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Primary Trauma Care

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Summary

The Primary Trauma Care programme is a course designed to train anaesthetists, surgeons and others in the systematic review and management of severe trauma victims at the District Hospital. Over the last 10 years, many individuals have been involved in training, empowering and supporting doctors and nurses in a number of countries. Local programmes and training courses are increasingly co-ordinated by regional offices in South America, India, China, Indonesia, the South Pacific and Africa. The Primary Trauma Care Foundation continues to support these regional offices in their need for qualified instructors, fund-raising, and for updating educational material. With anaesthetic support, the Primary Trauma Care Foundation will continue to empower anaesthetists worldwide as they work with their surgical colleagues to treat severely injured patients in areas where, previously, due to inadequate resources and training, comprehensive treatment was not available.

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Trauma is the second most common cause of death in the income-generating age group worldwide. The increasing incidence of trauma affects all parts of our society. Both in the developed and in the developing world, natural and man-made disasters continue to dominate our headlines. Road traffic accidents, civil unrest, assault and domestic injury take an increasing amount of a country's resources as well as a tremendous amount of time and effort on behalf of the medical and nursing staff to treat and improve survival [1].

As anaesthetists have not traditionally been the first medical contact of severely injured patients, the training and education they receive in managing the severely injured patient is often poor. The College of Surgeons in America produced the Advanced Trauma Life Support System (ATLS), which is now adopted in most developed countries as a well-established protocol system for treating severely injured trauma patients. Increasing numbers of anaesthetists have been involved in the training on the ATLS course and their involvement has broadened the scope and the appeal of such courses. The anaesthetist has brought in a depth of training and understanding of the physiology of the human body, as well as great expertise in airway and breathing management

Many industrialised countries including North America, Western Europe, and some major centres in Africa and Asia have adopted the ATLS system. After more than two decades of developed world expansion in trauma care management, it is appropriate to question and validate the use of such a trauma system [2–5]. The concept of a well-oxygenated, stabilised patient, with in-line immobilisation of neck by a hard collar and neck support, with intravenous access, on a hard trolley for helicopter transfer for definitive care, is a commendable and highly desirable goal for any health systems that can afford it.

The trimodal distribution of deaths described in the ATLS system with a 'golden hour' when early intervention is associated with improved outcome appears to be an appropriate model in developed countries with a mature transport, communications and healthcare infrastructure.

The question we need to ask ourselves is, if the primary and secondary survey addressed in the ATLS system is of benefit, should it not be introduced into all countries?

The reality of trauma management in developing countries is, however, substantially different. The reasons for these differences are multifactorial, but they include geographical factors, relative lack of resources, funding, manpower and education. The trimodal distribution

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described by the American College of Surgeons simply does not work in most parts of the developing world. The so-called 'golden hour' must be extended into the 'silver day' or the 'bronze week'. The stabilised patient on a firm trolley for transfer for definitive care mentioned above usually does not exist. In addition, the concept of treating people in intensive care for complications for trauma is often unrealistic in the developing world with minimal resources.

The ATLS system is probably not only inappropriate in remote rural locations, but it is expensive, and the notion of sending medical staff to attend a 2-day course costing US$400–800 is quite simply a waste of resources in countries with a health budget of $20 per person per annum or less.

The Primary Trauma Care (PTC) programme was designed to train doctors and nurses in the management of the severely injured patient at the District Hospital level, where resources and manpower are often limited.

The PTC programme is designed and run by anaesthetists, accident and emergency physicians and surgeons in any country that requests the Primary Trauma Care Programme [6, 7]. The first Primary Trauma Care course was run in Fiji and the South Pacific in 1997 as a pilot study. The PTC manual is now available free on the Internet, and since 1997 has been translated into many languages including English, French, Chinese, Vietnamese, Spanish, Indonesian, Urdu, Arabic, Mongolian and Portuguese.

The PTC Programme

The Primary Trauma Care 2-day programme is designed to train doctors and nurses working in the rural environments to treat the severely injured patients with the resources that are available to them. Clearly, the introduction of such a programme needs to be centrally based initially and the first few courses are generally held at big academic institutions, empowering the local academics and educationalists in the concept of the PTC programme.

To train instructors, a 1-day Instructor Course is held after the initial 2-day PTC course, and potential instructors from the 2-day PTC course are encouraged to attend and become future trainers. Ideally, the newly trained instructors will then immediately go on to run a further 2-day PTC course with the help of the external instructors.

