Communication in the emergency department: separating the signal from the noise

Communication overload may well lead to errors, but this is yet to be firmly established

ALTHOUGH STORIES OF MISUNDERSTANDINGS, ambiguity, amnesia and lack of cooperation abound, there have been few studies of communication between healthcare professionals. Recently, the topic has been given new impetus as communication problems have been identified as a major contributory factor to the occurrence of errors and adverse events.[1]

In this issue of the Journal, Coiera and colleagues (*page 415*) report a study of communication in two Australian emergency departments,[2] extending earlier work carried out in the United Kingdom.[3] The "communication load" was high, occupying about 80% of clinicians' time. As in other studies,[4] almost a third of communications were interruptions, and about 10% of the time two or more conversations were occurring simultaneously (multitasking). Synchronous communication (face-to-face or telephone conversations) accounted for almost 90% of communications traffic. The authors argue that the combination of interruptions, multitasking, and sheer volume of information (much of it unwanted or irrelevant) may produce clinical errors by disrupting memory processes.

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Communication problems may take a number of different forms and it is important to distinguish between them, as both the contribution to error or adverse outcome and the appropriate remedy vary considerably. Communications may simply be omitted, as when a surgeon fails to inform the anaesthetist of a drug being administered, thus not preparing him or her for a fall in blood pressure. A common cause of omitted communication is an excessively deferential and hierarchical workplace social structure. The classic examples derive from copilots being reluctant to inform senior pilots of potentially dangerous situations.[5,6] There is evidence that medical hierarchies and attitudes are even more entrenched than those in aviation.[7]

Communications may be ambiguous in a variety of ways. Semantic ambiguity occurs when the same phrase is correctly sent and received, but assigned different meanings by the parties. For example, in a child with a right forearm fracture of both the ulna and radius and a dislocation of the right elbow, a plan to reduce "both injuries" might refer to the two fractures, or to the forearm injury (taken as a whole) and the dislocation. Phonetic or lexical ambiguity (eg, aortic stenosis confused with atherosclerosis[8]) underlies the problem of sound-alike or look-alike drugs. And finally, message ambiguity can occur because the channel is noisy and the message received does not match the one transmitted. Emergency departments, in particular, are literally noisy channels, with high levels of ambient noise from patients, staff, telephones, alarms, pagers and equipment. Ironically, the natural response to noise interfering with communication is to speak more loudly, creating a positive-feedback loop and an ever-increasing din.

Communication may also become problematic because the sheer volume of information overwhelms short-term memory, causing some of the information to be lost before processing is completed.[9] In addition, the incoming information may be distracting, interrupting and disrupting complex procedures and decision-making. When levels of interruption are high, clinicians may react by ignoring pagers and messages, or waiting until they are paged twice before responding, to separate the trivial from the truly urgent, which, paradoxically, increases the volume of communications still further. A particularly interesting insight arising from previous studies by Coiera and colleagues is that, despite their own disinclination to be interrupted, clinicians often initiate communication or request information without any thought of the impact of their request on the other person.[3,10] This is a form of suboptimisation, in which trying to increase one's own performance results in a net decrement in performance over the entire organisation.

Solutions to communication difficulties are often couched in terms of training — "we must learn to communicate better". In a sense this will always be true, in that, ultimately, most improvements in communication will require a change in human behaviour. However, depending on the nature of the problem, the key intervention may be individual training, or involve technical aids, or be team oriented.

- *Training of individuals* might focus on giving precise information according to a standard format and considering the impact of the information on the other person. More thought might also be given to how clinicians could be trained to maintain focus and concentration in the face of multiple demands and a constantly changing environment;
- *Technical aids* might be simply the introduction of a white board in the emergency department, cutting down the need for multiple face-to-face interactions; and
- *Team-based interventions* might include restrictions on interruptions and face-to-face interactions (when information might be easily available in written form), or restrictions on communication and interruption at certain critical phases of procedures, analogous to the "sterile cockpit" rules prohibiting extraneous conversation during takeoff and landing.

Human beings are immersed in a sea of communications for much of their waking life, and are well equipped for interpreting ambiguous messages when using information-rich channels such as face-to-face conversation. While communication overload may well lead to errors, this is yet to be firmly established and further studies of the nature of communication between clinicians may be needed first. It is important to realise that safety in high-risk environments relies heavily on continuous communication and rapid updating of information. The task for researchers is to begin to separate out the irrelevant and ambiguous communication from the necessary, if sometimes burdensome, flow of important information.[11] Until this issue is clearer, any interventions to reduce communication overload should be implemented with caution. There is a risk that attempts to reduce the communication burden in healthcare by shifting it to progressively terser, more impoverished channels might inadvertently increase miscommunication, or result in even greater demand for synchronous communication. Coiera rightly points out in another article that the benefits of technical solutions may be limited unless they are well understood and carefully targeted.[12]

Observational studies of the many factors which affect human performance in complex environments have a long history, going back at least to World War II.[7] However, in medicine, with a few notable exceptions,[13] such studies have been infrequent. The approach taken by Coiera and colleagues[2] to the understanding of error and adverse events is important in that it involves direct observation and study of work and workers "in the wild".[14] While many valuable studies of error and adverse events have been conducted from records or other documents, it is clear that the full range of factors involved in the genesis of adverse events[15] can never be captured completely by such methods. The fluidity and complexity of the clinical environment[16] and the need to appreciate clinicians' decision making and cognitive load require studies in which interviews and verbal protocols are combined with observation or video recordings. These methods are not familiar to medicine, and will require collaboration with psychology and engineering.[17] Future studies will also have to tackle the difficult topic of linking the details of communication to the occurrence of error or some more general aspect of clinical performance or outcome.

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Surgery for epilepsy

Neurosurgery is now an effective treatment option for some patients with epilepsy

When a seizure disorder persists despite optimum drug therapy and significantly affects quality of life, surgical treatment should be considered. Many patients with severe refractory epilepsy can benefit from appropriate surgery and should be given this option by timely referral and investigation. Extrapolating US studies,[1] there are probably several thousand eligible people in Australia. In the past, operations were confined to removal of obvious structural causes of seizure, such as tumours or post-traumatic scars. Over the past 50 years, it has become increasingly apparent that there are many patients with persisting epilepsy who could benefit from surgical resection of foci previously difficult to define. The development of increasingly precise methods of anatomical and functional seizure localisation has expanded this group.

The evidence for effectiveness of surgery for epilepsy can be seen by outcome studies comparing patients who have had surgery with patients who have had long-term medical therapy. An important recent Canadian study[2] of 80 patients refractory to at least two anticonvulsants who were randomly assigned to either undergo temporal lobe surgery or receive further drug treatment showed clear statistical evidence of the success of surgery. At one year, 58% of patients in the surgical group and 8% in the medical group were free of seizures. It should be noted that four patients had adverse effects of surgery, including one small thalamic infarct, one wound infection, and reduced verbal memory in two cases. One patient in the medical group died.

Not all patients with refractory epilepsy can be treated surgically. A prerequisite for successful surgery for epilepsy is the precise definition of a discrete seizure focus involving an area of cortex amenable to safe excision. Psychiatric and social factors must also be taken into account. The sequence of events leading to surgery will usually include a period of