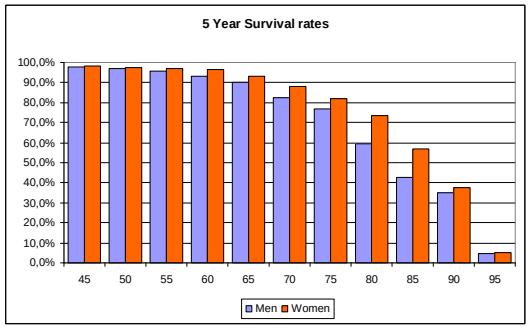
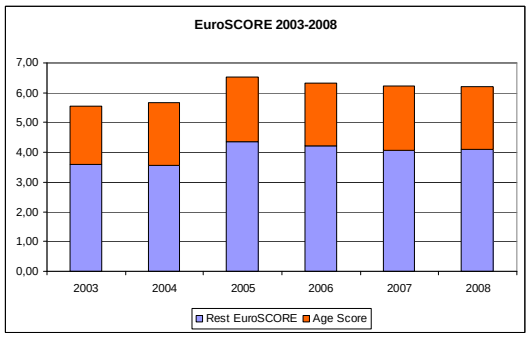
Anaesthetic challenges and management of geriatric patients for cardiac surgery

Carl-Johan Jakobsen, Aarhus University Hospital – Skejby, Denmark, cjj@cale.dk

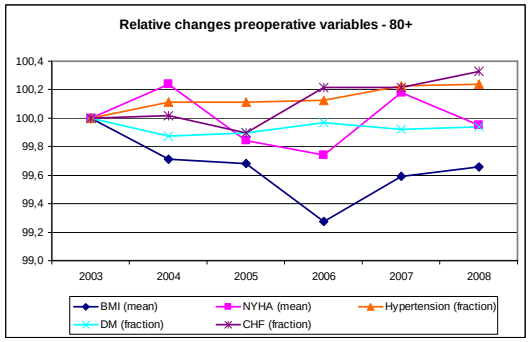
Most health care institution are under increasing financial pressure, due to both weaning economics but primarily due to an increased demand for health care. As a result of progressive cost containment in health care, providers of care are increasingly expected to produce reliable information regarding the cost-effectiveness of their procedures. Following, there is an augmented demand for containing the burgeoning costs and saving resources, and as the surgery and especially the intensive care unit (ICU) time involved are the major costs related to cardiac surgery there has been a growing interest for ICU turnover. This is further enhanced by the fact that Length of stay (LOS) in the ICU is one of the factors limiting operating room utilization in cardiac surgery and consequently one of the primary cost-effectiveness parameters.



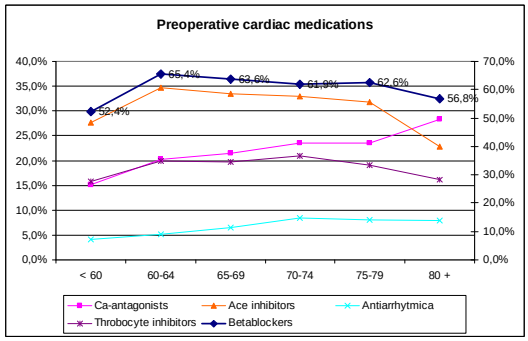
These facts might impose psychological depended reluctance to follow the increased demand for cardiac surgery in the elderly population. However, looking on facts on life expectance the 5 year life expectancy of an 80 year old woman is not much different from a 75 year old man and we need to look at late 80th or early 90th before the 5 year "survival" rate of the normal population is less than 50%.



Another important fact is the understanding that older patients for cardiac surgery have an increased co-morbidity. However, at least in our institution, we do not see this pattern as the average EuroSCORE is more or less unchanged, while the average age has increased over the years and the operation types has changed from single procedures to more complex procedures. Further looking at other co-morbidity factors we do not see any greater changes. As the number of patients beyond 80 years has increased 60% the last six years, it indicate that either do the patients not have a higher co-morbidity or the patient population for surgery is more selected despite the fact that we do not have an agreed policy to avoid the elderly patients.

