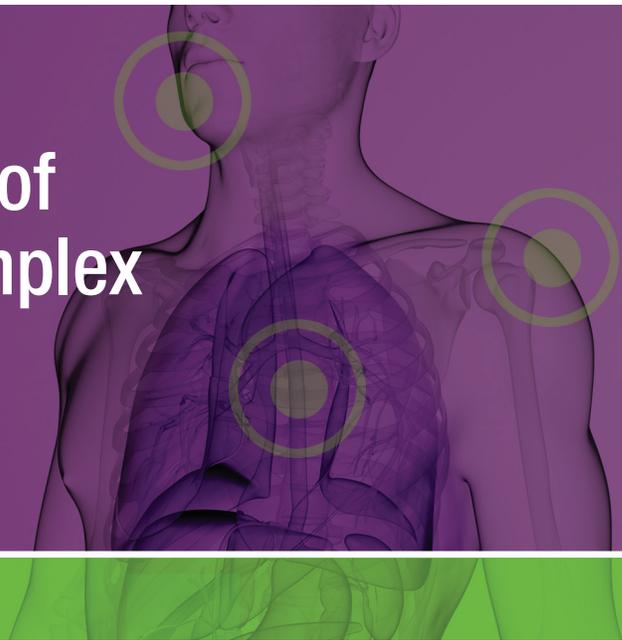


Dermatologic Features of Tuberosus Sclerosis Complex

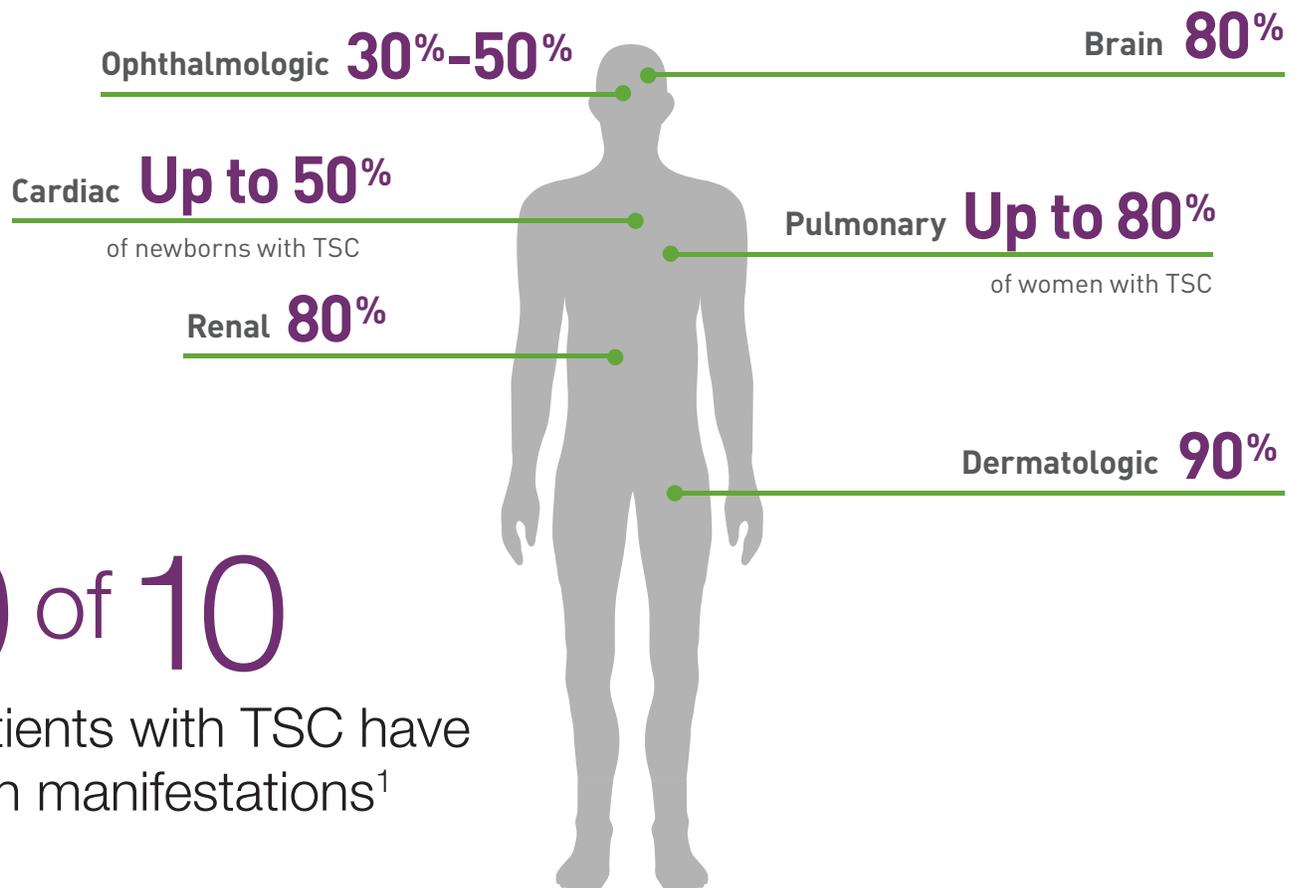


Tuberous sclerosis complex (TSC) is a genetic disorder characterized by the growth of benign tumors in multiple organs, including^{1,2}:

- Numerous skin lesions
- Lesions of the brain, kidneys, and lungs that significantly contribute to morbidity and mortality

Clinical manifestations of TSC can range from mild to severe and vary from patient to patient.^{1,2}

