CLINICAL ETHICS

Priority setting in cardiac surgery: a survey of decision making and ethical issues

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Objectives: The aim of this study was to examine priority setting for coronary artery bypass surgery, and to provide an overview of decisions and rationales used in clinical practice.

Method: Questionnaires were sent to all permanently employed cardiologists, cardiothoracic surgeons, and anaesthesiologists at nine Swedish hospitals performing adult cardiothoracic surgery.

Results: A total of 208 physicians responded (a 44% return rate). There was considerable agreement concerning the criteria that should be used to set priorities for coronary artery bypass interventions (clusters of factors in synthesis). However, there was a lack of accord regarding the use of national guidelines for priority setting and risk indexes.

Conclusions: Basic training and the strong support of ethical principles in priority setting are lacking. The respondents indicated a need for clearer guidelines and an open dialogue or discussion. The lack of generally acknowledged plans and guidelines for priority setting may result in unequal, conditional, and unfair treatment.

Like other wealthy nations, Sweden has a large proportion of elderly people who have an increasing need for medical and nursing care for cardiovascular disease. Coronary artery disease affects about 30 000 Swedes annually.¹ New research shows that interventions, such as, coronary angiography, percutaneous coronary intervention, and coronary artery bypass grafting surgery, should be performed early in the course of illness.¹ The number of patients waiting for treatment is currently greater than capacity because of budget constraints and a lack of staff with specialist competence. Patients with the greatest need and who can benefit the most from the procedure must consequently be given highest priority.

The importance of rationales for priority setting discussions is emphasised in legitimate and fair priority setting.^{2,3} The major bioethical principles formulated by Beauchamp and Childress⁴ are the principles of beneficence, non-maleficence, autonomy, and justice. Of these principles, the principle of justice is most relevant for priority setting. Priority setting can take place both horizontally and vertically. The former requires the setting of priorities between areas, such as hip replacement versus treatments for cancer, whereas the latter entails setting priorities within a specific health care area, such as for the care of patients with cardiovascular diseases.⁵

Priority setting in Sweden began with efforts to reduce long waiting lists, and the plan is to proceed by way of exclusions and smaller resource allocations to services of lower priority. Elected officials determine how priorities are decided upon and money is spent under the guidance of politicians at the national level.⁶ The Swedish Parliamentary Priorities Commission (appointed in 1995 by the national government to provide guidance for priority setting) established three principles, which in order of importance are human dignity, need and solidarity, and cost efficiency (formalised as Swedish law since July 1997, as a general priority rule).^{1,7,8} The principle of human dignity signifies that all people have equal dignity and the same rights regardless of their personal characteristics and their function in the community. The need and solidarity principle

encompasses both the requirement to direct resources to those whose needs for health care are greatest, as well as to direct special attention to those who are less able to voice their needs or exercise their rights. The cost efficiency principle signifies that there should be a reasonable relationship between cost and effect, but it also stipulates that comparisons of interventions are possible only for the same disease. On the basis of these principles, the ethical framework identifies client groups that should be accorded priority based on the administrative as well as the clinical level of care (based largely on the seriousness of their illnesses). In some county councils frameworks have now been developed for setting priorities.⁶

The National Board of Health and Welfare in Sweden provides national guidelines for diseases. These are based on current knowledge and expertise, including literature reviews and consensus decisions. The national guidelines for coronary artery diseases¹ include three versions, each directed at different target groups: health care professionals, governing bodies (County Councils), and patients. The aim of state of the art clinical guidelines and patient information is to provide health care professionals with documents containing reliable data for making decisions regarding appropriate and cost effective interventions.

Outcomes research now represents a new foundation for future clinical decisions about patient care. Some information is accessible to aid in decision making, such as evidence based national and local clinical guidelines and risk indexes.^{6,9,10} In this study priority setting was defined as "situations of choice where surgical treatment is decided against and where this is not only motivated by medical factors".

