

A young girl with blonde hair is looking through two glasses of water. The image is partially obscured by a teal circular graphic on the right side of the page.

Wise up
on water!

Kids run on
water too!

Introduction

Children establish drinking patterns early in childhood, so it is vital to teach them about the importance of good hydration at an early age. Good hydration benefits children's health now and in the future.

Children can easily become dehydrated during hot weather and as a result of physical activity because they have:

- a higher surface area to body mass ratio compared to adults, so are more likely to lose water by evaporation
- less developed sweating ability and kidneys function¹
- less sensitive thirst response²

Water is one of the most important basic nutrients required by the body, together with carbohydrate, fat, protein, vitamins and minerals.³ Unfortunately, many children do not drink adequately for their age or activity level.⁴ Some drink significantly less during the school day than at the weekend.⁵

In order to keep properly hydrated throughout the day, children need access to water at school. The promotion of good hydration is included within the government's Food in Schools programme,⁶ which supports the National Healthy Schools Standard.⁷ It advises that good quality drinking water should be available to pupils throughout the day and not from taps or drinking fountains located in toilets areas.⁸

Weight

Obesity in children increased significantly between 1995 and 2002 and continues to rise. In 2002, 22 per cent of boys and 28 per cent of girls were either overweight or obese.⁹ The high sugar content of soft drinks has been identified as one of the factors involved in childhood obesity.¹⁰ Replacing soft drinks in the diet with water (which has no calories) can help with weight control.¹¹

Fifteen per cent of preschool children consume just under half their recommended daily energy intake in the form of sugary drinks. These drinks are nutritionally poor and can reduce children's appetite so that they miss eating valuable nutrients at mealtimes.¹² In addition, sugary drinks may not quench thirst as much as water, which encourages children to drink more of them.¹³

One theory linking mild dehydration to obesity suggests that low fluid intake may stimulate a preference for a high fat diet. Of all the nutrients, fat generates the most metabolic water when it is broken down by the body. By providing maximum metabolic water, a high fat diet could be part of a compensatory mechanism to deal with perpetually low water intakes.¹⁴

Obesity in childhood is a risk factor for other serious diseases such as type 2 diabetes,¹⁵ heart disease and increases the chance of



Good hydration helps children to:

