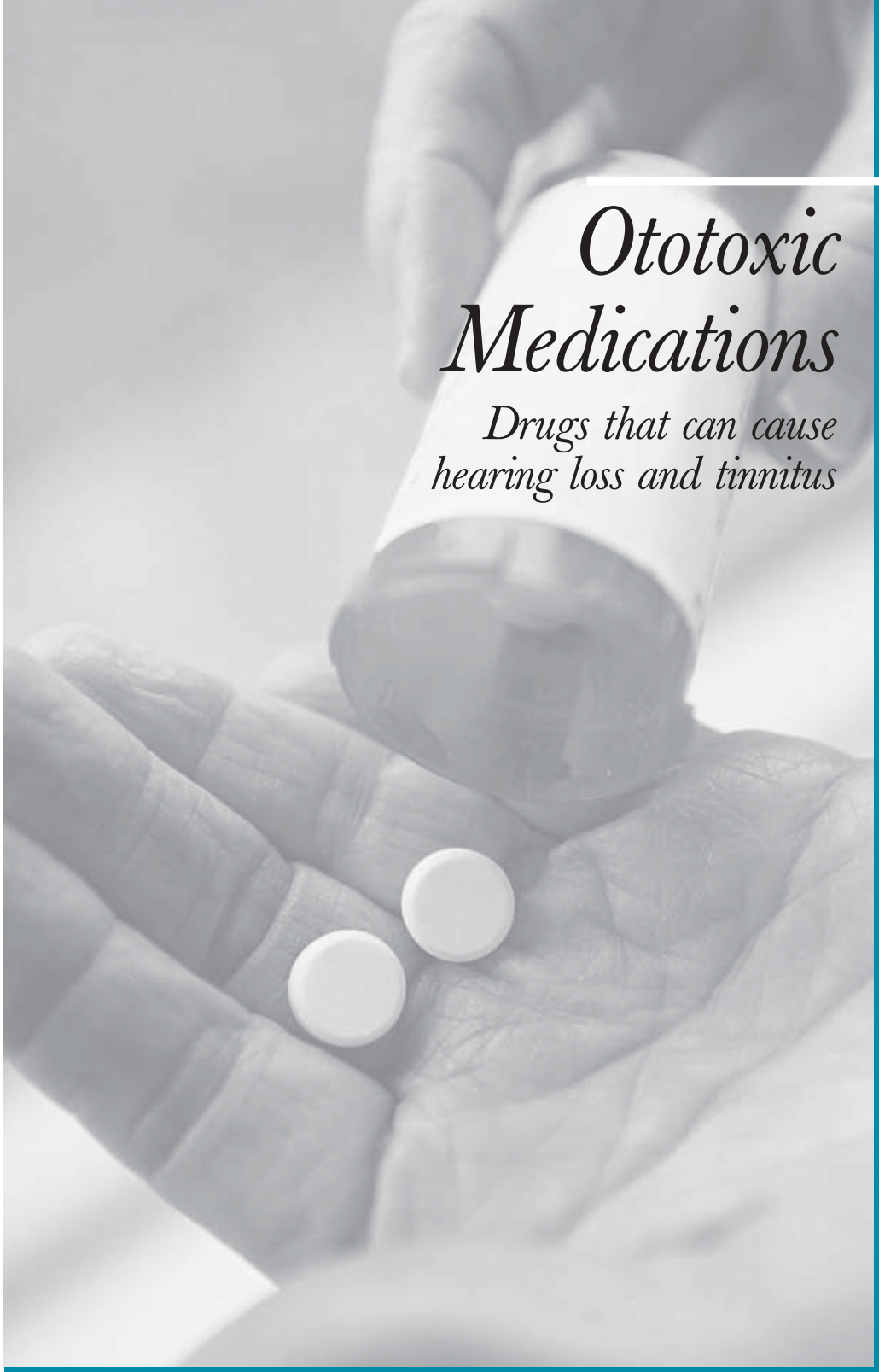

Ototoxic Medications

Drugs that can cause hearing loss and tinnitus

LEAGUE FOR THE HARD OF HEARING

SINCE 1910

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This pamphlet indicates which most commonly used medications could potentially cause damage to your hearing, or aggravate an already existing problem. It is important that you, the patient, take responsibility in knowing which drugs you should try to avoid. Usually any hearing problem will only be caused by exceeding the recommended dosage of the medications. Often these problems are reversible upon discontinuation of the drug. Occasionally there are times when this change in hearing can be permanent. If you are experiencing a hearing problem, or if there is a hearing disorder in your family, it is imperative that your treating physician and pharmacist be aware of this fact. If you are prescribed one of the medications found on this list, you should speak to your physician to see if another, potentially less toxic drug, could be used in its place. If the drug is over-the-counter, you should ask the pharmacist for a recommendation of a less toxic drug.