The aim of this study was to examine priority setting for coronary artery bypass surgery in Sweden, and to provide an overview of the decisions and rationales that are used. Do physicians do any systematic prioritising? To what degree is clinical practice in accord with the principles for priority setting of the Swedish Priorities Commission? Can risk prediction be used on an individual level and what are the ethical questions?

SUBJECTS AND METHODS

The researchers sent information about the survey to the heads of departments at nine Swedish hospitals performing adult cardiothoracic surgery. Shortly thereafter questionnaires were sent to all permanently employed cardiologists, cardiothoracic surgeons, and anaesthesiologists. When necessary, reminder letters and questionnaires were sent two weeks after the first mailing. The cover letter described the study and procedures for ensuring confidentiality. The questionnaire consisted of 16 multiple choice questions with extra space for comments. It consisted of three parts: basic demographic information, general questions about priority setting, and specific questions regarding priority setting for coronary artery bypass surgery. In the last question the respondents were asked to rank 10 fictitious patient cases (see appendix) being assessed for coronary artery bypass interventions on the basis of a brief summary of each patient's condition together with the operative risk and improvement potential.

Statistical analysis

The non-parametric Mann-Whitney U test was used for variables with two categories and the Kruskal-Wallis test for variables with more than two categories. A *p* value of ≤ 0.05 was considered as statistically significant. Six age groups were used: ≤ 29 , 30–39, 40–49, 50–59, 60–69, and ≥ 70 years. Length of employment was divided into four categories: ≤ 2 , 3–5, > 5 –15, and ≥ 15 years. All statistics were performed using SPSS version 9.0.

RESULTS

Basic demographic information

The overall response rate was 208/469 (44.3%), varying between 26.9% and 65.4% for the hospitals, and between 17.6% and 86.4% for the cardiology and thoracic specialties. Of the responding physicians, 82 (39.4%) were cardiologists, 71 (34.1%) were cardiac surgeons, and 55 (26.4%) were cardiac anaesthesiologists. The response rates for each speciality were as follows: cardiologists 35%, cardiothoracic surgeons 53%, and cardiothoracic anaesthesiologists 55%. Of the respondents, 42 (20.2%) were female and 166 (79.8%) were male. Only five of the cardiothoracic surgeons were women ($p = 0.001$). Approximately 25% of the respondents were 39 years of age or younger, 45% were between 40 and 49 years of age, and 30% were 50 years of age or older. Average length of employment within the speciality was 12.7 years (range 0 to 39).

The questionnaire comprised questions focusing on priority setting for patients undergoing coronary artery bypass surgery. Missing responses on the questionnaire can be explained in part by the fact that some respondents were not involved in decisions about coronary artery bypass surgery. In Sweden, decisions to perform cardiac surgery are usually taken at a planning conference where participants are cardiologists responsible for coronary care and cardiac surgeons. Cardiac anaesthesiologists participate only when complicated cases are discussed. Respondents who returned but did not complete the questionnaire, stated that their main reason for not doing so was that they did not work with this special condition or that they had too little experience. Consequently, there is a potential non-response bias. Approximately 10–15% of the potential respondents did not feel qualified, or felt that responding to and returning the questionnaire would not be relevant.

Of the respondents, 26% had undergone education and training in prioritising during their basic/specialist training. In the age groups 40–49 years and 50–59 years, 73% of the respondents in each group had not received basic training in prioritising ($p = 0.007$). Information on priority setting and

resource allocation had been given to 64% of the respondents during their clinical practice, and 80% had been informed about or discussed ethical principles for prioritising.

General questions about priority setting

When the respondents were asked about whom they thought should influence the decision on priority setting in health care, 76% answered that it should be physicians (table 1). Of the respondents, 39% thought that patients and the general public should have greater influence on priority decisions, whereas 74% thought that health care professionals should have greater influence in decision making regarding priority setting. Other comments by the respondents included: "The profession is responsible for medical knowledge," "Elected officials decide about priority setting," "Influence requires knowledge," "The basis for priority decisions should be presented openly to patients/the general public by those responsible." About one fifth of the respondents felt uncertain regarding their responses to the questions about influence.

