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Introduction: anaesthetic practice. Past and present

Brian Smith and Paul Wicker

Key Learning Points

- Understand historical events in anaesthesia
- Explore the place of present-day changes in anaesthetic practice
- Recognise the importance of evidence in developing a body of anaesthetic knowledge
- Develop a reflective approach to anaesthetic practice

The past three centuries have brought many changes to the care of patients undergoing anaesthesia. Many of those changes have been at the hands of inspirational doctors who many now regard as pioneers of present-day anaesthesia.

Before anaesthesia, surgery was a traumatic event, full of pain and suffering of an unimaginable degree, which often led to patients' death. It is important to understand the horror and brutality of early surgery without anaesthesia, to understand the real value of anaesthesia today. It is hard to imagine how patients must have suffered under the knife when, for example, cutting through the perineum, opening the bladder, extracting a stone and then sewing up the wounds. Meanwhile the patient would have been in unbearable agony, suffering convulsions and muscle spasms, may have gone into deep shock and would have most probably died of the experience.

Joseph Priestly, in 1777, developed one of the most valuable contributions to present-day anaesthesia. Arguably the first anaesthetist, Priestly discovered the value of nitrous oxide for anaesthesia. The work of Humphrey Davy in 1800 described the analgesic action of nitrous oxide, thus confirming its use for anaesthesia. Nitrous oxide is an anaesthetic gas which anaesthetists still use today to aid the delivery of volatile agents and to control the patient's conscious level and pain.

Nitrous oxide does not, however, come free of controversy. Tramer *et al.* (1996) argue that nitrous oxide is an emetic and causes post-operative nausea and vomiting. Other case reports (Puri, 2001) suggest introducing nitrous oxide to a patient's anaesthetic can raise the Bispectral Index System (BIS) reading, which is a translated electro-encephalogram (EEG) of the effects of the anaesthetic on the brain. Indeed Glass *et al.* (1997) found that nitrous oxide combined with propofol raised the BIS reading and patients failed to respond to verbal commands when compared with an anaesthetic without nitrous oxide.

Similarly, in 1847 Simpson suggested that chloroform was the ideal 'knock out' gas for obstetric patients. The discovery of chloroform may not have been an acceptable approach in today's conventional terms; nevertheless the experiments which Simpson carried out on himself, conducted by sniffing the solvents, did lead to the discovery of this early anaesthetic agent. Chloroform remained in practice for a few years but never became the 'single agent' for anaesthesia, because of its rather distressing side effects.

Core Topics in Operating Department Practice: Anaesthesia and Critical Care, eds. Brian Smith, Paul Rawling, Paul Wicker and Chris Jones. Published by Cambridge University Press.

The search was on for other doctors to find the perfect anaesthetic agent. In 1846, William T. G. Morton gave the first ether anaesthetic. This was an exciting stage in anaesthesia and created a strong interest among many surgeons, including Robert Listen 'The showman surgeon', Professor of Clinical Surgery at University College London. Shortly after this news had reached Listen, he performed the first pain-free surgical procedure with the patient waking up to ask 'When will we begin?'.

In 1847 John Snow favoured inhaling ether and later designed a suitable machine for its delivery. He developed this equipment because he discovered that patients received unregulated levels of anaesthetic agent due to flaws in the anaesthetic administration technique. The new equipment resulted in much safer anaesthesia by regulating the depth of the patient's unconsciousness.

In present-day anaesthesia, the 'vaporiser' equipment has developed through a long line of improvements from Snow's original machine. Today we benefit from the interlocking mechanism on the back bar system to which a vaporiser is attached (Al-Shaikh & Stacey, 2002). This safety feature of preventing two vaporisers turning on simultaneously inhibits the delivery of potentially lethal mixtures of volatile agents. Also, the intricate mechanics of the vaporisers ensures the delivery of an accurate percentage of the volatile agent. The temperature-compensating bimetallic strip helps with this accuracy by detecting any deviations in temperature.

