

Conference on ‘Malnutrition matters’

Pennington Lecture

Teams, strategies and networks: developments in nutritional support; a personal perspective

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Chris Pennington was an archetypal team player, strategist and networker. Clinical nutritional support has progressed remarkably since the 1970s and it has been a privilege to work in this field over this period during which teamwork, strategy development and networking have been crucial. British experience has been characterised by groups of individuals of differing professions and specialties coming together to enable progress to be made. This approach was initially in the form of nutrition support teams orientated to patient-centred ward-based care, then as hospital strategic committees and the concept of the ‘patient journey’. Indeed, the formation of the British Association for Parenteral and Enteral Nutrition (now known as BAPEN) in 1992 required the statesmanlike burying of jealousies as societies came together into a multiprofessional association. With the understanding that disease-related malnutrition was highly prevalent it became apparent that it must be managed on a broad and organised clinical front. In the Organisation of Food and Nutritional Support in Hospitals a group of professionals developed for BAPEN concepts of hospital-wide organisation to tackle malnutrition that were based on previous reports, both national and international, and were made easily accessible from the BAPEN website, especially the ‘Malnutrition Universal Screening Tool’ and the National Institute for Health and Clinical Excellence nutrition guidelines. The coming together of six national clinical societies to develop evidence-based consensus guidelines for intravenous saline therapy (also on the BAPEN website) has shown that BAPEN can catalyse opinion well beyond its own nutritional constituency. In England Chris Pennington’s Scottish lead is being followed by developing a patient-centred strategic framework for a managed home parenteral nutrition and intestinal failure national network. In research, education or clinical practice the engines of progress have been teams, strategies and networks.

Nutrition support teams: Nutrition strategies and guidelines: Networks for nutrition support: Nutrition education: Parenteral nutrition and intestinal failure

Florence Nightingale famously drew attention in her *Notes on Nursing, What is and What it is Not*, published in 1859, to the ‘starvation in the midst of plenty’ when she wrote ‘Ever careful observer of the sick will agree in this, that thousands of patients are annually starved in the midst of plenty, from want of attention to the ways which alone make it possible for them to take food’ (see Dealey⁽¹⁾). At the turn of the 20th century it was seen as an important part of the nurses’ role to ensure that their patients were fed appropriately, and nurses received the relevant training.

The services of the American dietitians date back to 1919 when a dietetic section was organised in Public Health Service hospitals for American seamen, later largely incorporated into the Veteran’s Administration. Among the first of the pioneer dietitians in the UK was Rose Simmonds, a ward sister at the London Hospital (now the Royal London Hospital) who understood the importance of nutrition. After a period in the USA funded by a Rockefeller Travelling Fellowship in 1924–5 she returned to the London Hospital to run the dietetics unit and

Abbreviations: HPN, home parenteral nutrition; IF, intestinal failure; OFNoSH, Organisation of Food and Nutritional Support in Hospitals.
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diet kitchen on Grocer's ward. Earlier in her career Miss Simmonds had been decorated with the Royal Red Cross for her services in France during the First World War of 1914–18. Her *Handbook of Diets* was published in 1937⁽²⁾. During the Second World War she continued working with the Red Cross as an advisor on the composition of prisoner-of-war parcels. At the end of the war she spent some time reporting on the condition of children in Berlin and the Ruhr. From 1941 until a few weeks before her death in 1951, she held monthly tea parties to keep those interested in dietetics in touch with each other.