This introductory programme is known as the '2 : 1 : 2' model and is held over 5 consecutive days in a week. By the end of the first week of Primary Trauma Care and Instructor courses, a group of interested people with cross-speciality interests are asked to form a Primary Trauma Care Committee to plan subsequent courses in that Region. The rapid introduction of the Primary Trauma Care Course and the devolution of responsibility of training to the local doctors and educationalists make it vitally important that information is efficiently taught and retained during the comprehensive training programme.

The essential differences between PTC and other trauma care systems include:

- PTC is a 2-day course aimed at doctors and other healthcare workers working in rural environments.
- PTC aims to train people in the basics of the 'two-look' primary and secondary survey within the context of their experience and time restraints, especially in locations where equipment such as oxygen, hard collars and CT scanners are not readily available. The PTC programme concentrates on using minimal resources to maximum effect.
- PTC teaching is rapidly handed over to local instructors, thereby empowering local doctors and nurses early in the programme.
- Unlike other trauma systems, the PTC Course is offered free to all countries that wish to use the PTC programme. The PTC manual is also freely available on the Internet and the Primary Trauma Care Instructor packs are available free of charge. This is to ensure maximum uptake of the programme, in contrast to other trauma programmes which are prohibitively expensive and restricted in circulation, therefore reducing their exposure.

More information can be found on the website http://www.primarytraumacare.org.

Primary Trauma Care has been active in several regions worldwide.

South Pacific

Fiji was the venue for the first 3-day PTC course in 1996. In 2001, AusAID (the Australian Government overseas aid programme) and the World Federation of Societies of Anaesthesiologists (WFSA) sponsored visits, after which PTC was run independently in Fiji. The PTC programme in Fiji now consists of two courses per year for graduating medical students, one in Lautoka and one in Suva, administered and financed by the Fiji Ministry of Health.

PTC began in Papua New Guinea in 2002 under the auspices of the Australasian College of Emergency Medicine with assistance from the Australian Society of Anaesthetists.

Courses have also been held in the Cook Islands, Solomon Islands, Palau and other areas.

South-east Asia

PTC was established in Indonesia in 2001 and by the end of 2006 there had been 58 PTC courses training over

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1500 health workers. Most of those trained are doctors working in regional areas. Included in this figure are two courses run in East Timor by PTC Indonesia.

The first PTC course in Vietnam was held in 2002 in Ho Chi Minh City. This was followed in 2004 by the establishment of PTC programmes in Hanoi and the central provinces of Vietnam. There are now over 20 Vietnamese-speaking instructors. This successful programme was initiated by the WFSA and continues with the support of the Hoc Mai Foundation and Rotary.

Asia

PTC began in India in Vellore, Tamil Nadu, in 1999. Over the past 8 years a number of PTC courses have been held, but there is no formal programme in place in South India.

In Pakistan, PTC was initially established in 2004 as part of a joint project between PTC Foundation, the IDEALS charity and the Government of the North-west Frontier Province. Following the initial courses, a PTC Board of Governors was established and numerous courses have been run in this province, which has a history of natural disasters and conflict. PTC has expanded in the Sind area, as well as into the Punjab areas.

Following the successful introduction to PTC to Pakistan, PTC Delhi was commenced in November 2005. This involved visiting instructors from Pakistan and the UK. Up until the end of 2006, four PTC courses had been run in Delhi. PTC Delhi has dedicated office space, paid secretarial staff and a strong instructor base.

Mongolia had its first PTC course in 2005, and a second course and instructor course was held in June 2007.

Growth of PTC in Sri Lanka, Nepal and Iran continues. Sri Lanka PTC continues in the North and South, with an active programme including prehospital PTC for paramedics.

Nepal PTC is organised through physicians and anaesthetists, who have run 27 courses in the last 3 years. A recent PTC start in Tehran, Iran, has been very successful, with 12 courses run in the first 6 months.

The first PTC Regional Conference was held in January 2007 in Lahore, Pakistan, with over 100 delegates from Pakistan, Sri Lanka, Nepal and India. This conference discussed a selection of topics over the 3 days, including PTC expansion, training materials, closer interaction and growth and sustainability. The second

An anaesthesia challenge

M. Z. B., Anaesthetic officer

In January 2007, we experienced a road traffic accident that claimed 67 casualties and with three deaths from a bus that collided with another at a stiff junction in the National Park. By 7.30 am, news broke that an accident had occurred and we were on stand-by to receive casualties. Our outpatient department, which serves as a casualty unit, has six examination tables and our surgical ward has 46 beds but the majority were occupied.

The greatest challenge came from 10 patients of the 67 casualties who needed urgent attention as some had head injuries with multiple fractures, fractured ribs, severe bleeding from cut wounds and others were unconscious without definite injuries.

