Urinalysis Interpretation

ALWAYS wear gloves whilst messing about with another persons pee.
Eye protection is a pretty good idea too. Those dipsticks make a pretty good catapult for drops of eyeball-seeking urine.
Immerse the dipstick completely in the specimen of fresh urine. Withdraw immediately, drawing or gently tapping edge along rim of container to remove excess.
Take your time. Some of the reactions can take up to 2 minutes to cook. Many nurses simply dip, pause, read; potentially missing abnormal results.

Smell:

The normal smell of urine can be described as *urinoid*.
Other smells of interest include:
Faecal smell: gastrointestinal-bladder fistula
Fruity or sweet smell: diabetic ketoacidosis
Smell of ammonia: alkaline fermentation.
Smell of asparagus: umâ€¦erâ€¦.eating a lot of asparagus.

Colour:

Normal urine colour is often described as straw, yellow or amber.This colour may be altered by medications, food sources or disease.
Vitamin tablets often result in a bright yellow urine, as does the presence of bilirubin (a bile pigment).
Red urine may be due to blood, haemoglobin, or beetroot.
Iron supplements may cause a dark brown specimen, as might amounts of prophobilin or urobilin (a chemical produced in the intestines)
Normal urine is also transparent. Turbid or cloudy urine may result from infection the presence of blood cells, bacteria or yeast (eg Candida).
A foamy urine may indicate either the presence of glucose or protien.

Leukocytes:

Detects white cells in the urine (pyuria) which is associated with urinary tract infection.

Nitrites:

Nitrites are formed by the breakdown of urinary nitrates. This us usually caused by Gram-negative and some Gram-positive bacteria.
So the presence of nitrites suggests bacterial infection such as E.coli, Staphylococcus and Klebsiella.
Commonly found during a urinary tract infection.

Urobilinogen:

Normally present in the urine in small quantity. Less than 1% of urobilinogen is passed by the kidneys the remainder is excreted in the faeces or transported back to the liver and converted into bile.
Raised levels may be due to:
Cirrhosis
Hepatitis
Hepatic necrosis
Haemolytic and pernicious anaemia
Malaria

Protein:

This is measuring the amount of albumin in the urine. Normally there should be no detectable quantities.
Elevated protein levels are known as proteinuria. Albumin is one of the smaller protiens, and if the kidneys begin to dysfuncion it may show an early sign of kidney disease.
Other conditions which may lead to protein in the urine include:
Injury to the urinary tract, bladder or urethra
Inflammation, malignancies.
Multiple myeloma.

pH (that's *pee-H* not *ffff-H*):

Measures the hydrogen ion concentration of the urine.
It is important that a fresh sample be used as urine becomes more alkaline over time as bacteria convert urea to ammonia (which is very alkaline).
Urine is normally acidic but its normal pH ranges from 4.5 to 8.

Low pH (acidic):

Foods such as acidic fruits (cranberries) can lower the pH, as can high a high protein diet.
As urine generally reflects the blood pH, metabolic or respiratory acidosis can make it more acidic.
Other causes of acidic urine include diabetes, diarrhoea and starvation.

High pH (alkaline):

Low carb or vegetarian diet
May be associated with renal calculi.
Respiratory or metabolic alkalosis
Urinary tract infection

Haematuria:

Classified as microscopic or macroscopic. Microscopic means that the blood is not visible with the naked eye.
Blood may be present in the urine following trauma, smoking, infection, renal calculi or strenuous exercise.
It may also be present with:
Urinary tract infections.
Damage to the glomerulas or tumours which erode the urinary tract.
Acute tubular necrosis.
Traumatic catheterization.
Damage caused by the passage of kidney stones.
Contamination from the vagina during menstruation.
The presence of myoglobin (myoglobinuria) after muscle injury will also cause the reagent strip to indicate blood.

Specific Gravity:

The specific gravity (SG) of urine signifies the concentration of dissolved solutes and reflects the effectiveness of the renal tubules to concentrate it (when the body needs to conserve fluid). If there were no solutes present the urines SG would be 1.000, the same as pure water.
The SG of urine is around 1.010 but can vary greatly:
Decreased SG may be due to:
Excessive fluid intake (oral or IV fluids)
Renal failure
Acute golmerulonephritis, pyelonephritis, acute tubular necrosis
Diabetes insipidus

Increased SG may be due to:
Dehydration due to poor fluid intake, vomiting or diarrhoea
Heart failure
Liver failure
Inappropriate antidiuretic hormone secretion
It also reflects a high solute concentration which may be from glucose (diabetes or IV glucose) or protein.

Ketones:

Not normally found in the urine, ketones are produced during fat metabolism.
Presence of ketones may indicate:
diabetes
alcoholism
eclampsia
a state of starvation
pregnancy

Bilirubin:

Produced as a by-product during the degradation of RBC in the liver and normally excreted in the bile. Once in the intestine it is excreted in the faeces (as stercobilin) or by the kidneys (as urobilinogen).
Presence of bilirubin in the urine may therefore indicate:
liver disease
biliary tract infection
pancreatic causes of obstructive jaundice.

Glucose:

Glucose is not normally present in the urine.
Once the level of glucose in the blood reaches a ˜renal threshold ™ the kidneys begin to excrete it into the urine in an attempt to decrease the blood concentration. So high blood concentrations lead to glucosuria, as does conditions that may reduce this renal threshold.
Diabetes
Liver disease
Medications such as tetracycline, lithium, penicillin, cephalosporins
Pregnancy.