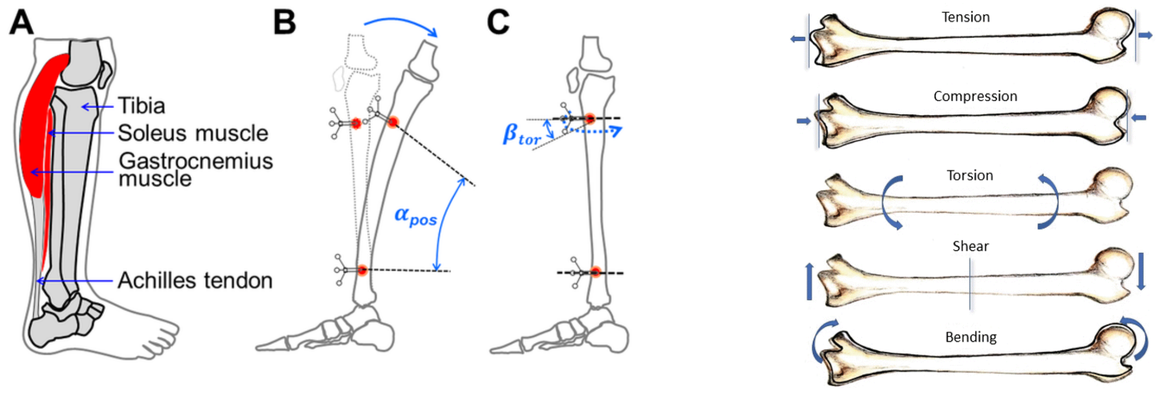
Utilizing Torsion/Tension on Bone

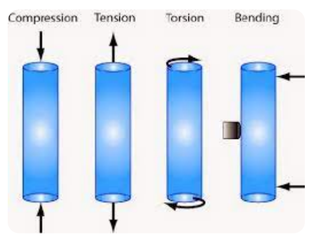
Torsion and tension are types of mechanical forces that can affect bones, and they both play a significant role in the growth and development of bones during childhood and adolescence.

Torsion refers to a twisting force applied to a bone. When a bone experiences torsion, it is subjected to rotational stress, which can cause it to twist around its long axis. In response to this, the bone may undergo structural changes to strengthen or resist the twisting force. Over time, if torsion is applied consistently, it can lead to changes in the shape of the bone or even affect how bone grows, particularly if the torsion is abnormal or excessive.
Tension, on the other hand, is the stretching force applied to a bone. When bones are subjected to tension, it usually involves a pulling force that causes the bone to elongate or undergo stretching stress. Tension plays a key role in the process of bone growth, especially during childhood and adolescence. It is most prominent in the areas where muscles attach to the bone (the tendons). These areas are sensitive to mechanical stress, and tension can stimulate bone growth by promoting bone formation (ossification) in response to the strain.

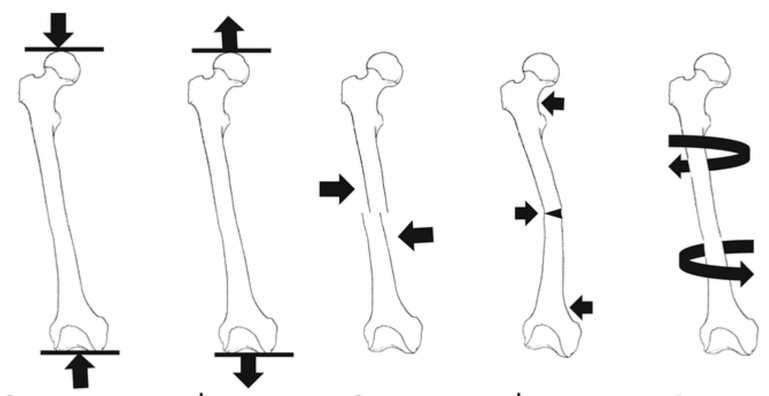


For example, tension applied at the growth plates (areas of cartilage at the ends of long bones) can stimulate bone lengthening. This is why physical activity, like exercise or weight-bearing activities, often leads to increased bone density and growth. If there is abnormal or excessive tension, however, it can result in deformities, stress fractures, or other growth abnormalities.

From a scientific perspective, both torsion and tension affect bone growth primarily through the process of mechanotransduction. This is the process by which mechanical forces like torsion or tension are converted into biochemical signals within bone cells (osteocytes, osteoblasts, and osteoclasts). These signals can influence the rate of bone formation and resorption, thus impacting how bones grow in response to these forces.