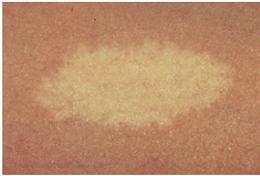
Organ Involvement in TSC^{1,3,4}



Dermatologic manifestations are important clinical diagnostic criteria for TSC¹



Physical exam: Look for skin abnormalities¹

IMAGE	SKIN LESION	AGE AT ONSET	CONSIDERATION
Major features of TSC			
	Hypomelanotic macules	<ul style="list-style-type: none"> • At birth or infancy 	<ul style="list-style-type: none"> • Observed in about 90% of individuals with TSC • ≥ 3 lesions at least 5 mm in diameter must be present (1 or 2 lesions is relatively common in general population)
	Angiofibromas	<ul style="list-style-type: none"> • Ages 2 to 5 	<ul style="list-style-type: none"> • Occur in 75% of TSC patients • ≥ 3 lesions must be present (1 or 2 isolated sporadic lesions often present in general population)
	Fibrous cephalic plaque	<ul style="list-style-type: none"> • Ages 2 to 5 	<ul style="list-style-type: none"> • Occurs in 25% of TSC patients • Most specific skin finding for TSC • Most common on forehead, but may occur on other parts of face or scalp
	Ungual fibromas	<ul style="list-style-type: none"> • Second decade or later 	<ul style="list-style-type: none"> • Occur in 20% of TSC patients overall, but in up to 80% of older adults • ≥ 2 must be present
	Shagreen patch	<ul style="list-style-type: none"> • First decade 	<ul style="list-style-type: none"> • Occurs in 50% of TSC patients

Worth noting: Other more uncommon “confetti” skin lesions are seen throughout life and vary widely in frequency, from 3% in children to 58% overall. Minor dental features of TSC include multiple dental enamel pits (≥ 3) and multiple intraoral fibromas (≥ 2).

Recognizing TSC

Understanding the genetic and clinical features of TSC¹

Genetic

Identification of a mutation in the *TSC1* or *TSC2* gene is sufficient to diagnose TSC. However, 10% to 25% of TSC patients show no mutations in these genes.

- If genetic test outcome is normal, or if testing is unavailable, the use of clinical diagnostic criteria is necessary for an accurate diagnosis

Clinical

DEFINITE DIAGNOSIS	POSSIBLE DIAGNOSIS
2 major features or 1 major feature with ≥ 2 minor features	1 major feature or ≥ 2 minor features

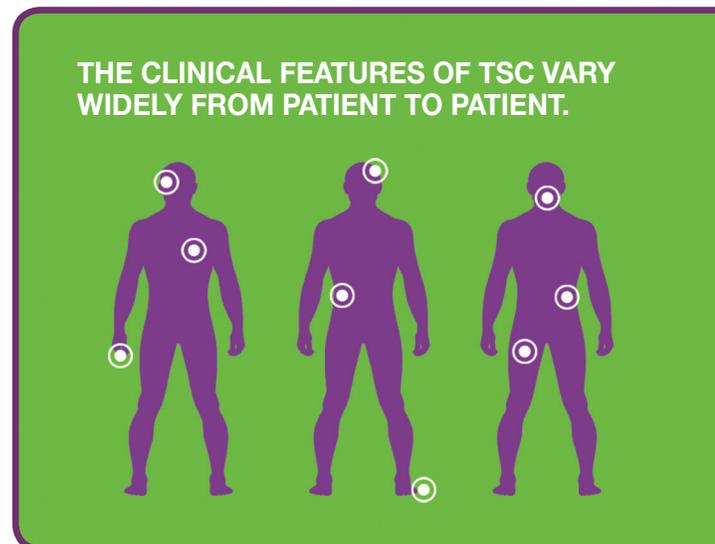
MAJOR FEATURES

1. Hypomelanotic macules (≥ 3 , at least 5 mm in diameter)
2. Angiofibromas (≥ 3) or fibrous cephalic plaque
3. Ungual fibromas (≥ 2)
4. Shagreen patch
5. Multiple retinal hamartomas
6. Cortical dysplasias (includes tubers and cerebral white matter radial migration lines)
7. Subependymal nodules
8. Subependymal giant cell astrocytoma (SEGA)
9. Cardiac rhabdomyoma
10. Lymphangiomyomatosis (LAM)*
11. Angiomyolipomas (≥ 2)*

*A combination of the 2 major features (LAM and angiomyolipomas) without other features does not meet criteria for a definite diagnosis.

MINOR FEATURES

1. "Confetti" skin lesions
2. Dental enamel pits (>3)
3. Intraoral fibromas (≥ 2)
4. Retinal achromic patch
5. Multiple renal cysts
6. Nonrenal hamartomas



Serious complications of TSC¹

Renal angiomyolipomas are a major cause of morbidity and mortality in patients with TSC

- **Approximately 80%** of patients with TSC have renal angiomyolipomas

SEGAs can cause potentially life-threatening hydrocephalus

- These occur in **up to 15%** of patients with TSC

LAM is a lung disease that can present with progressive dyspnea on exertion and recurrent pneumothoraces

- It occurs in **up to 80%** of women with TSC, and in a smaller percentage of men

When your patients have skin features associated with TSC,

Consider referring them to a nephrologist, urologist, neurologist, or pulmonologist

For more disease information, visit

www.tsalliance.org/TSC-clinics

www.tuberous-sclerosis.com

References:

1. Northrup H, Krueger DA on behalf of the International Tuberous Sclerosis Complex Consensus Group. Tuberous sclerosis complex diagnostic criteria update: Recommendations of the 2012 International Tuberous Sclerosis Complex Consensus Conference. *Pediatr Neurol.* 2013;49:243-254.
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4. Tuberous Sclerosis Alliance. Diagnosis, surveillance, and management. <http://www.tsalliance.org/healthcare-professionals/diagnosis/>. Accessed August 18, 2017.