It is worth remembering the major efforts made not only by the principal ward sister–dietitians of the day like Rose Simmonds, but also by their medical consultants led by the then President of the Royal College of Physicians, Lord Dawson of Penn, to try to formalise a diploma course in dietetics. It should also be noted that some enlightened physicians keenly supported developments in dietetics. However, after some delays, The British Dietetic Association was formed in 1936 by such individuals as Miss Pybus of Edinburgh, Rose Simmonds and the other London ward sister–dietitians from St Thomas' Hospital, University College Hospital and the Middlesex Hospital coming together under the chairmanship of Miss MA Abrahams. Miss Abrahams was an Oxford graduate, one of a new breed of graduate dietitians who had taken the lead on dietetics at St Bartholomew's Hospital. By 1982 British dietetics had become a totally graduate profession. Nowadays, there is a strong and desirable trend for dietitians to contribute to nutritional scientific research at doctorate level and above; thus invigorating the academic basis on which their own specialty and degrees were originally based.

Nutrition science was well recognised by the 1930s, but it was not till 1941 and the stimulus of war that the Nutrition Society was founded under the initial leadership of Sir John Boyd Orr. The proceedings of the Nutrition Society meetings were first published in the *Proceedings of the Nutrition Society* in 1944, supported by a loan from the Royal College of Physicians.

Much of the stimulus for the development of artificial nutritional support was based around intravenous metabolic management of complicated surgery, inflammatory bowel disease and burns. Specialist progress had been made in the field of parenteral nutrition, which, although it could trace its origins back to Robert Boyle and Sir Christopher Wren in the seventeenth century, was only to become a real clinical possibility in the 1960s following the work of such luminaries as Arvid Wretling, Eric Vinars, Khursheed Jeejeebhoy and Stan Dudrick. Nevertheless, a search in PubMed on 'parenteral nutrition' reveals approximately 600 papers going back from 1970 to 1948 and earlier.

Doctors who qualified in the early 1970s had been taught about deficiency syndromes and had received intensive instruction on biochemical pathways, but had to rediscover for themselves the impact of nutrition on everyday hospital medical practice. They knew a little about fluid balance and the importance of maintaining the circulating volume in the context of shock and burns, for which there had been important advances. However,

doctors were relatively ignorant of the science behind parenteral nutrition and its development. Parenteral nutrition then had a bad clinical press and doctors were perhaps most aware of the critics who stressed the risks; the *New England Journal of Medicine* editorial entitled 'First do no harm' published in 1971⁽³⁾ was influential.

In the UK doctors benefited from the meetings of the Surgical Metabolic Group run by Ron Clark, Ivan Johnston and Adam Fleck, which came together with Barry Stoner's Injury Research Group to form the Clinical Metabolism and Nutrition Support Group, one of the first specialist groupings within the Nutrition Society. Ivan Johnston and Ron Clark and in a younger generation Alan Shenkin, Andrew Sim and others brokered this important coordination. In those days the protein turnover experts emerging from John Waterlow's unit (Joe Millward, Peter Garlick, Dave Halliday and Mike Rennie) were particularly influential. The European Society for Parenteral and Enteral Nutrition (now known as ESPEN) met for the first time in 1978 (in Stockholm), with the second ESPEN meeting held in Newcastle in 1979. It has subsequently been held in the UK twice, in Birmingham and in Glasgow.

The team approach to nutritional support and the 'three litre' bag

The 1970s saw major changes in the way parenteral nutrition was used clinically in the UK. Safe management of parenteral nutrition needed coordinated care between:

- doctors, who identified the need, gained consent, inserted central lines and prescribed safe and complete feeds;
- nurses, who delivered the intravenous fluids safely without causing air embolus and infection and without distressing the patient, maintained patient morale and encouraged mobilisation;
- pharmacists, who researched availability, provided the feeds and found ways of combining nutrients that made the nurses' work possible.

