ml (100, 200 ml) (fruit) (sulfites)

Comment: *tetracycline* is contraindicated <8 years-of-age, in pregnancy, and lactation (discolors developing tooth enamel). A side effect may be photo-sensitivity (photophobia). Do not give with antacids, calcium supplements, milk or other dairy, or within two hours of taking another drug.

TOPICAL RETINOIDS

Comment: Wash affected area with a soap-free cleanser; pat dry and wait 20 to 30 minutes; then apply sparingly to affected area; use only once daily in the evening. Avoid applying to eyes, ears, nostrils, and mouth.

- ▶ **adapalene (C)** apply once daily at HS
Pediatric: <12 years: not recommended; ≥12 years: same as adult
Differin *Cr:* 0.1% (45 gm); *Gel:* 0.1, 0.3% (45 gm) (alcohol-free); *Pad:* 0.1% (30/pck) (alcohol 30%); *Lotn:* 0.1% (2, 4 oz)
- ▶ **tazarotene (X)(G)** apply to affected area once daily at HS
Pediatric: <12 years: not recommended; ≥12 years: same as adult
Avage Cream *Cr:* 0.1% (30 gm)
Tazorac Cream *Cr:* 0.05, 0.1% (15, 30, 60 gm)
Tazorac Gel *Gel:* 0.05, 0.1% (30, 100 gm)
- ▶ **tretinoin (C)(G)** apply to affected area once daily at HS
Pediatric: <12 years: not recommended; ≥12 years: same as adult
Retralin Gel *Gel:* 0.05% (45 gm)
Avita *Cr:* 0.025% (20, 45 gm); *Gel:* 0.025% (20, 45 gm)
Retin-A Cream *Cr:* 0.025, 0.05, 0.1% (20, 45 gm)
Retin-A Gel *Gel:* 0.01, 0.025% (15, 45 gm) (alcohol 90%)
Retin-A Liquid *Soln:* 0.05% (alcohol 55%)
Retin-A Micro Gel *Gel:* 0.04, 0.08, 0.1% (20, 45 gm)
Tretin-X Cream *Cr:* 0.075% (35 gm) (parabens-free, alcohol-free, propylene glycol-free)

TOPICAL RETINOID+ANTIMICROBIAL COMBINATIONS

Comment: Wash affected area with a soap-free cleanser; pat dry and wait 20-30 minutes; then apply sparingly to affected area; use only once daily in the evening. Avoid eyes, ears, nostrils, and mouth.

- ▶ **adapalene+benzoyl peroxide (C)(G)** apply a thin film once daily
Pediatric: <18 years: not recommended
Epiduo Gel *Gel:* adap 0.1%+benz 2.5% (45 gm)
Epiduo Forte Gel *Pump gel:* adap 0.3%+benz 2.5% (15, 30, 45, 60 gm)
- ▶ **tretinoin+clindamycin (C)(G)** apply a thin film once daily
Pediatric: <18 years: not recommended
Ziana Gel: *tret* 0.025%+*clin* 1.2% (30, 60 gm)

ORAL RETINOID

Comment: Oral retinoids are indicated only for severe recalcitrant nodular acne unresponsive to conventional therapy including systemic antibiotics.

8 ■ Acne Vulgaris

- ▶ **isotretinoin (X)** initially 0.5-1 mg/kg/day in 2 divided doses; maintenance 0.5-2 mg/kg/day in 2 divided doses x 4-5 months; repeat only if necessary 2 months following cessation of first treatment course

Pediatric: <12 years: not recommended; ≥12 years: same as adult

Accutane Cap: 10, 20, 40 mg (parabens)

Amnesteem Cap: 10, 20, 40 mg (soy)

Comment: **isotretinoin** is highly teratogenic and, therefore, female patients should be counseled prior to initiation of treatment as follows: Two negative pregnancy tests are required prior to initiation of treatment and monthly thereafter. **Not** for use in females who are **or** who may become pregnant **or** who are breastfeeding. Two effective methods of contraception should be used for 1 month prior to, during, and continuing for 1 month following completion of treatment. Low-dose *progestin* (mini-pill) may be an *inadequate* form of contraception. No refills; a new prescription is required every 30 days and prescriptions must be filled within 7 days. Serum lipids should be monitored until response is established (usually initially and again after 4 weeks). Bone growth, serum glucose, ESR, RBCs, WBCs, and liver enzymes should be monitored. Blood should **not** be donated during, **or** for 1 month after, completion of treatment. Avoid the sun and artificial UV light. **isotretinoin** should be discontinued if any of the following occurs: visual disturbances, tinnitus, hearing impairment, rectal bleeding, pancreatitis, hepatitis, significant decrease in CBC, hyperlipidemia (particularly hypertriglyceridemia).