In one question respondents were asked if they were aware of the meaning of the three principles for priority setting (formulated by the Commission and prescribed by law since 1997). Approximately 55% acknowledged knowing the meaning of the principle of human dignity, 47% of the respondents were aware of the meaning of the principle of need and solidarity, and 45% the meaning of the principle of cost efficiency. According to their comments, some respondents deemed these principles difficult to apply in everyday practice, and others had heard about but not read them.

Specific questions regarding priority setting for coronary artery bypass surgery

Approximately 83% of the respondents had refrained from surgical treatment during the past year for different reasons. The main reasons given for refraining from surgical treatment are: too high a risk in relation to the benefits of the intervention (80%), palliative treatment being the only possible option (42%), lack of staff with specialist competence, facilities, medical or technical equipment (34%), and ethical reasons (26%). Financial reasons accounted for 5% and the clinic's medical programme 3%. According to the comments, the cardiologists often saw palliative treatment as a reasonable alternative.

About 92% of the respondents had attended clinical discussions about priority setting without making the decisions themselves. In 22% of these discussions the respondents felt that the basis for decision making was insufficient. The main reasons for this were a lack of information about medical benefits, quality of life, risk assessment, patient satisfaction, ethical awareness, the consequences of the illness/conditions for the patient, and

Table 1 Distribution of answers to the question: "Who do you think should influence decisions on priority setting?"

Answers	Priority setting (%)
Hospital/local administration	40
Physicians	76
Other health care professionals	11
Consensus*	40
Patients	24
Relatives	12
Other**	17

*Consensus includes hospital/local administration, physicians, other health care professionals, patient group, other, etc.

**Other includes the public, politicians, the system, principles, guidelines, etc.

Table 2 Decision about priority setting in clinical care (on the last occasion the respondent was involved)

Answers	Responses to the questions (%)
Was the decision discussed with the patient?	57
Was the decision discussed with relatives?	42
Was the decision discussed with other physicians?	86
Was the decision discussed with other staff?	30
Was the decision discussed with the referring physician?	22
Was the decision discussed with a team of specialists?	69
Was the decision discussed with a patient group?	0.5
Was the decision discussed with a medical ethicist?	0
Should the decision have been made earlier?	20
Should the decision have been made later?	1
Was the decision reconsidered during the care period?	19
Was the decision and its basis documented?	70

clinical guidelines. Of the respondents, 39% participated in clinical prioritisation every week, 18% participated daily, 20% monthly, and 20% less frequently than monthly. Twenty four per cent of the respondents considered the revised national guidelines for coronary artery disease (published in April 2001) to be supportive. Table 2 shows the last occasion when respondents participated in a priority decision, who was mainly involved in the discussion, whether the time decision making took place was appropriate, and if the decision making and its basis were documented.

National and clinical guidelines (consensus document) or protocols for risk assessment were used by 21% of respondents. Risk models/indexes based on preoperative variables, which predict the risk of adverse outcomes, are developed on a group level and used in cardiac care. The cardiologists mainly used functional scores such as the New York Heart Association (NYHA) score and the Canadian Cardiovascular Society (CCS) classification, whereas the cardiothoracic surgeons and anaesthesiologists used risk indexes such as the Higgins score, the Parsonnet's risk system, and the EuroSCORE. Half of the respondents thought that different risk indexes should be used for individual priority setting. However, many respondents felt that risk indexes provide some guidance and support, but that they are just one piece of the puzzle when engaging in solid decision making and prioritisation. One third of the respondents felt a need for decision support (for example, risk databases, a pocket sized risk index, etc) in their dialogue with the individual patient.