The concept of the nutrition support team in the UK was developed at St Mark's Hospital (London)⁽³⁾, as well as in Oxford and at St Mary's Hospital Paddington (London), influenced by comparable progress in units in the USA, Canada and France. The author was particularly influenced by Khursheed Jeejeebhoy in Toronto (Canada) and Claude Solassol and Henri Joyeux in Montpellier (France). Initially, regimens were complicated and required six 500 ml bottles or bags, which were often infused in pairs, to avoid too rapid infusion of individual nutrients and employed a specially-designed one-piece double-limbed giving set. The disposable 'three litre bag' was also 'born' at St Mark's Hospital⁽⁴⁾ with the multiprofessional team, of which the author was a proud part, led by John Lennard-Jones and partnered strongly by Gil Hardy of Travenol Laboratories Inc. (now Baxter Travenol Laboratories Inc., Chicago, IL, USA). Designs and plans were brokered by Gil Hardy, John Farwell (principal pharmacist at St Bartholomew's) and the author and put into first clinical use by the ward nurses led by the first of the modern British nutrition nurse specialists, Thalia Nielsen, strongly

supported by the enthusiasm of the St Mark's ward sisters, especially June Baker. The hospital pharmacists at St Mark's Hospital who rose to this challenge by using a specially-constructed ward-based laminar flow hood were Helen Doery and Charles Tugwell. The 'big bag', as it became known some years later, was a disposable product based on the mixtures used in Toronto (Canada), Seattle (USA) and Montpellier (France), although it initially differed from the latter in that it did not include lipid. Nutritional knowledge was required and the skills of the dietitians (at last) were increasingly drawn upon. Pharmaceutical input became crucial to enable the admixtures and nursing expertise rapidly developed. The team learned how important it was to include the patient in developments and decisions if infection was to be prevented, morale maintained and effective nutritional improvement over weeks achieved. The team approach rapidly became involved not only in parenteral nutrition but also in enteral nutrition. However, the period that followed was not without its potential conflicts, not least between the medicalisation of nutritional support and its perceived threats to those already trained and expert in the field, the dietitians. Some hospitals learned early that strategic committees, not just nutrition support teams, were needed to improve the understanding and coordination of roles.

BAPEN beginnings

Approximately 15 years later, in 1992, the British Association for Parenteral and Enteral Nutrition (now known as BAPEN) was formed following the King's Fund report *A Positive Approach to Nutrition as Treatment*⁽⁵⁾, which was produced by a working party chaired by John Lennard-Jones with support from David Silk and Marinos Elia among others. BAPEN encapsulated the multiprofessional approach by bringing together into a single association the society representing doctors and researchers, the Clinical Metabolism and Nutrition Support Group of the Nutrition Society, with the independent societies of dietitians, pharmacists, patients and nurses formed earlier during the 1980s.

Reports edited by David Silk⁽⁶⁾ and by Simon Allison⁽⁷⁾ looked at the way in which hospital-based disease-related malnutrition could be managed, not only with artificial nutrition delivered expertly through multiprofessional teams but also through the support of catering systems.

The wide prevalence of disease-related malnutrition became increasingly apparent through work from Boston (USA) in medical wards⁽⁸⁾ and surgical wards⁽⁹⁾, but the work of Janet Baxter (then Janet McWhirter) and Chris Pennington⁽¹⁰⁾ had a huge impact. Malnutrition was common; it was already present on hospital admission and worsened during hospital stay. Better screening systems were developed that built on BMI and weight loss together with concepts of nutrition risk. The plethora of approaches to nutritional assessment, of which Helen Reilly's Birmingham initiative⁽¹¹⁾ deserves special mention, needed simplification and rationalisation. The 'Malnutrition Universal Screening Tool'⁽¹²⁾ as championed by Marinos Elia achieved a nationwide and increasingly international

acceptance as a most valuable tool of standardisation, backed by a formidable academic infrastructure. Christine Russell's British initiative, the Nutrition Screening Survey of 2007⁽¹³⁾, based on returns on approximately 10 000 patients in 175 hospitals and 173 care homes, has demonstrated beyond any reasonable doubt that the prevalence of 'Malnutrition Universal Screening Tool'-defined under-nutrition in hospitals and care homes at the point of admission is approximately 28%. In Europe the initiative through ESPEN, the Nutrition Week, based on 11 651 patients from twenty-five countries has shown a BMI among hospitalised patients of $\leq 20 \text{ kg/m}^2$ in 12.6% and weight loss before admission in approximately 37%. With the growing awareness of the high prevalence of malnutrition it has become increasingly clear that a strategic and coordinated approach is required.

