WHAT IS A RENAL CALCULUS?
- A renal calculus (kidney stone) is a concretion formed in the kidney.
- The exact cause is not known.
- McLatchie and Leaper (2002) describe the two types of stone as metabolic and infective. Metabolic stones result from excessive excretion of metabolites that crystallise in urine (calcium oxylate, carbonate or urate). Infective stones contain urea-splitting organisms found in the urine and which make the urine alkaline.
- Stones vary greatly in shape and size – from sand particle to golf ball.
- Stones can cause severe pain if they pass into the ureter. However, it is possible for stones to be present without symptoms.

AETIOLOGY
- Although the cause is unknown risk factors include: dehydration; infection; urinary stasis; kidney disorders; elevated calcium or uric acid levels in the blood; living/working in hot climates; excessive perspiration; gout, and a high intake of vitamin D.
- There is a familial tendency towards calculi and a high risk of recurrence: half of the people who have a kidney stone will develop another within 10 years.

SIGNS AND SYMPTOMS
- Intense pain – this occurs when a stone becomes stuck in a ureter and causes the muscle of the ureter wall to go into spasm. Pain may radiate to the lower abdomen and into the groin as ureteric or renal colic. Pain can be constant during attacks.
- Haematuria.
- Recurrent urinary infection.
- Associated infection may cause fever and septicemia.
- Dysuria.
- Complications: a stone may be large enough to block the ureter. This may result in kidney damage if untreated.

INVESTIGATIONS
- X-ray.
- Medical examination.
- Ultrasound.
- Urine dipstick.

TREATMENT
- Lithotripsy (extracorporeal shockwave lithotripsy or EWSL): ultrasound waves break up the stones and the fragments are passed naturally via the urine.
- Open surgery is now uncommon and reserved for complicated renal stones or stones impacted in the ureter at the site of a stricture, usually caused by a previous stone.
- Percutaneous nephrolithotomy (PCNL), if calculus is in the kidney.
- Ureteric stenting.
- Some stones pass on their own if they are less than 5mm in diameter, solitary or if they are in the lower third of the ureter.

NURSING IMPLICATIONS
- Pain relief.
- Report increased redness in urine and monitor vital signs.
- Fluid balance chart.
- Observation for anuria.
- Observation for signs of infection.
- Health education/prevention: importance of good fluid intake (two to three litres daily unless contraindicated by medical staff) in those patients who have had previous kidney stones; dietary restrictions (once the composition of the stone is determined); exercise.

REFERENCES


WEBSITES
National Kidney Research Fund: www.nkrf.org.uk
National Kidney Federation: www.kidney.org.uk
OMNI (Internet resource in health and medicine): http://omni.ac.uk/browse/mesh/detail/C0022650L0022650.html
Patient Information (validated by Prodigy): www.patient.co.uk