HealthConnect: a trial of an after-hours telephone triage service

PATRICK BOLTON, SHARRYN GANNON, AND DAVID ARO

Patrick Bolton is Director of Acute Primary Care, Central Sydney Area Health Service,
CEO of Canterbury Division of General Practice, and Lecturer in the School of Community Medicine,
University of New South Wales. Sharryn Gannon is Nursing Unit Manager, HealthConnect.
David Aro is Principal, Communio Consultancy.

Abstract

This paper describes HealthConnect, an after-hours telephone triage and advice service which operated for 15 months in 2000 and 2001. We describe the service, discuss utilisation and implementation issues, and conclude with a description of the key lessons learned from the trial.

The service received over of 12000 calls, of which over half were for information rather than immediately seeking care. Continuing marketing appears to be required in order to ensure ongoing demand for services of this kind. Quality assurance is essential to ensure that an optimal service is provided, and staff recruitment and training are critical to this. A national standardised approach to services of this kind is desirable to provide a consistent service to consumers and realise economies of scale.

Service description

HealthConnect was an after-hours telephone advice and triage service established as part of the Central Sydney / Broken Hill After Hours Primary Medical Care Trial (AHPMCT). It operated between 1 April 2000 and 30 June 2001, in which period it handled in excess of 12,000 calls. The trial was funded by the Commonwealth Department of Health & Aged Care. It also received support in kind, and was run by, Central Sydney Area Health Service (CSAHS). Other stakeholders in the trial included local divisions of general practice and Area Health Services, NSW Ambulance, and the Children's Hospital at Westmead.

HealthConnect was available on a 1800 number to all callers in Central Sydney and Broken Hill. It was accessible from 6.00pm to 8.00am Sydney time on weekdays, from 1.00pm on Saturdays until 9.00am on Monday mornings, and all day on public holidays.

The call process is outlined in Figure 1. Patients were informed about the service through publicity about the service, because the service had been made available through their usual GP, through the switchboards of hospitals in CSAHS, and from KidsNet. KidsNet is the telephone triage and advice service offered by the Children's Hospital at Westmead.

A nurse experienced in triage in a casualty setting obtained patient identification details whenever possible, and then triaged the patient using DHSI computerised clinical triage protocols. These protocols are evidence based and cover in excess of 20 million lives in North America.

On the basis of this process, patients were offered one of seven care pathways as follows.

1. Self care. Following the provision of advice, the patient's problem can be managed without further care from a health professional.
2. Deferred care with the patient's usual GP in the next in-hours period.

3.   Referral to the Balmain Hospital General Practice Casualty or Canterbury GP After Hours Service at the times at which a GP was there. Cab vouchers were available to facilitate access for selected patients in this category.

4.   Referral to an emergency department.

5.   Urgent or emergent care by ambulance.

6.   Referral to another service.

7.   Treatment required unclear.

Conference call facilities were used with the referral service in categories 5 and 6, and a GP was available to provide advice for any patient about whom uncertainties arose. In all circumstances the patient could gain access to face-to-face care, and in all cases the patient's usual GP was notified about the care provided, subject to patient consent. The telephone interpreter service was conferenced into the conversations for patients of Non-English Speaking Background (NESB).