Chris Pennington was one of those who developed the concept of the 'patient journey'⁽¹⁴⁾. Individuals who were ill were moved from home to hospital. Within hospital they were moved from unit to unit, each unit under different direction. From hospital they were moved back home. Nutrition support had to be present throughout, during early illness, during critical illness, before and after surgery and continuing into convalescence. Early clinical trials conducted in Dundee (UK)⁽¹⁵⁾ and at the Central Middlesex Hospital (London, UK)^(16,17) interestingly tried to examine how the different phases of nutritional support within this patient journey interplayed.

Organisation of Food and Nutritional Support in Hospitals

Rick Wilson and the author were charged 3 years ago with reviewing the earlier BAPEN reports^(6,7). It was concluded that food and nutritional support within hospital care should be considered together. The Organisation of Food and Nutritional Support in Hospitals (OFNoSH), which was launched at the BAPEN annual meeting in November 2007, aimed to draw on the principal international and national reports and recommendations that had emerged previously and make them easily available from a single website^(18,19). It sought to bring them together into a coherent vision for the governance of nutrition in hospitals. While the roles of the nutrition support team and the nutritional strategy committees remained of kernel importance it was clear that there needed to be a change in culture across all hospital units to encompass nutrition. Widespread malnutrition needed to be tackled on a broad front. Dietitians and nutrition support teams could help with a small number of special problematic clinical situations directly and develop policy for dietary manipulation, enteral and parenteral feeding, but ultimately each specialty needed to develop a sophisticated concept of how nutrition and metabolism impinged on its own area of interest. They each needed to be sufficiently aware of a hospital central policy to adapt it for appropriate interpretation in their own unit. This approach can be seen in the case of intensive care, in the management of diabetes and other endocrine disorders and in renal failure, but there have often been insufficient links between the nutritional

practice in such units and nutrition support team practice and hospital strategy as a whole. The dietitians have tried to take a lead, but their efforts are all too often rebuffed or insufficiently heard. The strategic and nutrition support multiprofessional approach can help make the necessary progress become a reality. OFNoSH has tried to show how nutritional care could be devolved better into routine hospital care from the nutrition support team–dietetics–strategic committee axis⁽¹⁹⁾. This approach is emphatically not to advocate a return to the old status quo with a free-for-all go-it-alone approach, but rather to encourage different specialist units to use a centrally-formed and coordinated policy adapted to special units' needs by those units working together with the nutrition support team, nurse specialists and dietitians. It is encouraging indeed that the messages of OFNoSH are so strongly supported in the 2007 governmental joint action plan from the Department of Health and the Nutrition Summit stakeholders, *Improving Nutritional Care*⁽²⁰⁾.

The core objectives of OFNoSH⁽¹⁹⁾ are:

1. appropriate nutrient intake for all hospital patients bearing in mind their nutritional status, their length of stay and (changes in) their clinical situation;
2. good food, acceptable to the patient bearing in mind tastes, culture, religion, age and making allowance for illness;
3. a pleasant environment conducive to enjoyment of food and suitable for various states of health and disease, with food able to be delivered to patients flexibly according to their needs in sites such as the ward, ward common room or a patient restaurant;
4. encouragement of a social component to eating to aid psychological recovery;
5. safe and effective artificial feeding;
6. pre-admission nutritional support when possible;
7. discharge planning and continued community and outpatient nutritional care.

