



Thyroid eye disease: An evolving continuum of care

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Expert panel



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Agenda

Understanding the mechanisms of TED: Who is at risk?

Clinical presentation of TED: What are the signs and symptoms?

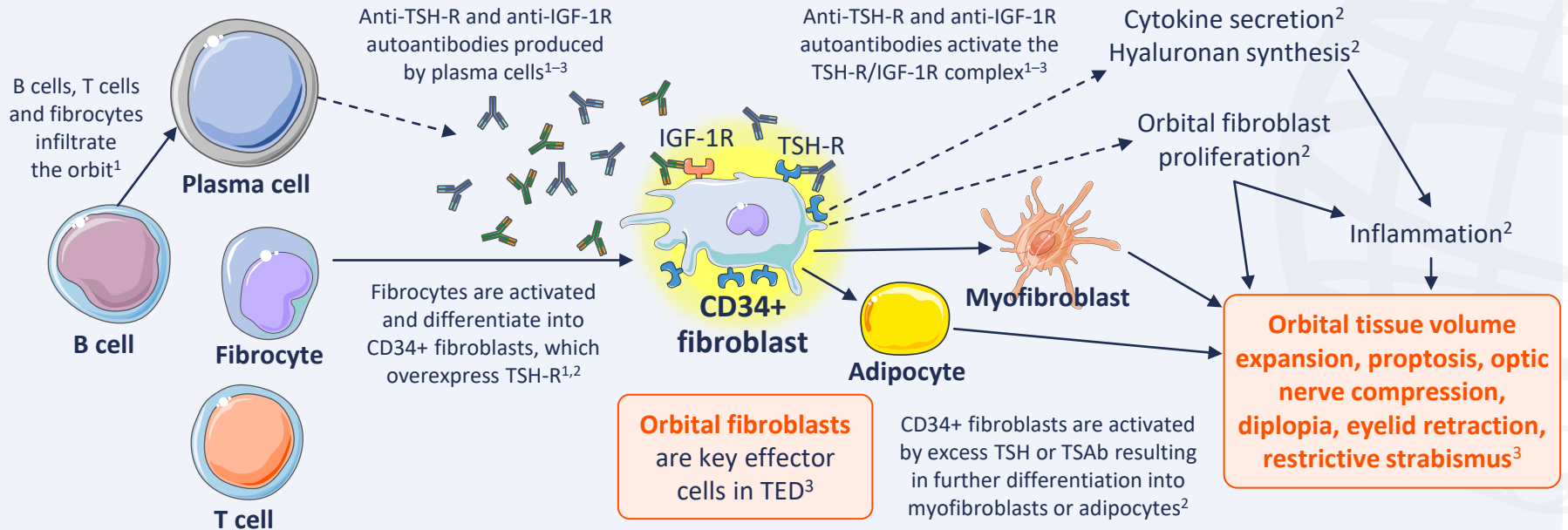
Diagnosing TED: What is involved?



Understanding the mechanisms of TED: Who is at risk?



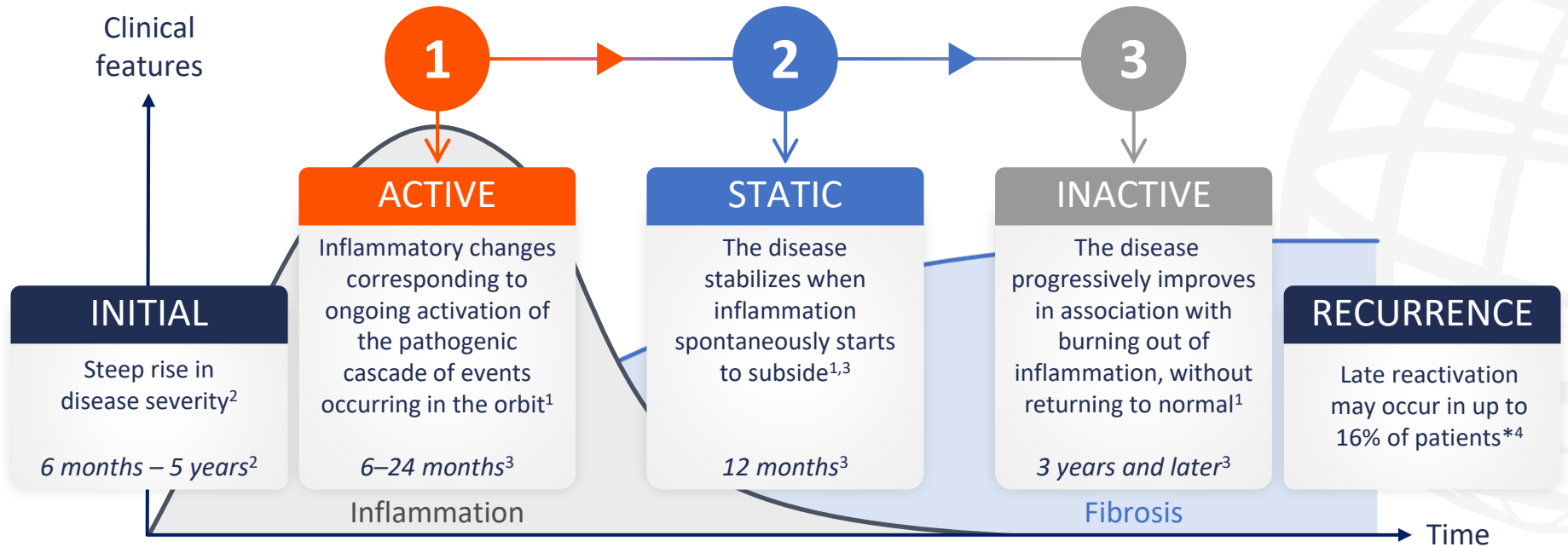
TED is characterized by inflammation and remodelling of the orbital soft tissues and periorbital areas^{1,2}



