Appendix 1: systematic review of the cognitive functions affected in POCD

To determine which cognitive functions may deteriorate after surgery, a review of citations from MEDLINE was conducted of articles until December 2011. The following keywords were used: (postoperat* OR operat* OR surgery OR chirury OR post-operat*) AND (cognit* OR memory OR neuropsychological* OR perception OR attention OR learning) AND (dysfunction* OR impair* OR recover* OR decline* OR function* OR disability OR deficit OR deteriorat* OR ability). Additional citations were retrieved from reference lists of relevant review articles. In our analysis we included randomized controlled trials or observational studies that covered POCD after non-cardiac surgery, more than 7 days after surgery, and that showed the outcomes of the separate cognitive tests used in the study. Exclusion criteria were cardiac or major artery surgery or surgery on the brain, publications of which a full English written version was not available, and publications that only presented the test outcomes as group averages. The latter exclusion criterion was added because only approximately 10% of all patients experience POCD on the long term after surgery. Consequently, the use of group averages to analyse cognitive deterioration after surgery leads to loss of information. This is illustrated by studies that show that, even though the average test scores of surgery and control groups do not differ, there is a small percentage of surgery patients that have markedly reduced test performances on several tests (Grichnik et al., 1999; Williams-Russo et al., 1995).

Eleven papers were found in which the study results were analysed by a different method than using group averages. These papers are included in Table 1 and Table 2. The authors have either mentioned the percentage of patients that showed a decline in each test or the average test
outcomes for the patients that developed POCD. The neuropsychological tests used in these studies were categorized into domains based on the main cognitive function they evaluate (Table 3), and the test outcomes were summarized for each domain.