Human factors in suicide prevention

This article uses a case study to discuss the importance of human factors in maintaining patient safety in the community. Although the case relates to a patient suffering from mental illness, the principles discussed here are transferrable to physical illnesses. This article aims to describe some of these human factors and how they relate to the healthcare setting.

The GP curriculum and suicide

Professional module 2.02: Patient safety and quality of care states that:

- The RCGP aims to improve the quality of healthcare by defining and upholding high standards for general practice education and training, aiming to improve health outcomes for all by promoting high-quality general practice at the heart of the health service
- As a GP you are in a strong position to influence the care of your own patients, that of your practice population and that of the wider healthcare community
- Understanding how and when to apply tools and metrics to improve the quality of care is a key skill that can and should be learnt during your training, as well as enhanced in lifelong learning
- Working in partnership with your patients and understanding their needs is vital to improving clinical care and reducing health inequalities
- Patients, their families and carers have an important role in the assessment of health care; their views are therefore essential for the development of high-quality health care. Patients should be encouraged to be actively involved in planning their care and in the development of services at practice level and beyond
- How we learn from and share lessons regarding clinical care is an important marker of our personal and collective professional development

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Patient safety

There are a number of definitions of what 'patient safety' and 'safety culture' encompasses. Although there is no single definition, there are a number of accepted characteristics which include:

- **Safety:** Is 'a dynamic non-event' (Maurino, Reason, Johnston, & Lee, 1998; Vanderhaegen, 2015).
- **Safety culture:** Is 'the attitude, beliefs, perceptions and values that employees share in relation to safety in the workplace' (Cox & Cox, 1991)

Introduction to human factors

To err is human.

The NHS is recognised as a high-risk organisation, comparable to aviation, maritime and nuclear industries, military operations, oil and gas production units, and policing in its ability to cause catastrophic damage to humans. Many structural, procedural and organisational differences exist between healthcare and these other high-risk industries. Despite these differences, many argue that healthcare lags behind many of these 'highly reliable' industries. It is estimated that between 44 000 and 98 000 people die from medical errors each year in the US, which is equivalent to two plane crashes per day (Richardson et al., 2000). The number of patients damaged by medical errors is even higher. Most of these mishaps are not due to lack of knowledge, but rather to the poor application of knowledge within complex clinical systems. In fact, 70–80% of all medical errors are estimated to be attributable to human factors (Dunn et al., 2007; Schaefer, Helmreich, & Scheidegger, 1994).

Human error cannot be eliminated, but training doctors to develop their non-technical skills can minimise errors and mitigate disaster by early recognition and rectification of errors. Non-technical skills are defined as 'cognitive, social and personal resource skills that complement technical skills and contribute to safe and efficient task performance' (Flin, O'Connor, & Crichton, 2008).

Although human factors training is an integral part of patient safety in acute settings, such as anaesthesia and intensive care, it is now coming to the fore in community-based medicine (Brennan, Rahman, & Reynolds, 2014). Human factors are at play not only in immediate reactions and interactions with people and environment, but also on a 'slow burn' as is the nature of primary care (Ahmed et al., 2014).

Does awareness of human factors need to be addressed differently in primary care? All clinicians have a vital role in promoting patient safety that goes beyond technical competence. Highly publicised cases, such as that of Mid-Staffordshire NHS Trust, focus sharply on hospital care (Francis, 2013). However, in the UK over 300 000 000 consultations take place in primary care per year. Evidence from the Health Foundation suggests that between 1 and 2% of such consultations may result in an adverse outcome, often due to inadequate communication and information-sharing, especially in patients with multiple complex conditions (The Health Foundation, 2011; Tsang, Majeed, Banarsee, Gnani, & Aylin, 2010).

The list of non-technical skills is a long one: situation awareness, decision-making, communication, teamwork, leadership, managing stress, coping with fatigue, organisational skills, being confident, being responsive, applying crisis management, seeking advice, humility, honesty and vigilance. At this point it is important to note, that the use of all available resources is vital. This may include involving family members, carers and friends who know the patient.

The objective of this paper is to illustrate the importance of three of these human factors in healthcare in the community, with reference to suicide prevention and a case study. The human factors of particular importance here are:
- Situation awareness
- Decision-making
- Communication

Each is considered in some detail to illustrate the scope and potential for specific non-technical training, which is quite distinct from specific professional, technical training.