IGF-1R, insulin-like growth factor 1 receptor; TED, thyroid eye disease; TSAb, thyroid stimulating antibody; TSH, thyroid stimulating hormone; TSH-R, thyroid stimulating hormone receptor.

1. Men CJ, et al. *Ther Adv Ophthalmol*. 2021;13:1–14; 2. Moledina M, et al. *Eye (Lond)*. 2024;38:1425–37; 3. Maurya RP, et al. *Int J Ocular Oculoplast*. 2021;7:117–30.

The natural history of TED involves an active phase, a static phase and an inactive phase¹⁻³



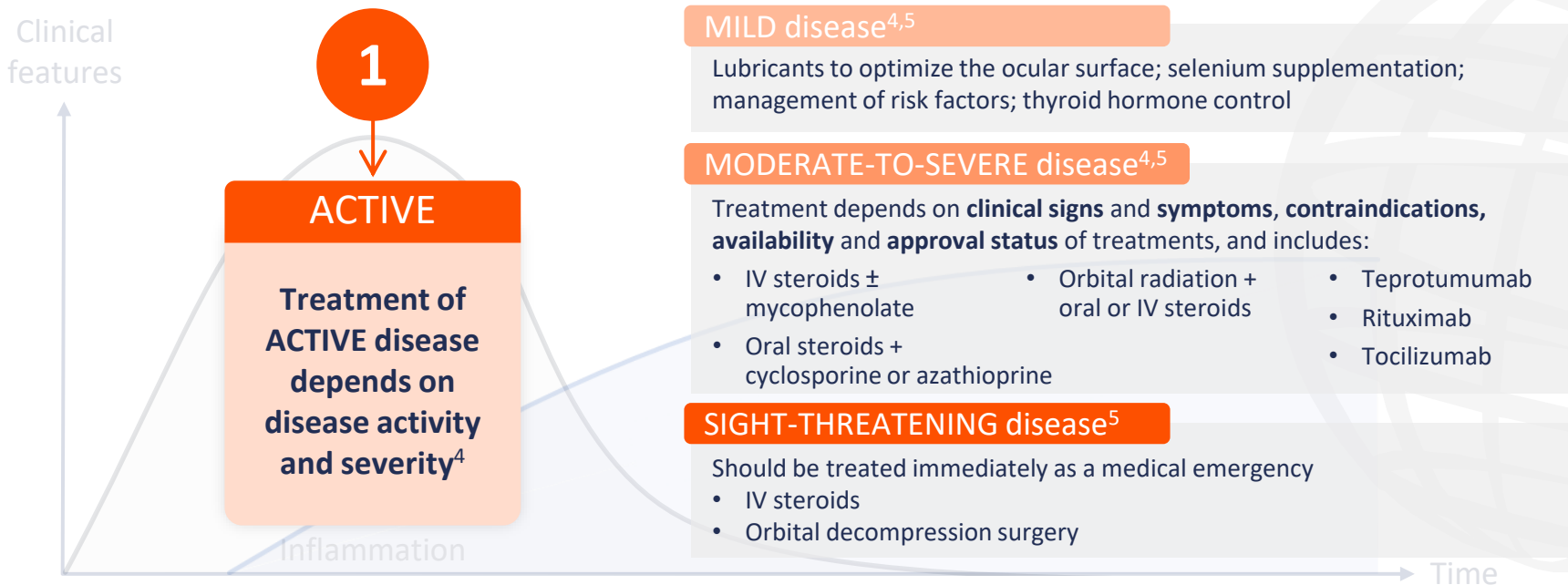
Graph reproduced from Maurya RP, et al. *Int J Ocular Oculoplast.* 2021;7:117–30 (CC BY 4.0 www.creativecommons.org/licenses/by/4.0/).

