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26/07/2012

Delivering Quality Surgery. What has Trafalgar taught us ?

Thank you for inviting me to address your meeting. This is the first time that I have attended a *Medecine de la Personne* conference, but I have been aware of the organisation for some time, and know, understand and fully subscribe to your objectives.

My task is to provide a surgeon's perspective on how we might best deliver a quality service to our patients in times of austerity. These are my opinions and don't necessarily represent views of any organisation with which I am associated. My background is as a general and gastro-intestinal surgeon, with is nothing out of the ordinary. However, my experience has come from working over three continents with vastly different systems for healthcare delivery, and from working in private systems, independent public systems, nationalised health services and focussed expeditionary trauma management systems. Despite differences between these locations, there has always been a bottom line of accounting for expenditure and managing with limited resources and with limited budget. There is no surgical service or indeed, healthcare systems, that operates with a limitless budget. There will never be enough time, enough expertise or enough equipment to meet the demands of our patients. That stems from our human nature to always want more, always want better and always want bigger. And that demand comes similarly from the patients themselves and from healthcare providers.

So to my first question :

Do I need the best ? Is good adequate ? Can we all have the best ?

A former British Prime Minister, once said with regard to education policy : 'I want every student in Britain to have above average results'. Those savvy statisticians amongst you will know that it is not possible for all data to be above the average of the population. This is the car which I used to get here. It is a high quality, reliable and safe European-built vehicle, about 7 years old. I am totally satisfied with it and am confident it can carry my family safely and comfortably. But it is without doubt not the best. You might not necessarily agree with my choice, but this is a top-of-the-range, state of the art, latest, car, which could be built to my exact requirements at much greater expense. With my limited resources, I have chosen not to get the latest and the best car, and the principle applies to surgery too.

In the last 25 years laparoscopy has become a desirable technique for managing groin hernia. Because of the technology required, it is expensive, uses complex equipment and single-use disposable kit. Compared with older techniques, laparoscopic surgery needs a general anaesthetic with muscle paralysis. However, the post operative pain a patient experiences and the time to return to work is not necessarily better when compared with a less expensive technique using local anaesthetic and an open approach. Is good adequate ? What is good enough ? What operation would you want personally, or for your beloved ?

Limited Resources. Rationalising choice.

There are many financial choices to be made delivering quality surgery in austere environments. Let's return to the hernia repair. Lichtenstein and others showed in the late 1980s that by using a prosthetic mesh in a hernia, long-term recurrence which used to be a major issue, could be reduced from >20% to <1%. It was inevitable that the added expense of mesh would ultimately save healthcare money. Today inguinal hernia repairs are almost never done without mesh placement. However the choice of mesh has expanded. There is still the original Bard polypropylene mesh, and many generic versions. There are also composite meshes, which cost much more than the single material. They are advertised as being thinner and more comfortable than the original, but out beyond the first 3 or 4 months following repair, it is uncommon for any patient, whichever mesh has been used, to have problems with thickening and comfort. The issue here is whether the added expense of the latest mesh can be justified.

These arguments can be extended to wound dressings where there is a plethora of expensive drug infiltrated materials, too many for me to completely understand. Their costs are substantial, and ongoing. But if basic science and principles behind the physiology of wound healing are addressed, one can rationalise care down to a handful of simple principles. Don't get me wrong, the expensive proprietary dressings also address these principles. But one can keep costs comparatively low by using 'old fashioned' cheaper dressings, and selective expensive dressings.

My example here is of war wound management. By removing all necrotic tissues and by formal and structured checking for missed necrosis with further debridement; then by keeping wounds moist so that healthy tissues don't dry out and die, wounds have the best chance to heal. We do not use complex impregnated dressings, but do use water-tight seals, and negative pressure to evacuate exudation and minimise oedema.

This is a topical negative pressure dressing system. It consists of a portable vacuum apparatus, a container for collecting exudate and a dressing that allows transmission of the negative pressure to the wound surface and removal of exudate. The dressing needs to adhere to healthy tissue and not to the wound surface. And as financial austerity is our discussion today, these dressing kits are expensive, but partially reusable, and costs of the consumables still significant. But frequency of dressing change is relatively low, sometimes twice weekly, or less.

Let me dwell on the area of expeditionary surgery. If a surgical team operates a long way from the suppliers of surgical equipment, logistic support needs to be efficient. Austerity far from home is highlighted through firstly limiting the range of equipment and quantity. That stated, surgical outcomes in remote areas can be just as good as in the best institutions. The British Hospital in SW Afghanistan has trauma outcomes that far exceed the outcomes expected when internationally recognised trauma grading tools are applied to its patients. In hospitals like Bastion, expertise is not rationed, but equipment is limited to agreed lists. Every surgeon, anaesthetist and nurse has

preferred types of tools : here they accept a common set and through a combination of training, experience and expertise, they can use the defined limited equipment to achieve excellence. There is no place here for the prima donna who wants a particular instrument, but there is space for the experienced person who can adjust his or her approach to use the resources available to their and their patient's advantage (we are reminded of the parable of the talents in Matthew chapter 25).

