

In Shape for Surgery

The evidence base considered by Wider Devon STP

July 2017

Background

The fitness criteria span diabetes, hypertension, anaemia, heart rate control in atrial fibrillation, previously undiagnosed heart murmur, smoking status, underweight and morbid obesity. These criteria were based on a local clinical consensus.

The evidence base considered in arriving at recommended fitness criteria for non-urgent surgery has been wide ranging. See Appendix A for the recommended markers of pre-operative fitness and the thresholds for pre-operative intervention, ideally in primary care.

Developing the range of factors for pre-operative fitness focussed first on avoidance of peri-operative complications and improvement of surgical outcomes for individuals. However, the work also considered population health and operational perspectives, such as:

- Psychosocial and physical impacts of complications from the patient's perspective
- Operational consequences of late cancellations of operations
- Relative costs of treating avoidable complications
- Longer term individual and population health gains where health improvements pre-surgery can be sustained, including the impacts of unmanaged poor health on future demands for health care.

Sources of evidence for pre-operative medical fitness

The development group for the local guidelines, which includes anaesthetists, surgeons and GPs have provided the following sources in support of this work:

- British Committee for Standards in Haematology Guidelines on the Identification and Management of Pre-Operative Anaemia. Alwyn Kotze et al British Journal of Haematology 2015; 171: 322–331
- Type 2 diabetes: prevention in people at high risk. NICE Public health guideline (PH38). July 2012.
- Peri-operative management of the surgical patient with diabetes. Association of Anaesthetists of Great Britain and Ireland Anaesthesia 2015; 70: 1427–1440
- Management of adults with diabetes undergoing surgery and elective procedures: improving standards. Joint British Diabetes Societies for Inpatient care (JBDS-IP). Revised September 2015.
- The measurement of adult blood pressure and management of hypertension before elective surgery. Joint Guidelines from the Association of Anaesthetists of Great Britain and Ireland and the British Hypertension Society. Anaesthesia 2016; 71(3): 326–337

- Major complications of airway management in the United Kingdom, Chapter 20: Obesity. NAP 4: 4th National Audit Project of The Royal College of Anaesthetists and The Difficult Airway Society. Report and findings March 2011
- Body mass index and risk of perioperative cardiovascular adverse events and mortality in 34,744 Danish patients undergoing hip or knee replacement. Thornqvist C. et al Acta Orthopaedica 2014; 85 (5): 456-462
- Perioperative Outcomes among Patients with the Modified Metabolic Syndrome Who Are Undergoing Non-Cardiac Surgery. Glance L.G. et al Anesthesiology 2010; 113(4): 859-872

Smoking & Surgery

A [Joint Briefing: Smoking & Surgery](#) has been published by the Royal College of Surgeons of Edinburgh, Royal College of Surgeons, Royal College of Physicians, Royal College of Anaesthetists, Royal College of General Practitioners, Faculty of Public Health and Action on Smoking & Health (April 2016).

The briefing summarises evidence for increased complications and poorer surgical outcomes amongst people who smoke. This document underpins our local recommendation for smoking cessation targeted optimally at 8 weeks pre-operatively the need to culturally and clinically embed support for smoking cessation into the roles of all healthcare professionals.

The Joint Briefing notes the 'teachable moment' that may occur in the run up to surgery making a quit attempt more likely. Wider systematic review also supports pre-surgical quit attempts as superior to smoking cessation at other times. (For a summary of this area, see for Furlong C. [Pre-operative smoking cessation and its effects on post-operative complications](#), 2005, London Health Observatory.

The use of Carbon Monoxide monitoring to support a successful quit attempt and on the acceptance of e-cigarettes and nicotine replacement therapies is consistent with national guidance for specialist smoking cessation services: [Local Stop Smoking Services – service and delivery guidance](#), 2014, Public Health England & the National Centre for Smoking Cessation Training. Use of Carbon Monoxide monitoring in secondary care and other settings is supported practice (see for example, [Helping Smokers Quit](#), July 2016, London Clinical Senate).

Impacts of complications on patients

An immediate aim of the *In Shape for Surgery* pathway is to reduce complications. It is obviously important to consider these from a patient's perspective as far as possible.

Local review was influenced in particular by Pinto et al., who undertook a systematic review and synthesis of 50 studies of post op well-being. (See Pinto et al, [Surgical complications and their impact on patients' psychological wellbeing: a systematic review and meta-analysis](#). *BMJ Open*, 2016(6).). They found that patients who suffered complications had worse post-

operative psychosocial outcomes. Physical and mental health quality of life was statistically significantly lower for these patients ($p < 0.001$).

Key observations:

- Adverse effects of complications endure for psychosocial outcomes for 12 months or more following surgery.
- Severe events and minor complications both contribute to lower well-being and they raise the prospect that the severity of complications as judged by healthcare professionals do not always correspond to the patient's experience of complications.
- Complications from both major surgery and minor procedures are negatively correlated with post-op psychosocial outcomes. There is a potential independence of the magnitude of the initial surgery with the effect of complications on the patient's well-being.

