Cystic fibrosis. In patients with cystic fibrosis (see p.166), the inflammatory response to chronic pulmonary infection with *Pseudomonas* organisms contributes to lung destruction. NSAIDs have been studied in patients with cystic fibrosis as an alternative to corticosteroids to reduce pulmonary inflammation. A systematic review[1] found evidence in support of using high-dose NSAIDs, most notably ibuprofen, to slow the progression of lung damage in patients with cystic fibrosis. However, there are limited data about the long-term safety of high doses[1] and some consider that this may have limited such use of NSAIDs;[2] others remain to be convinced that a benefit has been demonstrated.[3] The reviewers did consider that there were sufficient data to recommend that NSAIDs be temporarily stopped when intravenous aminoglycosides or other nephrotoxic drugs are used.[1]

1. Lands LC, Stanojevic S. Oral non-steroidal anti-inflammatory drug therapy for cystic fibrosis. Available in The Cochrane Database of Systematic Reviews; Issue 4. Chichester: John Wiley; 2007 (accessed 07/11/07).
2. Fennel PB, *et al*. Use of high-dose ibuprofen in a pediatric cystic fibrosis center. *J Cyst Fibros* 2007; **6:** 153–8.
3. Bush A, Davies J. Non! to non-steroidal anti-inflammatory therapy for inflammatory lung disease in cystic fibrosis (at least at the moment). *J Pediatr* 2007; **151:** 228–30.

Pain. Findings from a long-term study[1] in 585 patients (mean age of 64 years) with knee pain suggested that oral and topical ibuprofen had an equivalent analgesic effect although the former was associated with more minor adverse effects; there was no difference in the rate of major adverse effects.

1. Underwood M, *et al*. Topical or oral ibuprofen for chronic knee pain in older people: the TOIB study. *Health Technol Assess* 2008; **12:** 1–176.

Patent ductus arteriosus. Ibuprofen or its lysine salt may be given **parenterally** for the treatment of patent ductus arteriosus (p.68) in preterm infants of less than 34 weeks' gestation; doses are expressed in terms of ibuprofen. Three intravenous doses (infused over 15 minutes) are given at 24-hour intervals; the initial dose is equivalent to 10 mg/kg of ibuprofen followed by two further doses of 5 mg/kg. If, 48 hours after this course of therapy the ductus remains open, a second course may be given, but if this produces no response surgery may be necessary. Ibuprofen injection, *when given as the base*, should be used undiluted, but if necessary it may be reconstituted with sodium chloride 0.9% or glucose 5% for injection. *When given as the lysine salt*, it should be diluted with sodium chloride 0.9% or glucose 5%.

For a suggestion that ibuprofen might be a better choice than indometacin for the treatment of patent ductus arteriosus, see p.68.

Preparations

BP 2008: Ibuprofen Cream; Ibuprofen Gel; Ibuprofen Oral Suspension; Ibuprofen Tablets;
USP 31: Ibuprofen and Pseudoephedrine Hydrochloride Tablets; Ibuprofen Oral Suspension; Ibuprofen Tablets.