The idea of an 'anaesthetic machine' was developed from the work of these early pioneers and has resulted in the sophisticated, but safe and efficient, anaesthetic machines used today. Sir Frederic Hewitt, Elmer McKesson, and Robert Boyle's invention of the anaesthetic machine, and later improvements from 1898, have produced many advances for anaesthesia. Their early introduction of a machine that could deliver oxygen and volatile agents helped anaesthesia to develop into a precise science. With the advantages of anaesthesia recognised by many surgeons, and its increase in popularity, there became a pressing need to accurately control the delivery of anaesthetic agents. Anaesthetists required this control to prevent the deaths that occurred regularly with chloroform in 1886. Today the definition of an anaesthetic machine is clear, however, the role of the various pieces of anaesthetic equipment on the machine remain similar in many ways to the original Boyle's machine.

The original Boyle's machine delivered fresh compressed gas from cylinders attached to the machine by channelling the flow through the fine controls of a flowmeter. The journey of the fresh gas continued through the volatile agent (ether, chloroform and later halothane) and out the other side of the vaporiser, delivering a mixture to the patient. The patient would receive this mixture usually through an anaesthetic circuit that would have a face mask attached, known as 'a continuous flow apparatus'. The modern-day anaesthetic machine is also classified under this heading to show that the machine is dependent on a supply of compressed gas.

Another important comparison with past and present anaesthetic practice is the invention of the 'circle absorber system'. According to Ince and Davey (2000), 200 years before Brian Sword brought carbon dioxide absorption into anaesthetic practice, Joseph Priestly had described the absorption proprieties of alkalis.

Introducing the circle to anaesthesia in 1928 reduced atmospheric pollution and helped to recycle the patient's expired gas. Directing the expired gas in a unidirectional way passes the exhaled gas through soda lime to absorb carbon dioxide, thus filtering the mixture and making it suitable for recycling.

Today the principle use of the circle system has not changed and two of the key aims still include improved cost-effectiveness and reduced pollution. However there are many concerns about its use with some modern volatile agents. Moriwaki *et al.* (1997) discussed the known reaction of sevoflurane with carbon dioxide absorbents resulting in the 'generation of five degradation products'. Their studies have identified that sevoflurane with

partially exhausted soda lime (carbon dioxide absorbent) produced less concentration of the degradation product compound A. The debate continues with the argument that it is unclear if low-flow sevoflurane anaesthesia can lead to renal injury. However, it is noted that a study mentioned by Moriwaki *et al.* (1997) suggests the possibility of compound A contributing to renal injury in the patient.

It is clear that anaesthesia methods, medication and monitoring have changed from the eighteenth century. However, there are also some areas that have not changed and are still taught today. For example, the traditional description of the stages or depth of anaesthesia (Figure 1.1) is still in use today. These stages have informed anaesthetic practice for several years, and have helped the anaesthetist to gauge the dosage of anaesthetic agent to give.

The first description of the stages of anaesthesia was in the days of ether and its delivery by inhalation. It was noted that the patient moves progressively through the analgesia and delirium stages to the surgical anaesthesia stage, enabling tracheal intubation or the surgical procedure to continue. In some unfortunate cases, the delivery of too much of the volatile agent resulted in stage four, medullary depressions, which eventually resulted in death.

This model has aided the anaesthetic team (AAGBI, 2005) to make clinical judgements about the dosage of anaesthetic agents each patient needs. With the increase in different methods of delivery of anaesthesia, for example, with intravenous and regional approaches, it may be fitting to consider Snow's stages of anaesthesia as applied to non-inhalational delivery.

The question arises of whether all the stages of anaesthesia are present during the use of modern intravenous induction agents. According to Drummond (2000), John Snow's stages of anaesthesia have changed and the emphasis now focuses more on the depth of anaesthesia. Initially, the hazards of overdosing concerned many anaesthetists, however, this focus has also shifted towards reducing underdosage, which can result in awareness under anaesthesia.

