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Cost-effective analysis of conventional and nurse-led clinics for common otological procedures

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Abstract

The need to reduce costs while providing a first-class service has led to the expansion in the role of nurses in recent years. We present results of a comparison of the cost-effectiveness of conventional and nurse-led out-patient ear clinics. Our results indicate that cost-effective health care is a distinct competitive advantage for nurses taking up some roles conventionally performed by doctors. The difference in mean cost of out-patient visit per patient between the two groups is £75.28. This is equivalent to a reduction in cost to the hospital of more than £47 000 for the 626 patients seen in a nurse-led ear clinic in a year. The nurse-led service is thus more cost-effective and presents an opportunity by freeing up otolaryngologists' time to see more complex patients and has the potential for reducing out-patient access time in the NHS.

Key words: Otologic Surgical Procedures; Nurse's Role; Cost-Benefit Analysis; Cost Savings

Introduction

Conventionally, patients undergoing myringotomy and grommet insertion are seen at regular intervals by an otolaryngologist in the post-operative period. The same is true of patients undergoing open cavity mastoid surgery, with some of these patients requiring life-long follow up (every few months) for the care of their mastoid cavity. A substantial number of patients are seen for micro-suction of ears for removal of wax. The age old convention of an otolaryngologist seeing every patient requiring simple procedures such as micro-suction of ear and follow-up after grommet insertion and mastoid surgery has significant resource implications in the National Health Service (NHS). With increased emphasis on bringing down the access times to nationally agreed limits and to reduce costs, there has been a move in recent years to devise innovative ways of delivering patient care. The issues of cost, the need to increase provision of care and decrease access times, the limited availability of doctor's time and the increasing skill and expertise of nurses have led to the expansion in the role of nurses in recent years.[1]

Over the last decade nurses have been involved in running pre-admission clinics, and providing post-operative care following adenoidectomy, tonsillectomy, grommet insertion, endoscopic sinus surgery, nasal septal surgery and tracheostomy.[2–5] Nurse practitioners have also been involved in the care of otology patients with active chronic otitis media, otitis externa, presbycusis, sudden hearing loss and facial palsy.[2] For the last seven years two senior nurses in our department have run a nurse-led ear clinic. The impetus for developing this service was high patient volumes and long delays in appointment scheduling. A similar service is also provided in a few other hospitals in the UK. To date a cost-effectiveness analysis of nurse-led ear clinics has not been published. The aim of this study was to compare the cost of seeing a patient in an otolaryngologist-led conventional out-patient clinic with a nurse-led ear clinic.

Patients and methods

Conventional out-patient clinic

Before setting up the nurse-led ear clinic, post-operative cases of grommet insertion and open cavity mastoidectomy, new patients requiring micro-suction of the ear for removal of wax, and patients requiring repeated micro-suction of the ear for recurrent otitis externa and active chronic supurative otitis media were seen by an otolaryngologist in the out-patient clinic.

Nurse-led ear clinic

Two senior nurses received in-house training in otoscopy, interpretation of audiograms, and use of the microscope for examination and micro-suction of ears prior to the start of this service. Consultant otolaryngologists and specialist registrars in otolaryngology trained the nurses. At present the scope of the service encompasses:

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(1) *Post-operative follow-up after myringotomy and grommet insertion.* A senior ENT nurse follows patients who have undergone myringotomy and grommet insertion in the post-operative period. All the patients are counselled pre-operatively about the expected course of events in the post-operative period and provided with an information sheet. The patients are specifically informed that a nurse in the out-patient clinic would see them six weeks after surgery. The patients have the choice of contacting the nurse earlier if they are concerned about their progress in the post-operative period or have any unexpected symptoms. After the initial out-patient review appointment the nurse sees the patients at nine-month intervals or earlier if they have any problems. The patients are free to ask for an appointment to see a doctor at any stage during their follow-up. The nurse consults an otolaryngologist if she is unsure of the findings or the patient needed further medical or surgical intervention.

