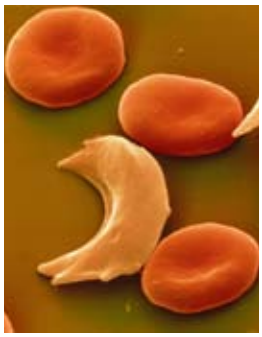
Antenatal haemoglobinopathy screening

Is important but needs to be done earlier in primary care



EYE OF SCIENCE/SPL

RESEARCH, p 926

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The haemoglobinopathies, sickle cell disease and β thalassaemia major, are autosomal recessive diseases. In the United Kingdom, about 240 000 people are healthy carriers of sickle cell gene variants and 12 500 have the disease; β thalassaemia is less common, with 214 000 healthy carriers and 700 patients affected by illness.[1] The NHS screening programme for sickle cell disease and thalassaemia was set up in 2001 on evidence from systematic reviews.[2] It aims to offer screening before 10 weeks of pregnancy to all women in England, in addition to neonatal blood spot screening.[3] Screening couples before 12 weeks provides the opportunity to discuss all the reproductive choices available, including prenatal diagnosis and termination of pregnancy. In the linked randomised controlled trial, Dormandy and colleagues assess whether offering screening in primary care facilitates earlier uptake of screening.

A problem exists with antenatal screening for sickle cell disease and thalassaemia. Previous research in a high prevalence area has shown that although most women visit their general practitioner early (median gestation 7.6 weeks) screening is significantly delayed (median gestation 15.3 weeks).[4] Although 74% of women presented in time only 5% were screened before 10 weeks.

The present study attempted to tackle this problem. Three antenatal screening strategies were compared: parallel testing in general practice, where screening was offered to both parents when pregnancy was first confirmed; sequential testing in general practice, where screening was offered to mothers at first presentation and then to the partners of screen positive women; and midwifery care, where screening was offered when the woman first presented to the midwife.[5] Around 24% and 28% of women were screened before 10 weeks in the parallel and sequential arms, respectively, significantly more than the 2% in the midwifery arm. The proportion of women screened by 26 weeks was similar in all three groups (81%); this indicates that the women did not differ in their willingness to be screened. The uptake of screening by partners was very low in all three groups. The research design included training and support for recruited practices; in usual practice the results would probably be even worse.

Other evidence indicates that health professionals rather than pregnant women are responsible for the delay in screening.[6 7] In a study of antenatal screening for Down's syndrome, women from ethnic or socioeconomically disadvantaged groups (or both) were less likely to be screened than other women, not because they had more negative attitudes to screening, but because they had lower testing rates.[8] The reasons for this are unclear but probably reflect language problems and cultural differences.

The full report of the linked study explores barriers to screening for sickle cell disease and thalassaemia by general practitioners.[9] These include lack of time within the 10 minute consultation, delays in arranging blood tests, language problems, and negative professional attitudes. In another study, general practitioners reported a lack of confidence and knowledge about communicating basic genetic information to women and families at risk, and a lack of knowledge of the importance of rapid referral to prenatal diagnostic services.[10]

If the results for general practitioners are poor, those for midwives are even worse. This may be the perverse effect on midwives of a national target that makes "booking" women by 12 weeks of completed pregnancy more important than seeing women early, especially when there are workload pressures and recruitment difficulties.

Preconception testing may be more acceptable culturally and ethically to some women and men. The experience from Cyprus, where the prevalence of the thalassaemia carrier state is higher, is compelling: there has been an intensive educational campaign and preconception screening policy since the 1970s, and babies with thalassaemia are now uncommon there. Most Cypriots living in the UK request preconception screening, unlike South East Asian people, whose awareness of the risk is poor.[11] It is clearly important to raise awareness within ethnic populations. In the voluntary sector, the Sickle Cell Society and Thalassaemia UK have active educational campaigns that aim to do just this and to encourage early testing.

What are the implications of this study for general practitioners? The role of general practitioners in maternity care has changed greatly over the past 20 years; in current practice they rarely do more than signpost to midwives.[12] The challenge is to re-engage general practitioners in early maternity care and to raise their awareness and skills. The NHS sickle cell disease and thalassaemia screening programme provides patient information in different languages and training is offered through PEGASUS (www.pegasus.nhs.uk/index.php). Future technological advances may make it easier to do rapid tests on blood spots or saliva, but unless the tests are offered they won't happen. Antenatal screening for sickle cell disease and thalassaemia is just the tip of a genetic iceberg and primary care needs to be prepared.