Proprietary Preparations (details are given in Part 3)
Arg.: Actron; Acuilfem; Afebril; Algioprofen†; Atomo Desinflamante Ibu; Bistryl†; Brunal†; Butidiona; Causalon Ibu; Copiron; Dolocox†; Dolorsyn; Druisel; Fabogesic; Febratic; Fontol; Ibu; Ibu Evanol; Ibu-Lady†; Ibu-Novalgina; Ibubenitol; Ibucalmin; Ibucler; Ibufabra; Ibufix; Ibulam; Ibumar; Ibumultin; Ibup; Ibupirac; Ibupiretas; Ibuprofenix; Ibuprofex; Ibusi; Ibusol; Ibusumal; Ibutenk; Ibuxim; Ibuzidine; Kesan†; Matrix; Motrax†; Novo Geniol; Oxibut; Pakurat; Paraflex Crema†; Ponstil Mujer; Ponstin; Ponstinetas; Salivia; Sindol; Teprix; Tonal; Vefren; ***Austral.:*** ACT-3; Actiprofen; Advil; Brufen; Bugesic†; Dimetapp Pain & Fever Relief; Hexal Compufen†; Nurofen; Proven; Rafen; Tri-Profen; ***Austria:*** Advil; Aktren; Avallone; Brufen; Dismenol Neu; Dolgit; Dolibu; Dolofort; Duafen; Ibu; Ibudol; Ibufem; Ibugel; Ibumetin; Ibupron; Iburem†; Ibutop; Imbun; Kratalgin; Momento; Nurofen; ratioDolor; Tabcin; Urem†; ***Belg.:*** Adulfen Lysine; Advil Mono; Brufen; Buprophar; Dolofin; Epsilon; Extrapan; Ibu-Slow†; Ibumed; Ibutop; Junifen; Malafene; Nurofebryl; Nurofen; Optalidon Nieuwe Formule; Perdofemina; Perdophen; Perviam; Provenol; Siprofen†; Spidifen; ***Braz.:*** Actiprofen; Advil; Algiflex; Algy-Flaneril†; Alivium; Artril; Dalsy; Doraplax†; Doretrim†; Dorigren; Frenador†; Ib-Profeno†; Ibufran; Ibupril; Ibuprofan; Lombalgina; Motrin; Parartrin; Spidufen; Uniprofen; ***Canad.:*** Advil; Motrin; Novo-Profen; ***Chile:*** Actron; Advil†; Bediatil; Bladex†; Deucodol; Dolorub; Fenpic†; Fortapal; Ibu; Ibu-4†; Ibu-6†; Ibupirac; Ipson; Kin; Motrin; Niofen; Pediaprofen; Pironal; Pyriped; Tifen†; ***Cz.:*** Advil; Baroc; Brufen; Dolgit; Ibalgin; Ibumax; Irfen†; Nurofen; Nurofen Advance; Nurofen Stopgrip; Pabiprofen; Panafen; Pedea; Solpaflex; Tomaflex; Urgo; ***Denm.:*** Apain; Brufen; Ibumetin; Ibureumin; Ibutop; Ipren; Pedea; Solpaflex†; ***Fin.:*** Brufen; Burana; Ibumax; Ibumetin; Ibusal; Ibuxin; ***Fr.:*** Advil; Anadvil; Antarene; Brufen; Dolgit; Doltaque; Ergix; Expanfen; Gelufene; Hemagene Tailleur; Ibualgic†; Ibutop; Intralgis; Nureflex; Nurofen; Nurofentabs; Nuroflash; Pedea; Solufen; Spedifen; Spifen; Upfen; ***Ger.:*** Advel; Aktren; Contraneural; Dismenol N; Dolgit; Dolo Sanol; Dolo-Puren; Dolododoc; Dolormin; Esprenit; Eudorlin Extra; Eudorlin Migrane; Gyno-Neuralgin; Gynofug†; Ibu; Ibu Benuron; ibu-Attritin; Ibu-ratiopharm; Ibubeta; Ibudolor; Ibuflam; Ibuhexal; Ibumerck; Ibuphlogont†; Ibuprof†; Ibutad; Ibutop; Ilvico