

MENIERE'S DISEASE

- **Vertigo**
- **Endolymphatic Hydrops**

Meniere's Disease is a very disturbing illness, presenting patients with hearing loss, pressure in the ear, tinnitus, severe imbalance and vertigo.

- **Vertigo is the most dramatic and distressing symptom of Meniere's; it is described as a sudden loss of normal balance or equilibrium. The room may suddenly begin to spin and rotate at high speed. Focusing is difficult, and if the vertigo continues, nausea and vomiting may occur. Vertigo is commonly caused by acute labyrinthitis (a viral inflammation of the inner ear), benign positional vertigo (a condition due to abnormally floating crystals in the inner ear that stimulate the nerve endings of the inner ear), delayed symptom of head injury, or result of cervical spine problems.**
- **Hearing loss typically fluctuates with hearing being worse some days than others. The hearing loss in Meniere's may lead to severe permanent hearing loss and deafness in the affected ear.**
- **People with Meniere's Disease report that tinnitus may be variable and often worsen before an attack of vertigo. Tinnitus is often described as a motor-like whirring noise present only in the ear with the hearing loss.**
- **Pressure or a sense of fullness in the affected ear are also common.**

Meniere's Disease rarely occurs in children. In most cases, it begins in both men and women in the thirties or early middle age. Also, Meniere's is rarely noted for the first time in older people. Ear surgeons see many patients with dizziness. Very few of these patients actually have Meniere's Disease.

SYMPTOMS

Symptoms of Meniere's Disease come in cycles. The patient suffers multiple episodes lasting several months at a time; then, it generally subsides. In some individuals, the symptoms seem to be more severe in spring, fall or when under extra emotional stress.

The most unpredictable and frightening symptom of Meniere's Disease is vertigo. The vertigo in Meniere's Disease is thought to result from an accumulation of excessive fluid in the inner ear. The fluid pressure stretches the membranes, that divide the compartments of the inner ear. As the membranes of the inner ear stretch, hearing diminishes and tinnitus worsens. When the membranes are severely stretched, the fluids of the inner ear may rupture them. This results in mixing of the fluids, one rich in sodium, the other rich in potassium. The mixture of these fluids is thought to bring on the vertigo.

After the membranes rupture, they eventually heal, but some hearing is usually lost. Surprisingly, with salt restriction, careful dietary planning and a mild diuretic, the symptoms of Meniere's Disease will often subside. In some cases, hearing can return to normal.

Classic symptoms of Meniere's aren't always present. Sometimes, hearing loss will precede episodes of vertigo by several years. Tinnitus alone, without associated hearing loss or vertigo, is rarely caused by Meniere's Disease. The only symptom in very early cases of Meniere's may be a sense of fullness

or pressure in one ear.

DIAGNOSING MENIERE'S DISEASE

Other conditions can produce the same symptoms as Meniere's Disease and, thus, have to be ruled out or excluded in order to develop an accurate diagnosis.

For instance, infections of the inner ear, including syphilis and Lyme's Disease, may produce episodes of vertigo and hearing loss quite indistinguishable from Meniere's; these symptoms usually occur in both ears. Tumors of the inner ear nerve (the eighth nerve), especially acoustic neuromas, can also produce similar symptoms. These tumors grow slowly and compress the nerve. Thus, the hearing loss doesn't have periods of improvement. Also, the patient usually experiences imbalance rather than vertigo.

Ten to 15 percent of cases resembling Meniere's Disease may be the result of an immune disorder of the body, the system producing antibodies which attack the inner ear. Cholesteatomas (cystic growths) and other infections of the middle ear can also produce symptoms similar to Meniere's.

HOW WE DIAGNOSE

Initial evaluation is based on a very careful history given to the ear surgeon, as well as an examination of the ears under the operating microscope to rule out obvious infections or visible growths. Then, a comprehensive hearing test (audiogram) is taken. A low frequency upsloping hearing loss of the neural type noted on the hearing test is typical of Meniere's.

Additional testing is performed:

- electronystagmography, or balance test (ENG),
- electrocochleography (ECOG),
- brainstem evoked response audiometry (BSER),
- Magnetic Resonance Imaging (MRI) with a contrast dye called Gadolinium can rule out an acoustic neuroma or other brain tumor as a possible source of symptoms
- lab tests should include examination for inner ear immune related infections or conditions.

Once testing is completed, the ear surgeon can evaluate the results, rule out extraneous conditions and confirm the diagnosis of Meniere's Disease. Even after this extensive testing, the test results may not be conclusive.