The results from a risk assessment of an individual patient can be used in various ways. A risk that is judged as high can lead to surgical treatment being refused, or that extra resources will be allocated at the time of surgery. A case scenario was described for a high risk patient in which he or she could decide to refuse or accept surgical treatment under the condition that intensive care efforts after a possible complication would be restricted. Of the respondents, 61% found that situation to be ethically justified under certain conditions. The respondents acknowledged the importance of the issue and wondered, "Where do you draw the line?" The information must be adequate. "If you have started a treatment such as surgery, you have to complete it using the resources that are available." "Vertical priority setting is not especially well defined. Instead, it is mostly done intuitively." More than 69% of the respondents expressed a need for clearer guidelines and an open dialogue when it comes to judging needs and priority setting within their own speciality.

Table 3 Distribution of responses to the question: "Which of these factors for decision making do you consider important for priority setting at your department?"

Answers	Factors judged to be important in priority setting (%)
Evidence based medicine	82
Risk assessment	80
Expected results/benefits	76
Patient's quality of life/satisfaction	76
Severity of illness (individual perspective)	70
Need for intervention	69
Patient's preferences	64
Ethical assessment	58
Age, lifestyle related illness	53
Decision based on laws and regulations	47
Waiting lists, number of beds	45
Resource limitations	40
Access to staff with specialist competence	40
Consideration for weak patient groups with difficulty in voicing their needs or exercising their rights	40
Costs for different interventions	36
Alternative cost without intervention/care effort	34
Costs that affect other caregivers	21

The four top ranked factors were evidence based medicine, risk assessment, expected results/benefits and patient's quality of life.

The respondents were asked to assess important factors in decision making and if possible to rank the three that are most important (table 3). A large majority were of the opinion that evidence based medicine, risk assessment, expected results/benefits, the patient's quality of life/satisfaction, severity of illness, need for intervention, and patient's preferences should be important factors in setting priorities. Costs for interventions seemed less important. The respondents had greater respect for the patient's quality of life/satisfaction and individual wishes than they had for laws and regulations, waiting lists, and available resources. Half the respondents considered patient age and lifestyle related illnesses to be important factors in priority decisions. On average 10% (range 2 to 20%) of the respondents felt unsure about the importance of these different factors, and many also found it difficult or impossible to rank those that are most important.

There was on average no great variation between the specialties when respondents were asked to rank 10 patient cases (see appendix) according to the applicability of coronary bypass interventions based on operative risk and

Table 4 Distribution of physicians' rankings of 10 fictitious patient cases assessed for coronary bypass interventions on the basis of operative risk and improvement potential

Patient case	Priority setting (median (range))		
	Cardiology	Cardiothoracic surgery	Cardiothoracic anaesthesia
1	1 (1-8)	1 (1-7)	1 (1-5)
2	8 (1-10)	8 (1-10)	7.5 (1-9)
3	3 (1-9)	3 (1-7)	3 (1-10)
4	10 (3-10)	9 (2-10)	9 (1-10)
5	7 (2-10)	7 (1-10)	7 (1-9)
6	2 (1-8)	3 (1-10)	3 (1-10)
7	5 (2-10)	5 (1-9)	5 (1-10)
8	6 (1-10)	7 (2-10)	6 (1-10)
9	4 (1-10)	4 (1-10)	4 (1-9)
10	7.5 (2-10)	8 (1-10)	9 (1-10)

See appendix for details of the patient cases.

Figure 1 Variation in the ranking of 10 fictitious patient cases by respondents based on the patients' improvement potential and operative risk (see also table 4). The graphs show the distribution of ranking from 1–10 (on the horizontal axis) and the frequency of the respondents ranking (on the vertical axis).

improvement potential (table 4). However, considerable variation could be seen in the ranking of specific patient cases (figure 1). The patient cases were ranked by the respondents with higher priority given to patients with the greatest improvement potential, and lower priority to those with very high operative risk. Many of the respondents argued that this was a difficult question due in part to a limited basis for decision making.