Equally, the patient and anaesthetic team should make a joint decision about the anaesthetic approach to use. Total Intravenous Anaesthesia (TIVA; without inhalation agents) might be a more suitable approach when considering each patient's medical history, surgical procedure, and recovery time. A randomised, double-blinded study by Ozkose *et al.* (2002) suggests TIVA can be a useful anaesthetic technique on patients who need to undergo a lumbar discectomy. It promotes rapid recovery without post-operative nausea and vomiting. These conditions offer the opportunity for the patient to have a neurological assessment post-operatively to identify the success of the procedure.

Pharmaceutical agents developed over the last 20 years, such as remifentanil and propofol have significantly contributed to anaesthesia as

Stages of Anaesthesia

Stage One – Analgesia: between induction of anaesthesia and ends at loss of consciousness.

Stage Two – Excitement or delirium: often sudden response to stimuli or uncontrolled movements.

Stage Three – Surgical anaesthesia – Plane 1
Plane 2
Plane 3
Plane 4

Stage Four – Medullary depression: overdose of the patient.

Figure 1.1 Stages of anaesthesia.

alternatives to inhalational anaesthesia. Constant review and trials of different drugs draw new findings and continue to develop the scientific field of anaesthesia.

Evidence-based practice and quality is at the heart of the anaesthetic service. This in turn is dependent on those who invest time, knowledge and resources to increase the effectiveness and safety of anaesthetic provision.

At the time of writing this book, anaesthetists who have undertaken further training, after having qualified as a doctor, predominately deliver anaesthesia. The further training often takes six years or more working through the specialist qualification to become a consultant anaesthetist.

Developing the consultant anaesthetist role has been the result of trial and error by many influential doctors, such as John Snow, Sir James Young Simpson, William T. Morton, and others. According to the Association of Anaesthetists of Great Britain and Ireland (AAGBI) (2006), Dr Henry Featherstone founded the association in 1932 before the birth of the National Health Service (NHS). Before this time general practitioners (GPs) gave anaesthetics as an optional extra to their role. Pay was low for this role, and many saw it as being subordinate to the surgeons.

The main reason for founding the AAGBI was to promote and encourage anaesthetic advances through academic and clinical application. The AAGBI also supported the welfare of anaesthetists because of the pressures experienced by many in that role.

Concurrently, there have been several developments over the last century for the assistants to the anaesthetist. Before 1976, the group of staff referred to as theatre technicians adopted an alliance towards the anaesthetist. They often became skilled and reliable assistants to the anaesthetist with the main purpose of increasing the safety of the patient under anaesthesia.

Theatre technicians soon reached a key stage in their development with the publishing of the Lewin report. The report itself introduced some key changes for this group of staff. According to Wicker and Smith (2003), the Lewin report (DH, 1970) resulted in national training centres and the name change from technician to operating department assistant (ODA). Ince (2000) states that this report also introduced the City and Guilds of London Institute (CGLI) qualification 752 for Hospital Operating Department Assistants.

Throughout the two-year training scheme the ODA studied knowledge and skills in surgery, anaesthesia, and recovery and related subjects. Although the course prepared ODAs to work in all areas of the operating department, the presence of nurses in surgery created a natural opening in anaesthesia which ODAs migrated towards. The lack of uptake of surgical duties by the individual and the department resulted in a further report in 1989 (NHS Management Executive, 1989, the 'Bevan report').

Theatre nurses were also building on their experiences within anaesthesia. The English National Board (ENB) anaesthetic units of study gave nurses (in England) a nationally recognised qualification to practice as an anaesthetic nurse. The lack of a similar qualification in Scotland led to some confusion of the acceptability of locally developed anaesthetic courses, even when developed by Higher Education Institutes.

These two groups did not work in harmony, tensions arose between ODAs who were aspiring to become registered, and nurses who already had statutory registration. The differences in training led to further tensions as the two groups tried to understand each other's priorities for patient care. Professor P. G. Bevan (1989) identified the overlaps of roles and Wicker (1997) further commented on this area several years later.

Bevan's report identified opportunities for developing both professions through shared learning and management of the theatre service. Partly because of this report, partly the professions' internal changes in thinking, the ODA became an Operating Department Practitioner (ODP). The emphasis changed from 'assisting' to 'practicing', and the profession took another step in its long struggle towards statutory registration.