The philosophy of these objectives is also documented as follows: 'The first of these objectives seeks to achieve appropriate nutrient intake which implies early nutritional assessment and estimation of requirements. It also implies the use of the simplest, safest, most cost-effective means of nutrient intake acceptable to the patient. It will encompass food, nutritional supplements (including snacks, sip feeds, vitamin and minerals), enteral and parenteral nutrition. It does need to be acceptable to the patient, particularly in the context of artificial feeding. The second demands good hospital catering and an awareness of social and religious constraints on food intake. It takes account of changing taste in relation to disease and its treatment. The third depends upon an understanding of how to achieve an environment conducive to a good appetite and the enjoyment of food and might imply investment in/development of patient restaurant facilities or other innovations. The fourth gives regard to the importance of food as a social activity vital in the maintenance of patients' morale and psychological independence and well being. The fifth emphasises excellent multi-professional care in the delivery of safe artificial feeding – 'first do no harm'. The sixth reminds us that nutritional management is not a quick fix,

and requires continuing care, often amounting to recommendations for changes in the patient's lifestyle.'⁽¹⁹⁾

It is clear that no single individual or department can hope to achieve all these objectives without the widest of collaboration within the management structures of the hospital.

Fluid and nutritional management in the critically-ill and high-dependency patient: the British consensus guidelines on intravenous fluid therapy for adult surgical patients

While strategic overviews are important, it is necessary not to lose sight of where many clinicians started, i.e. the metabolic and nutritional support of very-seriously-ill patients in hospital. It is in the areas of high dependency and critical illness that hospital nutritional support might be expected to have its greatest impact on morbidity and mortality outcome measures, i.e. on life and death. In critical care the understanding that pharmacological manipulation of nutrition and metabolism can have a major impact on mortality has improved. Growth hormone, although effective in reducing N wasting, increases mortality substantially⁽²¹⁾, whereas insulin and carefully maintained normoglycaemia, which in this context has proved less effective in its impact on protein turnover, has proved able to substantially reduce mortality, at least in critically-ill patients following surgery⁽²²⁾. The impact of glutamine⁽²³⁾, which has been discussed at this 2008 BAPEN conference^(24,25), and Se^(26,27) appears very promising in this context; the outcome of large-scale trials with mortality as the primary end point are eagerly awaited. Fatty acid manipulation^(28–30) also looks exciting as another way in which the sepsis-induced metabolic cascades can be influenced and down regulated as they become self destructive. Large-scale clinical outcome trials are much needed.

Surgeons have learned to minimise the time during which patients are not eating and are receiving intravenous fluids, as part of a fast-track approach to enhancing recovery after surgery (especially colonic surgery)⁽³¹⁾. However, for some patients with complicated post-operative courses management has been weak. Water and Na overload are all too common in these patients whose metabolic response is to activate the renin–angiotensin–aldosterone system and elaborate antidiuretic hormone, which result in reduced urine flows. The latter combined with inappropriate and excessive saline loading result in widespread oedema and increased morbidity. Abnormal partitioning of Na, K and water between intracellular and extracellular spaces arise as a result of ATP depletion secondary not only to the effects of sepsis but also to poor nutrition, whether resulting from deficiency of vitamin-based cofactors or of energy and protein. Increasing clinical awareness of the ways in which these functions interplay in the intra- and extracellular partitioning of water and electrolytes (including Na, K, Mg and phosphate) has been stimulated by increasing awareness of the refeeding syndrome. However, it should not be forgotten that the refeeding syndrome is, in large part, a correction of

an abnormal underfed state towards normality. To avoid it altogether is to avoid or delay correction of the malnutrition. It is necessary to be good at understanding the water, Na, K and nutritional needs of these patients and how they interplay. Furthermore, the evidence-based rationale lying behind current best practice during surgical and critical illness must be understood, as it should be practised by colleagues in surgery, anaesthesia and intensive care specialties. The concerns over hyponatraemia and the advances in flow-based circulatory monitoring, which are driving progress in this field, must be understood. Recently, BAPEN Medical has launched a joint consensus process, the British Consensus Guidelines on Intravenous Fluid Therapy for Adult Surgical Patients, in association with the Association of Surgeons, the Society of Academic and Research Surgery, the Intensive Care Society, the Renal Association and the Association for Clinical Biochemistry in order to provide an authoritative statement based on current best evidence that might form the foundation for consistent teaching of this important area of medicine across specialties⁽³²⁾. Here is another example of multi-disciplinary team working. To have a consensus across principal national stakeholder learned societies in this way is important if tutees are to have the confidence that is brought by consistent teaching from tutors of varying specialty.