Avoidable complications

The potential to avoid complications and late cancellations of surgery via better optimisation and more coherent protocols across primary care and secondary care has been a theme in the literature for at least 25 years. See for example:

“...major cause of cancellation...one or more comorbidity which gets diagnosed on admission or medical condition that is not revealed to the surgeon.” (Karnalcker et al. Causes of cancellation for elective orthopaedic procedures on the day of surgery. *International Journal of Scientific Reports*, 2015;1(5);235-238.)

“The number of cancellations on medical grounds would be reduced by closer liaison with general practitioners.” (Wildner et al. Avoidable causes of cancellation in elective orthopaedic surgery. *Health Trends*, 1991;23;114-15.)

Costs of complications

Major work on the relative costs of treating patients with complications versus those without has primarily been conducted and reported via the US National Surgical Quality Improvement Programme.

The programme highlights its finding that on average for a patient with a single complication, costs of treatment can increase by 50% compared to uncomplicated patients undergoing the same procedure. This can increase up to five times in the most complicated patients.

The following work was influential in our consideration of this rationale:

Vonlanthen, R., Slankamenac, K., Breitenstein, S., Puhan, M.A., Muller, M.K., Hahnloser, D., Hauri, D., Graf, R. & Clavien, P.A. The impact of complications on costs of major surgical procedures: a cost analysis of 1200 patients. *Ann Surg*. 2011 Dec;254(6).

Hall, B.L., Hamilton, B.H., Richard, K., Bilimoria, K.Y., Cohen, M.E. & Ko, C.Y. Does surgical quality improve in the American College of Surgeons National Surgical Quality Improvement Program: an evaluation of all participating hospitals. *Ann Surg.* 2009 Sep;250(3):363-76.

Population health perspectives

It is our intention that health gains triggered by the prospect of surgery and with added focus on achieving them will be sustained for some patients and benefit their longer term health. Many of the health factors affecting pre-surgical health are of course influential on longer term health.

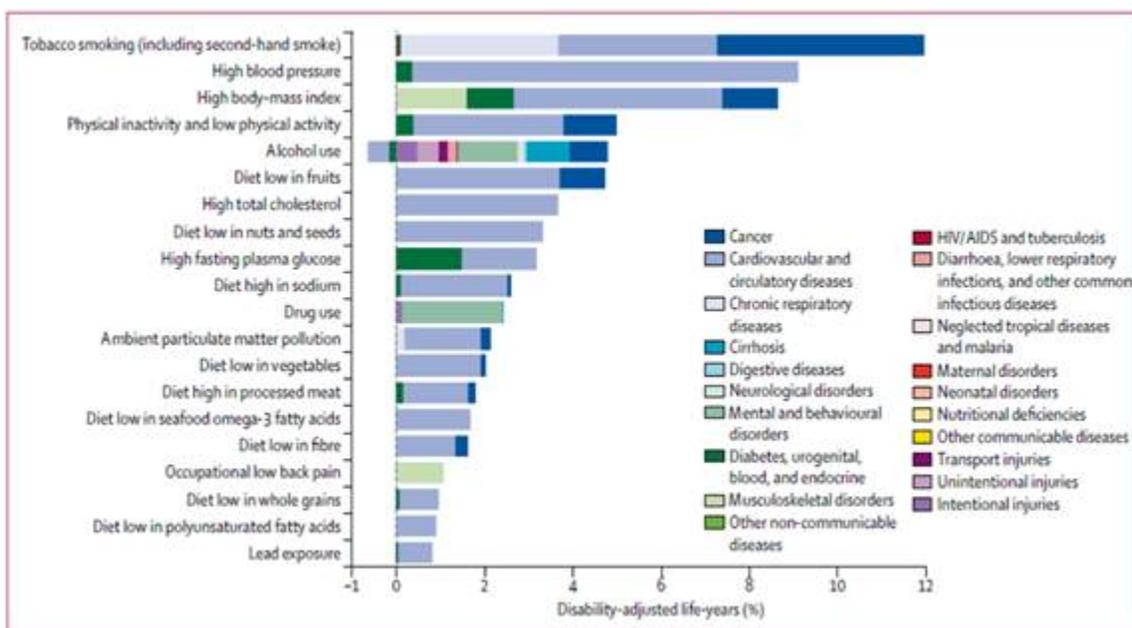


Figure 1 Burden of disease attributable to 20 leading risk factors for both sexes in 2010, expressed as percentage of Disability Adjusted Life Years.

Those diseases, amenable to healthcare and to lifestyle change, also account locally for mortality and morbidity differences and health inequalities across our four STP populations.