ACROMEGALY

GROWTH HORMONE RECEPTOR ANTAGONIST

- ▶ **pegvisomant (B)** *Loading dose:* 40 mg SC; *Maintenance:* 10 mg SC daily; titrate by 5 mg (increments **or** decrements, based on IGF-1 levels) every 4 to 6 weeks; max 30 mg/day

Pediatric: <12 years: not recommended; ≥12 years: same as adult

Somavert Inj: 10, 15, 20 mg

Comment: Prior to initiation of **pegvisomant**, patients should have baseline fasting serum glucose, HgbA_{1c}, serum K⁺ and Mg⁺⁺, liver function tests (LFTs), EKG, and gall bladder ultrasound.

Cyclohexapeptide Somatostatin

- ▶ **pasireotide (C)** administer SC in the thigh **or** abdomen; initial dose is 0.6 mg **or** 0.9 mg bid. Titrate dose based on response and tolerability; for patients with moderate hepatic impairment (Child-Pugh Class B), the recommended initial dosage is 0.3 mg twice daily and max dose 0.6 mg twice daily; avoid use in patients with severe hepatic impairment (Child-Pugh Class C)

Pediatric: <12 years: not recommended; ≥12 years: same as adult

Signifor LAR Amp: 0.3, 0.6, 0.9 mg/ml, single-dose, long-act rel (LAR) susp for inj



ACTINIC KERATOSIS

Comment: **pasireotide** is also indicated for destroying superficial basal cell carcinoma (sBCC) lesions.

- ▶ **diclofenac sodium 3% (C; D ≥30 wks)(G)** apply to lesions bid x 60-90 days

Pediatric: <12 years: not established; ≥12 years: same as adult

Solaraze Gel Gel: 3% (50 gm) (benzyl alcohol)

Comment: *diclofenac* is contraindicated with *aspirin* allergy. As with other NSAIDs, **Solaraze Gel** should be avoided in late pregnancy (≥ 30 weeks) because it may cause premature closure of the ductus arteriosus; may cause premature closure of the ductus arteriosus.

Voltaren Gel apply qid; avoid non-intact skin

Gel: 1% (100 gm)

- ▶ **fluorouracil (X)(G)** apply to lesion(s) daily-bid until erosion occurs, usually 2-4 weeks

Pediatric: <12 years: not recommended; ≥ 12 years: same as adult

Carac Crm: 0.5% (30 gm)

Efudex (G) Crm: 5% (25 gm); *Soln:* 2, 5% (10 ml w. dropper)

Fluoroplex Crm: 1% (30 gm); *Soln:* 1% (30 ml w. dropper)

- ▶ **imiquimod (B)**

Pediatric: <18 years: not recommended; ≥ 18 years: same as adult

Aldara (G) rub into lesions before bedtime and remove with soap and water

8 hours later; treat 2 times per week; max 16 weeks

Crms: 5% (single-use pkts/carton)

Zyclara rub into lesions before bedtime and remove with soap and water 8 hours

later; treat for 2-week cycles separated by a 2-week no-treatment cycle; max 2

packs per application; max one treatment course per area

Crms: 3.75% (single-use pkts; 28/carton) (parabens)

- ▶ **ingenol mebutate (C)** limit application to one contiguous skin area of about 25 cm² using one unit dose tube; allow treated area to dry for 15 minutes; wash hands immediately after application; may remove with soapy water after 6 hours; *Face and Scalp:* apply 0.015% gel to lesions daily x 3 days; *Trunk and Extremities:* apply 0.05% gel to lesions daily x 2 days

Pediatric: <18 years: not recommended; ≥ 18 years: same as adult

Picato Gel: 0.015% (3 single-use tubes), 0.05% (2 single-use tubes)



ALCOHOL DEPENDENCE, DETOXIFICATION/ALCOHOL WITHDRAWAL SYNDROME

Comment: Total length of time of a given detoxification regimen and/or length of time of treatment at any dose reduction level may be extended based on patient-specific factors, including potential or actual seizure, hallucinosis, increased sympathetic nervous system activity (severe anxiety, unwanted elevation in vital signs). If any of these symptoms are anticipated or occur, revert to an earlier step in the dosing regimen to stabilize the patient, extend the detoxification timeline and consider appropriate adjunctive drug treatments (e.g., anticonvulsants, antipsychotic agents, antihypertensive agents, sedative hypnotics agents).

