

Product Guide

Intra-oral cameras and magnification

Magnification Loupes – an Ergonomic & Wellness Perspective

These days most clinicians wear magnification loupes, which greatly assist us in diagnosis and treatment. Unfortunately, there is little or no education on how to use loupes correctly and the criteria for selecting them.

I have been investigating loupes for over two years after finding that most dentists and hygienists attending my 'Ergonomics & Wellness in Dentistry' workshops are using TTL (through the lens) loupes with inadequate declination angles, forcing harmful bending of the spine and resulting in chronic pain.

Biomechanical design principles every clinician needs to know

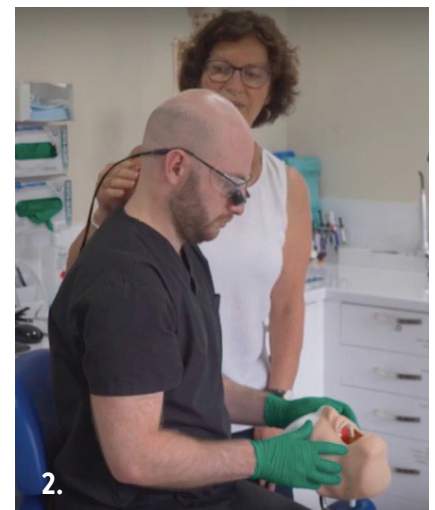
The head is connected to the spine at the atlanto-occipital or nodding joint (at the height of the ears). An imaginary rod through the ears is the axis of rotation for the head. This joint is designed to look up and down. There is only a 10-degree freedom of movement for the head to look down at the top of the spine. Any more tilting of the head involves other cervical joints.

The next joint is the atlanto-axial joint, C1 & C2, designed for head rotation to the left and right. All the intervertebral joints below C2 are gliding or plane joints, which are not designed for bending or twisting, especially for prolonged periods as we do in dentistry.

Clinicians bending and twisting joints in a manner contrary to biomechanical design increase the risk of musculoskeletal disorders and occupational chronic pain.

In my workshops I check loupes by guiding clinicians to:

- sit on their sit bones;
- pivot their torso slightly forward at the hip joints without bending their spine (you can't expect to sit upright and look into the mouth without spinal damage unless using Pentax loupes or an operating microscope);
- look down from the top of the spine (at



1. Dr Anikó Ball checking TTL loupes for Dr Sam Talpis, ensuring there is no bending of his cervical spine and pointing to his field of vision.
2. Dr Talpis demonstrating the neck bending required to look into the mouth due to inadequate declination angle of his loupes. He had been suffering chronic neck pain.

the height of the ears) into a manikin's mouth.

I have found in over 90% of the time, both with TTL and the adjustable loupes, that the field of vision is a long way past the mouth due to inadequate declination angles. This forces clinicians to bend at the gliding joints of the cervical spine which are not designed for bending for prolonged periods, resulting in cumulative trauma.

Some of the adjustable loupes allow for a steeper declination angle, approximately 45 degrees. Unfortunately, most of the TTL types can't be sent back to the distributor for an adjustment. Most of the designers, manufacturers and distributors don't understand biomechanical design.

Selection criteria:

Given the problems I have seen with TTL loupes, I recommend adjustable loupes, such as Heine, which allows for an adequate declination angle.

The other spine safe options are the Pentax loupes or an operating microscope, which are designed to have the clinician sitting upright.

I don't recommend buying loupes at Expos or online. The measuring of your interpupillary distance should always be done in person and in your surgery with someone in the dental chair for the working distance.

Deal only with reputable companies and reps who know their product well, sell good quality loupes and provide good after sale service.

Please don't cut corners on quality to save money when you are purchasing loupes. Take care of yourself—you are your most precious instrument. Your loupes are replaceable, your spine is not.

I have no financial involvement with any dental company. I am an advocate for the wellness of my colleagues.

I have investigated many TTL and adjustable loupes, but not all, available in Australia. **Bite**

By Dr Anikó Ball, B.D.Sc.(Melb), Dip. Clin. Hyp., Adv. Dip. Alexander Studies; Founder Optimum Dental Posture. Dr Ball has been a presenter at ADA Congresses and CPD courses. She runs 2-day 'Ergonomics & Wellness in Dentistry' Workshops and In-practice Team Training Programs around Australia and New Zealand.