Cost-effectiveness of coronary artery bypass surgery
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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
Coronary artery bypass grafting (CABG).

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis and cost-utility analysis.

Study population
Males aged 55 affected by angina.

Setting
The study was carried out in the USA.

Dates to which data relate
Price related to 1981.

Source of effectiveness data
Published literature.

Modelling
Epidemiological cohort model (model of survival and disease).

Measure of benefits used in the economic analysis
Life years gained and quality-adjusted life years (QALYs). Subjective response to angina was used for the health state description. Arbitrary adjustment was used as a basic method of valuation of health states. Author and literature values were used to assess the health states.

Direct costs
Direct costs were to the health service. For coronary artery bypass grafting (CABG) for males aged 55 with good ventricular function these costs were surgery, medical management, sequelae (myocardial infarction), and repeat operations. For coronary angiography for males aged 55, CABG surgery guided by findings these costs were angiography, surgery, medical management, sequelae (myocardial infarction), and repeat operations. Price information related to 1981.
Currency
US dollars ($). In the DH Register of Cost-Effectiveness Studies, the original results were converted to UK using GDP purchasing power parities, and reflated to 1991, using the NHS pay and prices index.

Sensitivity analysis
Sensitivity analysis was carried out using the method of single parameter variation.

Estimated benefits used in the economic analysis
Intervention QALYs per patient (benefits not discounted) for: left main vessel (LMV) disease, severe angina were 16.2;
three vessel disease (3VD), severe angina were 16.9;
two vessel disease (2VD), severe angina were 16.8 and;
one vessel disease (1VD), severe angina were 17.1.
Comparison QALYs per patient (benefits not discounted) for: left main vessel (LMV) disease, severe angina were 10.0;
three vessel disease (3VD), severe angina were 13.7;
two vessel disease (2VD), severe angina were 15.7 and;
one vessel disease (1VD), severe angina were 16.6.
Incremental QALYs per patient (benefits not discounted) for: left main vessel (LMV) disease, severe angina were 6.2;
three vessel disease (3VD), severe angina were 3.2;
three vessel disease (3VD), mild angina were 3.2;
two vessel disease (2VD), severe angina were 1.1;
two vessel disease (2VD), mild angina were 0.8;
one vessel disease (1VD), severe angina were 0.1 and;
one vessel disease (1VD), mild angina were 0.5.
Duration of follow-up of the treatment cohort was 6 years. Outcome duration was life long and it was not relevant whether treatment side-effects were included.

Synthesis of costs and benefits
Cost duration was 10 years. Incremental cost per life year gained (costs and benefits discounted at 5%) for:
left main vessel (LMV) disease, severe angina was 3660;
three vessel disease (3VD), severe angina was 8060;
two vessel disease (2VD), severe angina was 49200;
one vessel disease (1VD), severe angina yielded positive incremental costs and negative incremental benefits and three vessel disease (3VD), severe angina, poor ventricular function it was 13200.
Incremental cost per QALY gained (costs and benefits discounted at 5%) for: left main vessel (LMV) disease, severe angina was 3980;
left main vessel (LMV) disease, mild angina was 3770;
three vessel disease (3VD), severe angina was 7540;
three vessel disease (3VD), mild angina was 7850;
two vessel disease (2VD), severe angina was 17800;
two vessel disease (2VD), mild angina was 31400;
one vessel disease (1VD), severe angina was 31400;
one vessel disease (1VD), mild angina was 492000;
three vessel disease (3VD), severe angina, poor ventricular function was 11000;
and for coronary angiography for males age 55, CABG surgery guided by findings was 18900.

CRD Commentary
(This commentary was not written by CRD, but by the authors of the DH Register).
1) The health state valuations are illustrative; they reflect a patient's perception of angina, rather than the severity of underlying disease.
2) After six years, life expectancies were extrapolated using normal population life tables: this is optimistic.
3) Single vessel disease is excluded from treatment by angiography.
4) There were no health omissions.
5) The parameters investigated by the sensitivity analysis were not adequately justified.

Bibliographic details

Indexing Status
Subject indexing assigned by NLM

MeSH
Angina Pectoris /drug therapy /surgery; Angiography /economics; Comparative Study; Coronary Artery Bypass /mortality /economics; Coronary Disease /drug therapy /surgery; Coronary Vessels /radiography; Cost-Benefit Analysis; Life Expectancy; Life Style; Male; Middle Aged; Quality of Life; Statistics

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