General practitioners provide lifelong care and haemoglobinopathy testing is a "test for life," not just for pregnancy. Done once and computer coded properly, sickle cell disease and thalassaemia screening does not need repeating. Men as well as women need to consider their genetic heritage. General practitioners have many opportunities to

raise the subject of haemoglobinopathy testing whenever they see young people—for example, when giving contraception advice.

Antenatal screening for sickle cell disease and thalassaemia is an important and worthwhile programme, but it cannot be successful unless general practitioners take responsibility for testing or midwives book women earlier, or both. The current low level of uptake of early screening is unacceptable; we are failing women with affected pregnancies, who cannot make reproductive choices if professionals "miss the boat." It may be that the only way to facilitate this change is through an incentive scheme, such as the Quality and Outcomes Framework.

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Avoidance of high concentration oxygen in chronic obstructive pulmonary disease

Routine use may also be harmful in several other medical emergencies

RESEARCH, p 927

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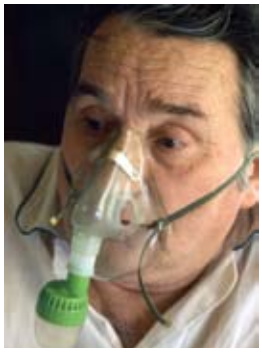
Oxygen was used to treat several diseases as early as the 1790s, and the belief that "purified air" was better than ordinary air persisted among doctors and the general public for the next two centuries.[1] In the early 1960s, Moran Campbell recognised the danger of hypercapnic respiratory failure (carbon dioxide retention) caused by high concentrations of oxygen in the treatment of acute exacerbations of chronic obstructive pulmonary disease.[2] Subsequent research has consistently reported adverse outcomes after the use of uncontrolled oxygen treatment in this condition.[3 4] Evidence on the benefits and harms of the use of oxygen in acute exacerbations of chronic obstructive pulmonary disease has led all specialties in the United Kingdom to recommend controlled oxygen treatment with a target saturation range (usually 88-92%) in this condition.[5] However, this recommendation was limited by the lack of level 1 evidence, because no randomised controlled trials were available.[6]

The linked cluster randomised trial by Austin and colleagues finally fills this gap, and it provides robust evidence that the routine administration of high concentration oxygen in acute exacerbations of chronic obstructive pulmonary disease is associated with increased mortality.[7] The trial compared high concentration oxygen treatment with titrated oxygen treatment in the pre-hospital setting in 405 patients with a presumed acute exacerbation of chronic obstructive pulmonary disease. Mortality was significantly lower in patients receiving titrated oxygen rather than high concentration oxygen (relative risk, 0.42, 95% confidence interval 0.20 to 0.89). In the subgroup of patients with confirmed chronic obstructive pulmonary disease (n=214) mortality was reduced even further (0.22, 0.05 to 0.91). In patients who had arterial blood gas measurements within 30 minutes of presenting to hospital, those who received titrated oxygen were significantly less likely to have hypercapnia (mean difference in alveolar carbon dioxide tension −34 mm Hg) or respiratory acidosis (mean difference in pH 0.12) than were those who received high concentration oxygen treatment. These physiological effects probably contributed to the increased risk of death, especially if high concentration oxygen treatment was continued within the hospital setting or if management of respiratory acidosis required exposure to the hazards of invasive ventilation.

Two other less well recognised mechanisms may also have contributed to the increased risk of death. Firstly, hyperoxaemia causes coronary artery vasoconstriction and reduced coronary artery blood flow.[8] Cardiac troponin concentrations are raised in about 25% of patients with acute exacerbations of chronic obstructive pulmonary disease and positively correlate with the degree of hypercapnia and acidosis.[9] Many patients with acute exacerbations of chronic obstructive pulmonary disease have coexisting ischaemic heart disease, and high oxygen concentrations may increase the risk of death by causing myocardial damage as a result of reduced coronary blood flow.