Apply this to any austere environment, and the outcomes probably don't rely on the range of equipment, but on the expertise and experience of the user.

What technology is proven ?

There are endless clever ideas and technologies in the world of surgical intervention. No doubt many work. But are they justified in financial austerity ?

How does one decide whether to take on a new technology or technique in time of austerity ? It is unethical not to offer better surgical treatment if it is available. Robust critical analysis of surgical literature will help us determine clinical benefit, or indeed whether an advertised better technique is indeed better. Astute engagement with suppliers will yield a cost for a treatment. Integration of these often relies on common sense and experience.

Attempts have been made to quantify the relationship between cost and clinical outcome from use of quality of life and added years assessment tools at the individual level. For larger populations, there have been systems assessing cost and benefit ratios for whole jurisdictions such as the Oregon Health Plan in USA and National Institution for Health and Clinical Excellence(NICE) in UK. These organisations attempted to ration treatment modes and guide us clinicians. But it should be our own critical analysis of new technology that finally determines how we adopt it.

Let me pick a surgical example and apply my personal perspective: laparoscopic cholecystectomy (removal of the gall bladder via key-hole surgery). The open incision carried morbidity, was painful, and was associated with admission to hospital for a number of days. As a result there was a population, especially of elderly patients who had biliary disease, but who did not seek surgical treatment. With the advent of laparoscopic cholecystectomy, the risks were reduced especially where associated with the wound. And bed occupancy was reduced with a concordant financial saving.

In contrast, with laparoscopic hemicolectomy (removal of part of the colon, usually for cancer), key-hole surgery takes much longer when compared with the more traditional open approach, and the equipment and single-use instruments are far more expensive. From a cancer perspective, there is no difference in outcome or in the speed of return to normal activity, although early pain scores are lower for key-hole surgery. Importantly, the length of stay in hospital is a few days for key-hole surgery versus a week or more for open surgery. There is a significant saving in bed occupancy, but at a cost of time spent in theatre. The more proficient a surgeon is, and the quicker he works, the cheaper the operation. Unlike the cholecystectomy example, the clinical benefit for the patient is marginal. The main benefit is a financial saving through reduced admission length, which might lead to reduced demand on hospital beds, or assuming beds are not closed, to the capacity to treat more patients for the same healthcare spend.

Stream-lining protocols/care pathways

For as long as I have been working in surgery, there have been pressures on surgical resources. The most expensive of these are bed spaces and operating space. In the British NHS, bed costs are typically £250-400 per day and £25-30 per minute respectively. It is therefore not surprising that there has been a progressive reduction in these resources. And unsurprisingly, the demand for services provided by the NHS has not dropped. I also believe that the quality of surgery has not dropped, and might have improved. How do we explain this and does it tell us how we can cope with financial austerity ?

So let's consider bed days. Patients occupy beds when they are recuperating or too unwell to be out of hospital. Patients also occupy hospital beds when they are waiting: waiting to be assessed, waiting for a scan or a test, waiting to be operated on; waiting to go home. By streamlining care pathways, this bed occupancy can be reduced, possibly to the actual advantage of patients.

Various models have been validated for elective surgery : organisationally, undertake clinical investigations where possible as outpatients; put a patient through the admission process as an outpatient well before surgery; bypass the ward before surgery and come straight to the operating suite. Clinically, minimise physiological derangement before, during and after operations through judicious fluid management, gentler anaesthetic techniques, and question historic dogma such as fasting and bed-rest after operations. These approaches have come to be known collectively as Enhanced Recovery and have been applied to almost every surgical specialty.

Models applicable to emergency referrals are also being developed. Improving triage with more senior input earlier means that admissions can be delayed or avoided, through entry onto an elective care pathway. Earlier senior input negates the need for multi-level junior input, saving assessment time for patients and man-hours for staff. Rather than be admitted to a ward, have non-operative reduction and then wait for a scheduled operation, a patient with an acutely incarcerated hernia could have it reduced as an ambulatory patient, not be admitted to await surgery, but go home and return directly to an operating theatre reception area for an operation the next day. Applying these principles in a large UK teaching hospital has resulted in an average bed occupancy reduction for all emergency admissions from 6.5 to 4.1 days, and you can guess the cost savings, both in terms of money and the absolute need for beds. Benefit to the patient : a shorter admission, reduced exposure to hospital acquired infections; faster rehabilitation because there is less resting in bed. Cost to the patient : more commuting to hospital, but next-of-kin would probably have done this anyway. Pathways are being developed for all common emergency admissions from fractured hips to acute biliary disease to simple subcutaneous abscesses.

Certainly in the UK, it is financial imperative that is driving this, but changes in training would have led to these changes in the longer term. This is because the number of trainees will be reduced in re-organisation of the surgical career paths. There will be fewer trainees to do work. The new pathways bypass double handling of patients, and that too frees up financial resources for other aspects of care of surgical patients.

The Cost of Experience and Training

The technical principles of surgery are not especially complicated, and it is possible to train operatives to undertake many procedures. In the UK, many surgical procedures have been successfully transferred to other non-surgical groups to address increased demand and reduce costs. Endoscopy, podiatry and hernia repair are good examples. The technical outcomes are

typically equal (and some would argue superior) compared to those procedures undertaken by surgeons. The case for others doing these procedures is irrefutable. So if the cost of training in terms of time and experience is less, then the cost of the operator in terms of salary and benefits should be less.