grippal†; Imbun; Jenaprofen; Kontagripp; Mensoton; Migranin Ibuprofen; Novogent†; Nurofen; Optalidon; Opturem; Parsal; Pedea; Pfeil†; Phamoprofen†; ratioDolor†; Schmerz-Dolgit; Spalt; Tabalon; Tempil†; Tispol Ibu-DD; Togal Akut Ibuprofen; Trauma-Dolgit; Urem; ***Gr.:*** Advil; Algofren; Brufen; Buscofem; Nurofen; Rozovin†; ***Hong Kong:*** Advil; Bifen; Brufen†; Bupogesic; Dolo-Spedifen†; Ibufac; Ibupen; Neutropain; Nurofen; Perofen; Profen; Rupan†; Schufen; Spedifen; ***Hung.:*** Advil; Algoflex; Dolgit; Huma-Profen; Ibulos†; Ibumax; Ibutop; Melfen; Nurofen; Solpaflex; Spedifen; ***India:*** Brufen; Butafen†; Cipgesic; Emflam; Ibugesic; Ibupal; ***Indon.:*** Anafen; Arthrifen; Bufect; Dofen; Dolofen-F; Febryn; Fenris; Iprox; Lexaprofen; Nofena; Ostarin; Prifen; Profen; Proris; Rhelafen; Ribunal; Shelrofen; Spedifen; Yariven; ***Irl.:*** Advil; Brufen; Bufigen; Fenopine; Ibugel; Melfen; Nurofen; Phorpain; Proflex; Solfen†; ***Israel:*** Adex; Advil; Artofen; Ibufen; Ibuleve; Nurofen; ***Ital.:*** Algofen; Antalfebal; Antalfort; Antalgil; Antalisin; Arfen; Benflogin; Brufen; Buscofen; Calmine; Cibalgina Due Fast; Dolocyl; Dolofast; Edenil; Faspic; Ganaprofene†; Gineflor; Ginenorm; Moment; Nureflex; Nurofast; Nurofen; Nurosolv; Pedea; Subitene; Zafen†; ***Malaysia:*** Bifen; Brugesic†; Ibufac; Ibufen†; Nurofen; Perofen; Rupan†; Spedifen; ***Mex.:*** ABKI; Actron; Adivon; Advil; Aflusil; Ainex; Aldofen; Algidol; Bestafen; Carone; Citalgan; Dadicil; Days; Dibufen; Dipofen; Diprodol; Dolprin; Dolprofen; Dolval; Dolver; Eufenil; Febratic; Fidoin-Q; Flexafen; Gelidol; Gobrosan; Ibuflam; Ibuflex; Ifentil; Inpained; Maxifen; Medifen; Mejorultra†; Motrin; Natiken†; Novartril†; Offeno†; Pro-XB; Proartinal; Probuxil; Quadrax; Realdrax; Ribufen; Tabalon; ***Neth.:*** Advil; Brufen; Femapirin; Ibosure; Ibulgan†; Nurofen; Pedea; Roco; Sarixell; Spidifen; Zafen; ***Norw.:*** Brufen; Ibumetin; Ibuprox; Ibux; ***NZ:*** ACT-3; Brufen; Fenapaed; Ibucare; Nurofen; Panafen; ***Philipp.:*** Advil; Brufen; Dolan; Idyl; Medicol; Midol; Skelan; ***Pol.:*** Bolinet; Deep Relief†; Dolgit; Ibufen; Ibum; Ibupar; Ibuprom; Nurofen; Pedea; ***Port.:*** Anadvil; Arfen; Baroc; Brufen; Calbrun; Dolocyl; Dolomate; Dolormin; Faspic; Frenidor; Ibupax†; Junifen; Moment; Motrin†; Norvectan; Nupriland†; Nurofen; Ozonol; Pedea; Plusofen; Seclodin; Solufen; Solvium; Spidifen; Sporfen; Trifene; Zafen; Zip-A-Dol; ***Rus.:*** Aldospray (Альдоспрей); Burana (Бурана); Dolgit (Долгит); Ibufen (Ибуфен); Nurofen (Нурофен); Solpaflex (Солпафлекс); ***S.Afr.:*** Advil; Antiflam†; Betagesic; Betaprofen; Brufen; Brugesic†; Iboflam; Ibugesic; Ibuleve; Ibumax; Ibumed; Inza; Lenafen†; Norflam T; Nurofen; Painil†; Ranfen; ***Singapore:*** Ampifen†; Bifen; Ibufen; Ibuloid†; Nurofen; ***Spain:*** Advil; Aldospray Analgesico; Algiasdin; Algidrin; Alogesia; Altior; Babypiril; Bexistar; Calmafher†; Dadosel; Dalsy; Diltix; Doctril; Dolbufen; Dolorac; Dorival; Espidifen; Factopan; Feminalin; Fiedosin; Frenatermin; Gelofeno; Ibubex; Ibufen; Ibumac; Ibuprox; Inadol†; Isdibudol†; Isdol†; Junifen; Narfen; Neobrufen; Nodolfen; Norvectan; Nurofen; Oberdol; Oltyl†; Optajun; Paidofebril; Pedea; Pirexin; Pocyl†; Ratiodol; Remidol†; Saetil; Solvium; Takigrip†; Tedifebrin; ***Swed.:*** Alindrin; Brufen; Ibumetin; Ipren; ***Switz.:*** Algifor; Artofen; Brufen; Dismenol; Dolo-Dismenol; Dolo-Spedifen; Dolocyl; Ecoprofen; Grefen; Ibufen-L; Ibusifar; Iproben; Iprogel†; Irfen; Melabon; Nurofen; Optifen; Perskindol Ibuprofen acute; Saridon N; Sinedol Ibuprofen; Spedifen; Treupel Dolo Ibuprofen; ***Thai.:*** Ambufen; Anbifen; Aprofen; Babefen Sus†; Borafen; Borakid; Brufen; Brumed†; Bruprin; Brusil; Bumed; Cefen; Cenbufen; Duran†; Faspic; G-Fen; Gesica; Greatofen; Heidi; Ibrofen; Ibu; Ibufac; Ibugan; Ibulan; Iburen†; Junifen†; Mano-Bruzone; Nurofen; Ostofen†; P-Fen; Perofen†; Pippen; Probue; Probufen; Profena†; Profeno; Rheumanox; Rumasian; Rumatifen; Rupan†; Schufen; Skelan IB; Tofen; Trofen; Umafen; ***Turk.:*** Advil; Artril; Bebol; Biophen; Brufen; Dolgit; Dolven; Gerofen; Ibu-600; Ibufen; Nurofen; Pedifen; Profen; Repozal; Rofen; Siyafen; Suprafen; Temsofen; Ultrafen; Upren; ***UAE:*** Profinal; ***UK:*** Advil; Anadin Ibuprofen; Anadin Joint Pain; Anadin Ultra; Arthrofen; Biatain-Ibu; Brufen; Calprofen; Cuprofen; Ebufac; Fenbid; Fenpaed; Feverfen; Galprofen; Hedex Ibuprofen; Ibrufhalal; Ibufem; Ibugel; Ibuleve; Ibumousse; Ibuspray; Ibutop Cuprofen; Ibutop Ralgex; Librofem; Mandafen; Manorfen; Mentholatum Ibuprofen; Migrafen; Motrin†; Novaprin; Nurofen; Nurofen Migraine; Obifen; Orbifen; Pacifene; Pedea; Phor Pain; Proflex; Radian-B Ibuprofen; Relcofen; Rimafen; ***USA:*** Advil; Anadar; Genpril†; Haltran†; Ibu; Ibu-Tab; Ibu-4, -6, -8; Ibutab; Menadol; Midol Cramp & Body Aches; Motrin; NeoProfen; Nuprin†; Saleto-200; ***Venez.:*** Advil; Brugesic; Buprifen†; Buprodol; Butilene†; Dologesic; Femicaps; Femmex Plus; Ibucaps; Ibufen; Ibufenac†; Ibuprin; Ibuprox†; Ibutan; Lumbax; Max; Maydol; Mestral; Motrin; Pedibu.