DISCUSSION

In times of flux within the health care system, the clinical and ethical dilemmas encountered by physicians are thornier than ever. Decision making at an operative level and in the allocation of scarce financial resources raises ethical issues. This study presents current priority setting in clinical practice in Sweden for coronary artery bypass surgery. The main finding is that basic training and the strong support of ethical principles in priority setting are lacking. Only 26% of the respondents had received training in prioritising during their basic/specialist training, and two thirds had undergone training in resource allocation (that is, ethics with respect to limited resources) during their clinical practice. Even though 80% had been informed about or discussed ethical principles for prioritising in practice, only about half were aware of the meaning of the three principles for priority setting. This may be due in part to the fact that earlier basic/specialist medical education did not embrace this kind of training. On the other hand, this also indicates a lack of accord between practice and the principles for priority setting. One of the respondents stated that, "we are all ethicists", and another wrote that, "risk/benefit for the patient is equal to the ethical principle." The respondents depended on their judgement and intuition in decision making, and the ethical dimension was considered to be an integral part of medical decisions. Against this background, the finding that half of the respondents were not aware of the established principles for priority setting seems paradoxical.

In October 1998 an international meeting on priorities in health care was held in London, and thereafter a special publication on the second phase of priority setting was released. The first phase had been based on simple solutions, such as cost effectiveness analyses, on the assumption that it was "possible to devise a rational priority setting system that will produce legitimate decisions." The second phase "has followed the realisation that the idea of devising a simple set of rules is flawed", and focuses on the priority setting process itself and its transparency and accountability.¹¹ There is no universal way to balance different goals for priority setting. Criteria such as severity of a disease, urgency of treatment,

and the possibility of treating the disease are also open to different interpretations, and constitute a problematic basis for a simple priority setting system.¹¹ Eddy's analyses emphasise the variability among and between clinicians in their observations, perceptions of outcome, and reasoning processes, and he has shown how these variations affect the outcome of diagnosis, treatment, and prognosis.⁹ The strength of our survey is that it provides a view of current priority setting in clinical practice at nine hospitals in Sweden. Our results indicate that decisions are often reached after consultations between the specialties. According to the respondents' comments, some of them thought that the decision making process functioned well, while others thought that it did not always work out properly, due in part to variations in reasoning and practices between the specialties, limited time, lack of a basis for priority setting, and lack of available resources.

Decisions on priority setting in cardiac surgery seem to be reserved today for physicians. In one third of these decisions other staff members were involved. In the future, a care team approach will probably be more common, as aspects other than medical factors might be considered of increasing importance. The most important individual factors that shaped decision making were evidence, risk assessment, benefits, the patient's quality of life/satisfaction, severity of illness, need for intervention, and patient's preferences. The evidence based approach had the greatest role in forming the basis for priority setting (82%). The reasons underlying decisions did not rest on individual factors. Instead, the respondents made decisions based on clusters of factors (in synthesis).

Several factors are associated with a higher risk of cardiac complications including congestive heart failure, diabetes, and poor functional status. Half the respondents in the present study thought that risk indexes could be used for individual prioritisation, but they also commented that risk scores should be used with caution and considered as a complement and aid to other parameters. Jackson *et al* claim that access to treatment should be based on proven benefits weighed against likely costs for each patient, and should not be based on a numerical score that has not been validated against the risks and benefits of surgery, or other adverse cardiac events.¹² Kee *et al* think that the scoring systems have thus far not clarified their specific objectives nor distinguished between "urgency" and "priority".¹³

The main reasons given for refraining from surgical treatment were too high a risk in relation to the benefits of the intervention, followed by palliative treatment being the only possible option. Many respondents commented on the age factor. It is against the principle of human dignity to give

elderly individuals lower priority in relation to younger persons, but age can be taken into account if this criterion decreases the benefit of care or treatment.⁷⁻¹⁴ According to the national guidelines patients with the greatest need and who can benefit the most from the procedure must be given highest priority.¹ Criteria for priority setting in the national guidelines are: (a) the consequences of the illness/conditions for the patient; (b) the measure's effect on health and life quality; (c) scientific support (evidence) for this effect, and (d) cost efficiency. When the respondents were asked to rank 10 fictitious patient cases, the respondents gave higher priority to patients with the greatest improvement potential and lower priority to those with very high operative risk. An ethical implication of such a decision rule is that cardiac surgeons may not operate on very sick patients who have the most to gain in the longer run but who are also at greatly increased risk of complications and death from the surgery itself. The variation in ranking in itself could also be considered as an ethical implication.