Figure 1: Care pathways resulting from calls to HealthConnect.
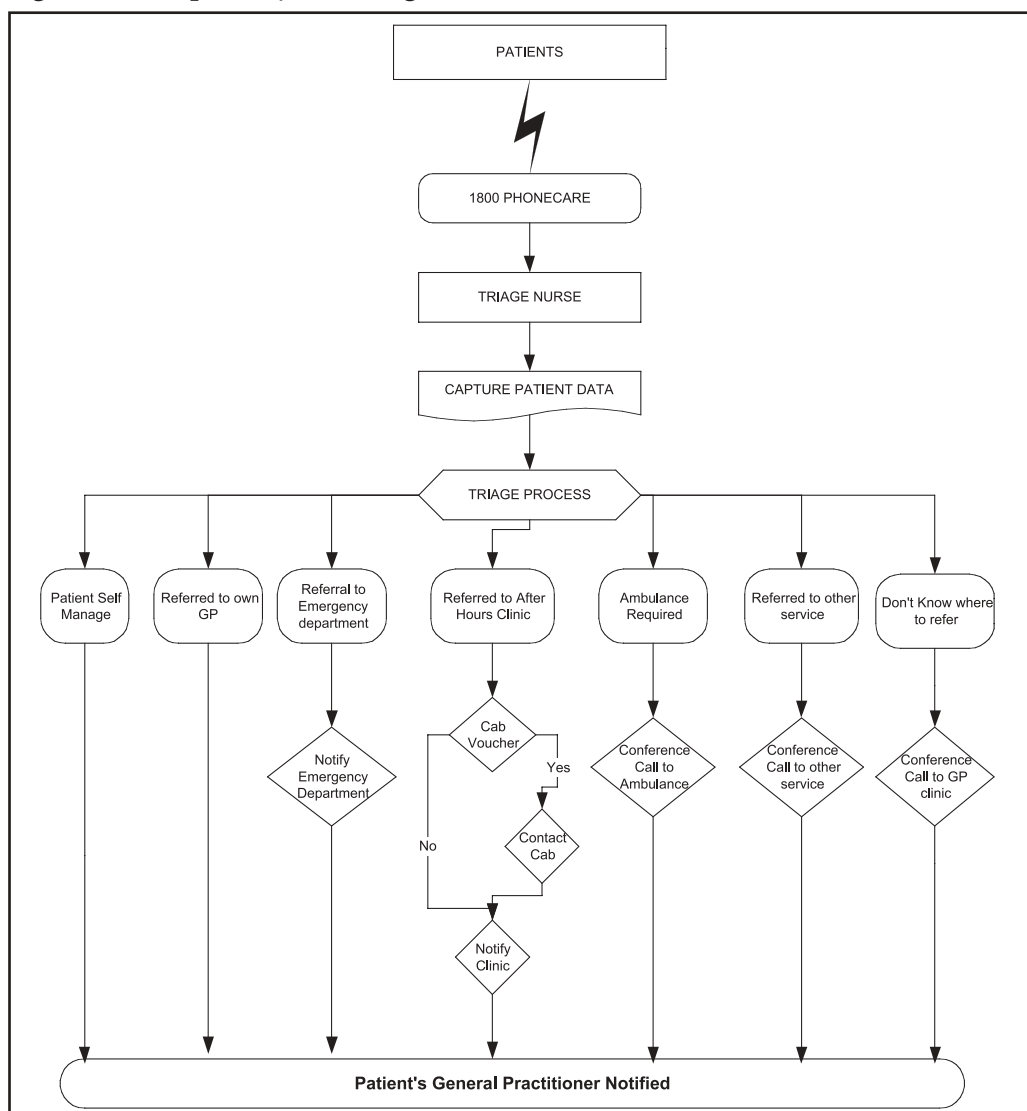
Service utilisation

Data about service utilisation were available from Telstra for the 1800 *HealthConnect* number, and about the kinds of services provided from the DSHI system.

Call volumes

Data are available from Telstra about calls made to *HealthConnect's* 1800 number for the period 30 August 2000 to 30 April 2001. Data for 12 to 17 October 2000, 8 to 12 March 2001 and 29 March to 3 April 2001 are missing due to Telstra error.

Calls to *HealthConnect* were answered by the HealthConnect PABX immediately and placed in a queue. All callers received a recorded message informing them that calls were taped for medical records purposes. If kept waiting, they were repeatedly advised that they were on hold with *HealthConnect* and that they should call 000 if theirs was an emergency call. If a caller in the queue hung up after they reached the HealthConnect PABX, but before a nurse answered the call, Telstra recorded this as a successful call of a given duration. More complete data about the length of waiting times and actual conversations is available through the PABX, but the technical capacity to operationalise this was not implemented during the trial for cost reasons. This section presents data based on that provided by Telstra.