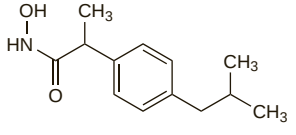
Multi-ingredient: ***Arg.:*** Aliviagrip; Bioneural B12†; Buscapina Fem; Butidiona†; Causalon Gesic†; Deep Relief†; Dexprofeno; Espasmo Ibupirac†; Espasmo Motrax†; Espasmofin; Ibu Evanol Plus; Ibu-Buscapina†; Ibu-Tetralgin; Ibudolofrix; Ibudristan; Ibumar Migra†; Ibunastizol; Ibupirac Fem; Ibupirac Flex; Ibupirac Migra; Mensalgin; Migral II; Novo Wilpan†; Roveril; Supragesic; ***Austral.:*** Dimetapp Headcold & Flu; Nurofen Cold & Flu; Nurofen Plus; Panafen Plus; Sudafed Sinus & Anti-inflammatory Pain Relief; Tri-Profen Cold & Flu†; ***Austria:*** Advil Cold; Ardinex; ***Belg.:*** Adulfen Codeine; ***Braz.:*** Algi-Itamanil†; Algi-Reumatril; Algifen†; Fymnal†; Reuplex; ***Canad.:*** Advil Cold & Sinus; Advil Cold & Sinus Plus; Childrens Advil Cold; Dristan Sinus†; Robax Platinum; Sudafed Sinus Advance; Vicks DayQuil Sinus & Pain Relief; ***Chile:*** Adona; Artritapsin; Butartrol; Deucodol Plus; Dioran†; Dolnix; Dolo Winasorb; Dolo-Niofen; Dolo-Octirona; Dolonase; Gedol†; Ibupirac Compuesto; Ibupirac Flu; Ipson-D; Midol†; Neo Butartrol; Niofen Flu; Predual DI†; Silartrin†; Termo-Niofen; ***Cz.:*** Advil Cold; Ardinex†; Ibu-Hepa; Ibufein†; Modafen; ***Fin.:*** Ardinex; Burana-C; ***Fr.:*** Anadvil Rhume; Cliptol; Nurofen Rhume; Rhinadvil; Rhinathiol Rhume†; Rhinureflex; Vicks Rhume†; ***Gr.:*** Nurofen CF; Vicks; ***Hung.:*** Advil Cold; Algoflex-M; Deep Relief; Nurofen Cold & Flu; Rhinathiol Cold; ***India:*** Acks; Anaflam; Answell; Bruace; Cipgesic Plus; Combiflam; Duoflam; Duoflam Plus; Emflam Plus; Flexon; Flexon-MR; Ibu-Proxyvon; Ibuflamar-P; Ibugesic Plus; Ibugesic-M; Reactine Forte; Reducin-A†; Robiflam; Somaflam; ***Indon.:*** Aknil; Axalan; Iremax; Limasip; Neo Rheumacyl; Neuralgin; Shelrod-Plus; ***Irl.:*** Advil Cold & Flu; Codafen Continus†; Nurofen Cold & Flu; Nurofen Plus; ***Israel:*** Nurofen Cold & Flu; ***Ital.:*** Solviflu; Vicks Flu-Action; ***Jpn:*** Colgen Kowa IB Toumei; ***Mex.:*** Algitrin; Bipasmin Compuesto NF†; Carbager-Plus; Dualgos; Sinutab Advance; ***NZ:*** Nurofen Cold & Flu; Nurofen Plus; ***Philipp.:*** Alaxan; Anoflam; Brustan; Flexigesic; Muskelax; Restolax; Selxan; ***Pol.:*** Ardinex; Dip Rilif; Ibalgin Sport; Ibuprom Zatoki; Metafen; Modafen; Nurofen Antigrip; Nurofen Plus; ***Rus.:*** Brustan (Брустан); Ibuclin (Ибуклин); Novigan (Новиган); Nurofen Plus (Нурофен Плюс); ***S.Afr.:*** Advil CS; Dentopain; Gen-Payne; Ibucod; Ibumol; Ibupain; Ibupain Forte; Lotem; Mybucod; Mybulen; Mypaid; Myprodol; Nurofen Cold & Flu; Sinumax IB; ***Spain:*** Nurofen Complex; Salvarina; ***Swed.:*** Ardinex; ***Switz.:*** Ibufen-L; ***Thai.:*** Alaxan PI; Brustan; Cetan; Dologen; Kintal†; Rumatifen-Plus; Skelan; ***Turk.:*** Nurofen Cold & Flu; ***UAE:*** Profinal Cold & Sinus; Profinal FM; Profinal XP; ***UK:*** Codafen Continus†; Cuprofen Plus; Deep Relief; Lemsip Flu 12Hr; Lemsip Pharmacy Powercaps; Non-Drowsy Sudafed Dual Relief Max; Nurofen Cold & Flu; Nurofen Plus; Nurofen Sinus; Orbifen Cold & Flu; Solpadeine Migraine; Solpaflex; ***USA:*** Advil Allergy Sinus; Advil Cold & Sinus; Advil PM; Anadar Cold & Flu; Childrens Advil Cold; Childrens Ibuprofen Cold; Childrens Motrin Cold; Combunox; Dimetapp Childrens Cold & Fever; Dimetapp Sinus; Dristan Sinus; Ibudone; Motrin IB Sinus; Reprexain; Sine-Aid IB; Vicoprofen; ***Venez.:*** Brudol; Brugesina; Colfene; Femmexultra; Ibucoden.