The hospital has two anaesthetic officers that were mobilised and attended the casualties using ABCD criteria.

A decision was reached by the surgeon and the anaesthetist to treat a 34-year-old multiply injured patient who was deteriorating with Galsgow Coma Score (GCS) of 8/15 on admission. Her blood pressure was 80/50 mmHg, pulse 120 beats.min^{-1} and she was bleeding profusely from scalp wounds.

Blood for haemoglobin, grouping and cross-match was taken. An intravenous line had been established and she was given 3.5 l of normal saline in casualty.

The patient was taken to theatre for surgical toilet and suturing, decompression and immobilisation of fractures. The anaesthetic technique was general anaesthesia with intubation; she was premedicated with atropine, induced with ketamine, and anaesthesia was maintained with ether. The operation lasted for 4.5 h. At this stage the other anaesthetist was dealing with another patient in the second theatre.

To my surprise and as a challenge, two mothers presented with fetal distress, which required the same theatres with the same anaesthetists who were still working on the other patients. I knew the implications of fetal distress and the ongoing surgery, but I didn't have the option to refer the mothers to another health facility as the nearest was 56 km from the station and had no doctor at the time. Equally, I couldn't abandon the already anaesthetised patients to attend to the fetal distress.

We continued with the surgery as quickly as possible and the two road traffic accident patients recovered from anaesthesia well. The two mothers were sectioned immediately after and the babies were born in good condition. Thank God for sustaining the babies while we attended to the trauma patients.

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Asian PTC conference is planned for Sri Lanka in early 2008.

China

Four pilot PTC courses were run in China in 2002. These courses, which were supported by the WHO, resulted in PTC Foundation signing a Memorandum of Understanding (MOU) with the Ministry of Health to run a 3-year PTC programme in China. The funding for this huge venture is being slowly negotiated. If successful, PTC will work with the Ministry of Health in Beijing to introduce the course into senior teaching hospitals in each province, which will serve as centres for subsequent PTC training.

The expectation is that initially PTC instructors will be brought in worldwide to train in key institutions, through translators. As soon as possible, training will continue with Chinese PTC instructors to do the training, and the PTC Foundation will continue to work with the MOH to advise on audit and quality control.

Africa

The PTC course materials were initially developed with Africa in mind and the majority of early courses were held in Africa. PTC courses have been held in Tanzania, Kenya, Uganda, Nigeria, Sierra Leone, Zimbabwe, South Africa, Malawi, Rwanda and Lesotho.

Unfortunately, PTC programmes have not been sustainable in many of these countries.

Even with the low cost of running PTC courses, they do rely on local instructors who have the time, motivation and ability to take time out of their own practices to teach.

In 2005/6, there was significant activity in Lesotho, Malawi and Rwanda.

In December 2005, a week-long PTC programme (in the 2 : 1 : 2 model) was run by the PTC Foundation at the request of the Rwandan Ministry of Health and the local WHO representative. Two courses (54 participants) and an Instructor course for 11 were held. The new instructors come from a variety of backgrounds. The prospects for PTC in Rwanda are bright.

A summary of PTC activity in Africa over this period reveals the reasons why PTC has not been as successful in Africa as in other regions. Recommendations include:

- PTC should build stronger links with and between PTC representatives in each country;
- Encourage surgical involvement as surgeons are often the natural leaders in African medicine;
- Adopt the '2 : 1 : 2' model when introducing PTC to a country.
- Make fund-raising for PTC Africa a priority.
- Make every attempt to link up with local Ministries of Health and WHO representatives.

Mr David Oloruntoba is a Nigerian surgeon who has been appointed to the role of Regional Representative for Africa.

South America

Over the last 5 years, the WFSA have funded courses to run in Paraguay, Ecuador, Venezuela, Suriname and Chile. A PTC course is planned for Panama in 2007.

PTC courses are run for undergraduates in Paraguay where there are surgical PTC instructors active. The first PTC South American conference was held in January 2006 in Chile, where the future expansion of PTC was discussed, as well as different countries giving their reports and feedback.

In many areas PTC has not expanded. The reasons for this are multifactorial, including lack of corporate external sponsorship, lack of funds to free clinicians to travel and train on courses and, in one area, concern that the PTC materials are not appropriate. The wide variation between tertiary teaching hospitals and rural health clinics is marked, and any trauma course, including PTC, is going to find it difficult to be appropriate for every level.

World Health Organization (WHO)

The WHO has recently included the Primary Trauma Care manual in its new publication called '*Surgical Procedures at the District Hospital*' [8]. This comprehensive manual presents the Primary Trauma Care manual as an Appendix for quick reference and convenience.

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