HealthConnect was accessible to approximately 500,000 people, of whom 22,000 live in Broken Hill. In the period 30 August 2000 to 30 April 2001 for which data are available from Telstra, HealthConnect received 10,949 calls, of which 228 (2.1%) were received from Broken Hill. This equates to an average of 50 calls per day or 353 calls per week, of which seven per week came from Broken Hill.

In the first three months of the trial, between May and July 2000, *HealthConnect* records show that a total of 54 calls were received. Call volumes climbed steadily throughout August in response to the marketing of HealthConnect, in particular the provision of fridge magnets to all households in the target areas, in that month.

Figure 2 provides a scatter plot of the number of calls received each day by *HealthConnect* after 11 August 2000. Two trend lines have been fitted. The first, a line of best fit, is dotted. This shows that there was a steady downward trend in the average daily number of calls from early August. This downward trend is significant ($p=0.0012$) and presumably reflects attrition of the effect of the primary advertising campaign, suggesting a need for long term on-going publicity, in order to maximise the efficiency of these services.

The second trend line, which is solid, is a weekly shifting average. This better reflects the week to week call load on the service. Again, a decline in call volumes can be seen after an initial surge associated with the publicity campaign. There is a spike in call numbers across the Christmas – New Year period. This is traditionally a busy period for acute primary care services because many GPs shut over the holiday period. There is no obvious explanation for the two other spikes seen early in 2001.

Figure 2: Daily call volumes
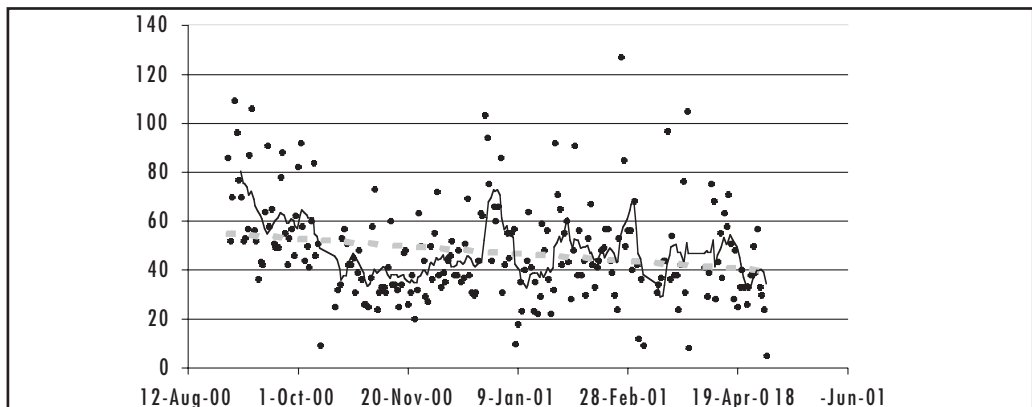
The median duration of these calls was 5 minutes 12 seconds, with a range of 0 to 51 minutes and an interquartile range of 36 seconds to 9 minutes 47 seconds.

Figure 3 shows the proportion of calls received in each hour of the day. Figure 4 shows the proportion of calls received on each day of the week.

