



**MN**

Membranous  
Nephropathy

How can research help?

Research, which often requires patient participation, can lead to a better understanding of the causes, provide better diagnoses and more effective treatments, and ultimately help to find a cure.

Be part of the discovery: By studying patients, researchers can more quickly unlock the mysteries of this disease.

To get involved in research and stay informed, go to:

[www.Nephrotic-Syndrome-Studies.org](http://www.Nephrotic-Syndrome-Studies.org)

or call 1-866-NephCure  
(637-4287)



the **halpin** foundation



Nephrotic Syndrome Study Network

NEPTUNE is a part of the NIH Rare Diseases Clinical Research Network (RDCRN). Funding and/or programmatic support for this project has been provided by U54 DK083912 from the NIDDK and the NIH Office of Rare Diseases Research (ORDR), the NephCure Foundation and the University of Michigan. The views expressed in written materials of publications do not necessarily reflect the official policies of the Department of Health and Human Services; nor does mention by trade names, commercial practices or organizations imply endorsement by the U.S. Government.



**MN**

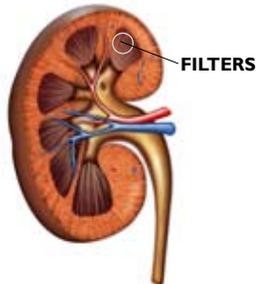
Membranous  
Nephropathy



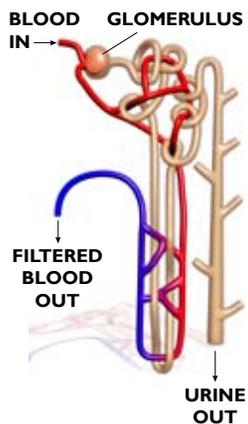
# What is Membranous Nephropathy?



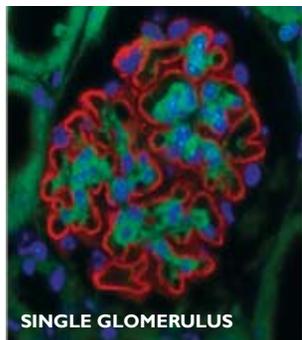
Each person has two kidneys in their lower back.



The kidneys continuously filter blood and produce urine to remove waste products, salts and excess fluid.



Each kidney is made up of approximately one million tiny filters called "glomeruli." Much as a coffee filter keeps coffee grounds in, glomeruli keep valuable cells and protein in the blood.



When glomeruli become damaged, proteins begin leaking into the urine (proteinuria). Proteinuria causes fluid to accumulate in the body and prolonged leakage can lead to kidney damage and even failure.

# Symptoms, Diagnosis and Treatment

Membranous nephropathy (MN) occurs when the thin membrane of the glomerulus becomes damaged and allows large amounts of protein to leak out from the blood into the urine. MN is one of the causes of a condition known as Nephrotic Syndrome (NS).

## What are some symptoms of MN?

- Proteinuria – Large amounts of protein "spilling" into the urine
- Edema – Swelling in parts of the body, most noticeable around the eyes, hands and feet, that can become painful
- Hypertension – High blood pressure
- Hypoproteinemia – Low blood protein
- Hypercholesterolemia – High blood cholesterol

## How is MN diagnosed?

A series of tests are ordered:

- Urine: determine the amount of protein in the urine
- Blood: determine levels of protein, creatinine, albumin, cholesterol and others
- "Glomerular Filtration Rate" (GFR): an estimate of kidney function
- Kidney ultrasound
- Kidney Biopsy: Removal of a small portion of the kidney for examination under the microscope

## How is MN treated?

Your nephrologist may recommend:

- Diuretics and low salt diet help to control edema
- A medication that blocks a hormone system called the renin angiotensin system (ACE inhibitor or ARB) to control blood pressure or lower urine protein

- Medications that suppress your immune system if proteinuria and severe edema persist despite these measures
- Anticoagulants to prevent blood clots
- Maintaining a healthy diet: Correct amounts of protein and fluid intake according to your nephrologist's recommendations
- Statins to lower the cholesterol level
- Exercising
- Not smoking
- Vitamins

## What causes MN?

MN is "idiopathic," which means it arises without a known cause, so researchers are actively trying to learn more. There are many other "secondary" causes of MN, such as cancer or the side effect of other drugs or immune diseases such as lupus, or some infections such as Hepatitis B or C.

For some people, MN sometimes goes away on its own, even without any particular treatment, but this is more likely if there is only a mild or moderate amount of protein in the urine. For some, MN may remain stable over many years, not getting better or worse. For others, MN may cause gradual loss of kidney function.

## Who gets MN?

Anyone can have MN but it is rare in children and adolescents and is more common in adults over the age of 40.