



Spondyloepimetaphyseal dysplasia, Strudwick type

Spondyloepimetaphyseal dysplasia, Strudwick type is an inherited disorder of bone growth that results in short stature (dwarfism), skeletal abnormalities, and problems with vision. This condition affects the bones of the spine (spondylo-) and two regions (epiphyses and metaphyses) near the ends of long bones in the arms and legs. The Strudwick type was named after the first reported patient with the disorder.

People with this condition have short stature from birth, with a very short trunk and shortened limbs. Their hands and feet, however, are usually average-sized. Affected individuals may have an abnormally curved lower back (lordosis) or a spine that curves to the side (scoliosis). This abnormal spinal curvature may be severe and can cause problems with breathing. Instability of the spinal bones (vertebrae) in the neck may increase the risk of spinal cord damage. Other skeletal features include flattened vertebrae (platyspondyly), severe protrusion of the breastbone (pectus carinatum), an abnormality of the hip joint that causes the upper leg bones to turn inward (coxa vara), and an inward- and upward-turning foot (clubfoot). Arthritis may develop early in life.

People with spondyloepimetaphyseal dysplasia, Strudwick type have mild changes in their facial features. Some infants are born with an opening in the roof of the mouth (a cleft palate) and their cheekbones may appear flattened. Eye problems that can impair vision are common, such as severe nearsightedness (high myopia) and tearing of the lining of the eye (retinal detachment).

Frequency

This condition is rare; only a few affected individuals have been reported worldwide.

Causes

Spondyloepimetaphyseal dysplasia, Strudwick type is one of a spectrum of skeletal disorders caused by mutations in the *COL2A1* gene. This gene provides instructions for making a protein that forms type II collagen. This type of collagen is found mostly in the clear gel that fills the eyeball (the vitreous) and cartilage. Cartilage is a tough, flexible tissue that makes up much of the skeleton during early development. Most cartilage is later converted to bone, except for the cartilage that continues to cover and protect the ends of bones and is present in the nose and external ears. Type II collagen is essential for the normal development of bones and other connective tissues that form the body's supportive framework.

Most mutations in the *COL2A1* gene that cause spondyloepimetaphyseal dysplasia, Strudwick type interfere with the assembly of type II collagen molecules. Abnormal collagen prevents bones and other connective tissues from developing properly, which leads to the signs and symptoms of spondyloepimetaphyseal dysplasia, Strudwick type.

Inheritance Pattern

This condition is inherited in an autosomal dominant pattern, which means one copy of the altered gene in each cell is sufficient to cause the disorder.

Other Names for This Condition

- Dappled metaphysis syndrome
- SED Strudwick
- SEMD, Strudwick type
- SMED, Strudwick type
- SMED, type I
- Spondylometaphyseal dysplasia congenita, Strudwick type
- Spondylometaphyseal dysplasia (SMD)
- Strudwick syndrome

Diagnosis & Management

Genetic Testing Information

- What is genetic testing?
[/primer/testing/geneticTesting](#)
- Genetic Testing Registry: Spondylometaphyseal dysplasia
<https://www.ncbi.nlm.nih.gov/gtr/conditions/C0700635/>

Other Diagnosis and Management Resources

- GeneReview: Type II Collagen Disorders Overview
<https://www.ncbi.nlm.nih.gov/books/NBK540447>
- MedlinePlus Encyclopedia: Clubfoot
<https://medlineplus.gov/ency/article/001228.htm>
- MedlinePlus Encyclopedia: Retinal Detachment
<https://medlineplus.gov/ency/article/001027.htm>
- MedlinePlus Encyclopedia: Scoliosis
<https://medlineplus.gov/ency/article/001241.htm>

Additional Information & Resources

Health Information from MedlinePlus

- Encyclopedia: Clubfoot
<https://medlineplus.gov/ency/article/001228.htm>
- Encyclopedia: Retinal Detachment
<https://medlineplus.gov/ency/article/001027.htm>