According to their comments, respondents may disagree with clinical guidelines about priorities written by national experts and instead rely on their own experience or the recommendations of colleagues. As stated by some of the respondents, "the national guidelines are too general or theoretical...and already out of date when published;" "faced with the individual's suffering it is difficult to be rational—you have to give the patient a possibility for improvement." On the other hand, a few respondents found these guidelines to be supportive, with good illustrative examples. The process of preparing clinical guidelines is both time consuming and complex.⁶⁻¹⁵ If the national guidelines are to guide judgements about priorities, medical efficiency must be balanced against consideration of the basic ethical principles for priority setting in health care established by the Swedish Parliament.¹ The national guidelines have been established by a consensus process and can thereby be considered as justified. In order to avoid arbitrariness in priority setting there is a need for general principles. This is also a way to avoid differing standpoints between different clinics.

Many authors also underline the need for common ethical principles in health care. Griffiths and Dunlop assert that a code of ethics, which in our case are the national principles for priorities, must be a living document, and genuinely form the basis of the value system on which all staff operate within the hospital. Hall claims that making the connection between ethics and law provides a sound basis for practice.¹⁷ Hall argues that by following the basic codes of ethical behaviour, professional actions will also be legally correct. Tolley and Whyntes describes an instrument for training in health care resource allocation, and they recommend exercises in priority setting as an essential experience for all those concerned with the management of modern medicine.⁵

When health care is under the control of local authorities, methods for priority setting can vary greatly.⁶ The respondents want straight answers from politicians about priority setting in order to be able to handle the imbalance between potential cases and resources. The respondents argued that politicians must dare to discuss how to allocate resources in situations involving rapid medical technological progress and possibilities but a restricted budget. One of the respondents wanted to see an improvement regarding priority setting: "the population should not be offered more than the economy can provide" and "the decisions must be open and detailed enough so that we don't feel insecure." One respondent commented, "there is a risk that you refrain from operating on a patient and motivate this as 'too high a risk', when the real reason is rationing/saving in an attempt to balance an unmanageable, long waiting list." Principles for allocation must be based on rules that are generally

acknowledged and accepted by the general public, health care professionals, and patients.⁹

There are inconsistencies in the use of clinical guidelines in practice, and unresolved questions remain for national work groups. Personal opinions among the respondents varied widely concerning the use of parameters such as risk indexes and guidelines in determining priority. About 20% used clinical practice guidelines. Guidelines are not seen as absolute requirements. They may be adopted or rejected according to clinical needs and restraints. Eddy claims that guidelines are an essential part of medical decision making, but he also states that costs and cost effectiveness need to be incorporated in recommendations about the use of treatments in order to recognise that the budget is limited.¹⁸ More than 69% of the respondents indicated a need for clearer guidelines and an open dialogue or discussion regarding the determination of needs, priority setting, and common principles within their own specialty. This indicates the need for another approach in order to make national guidelines and ethical principles easily accessible to the medical profession. However, there are currently good efforts and more systematic working methods underway for the long term integration of the national guidelines for priorities in the decision making process. This applies in particular to the county councils that are conducting extensive medical programme work, the starting point of which comprises analyses of large groups of diseases. Part of this work involves developing methods aimed at providing a basis for priority setting and resource allocation within a certain disease group, and between groups of diseases,¹⁹ thus relevant and comparable data for measurement and follow up are required.