Organisation of intestinal failure and home parenteral nutrition: the Scottish and the English networks

In England since 1998 the management of the most complex type 2 intestinal failure (IF), and by default about half those patients requiring HPN, has been founded on two nationally-funded units at St Mark's Hospital and Salford Hospital (Salford, UK). Stabilised IF may result in the need for home parenteral nutrition (HPN). In drawing attention to teams and the team approach credit needs to be given to the patients and PINNT (a support group for patients receiving parenteral or enteral nutrition therapy and a ground-breaking founder group of BAPEN). In 2001 PINNT, about 13 years after its inauguration, conducted a survey of its members that importantly showed the shortcomings of the provision of HPN at the time. The patients wanted: clear lines of communication; improved emergency support; better informed junior staff; a link with a good homecare company; improved standards of care; knowledgeable general practitioners; more trained HPN nurses; good local services; modern equipment; faster hospital admissions; raised awareness amongst patients of external support. In summary, they wanted a balance between centralising high-quality specialisation and devolved accessibility.

Chris Pennington, characteristically sensitive and aware of patient needs and involvement, initiated the Scottish Home Parenteral Nutrition Managed Clinical Network, which first started to function in 2000, and which now, thanks to the work of Janet Baxter, Alastair McKinley and Ruth McGee, has achieved official maturity within the Scottish health system.

The progress being made with the development of the English combined HPN and IF network, HIFNET⁽³³⁾, is encouraging. It has been a long time coming and is not in practical place yet, but it is the right way forward in that it develops Chris Pennington's Scottish concept by building on the strengths of the existing IF units to provide a national network not only for HPN but also for type 2 IF. It is founded on the patients' wishes. It has been developed by a multiprofessional team drawing extensively on the founder groups of BAPEN and other stakeholders working with the National Specialised Commissioning Team to develop principles based substantially on the patients' stated needs⁽³³⁾:

- excellence: consistent high care standards;
- equity of access: high quality and safe, as close to the patient's home as possible;
- patient-centred and based on reflections on models of care;
- good value for money;
- built on the success of two principal IF units;
- built on comparative regional and national audit.

The nutritional management of complicated high-dependency patients is exemplified by the challenge of prolonged IF in patients with sepsis who are metabolically unstable. The advances outlined earlier together with the surgical timing and advances in the management of such patients need to be implemented with these patients who have a high risk of mortality. A select group of surgeons needs to follow the leads of the surgeons within the existing national IF units to make expertise in this area their own declared special interest. They need to be individuals who genuinely embrace the team approach and understand that it will not only be their own surgical expertise (which may need to be formidable) but also the expertise of their colleagues in nutrition support teams, specialist nursing and stomatherapy and high-dependency care areas that in combination will save lives, prevent liver damage and get patients safely home independent or dependent on HPN. The team approach is needed not only within hospitals in this case but across regional and hospital networks. Here is the opportunity to combine centrally-agreed and coordinated standards with regionally-devolved and developed practice to deliver the sort of care patients really want. Excellent skills developed in properly-supported regional centres and networks should have the byproduct effect of encouraging good practice in parenteral nutrition generally; it should also ensure that patients who need intestinal transplantation are referred properly.