Figure 3: Total number of calls received in each hour of the day.
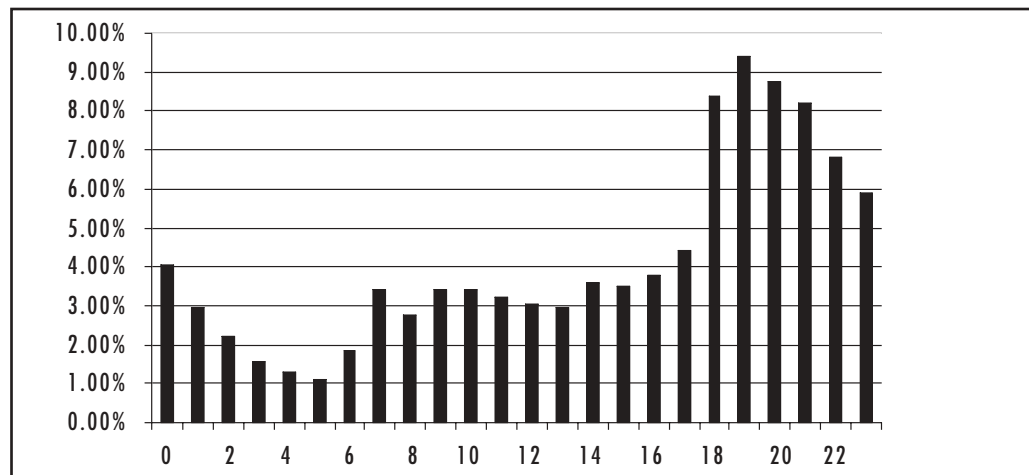
Figure 4 The proportion of calls received on each day of the week.
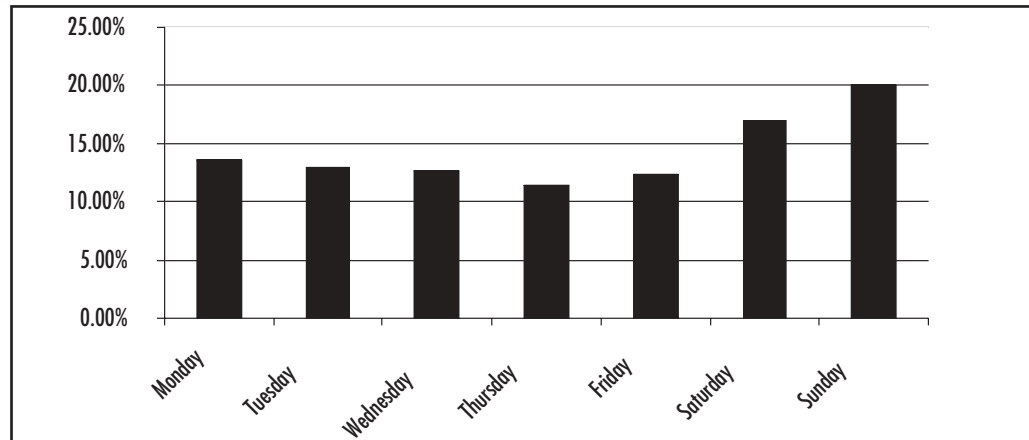
Data are available from Telstra about the exchange from which the call was made to *HealthConnect*. These data show that five calls were received from the ACT and three calls from other interstate locations, and 285 from mobile telephones. Of the 10,949 calls received by *HealthConnect* in the period for which data are available, 9,360 (85.5%) came from within the Trial area. The balance of calls occurred before geographic limitations to accessing the service were put in place on 29 September 2000. Unsolicited calls were referred from emergency departments outside the trial area in this initial period.

Operationally, installation or removal of these limitations is a minor technicality. Their installation was deferred to maximise call volumes in the interests of staff training and morale. The level of interest indicates the generalisability of the service and spillage that occurred around the publicity campaign. It should be noted that application of the geographic limitations was implemented on the basis of telephone exchanges, and that these match imperfectly to the Trial boundaries, which were based on Health Service boundaries.

Call abandonment rate

Data from Telstra can be compared with data from the DSHI system to give an approximation of the call abandonment rate for *HealthConnect*. Data to undertake this exercise are available between 1 October 2000 and 30 April 2001. These data suggest that, within the constraints of the data discussed previously, 6,167 calls (38.4%) were abandoned out of 16,049 made to *HealthConnect*. This reflects both an opportunity for *HealthConnect* to improve its throughput of telephone calls, and a level of unmet need in the target community.