In the lists that follow, the generic name of the drug is given first, with the trade name, if available, followed in parentheses and capitalized. Many times a particular generic drug is manufactured under several trade names.

Orin S. Kaufman, D.O.

The trade names mentioned in this article were selected by the author randomly. The inclusion of a particular trade name and the exclusion of another should not be interpreted as prejudicial either for one nor against the other.

Drugs that can cause hearing loss

Salicylates

- aspirin and aspirin-containing products
- salicylates and methyl-salicylates *(linaments)*

(Toxic effects appear to be dose related and are almost always reversible once medications are discontinued.)

Non-Steroidal Anti-Inflammatory Drugs (NSAIDS)

(Most NSAIDS have the potential for causing hearing loss and/or tinnitus. Because new drugs are being frequently approved for use, it is important that you check with your doctor or pharmacist to determine if the drug you were prescribed can cause a problem.)

- diclofenac *(Voltaren)*
- etocolac *(Lodine)*
- fenprofen *(Nalfon)*
- ibuprofen *(Motrin, Advil, Nuprin, etc.)*
- indomethacin *(Indocin)*
- naproxen *(Naprosyn, Anaprox, Aleve)*
- piroxicam *(Feldene)*
- sulindac *(Clinoril)*

(Toxic effects are dose related and are almost always reversible once medications are discontinued.)

Antibiotics

- aminoglycosides
  - amikacin *(Amakin)*
  - gentamycin *(Garamycin)*
  - kanamycin *(Kantrex)*
  - neomycin *(Found in many over-the-counter antibiotic ointments.)*
  - netilmicin *(Netromycin)*
  - streptomycin
  - tobramycin *(Nebcin)*

(Of particular interest is that topical ear drop medications containing gentamycin or neomycin do not appear to be ototoxic in humans unless the tympanic membrane (ear drum) is perforated. When a solution of an aminoglycoside antibiotic is used on the skin together with an aminoglycoside antibiotic used intravenously, there is a risk of an increase of the ototoxic effect, especially if the solution is used on a wound that is open or raw, or if the patient has underlying kidney damage. Neomycin is the drug that is most toxic to the structure involved in hearing, the cochlea, so it is recommended for topical use only. But even topical therapy has resulted in hearing loss when large areas were treated which allowed for large amounts of the drug to be absorbed into the body. Hearing loss caused by this class of antibiotics is usually permanent.)

- erythromycin
  - *(EES)*
  - *(E-mycin)*
  - *(Ilosone)*
  - *(Eryc)*
  - *(Pediazole)*
  - *(Biaxin)*
  - *(Zithromax)*

(Usually ototoxic when given in intravenous doses of 2-4 grams per 24 hours, especially if there is underlying kidney failure.)

- vancomycin *(Vancocin)*

(Similar to aminoglycosides in that it may be ototoxic when used intravenously in life-threatening infections. The fact that aminoglycosides and vancomycin are often used together intravenously when treating life-threatening infections futher exaggerates the problem.)

- minocycline *(Minocin)*
  (Similar to erythromycin)
- polymixin B & amphotericin B
  (Antifungal preparations)
- capreomycin *(Capestat)*
  (Anti-tuberculosis medication)

Diuretics

- bendroflumethazide *(Corzide)*
- bumetadine *(Bumex)*
- chlor-thalidone *(Tenoretic)*
- ethacrynic acid *(Edecrin)*
- furosemide *(Lasix)*

(These are usually ototoxic when given intravenously for acute kidney failure, acute hypertensive crisis, or acute pulmonary edema/congestive heart failure. Rare cases of ototoxicity have been found when these medications are taken orally in high doses by people with chronic kidney disease.)

Chemotherapeutic Agents

- bleomycine *(Blenoxane)*
- bromocriptine *(Parlodel)*
- carboplatinum *(Carboplatin)*
- cisplatin *(Platinol)*
- methotrexate *(Rheumatrex)*
- nitrogen mustard *(Mustargen)*
- vinblastin *(Velban)*
- vincristine *(Oncovin)*

(The ototoxic effects can be minimized by carefully monitoring blood levels.)

Quinine

- chloroquine phosphate *(Aralen)*
- quinacrine hydrochloride *(Atabrine)*
- quinine sulfate *(Quinam)*

(The ototoxic effects are very similar to those of aspirin.)

