As divers descend in the column of water, environmental pressure on the body increases in a linear fashion across the body. To prevent pressure-related injuries such as bleeding, edema (swelling) of soft tissues, leakage of fluid into the air space and membrane rupture, divers must actively enable air from the throat to enter through the Eustachian tubes into the middle ear by using equalisation techniques.

**Anatomy of an Ear**

The ear is the organ of hearing and balance. Understanding its anatomy can help better illustrate why it’s essential to equalise. The ear consists of three distinctive spaces filled with either air or liquid: the external, middle and inner ear.

**Why You Must Equalise**

<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Pressure Differential</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10% greater</td>
<td>Pressure discomfort or pain</td>
</tr>
<tr>
<td>2</td>
<td>20% greater</td>
<td>Pressure discomfort or pain</td>
</tr>
<tr>
<td>Beyond 2</td>
<td>20% greater</td>
<td>Eustachian tubes shut</td>
</tr>
<tr>
<td>3</td>
<td>30% greater</td>
<td>Pressure discomfort or pain</td>
</tr>
<tr>
<td>Beyond 3</td>
<td>40% greater</td>
<td>Eustachian tubes shut</td>
</tr>
</tbody>
</table>

To prevent pressure-related injuries such as bleeding, edema (swelling) of soft tissues, leakage of fluid into the air space and membrane rupture, divers must actively enable air from the throat to enter through the Eustachian tubes into the middle ear by using equalisation techniques.
Equalise before you dive.
Prior to descent, while you are neutrally buoyant with no air in your buoyancy control device (BCD), gently inflate your ears using your preferred equalisation technique to check that you are able to equalise.

Descend feet first.
This allows air to travel upward into the Eustachian tube and middle ear, a more natural direction. Use a descent line or the anchor line to control the speed of descent.

Equalise often.
Inflate your ears gently every few metres for the first 3-5 metres.

Pain is not acceptable.
If there is pain, you have descended without adequately equalising. Ascend a few metres until the pain stops.

Stay ahead.
If you do not feel your ears opening, stop and try again; you may need to ascend a few metres to diminish the pressure around you. Do not bounce up and down.

Try tilting.
If you are having trouble equalising on one side, it may be helpful to tilt the blocked ear toward the surface.

Stop if it hurts.
If you are unable to equalise, abort the dive. The consequences of descending without equalising could ruin an entire dive trip or cause permanent damage and hearing loss.

Do not dive with congestion.
Decongestants and nasal sprays may be used prior to diving to reduce swelling in the nasal and ear passages. If your doctor agrees with your decision to use oral decongestants, take them one to two hours before ascent. They should last from eight to 12 hours, so you don’t need to take a second dose before a repetitive dive. Nasal sprays should be used approximately 30 minutes before descent and usually last 12 hours. Take caution when using over-the-counter nasal sprays; repeated use can cause a rebound reaction resulting in increased congestion and possible reverse block on ascent. Decongestants may have side effects. Do not use them before diving if you do not have previous experience.

Tips for Easy Equalisation

1. **Equalise before you dive.**
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2. **Descend feet first.**
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   - Inflate your ears gently every few metres for the first 3-5 metres.

4. **Pain is not acceptable.**
   - If there is pain, you have descended without adequately equalising. Ascend a few metres until the pain stops.

5. **Stay ahead.**
   - If you do not feel your ears opening, stop and try again; you may need to ascend a few metres to diminish the pressure around you. Do not bounce up and down.

6. **Try tilting.**
   - If you are having trouble equalising on one side, it may be helpful to tilt the blocked ear toward the surface.

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9. **Know when to call it.**
   - If at any time during the dive you feel pain, experience vertigo or note sudden hearing loss, abort the dive. If these symptoms persist, do not dive again and consult your physician.

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**How to Equalise**
There are several techniques divers can employ to effectively equalise their ears.

- **Passive**
  - Requires no effort. Occurs during ascent.

- **Voluntary Tubal Opening**
  - Try yawning or jaw wiggling.

- **Valsalva Manoeuvre**
  - Pinch your nostrils and gently blow through your nose.

- **Toynbee Manoeuvre**
  - Pinch your nostrils while contracting your throat muscles and make the sound of the letter “k.”

- **Frenzel Manoeuvre**
  - Pinch your nostrils while contracting your throat muscles and make the sound of the letter “k.”

- **Lowry Technique**
  - Pinch your nostrils and gently try to blow air out of your nose while swallowing (think Valsalva Manoeuvre meets the Toynbee Manoeuvre).

- **Edmonds Technique**
  - Push your jaw forward and employ the Valsalva Manoeuvre or the Frenzel Manoeuvre.

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**Practice Makes Perfect**
Divers who experience difficulty equalising may find it helpful to master several techniques. Many are difficult until practiced repeatedly, but this is one scuba skill you can practice anywhere—in a pool, on a plane or even at your desk. Just do it gently!