

## Evaluation of Hematuria

### Symptoms:

- Visible blood or clots in the urine (gross hematuria)
- Invisible blood in the urine seen under the microscope (microscopic hematuria)
- Blood staining the underwear or appearing on tissue

### Underlying causes:

There are numerous causes of hematuria, most of which are listed in Table 1. The presence of hematuria does not always indicate a serious problem, as there are many benign causes, including stones, urinary infections, and prostate enlargement. However, the presence of hematuria should be thought of as a “red flag” that mandates a careful evaluation to rule out serious and life-threatening causes including cancers of the kidney, ureter, or bladder.

### Evaluation:

- Urine culture
- Urine cytology
- Imaging: sonography, computerized tomography, magnetic resonance imaging, retrograde studies
- Cystoscopy

Urine Culture: A lab test to see if bacteria are present in the urine, and if so, which specific type of bacteria and which antibiotics are most appropriate to treat the infection.

Urine Cytology: A lab test similar to a Pap smear in which a urine specimen is examined microscopically by a pathologist. Within the urine are exfoliated cells that line the urinary tract—these cells are carefully scrutinized for abnormalities running the gamut between normal and malignant with atypical cells indicative of a mild abnormality.

Sonography: A sonogram (ultrasound) is a non-invasive means of imaging the urinary system using sound waves. It involves no needles, contrast injection, or radiation, and requires no preparation. This test can be performed in the office setting.

Computerized tomography: C.T. scanning is a very sophisticated means of imaging the urinary tract as well as the other structures of the abdomen and pelvis. It is performed at an imaging center and may require the use of oral and/or intravenous contrast.

Magnetic resonance imaging: M.R.I. is also an extremely sophisticated means of imaging the urinary tract as well as the other structures of the abdomen and pelvis. It uses radiofrequency waves and a strong magnetic field rather than x-rays to provide remarkably clear and detailed pictures of internal organs and tissues, with images provided in multiple orientations.

Retrograde Studies: This is an Xray of the collecting system of the urinary tract (the inside of the kidney tubes and renal pelvis. This is done by the urologist in the surgicenter or operating room. Cystoscopy is used to access the ends of the kidney tubes, which are injected with contrast material to fill up and visualize the collecting system.

Cystoscopy: A narrow-caliber flexible instrument is used to directly visualize the urethra, bladder neck, and bladder in the female, and the urethra, prostate and the bladder in the male. Lidocaine jelly is placed in the urethra to minimize any discomfort. This is performed on a monitor with optical magnification, so that the patient can view the procedure.