Nature of calls taken

Data are available from DSHI about the content of calls. Table 1 shows the most commonly used protocols for all ages. A Pareto effect exists since these 19 protocols cover 4,160 (38.0%) of calls.

Table 1: The most commonly used protocols for all ages.

Child vomiting	566	Infant diarrhoea	177
Child fever	547	Insect bites and stings	157
Infant fever	493	Rashes and spots	148
Infant Cough and congestion	403	Nausea and vomiting	146
Infant vomiting	360	Child diarrheal	132
Child Cough and congestion	331	Ear pain	131
Abdominal pain	300	Headache	123
Head injury	192	Child Abdominal pain	122
Multiple chief complaints	179	Fever	117
Child rashes and spots	178		

It is clear from both the evaluation and the experience of call takers that as many as half of callers to *HealthConnect* are making general health enquiries and/or seeking support with respect to minor health care decisions. Indeed, it appears that a continuum exists between callers seeking health information and those requiring triage, and that in the absence of telephone advice many people seek face to face advice in the after-hours period.

Implementation issues

Protocols

The protocols used by the trial were purchased from DHSI for USD40,000 in April 2000. This fee covered a call centre with four seats. Annual renewal for 2001/02 was USD12,000.

Protocols for identified critical conditions, such as chest pain and meningitis, were reviewed by a panel of GPs at the start of the trial and found to be suitable. Protocols were reviewed in order of frequency of use. The impression formed by clinicians exposed to the protocols is that they are reliable and evidence based.

On three occasions, issues were identified with the protocols. These were as follows.

- Fever is sought in all callers presenting with headache. In the absence of a fever, it was possible that, if a rash were identified with a headache, meningitis was not adequately excluded.

- Home administration of ipecac was recommended for selected cases of paediatric ingestion. While there is evidence to support this, few Australian homes have ipecac and its use is increasingly discouraged in general.

- Discrepancies were identified in the management of children with facial swelling.

In all these cases, early modifications were made to the protocols by DSHI to address the concerns raised.

It is clear that, irrespective of the brand of protocols used, considerable operator training and experience are required to ensure safe and efficient outcomes. An example of this is that one of the DHSI protocols asks whether a child has been "projectile vomiting". This term has a particular technical meaning, which is sought by the protocol. Many parents when asked whether their infant has been projectile vomiting will reply in the affirmative, even though true projectile vomiting is not present. In a similar way, it might be possible for operators to drive protocols to different ends depending on the operators' wishes about patient access to, or use of, face to face services.

Staff recruitment

Recruitment of nursing staff was an on-going problem for *HealthConnect*. In part this relates to the Australia-wide shortage of nursing staff, and this may have been exacerbated by the hours of service operation. *HealthConnect* employed only relatively senior nurses with experience in face to face triage. Many nurses prefer in-hours to after-hours work, and this may be particularly the case as they become older, and correspondingly more senior.

In addition to these general difficulties, a number of other factors were observed with implications for the recruitment and retention of nursing staff. These are:

- Lack of a precedent for this model of service delivery, so that nursing staff lacked a clear idea of what was involved in working for *HealthConnect* until they had actually worked there. This hampered prior assessment by potential employees of whether they were suitable for the job. Some increase in staff turnover was observed when individuals recognised that there was a poor match between their expectations and what was offered by the position.

- Attraction to the service of some unsuitable employees who may have been attracted by aspects of the work of *HealthConnect*, such as the lack of face-to-face patient contact and the possibility of reduced supervision in the after-hours period.

- Anxiety towards the end of the trial about the future of the service and the possibility of continuing their preferred employment.

