NHS Direct versus general practice based triage for same day appointments in primary care: cluster randomised controlled trial

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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
The study compared triage service methods in primary care practices. In particular, off-site triage services provided by an external agency (i.e. NHS Direct) versus on-site nurse telephone triage services.

Type of intervention
Other: Triage services in primary care practices.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised all patients requesting same day appointments at the primary care sites involved in the study during the study period. No further inclusion or exclusion criteria pertaining to the study population were applied.

Setting
The setting was primary care. The economic study was carried out in York, UK.

Dates to which data relate
The dates to which the effectiveness and resource use data referred were not reported. The price year was not reported.

Source of effectiveness data
The effectiveness evidence was derived from a single study.

Link between effectiveness and cost data
The costing seems to have been carried out prospectively on the same sample as that used in the effectiveness study.

Study sample
The size of the sample was not determined in the planning phase of the study. In addition, power calculations were not performed retrospectively. The study sample comprised unselected consecutive patients requesting same day appointments at the primary care practice during the study period. The initial sample comprised 4,788 patients who were randomised to either the NHS Direct triage group (n=2,328) or to the usual practice triage group (n=2,460). Seventy (1.46%) patients refused to participate, 68 in the NHS Direct triage group and 2 in the usual practice triage group. Fifteen patients, 9 in the NHS Direct triage group and 6 in the usual practice group, were excluded from the study as it was impossible to contact them after their initial request for an appointment. Overall, 4,703 patients were included in the study, 2,251 in the NHS Direct group and 2,452 in the usual practice triage group. The actual number of
doctors and nurses included in the study was not reported.

**Study design**
The analysis was based on a multi-centre (three primary care sites of one general practice), cluster randomised controlled trial. The patients were randomised to the two groups using an independently determined 2-week block randomisation procedure over 26 weeks. The patients were randomised at the cluster level of the week, and not individually, so that both groups included 13 weeks for each clinical condition. The patients were followed up for 1 month after the index consultation. It was not possible to blind the patients or professionals to the group allocation, as different nurses provided triage in each condition.

**Analysis of effectiveness**
The analysis was conducted on an intention to treat basis. It included all patients except those who could not be contacted by nurses and who were excluded from the study. The primary outcome was the type of consultation (telephone, appointment or visit) after a patient's request for a same day appointment. This was estimated by calculating the percentage of patients at each final point of contact using repeated measures of variance analysis. In the analysis, week was used as a covariate to capture trend change over time. Further outcomes were nursing time, GPs' time and total time per patient taken for consultation, and the numbers of practice-based, emergency department and out-of-hours consultations during the month after same day contact. The patient groups were comparable in terms of their demographic and baseline characteristics. The only difference was that the usual practice group contained a higher number of patients with genitourinary complaints.

**Effectiveness results**
In the "NHS Direct weeks", the mean number of patients was 173.8 (standard deviation, SD=26.3; minimum 119, maximum 220), while in the usual practice group it was 189.0 (SD=32.1; minimum 140, maximum 250). The repeated measures variance analysis gave a Greenhouse-Geisser corrected F of 7.1 (d.f.=2.7, 62.3; p=0.001) for the interaction effect of group and final point of contact.

In the NHS Direct group, patients were less likely to have their call resolved by telephone contact with a nurse (percentage difference -3.55, 95% confidence interval, CI: -6.83 - -0.31; p=0.033) or an appointment with a nurse (-3.16, 95% CI: -5.11 - -1.18; p=0.003), and more likely to have an appointment with a GP (5.89, 95% CI: 2.28 - 9.46; p=0.003).

The average nursing time taken to manage same day requests was 6.9 minutes longer (95% CI: 6.07 - 7.72; p<0.001) in the NHS Direct group. The difference remained significant at 7.5 minutes (95% CI: 6.42 - 8.57; p<0.001) when controlling for final destination. The average GP's time per patient was also longer in the NHS Direct group (0.7 minutes, 95% CI: 0.27 - 1.17; p=0.003), but the difference was not statistically significant when controlling for final point contact (0.19 minutes, 95% CI: -0.25 - 0.62; p=0.377).

The analysis demonstrated that there was no difference in the number of patients who got further practice-based care, out-of-hours care, or emergency services within 1 month of the index consultation.

**Clinical conclusions**
The authors concluded that triage conducted by NHS Direct is feasible but does not achieve equivalent outcomes to practice-based triage.