*Based on a retrospective study, N=415.⁴

TED, thyroid eye disease.

1. Bartalena L, et al. *Front Endocrinol.* 2020;11:615993; 2. Shah SS, Patel BC. Thyroid Eye Disease. Updated 2023. Available at: www.ncbi.nlm.nih.gov/books/NBK582134/ (accessed 17 June 2024); 3. Maurya RP, et al. *Int J Ocular Oculoplast.* 2021;7:117–30; 4. Patel P, et al. *Ophthalmic Plast Reconstr Surg.* 2015;31:445–8.

The natural history of TED involves an active phase, a static phase and an inactive phase^{1–3}



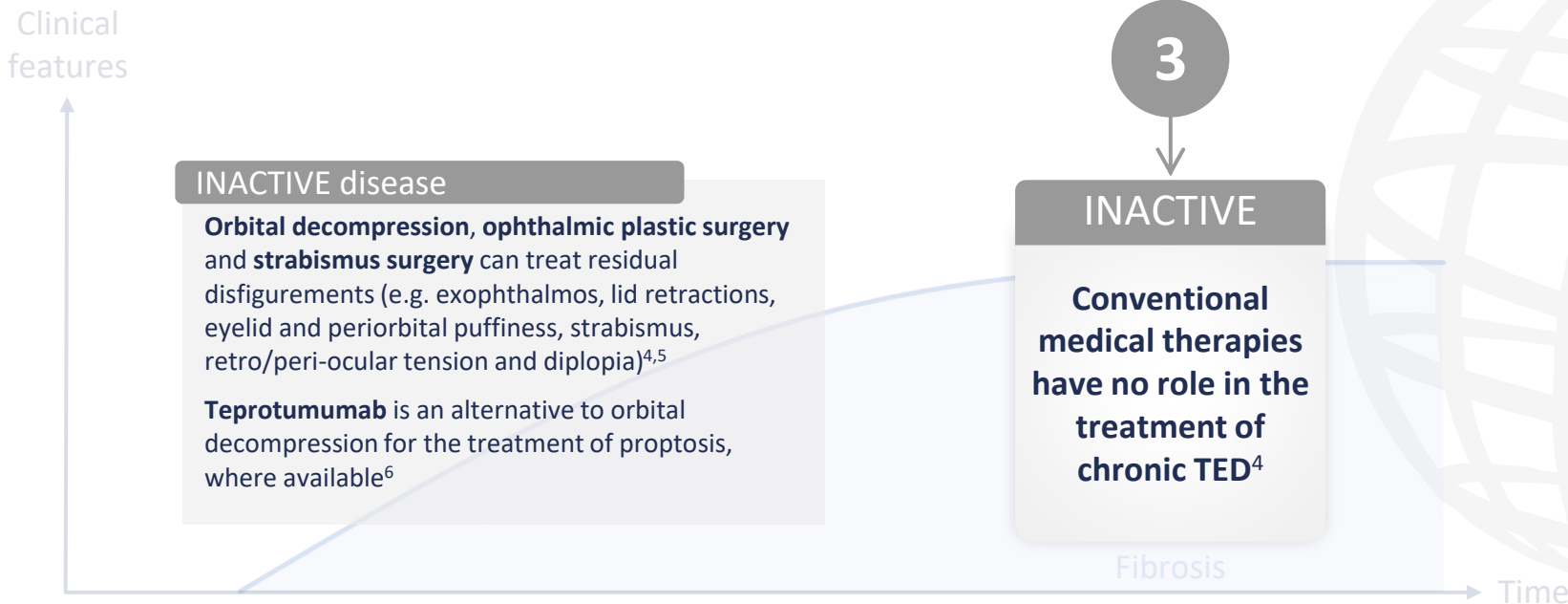
Graph reproduced from Maurya RP, et al. *Int J Ocular Oculoplast.* 2021;7:117–30 (CC BY 4.0 www.creativecommons.org/licenses/by/4.0/).

IV, intravenous; TED, thyroid eye disease.

