



Disease Information

Shwachman-Diamond Syndrome (SDS) is a recessively-inherited multisystem disorder occurring in approximately 1/75,000 births.¹ This condition is also called Shwachman-Bodian-Diamond Syndrome and was formerly called congenital lipomatosis of the pancreas. Symptoms are exocrine pancreatic insufficiency, hematological abnormalities including bone marrow failure and malignancy, and skeletal defects due to metaphyseal dysostosis.

Diagnosis is often made in early childhood due to failure to thrive, abnormal stools, and recurrent infections. Rib cage abnormalities and short stature are common signs of irregular bone growth and maturation that characterize SDS. Hepatomegaly and elevated liver enzymes are found in many very young patients, but these tend to resolve in later childhood and approximately half of patients become pancreatic sufficient over time.¹ Neutropenia, thrombocytopenia or anemia are present in nearly all patients and at least one quarter of patients develop aplastic anemia, myelodysplastic syndrome, or leukemia.²

Treatments for SDS can include pancreatic enzyme replacement, surgery to improve skeletal function, routine blood and bone marrow analyses for monitoring, blood transfusions, chemotherapy, and hematopoietic stem cell transplant.

Approximately 75% of SDS alleles result from gene conversion events that introduce mutated sequence from a pseudogene into the *SBDS* gene.³ Genotype does not appear to correlate with phenotype for presence or severity of symptoms.¹⁻³

Testing Benefits & Indications

- Diagnostic confirmation in patients suspected to have SDS
- Mutation identification in known affected patients
- Familial mutation testing in relatives to determine carrier status
- Prenatal diagnosis for known carrier couples

Test Description

The Ambry Test: Shwachman-Diamond Syndrome is a full gene sequence analysis performed by PCR-based double-stranded automated sequencing in the sense and antisense directions for exons 1-5 of the *SBDS* gene, plus at least 20 bases into the 5' and 3' ends of all the introns. The assay design prevents unwanted amplification of the pseudogene. Specific mutation analysis for individual *SBDS* mutations known to be in the family is also available.

Mutation Detection Rate

The Ambry Test: Shwachman-Diamond Syndrome detects ~95% of the described *SBDS* mutations. The detection rate in affected patients is ~78%.³⁻⁵ Approximately 90% of patients will test positive for at least one *SBDS* mutation.¹

Turn-Around-Time

Full gene analysis	10 – 21 days
Specific mutation analysis	10 – 14 days

Specimen Requirements

BLOOD: Collect 3-5 cc from adult or 2 cc minimum from child into EDTA purple-top tube (first choice) or ACD yellow-top tube (second choice). Store at room temperature or refrigerate. Ship at room temperature.

SALIVA: Collect 2 ml into Oragene™ DNA Self-Collection container. Store and ship at room temperature.

For patients who have had a bone marrow transplant, please send whole blood and saliva together.

DNA: Send 20 µg in TE at 50-100 ng/µl. Store frozen and ship on ice or dry ice.

PRENATAL: Prenatal testing is available. Please call an Ambry Genetic Counselor to discuss your case.

CPT Codes

Full gene analysis or specific mutation analysis 83891, 83894, 83898, 83904, 83909, 83912

References

¹Dror Y. *Pediatr Blood Cancer*. 2005;45:892-901.

²Kawakami T et al. *Tohoku J Exp Med*. 2005;206:253-259.

³Kuijpers TW et al. *Blood*. 2005;106:356-361.

⁴Boocock GRB et al. *Nat Genet*. 2003;33:97-101.

⁵Woloszynek JR et al. *Blood*. 2004;104:3588-3590.