Urinalysis

Urinalysis is a diagnostic test that involves analyzing a urine sample to evaluate various aspects of a person's health. It provides valuable information about the functioning of the urinary system, as well as insights into other aspects of overall health. Urinalysis is commonly performed as part of a routine checkup, to diagnose medical conditions, or to monitor treatment progress. Here are the key components typically assessed in a urinalysis:

Color: The color of urine can vary and may indicate certain health conditions. Normally, urine can range from pale yellow to amber. Darker urine may suggest dehydration or the presence of certain substances or medications.

Clarity: Urine is usually clear. Cloudiness or turbidity may indicate the presence of cells, mucus, bacteria, or crystals in the urine.

Odor: Normal urine has a slightly aromatic odor. Unusual or strong odors may be associated with certain foods, medications, or medical conditions.

Specific Gravity: This measures the concentration of dissolved particles in the urine. It can help assess the kidneys' ability to concentrate urine. High specific gravity may indicate dehydration, while low specific gravity may indicate overhydration.

pH Level: The pH level measures the acidity or alkalinity of urine. Normal urine is slightly acidic, with a pH between 4.5 and 8.0. Deviations from this range may indicate metabolic or kidney-related issues.

Protein: Protein is not usually found in significant amounts in urine. The presence of protein (proteinuria) may be a sign of kidney disease or other health conditions.

Glucose: Normally, glucose is not present in urine. The presence of glucose (glucosuria) may be indicative of diabetes or other metabolic disorders.

Ketones: Ketones are byproducts of fat metabolism. The presence of ketones in urine may indicate conditions such as diabetic ketoacidosis, fasting, or a low-carbohydrate diet.

Blood: The presence of red blood cells in urine (hematuria) can indicate various conditions, including urinary tract infections, kidney stones, or injury.

Bilirubin and Urobilinogen: Abnormal levels of these compounds in urine may be associated with liver or gallbladder problems.

White Blood Cells (Leukocytes): The presence of white blood cells in urine may suggest infection or inflammation in the urinary tract.

Nitrites: Nitrites in urine may indicate a urinary tract infection (UTI) caused by certain bacteria that convert nitrates into nitrites.

Crystals: The formation of crystals in urine may be associated with specific medical conditions or may be normal.

Microscopic Examination: Under a microscope, a technician can examine the urine sediment to

identify the presence of cells, bacteria, crystals, or other particles not visible to the naked eye.

Urinalysis results are interpreted in conjunction with a person's medical history, symptoms, and other diagnostic tests to make a diagnosis or monitor ongoing health conditions. Abnormal findings in a urinalysis may prompt further investigation or treatment by a healthcare provider. It's important to note that urinalysis results can vary based on factors such as diet, hydration status, and medications, so clinical context is essential for accurate interpretation.

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pre-operative urinalysis (UA), testing may significantly increase costs and lead to inappropriate antibiotic treatment. We prospectively evaluated whether eliminating pre-operative UA was non-inferior to routine pre-operative UA as measured by 30-day readmission for surgical site infection (SSI) in adult elective neurosurgical procedures.

Methods: A single-institution prospective, pragmatic study of patients receiving elective neurosurgical procedures from 2018-2020 was conducted. Patients were allocated based on same-day versus pre-operative admission status. Rates of pre-operative urinalysis and subsequent wound infection were measured, along with detailed demographic, surgical, and laboratory data.

Results: A total of 879 patients were included in the study. The most common surgery types were cranial (54.7%), spine (17.4%), and stereotactic/functional (19.5%). Three-hundred and fifteen patients had no pre-operative UA, while 564 received testing. Of tested patients, 103 (18.3%) met criter.ia for suspected UTI and 69 (12.2%) received subsequent antibiotic treatment. Fourteen patients were readmitted within 30 days (7 without UA [2.2%] vs 7 with UA [1.2%]) for subsequent wound infection with a risk difference (RD) of 0.98% (95% CI -0.89% - 2.85%). The upper limit of the CI exceeded the pre-selected non-inferiority margin of 1%.

Conclusions: We performed the first prospective study of pre-operative urinalysis for elective neurosurgical procedures using a pragmatic, real-world design. The risk of readmission due to SSI was very low across the study cohort, suggesting a limited role of pre-operative urinalysis for elective neurosurgical procedures [1)]

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Haskell-Mendoza AP, Radhakrishnan S, Nardin AL, Eilbacher K, Yang LZ, Jackson JD, Lee HJ, Sampson JH, Fecci PE. Utility of Routine Pre-Operative Urinalysis in the Prevention of Surgical Site Infections. World Neurosurg. 2023 Sep 26:S1878-8750(23)01355-4. doi: 10.1016/j.wneu.2023.09.087. Epub ahead of print. PMID: 37769846.