- **Torsion** may lead to adaptive changes in bone structure, making bones more resistant to twisting forces, but if the forces are excessive, it can lead to deformation or abnormal growth.
- **Tension** tends to promote bone growth by stimulating the cells responsible for laying down new bone material. This is particularly important during periods of rapid growth, as seen during puberty. However, excessive tension (like in the case of repetitive stress or abnormal mechanical loading) can also lead to overgrowth or irregular bone development.



When torsional strain or other mechanical forces create significant fluid flow within the bone, intermediate tissue, such as cartilage or fibrous tissue, will form at the ends of the bones. This tissue will undergo endochondral ossification (as seen in joint cartilage) and will eventually turn into bone, contributing to lengthening. This is not the same as normal childhood bone growth but is a form of adaptive or regenerative response to mechanical stress.

We will now list exercises for both torsion and tension, or each isolated (torsion or tension alone.)

Unfortunately we wont have images for these specific exercises, but please read the “SETUP” section carefully.

1. Torsion with Loaded Tibial Rotation (Rotational Deadlifts with Bands)

- **Setup**: Use a barbell for a deadlift with added rotational bands. Attach resistance bands around your midsection or feet while setting up a deadlift.
- **Execution**: As you perform the deadlift, rotate your feet inwards or outwards while pulling up the barbell, causing **torsion in the tibia and spine**. The external band resistance would add tensile force along the tibia. By combining rotation with heavy loading, you apply torsional

strain to the tibia while forcing interstitial fluid flow. Gradually increase the weight and tension in the bands over time to build up the strain.

- **Goal**: This would combine torsional forces with **axial loading** and **tensile resistance**, creating mechanical signals that stimulate bone remodeling.

2. Loaded Slacklining (Tension + Spinal Decompression with Rotational Load)

- **Setup**: Use a **slackline** that is slightly **tightened** and hold light **ankle weights** or use **resistance bands** to add load while walking on it.
- **Execution**: As you walk, rotate your tibias inward and outward with each step, while holding your body in an elongated, slightly rotated position. This creates **tension through the tibia** and **torsion through the spine** as you shift your weight to maintain balance. The added load from the resistance bands around your feet, or weights on your body, increase the **force through the tibia**, enhancing the **tensile and torsional strain** over time.
- **Goal**: By increasing the weight or resistance, you apply a **compound tension-and-rotation effect**, potentially stimulating bone adaptation and elongation.

3. Tibial Torsion with Weighted Cables or Bands

- **Setup**: Use **cable machines** or **resistance bands** to pull your tibia into a specific direction. Attach bands or cables at a low point around your tibia or feet.
- **Execution**: Perform **lunge** or **squat** movements while your feet are rotated inward or outward. Apply resistance via the cable or band, pulling on your tibia and forcing **torsional strain** as you move. The load will be more pronounced because of the resistance, and you'll increase the mechanical stress applied to the tibia and spine.
- **Goal**: Combining **external resistance** with **ankle rotation** and **tibial torsion** increases the **fluid flow** inside the bones, stimulating mechanical adaptation.

4. Spinal Decompression with Weighted Rotation (Hanging with Rotation + Load)

- **Setup**: Set up a **pull-up bar** with **resistance bands** or a **weighted vest** to add load while you're hanging.
- **Execution**: Hang from the bar with your body in a decompressed position (feet off the ground). Slowly rotate your torso while your legs also perform **controlled tibial rotation** (feet inward or outward). The **spinal decompression** combined with **rotational force** on the tibia and spine creates significant **tensile strain**. The added weight will amplify the forces.
- **Goal**: This method applies **axial loading** to the spine, combined with **torsional rotation** of the tibia, creating a strong stimulus for bone remodeling.

5. Tibial Torsion with Weighted Ankle and Hip Rotations (Band Resistance + Weights)

- **Setup**: Attach a **resistance band** around your ankle or foot, anchoring it to a low point, and use **dumbbells** or **weight plates** to add extra load.
- **Execution**: Stand in place or perform **slow squats** with your feet positioned at a slight inward or outward angle (depending on desired tibial torsion). Rotate the hip and tibia with each squat, causing the tibia to twist while holding the load. The **band resistance** adds **tension** while the **weights** help enhance the load applied through your legs and spine.
- **Goal**: This combines **local tibial tension** with **rotational forces**, applying a **loading effect** that potentially stimulates **bone growth** or remodeling through mechanotransduction.

6. Creeping Crawl with Weighted Vest (Tension + Rotation + Loading)

- **Setup**: Wear a **weighted vest** and perform **quadrupedal movements** (creeping or crawling) on the floor.
- Execution: Crawl on all fours with your feet rotated inward or outward, adding a slight rotational strain through your tibia. The weighted vest increases the load on your spine and limbs while you move, adding more tensile stress to the *Legal Disclaimer 67c722f21fe3a* tibia. The crawling movement itself adds additional dynamic torsion to the tibia.
- **Goal**: The combination of **external weight** (the vest), **dynamic crawling** movement, and **rotational strain** on the tibia and spine generates mechanical signals that could induce bone remodeling.