In 2006, 'The Anaesthetic Team' guidelines (AAGBI) identified the nationally accepted qualification for an ODP. The report recommended that ODPs should hold a Diploma of Higher Education in Operating Department Practice, gained from a two-year programme of study. The increased academic profile for the profession subsequently supported the acceptance on the statutory register with the Health Professions Council.

What is not clear from the AAGBI document is the relevant qualification for an anaesthetic nurse. Since the English National Board (ENB) dissolved in 2002, there has been increasing uncertainty about the accepted nationally recognised qualification for registered nurses wishing to practice in anaesthesia.

Previously the ENB (formerly Joint Board for Clinical Nursing Studies (JBCNS)) 182 units of learning had set out common objectives so the registered nurse could meet the needs of the patient undergoing anaesthesia. Those had encouraged and developed the registered nurse interested in anaesthetic care (ENB, 1994).

Today, *The Anaesthesia Team* (2005) recommends: 'Assistance for the anaesthetist may be provided by ODPs or nurses. Whatever the background, the training for all anaesthesia assistants must comply fully with national standards'. Judging from the activities of the Association for Perioperative Practice, the Association of Operating Department Practitioners and the British Association of Anaesthetic and Recovery Nurses, anaesthetic nursing is still of interest to the registered nurse and their employer. The former group's interest possibly takes its roots from the interesting scientific developments in anaesthetic care. The interest of the latter group may be credited to the national shortage of perioperative staff within the United Kingdom.

Employers seek new ways to staff the whole perioperative service and take action to advance many of their staff skills by crossing once traditional boundaries. Multi-skilling the individual is a long-standing term within the perioperative environment and draws with it the term 'Skill Mix' as suggested by Mackenzie (1998). At the heart of this idea is the need to ensure that quality of care is affordable by ensuring flexibility across traditional divisions of labour.

It is no longer the historical case as mentioned by Pittaway (2004) that only perioperative nurses should have the opportunity for 'clinical experience and years of service' to progress their career. Instead, all perioperative practitioners today (registered nurses and ODPs) should be able to exercise their professional autonomy and choose which professional experiences would advance their career.

Practitioners may base their choice on the need to fulfil the requirements for registration with the Nursing & Midwifery Council or the Health Professions Council. Alternatively they may base their decision on a wish to undertake academic studies to develop their skills and knowledge in the area. Whatever approach the practitioner adopts, more opportunities for role improvement are available with the examples of the new roles emerging in the perioperative environment (Lipp, 2004).

The National Health Service Modernisation Agency (2004) recommended developing a select group of professionals with non-medical backgrounds to deliver anaesthesia. This development sits well with the two national agendas to reduce the doctors in training hours to a 58-hour week (DoH, 2004) and secondly with the NHS Career framework (Skills for Health) (Figure 1.2).

These two agendas offer opportunities for many perioperative practitioners to develop their knowledge and skills at higher levels to be able to progress their career to specialist practitioner, consultant practitioner and other levels. One possible new role for the perioperative practitioner will be to undertake both prescribing and administration of anaesthesia. Many other countries have set up the 'nurse anaesthetist' role. Within the United Kingdom the National Health Service Modernisation Agency (2004) is reviewing a pilot study looking at the non-medical anaesthetist role. When this role is firmly part of the anaesthetic

Figure 1.2 A Career Framework for Health. The Career Framework for Health is being developed by Skills for Health to support the introduction of flexible career opportunities for staff across the health sector and the concept of competence-based skills education.
See: www.skillsforhealth.org.uk Skills for Health (2005).

team, then the nurse or ODP performing this role will be accountable in their own right for their performance (Hind & Wicker, 2000). Practitioners should not underestimate the scope of this undertaking, as careful reviewing of this role will be essential to address any accountability, autonomy, educational and registration issues that may arise.

