Osteoarthritis

| Practice points |

- Glucosamine and chondroitin are natural building blocks of cartilage and may improve osteoarthritis (OA) pain and function over time (weeks-months) and slow progression of disease. They are well tolerated; may rarely cause gastrointestinal upset.
- Vitamin D - low levels are associated with OA progression and severity. Ensure adequate serum vitamin D and consider supplementation if insufficient.
- Anti-inflammatory agents such as high dose fish oil, turmeric and green-lipped mussel extract. May improve clinical symptoms.

| Description |

OA is the most common joint disorder in the world. In Western countries it is one of the most frequent causes of pain, disability and loss of function in adults. Characterised by joint pain and mobility impairment associated with the gradual wearing of cartilage. Inflammation is also an important factor in the development and progression of OA.

| Management principles |

- Optimise quality of life
- Improve mobility and function, reduce pain and disability
- Prevent or slow further progression
- Optimise self-management
- Prevent repeated acute episodes
- Prevent or delay complications

**Complementary medicines**

**Primary recommendations**

**GLUCOSAMINE AND CHONDROITIN**

**Characteristics**
- Compounds that are normal constituents of cartilage proteoglycans
- Glucosamine is available as sulfate (GS) or hydrochloride (GH). More clinical research has been conducted with GS
- A combination with chondroitin sulfate (CS) may be more effective

**Mechanism of action**
- Anti-inflammatory
- Inhibits cartilage degradation

**Research**
A randomised controlled trial (Fransen et al 2015) investigated GS 1500 mg/d, CS 800 mg/d or both in 605 patients with painful knee OA. Outcomes were joint space narrowing (JSN) and clinical symptoms. The combination GS + CS group had significant reduction in JSN (0.1 mm) vs placebo which was approximately ½ of that in controls after 2 years. The authors state that ‘If this reduction in JSN were to be sustained over a clinically meaningful period of OA development (e.g. 10 to 15 years), it would be very meaningful indeed’.

The number needed to treat (NNT) was 14, meaning 14 people would need to be treated for 2 years to prevent one knee-replacement surgery in following 2-5 year period.

Knee pain and physical function (WOMAC) improved between baseline and year 1 in all groups with no further improvements in year 1-2.
A 2015 Cochrane Review found chondroitin alone, or with glucosamine resulted in statistically significant and clinically meaningful improvement in pain scores (10% lower than placebo). There was an 8 point improvement in WOMAC pain and a 2 point improvement in Lequesne’s Index; NNT was 5. There was a lower risk of adverse effects compared to control.

**Comparative information**
May give similar pain relief to NSAIDs and paracetamol. Slower to work but better tolerated.
- Non-inferiority trial comparing 200 mg/d celecoxib with 1500 mg GH+1200 mg CS found equal pain...
reduction (~50%)\(^9\).  
- GS may be comparable to NSAIDs and paracetamol for symptom relief but onset of action is slower (4-8 weeks up to 6 months)\(^{10}\).  
- GS 1500 mg/d is tolerated at least as well as ibuprofen 1200 mg per day, and is better tolerated than piroxicam 20 mg/d\(^{10}\).  
- GS may be as effective as NSAIDs for symptom relief but has slower onset of action (2-4 months)\(^{10}\).

### Dosage
- Typical dose of GS is 1500 mg/d however higher doses may be required in people with higher BMI\(^{6}\).
- Typical dose of CS is 800-1200 mg/d\(^{6}\).

### Adverse effects
- GS may cause mild gastrointestinal (GI) problems -nausea, heartburn, diarrhoea, constipation\(^{10}\).  
- Adverse effects to GS and CS are generally comparable to placebo\(^{10,11}\).

### Interactions
- Glucosamine and chondroitin may increase the risk of bleeding with warfarin. Use with caution and monitor\(^{4,12}\).

### Secondary recommendations

#### VITAMIN D
- Low levels (serum 25(OH)D < 25 µg/ml) are associated with OA progression\(^{13}\).
- There is a strong association between serum levels and cartilage loss\(^{14}\).
- Adequate levels are associated with less pain in knee OA\(^{15}\).

#### HIGH DOSE OMEGA-3 FATTY ACIDS
- Research suggests the dose needed to reduce inflammation is 2.7 g/d omega-3 (EPA plus DHA)\(^{16}\).

#### TURMERIC
- A proprietary extract of turmeric with enhanced bioavailability (Theracumin) has demonstrated anti-inflammatory effects and improved clinical symptoms in osteoarthritis. Dose 300-600 mg/d curcumin\(^{6}\).

#### GREEN-LIPPED MUSSEL EXTRACT
- A proprietary lipid extract of New Zealand green-lipped mussel has demonstrated anti-inflammatory effects and may provide relief of osteoarthritic pain\(^{17,18}\).

### Diet and lifestyle recommendations
- Exercise therapy: should be tailored to individual preference. Land-based exercise including walking, resistance, stretching and strengthening; swimming or Tai Chi can relieve pain, improve function and overall aerobic fitness\(^{2}\).
- Weight loss: obesity is a risk factor for OA development and progression. Weight loss improves pain and disability\(^{2}\).
- There is preliminary data that a Mediterranean diet may be beneficial\(^{4,5}\).

### REFERENCES