

Telephone triage in Western Australia

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We describe the development and operations of the first large-scale Australian medical telephone triage centre. Studies have commenced to evaluate efficacy and safety of the service, as well as gauge the impact on demand for healthcare services. (MJA 2002; 176: 100-103)

INTERNATIONALLY, there has been mounting interest in call centres and their use of modern telecommunications and information technology for the purpose of medical triage.¹ These initiatives originated mostly in the United States in response to the need to reduce escalating healthcare costs.² However, they became widespread in the early 1990s as part of a broader strategy by many US healthcare organisations to implement demand-management strategies focused on improving consumer health knowledge and preventing unnecessary use of expensive health resources such as emergency departments.³

These services, staffed largely by registered nurses, often acted as a gatekeeper for access to emergency healthcare services and provided telephone triage, recommending appropriate levels of care supplemented by advice on self-care and information about provider availability. In countries with largely public healthcare systems, such as the United Kingdom and Canada, gatekeeper functions are performed mostly within existing primary care services. Thus, potential indirect benefits such as improvement in service access and availability (especially after-hours) have made telephone triage a rational and popular policy initiative. The largest whole-of-population approach to date has been *NHS Direct* in the United Kingdom. This service began in 1997 and currently 65% of the population of England has 24-hour access.^{1,4} In the United States 100 million people are estimated to have access to telephone triage, while in Ontario, Canada, the Ministry of Health and Long-Term Care has instituted a similar approach for a population of more than 10 million people. In 1996, the Department of Health in Western Australia (DoHWA) began negotiations with relevant stakeholders which

1: Triage standard performance criteria

- Operational 24 hours, seven days a week
- Access for people with hearing impairment and from non-English-speaking backgrounds
- Call interaction documentation
- Advice supported by a clinical decision support system
- Patient confidentiality maintained
- Activity and performance reporting
- Ability to link with other services and transfer calls
- 80% of calls answered within the first 20 seconds
- Abandonment rate of 5% or less of calls
- Call time (talk time and after-call work time) 550 seconds
- 1% of calls monitored for quality assurance

culminated in the official launch of *HealthDirect* at the end of May 1999. This triage and health information service is provided by McKesson, a specialist in the delivery of health call centre services on behalf of the DoHWA. It operates from a dedicated call centre with 33 full-time-equivalent (FTE) operational staff (48 nurses) and is available to the whole of the State, 24 hours a day, seven days a week. Here, we document the activity of this centre over the first two years.

The service

Telephone triage is performed by nurses registered to practise in Western Australia. Recruitment is followed by several weeks of intensive training. Once nurses are taking calls it takes a further three to six months to build skills to a level commensurate with the expected triage standard performance criteria (Box 1) and key performance indicators (Box 2). During training and throughout the probationary period, nurses are provided with information about their individual performance related to these performance indicators. Monitoring and feedback continue throughout employment, focusing on the positives while identifying areas for improvement.

Access to the triage service is by an extensively advertised, freecall 1800 number. The nurse asks for the caller's name and contact number, although the service accommodates the 6.4% of callers who wish to remain anonymous. After registering the caller, the nurse obtains sufficient history to assign a "primary symptom" from which the most appropriate clinical guideline is selected from the call centre Centramax decision-support software

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2: Summary of key performance indicators

- Opening, closing, transfer, holding
- Establishing caller needs
- Rapport, conversation control
- Attentive listening
- Capturing relevant data
- Data entry accuracy
- Use of approved resources and information
- Primary assessment
- Interpretation of presenting problem
- Choice of guideline
- Determining first pertinent positive and disposition (see Box 3)
- Need to override disposition
- Provision of understandable solution
- Lack of bias
- Management of difficult calls

(proprietary software written in the US, but modified by a DoHWA-appointed group of Western Australian general practitioners to reflect Australian terminology and medical practice). After a series of responses to guideline-prompted questions, a disposition (one of 26 codified management recommendations; see Box 3) is reached and the caller advised to seek the recommended level of care. At their discretion nurses may override to a higher level, but there is no provision to downgrade dispositions.

Training, continuing education and continuous quality management

Training, quality assurance (QA) and quality improvement (QI) are overseen by three part-time medical directors (a general practitioner, consultant psychiatrist and emergency physician) and an emergency clinical nurse specialist employed by DoHWA. There is also a nurse responsible for training and continuing professional education (0.5 FTE), as well as two nurses (1.5 FTE) who undertake quality control and improvement.