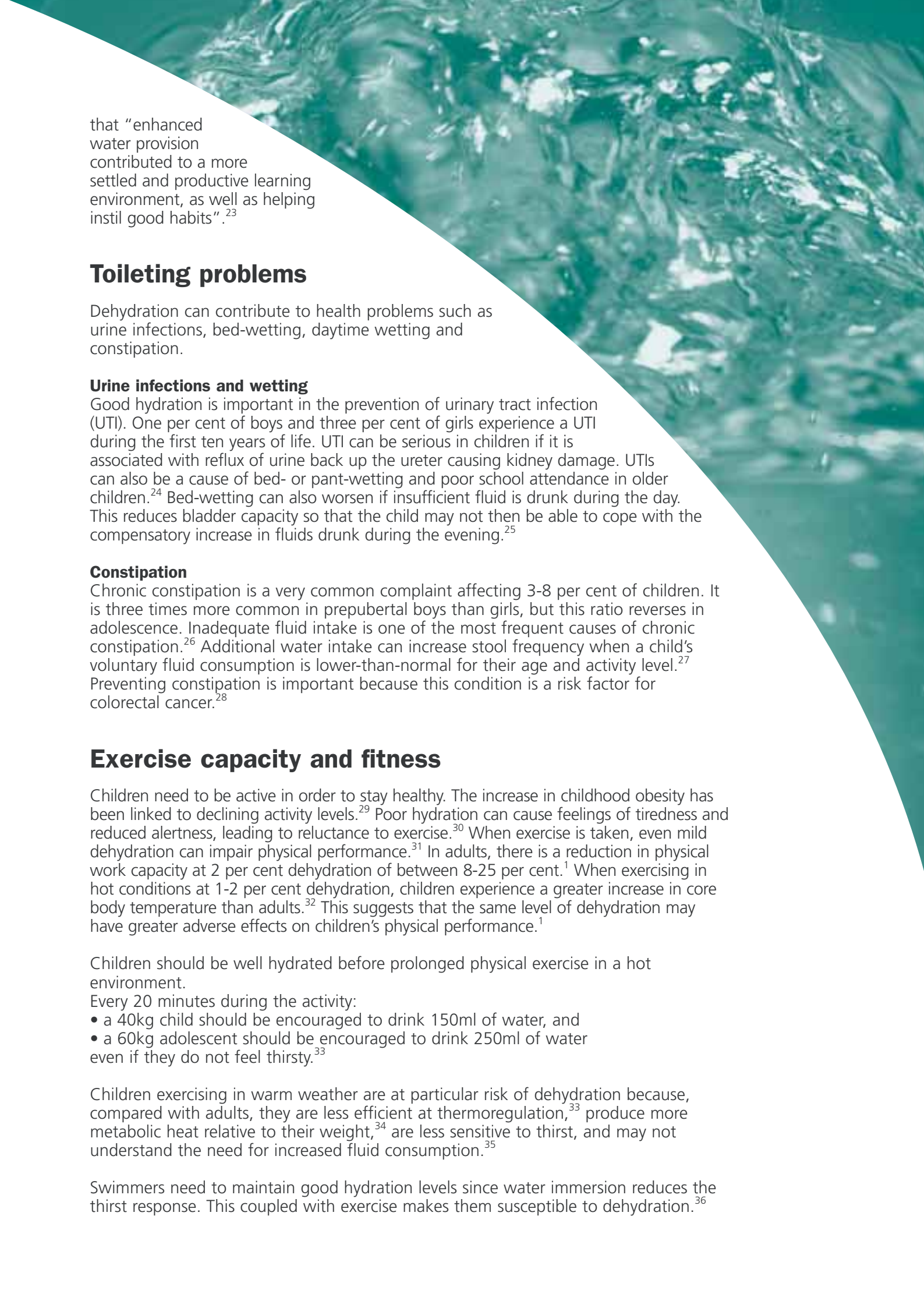
maintain a healthy...	W eight
improve...	A ttention and concentration
resolve...	T oileting problems such as wetting and constipation
increase...	E xercise capacity and fitness levels
reduce the...	R isk of chronic disease

being overweight or obese as an adult.¹⁶ The White Paper *Choosing Health: making healthier choices easier* sets out a broad strategy to tackle obesity, with the specific target to halt the increase in obesity among children under 11 by 2010.¹⁷

Attention and concentration

Poor hydration adversely affects a child's mental performance and learning ability. Symptoms of mild dehydration include light-headedness, dizziness, headaches and tiredness,¹⁸ as well as reduced alertness and ability to concentrate.^{19,20} Once thirst is felt, mental performance including memory, attention and concentration can decrease by about 10 per cent. Mental performance deteriorates progressively as the degree of dehydration increases.^{19,21,22} Thirst is usually felt when dehydration reaches 0.8-2 per cent loss of body weight due to water loss.¹⁸ For a 10-year-old child weighing 30kg this is the equivalent to one or two large glasses of water (300ml each).

Water consumption also has an immediate "alerting" and "revitalising" effect.¹⁹ In schools taking part in the Food in Schools water provision pilot project, teachers reported



that “enhanced water provision contributed to a more settled and productive learning environment, as well as helping instil good habits”.²³

Toileting problems

Dehydration can contribute to health problems such as urine infections, bed-wetting, daytime wetting and constipation.