Secondly, if supplemental oxygen is withdrawn abruptly from patients in whom high concentration oxygen treatment has caused hypercapnia and a marked increase in alveolar carbon dioxide tension, the oxygen tension in the alveoli will fall rapidly to below that seen before the



SALLY AND RICHARD GREENHILL/ALAMY

start of oxygen treatment, and this may result in profound hypoxaemia.[5] This phenomenon, known as rebound hypoxaemia, can occur if oxygen treatment is suddenly stopped—for example, during a meal or in response to a blood gas sample showing hyperoxaemia in association with severe hypercapnia and acidosis.

The 9% mortality in patients given high concentration oxygen treatment in Austin and colleagues' study is comparable to the 7.4% mortality reported in a 2003 UK national audit of acute exacerbations of chronic obstructive pulmonary disease.[10] However, the mortality of only 2% in patients randomised to oxygen titrated to achieve an oxygen saturation of 88-92% sets a new "gold standard" for management of this condition. The priority for future randomised controlled trials will be to define the ideal target oxygen saturation levels; further trials of high concentration oxygen in this condition would not be ethical.

It is important to recognise that concerns about the safety of the routine use of high concentration oxygen treatment extend beyond chronic obstructive pulmonary disease. Evidence suggests that this therapeutic approach may worsen outcomes in a wide range of other clinical situations including, but not limited to, myocardial infarction, stroke, neonatal resuscitation, and postcardiac arrest resuscitation in adults.[5 11 12] Sufficient evidence exists to recommend avoidance of routine administration of high concentration oxygen treatment in the emergency setting. The UK National Patient Safety Agency has expressed concerns about inadequate oxygen prescription, administration and monitoring.[13] The use of oxygen should be limited to patients with hypoxaemia, and it should be titrated to relieve hypoxaemia and avoid hyperoxaemia. After more than 200 years of haphazard use it should be recognised that oxygen should be prescribed for defined indications in which its benefits outweigh its risks and that the patient's response must be monitored.

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Chinese health care in rural areas

The new rural cooperative medical scheme is on the right track despite the challenges ahead

RESEARCH, p 929

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In the linked study, Babiarz and colleagues assess the impact of China's New Rural Cooperative Medical Scheme (NCMS) on village clinic operations and patterns of clinic use. The scheme aims to provide health insurance to 800 million rural citizens and to correct distortions in rural Chinese health care.[1]

One defining feature of contemporary China is the pervasive divide according to urban or rural residence. This divide has permeated all aspects of Chinese society, and health care is no exception. However, in the collective era (mid-1950s to early 1980s, when rural agricultural production was organised by production teams and collective farming), glaring health disparities were kept in check by the presence of almost universal health insurance coverage. In the countryside, a cooperative medical scheme was established in the 1960s. It was a collective, community based insurance programme organised, planned, and financed by the government. Its guiding principle emphasised basic primary health care for all, preventive medicine, and health promotion. The system worked. In the heyday of the scheme's operation (mid-1970s), it effectively reached 90% of all rural Chinese people,[2] with decades of accumulated benefits substantially improving the overall health profile of China's population.

The market based economic reforms since 1978 set in motion a roller coaster of changes in every part of Chinese society. Like the economy, the healthcare sector was decentralised and left in the invisible hand of market forces. The government retrenched healthcare financing, and at the same time medical pricing and patients' out of pocket healthcare costs soared. The medical establishments and healthcare providers became increasingly driven by economic incentives and profit seeking.

Although these changes were global, the consequences were particularly detrimental to rural health care.[3] The

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previous system collapsed. What emerged in its place were predominantly private practices that operated on fee for service, out of pocket financing, or simply, the ability to pay. This resulted in a massive loss of access to care among rural residents, especially the poor. The numbers say it all—in 2003, more than 90% of the rural population, about 700 million rural Chinese, had no health insurance coverage and had to pay out of pocket for almost all health services.[4] Medical impoverishment, among many other predicaments of rural families, has become a pressing policy concern. The urban-rural gap in access to health care has widened.[3 4] It is only fair to conclude that China's market based health reforms failed on virtually all measures.

