HERU Briefing Paper

HEALTH ECONOMICS RESEARCH UNIT

Briefing paper **Nov 09**

ECONOMIC EVALUATION OF TELE-ENDOSCOPY CLINICS IN REMOTE LOCATIONS

Key Messages

1. Whether average cost per patient is lower for tele-endoscopy clinics than for the central hospital clinic is highly dependent on annual patient numbers.
2. Assuming equal waiting times, members of the general public prefer tele-endoscopy clinics with short drivetimes to face-to-face clinics with long drivetimes.
3. In the case of Shetland, tele-endoscopy clinics are more cost effective than the central hospital clinic as long as the additional waiting time is no longer than around 4 weeks.

Background

All NHS boards in Scotland have recently been encouraged to implement the use of telehealth to redesign and improve patient access to health care. Telehealth has been used successfully in a number of clinical areas. Telecommunication technology can be used for communication between the patient and a consultant at a different location and to transfer images via videoconferencing. It can help reduce the need for patients to travel to major cities and hospitals to receive their care and treatment.

This briefing paper presents the results of an economic evaluation of a pilot project set up with the support of the Scottish Centre for Telehealth: an Ear Nose and Throat (ENT) tele-endoscopy service from Aberdeen to Shetland to assess patients whose symptoms suggested possible cancer of the airways. The economic evaluation compares the costs and benefits of the tele-endoscopy with traditional endoscopy.

Many economic evaluations of telehealth only consider the differences in costs as it is often assumed that telehealth is just as effective. However, it is likely that individuals have strong preferences over how the care is delivered. The economic evaluation reported here incorporates these preferences through the use of a survey method called Discrete Choice Experiments.

The service

The tele-endoscopy service was set up for ENT patients in Shetland who would otherwise have to attend a clinic in Aberdeen. In the case of the tele-endoscopy service, patients attend a clinic in Lerwick. An anaesthetist in Lerwick performs the endoscopy and the Aberdeen consultant communicates with the patient through videoconferencing equipment. The images from the endoscopy are also transferred using videoconferencing. The tele-endoscopy clinics are offered in addition to the visiting service to Lerwick.

Costs

Costs are estimated from a NHS perspective. Costs include staff time, equipment, travel time and travel costs. Data on resource use are combined with unit costs.1 Costs are in 2007 prices. Staff costs are estimated using mid-point salary scale including 'on costs' (superannuation plus national insurance). Capital costs are estimated as annual equivalent costs using a discount rate of 3.5% and an assumed equipment lifetime of 5 years. Unit costs for capital items and disposables are estimated using local cost information. Patient travel costs to Aberdeen are reimbursed apart from the first £10.

The average staff cost and equipment cost per patient is much higher for the tele-endoscopy clinics than the Aberdeen clinic. This is mainly due to the lower patient numbers both per clinic and per year for the tele-endoscopy clinic compared to the Aberdeen clinic. In addition, the tele-endoscopy clinic requires additional equipment and the costs of these are currently only shared with one other tele-clinic (tele-neurology). However, the higher staff and equipment costs of tele-endoscopy clinics are offset by savings in travel costs. The average total cost per patient is lower for the tele-endoscopy clinic compared to the Aberdeen clinic.

Benefits

Preferences for the different types of clinics are measured using a survey method called Discrete Choice Experiments. A random sample of 90 members of the general public completed a postal questionnaire. The questionnaire contained 16 hypothetical pairwise choices between a tele-endoscopy clinic and a face-to-face clinic which varied in waiting time, drivetime and cost. Using regression methods the relative importance of the attributes is estimated as well as the willingness to pay values for the different types of clinics. The table shows that the willingness to pay for the tele-endoscopy clinic is higher than for the Aberdeen clinic.

Costs per clinic and patient

	Staff	Equipment	Disposables	Travel	TOTAL
Total cost per clinic					
Tele-endoscopy	£361	£1390	£16	£0	£1767
Aberdeen clinic	£351	£247	£35	*	*
Average cost per patient					
Tele-endoscopy	£72	£278	£3	£0	£353
Aberdeen clinic	£18	£12	£2	£349	£381

* dependent on number of patients from Shetland

Willingness To Pay values and net benefits

Waiting time in weeks	1	4	7	13	18
Willingness to pay values					
Tele-endoscopy	£403	£359	£316	£228	£156
Aberdeen	£372	£329	£285	£198	£125
Net benefits					
Tele-endoscopy	£49	£6	£-38	£-125	£-198
Aberdeen	£-9	£-53	£-97	£-184	£-257