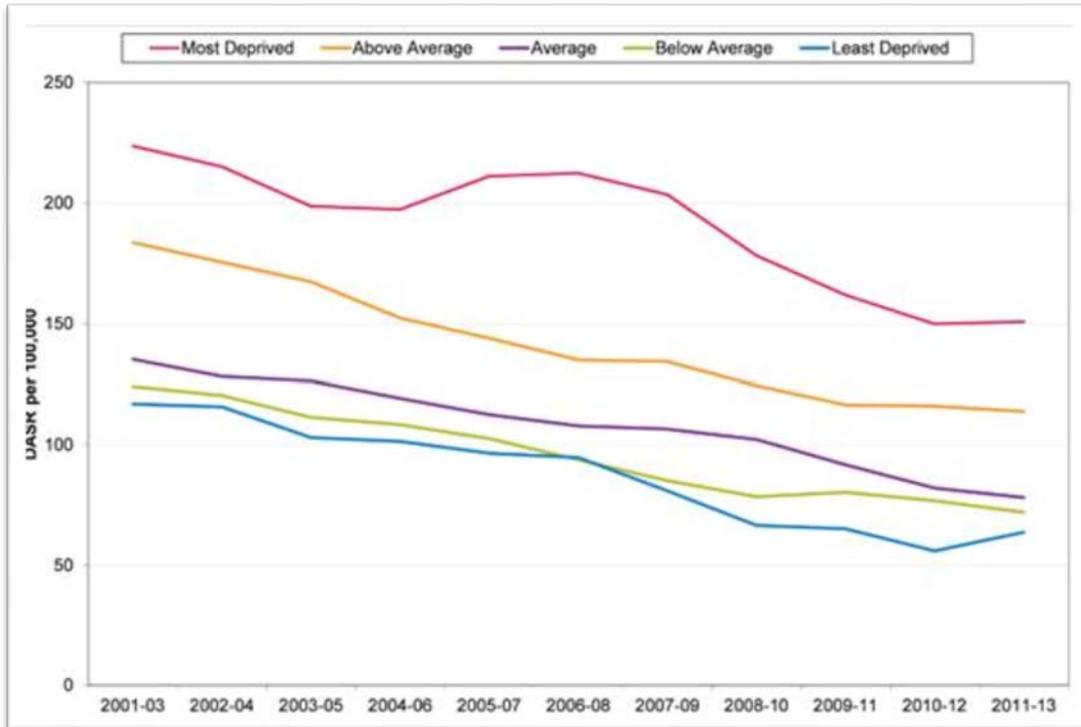


Figure 2 Mortality rates from conditions considered amenable to healthcare by Index of Multiple Deprivation, Devon 2001-2013

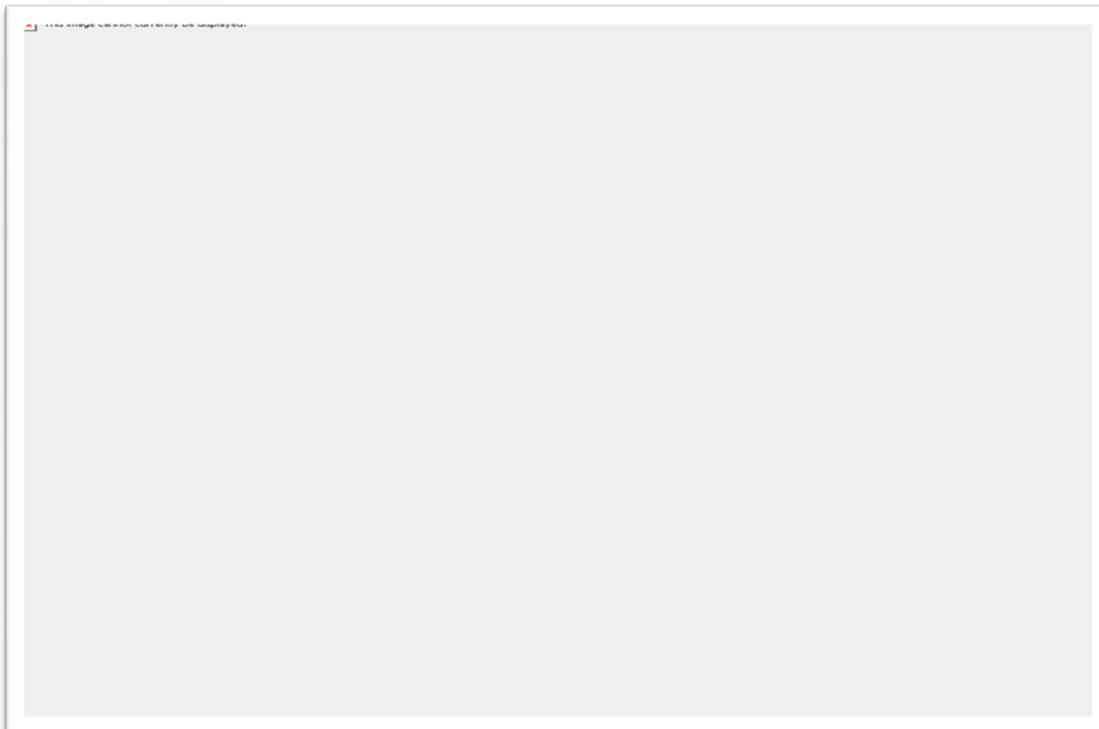


Figure 3 Conditions contributing to life-expectancy gap, by area of Devon, 2013