standard WHO solution, as proposed by the authors, is debatable.

Should reduced osmolarity solution replace the current WHO oral rehydration solution as the new "standard" or should there be two standard solutions, one for regions where cholera is endemic and another for everywhere else? The balance of evidence as highlighted by Hahn et al's study indicates that reduced osmolarity oral rehydration solution is superior to standard WHO oral rehydration solution in certain relevant aspects. Yet it probably falls short in overcoming the major obstacle of improving acceptance and compliance by sweeping away misguided perceptions of the lack of efficacy of oral rehydration solution. The benefits of reduced complications associated with intravenous infusion (not just rate of infusions) compared with an incompletely defined risk of symptomatic hyponatraemia with reduced osmolarity solution in children with cholera are not known and make it difficult to promote reduced osmolarity solution alone in areas where cholera is endemic. In this context, reduced osmolarity oral rehydration solution is an important and meaningful step but not a leap forward.

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Umbilical cord blood banks in the UK

Have proved their worth and now deserve a firmer foundation

Allogeneic stem cell transplantation has revolutionised the outcome for a wide range of malignant and non-malignant haematological conditions.[1] Of the sources of stem cells, umbilical cord blood, obtained from the placenta directly after delivery, is enriched in stem cells and has a higher proliferative capacity than cells obtained from bone marrow and peripheral blood.[2 3] Like any blood product, however, stem cells from cord blood need an infrastructure for collecting, banking, and matching the donations.

Several cord blood banks and registries have been formed internationally (four of them in the United Kingdom) which collect the cord blood products and perform cryopreservation, tissue typing, and viral assessment. These products can then be accessed after a search of the internet linked databases and the cryopreserved product transported to the transplant centre for use.

Marrow engraftment can occur quite quickly after infusion of cord blood, although it may be delayed in some instances—this depends largely on the cell dose in the sample and the size of the recipient. In the largest series, reported by Rubinstein et al, 562 recipients were transplanted with products matched for at least four of six unrelated cord blood donor HLA-A, B, and DR antigens, and the average time to engraftment was 28 days for neutrophils and 90 days for platelets.[4]

Stem cells from cord blood have been used with considerable success in various haematological and immunological disorders.[5] Generally the best results are seen from cord blood donations from HLA-matched siblings, with 63% of recipients alive at one year. The results are less favourable in patients who receive cord blood transplants from matched unrelated donors, with survival of 30% at one year, though many of the early cases were in very poor risk categories.

Cord blood grafts have largely been limited to children and young adults because the size of the graft has been restricted by the relatively small numbers of progenitors in a given donation. This has led to the attractive concept of expanding the number of progenitors in cord blood in vitro before transplantation. The advantages of cord blood compared with other stem cell sources include ready "off the shelf" availability, no risk to the donor, low rate of viral contamination, and a likely reduction in graft versus host disease, which will allow less rigid HLA matching of donors and recipients.[6]

Cord blood's major advantage of a reduction in the incidence and severity of graft versus host disease is under intensive study.[7] In one study which compared 113 recipients of cord blood from HLA identical siblings with 2052 recipients of bone marrow from HLA identical siblings the relative risk of developing graft versus host disease was significantly lower for the recipients of cord blood.[6] The likely explanation is that T lymphocytes within the donation are immunologically naive and have an altered intracellular cytokine profile compared with adult blood cells, particularly in the production of interferon γ and tumour necrosis factor α.[8 9]

In Britain cord blood banking has evolved largely because of the interests of particular researchers and clinicians—those in the blood transfusion services interested in providing a bank and those in specialist centres interested in various aspects of transplantation. Four NHS banks have been set up, in London, Newcastle, Belfast, and Bristol. The largest bank is housed by the National Blood Service Unit in north London, where the aim is to create a bank which has a broad based ethnic distribution to provide cord blood for such populations. In Bristol the interest was sparked by experimental haematology and transplantation work. Our own centre in Newcastle was formed to collect from Northern region donors and provide a bank that reflected the mix of tissue types in a relatively static, predominantly white north European population. Our calculation was that with 1000 cord blood samples in

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our bank, under constant replenishment, we could provide a donation matched for more than 5 HLA antigens for a high proportion of local patients. A recent review of 50 consecutive patients with acute leukaemia seen at the Royal Victoria Infirmary, Newcastle, showed that from our bank (which currently has 630 donations) 15 of 50 received a 6 out of 6 HLA match and 22 had a 5 out of 6 match. The issues remain that of volume[10 11] and the potential for use in adult patients, something undergoing further investigation in both Bristol and Newcastle.[10 11]

The true value of a cord bank was seen in a recent case where a baby with severe combined immunodeficiency was born in Dublin, diagnosed on day 10, transplanted with a 6/6 matched cord blood in Newcastle on day 20, discharged four weeks later, and six months was haematologically and immunologically normal.[12] To date, more than 40 cord bloods have been issued by the British banks for use in Britain and internationally.

The evolution of cord blood banks within Britain has achieved adequate geographical coverage and level of interest from transfusionists, experimental haematologists, and immunologists linked to transplant centres. So far, however, funding has been inconsistent, with money coming from the National Blood Service, regional health authority grants, and research charities. Now that the technique of cord blood transplantation and these banks have proved their worth the time has come to provide a more coordinated and secure financial infrastructure.

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Bridging the quality chasm

To improve health care we need to understand the motivations of those who work in it

Earlier this year the Institute of Medicine issued another report on health care quality, following its much heralded report on patient safety in 1999. *Crossing the Quality Chasm* is unequivocal in its assertion: the defects of American health care are so widespread that they detract from the "health, functioning, dignity, comfort, satisfaction, and resources of Americans."[1] The report fails, however, to create an equally compelling vision of how health care in the United States can be transformed. We are not given a sense of how hundreds of thousands of healthcare workers will be engaged in this enormous task.

The authors of this report characterise their earlier one, *To Err is Human: Building a Safer Health System*,[2] as a "small part of an unfolding story of quality in American health care." Yet that report, on medical errors, provoked universal, dramatic calls for action, while this latest report has received only a subdued response. Perhaps to the public and those who provide their care the quality problem is "old news." Or perhaps the problem is too large and too close to grasp. The indictment of our current system acknowledges both the tremendous advances in medical science and the good intentions and dedicated work of the vast majority of care givers. Nevertheless, the report describes a system that is wasteful, often redundant, and lacking even the most basic information systems to support clinical care. Patients see long waiting times, delays, errors, and unnecessary services that pose risk without benefit. The authors contend that mergers, acquisitions, and downsizing in health care has led to little or no substantive improvement in the patient's experience.[3]

To rectify this situation the report offers six key characteristics for ideal health care (see box). The report exhorts employers, professional organisations, educators, regulators, payers, and the Department of Health and Human Services to create "an environment that fosters and rewards health care that is evidence based, facilitated by a sophisticated information technology, where quality is rewarded, and where the work force is prepared for rapid change in the interest of better service to patients."

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