Suicide prevention

When it comes to suicide, we can only offer prevention. There is no cure. Three times more people die of suicide than in road traffic accidents. Whereas fatalities in road accidents have dropped by nearly 50% over the past decade, those by suicide have stayed nearly the same (Department of Transport, 2016). In the UK 6122 suicides were registered in 2014. This corresponds to a suicide rate of 10.8 per 100 000 people (16.8 per 100 000 for men and 5.2 per 100 000 for women. In 2006, the incidence was 17.2 and 5.3, respectively) (Office for National Statistics, 2014; Samaritans, 2016).

Suicide is the biggest killer under the age of 35 years: over four deaths per day. Every year many thousands more attempt (Hines, Cole-King, & Blaustein, 2013) or contemplate suicide, harm themselves and suffer alone. Although 25% of those who die by suicide are known to specialist mental health services, the majority of the remaining 75% will be in contact with front line services, including primary care. A large percentage of individuals who end their life by suicide have had contact with primary care around the time of their death (Luoma, Martin, & Pearson, 2002). Contrary to popular belief, most people who take their lives have communicated intent beforehand, either blatantly or subtly. Almost everyone who is suicidal is ambivalent about dying. In fact, all they want is for their pain to end (BBC News, 2014). They lean towards death at one instant and towards life the next. Thus, anticipating suicide, picking up early signs and making timely interventions can be effective in preventing tragedy.

Situation awareness

Situational awareness (SA) can be defined as:

> Developing and maintaining a dynamic awareness of the situation in theatre based on assembling data from the environment (patient, team, time, displays, equipment); understanding what they mean, and thinking ahead about what may happen next (Intercollegiate Surgical Curriculum Programme, 2012).

Endsley reviewed major air crashes between 1989 and 1992 and found that lack of SA was the main cause in 88% of accidents associated with human error. A surgical team that operates on the wrong site is a classic example of this within a hospital setting (Endsley, 1999). Three levels of SA have been described (Box 1).

Case study.

SN is a 20-year-old bright young man of South Asian origin. He is a gifted musician and linguist. He also plays the drums in a band and is a fast bowler in his college cricket team. He is reading modern languages at university. He has just completed his second year at university with good grades. He is home for the summer holidays when he is taken to A&E following

an episode of erratic behaviour. He is diagnosed with 'hypomania' and handed over to the Home Treatment Team. He is started on Olanzapine 5 mg and begins to show improvement. A diagnosis of 'bipolar disorder' is made by an Honorary Consultant Psychiatrist and he is then discharged to the GP to facilitate his study of French abroad. Within days he starts to get depressed, but he still goes back with the intention of starting his third year at university. He is unable to cope and has to be brought home within 48 hours of his departure. His parents take him back to the GP on the day of his return. He reassures the parents and advises them to take a week off work and take care of him at home. Two weeks later his Patient Health Questionnaire (PHQ)-9 score is 19/27 and a fortnight thereafter it is 27/27. He is started on Citalopram 10 mg once a day. Two weeks later, SN reports a minor setback. His PHQ-9 scores are not repeated, his parents reassured and Citalopram increased to 20 mg/day. Two days later SN ends his life.

Box 1. The three levels of SA.

- Level 1: Gathering facts, e.g. assessing road conditions and traffic while driving. In a study on aviation accidents performed by Jones and Endsley (1996), 78% of those due to lack of SA were due to Level 1 failures.
- Level 2: Interpretation of the gathered data to make sense of it, thus creating a 'mental model' which is an efficient way of using the information. However if the wrong mental model is activated, it can lead to incorrect decision-making.
- Level 3: Projecting forward, anticipating future states and thinking about how the situation might develop. Jet pilots are taught that 'If you know where you are now it's too late because you were there 5 miles ago'.

Retrospective accounts by those involved when failures in SA occur sound like this:
I didn't know...
I didn't realise...
I didn't notice...
I was convinced that...
I was so busy attending to...