CONCLUSIONS

Our aim was to describe how physicians involved in coronary artery bypass surgery made decisions about priority setting taking ethical considerations into account. There was considerable agreement on the criteria that should be used to set priorities for coronary artery bypass interventions: evidence, risk assessment, benefits, patient's quality of life/satisfaction, severity of illness, need for intervention, and patient's preferences in synthesis. However, there was a lack of accord concerning the use of national guidelines for priority setting and risk indexes. The respondents indicated that politicians must take more responsibility for how to allocate resources and give directions about priority setting. Basic training and the strong support of ethical principles in priority setting are lacking. The respondents indicated a need for clearer guidelines and an open dialogue or discussion. The lack of generally acknowledged plans and guidelines for priority setting may result in unequal, conditional, and unfair treatment.

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APPENDIX 1

VERTICAL PRIORITISATION: HOW WOULD YOU RANK THESE PATIENTS WITH RESPECT TO CORONARY BYPASS SURGERY?

(Think about the motives for your decisions)

1. A 54 year old patient without comorbidity, with disabling angina pectoris/threatening myocardial infarction, and good possibilities for revascularisation. (Operative risk 1%, improvement potential 95%.)
2. An 86 year old male with completely disabling angina pectoris (angina at rest, confined to the hospital with IV infusion), a long history of diabetes, generalised arteriosclerosis, renal insufficiency (creatinine 230 µmol/l), poor LV function (ejection fraction <30%), and previous coronary artery bypass grafting surgery including left internal mammary artery to the left anterior descending coronary artery. (Operative risk 50%, improvement potential 50%.)
3. A 62 year old previously healthy male who experienced chest pain during a quarrel at work. Has never experienced similar discomfort before. Comes in as an emergency case—admitted as “rule out myocardial infarction”. Suspected myocardial infarction not verified. Exercise stress testing before discharge. The patient does not get chest pain but has a 2 mm depression in antero-lateral leads. Coronary angiography performed before discharge shows 95% stenosis of the main branch and it is recommended that the patient undergo coronary artery bypass graft. He feels shocked, confused and hesitant about surgery. (Operative risk 4%, improvement potential prognostic.)
4. An 86 year old female with moderate to severe angina pectoris (no angina at rest), a long history of diabetes, generalised arteriosclerosis, renal insufficiency (creatinine 230 µmol/l), poor LV function (ejection fraction <30%), and previous coronary artery bypass grafting surgery including left internal mammary artery to the left anterior descending coronary artery. (Operative risk 75%, improvement potential 10%.)
5. A 56 year old male with moderate to severe angina pectoris (no angina at rest), a long history of diabetes, generalised arteriosclerosis, renal insufficiency (creatinine 230 µmol/l), poor LV function (ejection fraction <30%), and previous coronary artery bypass grafting surgery including left internal mammary artery to the left anterior descending coronary artery. (Operative risk 50%, improvement potential 40%.)
6. A 65 year old female with completely disabling angina pectoris despite optimal medical treatment, without serious comorbidities, and with good possibilities for revascularisation. (Operative risk 2%, improvement potential 90%.)
7. A 58 year old male with disabling angina pectoris despite optimal medical treatment, without serious comorbidity. Has had large anterior infarction, totally occluded left anterior descending coronary artery and a good deal of peripheral stenosis in the right circumflex vessels (in both cases the diameter of the vessel is about 1.5 mm peripheral to the stenosis). Ejection fraction 30%. (Operative risk 20%, improvement potential 40%.)
8. A 77 year old male, previously essentially healthy, with relatively moderate typical angina pectoris the past two years. It has possibly increased somewhat in the past month and he now has difficulty playing 18 holes of golf (difficulty keeping up with fellow players), has discomfort when carrying bags from the grocery store, etc.

His wife does not want to (does not dare) do any long term sailing during the summer, which the patient loves. He is treated with adequate doses of beta blockers and long acting nitroglycerine. During exercise stress testing the patient manages 70% of reference values, gets slight chest pain at the end of the test and a 1 mm ST depression in infero-lateral leads. The patient now wants/demands coronary angiography and revascularisation. (Operative risk <2%, improvement potential 50%.)