Call centre training

Excellence in call centre performance was identified as central to the long-term competitiveness of *HealthConnect*. Training in call centre techniques is the key to this. In addition, as noted, computerised protocols were viewed as an adjunct to telephone triage, and nurse training is the key to using protocols to obtain safe and efficient health outcomes. Training was therefore an ongoing process that was responsive to performance issues.

All team members received extensive initial training and supervision, and continuous monitoring and quality assurance were established as part of the service culture. Process indicators of call quality were call length, system usage skills, telephone manner, patient complaint and disposition.

The relationship grew favourably between *HealthConnect* nurses and the "Points of Service" such as Balmain General Practice Casualty and the Emergency Departments within CSAHS and at Broken Hill Hospital. *HealthConnect* also developed relationships with other telephone information providers to develop more comprehensive patient care. These services include Tresillian Family Care Centre and the United Dental Hospital. As a result, callers to each of these centres were referred appropriately from one to the other as necessary. *HealthConnect* nurses also developed a database of out-of-hours services such as pharmacies and physiotherapists.

A number of initiatives were undertaken to improve service quality. An ongoing audit of 2.5% of calls was conducted to assure both the quality of the call management and the quality of the clinical care provided. A protocol was implemented for nurses who could not find the appropriate disease-specific protocol. This was done to assist nurse training and assess the completeness of protocols. Clinical review of the most commonly used protocols was undertaken. A message was added to the HealthConnect algorithm so that all callers were informed that calls were recorded for medical records purposes.

Problem callers

HealthConnect received a small number of dysfunctional calls. These included the sexually abusive, threatening, threatened suicide – including while on the line - bizarre and distressing. These callers were managed by referral to the appropriate agency, but it was also necessary to provide support and counselling, both specifically to the staff receiving these calls, and to staff in general in anticipation of this kind of call.

High volume users were drawn to the attention of management by *HealthConnect* staff, who then checked on the caller's volume and pattern of use. It was *HealthConnect*'s view that frequent users of the service had legitimate needs, and their use of the service was likely to have been appropriate. *HealthConnect* was however concerned that the needs of such callers might have been better met by the addition of face to face services. To explore this, *HealthConnect* approached frequent users of the service to ensure that they had adequate access to face to face care. This was done in liaison with the CSAHS Ethics Committee.

Marketing

On-going marketing appears important in order to keep health call centres of this sort in the public eye. The Trial was hampered in this respect because there were no electronic media limited to the service area. This restricted the service to using paper-based promotional methods.

The impact of marketing is clearly seen in the response to the letter box drop to residents of the Trial area in late August 2000. This involved providing a leaflet explaining the service and a fridge magnet with contact details for the service to all households in the Trial area.

Subsequent marketing targeted the local print media and community contact points. The strategy involved:
- Mailing leaflets to callers to pass on to friends and neighbours
- Articles in local media
- A trial of distribution of leaflets through pharmacies in suburbs with a low response rate
- Distribution of leaflets to patients in triage categories 4 and 5 in emergency departments in the Trial area
- Distribution of leaflets and information about HealthConnect through schools
- Display stands at local shopping centres and markets
- Enlisting the assistance of community health workers to distribute leaflets to relevant clients.

In addition to marketing directed at the public, *HealthConnect* was promoted to GPs in participating divisions with the view of encouraging them to recommend the service to their patients. In Broken Hill this took the form of both printed material and a personal visit by the Trial Director. In Central Sydney printed material about the service was made available through the division newsletters.

Provider outcomes

HealthConnect was approached by a number of GPs in the Central Sydney Area who wanted to include the service as one option for after-hours care for their patients. In addition, the combination of *HealthConnect* and the Commonwealth government's Practice Incentives Program provided some GPs in Broken Hill with an incentive and a mechanism to resume the provision of some after-hours care, which had previously been minimal. *HealthConnect* acted as a filter for these GPs to ensure that the calls that they received were appropriate. This prevented them from being overwhelmed by a large number of callers who could safely wait for the next in-hours period to receive care.