In SN's case, the GP claimed that he was not aware of the diagnosis of bipolar disorder (inadequate information - Level 1). Although the handover letter from the A&E clearly mentioned a diagnosis of 'hypomania', the four-page long discharge letter from the Home Treatment Team did not mention a working diagnosis. Hence, SN was treated for unipolar depression and prescribed Citalopram, which was probably inappropriate for his age group, as it often worsens suicidal ideation in the young (wrong mental model leading on to an incorrect decision – Level 2) (BNF, 2017). This is a case of

Over the last two weeks, how often have you been bothered by any of the following problems? (Use "x" to indicate your answer)	Not at all	Several days	More than ⅓ the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down depressed or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself – or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead, or of hurting yourself in some way	0	1	2	3
Total for Each Column:				
Total of all Three:				

10. If you have checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?	
	Not difficult at all
	Somewhat difficult
	Very difficult
	Extremely difficult

Figure 1. Patient health questionnaire (PHQ-9). *Developed by Drs. Robert L. Spitzer, Janet B.W. Williams, Kurt Kroenke and colleagues, with an educational grant from Pfizer Inc. Copyright ©1999 Pfizer, Inc*

worsening PHQ-9 scores in a highly achieving young man unable to rejoin third year of university (future state, suicide, not anticipated as a real possibility – Level 3, Fig. 1).

Decision-making

The first step to decision-making is accurate assessment of the current situation.

There are four main methods of decision-making:
- Recognition primed: Based on past experience
- Rule based: Following protocols and guidelines
- Choice: Analysing available choices and selecting one
- Creative: An unusual or inventive solution

Recognition-primed decision-making
Statements made by the GP on requests for a referral:
- 'This is not the first time I am treating someone like this'
- 'They (specialist services) are going to do the same thing that I am doing'

Although these kinds of decisions are fast and useful in routine situations, they may be difficult to justify. They also encourage looking for evidence to support one's current mental model, rather than considering evidence that does not support that model (confirmation bias or fixation error) (Klein, 2005).

Rules-based decision-making
There are no standard protocols or guidelines for when patients score highly on the PHQ-9 questionnaire.

In SN's case, the discharge letter from the psychiatric team did not warn the GP to watch out for depression. Neither did it identify any other clear triggers for a referral back to secondary services other than a 'relapse', though the definition of what this constituted in this case, was not confirmed in any further detail. 'It is better for him to be a bit depressed so as to avoid a ''relapse''' said the GP.

Choice-based decision-making

Choice-based decision-making analyses the situation in detail in the first instance. The decision maker then generates a number of possible courses of action with the help of memory, manuals and other team members. These options are compared with each other to determine the best fit for the given situation. For example, an airline pilot having to make an unscheduled landing to get a sick passenger to hospital may have several alternative airports and may have to choose the right one for the aircraft and the passenger.

Although time-consuming, this approach is more likely to produce an optimal solution. In practice, most decision makers use short-cuts or simple calculations to make comparisons between options and these are subject to a variety of cognitive biases:
- Status quo bias (to do nothing)
- Confirmation bias (to search for or interpret information in a way that confirms one's preconceptions, while ignoring information that does not support the preconceptions)
- Anchoring bias (to rely too heavily on the first piece of information offered when making decisions)
- Availability bias (to estimate what is more likely by what is more available in memory)
- Projection bias (to unconsciously assume that others share the same or similar thoughts, beliefs, values, or positions)

FORDEC is an acronym for decision-making (Box 2). This model is extensively used in practice and simulation as a vital part of crew/crisis resource management. In SN's case, some of the choices available to the GP were: Get the opinion of a colleague in primary or secondary care on worsening PHQ-9 scores, obtaining guidance from existing guidelines (NICE, 2014), referring the patient urgently to A&E or secondary care, informing parents about the high PHQ-9 score, appraising them of its implications and involving them in order to arrive at a comprehensive individualised safely plan. However, none of these options were taken. If the psychiatric team had applied FORDEC, they might have re-thought the appropriateness of their decision to discharge SN to the care of the GP, and ideally arranged an early follow-up appointment as well as a phone number to call in the event of deterioration. Had the GP used FORDEC, it might have focused attention on the facts: Why is the treatment decision not working and what else needs to be done to ensure a safe outcome?

Box 2. The FORDEC system.

F: Facts (what is the problem)
O: Options (escalate care, change medication or dosage, get a second opinion)
R: Risks/benefits (what is the downside/upside of each option)
D: Decide (best option, in discussion with other members of the team)
E: Execute (carry out selected option)
C: Check (Did everything go to plan? Is safe outcome likely? What else needs to be done?)

Creative decision-making

When decision makers find themselves in completely unfamiliar and unanticipated situations, they are forced to devise novel ways of dealing with them. This requires inventive thinking, but it can be time-consuming and creates untested solutions. Like SA, it is difficult to perform under stress or with noise and distractions.