This chapter has explored the long, sometimes torturous, development of anaesthesia, and in particular the role of practitioners working in this speciality. The result of many years of development, scientific investigation and trial and error, is a body of knowledge and skills which help to ensure the safest possible care for patients undergoing anaesthesia. Anaesthesia, on its own, is simply safer than driving a car, with a much lower mortality and morbidity rate.

It is on this foundation that the chapters of this book aim to support the advancing of practitioners' knowledge and abilities through their career progression. The breadth of knowledge from the core subjects will encourage others to continue to question, explore and contribute to the body of knowledge in anaesthesia and critical care.

The growing specialisation of anaesthetic practice, even within anaesthetic practice itself, means that practitioners have to develop skills and understanding far beyond those taught at preregistration level. The anaesthetic practitioner has a professional responsibility to advance patient care and to continue improving anaesthetic practice through developing the profession.

REFERENCES

AAGBI. (2005). *The Anaesthetic Team*. London: The Association of Anaesthetists of Great Britain and Ireland.

AAGBI. (2006). *The Association of Anaesthetists of Great Britain and Ireland*. Available at: www.aagbi.org/heritage/aagbihistory.htm (Accessed 12 October 2006.)

Al-Shaikh, B. & Stacey, S. (2002). *Essentials of Anaesthetic Equipment*, 2nd edn. London: Churchill Livingstone.

Department of Health. (2004). *A Compendium of Solutions to Implementing the Working Time Directive for Doctors in Training from August 2004*. London: HMSO.

Department of Health and Social Security, Welsh Office, Central Health Services Council. (1970). *The Organisation and Staffing of Operating Departments*. London: HMSO. (The Lewin Report.)

Drummond, J.C. (2000). Monitoring depth of anesthesia: with emphasis on the application of the bispectral index and the middle latency auditory evoked response to the prevention of recall. *Anesthesiology*, **93**(3), 876–82.

English National Board for Nursing, Midwifery and Health Visiting (ENB). (1994). *Creating Lifelong Learners: Preregistration Guidelines*. London: ENB.

Glass, P.S., Bloom, M., Kearse, L. *et al.* (1997). Bispectral analysis measures sedation and memory effects

of propofol, midazolam, isoflurane, and alfentanil. *Anesthesiology*, **86**, 836–47.

Hind, M. & Wicker, P. (2000). *Principles of Perioperative Practice*. London: Harcourt.

Ince, C. S. & Davey, A. (2000). *Fundamentals of Operating Department Practice*. Greenwich: Greenwich Medical Media.

Lipp, A. (2004). New ways of working in anaesthesia. *British Journal of Perioperative Nursing*, **14**(9), 384–90.

Mackenzie, J. (ed.) (1998). *Ward Management in Practice*. Edinburgh: Churchill Livingstone.

Moriwaki, G., Bito, H. & Ikeda, K. (1997). Partly exhausted soda lime or soda lime with water added, inhibits the increase in compound A concentration in the circle system during low-flow sevoflurane anaesthesia. *British Journal of Anaesthesia*, **79**(6), 782–6.

National Health Service Modernisation Agency. (2004). *Changing Workforce Programme. Role Design: Review of Activities 2004*. London: HMSO.

NHS Management Executive. (1989). *The Management and Utilisation of Operating Departments*. London: VFM Unit. (The Bevan Report.)

Ozkose, Z., Yalcin, Cok O. *et al.* (2002). Comparison of hemodynamics, recovery profile, and early postoperative pain control and costs of remifentanil versus alfentanil-based total intravenous anesthesia (TIVA). *Journal of Clinical Anesthesia*, **14**(3), 161–8.

Pittaway, D. A. (2004). The changing role of the perioperative nurse. In M. Radford, M. Oakley and B. County, eds., *Advancing Perioperative Practice*. Cheltenham: Nelson Thornes, pp. 1–14.

Puri, G. D. (2001). Paradoxical changes in bispectral index during nitrous oxide administration. *British Journal of Anaesthesia*, **86**(1), 141–2.

Skills for Health. (2005). *A Career Framework for Health*. Available at: http://www.skillsforhealth.org.uk/careerframework/ (Accessed 8 March 2006).