Urine infections and wetting

Good hydration is important in the prevention of urinary tract infection (UTI). One per cent of boys and three per cent of girls experience a UTI during the first ten years of life. UTI can be serious in children if it is associated with reflux of urine back up the ureter causing kidney damage. UTIs can also be a cause of bed- or pant-wetting and poor school attendance in older children.²⁴ Bed-wetting can also worsen if insufficient fluid is drunk during the day. This reduces bladder capacity so that the child may not then be able to cope with the compensatory increase in fluids drunk during the evening.²⁵

Constipation

Chronic constipation is a very common complaint affecting 3-8 per cent of children. It is three times more common in prepubertal boys than girls, but this ratio reverses in adolescence. Inadequate fluid intake is one of the most frequent causes of chronic constipation.²⁶ Additional water intake can increase stool frequency when a child’s voluntary fluid consumption is lower-than-normal for their age and activity level.²⁷ Preventing constipation is important because this condition is a risk factor for colorectal cancer.²⁸

Exercise capacity and fitness

Children need to be active in order to stay healthy. The increase in childhood obesity has been linked to declining activity levels.²⁹ Poor hydration can cause feelings of tiredness and reduced alertness, leading to reluctance to exercise.³⁰ When exercise is taken, even mild dehydration can impair physical performance.³¹ In adults, there is a reduction in physical work capacity at 2 per cent dehydration of between 8-25 per cent.¹ When exercising in hot conditions at 1-2 per cent dehydration, children experience a greater increase in core body temperature than adults.³² This suggests that the same level of dehydration may have greater adverse effects on children’s physical performance.¹

Children should be well hydrated before prolonged physical exercise in a hot environment.

Every 20 minutes during the activity:

- a 40kg child should be encouraged to drink 150ml of water, and
- a 60kg adolescent should be encouraged to drink 250ml of water even if they do not feel thirsty.³³

Children exercising in warm weather are at particular risk of dehydration because, compared with adults, they are less efficient at thermoregulation,³³ produce more metabolic heat relative to their weight,³⁴ are less sensitive to thirst, and may not understand the need for increased fluid consumption.³⁵

Swimmers need to maintain good hydration levels since water immersion reduces the thirst response. This coupled with exercise makes them susceptible to dehydration.³⁶

Risk of chronic disease

Drinking enough water can help to protect the body against certain chronic diseases. Individuals who maintain good hydration levels have been shown to have a reduced risk of developing the following diseases:

- breast,³⁷ colorectal,³⁸ urinary tract cancer.^{39,40}
- cardiovascular disease⁴¹
- gallstones⁴²
- kidney and bladder stones^{43,44}

Other health benefits of water for children

Oral health

Having a dry mouth is one of the early signs of dehydration.¹⁸ Mild dehydration may be a risk factor for dental disease because it impairs saliva production. Saliva is essential for good oral health:

- it neutralizes the acid created by the bacteria which cause tooth decay
- lubricates oral membranes
- contains minerals that enable tooth repair, and
- contains antibacterial agents that inhibit the growth of oral bacteria and help prevent gum disease.⁴⁵

Skin

Being well hydrated keeps skin looking healthy. The skin acts as a water reservoir and participates in fluid regulation for the whole body.⁴⁶ Mild dehydration causes skin to appear flushed, dry and loose.^{18,47}

Water requirements

Children's water requirements vary with age. As milk intake decreases, water obtained from drinks becomes increasingly important. There are no agreed recommended daily intake levels for water in the UK, but recommendations from the US National Academies Food and Nutrition Board¹ suggest that:

- 1-3 year olds should drink 0.9 litres per day
- 4-8 year olds should drink 1.2 litres per day and
- 9-13 year old girls should drink 1.6 litres per day, and boys should drink 1.8 litres per day
- 14-18 year old girls should drink 1.8 litres per day, and boys should drink 2.6 litres per day

Water intake should be higher in warm weather or when the child is exercising.

Further information can be obtained from:

Water UK, Water for Health, Ask about ...
<http://www.water.org.uk/home/resources-and-links/water-for-health/ask-about>
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Cover photograph kindly supplied by United Utilities

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