1. Bartalena L, et al. *Front Endocrinol.* 2020;11:615993; 2. Shah SS, Patel BC. Thyroid Eye Disease. Updated 2023. Available at: www.ncbi.nlm.nih.gov/books/NBK582134/ (accessed 17 June 2024); 3. Maurya RP, et al. *Int J Ocular Oculoplast.* 2021;7:117–30; 4. Men CJ, Kossler AL. *touchREVIEWS Ophthalmol.* 2024;18:33–40;

5. Bartalena L, et al. *Eur J Endocrinol.* 2021;185:G43–67.

The natural history of TED involves an active phase, a static phase and an inactive phase^{1–3}



Graph reproduced from Maurya RP, et al. *Int J Ocular Oculoplast.* 2021;7:117–30 (CC BY 4.0 www.creativecommons.org/licenses/by/4.0/).

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5. Bartalena L, et al. *Eur J Endocrinol.* 2021;185:G43–67; 6. Men CJ, Kossler AL. *touchREVIEWS Ophthalmol.* 2024;18:33–40.



**Clinical presentation of TED:
What are the signs and symptoms?**



Ocular discomfort is the most common presentation in patients with TED¹

Eyelid retraction is the most common clinical sign of TED¹

Upper lid retraction presents in over **90%** of cases^{1,2}

Ocular surface*



Dry eye symptoms occur in 65–85% of patients;³ lacrimal gland inflammation; increased tear production; superior limbic keratoconjunctivitis; lagophthalmos; exposure keratopathy; corneal ulceration;† corneal perforation;† endophthalmitis¹

Eyelid



Eyelid retraction; lateral flare; lid lag; lagophthalmos; redness; swelling¹

Orbit



Proptosis; hypertrophy of the orbital fat and EOM; venous stasis and congestion; ocular hypertension¹

EOM



Restrictive strabismus; EOM enlargement; late-onset fibrosis; diplopia¹

Optic nerve



Dysthyroid optic neuropathy (compressive optic neuropathy; optic nerve stretching)¹

*Active TED. †Severe cases. Bold text highlights the key sign/symptom within each category. EOM, extraocular muscles; TED, thyroid eye disease.

1. Shah SS, Patel BC. Thyroid Eye Disease. Updated 2023. Available at: www.ncbi.nlm.nih.gov/books/NBK582134/ (accessed 17 June 2024);

2. Burch HB, et al. *Thyroid*. 2022;32:1439–70; 3. Sun R, et al. *BMC Ophthalmol*. 2023;23:72.



Diagnosing TED: What is involved?



TED diagnosis is typically made clinically, based on presenting ocular signs and symptoms¹



Eyelid retraction present plus any of:²

- Thyroid dysfunction
- Proptosis
- Dysthyroid optic neuropathy
- Extraocular muscle (double vision or restricted eye movements)



Eyelid retraction absent plus thyroid dysfunction plus any of:²

- Proptosis²
- Optic nerve dysfunction²
- Extraocular muscle involvement²
- Classic imaging findings^{2,3}

All other presentations²

- Consider alternative diagnosis

TED, thyroid eye disease.

1. Barrio-Barrio J, et al. *J Ophthalmol.* 2015;2015:249125; 2. Burch HB, et al. *Thyroid.* 2022;32:1439–70; 3. Shah SS, Patel BC. Thyroid Eye Disease. Updated 2023. Available at: www.ncbi.nlm.nih.gov/books/NBK582134/ (accessed 17 June 2024).

Ophthalmologists can confirm a TED diagnosis and assess severity, activity and disease trajectory

Suggested office-based examination by endocrinologists for assessment of TED



Eyelids

Swelling, redness, retraction, lagophthalmos



Eye movements

Head posture, strabismus, restriction to movement, double vision, retro-orbital pain



Conjunctivae

Redness, chemosis



Cornea

Opacity due to scarring or erosions



Proptosis

Position of cornea in relation to the lateral orbital rim using exophthalmometer, if available



Vision*

VA, colour desaturation, visual field defects, relative afferent pupillary defect, papilledema/optic atrophy

Formal ophthalmic examination by ophthalmologists with expertise in TED



Vision

Central vision; colour vision; peripheral vision

Examination: Snellen chart; colour plates; pupil testing; fundus and optic nerve examination



Inflammation

Redness and swelling of eyelids and conjunctiva

Examination: Slit-lamp biomicroscope



Strabismus

Diplopia; ductions; strabismus

Examination: Corneal light reflex test; cover testing



Appearance

Eyelid retraction; proptosis; corneal exposure

Examination: Marginal reflex distance; exophthalmometry; slit-lamp biomicroscope; fluorescein stain

*Required if history suggests visual loss.
ED, thyroid eye disease; VA, visual acuity.
Burch HB, et al. *Thyroid*. 2022;32:1439–70.