

KEY TIPS ON HYDRATION

HYDRATION AND URINARY TRACT HEALTH



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Achieving and maintaining adequate hydration is essential for the normal functioning of several major organs in the body, not least the urinary tract and kidneys.

The main function of the kidneys is to maintain a stable blood composition and blood pressure by excreting waste products, such as urea and other nitrogen-containing compounds, salts, acids and alkalis, and regulating water balance.

KIDNEY STATISTICS



There are more
than a million
nephrons
in each kidney

THE KIDNEYS AND FLUID BALANCE

The urinary tract is one of the most important systems in the body for maintaining fluid balance. Dehydration is detected by the hypothalamus due to a rise in solute levels (especially sodium) in blood, or a reduction in blood volume. This stimulates the release of a hormone, vasopressin, from the pituitary gland which acts on the kidneys to conserve fluid and sodium, and also promotes thirst. An increase in blood solute concentration of just 1-2% prompts thirst and induces maximal water conservation by the kidneys¹.

The urinary tract also helps to rebalance overconsumption of fluid, although the capacity to do this is limited as the kidney has a maximal excretion rate of 0.7-1.0L per hour in most healthy people. In the case of overconsumption, stretch receptors in the cardiovascular system act to inhibit vasopressin and the kidneys simply increase fluid output, creating very dilute urine to conserve sodium.

RISK OF URINARY TRACT DISORDERS

Normal fluid balance helps to maintain a healthy urinary tract, while dehydration, particularly if prolonged and severe, can lead to disorders such as urinary tract infections (UTI), kidney stones and bladder cancer².

Urinary tract infections

UTI are typically caused by extrinsic bacteria invading the sterile environment of the urinary tract. These bacteria often originate from the bowel, vagina or environment and become displaced due to poor hygiene, anatomical issues or altered immune function. UTIs vary in their severity from causing mild pain and burning when passing urine, to the passing of blood in urine, and even renal failure. UTIs are more common in women, elderly people and hospital patients³.

Studies show that a higher fluid intake lowers the risk of UTI and their recurrence, while chronic dehydration can increase the risk of UTI⁴.



Kidney stones

Kidney stones are crystals of various substances that form in the urinary tract causing pain and damage to the kidneys and urethra.

A systematic review⁵ of 28 RCT found that increased fluid intake reduced kidney stone recurrence by 50%, while reducing sweetened soft drink consumption had a modest impact on stone reduction. An earlier meta-analysis⁶ by the same group, involving 8 RCTs, concluded that drinking more than 2L of water daily significantly reduced the recurrence of kidney stones by more than 60%.

Other conditions

Observational studies⁷ suggest that habitually low fluid intakes (less than 1.3L per day) are associated with an increased risk of bladder cancer. In contrast, fluid intakes of more than 2.5L daily are associated with a reduced risk. A review⁸ has noted the benefits of drinking 3-4L of water daily in populations at risk of polycystic kidney disease and chronic kidney disease.

PROMOTING GOOD HEALTH OF THE URINARY TRACT

Evidence suggests that the following advice is useful:

- Avoid becoming dehydrated
- Drink non-alcoholic fluids regularly in response to thirst
- Ensure that vulnerable groups such as children, elderly and hospital patients meet their hydration needs
- Adults with a history of kidney conditions should drink 2-4L daily with an emphasis on unsweetened beverages.



References

- 1 Benton D (2011) Dehydration Influences Mood and Cognition: A Plausible Hypothesis? *Nutrients* 3: 555-573.
- 2 Lotan Y et al. (2013) Impact of fluid intake in the prevention of urinary system diseases: a brief review. *Curr Opin Nephrol Hypertens Suppl* 1: S1-10.
- 3 Kodner CM & Thomas Gupton EK (2010) Recurrent urinary tract infections in women: diagnosis and management. *Am Fam Physician* 82: 638-643.
- 4 European Food Safety Authority (2010) Scientific Opinion on Dietary Reference Values for water. *EFSA Journal* 8:1459 (48 pages).
- 5 Fink HA et al. (2013) Medical management to prevent recurrent nephrolithiasis in adults: a systematic review for an American College of Physicians Clinical Guideline. *Ann Intern Med* 158: 535-43.
- 6 Fink HA et al. (2009) Diet, fluid, or supplements for secondary prevention of nephrolithiasis: a systematic review and meta-analysis of randomized trials. *Eur Urol* 56: 72-80.
- 7 Michaud DS et al. (1999) Fluid intake and the risk of bladder cancer in men. *NEJM* 340: 1390-1397.
- 8 Wang CJ et al. (2013) The medicinal use of water in renal disease. *Kidney Int* 84: 45-53.