Mucosal Protectant

- misoprostol *(Cytotec)*

Narcotic Analgesics

- hydrocodone *(Lorcet, Vicodin)*

Drugs that can cause tin

Vapors, Solvents

- cyclohexane
- dichloromethane
- hexane *(gasoline)*
- lindane *(Kwell)*
- methyl-chloride
- methyl-n-butyl-ketone
- perchlor-ethylene
- Styrene
- tetrachlor-ethane
- toluol
- trichloroethylene

Antibiotics

- aminoglycosides *(see previous section)*
- amphotericin B
- chloramphenicol *(Chloromycetin)*
- minocycline *(Minocin)*
- polymyxine B
- sulfonamides *(Septra, Bactrim)*
- vancomycin *(Vancocin)*

Anti-neoplastics

- bleomycin *(Blenoxane)*
- cis-platinum *(Platinol)*
- carboplatinum *(Paraplatin)*
- methotrexate *(Rheumatrex)*
- nitrogen mustard *(Mustagen)*
- vinblastin *(Velban)*

Diuretics

- acetazolamide *(Diamox)*
- bumetanide *(Bumex)*
- bendrofluazide
- clorothalidone *(Hygroton, Tenoretic)*
- diapamide
- ethacrynic acid *(Edecrin)*
- furosemide *(Lasix)*
- hydrochlorthiazide *(Hydrodiuril)*
- methylchlorthizide *(Enduron)*

Cardiac Medications

- celiprolol
- flecainide *(Tambocar)*
- lidocaine
- metoprolol *(Lopressor)*
- procainamide *(Pronestyl)*

- propranolol *(Inderal)*
- quinidine *(Quinaglute, Quinidex)*

Psychopharmacologic Agents

- amitryptiline *(Elavil)*
- benzodiazepine class
  - alprazolam *(Xanax)*
  - clorazepate *(Tranxene)*
  - chlordiazepoxide *(Librium)*
  - diazepam *(Valium)*
  - flurazepam *(Dalmane)*
  - lorazepam *(Ativan)*
  - midazolam *(Versed)*
  - oxazepam *(Serax)*
  - prozepam *(Centrax)*
  - quazepam *(Doral)*
  - temazepam *(Restoril)*
  - triazolam *(Halcion)*
- bupropion *(Welbutrin)*
- carbamzepine *(Tegretol)*
- diclofensine
- doxepin *(Sinequin)*
- desiprimine *(Norpramin)*
- fluoxetin *(Prozac)*
- imipramine *(Tofranil)*
- lithium
- melitracen
- molindon *(Moban)*
- paroxetin
- phenelzin *(Nardil)*
- protriptilin *(Vivactil)*
- trazodon *(Desyrel)*
- zimeldin

Non-Steroidal Anti-inflammatory Drugs (NSAIDS)

(Please see notation for NSAIDS under "hearing loss.")

- asprin
- acematacine
- benorilate
- benoxaprofen
- carprofen
- diclofenac *(Voltaren)*
- diflunisal *(Dolobid)*
- fenoprofen *(Nalfon)*
- feprazon
- ibuprofen *(Motrin, Advil, Nuprin)*
- indomethacin *(Indocin)*
- isoxicam
- ketoprofen *(Orudis)*
- methyl salicylates *(BenGay)*
- naproxen *(Naprosyn, Anaprox, Aleve)*
- D-Penicilliamin
- phenylbutazone *(Butazolidine)*
- piroxicam *(Feldene)*
- proglumetacin
- proquazon
- rofecoxib *(Vioxx)*
- salicylates
- sulindac *(Clinoril)*
- tolmetin *(Tolectin)*
- zomepirac

Glucocorticosteroids

- prednisolone *(Prednisone)*
- ACTH *(adrenocorticotrophic hormone) (Acthar)*

Anesthetics

- bupivacain
- tetracain
- lidocaine *(Novacaine)*

Antimalarials

- chloroquine *(Aralen)*
- hydroxychloroquine *(Plaquinil)*

Others

- thalidomide (*Thalomid*)

Miscellaneous Toxic Substances

- alcohol
- arsenum
- caffeine
- lead
- marijuana
- nicotine
- mercury
- auronofin *(gold, Ridaura)*

(Ironically, several of these drugs found to cause tinnitus, are also used to treat tinnitus (e.g., amitryptiline, benzodiazepine class, carbamazapine, furosemide, lidocaine, prednisone).)

About the League

A pioneer in hearing rehabilitation, human services, and hearing conservation. The League for the Hard of Hearing, founded in 1910, is a private not-for-profit rehabilitation agency for infants, children and adults who are hard of hearing, deaf, and deaf-blind.

The mission of the League for the Hard of Hearing is to improve the quality of life for people with all degrees of hearing loss. This is accomplished by providing hearing rehabilitation and human service programs for people who are hard of hearing and deaf, and their families, regardless of age or mode of communication.

We strive to empower consumers and professionals to achieve their potential and to provide leadership to, and be the model for, disciplines that relate to hearing rehabilitation.

We promote hearing conservation and provide public education about hearing.

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