Tramer, M., Moore, A. & McQuay, H. (1996). Omitting nitrous oxide in general anaesthesia: meta-analysis of intraoperative awareness and postoperative emesis in randomized control trials. *British Journal of Anaesthesia*, **76**, 186–93.

Wicker, P. (1997). Overlapping roles in the operating department. *Nursing Standard*, **11**(20), 44–5.

Wicker, P. & Smith, B. (2003). The changing workforce in the operating department: morphing the professions. Technic. *The Journal of Operating Department Practice*, **8–11**, 242.

2

Risk assessment

Toni Bewley

Key Learning Points

- Identification of hazards in the perioperative environment
- The principles of risk assessment
- Measures which practitioners can take to reduce risk
- Carrying out risk assessment

Few practitioners see the topic of health and safety as being relevant or interesting until they start to consider it in depth. As they explore the topic, the individual's anxiety heightens as the awareness of safe and unsafe practices grows. The reality is that any practitioner could, by act or omission, become involved in a critical incident. This awareness is especially important in the perioperative environment which by its nature is dangerous and full of many hazards which can harm patients or staff.

The motivating reasons that influence a practitioner's behaviour towards health and safety can be identified as:

- moral
- legal
- economic
- employment
- professional.

Moral reasons

It should be enough for all practitioners to always apply the principles of risk reduction and good adherence to health and safety practices, just because this is a moral responsibility to others. Nevertheless, if this is not reason enough to motivate practitioners, there is a wealth of health and safety legislation associated with the subject. As with any other Act, a breach of named regulations could result in the individual and/or the organisation receiving an enforceable punishment.

Legal reasons

Interestingly enough, most practitioners are aware of 'The Health and Safety at Work Act, 1974' (HSAWA). Why then, if perioperative practitioners have an awareness of their legal responsibilities about health and safety, do they often adopt seemingly complacent attitudes towards it?

This may occur because health and safety is a state of mind: practitioners believe they are as safe as they think they are. Therein lies the problem: practitioners may not be as safe as they think they are.

Mistakes happen, however the purpose of risk assessment is to identify set priorities and reduce risk. Proactive risk assessment enables there to be direct and justifiable decision-making. A ranking of risks with suitable financial and staff resource allocation raises staff awareness of a range of outcomes, protects the patient, prevents negative publicity and improves staff morale.

In 2000, the Chief Medical Officer reported on:

- the scale and nature of serious failures in the UK's National Health Service (NHS) care

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- how the NHS could learn from its mistakes in care delivery
- measures which could minimise future risk.

This report, 'An Organisation with a Memory' (DH, 2000), written by an expert group learning from adverse events in the NHS, found that, although uncommon, when serious failures happen they:

- have devastating effects on patients and their families
- cause extreme distress to staff
- undermine public confidence in healthcare.

During a recent discussion involving the author, practitioners reflected on a 'near miss' incident involving a patient. In this case the patient arrived in theatre for surgery on her left arm, however written consent stated the surgery was on the right arm.

The theatre list was running late, tempers were frayed, practitioners did not check the case notes correctly and nobody marked the arm. Only when the patient was anaesthetised and in theatre, and the X-rays were checked, was the error spotted.

In this case no harm was done but an 'adverse incident investigation' followed. The investigating team examined policies and procedures, highlighted individual responsibilities, and introduced clear pathways for all staff to follow. The report highlighted a catalogue of errors which included wrong consenting procedures, failure to check documentation, and omissions in double-checking procedures.

The purpose of risk assessment however is to minimise risk to the lowest level reasonably practicable. When undertaking an 'adverse incident investigation' or 'root cause analysis' it becomes obvious that no single cause decides the outcome of events. There is often a chain or sequence of failings that leads to a poor outcome and ultimately lessons need to be learned from this to prevent the risk of a similar incident reoccurring. If there are robust procedures in place that are practicable and workable in the environment, and staff are trained to act under these procedures then risks can be minimised.