Example: An Airbus A320 commercial airliner was disabled within 1 minute of take-off by a flock of birds. The pilot used the Hudson River as a runway and landed safely with no fatalities. This example has recently been made into a feature film, 'Sully'.

Communication

Communication is a key activity in co-ordination between humans and plays a major role in ensuring successful completion of tasks. Patients 'slipping through the net' are a well-known phenomenon in medicine. The reason is often a gap in communication and the consequence is often dire (Box 3).

Box 3. Reason's three main problems that cause communication failures.

- Systems failures: The necessary channels do not exist, are not functioning or are not regularly used. For example, absence of standard operating procedures
- Message failures: Channels exist but the necessary information is not conveyed. For example, cultural differences and an assumption of level of expertise at the receiving end
- Reception failures: Channels exist, the right message is sent but it is either misinterpreted by the recipient or arrives too late. For example, deafness or a technical fault delaying a fax/email

Source: Reason (1993).

Handovers involve the transfer of rights, duties and obligations from one person or team to another. In many high-risk situations, handing-over skills are practised repeatedly to minimise error, optimise precision and anticipate difficulties. In medicine, communication between physicians and patients has received considerable attention, but the focus on physician-to-physician communication is lacking. This is a vital link in continuity of care and deserves formal education.

There are three main elements of communication:
- Sending information: Clear, concise, including context and intent
- Receiving information: Listening and seeking clarification
- Identifying and addressing barriers to communication

The 'Situation, Background, Assessment and Recommendation (SBAR)' technique has become industry best practice for standardised communication in healthcare, structuring critical information in a logical and meaningful way (Box 4) (Haig, Sutton, & Whittington, 2006).

Box 4. The SBAR tool for communication.

(S) Situation:
- Identify yourself and the site/unit from which you are calling/writing
- Identify the patient by name and the reason for your report
- Describe your concern

(B) Background:
- Give the patient's reason for admission
- Explain significant medical history
- Inform the patient's background: admitting diagnosis, date of admission, prior procedures, current medications, allergies, pertinent laboratory results and other relevant diagnostic results

(A) Assessment:
- Vital signs/contraction pattern/current status
- Clinical impressions, concerns

(R) Recommendation:
- Explain what you need: be specific about request and time frame
- Make suggestions
- Clarify expectations and possible future courses of action

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This tool can be used to shape communication at any stage of the patient's journey, from the content of a GP's referral letter, consultant-to-consultant referrals, through to discharge back to a GP. The use of SBAR prevents the hit and miss process of 'hinting and hoping'.

Confidentiality does not always apply to suicide. In January 2014, a consensus statement was prepared and published by the Mental Health, Equality and Disability Division of the Department of Health. It aims to improve information and support for families who are concerned about a relative who may be at risk of suicide. It was written in response to those families who repeatedly raised concerns that practitioners can seem reluctant to take information from families and friends or give them information about a person's suicide risk. It states that:

> If a person is at imminent risk of suicide there may well be sufficient doubts about their mental capacity at that time. In these circumstances, a professional judgement will need to be made, based on an understanding of the person and what would be in their best interest. If the purpose of the disclosure is to prevent a person who lacks capacity from serious harm, there is an expectation that practitioners will disclose relevant confidential information, if it is considered to be in the patient's best interest to do so. Disclosure may also be in public interest because of the far-reaching impact that a suicide can have on others (UK Government, 2014).

In SN's case, there were gaps in communication: physician to patient, physician to family of the patient and physician to physician. There were also shortcomings in communication between and within teams. Many of these aspects were highlighted in the Coroner's report into SN's death.

Sending information

The Honorary Consultant Psychiatrist who made the diagnosis of bipolar disorder on SN did not give any written or verbal information about the implications of this diagnosis to his parents, even though they were his prime carers. The four-page long, non-standardised discharge letter did not mention a working diagnosis. It was written by a psychiatric trainee who had never actually met SN. The discharge meeting at the GP surgery was attended by two members of the Home Treatment Team who had no ownership of, or professional relationship with SN and his family or the GP. No physician-to-physician conversations took place at handover, either by telephone or face to face.

Receiving information

The letter warned about identifying early warning signs of 'relapse' of mania, but made no mention of watching out for depression. The ambiguous use of the word 'relapse' in the discharge letter instead of 'depression' or 'mania' and the vague use of the word 'crisis' instead of 'severe suicidal ideation' by the GP, led to misunderstandings. There were no feedback mechanisms in place to enable closing the loop of communication.

