**NAME: IFUNANYA ANNETTE ORAKA**

**DEPARTMENT: PHARMACHOLOGY**

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**Renal system disease**, any of the diseases or disorders that affect the human urinary system. They include [benign](https://www.merriam-webster.com/dictionary/benign) and malignant tumours, infections and inflammations, and obstruction by calculi.

**Acute renal failure**Acute renal failure occurs when renal function suddenly declines to very low levels, so that little or no urine is formed, and the substances, including even water, that the kidney normally eliminates are retained in the body. There are two main mechanisms that can produce acute renal failure. When the [cardiac](https://www.britannica.com/science/cardiovascular-disease) output—the amount of blood pumped into the general circulation by the heart—is lowered by hemorrhage or by medical or surgical shock, the renal circulation is depressed to an even greater extent. This leads directly to inefficient excretion, but, more importantly still, the kidney tissue cannot withstand prolonged impairment of its blood supply and undergoes either patchy or massive [necrosis](https://www.britannica.com/science/necrosis) (tissue death). Given time, the kidney tissue may regenerate, and it is on this hope that the treatment of acute renal failure is based. The form of acute renal failure that is due to a poor supply of blood ([ischemia](https://www.britannica.com/science/ischemia)) has many causes, the most common and most important being multiple injuries, [septicemia](https://www.britannica.com/science/septicemia) (infections invading the bloodstream), abortion with abnormal or excessive bleeding from the female genital tract, internal or external hemorrhage, loss of fluid from the body as in severe [diarrhea](https://www.britannica.com/science/diarrhea) or burns, transfusion reactions, and severe heart attacks; a special case is the transplanted kidney, which commonly goes through a phase of acute renal failure that is independent of possible rejection.

The second common mechanism of acute renal failure is toxic. Many [poisons](https://www.britannica.com/science/poison-biochemistry) are excreted by the kidney, and in the process, like other urinary [constituents](https://www.merriam-webster.com/dictionary/constituents), they become concentrated and thus reach levels in the tubular fluid that damage the lining cells of the tubules. Though the tubular cells die and are shed in the urine, regeneration can take place and the patient survive, if he can be maintained during the period of depressed renal function and is not killed by other effects of the poison. Poisons that can affect the kidney in this way are numerous, but the main groups are heavy metals (mercury, arsenic, uranium); organic solvents (carbon tetrachloride, propylene glycol, methanol); other organic substances (aniline, phenindione, insecticides); and antibacterial agents (sulfonamides, aminoglycosides, amphotericin), and some fungi (*e.g.,* *Amanita phalloides*). In addition to the ischemic and toxic causes of acute renal failure, mention must be made of fulminating varieties of acute renal illnesses that are generally mild (*e.g.,* acute glomerulonephritis—see below) and of the acute form of immunologic rejection that can destroy a kidney irrevocably within minutes of transplantation. Another mechanism of acute renal failure is characterized by acute obstruction of the flow of urine from the kidneys; this condition is easily treated by restoring adequate urinary drainage from at least one kidney.

# [Chronic](https://www.britannica.com/science/chronic-disease) renal failure The term [uremia](https://www.britannica.com/science/uremia), though it is sometimes used as if it were interchangeable with chronic [renal failure](https://www.britannica.com/science/kidney-failure), really means an increase in the concentration of urea in the blood. This can arise in many [acute](https://www.merriam-webster.com/dictionary/acute) illnesses in which the kidney is not primarily affected and also in the condition of acute renal failure described above. Uremia ought to represent a purely chemical statement, but it is sometimes used to denote a clinical picture, that of severe renal insufficiency.

# [Glomerulonephritis](https://www.britannica.com/science/Bright-disease) Glomerulonephritis is the disorder commonly known as nephritis, or Bright’s [disease](https://www.britannica.com/science/disease). The primary impact of the disease is on the vessels of the [glomerular](https://www.britannica.com/science/glomerulus) tuft. The suffix “-itis” suggests an inflammatory lesion, and glomerulonephritis is indeed associated with infection, in the limited sense that it may begin soon after a streptococcal infection and may be aggravated in its later course by infections of various kinds. Nevertheless, there is convincing evidence that glomerulonephritis does not represent a direct attack on the kidney by an infective agent; it appears to be, rather, an immunologic disorder, in the sense of the formation of [antibodies](https://www.britannica.com/science/antibody) in response to the presence of a foreign protein (antigen) elsewhere in the body; these form antigen–antibody complexes that lodge in the glomerular tuft or, in a small number of cases, themselves become deposited on the capillary glomerular walls. In each case the antibody or the antigen–antibody complex reaches the kidney via the circulation, and the mechanism is usually referred to as circulating complex disease. Glomerular damage is a consequence of the reaction that follows within the glomeruli. These deposits of foreign protein and complexes react with other protein components of blood (see the article [complement](https://www.britannica.com/science/complement-immune-system-component)) and attract to the site white blood cells and platelets, which also are circulating in the blood; these in turn release protease enzymes and other chemical mediators of tissue injury.