



# Pediatric Clips

**NURSING**

## *Osteopenia in a school-aged child*

*By Candace F. Zickler RN, MSN, CPNP*

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Pediatric Nursing Clips by Pediatric Advanced Practice Nurses at Dayton Children's provides quick reviews of common pediatric conditions.

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### CASE STUDY

JC is a 9-year-old boy with spastic cerebral palsy. He was admitted to the hospital for pain and surgical reduction of a dislocated hip. For the past two days JC was having significant pain when lifted in and out of his wheelchair. He has been unable to tolerate his physical therapy at school for the last two weeks.

He is currently eating three meals orally each day, but these consist of only small amounts of food. He also has a gastrostomy tube through

which he receives two cans of Pediasure, with fiber and eight ounces of water, per a nighttime drip-feeding. JC takes Depakote sprinkles three times daily and has not had a seizure in over four months. JC uses a communication board and is able to verbalize five to six single words such as "Hi, bye, mom, dad, go and no."

JC's mother stays with him when he is hospitalized and performs much of his care. During a nighttime diaper change by the nurse, while mom was

asleep, a "pop" was heard at his right leg and he let out a loud scream and started crying. His mother attempted to comfort him while the nurse called the doctor. JC had tenderness and some swelling over his right femur. An x-ray was ordered and the nurse gave him pain medication.

The x-ray was read as a hairline fracture of his right femoral head with significant osteopenia present.

### CASE DISCUSSION

In 2000 the National Institutes of Health Consensus Conference revised their definition of osteoporosis to read, "a skeletal disorder with compromised bone strength that predisposes a person to an increased risk of fracture." Children with low bone mass are classified as osteopenic, and those who do not bear weight and walk are at risk of fractures due to osteopenia. Unlike adults, children do not achieve peak bone mass until around 18 years of age. Whether ambulatory or not, children who have family members with osteoporosis are at increased risk for fractures. There are also several other factors that can increase the risk of osteopenia in children. (Table 1)

#### DIAGNOSIS

The indications that osteopenia is present remain elusive. The child may complain of limited range of motion or discomfort when moving, but this is not always the case. Many children who develop fractures are only diagnosed with osteopenia after an injury occurs and an x-ray is taken. The best treatment that can be

instituted is a preventive approach to care of all at-risk children.

#### PREVENTATIVE MEASURES

It is important to keep children eating a nutritionally balanced and wholesome diet that offers them foods rich in calcium and protein. A 24-hour dietary history and consultation of a dietitian are recommended if the child does not seem to be getting appropriate meals or snacks. The National Institutes of Health Consensus Conference on Osteoporosis recommends weight-bearing exercises for all children. Adequate amounts of sleep also improves metabolism and helps the body build strong bone mass.

If children have a chronic health condition such as spastic cerebral palsy, and require a wheelchair for mobility, they should be encouraged to be as active as possible. When lifting or transferring a child who requires assistance to get into and out of his chair, the caretakers should always move the child utilizing his or her existing physiologic positioning. Do not force extremities into

what may appear to be "better" positions. Always support the trunk and buttocks with any lifting, taking time to not force or overextend an extremity. In transferring and moving children who are lying on carts or in beds, utilize good body mechanics and log roll the patient. Ask for additional assistance from staff or family when moving or changing positions on a child who has abnormal body alignments. If range-of-motion exercises are needed, it is best to do these moves slowly and not too vigorously. Have a physical therapist demonstrate the appropriate technique if there is a question.

There is no standardized treatment protocol for children who develop osteopenia and subsequent fractures. However, there are studies ongoing in using oral bisphosphonates to treat this condition. Even with the best preventive measures, some children will develop fractures secondary to osteopenia. As health care professionals we need to be aware of the risks and take preventive steps to minimize this complication.

*Continued*

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**Table 1. FACTORS THAT PUT CHILDREN AT RISK FOR OSTEOPENIA**

Extreme prematurity with very low birth weight	Lack of sunlight, aging in adult years
Dietary deficiencies of calcium, vitamin D, vitamin C (scurvy)	Prolonged bed-rest following injury or burns
Eating disorders such as bulimia or anorexia, obesity or children on total parenteral nutrition	Crohn's, irritable bowel syndrome, chronic liver disease, malabsorption syndromes
High dose steroids IV, or over prolonged periods of time	Seizure medications such as Depakote, Dilantin, Phenobarbital
End stage kidney disease	Thyroid dysfunction, diabetes, juvenile arthritis
Genetic syndromes such as Lowe's, osteogenesis imperfecta and phenylketonuria	Embryonic malformations such as myelodysplasia or caudal regression
Muscular dystrophy or spinal muscular atrophy	Smoking, alcoholism
Cerebral palsy, spastic and flaccid types	Too little or too much exercise, nonweight bearing or sedentary life styles
Cancers, radiation or chemotherapy	Caucasian, Asian, Mexican ancestry

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**FEATURED NURSE SPECIALIST**



**CANDACE ZICKLER RN, MSN, CPNP** is a certified pediatric nurse practitioner in the developmental pediatrics department at The Children's Medical Center of Dayton. Candace earned her

bachelor's degree, master's degree and pediatric nurse practitioner certificate at Indiana University School of Nursing in Indianapolis. She has over 15 years of experience working with children with special health care needs, specifically cerebral palsy.

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