Recent experimental research seems to prove that the majority of the organisms introduced into the circulation are destroyed before reaching the kidneys, and that while many bacteria are eliminated by the urine, it is unusual for them to lodge in the kidney, if the kidney and ureter are normal. Micro-organisms may be thus excreted without in any way injuring the organ; thus bacteria in the urine of typhoid cases does not necessarily mean renal infection. Sampson, of Johns Hopkins, performed a series of experiments on dogs, in which he tied the ureter of one kidney and injected pure cultures of staphylococcus into the jugular vein. He found that bacteria were eliminated to a certain extent by the urine, but only in those cases in which he tied the ureter did the kidney become infected. Brewer, later, in a series of experiments on dogs, found that not only obstructing the ureter, but bruising the kidney caused infection. In addition to the intestine, the bladder, prostate gland, and the uterus and its adnexa are additional possible sources of bacterial infection of the kidney through the blood. The blood-vessels of the kidney communicate with those of the bladder, aside from the general circulation, through two other channels, the utero-ovarian and the vessels of the ureter itself.

In persons apparently well, the onset is usually acute and without warning. The course of the disease may be rapid, with increasing toxic symptoms, or after an acute onset the patient may go for weeks or months in a septic condition. The very acute cases are the ones which simulate most closely abdominal infections. On the contrary, in a small number of cases infection may manifest itself by slight pain in the back, and long continued fever with or without pyuria, which symptoms may never lead to a suspicion of the kidney.

In advanced stages of renal abscess, it is difficult, if not impossible, to decide whether the infection came through the blood or lower urinary tract. Dr. Cobb cites the histories of eight cases, of which the first one—a fulminating case simulating gastric or duodenal perforation—is particularly interesting:

Rose H., 23 years old, married. Aside from children's diseases her previous history was unimportant. Had been married three years, and but for slight irregularity in menstruation and some leucorrhea and occasional "nervous attacks" had considered herself well. Had had no children and no miscarriages. Up to a few months before, she was constipated: since then the bowels have been loose, about three movements a day. She had noticed nothing unusual in the character of the stools. For three weeks