Percutaneous Electrical Nerve Stimulation

Modalities that may be used to improve pain and/or function in patients with knee osteoarthritis include:

a) **Percutaneous Electrical Nerve Stimulation (pain and function)**
b) **Pulsed Electromagnetic Field Therapy (pain)**

Strength of Recommendation: Limited ★★☆☆ (downgrade)
Description: Evidence from one or more "Low" quality studies with consistent findings or evidence from a single "Moderate" quality study recommending for or against the intervention. Also, higher strength evidence can be downgraded to limited due to major concerns addressed in the EtD Framework.

Rationale

One high quality study was reviewed that examined the use of Percutaneous Electrical Nerve Stimulation (PENS) combined with a Cox-2 inhibitor to sham PENS combined with a Cox-2 inhibitor in subjects with knee osteoarthritis. (He 2019) The results indicated greater improvements in pain and function measures in subjects receiving PENS compared to sham PENS.

One high quality study was reviewed that examined the use of a wearable Pulsed Electomagnetic Field (PEMF) device for pain management in subjects with knee osteoarthritis. (Bagnato 2016) Subjects were randomized to either the PEMF group or a sham PEMF group. PEMF was applied 12 hours per day for a period of 4 weeks. The results indicated greater improvement in WOMAC pain and VAS pain scores for subjects receiving PEMF over sham PEMF. There was no difference between groups on WOMAC function scores.

The Percutaneous Electrical Nerve Stimulation/Pulsed Electromagnetic Field Therapy recommendation has been downgraded one level because of feasibility issues.

Benefits/Harms of Implementation

PENS is a minimally invasive procedure. Patients may experience reduction in pain and improvement in function after receiving the intervention. Because the intervention involves the insertion of very thin needles, side effects are similar to acupuncture and include bleeding, bruising, or skin irritation at the insertion site. Infection or nerve damage are possible but very rare side effects.

PEMF devices are generally safe and can reduce pain and inflammation. The treatment often results in an increase in blood flow which, in some circumstances, could temporarily trigger an increase in pain and discomfort and oxidative stress. Some patients may report fatigue and loss of energy, sleep disturbances, dizziness, and increased urination. PEMF treatment may induce a decrease in blood pressure and heart rate so caution must be taken in patients with cardiovascular deficiencies. A fall in blood sugar levels can also result in some people with PEMF treatment so caution should be taken in patients who have difficulty regulating blood sugar. PEMF may affect blood coagulation and is not recommended in people who are taking anti-coagulant therapies.

Acceptability

The interventions appear to be acceptable to most patients however some patients may not like the sensation of electrical or electro-magnetic energy being applied to their bodies.

View background material via the OAK3 CPG eAppendix 1
View data summaries via the OAK3 CPG eAppendix 2