Ibuproxam *(rINN)*

Ibuproxamum. 4-Isobutylhydratropohydroxamic acid.

Ибупроксам

$C_{13}H_{19}NO_2$ = 221.3.
CAS — 53648-05-8.
ATC — M01AE13.
ATC Vet — QM01AE13.



Profile

Ibuproxam is an NSAID (p.96) that has been used topically as a 5% ointment in musculoskeletal, joint, and soft-tissue disorders.

Preparations

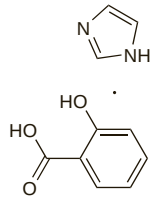
Proprietary Preparations (details are given in Part 3)
Ital.: Ibudros†; ***Spain:*** Nialen.

Imidazole Salicylate *(rINN)*

Imidazole, Salicylate d'; Imidazoli Salicylas; Salicilato de imidazol. Imidazole compounded with salicylic acid.

Имидазола Салицилат

$C_{10}H_{10}N_2O_3$ = 206.2.
CAS — 36364-49-5.
ATC — N02BA16.
ATC Vet — QN02BA16.



Profile

Imidazole salicylate is a salicylic acid derivative (see Aspirin, p.20) that has been used in the treatment of fever and inflammatory respiratory-tract and otorhinolaryngeal disorders. Imidazole salicylate has been given in oral doses of up to 2.25 g daily in divided doses. It has also been given as a rectal suppository and has been applied topically as a 5% gel for the relief of muscular and rheumatic pain.

Preparations

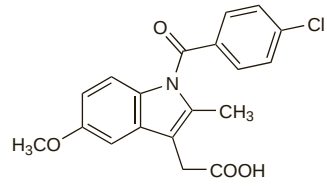
Proprietary Preparations (details are given in Part 3)
Ital.: Selezen.

Indometacin *(BAN, rINN)*

Indometacina; Indometacinas; Indométacine; Indometacinum; Indometacyna; Indometasiini; Indometasin; Indomethacin *(USAN)*. [1-(4-Chlorobenzoyl)-5-methoxy-2-methylindol-3-yl]acetic acid.

Индометацин

$C_{19}H_{16}ClNO_4$ = 357.8.
CAS — 53-86-1.
ATC — C01EB03; M01AB01; M02AA23; S01BC01.
ATC Vet — QC01EB03; QM01AB01; QM02AA23; QS01BC01.



Pharmacopoeias. In *Chin.*, *Eur.* (see p.vii), *Int.*, *Jpn*, *US*, and *Viet.*

Ph. Eur. 6.2 (Indometacin). A white or yellow, crystalline powder. Practically insoluble in water; sparingly soluble in alcohol. Protect from light.

USP 31 (Indomethacin). A pale yellow to yellow-tan, crystalline powder having not more than a slight odour. It exhibits polymorphism. Practically insoluble in water; soluble 1 in 50 of alcohol, 1 in 30 of chloroform, and 1 in 40 of ether. Protect from light.

Stability. Indometacin is unstable in alkaline solution.

Indometacin Sodium *(BANM, rINNM)*

Indometacina sódica; Indométacine Sodique; Indomethacin Sodium *(USAN)*; Indomethacin Sodium Trihydrate; Natrii Indometacinum. Sodium 1-(4-chlorobenzoyl)-5-methoxy-2-methylindole-3-acetate, trihydrate.

Натрий Индометацин

$C_{19}H_{15}ClNNaO_4,3H_2O$ = 433.8.
CAS — 74252-25-8.

Pharmacopoeias. In *US*.

USP 31 (Indomethacin Sodium). Protect from light.

Incompatibility. Indometacin sodium injection is reconstituted with preservative-free sodium chloride for injection 0.9% or preservative-free water for injection. Preparations containing glucose should not be used; reconstitution at a pH below 6 may