WHAT THE TESTS REVEAL

ENG (electronystagmography) measures the nerve of balance. Over time, this nerve will lose function in Meniere's Disease. Most patients with Meniere's have a reduced response to stimulation with cold and warm water or air which is used in this test. Electrocochleography (ECOG) measures the excess fluid accumulation in the inner ear; in Meniere's, this test will also confirm increased pressure due to excess fluids in the inner ear. The Brain Stem auditory evoked responses (BSER) will usually be normal despite the hearing loss, unless a central disorder is present.

WHAT THE OTHER TESTS SHOW

The MRI with Gadolinium specifically visualizes the eighth nerve (acoustic and balance nerve). Some older scanners can miss a small acoustic neuroma (tumor). Newer MRIs can actually visualize the structures of the inner ear including the cochlea and semicircular canals. This is most helpful. The eighth nerve can be clearly identified on MRI scan. A nerve that does not show enhancement (increase in brightness), when the dye is given, rules out an acoustic neuroma from the diagnosis.

Laboratory tests are geared to identify other conditions that may be responsible for Meniere's. Syphilis can involve the inner ear even twenty to thirty years after the original infection. Lyme

Disease can also produce Meniere's-like symptoms, and symptoms can surface months after the original infection.

Individuals with certain auto immune disorders such as Lupus and severe rheumatoid arthritis, or who suffer from thyroid disorders such as Grave's Disease and Hashimoto's thyroiditis may be at higher risk for developing Meniere's Disease. This sub-group with their potential auto immune cause for the Meniere's can often be successfully treated with medications which slow the immune system's responses: cortisone-containing medications such as Decadron or Prednisone.

TREATMENT

When the diagnosis of Meniere's Disease is eventually confirmed, treatment is directed at ending or markedly reducing the frequency and severity of attacks. Treatment includes modification of personal habits, diet, stress reduction and regular exercise -- all extremely important in the overall treatment of Meniere's Disease. Medications will be recommended; evaluation of all treatments must be carefully annotated.

DIETARY

Dietary restriction of salt intake is primary. Most Americans consume over 10 grams of salt daily. Under normal conditions, the body requires 2 grams or less. The taste for salting food is an acquired one. Most individuals who restrict their salt intake become keenly aware of excess salt added to their food. Over time, salt restriction results in decreased fluid accumulation in the inner ear, reducing excess pressure on the nerve endings of balance and hearing. A daily diuretic, typically Hydrochlorothiazide (combined with Triamterene to retain potassium) help the body to further reduce fluid retention.

OTHER LIFESTYLE MODIFICATIONS

Smoking must stop immediately. Smoking constricts and reduces blood flow to the tiny blood vessels which nourish the inner ear nerve endings. Caffeine in coffee, tea and colas, as well as chocolate, must also be eliminated from the diet since caffeine excessively stimulates nerve endings. Reasonable exercise such as a daily brisk walk will stimulate circulation and help blood flow. A regular exercise program is also helpful.

VERTIGO MEDICATIONS

Use of medications such as Antivert (Meclizine) is usually of no benefit in true Meniere's Disease, even if it helps in other balance disorders. However, Valium (Diazepam) and other Benzodiazepines have a direct effect on the nerve controlling balance and its central connections to the brain. When Valium is given at the onset of a vertigo attack, it can prevent the attack from continuing. (N.B. Valium and similar medications should not be taken daily, because they may be habit forming.)

EATING: PROS & CONS

Diets can include fresh meats, poultry, vegetables and fruits. Processed meats, canned products, monosodium glutamate, table salt and "Lite salt" should be avoided totally. Olives, pickled foods, chips and some cheeses are also very high in sodium and should be avoided. Flavor can be added by using natural herbs and other spices NOT mixed with salt. Many individuals with Meniere's follow a typical low salt diet, similar to those diets used to control high blood pressure. Dieticians, pamphlets, and diet books are sources of further information.

YOUNGER PATIENTS

Young patients may have symptoms which are more severe and resistant to treatment. When recurring bouts of vertigo begin to interfere with daily activities, surgical options are often discussed. Generally, surgery is not to be considered unless attacks of vertigo are severe and do not respond to treatment. Often, patients with Meniere's have consulted a number of physicians who used the aforementioned treatments without success. Combining Cortisone-type medications with diuretics should be tried once again. Dyazide, combined with oral Decadron or Prednisone (cortisone) given over a period of 2 to 3 weeks will be helpful in gauging some form of medical response. If combined cortisone and diuretics plus diet are not effective in improving clinical symptoms, then surgery is advised.

Sodium Content of Common Foods

The information below is provided to assist patients maintain a low-sodium diet. The following numbers may be useful as a guide.