The psychiatrists had no way of monitoring the progress of SN once discharged. The GP and SN's parents did not have direct access to the team that discharged SN and knew him best.

Barriers

The GP did not share the rising and maximal PHQ-9 scores with SN's parents. They found out about the scores following SN's death. The parents felt that their concerns about their son's symptoms were not listened to and addressed adequately by the GP at consultations. It is unusual for a Home Treatment Team to directly discharge a patient to their GP, and this process was not adequately monitored and supervised by the team leaders and within this multidisciplinary team, it was unclear as to who was the main decision maker. None of the team took full ownership of SN, and they did not share their mental models effectively with one another. There also appeared to be a lack of leadership and lines of responsibility in ensuring SN's safety. All available resources were not put to best use (e.g. SN's parents were not empowered with adequate information or resources to be able to help him).

Conclusions

Cardiopulmonary resuscitation is part of mandatory training because it saves lives. There is evidence to prove that suicide prevention training saves lives too. It is widely available, but not mandatory. The death rate from suicide in the young is far greater than that from coronary vascular disease, and hence, in terms of years-of-life-lost, it is significant.

Psychiatric training for GPs is not standardised and there are variations in the level of expertise available. One of the reasons for not identifying suicide risk could be a lack of focused training in this specific area leading to inadequate knowledge and skills in addition to an inaccurate belief that suicide is not preventable. Also, being expected to manage suicide risk once it has been identified and acknowledged could be another hindrance (Martin, McDaid & Parsonage, 2011).

SN's example illustrates how patients can get 'lost in the system', with sometimes tragic consequences. This can arise from a lack of non-technical skills within complex systems, teams and while working as individuals. This article highlights the importance of human factors in patient safety. It highlights the key components essential to effective decision-making, good SA and communication. It emphasises the importance of anticipating difficulties and using all available resources in a co-ordinated and meaningful way to avert tragedy, in this case to prevent suicide. Although this knowledge is invaluable, there is no substitute to gaining the necessary practical skills through simulation-based training in crisis

resource management. Specific training is also available in suicide prevention as outlined in Box 5.

Box 5. Resources: Suicide prevention training.

STORM Training (Suicide prevention and self-harm mitigation)
STORM is a well-established and academically evaluated skills-based training package that concentrates on the micro-skills of assessment and management of suicide risk. Through a process of practice and appraisal, staff members enhance their skills, leading to them to feel more able to assess a person considered to be at risk of suicide and to confidently manage the immediate crisis. Staff members also appreciate the benefits of working collaboratively with a patient/client to develop a plan of safety, care and support.
STORM can be delivered as a cascade model of training or direct-to-participant training. For more details, visit the STORM website: www.medicine. manchester.ac.uk/ storm or contact STORM enquiries storm.enquiries@manchester.ac.uk

ASIST training (Applied suicide intervention skills)
ASIST advocates a community-based approach to suicide prevention and is suitable for front line health care workers and the general public. Prior medical training is not required. Website: www.livingworks. net or Email: info@ livingworks.net

Connecting with People suicide awareness training
The Connecting with People training creates a platform to reach attendees who would not normally commit to attending a 2-day course. The 2-hour Connecting with People session raises awareness of the subject area and provides simple clinical tools to aid the assessment of patients with suicidal thoughts. The 1-day Connecting with People suicide response training provides clinical tools and therapeutic frameworks to enable practitioners to carry out a clinical assessment and develop a safe plan in addition to teaching simple problem-solving strategies. The 1-day training can also be delivered in 2-hour modules. It forms part of the Royal College of Psychiatrists (RCPsych) education programme and is a key module on the RCGP's Diploma in Mental Health. It is cited in the RCPsych College Report on self-harm and suicide and has secured the support of the RCGP/RCPsych Primary Care Mental Health Forum. This provides an excellent platform for practitioners to develop advanced skills in the assessment and management of risk by attending STORM.
Contact Email: info@openminds.org.uk

Reproduced from Cole-King, A., Green, G., Peake-Jones, G., & Gask, L. (2011).

Key points

- The NHS is a high-risk organisation
- Between 70 and 80% of all errors in medicine are estimated to be attributable to human factors
- Human error cannot be eliminated, but it can be minimised when doctors have appropriate non-technical skills
- Non-technical skills are social and cognitive skills that complement technical skills, they are essential for patient safety
- Using all available resources effectively is vital for improved outcomes
- Dedicated training in suicide prevention and non-technical skills for all front-line staff could save many lives

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