In order to support these cases and many other management encounters, we have developed 'care pathways', prescriptive recipes for the investigation and treatment of patients. The decision making in a pathway is supported by objective results from sometimes sophisticated testing. Business cases that drive these evolutions in treatment show that there are financial advantages in following a predetermined pathway through a diagnostic pathway and treatment. Routine work is delegated to the less experienced without change in outcome.

I have argued here that we don't need to train our healthcare providers to the same level as we might have in the past. I have argued that we don't need lots of experience and training. The argument is valid when the clinical case is straight forward and uncomplicated. Experience is only needed when things go wrong. A comparable system that is often used in this argument is a pilot flying a jet-liner. It is quite possible to use automation to fly a plane around the world: taking off, reaching cruise altitude, and even landing. The possibility of unmanned aircraft is indeed a reality today, but not quite here yet for commercial passenger travel. In modern commercial air travel, the pilot works as a supervisor, undertaking mundane checking and his/her expertise is only drawn upon when there is a problem.

Does this model apply in the provision of surgery ? Is it possible ? Is it practical ? Is it cost effective to train staff to a lower standard, as a lower cost, and then use an experienced supervisor to deal with problems ?

I am really not sure. Unlike the airline industry, much of clinical practice concerns the management of incomplete information sets or uncertainty. Patients present in such variable ways, and an experienced doctor uses clinical skills to distil these uncertainties while at the same time remaining alert to the atypical presentation which might represent an unusual presentation of a common condition or a rarer condition. Certainly in emergency situations, there is also a need to develop a situational awareness to enable prioritisation within a clinical treatment pathway of a patient, and to prioritise care for many patients where there is more than one patient.

In trauma management and in major incidents, we typically assign the most experienced surgeon not to operate, but to triage patients, to oversee care and so prevent missing problems.

Until the nineteenth century, surgeons have been trained, not within academic institutions, but by apprenticeship. William Beatty, Nelson's surgeon at Trafalgar, had earned his position and status from many years on the job as a surgeon. He joined the Navy when 18 years old as a 2nd surgeon's mate, progressing to 1st surgeon's mate and thence to surgeon. His standing as a surgeon would have been based on his ability and decisiveness. He was judged on speed of amputation, a vital attribute in an age when anaesthesia was unknown ! Beatty was formally educated as a doctor, gaining a university degree, but not until years after he gained his fame as the surgeon to Nelson.

Thankfully those days have passed, but the principle of experience and technical capability remain, among other more academically based attributes. I judge trainee surgeons not only on academic knowledge and competence, but on the ability to see and follow the anatomical planes between tissues, and to unpick the folds and twists that embryology and evolution, even creation, have evolved to make our being, and on the gentleness of tissue handling. These take time to develop, and therefore came at a cost, both financial and to the patients on whom the trainees might have learned.

Experience come at a cost : financial to the consumer, time to the trainee and discomfort to the patient on which the experience is honed. Do we need it ? Without doubt ! And, in times of limited financial resources ? Certainly ! Why ? It enables us to remained focussed on the task at hand when the less experienced are negotiating the mire of process. Surely that should save our limited resources !

Ethics of best versus good enough?

And now to the matter of expectation management. It is all very well to consider in a conference presentation various approaches to rationing in a financially austere environment. Engage with the general public and novel and intellectual approaches take on emotive dimensions. We all want to have the best and, as I said earlier, we all expect to be above average. Our politicians can teach us something here : stay away from the unpopular reality; leave it as the ignored and proverbial elephant in the corner.

Expectation management, though, equally involves our staff, our colleagues and us, ourselves. I believe this needs a centre-out approach, and we as individuals must be convinced by our own understanding of how we operate in our environment, that we are providing quality and safe surgical care for our patients. We convince ourselves through critical appraisal of others' analysis of the same issues. We critically analyse our own values, and where necessary and practical audit our practice for quality outcomes. We show those around us that we are driven to deliver quality whilst applying a pragmatic philosophy to limited resources. It all comes down to our own confidence that what we are doing is right and proper. I have argued that a less costly approach to some surgical procedures is eminently acceptable. This approach is applicable as much in first-world Europe as in the third world. Cost is independent of quality, and it is quality which we pursue.

Is it ethical to overspend to get a fringe benefit unrelated to the spend?

Earlier, I raised the issue of expertise and experience in managing in an austere environment. I also raised the economies of not necessarily using the latest, the best or proprietary materiel. So I want to finish by leaving you with an ethical question. If a major supplier provided certain advanced surgical equipment at a much higher price compared with a smaller supplier, which one do you choose ? But what if that major supplier then provided support to enable you to conduct specialist training for your staff or trainees? Would the added cost of training justify the spending on the more expensive equipment ? What if this added cost limited the number of patients you could treat ? Would the training that enables you to rationalise your expenditure justify added costs. And should those added costs be attributed to the cost of a procedure ?

Thank you for your invitation to speak.