With this painful realisation, in 1994 the Chinese government initiated a pilot project in 14 counties of seven provinces in an attempt to resurrect the rural cooperative medical scheme.[5] Building on that experience, the government launched the NCMS nationwide in 2003.[6] This new scheme is a government run, heavily subsidised voluntary insurance programme with its main policy focus on reducing the risk of catastrophic health spending for rural residents.[7] The prevailing model combines medical savings accounts or medical financial assistance (or both) with high deductible catastrophic hospital insurance (which covers rural residents in for a major medical event requiring costly hospital treatment).[8] This new round of health reform in China has run its course for nearly seven years and is now rapidly expanding, so has it achieved its intended policy goal?

Babiarz and colleagues' study is one of the most recent efforts to evaluate the impact of the NCMS and its implications for primary health care in rural China.[1] The study sample is fairly comprehensive and up to date, covering 160 village clinics and 8339 people from 100 villages across five Chinese provinces at two points in time, 2004 and 2007. One of the major findings—that out of pocket medical spending in the sample fell by 19% and catastrophic spending declined by 36% after enrolment in the new scheme— is particularly encouraging. On the basis of this finding, the authors concluded that the new scheme has provided some financial risk protection and reduced out of pocket health spending for enrolees. This conclusion should be interpreted with caution, however, in view of the relatively thin evidence base and mixed results across published studies in this area. For instance, several recent evaluations noted that the scheme had a relatively limited effect on reducing out of pocket spending or preventing rural households from financial catastrophe.[8-10] These inconsistent findings may result from the heterogeneity of study samples as well as substantial regional variations in the design of the programme and local resources. In addition, many more unanswered but important questions remain. For instance, has the new scheme attenuated (as it should) or accentuated (as it shouldn't) disparities in access and care between the haves and have-nots? In short, the available evidence seems too limited to draw any definitive conclusions about the effects of the ongoing NCMS programmes.

Looking ahead, Chinese policy makers and health practitioners face multifaceted challenges to furthering and sustaining the healthy development of the scheme. Given limited financial and health resources, multiple priorities must be balanced with respect to access, quality, and cost of health care. To redress the neglect of rural health care in the post-reform era, the most urgent policy goal is the expansion of access to basic health insurance and health care for rural residents. This goal is now being vigorously promoted by the government and should be achievable with relative ease if the determination is there.

The quality of medical services and patient outcomes under the new scheme is unclear, but unfortunately this is not yet perceived as urgent enough to move up the priority list on China's health policy agenda. It will have to be tackled sooner or later. Let us also not forget the obvious—that every progress comes with a cost. Costs driven by perverse incentives in the healthcare financing system are particularly difficult to tackle. Under the NCMS, there have already been symptoms of overuse of medical services, from overprescription of drugs[11] to unnecessary use of caesarean deliveries.[12] Because the government is heavily invested in the new scheme, Chinese policy makers will soon be consumed in waging battles against soaring healthcare costs. All of these challenges are compounded by the rapidly growing number of elderly people, especially in rural areas, who are bound to overwhelm the already overburdened healthcare system in the future.

Looking abroad, China's experience over the past 30 years may offer valuable lessons for other developing countries contemplating health reforms—namely, that a market driven laissez faire approach to healthcare reform is not a panacea, and that policy makers need to be prepared for dealing with unintended consequences of any reform.

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The impact of the spending review on health and social care

A combination of spending cuts and NHS restructuring do not bode well for the future

Chancellor, George Osborne

FEATURE, p 916

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The coalition government has finally wielded its long threatened axe with results that do not bode well for the NHS and social care.[1] Spending on the NHS is to be slashed from an annual increase of 6% to 0.4% over the next four years, starting in April. Excluding the £15bn (€16.8bn; $23.6bn) to £20bn savings target, and with the promised modest increase amounting in practice to a cut in purchasing power once pay and other increases have been factored in, the key question is now whether what was announced by the chancellor will actually be implemented. By cutting public spending so far and so fast, the entire economic recovery may be at risk.[2]

If a week is a long time in politics then four years is an eternity, and a great deal may (and can) yet happen to modify, or even derail, the government's various plans for spending cuts and restructuring. At the same time, strategic health authorities, primary care trusts, and local authorities are rushing to make deep cuts, often ahead of the need to do so, which means that many of the half million public sector jobs that are to disappear will have done so over the coming months, with results that are yet to be felt across the NHS and the wider economy.

The 0.4% annual increase in NHS spending is the lowest since the 1950s, when both the NHS and the health needs of the population were very different. Back then, it was widely believed that once the backlog of ill health had been cleared, pressure on the NHS would ease and its cost would be self liquidating.[3] We know better now. Even so, in important respects the population was healthier after the second world war, with full employment a feature and considerably narrower income differences in evidence.