HealthConnect took over the management of general health inquiry calls to emergency departments in the Trial area. Informal responses to this initiative suggested that this was well received because it permited staff in these departments to focus on face to face emergency care. Use of *HealthConnect* as a referral point by emergency departments from outside the Trial area in the early part of the Trial provides further evidence of the perceived advantage that services of this kind might provide to emergency departments.

The potential exists for services like *HealthConnect* to provide a "back end" for calls to the Ambulance Service which do not require ambulance transport.

Cost-competitiveness of the service

In the UK, a randomised control trial has found telephone triage to be associated with reduced demand for general practice services while providing the same outcomes as usual after-hours care (Lattimer et al. 1998), and an overview of services of this kind has suggested that they can reduce growing demand for face-to-face GP services in the after-hours period (Munro et al. 2000). Neither study found an impact on the demand for services from emergency departments. Data from HealthConnect are provided here which add to this picture.

Telephone follow-up interviews were conducted with a random sample of 314 *HealthConnect* users, two to four days after they called the service. Of these, 233 said that they had sought or intended to seek medical care for their problem (the balance were calls for advice), 28 (8.9%) from a specialist. Of the 205 who had sought, or intended to seek non-specialist care, 147 were able to indicate from a pick list the type of service that they would have attended had *HealthConnect* not been available. The alternative and actual care of these patients is shown in Table 2.

Table 2: Initial and alternate choice of service by a sample HealthConnect users.

		Total number who said they would initially have gone to	Number who subsequently sought actual care at:		
			Emergency Dept	After-hours GP	In-hours GP
Alternative choice of	Emergency Dept	96	21	3	72
care if *HealthConnect*	After-hours GP	26	1	0	25
not available	In hours GP	25	2	0	23
	Total	147	24	3	120

The Wilcoxon sign-rank test for paired data was used to compare the number of patients who said that they attended or would attend each of the three service categories. These were significant for the Emergency Department ($z=-8.82$, $p<0.00005$), after-hours GP ($z=-5.74$, $p<0.00005$), and in-hours GP ($z=10.00$, $p<0.00005$).

These results suggest that *HealthConnect* was successful in shifting care away from after-hours services towards in-hours general practice. If these figures were able to be generalised across New South Wales, then services of this kind would result in a reduction of in excess of 20,000 emergency department occasions of service annually in the after-hours period alone. These results should be interpreted cautiously because there may be a difference between what people report they would have done in the absence of *HealthConnect*, and what they actually would have done had the service not been available.

Key lessons

The trial has provided five key lessons which should be considered in future implementations of this kind of service. First, services like *HealthConnect* are a safe and acceptable mechanism to ensure more appropriate use of face-to-face services. Second, the nature of calls received spans both triage and information calls. The two are inseparable and future services should plan to include resources for both. Third, the skills, training and

management of staff are critical to the appropriate use and interpretation of care protocols. While important, the choice of provider of computerised care protocols is of secondary importance to staff issues. Fourth, ongoing publicity is required to ensure sustained call volumes. Provision of fridge magnets is an effective mechanism to do this. Fifth, central regulation of call centre standards and protocols is desirable to ensure high quality and consistent health service delivery. This will provide an infrastructure on which one or more call centre operators can be based, permitting the operation of market models if required.

Acknowledgements

References

Lattimer V, George S, Thompson F, Thomas E, Mullee M, Turnbull J, Smith H, Moore M, Bond H & Glasper A 1998, Safety and effectiveness of nurse telephone consultation in out of hours primary care: randomised controlled trial. *British Medical Journal* vol 317, pp 1054-1059.

Munro J, Nicholl J, O'Cathain A, Knowles E & Dagnall A 2000, *Evaluation of NHS Direct first wave sites: Second interim report to the Department of Health,* Sheffield: Medical Care Research Unit, University of Sheffield.