(2) *Post-operative follow up after mastoid surgery.* This group includes patients requiring regular micro-suction for the care of their mastoid cavity following open cavity mastoid surgery. All the patients are counselled pre-operatively about the expected course of events in the post-operative period and provided with an information sheet. An otolaryngologist sees the patients in the early post-operative period. Subsequently, the nurse sees patients with dry mastoid cavities requiring regular inspection and clearance of debris, and patients with discharging cavities without any signs of recurrence of cholesteatoma. The patients are followed up at regular intervals but have the choice of contacting the nurse earlier if they develop a discharge or any unexpected symptoms. The patients are free to ask for an appointment to see the doctor at any stage during their follow-up. The nurse consults an otolaryngologist if she is unsure of the findings or the patient needs further medical or surgical intervention.

(3) *New referrals.* Patients referred by general practitioners and community nurse practitioners are seen in the nurse-led clinic. These patients are referred for micro-suction of the ear for the presence of wax or ear discharge due to otitis externa and active chronic supurative otitis media.

(4) *Referral from Audiology department.* A proportion of patients referred directly to the Audiology department by general practitioners for the provision of a hearing aid have impacted earwax. These patients are referred to the nurse-led clinic for micro-suction so that hearing can be assessed satisfactorily and an impression of the ear taken for an ear mould.

Results

Nurse-led ear clinic

In 2001, 670 patients were scheduled to attend the nurse's clinic. However the nurses saw 626 patients as 44 patients (seven per cent) did not attend their scheduled appointment. The 626 patients included 403 new patients and 223 follow-up patients. In the nurse-led ear clinic the appointments were scheduled for every 15 minutes for a new patient and every 10 minutes for a follow-up patient. The nurses had to seek the opinion of an otolaryngologist in 45 patients. The nurse-led ear clinic costs comprised (Table I):

Direct costs

(1) *Nurse's Salary (Average of Grade E and F nurse's salary).* The hourly cost of employing a grade E nurse to the hospital is £11.98 and the cost per minute is £0.20. The hourly cost of a grade F nurse is £13.77 and the cost per minute is £0.23. Thus the average cost for the two nurses was £0.22 per minute i.e. £3.30 for a 15-minute appointment for a new patient and £2.20 for a follow-up appointment, assuming that all the patients attend their scheduled appointment. Since a proportion of the patients (seven per cent) did not attend the clinic for their scheduled appointment the cost to the hospital per patient seen increased proportionately. The increased average cost was calculated to be £3.53 per new patient and £2.35 per follow-up patient seen in the nurse's clinic.

(2) *Investigations.* These included audiometry, tympanometry and ear swabs for culture and sensitivity.

(3) *Consumables.*

(4) *Doctor's salary.* A total of 45 out-patient follow-up appointments with an ENT doctor resulted from the nurse-led ear clinic. The cost to the hospital of a follow-up out-patient appointment with an ENT

TABLE I
SUMMARY OF COST ANALYSIS: NURSE-LED EAR CLINIC

		Cost per patient (£)	Number of patients	Total cost (£)
Direct costs	New patients	3.53	403	1422.59
	Follow-up patients	2.35	223	524.05
	Consumables	2.00	626	1252.00
	Investigations	40.00	426	17 040.00
	Out-patient follow-up with ENT doctor	81.00	45	3645.00
	Total direct costs			23 883.64
Indirect costs	20% indirect expenditure			4776.72
	30% overheads			7165.09
	Grand total			35 825.45
	Mean cost per patient			57.22

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TABLE II
SUMMARY OF COST ANALYSIS: CONVENTIONAL OUT-PATIENT APPOINTMENT

	Cost per patient (£)	Number of patients	Total cost (£)
New patients	161	403	64 883
Follow-up patients	81	223	18 063
Total cost			82 946
Mean cost per patient			132.50

doctor is £81 (National database of reference costs, out-patient attendance data), leading to a cost of £3465 (£81×45).

