

Understanding Traumatic Aortic Injury

Reviewed by the Aortic Trauma Foundation medical leadership · July 2026

A diagnosis of Traumatic Aortic Injury (TAI) can be overwhelming. This guide explains the condition, treatment options, and the road to recovery.

Clinical guidance in this guide reflects *The Society for Vascular Surgery clinical practice guideline on the management of blunt thoracic aortic injury: Focused update* (March 2026).

What is the Aorta?

The **aorta** is the largest blood vessel in your body — the main highway carrying oxygen-rich blood from your heart to your brain, arms, internal organs, and legs. The section running through the chest, the **thoracic aorta**, is where traumatic injury most often occurs.

How the injury happens

Traumatic Aortic Injury typically occurs during a sudden, high-speed stop, such as a car accident or a fall from a height.

- **Deceleration Force:** when the body stops abruptly, the heart and part of the aorta continue forward due to momentum.
- **The Tether Point:** a ligament (the ligamentum arteriosum) holds the aorta in place at a spot called the isthmus.
- **The Tear:** this shearing force can cause the inner layers of the aortic wall to tear.

Diagnosis & Severity

Because patients often have other serious injuries from the accident, TAI can be "silent" (no specific symptoms). It is usually diagnosed using a **CT Angiogram (CTA)**, a rapid X-ray scan that uses dye to visualize blood vessels clearly.

Symptoms. While often overshadowed by other injuries, conscious patients might report chest or mid-back pain, shortness of breath, or hoarseness / difficulty swallowing.

Note: Absence of pain does not rule out injury.

The 4 Grades of Injury

Grade 1: Intimal Tear

A small tear on the innermost lining. Treated with medication alone. Routine follow-up scans are not usually needed.

Grade 2: Intramural Hematoma

Blood collects within the wall layers. Treated with medication. One follow-up CT scan (CTA) at 1–3 months is recommended to confirm it has resolved.

Grade 3: Pseudoaneurysm

A bulge forming on the outer wall. Usually repaired with TEVAR. If you are stable, the repair is often planned after the first 24 hours, so other injuries can be treated first.

Grade 4: Rupture

The wall has burst. Requires emergency repair to stop bleeding.

Treatment Options

RECOMMENDED FOR GRADE 1 & 2

1. Medical Management

Also known as "Anti-Impulse Therapy." The goal is to lower blood pressure and heart rate to reduce stress on the aortic wall, preventing the tear from getting worse.

Under current guidelines, medical management is the recommended treatment for Grade 1 and Grade 2 injuries — not surgery.

If you also had a head injury: your team may deliberately *not* lower your blood pressure aggressively. Protecting blood flow to the brain takes priority. This is a considered, guideline-based decision, not an oversight.

STANDARD OF CARE FOR GRADE 3 & 4

2. TEVAR (Endovascular Repair)

Thoracic Endovascular Aortic Repair is a minimally invasive procedure that has largely replaced open chest surgery. A catheter is inserted through a small artery in the groin, and a collapsed stent graft is guided up to the aorta and deployed at the injury site, bridging the tear so blood flows through the stent instead of against the injured wall.

For a Grade 3 injury, if you are stable, the repair is often planned after the first 24 hours so that other injuries can be treated first. A Grade 4 injury requires emergency repair.

Benefits: lower risk of paralysis · less blood loss · faster recovery · no large chest incision.

The Road to Recovery

Phase 1 — Hospital Stay. Most patients spend 24–48 hours in the ICU for close blood pressure monitoring. If there are no other major injuries, walking usually begins within a day.

Phase 2 — Follow-up Imaging. If you had a TEVAR repair, you will have follow-up scans to confirm the stent graft is in position and sealing correctly. There is no single fixed schedule: your team sets one based on your injury, your repair, and your other injuries. Ask your surgeon what your plan is.

Phase 3 — Long Term. TEVAR is designed to be permanent, and long-term follow-up remains important. Managing your blood pressure is the most effective way to protect your repair.

Frequently Asked Questions

Can I get an MRI?

Most modern stent grafts are "MRI Conditional" — generally safe under specific conditions. Always tell your radiology technician and doctor you have a stent implant first.

Will I set off airport security?

Very unlikely — the metal content is minimal. Carry your device implant card when traveling, just in case.

Can I return to sports and exercise?

Most patients return to normal activities. Heavy lifting and high-impact contact sports may be restricted for several months. Consult your surgeon first.

What warning signs should I watch for?

Call your doctor immediately for sudden chest or back pain, unexplained fever, or new weakness or numbness in your legs.

Will I feel the stent?

No — the aorta has no touch-sensing nerve endings. Once recovered, you should have no physical sensation of the device.

How long will the stent last?

TEVAR devices are designed to be permanent, and long-term data shows they are durable. Follow-up imaging is recommended after TEVAR to confirm the stent stays in position and no "endoleaks" develop. There is no single fixed schedule — your care team will set the one that is right for you.

What is an endoleak?

Blood still flowing into the space between the graft and the original wall. Many cause no symptoms and are found on surveillance scans; some resolve on their own, others need treatment.

Will I need blood pressure medication long term?

Many patients do, because controlled blood pressure protects the repair. Your own physician decides whether and at what dose.

When can I drive again?

This depends on your other injuries, pain, and medication. Most resume once off strong pain medication and able to react normally. Get clearance from your surgeon first.

Should I worry about CT scan radiation?

A reasonable question. Current guidelines recommend follow-up imaging after TEVAR but deliberately do not set one fixed schedule for everyone — your team individualizes it. If you have a low-grade injury treated with medication alone, you may need very little imaging, or none. Raise concerns with your physician.

MEDICAL DISCLAIMER

This guide is for educational purposes only and reflects *The Society for Vascular Surgery clinical practice guideline on the management of blunt thoracic aortic injury: Focused update*. It is not a substitute for professional medical advice, diagnosis, or treatment. Always seek the advice of your physician with any questions regarding a medical condition. If you think you may have a medical emergency, call your doctor or 911 immediately. © 2026 Aortic Trauma Foundation.