# **Vehicle Ergonomics**



Prolonged periods of sitting can place heavy demands of our posture, particularly when sitting in a vehicle due to added affects of movement and vibration on the body. Being comfortable and well positioned in a vehicle aims to reduce driver fatigue and the development of musculoskeletal disorders.

It is imperative that everyone using a vehicle for work observes adequate ergonomic requirements to minimise the risk of injury.

#### 1. Seat Height

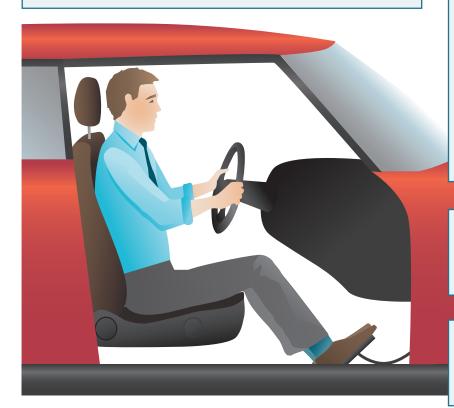
- · Raise the seat to ensure the driver has maximum vision of the road.
- Ensure there is adequate clearance from the roof.

# 2. Lower Limb Position

 Knees should be bent, in order to comfortably operate the accelerator/ clutch and break. The steering wheel should not come into contact with the top of the legs.

### 3. Seat Pan

- Thighs supported along the length of the cushion.
- · Avoid pressure behind the knees.



#### 4. Back Rest

 Adjust the backrest so it provides continued support along the length of the back. Shoulders slightly behind the hips.

#### 5. Lumbar Support

 The lumbar support whether adjustable or not, should provide comfort with no pressure points or gaps between the spine and car seat.
 A S-shape spine is a safe shape.

## 6. Steering Wheel

- All objects and controls should be in easy reach to prevent unnecessary reaching.
- Elbows and shoulders should be in a relaxed position with hands positioned below shoulder level.
- Check for clearance of thighs and knees (allow 2-4 cm).
- Ensure display panel is in full view and not obstructed.
- A good test is to put your arms straight in front (above the top of the steering wheel), the top of the wheel should sit at approximately wrist level.

#### 7. Headrest

• The neck should be in a neutral position, with the headrest positioned centrally behind the head.

#### 8. Mirrors

• Adjust the rear view and side mirrors to ensure adequate vision of surrounding areas.



# **Common Risks Associated with Driving**

# **Ways to Minimise the Risk**

## Musculoskeletal Disorders (MSD's)

- Driving a vehicle can be more detrimental than sitting or standing due to the affects of movement and vibration on the body.
- Common risk factors associated with the development of MSD's include: prolonged sitting, fixed postures, inappropriate lumbar support and manual handling tasks when getting out of the car.
- Lower back, shoulder and neck pain are commonly associated with prolonged periods of driving.
- Apply ergonomic principles (see overleaf).
- During breaks (15 minutes every 2 hours) incorporate postural variation e.g. stretches, walking around car etc.
- Make small adjustments to driving posture every 30-60 minutes.
- Practice correct manual handling techniques when taking items in/out of the vehicle.
- If pain or discomfort persists, consult your treating health practitioner for further advice.

## Fatigue

- Fatigue is often ranked as the major factor in causing road accidents.
- Fatigue occurs from insufficient sleep and when drivers are required to sustain attention over long periods of time.
- Fatigue results in impaired attention, reaction speeds, vision, memory, impacting on driving ability.
- Fatigue can result in micro-sleeps, which are unintended periods
  of light sleep, either in the form of a lapse in concentration, blankly
  staring/day dreaming or even momentarily nodding off. Microsleeps can last between last a few seconds to a minute.
- Ensure you get a 7-8 hour quality sleep the night before driving.
- Aim to not travel more than 8 hours per day.
- Take a 15 minute break every 2 hours.
- Where possible, alternate driving with your colleagues or with non-driving tasks.
- · Avoid driving whilst on medication that can cause drowsiness.
- Eat a well balanced meal, avoiding fatty foods as they cause drowsiness.
- Heat can increase feelings of fatigue, therefore fresh cool air and music act as a short term strategy in improving alertness.
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# Vibration

- Vibrations from the mechanics of a moving vehicle can be transferred to your body through the seat and steering wheel.
- The operation of heavy machinery or heavy vehicles can cause higher levels of vibration.
- Vibration forces can be decreased with thick, firm foam car seats, which can absorb some vibration as it passes through.
- If possible, it is important to alternate driving tasks with non-driving tasks, to reduce the vibration exposure.
- Maintain a neutral spine; your spine is better able to observe shock when the lumbar curve is being maintained in a neutral position, compared to a flexed lumbar spine position sit up straight.
- Ensure tyre and suspension systems are maintained.

#### **Sun Exposure**

- Most side car windows can only block out approximately 37% of harmful UV rays.
- The most vulnerable areas whilst driving include the eyes, face, neck, arms and hands, particularly on the right side of your body.
- This results in more pigmentation and sun damage on the right hand side of the body, increasing the risk of skin cancer.
- It is optimal to have UV blocking/protective film on all windows to minimise exposure.
- · Wear sun protective clothing such as a hat or long sleeves.
- Sunglasses are essential to prevent glare and reflection of UV rays.
- Sunscreen is SPF 30+, apply 20 mins before exposure and reapply every 2 hrs.
- Lip balm SPF 30+.