**Measure of benefits used in the economic analysis**
The authors did not derive a summary measure of benefit in the economic analysis. In effect, the study was a cost-consequences analysis.
Direct costs
The health service costs included in the analysis were for consultation time of health care professionals (nurses and general practitioners) for same day and follow-up consultations, drugs, tests, radiography, and out-of-hours and emergency department contacts. The unit costs and the quantities were not reported separately, and particular drugs or tests used were not reported explicitly. The quantities of resources used were based on actual data from the effectiveness study, while the costs were derived from official published sources. Discounting was not relevant as the costs were incurred during a time (less than 2 years). The price year was unclear, although the authors reported that nurse costs were based on mid-range salary scales operating at 1 April 2001.

Statistical analysis of costs
The cost data per patient were estimated by summating all health care costs on the day of index consultation and for the following month. The costs were aggregated using the mean at the week level. The authors used sample means and SDs to compare the mean difference in each cost category between the two groups, controlling for week number and, in a separate analysis, controlling for the percentage of patients at each final point of contact during that week.

Indirect Costs
The indirect costs were not included in the analysis.

Currency
UK pounds sterling (£).

Sensitivity analysis
A one-way sensitivity analysis was performed on the NHS Direct nurse time using estimates of the SDs. A one-way sensitivity analysis was also conducted on the unit cost of GPs and nurses' salaries by including training costs in addition to salary costs.

Estimated benefits used in the economic analysis
See the 'Effectiveness Results' section.

Cost results
The total costs were reported per patient. The total cost per patient was 23.61 in the NHS Direct triage group and 20.73 in the usual practice triage group.

The difference (NHS Direct - usual practice) in total cost when not controlling for final point of contact was 2.88 (95% CI: 0.88 - 4.87; p=0.007). After controlling for final point of contact the difference became statistically insignificant (i.e. 1.50, 95% CI: -1.58 - 4.58; p=0.320).

Synthesis of costs and benefits
The costs and benefits were not combined.

The sensitivity analysis demonstrated that when NHS Direct nurse time was reduced by half of an SD, the total cost-difference was reduced to just under the 0.05 significance level (1.86, 95% CI: -0.86 - 3.87; p=0.07). After controlling for final point of contact, there was no difference in total costs between the two groups, (p=0.77). The total costs remained different (4.15, 95% CI: 2.00 - 6.36; p=0.001) when training costs were included, although this was not the case after controlling for final point of contact, (p=0.108).

Authors' conclusions
Compared with practice-based nurse-delivered triage in primary care, the NHS Direct triage method was more costly and less effective in managing patients' requests for same day appointments.

CRD COMMENTARY - Selection of comparators
The choice of the comparator was explicitly justified. On-site nurse telephone triage would seem to represent common practice in the authors’ setting. You should decide if this represents a widely used technology in your own setting.

Validity of estimate of measure of effectiveness
The analysis was based on a cluster randomised controlled trial, which was appropriate given the study question. The study sample was representative of the study population and the patient groups were comparable at analysis. The methods of randomisation and losses to follow-up were reported, suggesting that the internal validity of the study is likely to be good. The analysis of effectiveness was handled credibly as it was conducted on an intention to treat basis and an appropriate statistical analysis was conducted. Although no power calculations were performed, it seems that the sample size used was appropriate.

Validity of estimate of measure of benefit
The authors did not derive a summary measure of benefit. In effect, a cost-consequences analysis was performed.

Validity of estimate of costs
The perspective adopted in the economic analysis was not reported, but it could not have been societal since the indirect costs were not included. The costs and the quantities were not reported separately, which hinders the reproducibility of the results. Discounting was not necessary, as the costs were incurred during less than 2 years, and was appropriately not performed. The price year was not stated, which will not aid any future inflation exercises. Certain resources used were not described in detail, for example the particular drugs or tests used. In addition, the use of summary costs makes it impossible to know if certain aspects of costs (e.g. overheads) were included. Although a sensitivity analysis was performed to assess the robustness of the results, the above mentioned factors will not enable the analysis to be easily reworked for other settings.

Other issues
The authors did not compare their results with those from other studies. However, this might have been due to a lack of published studies in this area. The authors reported that the generalisability of the study is limited since it was restricted to a single multi-site practice with adequate experience on the triage method. The authors do not appear to have presented their results selectively. The study enrolled patients making a request for a same day appointment and this was reflected in the authors’ conclusions. The authors reported a number of limitations to their study. For example, the estimates of time in the usual care group were not as robust as those derived from the electronic system used in the NHS Direct group, and this might have influenced the results.

Implications of the study
The authors did not make any explicit recommendations for changes in policy or practice. Although they did not recommend any further research, their discussion highlighted areas where more information is needed.

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Bibliographic details