9. A 78 year old male with completely disabling angina pectoris despite optimal medical treatment, without serious comorbidity, and with good possibilities for revascularisation. (Operative risk 6%, improvement potential 90%.)
10. A 52 year old female with a long history of insulin dependent diabetes with late complications in the form of neuropathy, retinopathy, and nephropathy. On dialysis—has little residual function. Hyperlipidaemia. No bruit over the carotids and no claudication. Due to unstable angina pectoris underwent coronary angiography one year ago and complete revascularisation of three vessels was performed. Postoperatively no angina pectoris, and exercise stress testing showed essentially normal working ability (80% of reference values). No chest pain. ECG reaction: 0.5 mm ST depression laterally. Thallium scintigraphy shows a small uptake defect infero-laterally with some reversibility. (Placement on the waiting list for kidney transplantation is now being contemplated (at least two years waiting-time). The transplantation unit now wants coronary angiography to be done again to guarantee a “good 4–5 year prognosis”.)

REFERENCES

1. **Nationella riktlinjer för kranskärlsjukvård.** Version för hälso- och sjukvårdspersonal (Swedish). Stockholm: Socialstyrelsen, 2001:228.
2. **Sabin JE.** Fairness as a problem of love and the heart: a clinician's perspective on priority setting. *BMJ* 1998;**317**:1002–4.
3. **Singer PA.** Medical ethics. *BMJ* 2000;**321**:282–5.
4. **Beauchamp TL, Childress JF.** *Principles of biomedical ethics*, 4th ed. New York: Oxford University Press, 1994:546.
5. **Tolley KH, Whynes DK.** The priority-setting exercise: an instrument for training in health care resource allocation. *Med Teach* 1995;**17**:391–8.
6. **Honigsbaum F, Holmström S, Calltorp J.** *Making choices for health care.* Abingdon: Radcliffe Medical Press, 1997:131.
7. **The Swedish Parliamentary Priorities Commission.** *Priorities in health care: ethics, economy, implementation (final report).* Stockholm: Fritze, SOU, 1995:5E.
8. **Holmström S.** Priority setting and health management in Sweden. *Eurohealth* 1996;**2**:30–2.
9. **Eddy DM.** *Clinical decision making. From theory to practice: collection of essays from the Journal of the American Medical Association.* Sudbury, Massachusetts: Jones and Bartlett Publishers, 1996:355.
10. **Robson J.** Information needed to decide about cardiovascular treatment in primary care. *BMJ* 1997;**314**:277–80.
11. **Holm S.** Goodbye to the simple solutions: the second phase of priority setting in health care. *BMJ* 1998;**317**:1000–2.
12. **Jackson NW, Doogue MP, Elliott JM.** Priority points and cardiac events while waiting for coronary bypass surgery. *Heart* 1999;**81**:367–73.
13. **Kee F, McDonald P, Kirwan JR, et al.** Urgency and priority for cardiac surgery: a clinical judgment analysis. *BMJ* 1998;**316**:925–9.
14. **Collste G.** Should every human being get health care? Priorities in health care and the principle of human dignity. *Ethical Perspectives* 1999;**2**:115–25.
15. **Battista RN, Hodge MJ.** Setting priorities and selecting topics for clinical practice guidelines. *CMAJ* 1995;**153**:1233–6.
16. **Griffiths MMJ, Dunlop IT.** Ethics, medicine and economics: integration in a hospital environment. *Med J Aust* 2002;**176**:226–8.
17. **Hall JK.** *Nursing ethics and law.* Philadelphia, PA: WB Saunders Company, 1996:508.
18. **Eddy DM.** *Doctors, economics and clinical practice guidelines: can they be brought together? Annual lecture, 1999.* London: The Office of Health Economics (OHE), 1999:33.
19. **Prioriteringar i sjukvården: beslut och tillämpning (Swedish).** Stockholm: Socialstyrelsen 1999:16, 129.