- ▶ **clorazepate (D)(IV)(G)** in the following dosage schedule: *Day 1:* 30 mg initially, followed by 30-60 mg in divided doses; *Day 2:* 45-90 mg in divided doses; *Day 3:* 22.5-45 mg in divided doses; *Day 4:* 15-30 mg in divided doses; Thereafter, gradually reduce the daily dose to 7.5-15 mg; then discontinue when patient's condition is stable; max dose 90 mg/day

Pediatric: <18 years: not recommended; ≥ 18 years: same as adult

Tranxene Tab: 3.75, 7.5, 15 mg

Tranxene T-Tab Tab: 3.75*, 7.5*, 15*mg

- ▶ **chlordiazepoxide (D)(IV)(G)**

Pediatric: <18 years: not recommended; ≥ 18 years: same as adult

Librium 50-100 mg q 6 hours x 24-72 hours; then q 8 hours x 24-72 hours; then q 12 hours x 24-72 hours; then daily x 24-72 hours

Cap: 5, 10, 25 mg

10 ■ Alcohol Dependence, Detoxification/Alcohol Withdrawal Syndrome

Librium Injectable 50-100 mg IM or IV; then 25-50 mg IM tid-qid prn; max 300 mg/day

Inj: 100 mg

- ▶ **diazepam (D)(IV)(G)** 2-10 mg q 6 hours x 24-72 hours; then q 8 hours x 24-72 hours; then q 12 hours x 24-72 hours; then daily x 24-72 hours

Pediatric: <18 years: not recommended; ≥18 years: same as adult

Diastat Rectal gel delivery system: 2.5 mg

Diastat Acu Dial Rectal gel delivery system: 10, 20 mg

Valium Tab: 2*, 5*, 10*mg

Valium Injectable Vial: 5 mg/ml (10 ml); *Amp:* 5 mg/ml (2 ml); *Prefilled syringe:* 5 mg/ml (5 ml)

Valium Intensol Oral Solution Conc oral soln: 5 mg/ml (30 ml w. dropper) (alcohol 19%)

Valium Oral Solution Oral soln: 5 mg/5 ml (500 ml) (wintergreen-spice)

- ▶ **oxazepam (C)** 10-15 mg tid-qid x 24-72 hours; decrease dose and/or frequency every 24-72 hours; total length of therapy 5-14 days; max 120 mg/day

Pediatric: <18 years: not recommended; ≥18 years: same as adult

Cap: 10, 15, 30 mg

ABSTINENCE THERAPY

GABA Taurine Analog

- ▶ **acamprosate (C)(G)** 666 mg tid; begin therapy during abstinence; continue during relapse; *CrCl* 30-50-mL/min: max 333 mg tid; *CrCl* <30 mL/min: contraindicated

Pediatric: <18 years: not recommended; ≥18 years: same as adult

Campral Tab: 333 mg ext-rel

Comment: **Campral** does not eliminate or diminish alcohol withdrawal symptoms.

AVERSION THERAPY

- ▶ **disulfiram (X)(G)**

Pediatric: <18 years: not recommended; ≥18 years: same as adult

Antabuse 500 mg once daily x 1-2 weeks; then 250 mg once daily

Tab: 250, 500 mg; *Chew tab:* 200, 500 mg

Comment: **disulfiram** use requires informed consent. Contraindications: severe cardiac disease, psychosis, concomitant use of **isoniazid**, **phenytoin**, **paraldehyde**, and topical and systemic alcohol-containing products. Approximately 20% remains in the system for 1 week after discontinuation.

NUTRITIONAL SUPPORT

- ▶ **thiamine (A)(G)** injectable 50-100 mg IM/IV once daily (or tid if severely deficient)

Pediatric: <18 years: not recommended; ≥18 years: same as adult

Vial: 100 mg/1 ml (1 ml)

ALLERGIC REACTION: GENERAL

Oral Second Generation Antihistamines *see* Drugs for the Management of Allergy, Cough, and Cold Symptoms page 591

Topical Corticosteroids *see* page 558

Parenteral Corticosteroids *see* page 563

Oral Corticosteroids *see* page 561