Article

Links between systems in Accident & Emergency and primary care

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ABSTRACT

The hospital emergency department and other elements of rapid access primary care constitute an emergency care network. Integration aims to maximise the network’s strengths and overcome its weaknesses. Taking the patient as a starting point, it is possible to envisage an objective data model that can operate at multiple levels within the network to describe its process efficiency and clinical effectiveness. Other means of integration are also identified. These contain significant subjective elements. In particular, the decision support system of NHS Direct has operated successfully to legitimise national and local intervention based on skill-mix, whereas its technical operation has been susceptible to human deviation from prescribed routine. As we scrutinise a system, we discover that it contains people who are doing things. Logical elements in the system turn out to be givers or recipients of deliberate and thoughtful care. Information systems in Accident & Emergency (A&E) and primary care can help accountable planners to measure and control aspects of the network’s operation. Clinicians also need their systems to enable, rather than constrain, effective interactions.

Keywords: emergency care networks, information model, information systems, primary care

Introduction

Although the hospital specialties continue to maintain their discrete identities, the past 12 months have seen a closer convergence between accident and emergency (A&E) medicine, acute internal medicine and critical care. At the same time, NHS Direct, walk-in centres and minor injuries units have been complemented by the continued development of general practice (GP) out-of-hours services and the announcement that ambulance services will, in future, undertake an expanded role in the delivery of care at home. The boundaries of emergency hospital reception thus extend beyond the A&E department, and rapid access primary care clearly extends beyond the confines of the GP surgery.

The World Health Organization recognises a worldwide need to achieve co-ordination between the out-of-hospital emergency medical services and hospital emergency departments, which form the ‘two pillars’ of emergency medical services.¹ There is worldwide concern to find the best organisational structure that can deliver prompt access and relevant care effectively, efficiently and at low cost.

Recent achievements in the UK

In the UK, the first fruits of the National Programme for Information Technology, manifest as technologies for remote booking, e-prescribing and first steps towards an electronic patient record, could assist these goals and should not be regarded as individual tasks to be implemented in isolation from a broader purpose.² Emergency care has been reformed, improved and transformed, achieving dramatic reductions in transit through the A&E department.³–⁵ Within A&E and the wider hospital, this has been achieved by slashing
waiting times for initial assessment, test results, specialist opinion and location of an empty bed. Diversification of demand away from A&E to alternative rapid access providers has entailed the continued development of new roles for non-medically-qualified personnel. The proliferation of rapid access providers has expanded demand for information exchange across organisational boundaries.

The emergency care network

At present, healthcare systems throughout the world are converging on 'network' in preference to 'hierarchy' or 'market' as the preferred organisational form within which to integrate emergency services inside and outside hospitals. The strength of the network approach lies in the expansion of access, and the diversity of models of provision from which to choose a portal of rapid entry to health care that is relevant and sensitive to individual need.

On the other hand, a network can suffer from discontinuity of care, dispersal of its resources, and allocative and technical inefficiency. Priorities may be distorted, and inefficient 'shopping around' is difficult to control. When care is shared by a number of providers, the most vulnerable people may be at risk.

Integrating the emergency care network

Efforts to integrate the network’s components can take a variety of forms.

Linked information systems

Linked information systems could help at a strategic level to shape the operation of the network in search of a variety of organisational goals.

Figure 1 places the patient at the origin of two diverging axes. The left-hand axis connects the patient with the clinician, institution or network responsible for his care, and represents the patient's institutional journey through the process of care. In contrast, the right-hand axis connects the patient with his clinical condition. At the top of the figure, the third side of the triangle represents the monitoring and audit of process performance and clinical outcomes.

Figure 1 Axes, dimensions and measurables in healthcare

These three axes respectively identify the quality dimensions of technical process efficiency, clinical effectiveness and public confidence. Their points of intersection represent the patient’s need for individual personal health, the achievement of aggregate public health, and the linkage of activity and resource consumption with billing and remuneration.

Single point of telephone access

Policy documents place NHS Direct at the heart of the network. It was envisaged that demand would be marshalled around a single point of telephone access. It would seem natural to integrate call taking for GP-based rapid access and the 999 ambulance alongside NHS Direct within the single point of telephone access. However, this model has not become widespread.

Protocols and decision support

Protocols and decision support aim to assist integration by assuring consistency of response throughout the network. Public confidence in NHS Direct has been assisted by the reassurance that the use of structured algorithms can ensure accurate and appropriate advice. Nevertheless, the Commission for Health Improvement found '... evidence of staff choosing not to use algorithms ...' and advised consideration of the potential risks.

