

# Duchenne Muscular Dystrophy and Creatine Monohydrate

## Key points

- Creatine is a naturally occurring compound that can improve the function of muscles
- Studies have shown that creatine can improve strength and performance in children with Duchenne Muscular Dystrophy (DMD), although the effect on long-term outcomes are unclear
- Creatine is safe and not associated with any known side-effects

## Background

Duchenne muscular dystrophy (DMD) affects 1 in 5000 boys. Many medications have been tried in DMD. Corticosteroids such as prednisolone are the only proven effective medication in DMD, but recent studies of the dietary supplement creatine monohydrate in boys with DMD have shown increased muscle strength with improvement in activities of daily living, such as walking and climbing stairs, in the short- and medium-term. These benefits were seen without any significant side-effects, so there is good evidence for the safe and effective use of creatine monohydrate in boys with DMD.

## Creatine

Creatine is a naturally occurring compound involved in making energy in cells in of the body, particularly in the brain and muscle. It is made in the liver and kidneys, as well as being in food. In healthy people, taking creatine monohydrate supplements increases muscle strength. In boys with DMD, creatine monohydrate supplements improve muscle strength and may have other effects on improving muscles, including better energy use within muscle cells and decreased muscle breakdown.

## What are the benefits?

Studies show that children with DMD taking creatine maintain strength longer, performing better in activities like walking and climbing stairs. It's also been shown that parents and patients notice an overall improvement in the childrens' strength. These benefits are present while they are taking the supplement, but the long-term benefits of this treatment are not yet known.

## What are the risks?

No side-effects have been identified in boys with DMD given dietary supplementation with creatine monohydrate. Healthy people who take creatine monohydrate, and those who take creatine monohydrate for other reasons, also do not report side-effects.

### When should I start creatine?

The best time to start a creatine monohydrate supplement in boys with DMD is not known, but in the absence of any known side-effects, it's reasonable for you and your doctor to consider it from the time of diagnosis.

### Where can I buy creatine?

Creatine comes in several different forms. The forms we use in clinic are:

Creatine *monohydrate*: this can be purchased from pharmacists or stores selling dietary supplements. It can also be purchased online.

Kre-Alkalyln: this "buffered creatine" (made to have a high pH) comes in a capsule form, which is easier to take for some people. It is not the form of creatine which has been studied in people with muscle disorders but it has been shown to have the same effect as creatine monohydrate in athletes and body builders. It can be purchased online.

We recommend that you purchase from New Zealand suppliers, as they have to conform to local medicine standards.

### What dose of creatine should I give my child?

Name:

Date:

Weight:

Your child's current dose is: \_\_\_\_\_ grams

So your child should have: \_\_\_\_\_ teaspoons/day

## How do I give it to my child?

Creatine monohydrate is a powder, which can be mixed into drinks. Follow these steps when giving creatine to your child:

1. Add the required dose of creatine to 50-100mls of milk or juice
2. Mix well
3. Drink immediately

Creatine powder does not dissolve very well, so you must keep mixing it to ensure that the white powder is not left at the bottom of the glass. The best time of day to take creatine is in the morning, before school.

## Tips for using creatine

DO's	DON'Ts
<ul style="list-style-type: none"> <li>✓ Mix well!</li> <li>✓ Drink immediately after mixing</li> <li>✓ Take daily</li> <li>✓ Buy creatine monohydrate OR Kre-Alkalyn instead of other forms (eg creatine esters)</li> </ul>	<ul style="list-style-type: none"> <li>X Buy from suppliers outside Australia</li> <li>X Buy in pre-mixed powders containing other supplements</li> </ul>

## More information

Cochrane review of creatine in DMD and other muscle disorders:

<http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD004760.pub4/abstract>

*“The NZ Paediatric Neurology Clinical Network acknowledges the cooperation of the Murdoch Children’s Research Institute Centre for Research Excellence (MCRI) in Australia, who originally created and published these guidelines, which have been adapted by Clinical Network for a New Zealand context”.*