One per cent of call volume, about 25–30 randomly selected calls per week, are monitored for this purpose. This involves real-time monitoring as well as examining the

case record. In some cases the nurse may also listen to a tape recording of the call, although taping is not routine and the tape is erased after review. These data are appraised against a set of guidelines developed by *HealthDirect* and enable the objective measurement of individual nurse performance as well as formalising feedback to DoHWA. QA is also complemented by fortnightly, formal coaching of all nurses by their team leader.

Performance data

During the 24 months there were 315 784 inbound calls, of which 217 891 (69%) originated from the metropolitan 1800 number, 78 946 (25%) were transferred from metropolitan hospital switchboards and 18 947 (6%) originated in rural Western Australia (where the service was only available for the last 12 months). The abandonment rate was 6.8%, but 30% of such calls disconnected were connected for less than 20 seconds. Based on data for 2001, 75% of calls were answered within 20 seconds, with an overall average speed to answer of 53 seconds. The average call duration was nine minutes 47 seconds (range, 1 to > 60 minutes), including one minute 46 seconds of after-call documentation. These results accord with *HealthDirect's* telephone service standards.

There were an average 13 158 inbound calls per month (range, 10 099–16 430; see Box 4a).

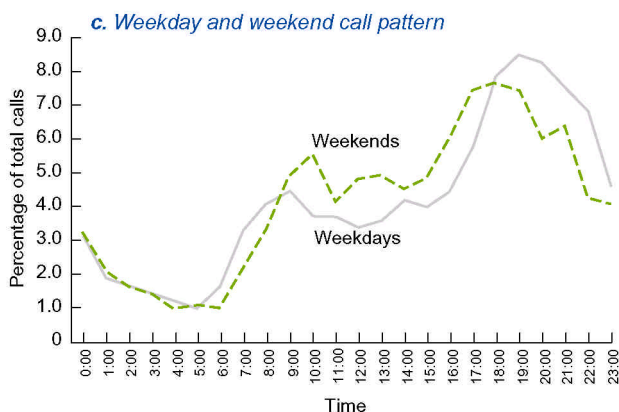
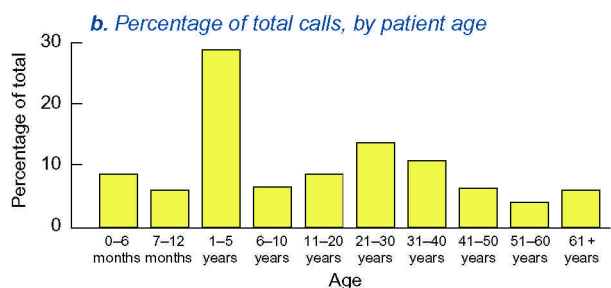
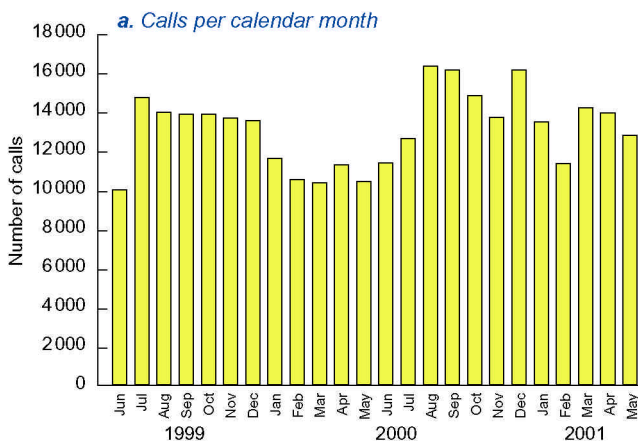
Consistent with international data,⁵ there is a preponderance of calls relating to childhood illness and adults aged 21–30 years (Box 4b). Of interest is the absence of a significant demand peak from persons older than 60 years. This may reflect a greater level of comfort among younger adults using the telephone as a means of obtaining services and information.

The number of calls increases after 6 AM and reaches a peak at 8 AM, which is sustained until mid-afternoon. This is followed by a second peak in the early evening (Box 4c). A reduction in call volume ensues at about 10 PM, but 30–40 calls are answered between midnight and 6 AM. Predictably, concern over public health issues increases call numbers and at times may prove overwhelming. For example, this occurred in late June 1999 immediately

3: The six principal dispositions (of a total 26), and the percentages of adults and children assigned these dispositions in the 24 months

