

## Patient and Family Resources

### Chronic Recurrent Multifocal Osteomyelitis (CRMO)

### Chronic Non-bacterial Osteomyelitis (CNO)

#### What is chronic recurrent multifocal osteomyelitis?

Chronic recurrent multifocal osteomyelitis (CRMO) is a rare and serious disease. It involves inflammation of one or more bones that can be chronic. Symptoms can come and go. CRMO/CNO is treated by pediatric rheumatologists.

Inflammation is a normal process. It is the way our immune system protects our bodies from infections and germs. It results in pain, redness, and swelling. In CRMO/CNO, however, there is no infection. Instead, the immune system wrongly attacks normal bone. This causes inflammation.

#### How is CRMO/CNO diagnosed?

CRMO/CNO is a “diagnosis of exclusion.” This means that other diseases must be ruled out before the diagnosis can be made. Generally, many tests are required, such as blood tests, X-rays, bone scans, MRI, and often a bone biopsy.

#### What causes CRMO/CNO?

The cause of CRMO/CNO is unknown. Genetic and environmental factors may play a role.

#### What happens after your child is diagnosed with CRMO/CNO?

Find a doctor who has experience with patients with CRMO/CNO. CRMO/CNO in children is generally treated by a pediatric rheumatologist. Ask your doctor for a referral.

#### Why do we treat CRMO/CNO?

- Reduce inflammation
- Prevent bone damage and bone deformities
- Help avoid growth problems
- Decrease pain

#### How is CRMO/CNO treated?

CRMO/CNO is different for each patient. Different children respond to different treatments. Your doctor may need to try several medications before finding the one that works best for your child. In severe cases, doctors may combine medications to treat the disease. Your doctor will work with you and your child to help find the best treatment.

For some CRMO/CNO patients, the disease can be managed with nonsteroidal anti-inflammatory drugs (NSAIDs). NSAIDs are the first-line treatment. However, if NSAIDs are not effective, or if your child does not tolerate NSAIDs well, additional treatments are available. In some cases, your doctor may use a short course of corticosteroids, for example, Prednisone (Deltasone®) and Prednisolone (Orapred®).

These medicines are also used in children with other inflammatory and/or bone conditions. Side effects may occur while taking these medications. Your physician will have a discussion with you prior to starting any new treatment.

<b>NSAIDs</b>	<b>Additional Medications</b>
Naproxen (Aleve®)	Methotrexate (Otrexup®, Rasuvo®, Trexall®)
Celecoxib (Celebrex®)	Sulfasalazine (Azulfidine®)
Meloxicam (Mobic®)	Leflunomide (Arava®)
Piroxicam (Feldene®)	Parmidronate (Aredia®)
Indomethacin (Indocin®)	Zoledronic Acid (Zometa®, Reclast®)
Diclofenac (Voltaren®)	Adalimumab (Humira®)
	Etanercept (Enbrel®)
	Infliximab (Remicade®)

#### What happens after your child begins treatment?

Your child’s pediatric rheumatologist will make sure your child gets the right care. CRMO/CNO is a chronic condition where symptoms can come and go for years. Children might have inflammation in other bones of the body without symptoms. For this reason, your doctor will want to see your child even if he/she is feeling well. Once your child is on effective treatment, he/she should begin to feel better.

The pediatric rheumatologist will carefully monitor your child. It is important to keep all appointments because your doctor will want to continue monitoring for bone inflammation and any possible side effects with the medications.

Whole body MRI is an imaging tool used to monitor CRMO/CNO. If a whole body MRI is not available, your pediatric rheumatologist may order MRI of painful sites (such as an ankle or collar bone) or a bone scan. A bone scan does not give as complete a picture as an MRI but can give a whole-body picture as a baseline.

#### How will you and your doctor know whether a treatment is working?

- Decrease in pain
- Return to normal activities
- Improvement in tests for inflammation and/or imaging studies

#### What is the prognosis for patients with CRMO/CNO?

Prognosis will depend on your child’s individual disease and response to treatment. It is best to discuss the prognosis with your child’s pediatric rheumatologist.