

NSAID steroid update

Leo Semes, OD, FAAO

- I. Mechanisms of action – the role of prostaglandins
 - a. Mediators of inflammation
 - b. ... and much more

- II. Topical NSAIDS – ophthalmic application

- III. Oral NSAIDs
 - a. Precautions and contraindications
 - b. Pain moderation and amelioration
 - c. OTC/Rx // Alternative recommendations
 - d. NSAIDs vs. narcotic analgesics

Learning Objectives

1. To understand mechanisms of inflammation and pain
2. To appreciate strategies topical and oral for management of inflammation and pain
3. To appreciate alternatives to Rx medications for oral pain and inflammation management

The Oxford League Table (modified from:

<http://www.medicine.ox.ac.uk/bandolier/booth/painpag/acutrev/analgesics/lftab.html>;

accessed and modified 6/6/10)

(paracetamol = acetaminophen)

The 2007 Oxford league table of analgesic efficacy					
Numbers needed to treat (NNT) are calculated for the proportion of patients with at least 50% pain relief over 4-6 hours compared with placebo in randomized, double-blind, single-dose studies in patients with moderate to severe pain. Drugs were oral, unless specified, and doses are mg. Shaded <u>rows</u> are intramuscular administration					
Analgesic	Number of patients in comparison	Percent with at least 50% pain relief	NNT	Lower confidence interval	Higher confidence interval
*Etoricoxib 180/240	248	77	1.5	1.3	1.7
*Etoricoxib 100/120	500	70	1.6	1.5	1.8
*Valdecoxib 40 (Bextra©)	473	73	1.6	1.4	1.8
**Dipyrone 1000	113	79	1.6	1.3	2.2
Ibuprofen 600/800	165	86	1.7	1.4	2.3
Valdecoxib 20 (Bextra©)	204	68	1.7	1.4	2.0
Ketorolac 20 Toradol©; (Acular, Acular LS, Acuvai, topical)	69	57	1.8	1.4	2.5
Ketorolac 60 (intramuscular)	116	56	1.8	1.5	2.3
Diclofenac 100	545	69	1.8	1.6	2.1
Piroxicam 40 (Feldene©)	30	80	1.9	1.2	4.3
Celecoxib 400	298	52	2.1	1.8	2.5

Celebrex©					
Paracetamol 1000 + Codeine 60	197	57	2.2	1.7	2.9
Oxycodone IR 5 + Paracetamol 500	150	60	2.2	1.7	3.2
Bromfenac 25	370	51	2.2	1.9	2.6
Rofecoxib 50 Vioxx©	675	54	2.3	2.0	2.6
Oxycodone IR 15	60	73	2.3	1.5	4.9
Aspirin 1200	279	61	2.4	1.9	3.2
Bromfenac 50	247	53	2.4	2.0	3.3
Dipyron 500	288	73	2.4	1.9	3.2
Ibuprofen 400	5456	55	2.5	2.4	2.7
Bromfenac 100	95	62	2.6	1.8	4.9
Oxycodone IR 10 + Paracetamol 650	315	66	2.6	2.0	3.5
Diclofenac 25	502	53	2.6	2.2	3.3
Ketorolac 10	790	50	2.6	2.3	3.1
Paracetamol 650 + tramadol 75	679	43	2.6	2.3	3.0
Oxycodone IR 10+Paracetamol 1000	83	67	2.7	1.7	5.6
Naproxen 400/440	197	51	2.7	2.1	4.0
Piroxicam 20	280	63	2.7	2.1	3.8
*Lumiracoxib 400 Prexige©	370	48	2.7	2.2	3.5