Indirect costs

(1) *Indirect expenditure for clinical support staff and equipment.* This was estimated at 20 per cent of direct costs by our finance department.

(2) *Overheads to support non-clinical staff (estates, domestics, personnel).* These were estimated at 30 per cent of direct costs by our finance department.

Conventional out-patient clinic

The data were compared to the cost of a conventional out-patient appointment with an ENT doctor (Table II). The cost of a new and a follow-up appointment in the ENT outpatient are £161 and £81 respectively (Personal communication with Director of Finance, Head and Neck Directorate, York Hospital). The costs are based on the national database of reference costs, out-patient attendance data. These figures are directly applicable to our hospital.

Comparison between the two groups

The mean cost to the hospital for the nurse-led ear clinic was £57.22 per patient. The mean cost to the hospital for the conventional out-patient clinic was £132.50 per patient. Thus the difference in the mean cost between the two groups per patient seen is £75.28. This is equivalent to a reduction in cost to the hospital of £47 125.28 for the 626 patients seen in the nurse-led ear clinic in the year 2001.

Discussion

The current trend in healthcare is to make prudent use of the limited resources. The trend is to devise means of patient care that are more cost effective while at the same time providing a high standard of care for the patients. Cost effectiveness is now given the same importance as many medical advances.[6] Our study has shown that our nurse-led ear clinic is more cost effective than our conventional out-patient clinic. We have shown in a separate study that patient satisfaction with nurse-led follow-up after grommet insertion is very high. We suggest that innovative ways of patient care, such as nurse-led ear clinics, can decrease costs and provide a useful first contact for common out-patient ENT procedures. This avoids unnecessary appointments with an otolaryngologist, thus saving valuable out-patient appointments for patients with more complex clinical conditions. Thus this methodology has the potential to reduce out-patient access times while at the same time identify patients that require further attention.

The yearly cost reduction in our study was modest. However, a large number of these procedures are performed in the NHS per year. The cost benefit of substituting a physician with a nurse for providing patient care of an equally high quality have previously been reported.[7,8] Hence nurse-led ear clinics have the potential for significant cost benefits for the NHS.

Our study may be criticized for the fact that a proportion of the cost incurred in a nurse seeing the 45 patients referred to an otolaryngologist for a second opinion (listed under new patients, follow-up patients, consumables, investigations and indirect costs) will already be included in the out-patient follow-up costs by an otolaryngologist (National database of reference costs, out-patient attendance data). Hence the formula used for the calculation of cost to hospital in our study may lead to some doubling. It is difficult to know the exact proportion of costs that have been double counted. The authors acknowledge this potential source of bias but wish to point out that exclusion of these costs from calculation would only result in the nurse-led service being more cost-effective.

Previous studies have indicated that patient satisfaction with nurse practitioner care is the same or even higher than the service provided by doctors.[9,10] Systematic review of nurse practitioners working in primary care has shown that patients are more satisfied with care by a nurse practitioner. No difference in health status, return consultations, prescriptions or referrals was found.[1] However, nurse practitioners had longer consultations, which is similar to our observation.

Conclusions

Nurse-led ear clinics for common out-patient otology procedures are more cost-effective than a conventional out-patient appointment with an otolaryngologist. It can lead to substantial reduction in cost per patient and avoids unnecessary out-patient appointments in the majority of patients thus freeing up otolaryngologists' time to see other patients with potentially more complex problems. This methodology has the potential of substantial cost reduction in the NHS and provides a means of reducing out-patient access times.

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- **Reduction in costs and retention of a first-class service has led to an expansion in the role of clinical nurse specialists**
- **This study shows that a nurse-led service is more cost effective and at the same time frees up time for otolaryngologists to see more complex cases and reduces out-patient access time in the NHS**

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