Disposition	Description	Adult	Paediatric
RING 000	The caller needs to be transported to hospital immediately and may require medical attention in transit or before being transported to hospital	9.1%	2.7%
EDIMMED	The caller needs to attend an emergency department immediately	14.7%	11.8%
URGCARE	The caller needs to attend a doctor immediately. The provider (general practitioner, clinic or locum service, or emergency department) is determined by availability at the time of call	12.6%	4.9%
SEEIN4	The caller needs to see a doctor soon and within four hours	16.6%	17.5%
SEEGP1	The caller needs to make an appointment to see a GP either the same day, or the next day if they are calling in the evening. Callers are informed that they should see their GP earlier if their symptoms worsen	18.4%	17.5%
SEEGP2	The caller should make an appointment to be seen by a GP when convenient within the same week. Callers are informed that they should see their GP earlier if their symptoms worsen	19.0%	42.6%

4: Call patterns over the 24 months



5: The 10 most frequently used adult and paediatric guidelines

Adult	Paediatric
Abdominal pain	Fever
Headache	Vomiting
Chest pain	Diarrhoea
Vomiting	Rashes, widespread
Neurological deficits	Cough
Backpain	Head trauma
Rash	Abdominal pain
Dizziness	Colds
Abrasions/ lacerations/bites/stings	Rashes, localised
Diarrhoea	Headache

“activated” (appraised and modified for local use). Of these, the 10 most frequently used adult and paediatric guidelines (Box 5) cover 51% of calls, while an additional 25 guidelines encompass 95% of all calls. In the absence of an appropriate guideline, the nurse follows an established procedure for assessing the urgency of symptoms and level of care needed. This type of assessment usually applied to low-acuity symptoms, for example chronic fatigue, and was used in 5.4% of calls.

The frequency of the principal dispositions for both adults and children is shown in Box 3. These frequencies are similar to those reported by similar nurse triage services in the US and the UK that use non-algorithmic decision support software⁵ (Ian Lazarus, McKesson Call Center, Phoenix, 1998, personal communication).

Since December 1999, 1479 1–2-hour QA assessments have been completed, a rate of 2–3 per month for each nurse. This included a monthly report card based on individual nurse performance on key indicators. Overall, 96% of appraisals scored a satisfactory or higher grade.

Discussion

HealthDirect was instigated by DoHWA to provide symptomatic callers with advice on when and where they should seek medical attention. The numbers of calls (an average of 95 per 1000 for the 1.67 million WA population) is similar to that documented in other countries.^{7,8} The annual call centre budget of \$4.5 million (including all programs) is less than \$2.51 per capita and represents about 0.2% of the State health budget. This translates to about \$20 per triage call. It must be stressed that *HealthDirect* advises most symptomatic callers to attend a healthcare provider, albeit in differing time frames. A homecare disposition was deliberately omitted initially in the interests of introducing a new service with maximum possible safety, but has now been included in some guidelines on the advice of the local medical review panel. In any case, there is evidence from a recent 72-hour call-back study conducted by Curtin University of Technology in WA (yet to be released) that a substantial

following a well-publicised enterovirus outbreak, when an additional 700 calls were received during a 24-hour period. That day there were 1149 calls, with rates exceeding 100 calls per hour during several periods.

The top six dispositions are listed in Box 3. *HealthDirect* advised 54% of adults and 78% of children to attend a general practitioner within four hours to one week. The remainder were given an immediate disposition to either a general practitioner or emergency department, or advised to call an ambulance. Six per cent of calls were referred to the Poisons Information Centre (PIC) and 0.24% to the Psychiatric Emergency Team. Transfers to Poisons Information involved a wide range of issues, including insect bites, accidental and deliberate ingestions and medication enquiries.

The Centramax software⁶ used at the *HealthDirect* database consists of 550 guidelines, of which 149 are

number of callers given lower dispositions are satisfied with the telephone advice provided and do not attend a medical service. Therefore, the greater use of a homecare disposition could potentially reduce general practitioner consultations for minor complaints without compromising patient wellbeing. Although we have records of several patients, including seven with documented meningococcal infections who were offered and took advice to attend hospital immediately, there are insufficient data to rigorously address the issue of efficacy, or to benchmark performance against other forms of medical assessment.

At present, there are only two specific outcomes supported by data. Firstly, the service appears to be popular. This accords with the experience of others,^{5,9,10} including in Australia, where research has “demonstrated enormous community support [for] emergency department telephone advice”¹¹ which is “rated highly by the community and the compliance is strong”.¹² Secondly, telephone advice calls directed to the Perth metropolitan hospital emergency departments are now, to all intents and purposes, non-existent. Given that 50 000 emergency department attendances equate to 24 hours of non-stop telephone advice,^{11,12} *HealthDirect* has relieved emergency departments of a considerable burden.