Naproxen 500/550	784	52	2.7	2.3	3.3
Diclofenac 50	1296	57	2.7	2.4	3.1
Ibuprofen 200	3248	48	2.7	2.5	2.9
Dextropropoxyphene 130 (Davron©)	50	40	2.8	1.8	6.5
Paracetamol 650 + tramadol 112	201	60	2.8	2.1	4.4
Bromfenac 10	223	39	2.9	2.3	4.0
Pethidine 100 (intramuscular)	364	54	2.9	2.3	3.9
Tramadol 150 (Ultram©, Tramol©)	561	48	2.9	2.4	3.6
Morphine 10 (intramuscular)	946	50	2.9	2.6	3.6
Naproxen 200/220	202	45	3.4	2.4	5.8
Ketorolac 30 (intramuscular)	359	53	3.4	2.5	4.9
Paracetamol 500	561	61	3.5	2.2	13.3
Celecoxib 200	805	40	3.5	2.9	4.4
Paracetamol 1500	138	65	3.7	2.3	9.5
Ibuprofen 100	495	36	3.7	2.9	4.9
Oxycodone IR 5 + Paracetamol 1000	78	55	3.8	2.1	20.0
Paracetamol 1000	2759	46	3.8	3.4	4.4
Paracetamol 600/650 + Codeine 60	1123	42	4.2	3.4	5.3

Paracetamol 650 + Dextropropoxyphene (65 mg hydrochloride or 100 mg napsylate)	963	38	4.4	3.5	5.6
Aspirin 600/650	5061	38	4.4	4.0	4.9
Paracetamol 600/650	1886	38	4.6	3.9	5.5
Ibuprofen 50	316	32	4.7	3.3	8.0
Tramadol 100	882	30	4.8	3.8	6.1
Tramadol 75	563	32	5.3	3.9	8.2
Aspirin 650 + Codeine 60	598	25	5.3	4.1	7.4
Oxycodone IR 5 + Paracetamol 325	149	24	5.5	3.4	14.0
Ketorolac 10 (intramuscular)	142	48	5.7	3.0	53.0
Paracetamol 300 + Codeine 30	379	26	5.7	4.0	9.8
Bromfenac 5	138	20	7.1	3.9	28.0
Tramadol 50	770	19	8.3	6.0	13.0
Codeine 60	1305	15	16.7	11.0	48.0
Placebo	>10,000	18	N/A	N/A	N/A

***not FDA-approved**

**** for veterinary use only**

IV. (<http://www.fda.gov/Drugs/DrugSafety/PostmarketDrugSafetyInformationforPatientsandProviders/ucm150314.htm>; accessed 6/6/10)

COX-2 Selective Non-steroidal Anti-inflammatory Drugs (NSAIDs) and Prescription and Over-the-Counter (OTC) Non-selective NSAIDs Approved Under New Drug Application (NDA) Abbreviated New Drug Application (ANDA)

COX-2 Selective NSAIDs	
Chemical Name	Brand Name
Celecoxib	Celebrex
Valdecoxib	Bextra
Rofecoxib	Vioxx

Non-selective NSAIDs	
Chemical Name	Brand Name
Diclofenac	Cataflam, Voltaren, Arthrotec (combination with misoprostol)
Diflunisal	Dolobid
Etodolac	Lodine, Lodine XL
Fenoprofen	Nalfon, Nalfon 200
Flurbiprofen	Ansaid
Ibuprofen**	Motrin, Motrin IB, Motrin Migraine Pain, Advil, Advil Migraine Liqui-gels, Ibu-Tab 200, Medipren, Cap-Profen, Tab-Profen, Profen, Ibuprohm, Children's Elixsure *, Vicoprofen (combination with hydrocodone), Combunox (combination with oxycodone)
Indomethacin	Indocin, Indocin SR, Indo-Lemmon, Indomethagan
Ketoprofen**	Oruvail, Orudis, Actron
Ketorolac	Toradol
Mefenamic Acid	Ponstel
Meloxicam	Mobic
Nabumetone	Relafen
Naproxen**	Aleve, Naprosyn, Anaprox, Anaprox DS, EC-Naproxyn, Naprelan, Naprapac (copackaged with lansoprazole)
Oxaprozin	Daypro

Piroxicam	Feldene
Salsalate	Disalcid
Sulindac	Clinoril
Tolmetin	Tolectin, Tolectin DS, Tolectin 600

*There are many OTC Combinations with ibuprofen: Advil Cold And Sinus, Advil Cold, Advil Allergy Sinus, Children's Advil Allergy Sinus, Ibuprohm Cold and Sinus, Sine-Aid IB, Children's Motrin Cold.

**There are over-the-counter versions of these prescription medications.