7. Rotational Barbell Overhead Press (Torsional Spine + Load + Fluid Flow)

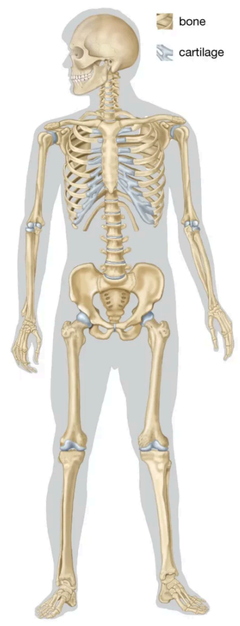
- **Setup**: Set up a **barbell** for a standing **overhead press** with an **extra twist**: apply resistance bands around your body or legs.
- **Execution**: As you perform the overhead press, intentionally **rotate** your torso and legs, or rotate the feet inwards or outwards. The **barbell load** increases the **axial tension**, while the rotation of the **feet, legs**, and **spine** adds torsional strain. This could encourage **fluid flow through the bone**, promoting bone adaptation.
- **Goal**: The overhead press adds **vertical load** while combining **spinal torsion** and **lower body rotation** to stimulate both **fluid dynamics** and **tensile forces**.

8. Hip and Tibial Rotation with Weighted Hip Thrusters (Loaded Extension + Rotation)

- **Setup**: Perform a **hip thrust** with **weights** (barbell or dumbbells), but place the feet in a **rotated** position (inward or outward).
- **Execution**: As you thrust your hips upward with the weight, ensure that your tibia is rotated inwards or outwards, placing rotational stress on the tibia and femur. The added weight causes **tensile strain**, and the hip extension forces additional strain through the bones of the legs and spine.
- **Goal**: This combines **compression** (from the hip thrust) and **torsion** (from the rotated tibia), maximizing **tensile force** and encouraging **bone adaptation**.

9. Modified Farmer's Walk with Rotational Foot Placement

- **Setup**: Hold heavy **dumbbells** or **kettlebells** in each hand and perform a **farmer's walk**, but with your **feet slightly rotated inward** or outward during the walk.
- **Execution**: As you walk, the **torsional strain** from your rotated feet will be transferred up to your tibia, while the load from the weights increases **tensile forces** on the legs and spine. The extra weight will cause more mechanical stress on the bones, which could stimulate fluid flow and bone remodeling.
- **Goal**: This method combines **dynamic load** with **rotational forces**, inducing stress across the tibia and spine.



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Please read the “SETUP” section CAREFULLY, research the terms or specific exercises beforehand if you don’t understand how to complete it.

If after research and trying the technique you are still confused, feel free to make a forum post asking about it (or DM me)

HERE IS THE FULL TORSION/TENSION HEIGHT ROUTINE:

MOST ADVANCED (distributes the most amount of methods, which will give you the most amount of potential growth)

Method 1: Rotational Deadlifts with Bands – 3-4 sets, 8-10 reps, 60-90 sec rest, 15-20 minutes total
Method 2: Loaded Slacklining – 3-5 sets, 2-3 minutes per walk, 1-2 min rest, 12-15 minutes total Method 3: Tibial Torsion with Weighted Cables/Bands – 3-4 sets, 10-12 reps, 60-90 sec rest, 12-15 minutes total
Method 4: Spinal Decompression with Hanging and Rotation – 3-4 sets, 30-45 sec hang, 90-120 sec rest, 10-12 minutes total
Method 5: Weighted Hip and Tibial Rotation (Hip Thrusts) – 3-4 sets, 8-10 reps, 60-90 sec rest, 12-15 minutes total
Method 6: Creeping Crawl with Weighted Vest – 3-5 sets, 1-2 minutes per crawl, 1-2 min rest, 10-12 minutes total
Method 7: Rotational Barbell Overhead Press – 3-4 sets, 8-10 reps, 60-90 sec rest, 12-15 minutes total
Method 8: Tibial Torsion with Weighted Ankle Rotations – 3-4 sets, 12-15 reps, 60-90 sec rest, 10-12 minutes total
Method 9: Modified Farmer’s Walk with Rotational Foot Placement – 3-4 sets, 1-2 minutes per walk, 1-2 min rest, 10-12 minutes total

BASIC
Follow methods 1, 2, 5, and 9, which will get you the most efficiency and torsion/tension with the least time.