Dietary Salt (sodium) Intake

- "Normal" salt diet 1100 - 3300 mg/day
- "High" salt diet 4000 - 6000 mg/day
- "Low" salt diet 400 - 1000 mg/day Physicians may initially suggest a partially reduced salt level, in the range of 1000 - 2000 mg/day, to see if symptoms can be alleviated. Maintaining a sodium intake below 2000 mg/day requires considerable effort. Eating in restaurants causes difficulty as the majority of restaurant food is salted. To maintain a low sodium diet, you need to scrutinize the "Nutritional Information" boxes on food cartons. The amount of salt is listed as "sodium". Choose those products which would give you the least sodium, **based on the amount of product you eat**. Note that many "high salt" products (ketchup, salad dressing, corn chips) show relatively low sodium values based on very small serving portions (who eats only 12 corn chips at a sitting??). What is important is the total amount of sodium you are eating each day. As shown in the list below, fresh fruits and vegetables have low sodium content, but avoid adding salt to vegetables during preparation. The following advice may help maintain a low salt intake.
- Do not use salt at the table
- Reduce the salt used in food preparation. Try 1/2 teaspoon when recipes call for 1 teaspoon. Many cakes and desserts can be prepared without adding salt.
- Use herbs and spices for flavoring meats and vegetables instead of salt.
- Avoid salty foods such as processed meat and fish, pickles, soy sauce, salted nuts, chips and other snack foods.
- Check every "Nutritional Information" label before you buy or use a product. Note sodium **and** portion size information.

A cautionary note: The body possesses exquisite systems which accurately regulate body sodium. The goal of a low sodium diet is to "push" this regulation system toward one end of its range, without pushing it to the limit when body sodium starts falling. Although a low-salt diet is difficult to achieve, be aware that the low-salt diet can be "overdone" with possible adverse consequences. For this reason, if your vestibular symptoms persist, do

not keep decreasing your salt intake. The level of sodium intake should be decided in consultation with your physician or nutritionist. Lower levels require more rigorous monitoring by your physician. You should also be aware that your body can lose sodium by a number of routes other than in the urine. Sweating, vomiting and diarrhea can all produce significant sodium loss. In addition, other diseases, such as those which impair kidney function, may result in greater than normal sodium losses. In the event of adverse symptoms, you should contact your physician.

Sodium Content of Common Foods

All values are given in mg of sodium for a 100 g (3.5 oz) food portion. These values are a **guide**. More accurate values are given in the Nutritional Information on the package of most products, in the form of mg of sodium per serving.

- Apple, raw unpeeled 1
- Apple juice, bottled 1
- Applesauce, sweetened 2
- Asparagus, cooked 1 (regular canned 236)
- Avocado 4
- Bacon, cooked 1021
- Bacon, canadian 2500
- Baking powder 11,000
- Banana 1
- Barly, pearled 3
- Beans, Lima 1 (regular canned 236)
- Beans, snap green, cooked 4 (regular canned 236)
- Beans, white common, cooked 7
- Beans, canned with pork and tomato sauce 463
- Bean sprouts, cooked 4
- Beef, roasted broiled or stewed 60
- Beef, corned 1,740
- Beef hash, canned 540
- Beef, dried 4,300
- beef hamberger 47
- Beef pie or stew, commercial 400
- Beets, cooked 43 (regular canned 236)
- Beverages, beer 7
- Beverages, liquor 1 (avoid margueritas with salt!)
- Beverages, wine 5
- Beverage, soda 0 to 100 (check can)
- Beverage, fruit drink 0
- Beverage, water 0
- Biscuits 630
- Blackberries 1
- Bluefish, cooked 104
- Bouillon cubes 24,000
- Bread 300 to 500
- Broccoli, cooked 10
- Brussel sprouts, cooked 10
- Butter, salted 826 (unsalted - less than 10)
- Cabbage 20
- Cakes 100 to 300

- Candy, caramels, fudge 200
- Candy, hard, marshmallow, peanut brittle 30
- Cantaloupe 12
- Carrots 40 (regular canned 236)
- Cashews, unsalted 15
- Cauliflower 10
- Celery, raw 126 (cooked 88)
- Cereals bran, wheat, crude 9
- Cereals, commercial 700 to 1100
- Cereal, Corn grits 1
- Cereal, Cornmeal 1
- Cereal, Farina, dry 2 (cooked salted or instant 160)
- Cereal, Oatmeal, dry 2 (cooked salted 218)
- Cereal, Rice flakes 987
- Cereal, wheat flakes 1000
- Cereal, wheat, puffed 4
- Cereal, wheat, shredded 3
- Cheese, cheddar 620
- Cheese, processed 1189
- Cheese, cottage 406
- Cheese, cream 296
- Cheese, Mozzarella 373
- Cheese, Parmesan 1,862
- Cheese, Swiss 260
- Cherries, Raw 2
- Chicken, cooked, without skin 60 to 80
- Chicken pot pie, commercial 411
- Chickpeas, dry 8
- Chicory 7
- Chili con carne, canned with beans 531
- Chili powder with seasonings 1574
- Chocolate, plain 4
- Chocolate syrup 52
- Clams, raw soft 36
- Clams, hard, round 205
- Cocoa, dry 6
- Cocoa, processed 717
- Coconut, fresh 23
- Coffee, instant, dry 72
- Coffee, beverage, 1
- Collards, cooked 25
- Cookies, Fig bars 252
- Cookies, oatmeal 170
- Cookies , plain 365
- Corn, sweet, cooked 0 (regular canned 236)
- Cowpeas, dry, cooked 8
- Crabmeat, canned 1000
- Crackers, Graham 670
- Crackers, saltines 1,100
- Cranberry juice or sauce 1
- Cream 40
- Cucumber 6

