The Clinical Case for Smoking Cessation for ORTHOPAEDIC PATIENTS

What is this initiative aiming to achieve?

The aim of this initiative is to provide clinical support for temporary abstinence with a view to prompting a permanent quit. To gain maximum benefit, hospital associated abstinence needs to lead to permanent quitting.

For planned admissions, smoking cessation eight weeks or more before admission is considered an optimum amount of time for the body to recover from the immediate effects of smoking. However, temporary abstinence beginning immediately around the time of admission whether planned or unplanned and lasting until a patient has recovered may still have worthwhile benefits.

Why intervene in secondary care?

Hospitalisation offers an opportune time to encourage patients to stop smoking for four main reasons.

- Firstly, this time is often a "teachable moment" where patients are more receptive to intervention and are more motivated to quit.
- Secondly, the hospital's no smoking environment creates an external force to support abstinence.
- Thirdly, patients are ideally placed to be given information about treatment options, support through withdrawal and signposted to specialist services.
- Fourthly, abstaining from smoking at this time can lead to significant health benefits.

What is the relationship between smoking and orthopaedic conditions?

Compared to those who have never smoked, smokers have been associated with:

- Decreased bone mass at the hip, lumbar spine, calcaneus and forearm.[1]
- 43% increased risk of developing osteoporosis (RR 1.43 (95% CI 1.16, 1.75). The risk is greater with greater length and intensity of smoking history.[2]
- 13% increased risk of any fracture (RR 1.13 (95% CI 1.01, 1.25), 29% increased risk of osteoporotic fracture (RR 1.29 (95% CI 1.13, 1.28) and 60% increased risk of hip fracture (RR 1.60 (95% 1.27, 2.02).[3]
- Increased risk of decreased bone mass and hip fracture in smokers relative to non-smokers is greater with age and in men. [4;5]
- No decrease in bone mineral density compared to non-smokers in premenopausal women. [6]
- 70% and 90% increased odds of seropositive rheumatoid arthritis in women and men respectively (OR 1.7 (95% CI 1.2, 2.3) women, OR 1.9 (95%1.0, 3.5) men).[7]
- Slower rate of fracture healing.[8]
- Increased need of rheumatoid arthritis patients for disease-modifying anti rheumatic drugs (DMARDs). [9]
- .08% increased odds of decline in lower extremity mobility in over 65 year olds (OR 1.08 (95% 1.02-1.15).[10]

What are the health benefits of quitting for orthopaedic patients?

Successful quitting will not only benefit a patient's long term health by reducing the risk of developing other disease [11] , smoking abstinence may also help a patient recover quicker by eliminating the acute effects of smoking on the body and smoking cessation has also been associated with improved orthopaedic outcomes.

Main acute effects of smoking on the body (estimated time of recovery, if known)

- Increase in sympathetic tone leading to increase in blood pressure, heart rate and peripheral vasoconstriction leading to an increased demand for oxygen and cardiac function. [12] (24-48 hrs)
- Formation of carboxyhaemoglobin leading to reduction in oxygen delivery to the tissues. [13] (8-24 hrs)
- Formation of carboxymyoglobin leading to reduction in oxygen storage in the muscles [14] (8-24hrs)
- Increase in red blood cell production which leads to increase in blood viscosity, a decrease in tissue perfusion, a decrease in oxygen delivery to the tissues and potentiation of thrombotic process. [15;16]
- Hypersecretion of mucus, narrowing of the small airways, decrease in ciliary function and change in mucus rheology leading to a decrease in mucociliary transport [15;16] (12-72 hours)
- Changes in functioning of a range of immune cells (pro- and anti-inflammatory cytokines, white blood cells, immunoglobulins) which lead to decreased immunity and are associated with atherosclerosis [15;16] (1week-2 months)
- Induction of hepatic enzymes which increases drug metabolism through both pharmacokinetic and pharmacodynamic mechanisms [17] (6-8 weeks)

Health benefits associated with smoking cessation for orthopaedic patients

- Smoking cessation has been associated with an increased bone mineral density at the femoral trochanter and total hip in post menopausal women after 1 year. [18]
- Smoking cessation reduces the risk of hip fracture in women, although in a large cohort study this benefit was not manifest until after 10 years. [19]
- Smoking cessation has been associated with a reduced risk of developing rheumatoid arthritis in women, with the risk reducing to that of a non-smoker after 10 years of cessation.[20]
- Smoking cessation for 6 months or more after posterior instrumented spinal fusion decreased the rate of non-union compared to those who continued to smoke.[21]

The 3A's

How to approach smoking cessation with patients

Smoking cessation interventions have been proven effective for hospitalised patients regardless of admitting diagnosis. [22] Interventions for hospitalised patients increase the rate of long term quitting if they include regular behavioural support and pharmacotherapy that is continued at least 1 month after discharge.

The DH guidance, "Stop Smoking Interventions in Secondary Care", [23] is designed to be practical for busy healthcare professionals and outlines a care pathway for supporting smoking cessation that can be adopted for orthopaedic patients. In essence, the care pathway incorporates a very brief intervention using the 3A's:

ASK and record smoking status

ADVISE the patient of the personal health benefits of quitting

ACT on the patient response
- -prescribe NRT for patients in withdrawal
- -monitor withdrawal and adjust pharmacotherapy accordingly
- -refer to local NHS Stop Smoking Service

How was this information sheet put together?

This information is a summary of the current scientific evidence on the association between cigarette smoking and orthopaedic outcomes. Studies were found by searching MEDLINE and EMBASE using combined exploded subject headings of "musculoskeletal diseases", "musculoskeletal physiological phenomena" and "tobacco use cessation" from 01/1990 – 10/2009 and by searching the Report of the US surgeon general on the health benefits of smoking cessation.[24] Evidence has been included in this summary from cohort studies, randomised controlled trials and reviews only.

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