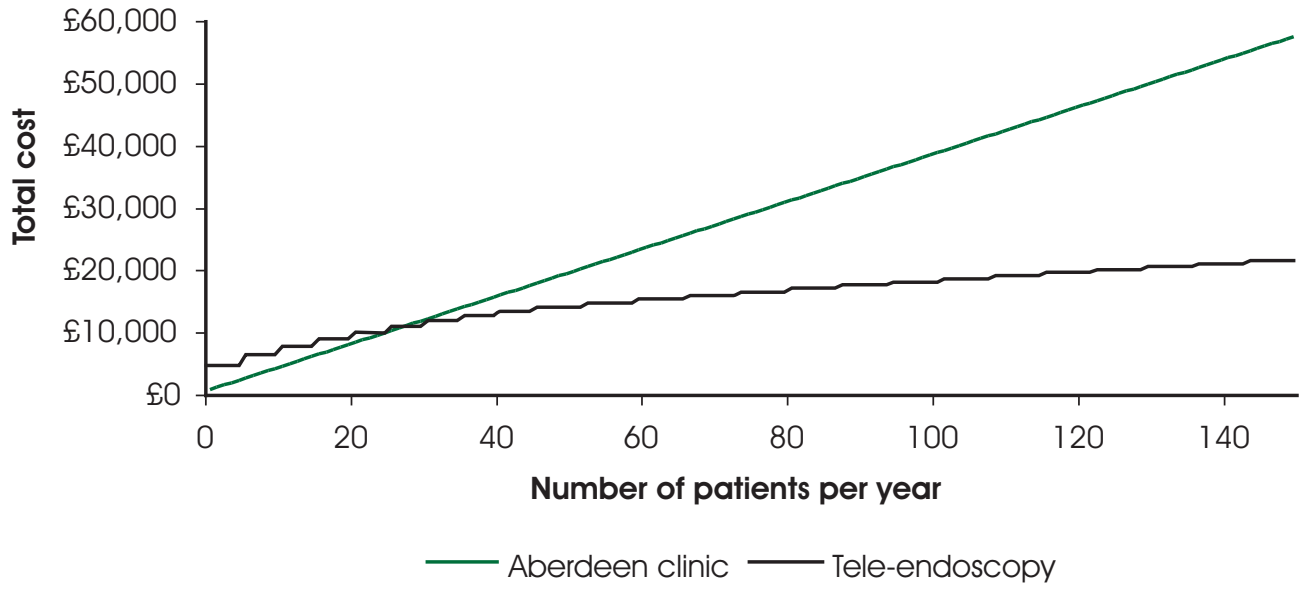
Net benefits

The cost-effectiveness of the tele-endoscopy clinics is assessed by estimating the net benefits (willingness to pay values minus the costs). A larger net benefit indicates a more cost-effective service. The table below indicates that the net benefits are larger for the tele-endoscopy clinic. Tele-endoscopy clinics are provided less frequently than the Aberdeen clinic and the waiting time may therefore vary across the two clinics. The results show that the net benefits for tele-endoscopy clinics are larger as long as the additional waiting time is not longer than 3.8 weeks.

Sensitivity analysis

The average cost per patient for the tele-endoscopy patients were estimated for different patient numbers to explore how sensitive the results are. Figure 1 shows the total cost for the tele-endoscopy clinic and the Aberdeen clinic by number of patients per year. Tele-endoscopy clinics have a lower total cost than the Aberdeen clinic as long as more than 27 patients per year are seen in the tele-endoscopy clinics. If there are fewer than 27 patients the Aberdeen clinic is less costly.

Total cost by number of patients per year



Conclusion

Treating patients in tele-endoscopy clinics in Shetland is less costly and produces higher benefits than treating patients from Shetland in an Aberdeen clinic. Whilst the equipment and staff cost are much higher in tele-endoscopy clinics, these costs are offset by savings in travel. Assuming equal waiting times, a random sample of members of the general public prefer tele-endoscopy clinics to the Aberdeen clinic.

The results are sensitive to both economies of scale and economies of scope. Telehealth often requires the purchase of relatively expensive telecommunication technology. The higher the patient numbers (economies of scale) and the more services use the equipment (economies of scope), the lower the average cost per patient.

The model could readily be applied to mainland communities outwith the main population centres. In the case of Scottish mainland communities outside the Highlands and Islands the patients bear the travel cost and so if the same perspective is adopted (NHS in Scotland) tele-endoscopy clinics are unlikely to be cost-effective. If the perspective of the NHS and the patients is taken (or if patients were to have their travelling expenses reimbursed) tele-endoscopy clinics will become cost-effective as long as a certain minimum number of patients are being seen.

For further details about HERU:

This briefing paper describes work conducted by HERU. Further information about this topic can be obtained by contacting Dr Marjon van der Pol, HERU, University of Aberdeen, Foresterhill, AB25 2ZD (tel: 01224 553269; email: m.vanderpol@abdn.ac.uk).

Please visit our website at
http://www.abdn.ac.uk/heru

References

1. Curtis L and Netten A. Unit Costs of Health and Social Care 2007. Personal Social Services Research Unit, University of Kent, 2007.

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