- Encyclopedia: Scoliosis
<https://medlineplus.gov/ency/article/001241.htm>
- Health Topic: Connective Tissue Disorders
<https://medlineplus.gov/connectivetissuedisorders.html>
- Health Topic: Dwarfism
<https://medlineplus.gov/dwarfism.html>

Genetic and Rare Diseases Information Center

- Spondyloepimetaphyseal dysplasia Strudwick type
<https://rarediseases.info.nih.gov/diseases/134/spondyloepimetaphyseal-dysplasia-strudwick-type>

Additional NIH Resources

- National Institute of Arthritis and Musculoskeletal and Skin Diseases: Heritable Disorders of Connective Tissue
<https://www.niams.nih.gov/health-topics/heritable-disorders-connective-tissue>

Educational Resources

- KidsHealth from the Nemours Foundation
<https://kidshealth.org/en/parents/dwarfism.html>
- MalaCards: spondyloepimetaphyseal dysplasia, strudwick type
https://www.malacards.org/card/spondyloepimetaphyseal_dysplasia_strudwick_type
- Nemours Children's Health System: Skeletal Dysplasia
<https://www.nemours.org/services/skeletal-dysplasia.html?tab=about>
- Orphanet: Orphanet: Spondyloepimetaphyseal dysplasia congenita, Strudwick type
https://www.orpha.net/consor/cgi-bin/OC_Exp.php?Lng=EN&Expert=93346

Patient Support and Advocacy Resources

- American Cleft Palate-Craniofacial Association
<https://cleftline.org/>
- Human Growth Foundation
<https://www.hgfound.org/>
- International Skeletal Dysplasia Registry, UCLA
<https://www.uclahealth.org/ortho/isdr>
- Little People of America
<https://www.lpaonline.org/>

- Little People UK
<https://littlepeopleuk.org/>
- The MAGIC Foundation
<https://www.magicfoundation.org/>

Clinical Information from GeneReviews

- Type II Collagen Disorders Overview
<https://www.ncbi.nlm.nih.gov/books/NBK540447>

Scientific Articles on PubMed

- PubMed
<https://www.ncbi.nlm.nih.gov/pubmed?term=%28%28spondyloepimetaphyseal+dysplasia,+Strudwick+type%29+OR+%28Strudwick+variant%29%29+AND+english%5Bla%5D+AND+human%5Bmh%5D>

Catalog of Genes and Diseases from OMIM

- SPONDYLOEPIMETAPHYSEAL DYSPLASIA, STRUDWICK TYPE
<http://omim.org/entry/184250>

Sources for This Summary

- Amirfeyz R, Taylor A, Smithson SF, Gargan MF. Orthopaedic manifestations and management of spondyloepimetaphyseal dysplasia Strudwick type. *J Pediatr Orthop B.* 2006 Jan;15(1):41-4.
Citation on PubMed: <https://www.ncbi.nlm.nih.gov/pubmed/16280719>
- Tiller GE, Polumbo PA, Weis MA, Bogaert R, Lachman RS, Cohn DH, Rimoin DL, Eyre DR. Dominant mutations in the type II collagen gene, COL2A1, produce spondyloepimetaphyseal dysplasia, Strudwick type. *Nat Genet.* 1995 Sep;11(1):87-9.
Citation on PubMed: <https://www.ncbi.nlm.nih.gov/pubmed/7550321>
- Tysoe C, Saunders J, White L, Hills N, Nicol M, Evans G, Cole T, Chapman S, Pope FM. A glycine to aspartic acid substitution of COL2A1 in a family with the Strudwick variant of spondyloepimetaphyseal dysplasia. *QJM.* 2003 Sep;96(9):663-71.
Citation on PubMed: <https://www.ncbi.nlm.nih.gov/pubmed/12925722>
- Walter K, Tansek M, Tobias ES, Ikegawa S, Coucke P, Hyland J, Mortier G, Iwaya T, Nishimura G, Superti-Furga A, Unger S. COL2A1-related skeletal dysplasias with predominant metaphyseal involvement. *Am J Med Genet A.* 2007 Jan 15;143A(2):161-7.
Citation on PubMed: <https://www.ncbi.nlm.nih.gov/pubmed/17163530>

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