The main focus of the HSAWA is to provide for securing the health and safety and welfare of anyone at work as well as protecting others against risks to health and safety during work activities. Section 3 of the Act states that every employer is under a duty to conduct their undertaking in such a way to ensure, so far as is reasonably practicable, that all employees are not exposed to risks to their health and safety. This applies as well to anyone not in their employment, but who may be affected by the employer's activities. For healthcare providers this includes visitors to NHS property such as members of the public.

Employers with five or more employees must produce a written statement of general policy for health and safety and must point out the current arrangements in place for meeting the policy. The way in which employers should structure, review and monitor policies has been significantly changed by the need to comply with regulation 3 of the Management of Health and Safety at Work Regulations, 1999a (MHSWR). This regulation introduces risk assessment in its broadest sense. It points out that significant risks must be recorded; and the approved code of practice applied. The department should only approve a change of policy where circumstances (such as the findings of a risk assessment) show the proposed change is suitable and necessary.

Economic reasons

Economic pressures can be the drivers to force individuals and or organisations to comply with health and safety guidance. This compliance is sometimes only reached following a critical incident. It is perhaps a sad reflection on a twenty-first-century society when advertisements are displayed in healthcare settings advising of firms who will represent individuals following accidents. If all practitioners adopted a proactive approach to health and safety these advertisements may become something of the past.

Employment pressures

Contracts of employment state that employees have a duty to obey the reasonable orders of the employer. They also have a duty to act with care and skill and to support any policies, procedures and guidance that employers issue to protect the health, safety and welfare of employees and others.

Professional pressures

Specific professional standards of proficiency for operating department practitioners (HPC, 2004: 3a3) highlight the practitioner's requirement to 'understand the need to establish and maintain a safe practice environment'. This includes specifically the need to be able to work safely, being able to select suitable hazard control and risk management, and to carry out techniques safely under health and safety legislation.

Likewise the Nursing and Midwifery Council (NMC) states that there is both a legal and a professional duty to care for patients and clients. Indeed within the NMC code of professional conduct, standards for conduct performance and ethics (2004) professionals are required to 'Act to identify and minimise risks to clients'.

Lord Atkin defined the duty of care when he judged the case of *Donoghue* v. *Stevenson* (House of Lords, 1932). He said that 'You must take reasonable care to avoid acts or omissions which you can reasonably foresee would be likely to injure your neighbour'. Who then is your neighbour? Your neighbour is 'persons who are closely and directly affected by your acts, and accordingly you should have thought about them possibly being affected as a result directly of your acts or omissions' (NMC, 2005).

It is important to understand the term 'reasonable' for a professional to decide whether their actions would always be viewed as being so. To determine this, the case of *Bolam* v. *Frien* Hospital Management Committee (1957) is still used. This test, the 'Bolam Test' is often used to examine the actions of any professional person; it refers to 'the test being the standard of the ordinary skilled man exercising and professing to have a special skill. The man need not possess the highest expert skill at the risk of being found negligent, it is sufficient if he exercises the skill of an ordinary competent man exercising that particular art'.

This definition is supported and clarified in the case of *Bolitho* v. *City and Hackney Health Authority* (1988). One of the judges in this case discussed 'the appropriate standard of care' and commented that 'the experts have directed their minds to the question of comparative risks and benefits and have reached a defensible conclusion on the matter'.

The case of *Wilsher* v. *Essex AHA* (1986) set the standard of reasonable care to that which patients can expect of students and junior staff. It highlighted that the standard is that of a reasonably competent practitioner and not of a student. Therefore professionals have a duty to ensure that any care that they may delegate is carried out to a reasonably competent standard. The professional remains therefore accountable for the care, the delegation of the work and for ensuring that the person to whom the work is delegated is able to undertake it.

The possible outcomes of failure to manage health and safety within organisations include:

- prosecution, fines and imprisonment
- compensation claims for damages
- loss of service or output
- replacement costs
- retraining
- loss of reputation.

Risk assessment in clinical practice

It is therefore obvious that there are many reasons why it is in both the individual's and employer's best interests to develop robust methods of detecting hazards and therefore plan risk reduction. Mandelstam (2005) recognises that the term 'risk' is stamped all over health and social care.