Education and training

The need for changes in the culture of nutritional practice within medicine and nursing implies a need for educational change. Within medical education some units have introduced nutrition modules or have embedded nutrition within problem-based and clinical learning. At Barts and the London School of Medicine and Dentistry the author has been involved intimately in both approaches. The development of the Stratford Group's initiatives⁽³⁴⁾ out of

meetings held at Barts and the London School of Medicine and Dentistry in 1989 have been impressive and have influenced government. However, governance of UK universities is rightly devolved and there is still much to do to ensure that medical students and nurses receive proper basic education in nutrition. The work of the Intercollegiate Group on Nutrition under the leadership of, for example, Alan Jackson, Michael Lean, Martin Wiseman and more recently George Alberti and Penny Neild is vital not only in influencing UK medical schools to take on this challenge, partly by influencing the content of the General Medical Council's *Tomorrow's Doctors*⁽³⁵⁾ but also in supporting the practical efforts of those medical schools trying to deliver such teaching across the country. In education as well different professions and specialties need to work together if nutrition is to be demonstrated as an exemplar of the modern multiprofessional approach to clinical practice. The author has been fortunate over the years to be strongly supported by colleagues in dietetics, nursing and pharmacy, as well as physicians and surgeons, in the provision of teaching programmes at Barts and the London School of Medicine and Dentistry. Close involvement with Pat Howard and many others in BAPEN's team-building course in Grasmere⁽³⁶⁾ during the 1990s was an exercise in multiprofessional learning and teaching that influenced the course leaders and teams in more than fifty UK hospitals. Those participants who taught and learned year by year on that course were struck by one very reproducible observation. When teams functioned multiprofessionally, particularly when the tasks required varying skills, happiness and creativity reigned. When teams were split into single disciplines (nurses, doctors, dietitians and pharmacists), as was necessary to discuss areas of specialist interest, the cross-team criticisms emerged and creativity became submerged. This outcome was seen by some participants as a model for BAPEN which, although it recognised the need for single discipline expertise and development, emphasised the advantages of coming together. This observation does not imply that everyone has to function at the same level of expertise in research or clinical practice, but rather that all become mutually supportive and respectful of each other's skills and developments.

Clinical research and development

Crucially important have been the authoritative and exhaustive reviews of the clinical nutrition evidence base by BAPEN members, notably Ceri Green, Rebecca Stratton and Marinos Elia⁽³⁷⁾, which culminated in the huge programme of evidence sifting and analysis on which the National Institute for Health and Clinical Excellence nutrition guidelines were based under the chairmanship of Mike Stroud⁽³⁸⁾ and in which appendices detailed analysis of all relevant clinical trials can be found.

The team approach needs increasingly to be used to foster research. Clinical trials are the fundamental basis for changing evidence-based medicine and yet the ability to conduct small-scale clinical trials of the type that many medical professionals have been involved in over the last

30 years has now been severely hampered by national and European regulation aimed with good intention at protecting patients from perceived coercion and exploitation. Although in the past the author has argued for the place of small well-conducted and analysed clinical trials⁽³⁹⁾, trials in the future will need to be big to justify the administrative time and expense incurred in dealing with the regulatory processes. BAPEN should enable the creation of cost-effective cross-centre teams to develop, find funding for, administer, analyse and interpret major trials relating to clinical nutrition. The ability to work together should stand researchers in good stead, if the Research Assessment Exercise process (a peer review exercise to evaluate the quality of research in UK higher education institutions, which informs the selective distribution of funds by the UK higher education funding bodies) does not work against such cooperation by creating inter-unit jealousies and political manoeuvring. Modern clinical trials will need wider inter-unit cooperation than has been seen in the past.

Conclusion

The team approach for the author started with an appreciation of how much patients who needed nutritional support benefited from pharmacists, nurses, dietitians and doctors working together in patient-centred mutual understanding and respect. It ramified into research and teaching and has moved from being unit based to hospital wide; the development of regional and national network formation is being seen. Clinicians need to keep their attentions patient centred. Patients are not just the beneficiaries of team work, but vital members of the team themselves. Team working is hugely rewarding and fun. It is the very basis of BAPEN, which is at its strongest when it is liaising with outside groups and bodies to influence clinical practice, demonstrating how the key groups that provide nutritional screening and support understand each other and respect each other's contributions.

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