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
Fine-needle aspiration biopsy or radioisotope and ultrasound scan in the initial evaluation of solitary thyroid nodules.

Type of intervention
Diagnosis.

Economic study type
Cost-effectiveness analysis.

Study population
Patients assigned to thyroid aspiration.

Setting
Hospital. The economic study was carried out in the USA.

Dates to which data relate
Effectiveness and resource use data for FNAB were collected from November 1981 to October 1989, whereas the ultrasound and radioisotope scan cost data were collected in the periods November 1981 to October 1989 and 1995-1996. The price year in this study was 1997.

Source of effectiveness data
The effectiveness data were derived from a single study.

Link between effectiveness and cost data
The costing analysis of FNAB was undertaken prospectively on the same sample as that used in the effectiveness study.

Study sample
The study sample was 83 patients undergoing thyroid aspiration at the Michigan State University Clinical Center from November 1981 to October 1989. Sixty four underwent radioisotope scanning and 38 had ultrasound examination. 45 patients referred for evaluation of thyroid nodules in 1995-1996 were also included in the analysis.

Study design
This was a non-randomised trial with concurrent and historical controls, carried out in a single centre. The length of follow-up varied for each patient, the longest being 4 years. Loss to follow-up was not reported.
Analysis of effectiveness
The FNAB effectiveness analysis was based on intention to treat. Sub-samples of patients underwent radioisotope scan and/or ultrasound examination, thus corresponding to the comparator group. The health outcomes measured were the number of cases diagnosed by the tests.

Effectiveness results
All patients (83) underwent FNAB. 64 patients (77%) underwent radioisotope and 38 patients (46%) underwent ultrasound scan. 33 out of 83 patients (40%) underwent both radioisotope and ultrasound scan. The results show that 90% of the referred patients required FNAB, and 90% of the patients additionally evaluated had cold lesions on radioisotope scan and 90% of lesions were mixed on ultrasound scan. Minor discomfort was the only complication during FNAB.

Clinical conclusions
The FNAB was more effective in diagnosis than both radioisotope scan and ultrasound scan. The authors believe that the FNAB was a better procedure for the diagnosis of a thyroid nodule than ultrasound and radioisotope scans.

Measure of benefits used in the economic analysis
No measures of benefit were used in the economic analysis.

Direct costs
The average and the total cost of each type of test (FNAB, ultrasound and radioisotope) were considered. Hospital charges were used as a proxy for costs. Average costs and quantities were reported. The cost data were based on the average charge in 1997. It is not clear whether discounting was applied in the study.

Statistical analysis of costs
No statistical tests were carried out in the analysis.

Indirect Costs
Not considered.

Currency

Sensitivity analysis
No sensitivity analysis was performed.

Estimated benefits used in the economic analysis
Not applicable.

Cost results
The average cost of FNAB was $200. Therefore the total cost of biopsies was $20,800 (83 patients). The average cost of ultrasound scan was $280 and the total cost of 38 scans was $10,640. The average cost of radioisotope was $350, and the total cost of radioisotope for 64 patients was $22,400.
Synthesis of costs and benefits
Not applicable.

Authors' conclusions
The authors concluded that "FNAB of the thyroid is an effective initial diagnostic test for maximising the number of malignant tumors found at operation and minimizing the number of operations for benign lesions". Given that FNAB is more accurate in diagnosis and more cost-effective than radioisotope and ultrasound scans, omitting the latter types of diagnosis would save the costs incurred in their performance (in this case $33,040).

CRD COMMENTARY - Selection of comparators
The reason for the selection of comparators is clear, given that the comparators are the alternative procedures commonly used in detecting malignancy in a thyroid nodule.

Validity of estimate of measure of benefit
It was not clear, from the reported findings, whether FNAB was significantly more effective than the radioisotope scan and the ultrasound evaluation.

Validity of estimate of costs
Hospital charges were used instead of actual costs. It is impossible to judge whether important costs were omitted in the analysis given the lack of detail provided. The differences between the costs of the diagnostic procedures were not tested statistically.

Other issues
Despite the authors' statement that the aim of the study was to determine the utility and cost effectiveness of FNAB, the utility unit of the procedure was not analysed. This study is, therefore, a cost-effectiveness study. Comparisons with other studies were made, and the generalisability of the study results to other settings was discussed by the authors.

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