The NHS operates in a far more complex and interdependent world than it did when it was founded in 1948. Spending cuts affecting welfare, incapacity benefit, working tax credits, childcare funding, housing, and other areas will have a serious negative impact on the NHS and result in growing pressures on services as the fallout from the cuts is felt and the unemployed grow in number.

Current pressures on the NHS are largely a consequence of lifestyle related illnesses that are preventable. Dealing with these at source demands action far beyond the NHS, although it has an important part to play. But it is the NHS that will suffer the consequences of rising demand because of the failure to tackle the root causes of obesity, alcohol misuse, and mental ill health. That is why ring fencing the NHS budget never made sense.[4] The commitment to place-based budgeting announced in the spending review for families with complex needs is an encouraging initial sign that the government understands the cross cutting nature of health problems, although ring fencing the public health budget is at odds with such an approach.

Cuts totalling 28% over four years in local government spending will add to the pressures on the NHS. Only social care is singled out for special protection, but the funding set aside (£2bn in total, with £1bn coming from NHS funds) is not ring fenced and may be insufficient to meet the funding gap identified by the Local Government Association.[5]

The Institute for Fiscal Studies has concluded that the spending review's impact is regressive because some of the biggest losses will be felt by those who benefit most from the public services that are being cut.[6] The heaviest users of such services are the poor, and without new jobs in the private sector to absorb the newly unemployed the ranks of the poor will inevitably grow. It is also likely that the "hidden economy" in cigarette and alcohol smuggling will grow, with negative consequences for public health.

Taking the cuts to public spending as a whole, it is hard to fathom how the NHS can escape having to bear the brunt of what will become an unhealthier community as the health gap between rich and poor widens. Maintaining social welfare programmes seems to be a key determinant of future population health.[7] Unequal societies are almost always unhealthy societies, and—because health and wealth go together—growing income inequality will have a negative effect on health.[8 9] The Marmot review on health inequalities, conducted for the last government, concluded that "austerity need not lead to retrenchment in the welfare state. Indeed the opposite may be necessary."[10] Its plea has gone unheeded in the spending review.

Not only will pressure on the NHS intensify as a result of the fallout from the spending review but the NHS will find it increasingly difficult to cope as it enters a period of major restructuring that threatens its very stability and long term future.[11] Even if there was widespread acceptance of the changes, which isn't the case, the changes affect every part of the NHS and will distract attention from more pressing matters, as the workforce gears up for the most disruptive upheaval since 1974. In this situation, the attention needed to achieve higher productivity gains through imaginative system redesign is unlikely to be present.[12] Indeed, the reorganisation will require additional resources estimated at around £3bn to succeed.[13]

The effects of the spending review on health, especially in the poorest and most vulnerable groups, combined with an ill conceived "redisorganisation" surely amounts to a perfect storm. We must wait and see if the NHS can weather the gathering storm or if events, as yet unforeseen, will intervene to redirect its path.

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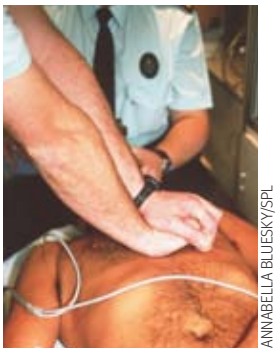
New international guidelines on resuscitation

Based on extensive review of the literature with important implications for practice



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The most extensive review of the resuscitation literature ever attempted was published on 18 October.[1] The review was performed by the International Liaison Committee on Resuscitation,[2] and was based on 277 specific questions about resuscitation; the answers were drawn from 411 systematic reviews.[3] The newly released resuscitation guidelines of various organisations throughout the world, including those of the European Resuscitation Council (ERC) and the American Heart Association (AHA),[4 5] are based on this information.

Many of the recommendations made in the 2010 ERC guidelines remain unchanged, either because no new studies have been published or because evidence since 2005 supports what was previously available. There are several new recommendations, however, that have practical implications.