Collocation

Collocation of the network's individual components can assist redistribution of demand and workload, but proximity alone need not guarantee optimum collaboration. In one reported project, the adoption of NHS Direct protocols provided the persuasive rationale necessary to facilitate the staged absorption of the
The ambulance service

The primary and most visible role of the ambulance service is to transfer the ill or injured person to hospital. A less widely appreciated expertise within the ambulance service is the transmission of signals. The Lancashire Ambulance Service has been an early adopter of a range of technologies, from global positioning and vehicle location to experimental ambulance-based telemedicine.10

The existence of this technology provides a framework within which to discuss the relationship of the person with the technical system. At the crudest level of logical analysis, the request for an ambulance results in the transmission of a signal from ambulance control to the vehicle, which responds by proceeding to the required destination. In that sense, the ambulance personnel are indistinguishable from the vehicle. Their function is incidental to that of the vehicle. The driver and crew are simply incorporated within the machinery of transport. At that level of analysis, the person and the signal are transmitted as inert objects, without modification.

In the control room, the first role of the call taker is to find out exactly where the incident is, and to report this to the dispatcher. The dispatcher’s role is then to provide pre-arrival advice to the caller, using decision support software. This role would not exist without the technical artefact. At the crude, logical level, the role is to encode information provided by the caller into the decision support software, and to articulate, to the caller, the instructions embedded in the software. In that sense the person is, once more, absorbed within the machine. However, the call takers themselves perform their role with human skill, tact and empathy; this distinguishes them from simple component objects. They are empowered rather than coerced by their technology.11 Both their role and the message from the caller are interpreted; meaning is attached by virtue of human intervention and subsequent action is modified as a result.

The emergence of the person from the machinery of service delivery is completed in the practitioner role recently announced for ambulance staff. Transfer of the patient to hospital is no longer obligatory. For certain patients, ambulance staff will be encouraged to provide treatment at home and, subsequently, to enlist intervention by other services with a greater or lesser degree of urgency, appropriate to the patient’s need. In this task, they will be assisted by handheld computers which presently interface with the information system in the A&E department through the medium of a transferable smart card. The paramedic practitioner will use the handheld computer to record the timing of key process events, and observations or changes in the patient’s condition during transport. The machine will contain information to support decision making and will facilitate audit across the boundary between the ambulance and the hospital emergency service.

Discussion

Links between systems in A&E and rapid access primary care have important objective features, related to broad strategic goals of efficiency and effectiveness. However, important subjective components can also be identified in the relationship between people and systems.

Unification of the single point of telephone access is impeded by inter-organisational rather than technical problems, yet the protocols of NHS Direct have been instrumental in promoting acceptance and public confidence in that organisation. Those same protocols have helped to overcome inter-organisational objections in at least one instance of collocation and the amalgamation of the out-of-hours GP service with the A&E department.

Professionals have preferred to interpret rather than rigidly follow the algorithmic process rules which tend to characterise computer-based transactions. They have resisted absorption of the person within the machine and have, instead, used the technology to promote their own professional aspirations and ambitions.

In other settings, computers have been successful in the automation of office procedures and business transactions. We are only just learning the use of information technology to transform people, roles and organisations. Electronic data transfer can faithfully transmit symbolic tokens. It is the injection of human interpretation and intervention that attaches meaning to these symbols, determines an appropriate response in relation to context, transforms data into information, and converts passengers into patients of the ambulance service.12

Conclusion

In structural terms, systems imply mechanical linkages and rules which constrain action. In functional terms, they imply the purposeful maintenance of the
system’s integrity. In contrast, the ‘systems’, construed at
the interface between hospital emergency services and
primary care, integrate the activities of people rather
than the mechanistic interaction of component ob-
jects. The purpose fulfilled is not to maintain systemic
integrity, but to enable care-givers to provide health
care to patients.

These human actions entail knowledgeable and
conscious interaction, within a context which not
only constrains but can also enable action.13 Delivering
21st Century IT Support for the NHS strongly em-
phasised the reinforcement of constraint in the form
of institutional performance management and the
delivery of National Service Frameworks.14 As clin-
icians, we need to intensify efforts to ensure that our
new information systems can facilitate and empower
clinically effective interaction initiated by collabor-
ating care-givers.

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CONFLICTS OF INTEREST
None.

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