Currently, a 12-month independent evaluation of *HealthDirect* is being undertaken by Curtin University of Technology WA on behalf of DoHWA and the Commonwealth Department of Health and Aged Care. The results will also form part of a national after-hours primary medical care “trial”, with similar studies being conducted in four other States. The main focus will be to determine the effectiveness of telephone triage as a demand-management and referral tool for the more efficient use of health services, particularly after-hour services. The approved study plan is comprehensive and employs several methods to gauge consumer compliance and satisfaction with advice given, health-provider acceptability with referrals, quality of clinical advice, impact on services, as well as financial aspects. The study will also measure the impact of *HealthDirect* on emergency department workload and ascertain the appropriateness of referrals.

Although overseas data document that call centre nurses with GP backup do not increase mortality, morbidity, admission to hospital or emergency department attendance,⁷ as well as significantly reduce after-hours telephone calls to GPs,⁸ there is justified uncertainty about the role of telephone triage centres. Opinions include those which regard the service as no more than a “*de facto* general practice”¹³ or express the opinion that “a multinational or offshore managed care organisation” would be “in a very good position to slowly set up a monopoly by opening their own health centres and directing after hours, and in-hours patients . . . to their own facilities”.¹⁴ Others argue that the impact of telephone triage on health services is unknown and assert that the high cost of such ventures would be better directed elsewhere. It bears repeating that only further research will provide sufficient data to decide these issues. Regardless, it is not the aim of telephone triage to diminish the role of general practitioners. Experience has

shown that almost three-quarters of calls occur after normal practice hours, and indeed *HealthDirect* consistently receives calls every few days from one or more of the six Perth GP after-hours cooperative clinics advising they are unable to accept further referrals.

The future

Over the next 12 months, given the policy direction articulated by both State and Federal governments, it is likely that an increasing proportion of the Australian population will have access to telephone-based triage and health information services. Further, the use of call centre infrastructure to provide services focused on improving access and outcomes for the mentally ill and those with chronic medical conditions is also likely to be trialled. Information documenting demand will be complemented by data measuring the ability of this type of service to favourably influence human behaviour and medical outcomes. It remains to be seen whether the inclusion of interactive options such as cardiac telemetry and spirometry is likely to prove beneficial and cost effective. Attractive as they may seem, novel inventions must transcend novelty.

Competing interests

We declare there is no conflict of interest between any author and either *HealthDirect*, McKesson and the Western Australian Department of Health. No funding source is applicable to this article.

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References

1. Nurse telephone-triage. *Lancet* 2001; 357: 323.
2. Fries JF, Koop CE, Beadle CE, et al. Reducing health care costs by reducing the need and demand for medical services. The Health Project Consortium. *New Engl J Med* 1993; 329: 321-325.
3. Vickery DM, Lynch WD. Demand management: enabling patients to use medical care appropriately. *J Occup Environ Med* 1995; 37: 551-557.
4. Department of Health. The New NHS: Modern, dependable. Cmd 3807. London: The Stationery Office. 8th December 1997.
5. Munro J, Nicholl J, O’Cathain A, Knowles E. Evaluation of NHS Direct first wave users: first interim report to the Department of Health. Sheffield: Medical Care Research Unit, University of Sheffield, 1999.
6. Centramax. MR System [computer program]. Version 3.04.6 04. Broomfield, CO: HBO & Company, 1993.
7. Lattimer V, George S, Thompson F, et al. Safety and effectiveness of nurse telephone consultation in out of hours primary care: randomised controlled trial. The South Wiltshire Out of Hours Project (SWOOP) Group. *BMJ* 1998; 317: 1054-1059.
8. Munro J, Nicholl J, O’Cathain A, Knowles E. Impact of NHS direct on demand for immediate care: observational study. *BMJ* 2000; 321: 150-153.
9. Florin D, Rosen R. Evaluating NHS direct. Early findings raise questions about expanding the service. *BMJ* 1999; 319: 5-6.
10. Oberklaid F. Twenty-four hour access to health information and advice: an essential component of the healthcare system. *Med J Aust* 1998; 169: 125-126.
11. Fatovich DM, Jacobs IG. Emergency department telephone advice: a survey of Australian emergency departments. *Emerg Med [Australia]* 1998; 10: 117-121.
12. Fatovich DM, Jacobs IG, McCance JP, et al. Emergency department telephone advice. *Med J Aust* 1998; 169: 143-146.
13. McNamara M. GP slams tele-triage as a “*de facto*” general practice. *Medical Observer* 2000; 17 March: 16.
14. Hall S. Division in bid to run call centre. *Aust Doc* 2000; 28 January: 19.

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