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# 14: PHYSICAL ACTIVITY AND SURGERY

The evidence for physical activity and health is well established across many areas which may prevent or affect surgery:[1]

- All-cause mortality – 30% risk reduction comparing most active with least active
- Risk reduction of hip fracture is up to 68% at the highest level of activity
- Lower risk of falls and fractures in elderly patients who regularly participate in physical activity
- Colon cancer – 30% lower risk in those who are active
- Breast cancer – 20% lower risk in those who are active
- Cardiovascular disease – 20-35% lower risk of cardiovascular disease, coronary heart disease and stroke.

There is emerging evidence that exercise both pre and post surgery improves surgical outcomes and reduces in patient times in hospital. Surgical patients increasingly have complex medical co-morbidities that may predispose them to post operative complications after surgery, delayed discharge and surgical survival rates.[2,3]

It has been shown that poor preoperative physical performance increases the risk of complications after major non cardiac surgery[4,5] and prolongs recovery after abdominal surgery.[6] There is also strong evidence that if cardiorespiratory fitness (CRF) is measured preoperatively, it is predictive of complications in the postoperative period in several settings.[7-13]

The assessment of CRF preoperatively has been shown to offer significant advantage when compared to age alone in predicting mortality after major surgery.[14] This same study also showed: firstly, CRF to be a significant independent predictor of length of stay in hospital with patients older than 75 and secondly, a low CRF to be associated with a median of 11 days longer in hospital and 2 days longer in critical care.[14]

Another study of pre-operative fitness and outcomes after major abdominal surgery also showed that physical fitness was an independent predictor of postoperative recovery in addition to conventional predictors of age and co-morbidities.[15]

Prediction models for mortality, discharge destination and length of hospital stay were once again all significantly improved by the physical activity and fitness factors.

With the increasing evidence of benefits of better preoperative CRF, it follows that a reasonable intervention for improving surgical outcomes is to introduce exercise training preoperatively.

However, in a major review[16] of the many studies which have looked at a preoperative training aerobic training intervention, the frequency, duration, intensity of exercise and outcomes have varied considerably. Also the period between a patient being listed and their operation may be very limited, for instance in cancer patients. As a result, evidence for improved postoperative clinical outcomes after preoperative aerobic training interventions is presently limited.[16] However, several useful points are already apparent:

- The largest randomised controlled trial found a reduced hospital and intensive care length of stay in the intervention group.[17]
- Preoperative aerobic training improved at least one reported measure of fitness in the majority of studies
- Preoperative aerobic training benefited or maintained health related quality of life
- Preoperative aerobic training appears to be both feasible and safe

In the area of cancer surgery, aerobic exercise programmes undertaken prior to surgery have mainly shown improved function and physical capacity.[18] However, patients often now require neo-adjuvant chemo and radiotherapy before major rectal cancer surgery, which can reduce physical fitness, potentially increasing their complications.

In a recent and important intervention study, it has been shown that structured exercise intervention post chemo radiotherapy is both feasible and can restore fitness to baseline levels again.[19]

This work correlates with the evidence presented in the *cancer section* on the Motivate2Move website, where physical activity has been shown to improve function before, during and after treatment for cancer. It has also been shown to reduce mortality risk in breast and colon cancer.[20]

There are no specific NICE guidelines on surgery itself but for vascular surgeons **NICE guidelines CG147**[21] on lower limb peripheral arterial disease recommend:

- Offering a supervised exercise programme to all patients with intermittent claudication.
- Consider providing a supervised exercise programme which involves:
  - 2 hours of supervised exercise a week for a three month period
  - **Encouraging people to exercise to the point of maximal pain**

## Conclusions

Surgeons and those giving advice in primary care should consider pre-surgical exercise interventions as a useful adjunct to therapy.

To help introduce this to your patients, the Royal College of Surgeons of Edinburgh have a guide leaflet for patients on exercise and surgery[22] and exercise sheets and can be *viewed here*.

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**Key points:**

- Poor cardiorespiratory fitness (CRF) increases the risk of complications of major surgery
- Conversely improving CRF preoperatively has been associated with reduced complications
- CRF assessment offers a better prognosis than age alone in major surgery
- CRF is an independent predictor of mortality and length of stay in hospital

**Take home message:**

Exercise is an important part of any treatment plan for a patient being referred for surgery. It can improve their health and lead to a shorter recovery time and inpatient stay after surgery.

**Consider:**

Advising on point of referral the importance of this lifestyle approach for their own well-being.

**Benefits to health professionals:**

Reduced inpatient stay, drug costs, appointments and visits

*Extracted from the Wales HEIW CPD module on physical activity Motivate2Move. Now part of the RCGP Clinical Priority on physical activity and lifestyle*

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