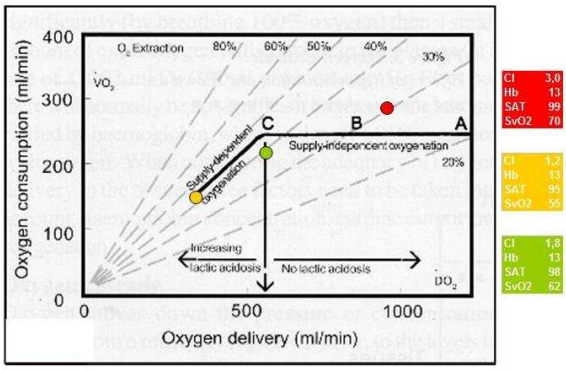


Haemodynamics change with time. Flow variables like Cardiac Output and Stroke volume index decrease, while pressure variables like Blood pressure and Central venous pressure increase slightly. Further the variance in haemodynamic variables tends to increase. However, due to the preoperative cardiac medications the differences from younger patients might not be that different and during the last years we have seen i.e. a tendency towards more or less equal blood pressure independent on age. Except for Ca-antagonists we see that patients elder than 80 years is less medicated either due to actually lower blood pressure or due to reduced kidney function.



The major challenge is the great variance – either up or down and secondly that any treatment corrections is much slower than in younger patients. Even though the response to anaesthetics is slower the result is often a greater fall or increase than in younger more stable patients, which increases the demand for foreseeing any procedure related changes. Further, in order to have a smooth and continuous procedure there is a need for added predictions of possible needs and response and thus a greater stress to the anaesthetist.

Basically the anaesthetic setup, for the very elderly patient, is not different from our routine cardiac anaesthesia, which is TIVA based on Propofol and Sufentanil. In patients with known very low cardiac function, very low ejection fraction or with severe aortic stenosis without greater compensation possibilities we often initialize anaesthesia with Ketamine. During anaesthesia the primary focus is to keep blood pressure within predefined limits and the SvO2 as high as the oxygen consumption is not supply depended.

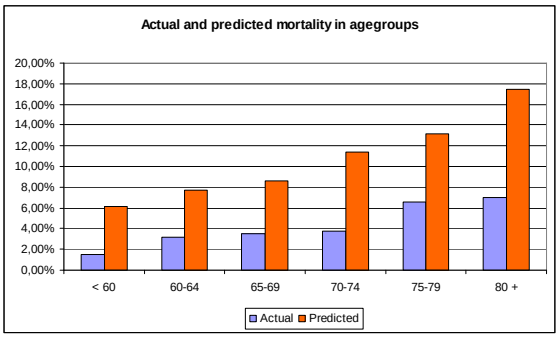


Age Group	Ventilation time (hrs)		LOS in ICU (hrs)		Hospital time (days)	
	median	mean	median	mean	median	mean
< 60	4,6	16,5	21,3	42,1	5,5	7,3
60-64	5,0	15,6	21,4	36,9	5,6	7,2
65-69	5,3	13,4	21,5	43,0	5,8	8,8
70-74	5,4	12,4	21,8	41,1	5,9	9,4
75-79	5,8	13,7	21,7	40,4	6,1	8,9
80 +	6,2	17,7	22,1	39,4	6,3	8,6

The table shows median and mean ventilation time together with length of stay in ICU and hospital. There is a tendency towards longer median times in all variables with older age, while the mean times did show some statistically significant differences (Kruskal-Wallis test), however not necessarily in favour of younger patients as we i.e. in ventilation time did not found differences between patient < 60 years and > 80 years.

Age Group	30-day mortality	Postoperative CNS	Postoperative AMI	Postoperative Dialyses
< 60	1,5%	1,9%	5,2%	1,8%
60-64	3,2%	2,2%	5,4%	2,6%
65-69	3,6%	3,3%	6,4%	4,1%
70-74	3,9%	2,3%	5,2%	3,9%
75-79	6,6%	4,3%	6,8%	3,8%
80 +	6,8%	2,8%	8,0%	4,0%

With regard to 30-day mortality and postoperative major events like stroke, acute myocardial infarction or the need for dialysis only mortality was statistically significant (ANOVA). However, the higher mortality can be fully explained by higher EuroSCOREs as shown in figure with predicted and actual 30-day mortality divided on age groups.



In conclusion normal life expectancy of patients older than 75 years is not much shorter than the standard cardiac patient. When careful selection of patients and procedures the co-morbidity is only marginally higher and if taken in account the more rigid hemodynamic system in monitoring and anaesthesia most patients can be handled with slightly higher anaesthetic precautions. Following the outcome is acceptable and in fully compliance with established risk scores.