Basic life support[6]: Chest compressions combined with rescue breaths remain the method of choice for cardiopulmonary resuscitation (CPR). However, "chest compression only" CPR is recommended if the rescuer is not trained (for example, in dispatcher assisted CPR) or is not willing to give rescue breaths. The aim is now to compress the chest to a depth of 5-6 cm (rather than 4-5 cm). This recommendation is based on several studies showing that deeper compressions were associated with improved short term outcomes. The risk of harm (such as injury to the victim) can be minimised by adequate training and experience.[7]

Monitoring devices that provide feedback to the rescuer about the quality of CPR may be used to improve performance, although rescuers should be aware of the potential to overestimate the depth of compression when the victim is on a soft surface, such as a mattress.[7] The compression rate should be 100-120 compressions per minute (previously "about 100 per minute").

Defibrillation[8]: Rescuers (wearing gloves) should continue compressions during the charging of the defibrillator.[9] This, combined with a rapid safety check and immediate resumption of chest compressions after defibrillation, should mean that chest compressions are interrupted for no more than five seconds. The use of up to three consecutive ("stacked") shocks may be considered if ventricular fibrillation or pulseless ventricular tachycardia (VF/VT) occurs during cardiac catheterisation, in the early postoperative period after cardiac surgery, or in a witnessed VF/VT cardiac arrest when the patient is already connected to a manual defibrillator.

Self adhesive defibrillation pads remain preferable to standard defibrillation paddles. If paddles are used, they should be used with gel pads not electrode pastes or gels (because these can spread between the two paddles, creating the potential for a spark).

Advanced life support[10]: Each patient in hospital should have a documented plan for monitoring vital signs, including criteria for escalation of care to help prevent cardiac arrest. Administration of drugs via a tracheal tube is no longer recommended. If intravenous access is not possible drugs should be given via the intraosseous route. Devices that can be used to access this route are becoming more widely available.

When treating a VF/VT cardiac arrest, adrenaline 1 mg and amiodarone 300 mg are given after delivery of the third shock, once chest compressions have restarted. Adrenaline is otherwise administered during alternate cycles of CPR. Atropine is no longer recommended for routine use in asystole or pulseless electrical activity.

Waveform capnography is the most sensitive and specific way to confirm and continuously monitor tracheal tube placement, to monitor the quality of CPR, and to provide an early indication of return to spontaneous circulation.

The real time use of echocardiography enhances the diagnosis of potentially reversible causes (such as cardiac tamponade, pulmonary embolism, myocardial ischaemia, aortic dissection, hypovolaemia, and pneumothorax). Once a return of spontaneous circulation has been established the inspired oxygen should be titrated to achieve an oxygen saturation of 94-98%. In patients with a sustained return of spontaneous circulation, protocol based treatment of the postcardiac arrest syndrome is recommended. Such protocols should include the use of primary percutaneous coronary intervention; treatment of blood glucose values greater than 10 mmol/l while avoiding hypoglycaemia; and induced hypothermia for survivors of cardiac arrest who are in a coma, irrespective of initial rhythms.[10] The techniques used to predict long term neurological outcome in people resuscitated from a cardiac arrest are not as reliable as previously thought, especially in patients treated with induced hypothermia.

The advanced life support (ALS) and paediatric advanced life support (PALS) algorithms have been revised to reflect the changes listed above, and to focus on the recommendations considered most important.[10 11]

Paediatric recommendations are aligned with the advanced life support recommendations above, but also include a new table for calculating tracheal tube sizes, and the administration of a second dose of amiodarone with adrenaline after the fifth shock.[11]

Education[12]: Short video and computer self instruction courses with hands on practice are an effective alternative to instructor led basic life support courses. Basic and advanced life support knowledge and skills deteriorate in as little as three to six months. Frequent assessments will identify people who need refresher training to help maintain their knowledge and skills. More emphasis on non-technical skills such as leadership, teamwork, task management, and structured communication will help to improve the performance of CPR and patient care.

The ERC recommendations are a guide to management rather than a prescription. Because consensus guidelines need to be developed even when only limited data are available, some of the changes are philosophical rather than strictly evidence based. Those are the ones that will probably cause the most controversy. Many challenges remain, including tackling the persistent large geographical disparities that exist for outcomes of cardiac arrests; increasing the quantity and quality of bystander CPR; showing that our educational strategies result in long term maintenance of knowledge and skills; effectively and swiftly implementing the new guidelines, and confirming that they translate into survival benefits.