- Dates 1
- Doughnuts 500
- Duck 74
- Eggplant, cooked 1
- Egg, whole, raw 74 (whites 152, yolk 49)
- Endive, curly 14
- Figs 2
- Flounder 78
- Flour 2
- Fruit cocktail 5
- Gelatin, dry 0 (sweetened, ready-to eat 51)
- Grapefruit, fresh, canned or juice 1
- Grapes 3
- Haddock, raw 61 (battered 177)
- Heart, beef 86
- Herring 74
- Honey 5
- Honeydew melon 12
- Ice cream, vanilla 87
- Jams and preserves 12
- Jellies 17
- Kale, cooked 43
- Lamb, lean 70
- Lard 0
- Lasagna 490
- Lemon, juice or fresh 1
- Lettuce 9
- Lime, fresh or juice 1
- Liver, beef 184
- Liver, pork 111
- Lobster 210
- Macaroni, dry 2 (commercial with cheese 543)
- Margarine 987
- Milk 50
- Milk, buttermilk 130
- Milk, evaporated 106
- Milk, dried 549
- Molasses, light 15 (Dark 96)
- Muffins, plain 441
- Mushrooms 14 (canned 400)
- Mustard, prepared yellow 1,252
- Mustard greens 18
- Nectarine 6
- Noodles, dry 5
- Nuts, in shell 1 (processed nuts may contain high amounts of salt)
- Oil, corn 0
- Okra, 2
- Olives, green 2,400
- Onions, green 5 (mature 10)
- Orange peeled, juice, canned or juice 1
- Oysters, raw 73
- Pancakes 425

- Papayas, raw 3
- Parsley 45
- Parsnips, cooked 8
- Peaches 2
- Peanuts, roasted 5 (salted 418)
- Peanut butter 607
- Pears 2
- Peas, cooked 2 (regular canned 236)
- Peas, dried 40
- Pecans, shelled 0
- Peppers, green 13
- Perch 79
- Pickles, dill 1,428
- Pickles, relish, sweet 712
- Pie 250 to 450
- Pie crust, baked 617
- Pike, walleye 51
- Pineapple, raw or canned 1
- Pizza, cheese 702
- Plums 2
- Popcorn, salted with oil 1,940
- Pork 65
- Pork, cured ham 930
- Pork canned ham 1,100
- Potatoes, baked, boiled or french fried 2 to 6
- Potatoes, mashed salted 331
- Potato chips, up to 1000
- Pretzels 1680
- Prunes 4
- Pumpkin, canned 2
- Radishes 18
- Raisins, dried 27
- Raspberries 1
- Rhubarb 2
- Rice, dry 5 (cooked salted 374)
- Rolls, bread or sweet 400 to 550
- Rutabagas 4
- Rye wafers 882
- Salad dressing 700 to 1300
- Salmon 64 (canned 387)
- Sardines, canned 400
- Sauerkraut 747
- Sausage, pork 958
- Sausage, Frankfurter 1,100
- Sausage, Bologna 1,300
- Scallops, 265
- Shrimp 150
- Soup, canned 350 to 450
- Spaghetti, dry 2
- Spaghetti with meatballs, canned 488
- Spinach, raw 71 (cooked 50)
- Squash 1

- Strawberries 1
- Sugar, white 1 (brown 30)
- Sunflower seeds 30
- Sweetpotatoes 12
- Syrup 68
- Tapioca, dry 3
- Tomato 3 (canned 130)
- Tomato ketchup 1,042
- Tomato juice, canned 200
- Tongue, beef 61
- Tuna in oil 800
- Turkey, 82
- Turnips 34
- Veal 80
- Vinegar 1
- Waffles 475
- Walnuts 3
- Watermelon 1
- Wheat germ 827
- Yeast, compressed 16 (dry , active 52)
- Yoghurt 46

Courtesy of Mark J. Levenson MD, FACS