What Is the Goal of Nutrition in the Intensive Care Unit?

S.P. Allison

Clinical Nutrition Unit, University Hospital, Nottingham, UK

Introduction

It is difficult to give a simple answer to this question for a number of reasons. Firstly, because the major determinants of outcome on the ICU are the severity of the disease, coincident cardiorespiratory pathology, sepsis and organ failure. Nutritional support is therefore likely to have only a modest effect on survival although it may have an important role in accelerating recovery. On the other hand, prolonged periods of starvation are deleterious, as is excessive or inappropriate nutrition. Secondly, as pointed out by Griffiths et al. [1] in their studies on glutamine supplementation, it is important to follow the whole course of the patient’s illness before, during and after the intensive care unit (ICU) episode, through convalescence to full recovery (fig. 1), since the patients pre-ICU condition and treatment during ICU stay may influence subsequent events. Our goals must therefore be long- as well as short-term. Thirdly, the ICU population is not only heterogeneous within each institution, but also varies from center to center. In a recent paper by Van Den Berghe et al. [2], 63% of the population studied were patients recovering from cardiac surgery. In our own ICU there are none. Berger et al. [3] have a high proportion of burned patients in their practice. Another unit may contain a high proportion of patients recovering from major abdominal surgery or even, in some American series, of gunshot wounds. The patient ventilated for 24–48 h for status asthmaticus suffers not one jot from being starved during their stay. In contrast, the catabolic patient ventilated for 1–2 weeks intuitively needs feeding to minimize a huge loss of lean mass. The average length of stay in many ICUs may be 3–4 days, but this average conceals a wide range.
I will therefore try to approach this subject by taking all these factors into account and setting goals for nutritional treatment that are realistic and relevant. Since our normal nutrition in everyday life is inseparable from the ingestion of fluid and electrolytes, I make no apology for including some aspects of this under the nutritional banner.

Finally, it is one thing to set goals and another to recommend measurements for use in clinical practice, as opposed to research programs, to define how well these goals have been achieved. I will, however, make some attempt to do this. While distinguishing between routine postoperative recovery and true critical illness – not always made clear in some systematic reviews – I shall nonetheless include some aspects of nutrition after major surgery. I shall also consider the whole of the patient’s journey through their illness, since, as I have argued above, it is misleading and illogical to consider the period of critical care in isolation.

**Protein Energy Malnutrition**

The normal anthropometric measurements of body mass index, mid arm circumference and triceps skinfold thickness may be relevant to the initial identification of this problem which adversely affects outcome from critical...
illness during and after ICU stay (fig. 2) [4]. They are, however, poor short-
term measures of nutritional success, since increases in their values are likely
to reflect gains in fluid from excess salt and water retention or gains in fat
from excess calories, concealing a diminished lean mass. Restoration of lost
lean mass awaits return to normal oral intake and mobility and takes many
weeks or months to achieve. On the other hand, as Sakurai et al. [5] has
stated: ‘The goal of nutritional management of critically ill patients is to
promote wound healing and resistance to infection while preventing
persistent loss of muscle protein since survival of critically ill patients is
inversely correlated with loss of lean mass.’

It must therefore be a goal of nutrition to minimize the loss of muscle mass
during ICU stay, while recognizing that the combination of immobility and the
catabolic response to injury will defeat any attempt to achieve meaningful
positive nitrogen balance. Although there is a correlation between muscle
mass and muscle strength, renutrition may have immediate and short-term
effects on muscle function before any change in mass is achieved [6, 7].
I recognize, of course, that one cannot measure voluntary muscle strength
while the patient is sedated on a ventilator, but it can be measured post-ICU
as can the rate of subsequent physical rehabilitation as we showed in our
fractured femur study many years ago [8]. It may also be useful to measure
muscle function by direct stimulation as described by Pichard and Jeejeebhoy
[9], although this is more a research than a standard clinical procedure.
However, since the respiratory muscles suffer just as much as the limb

Fig. 2. Multiple organ failure survival and body mass index (BMI) showing outcome
with BMI <15th percentile compared with >75th percentile. Outcome can be
improved by raising the BMI above the 15th percentile towards the 85th percentile.
Conversely, outcome is worsened if the BMI is allowed to fall excessively. From
Galanos et al. [4].
muscles from wasting [10–12] – and in surgical patients we have shown a good correlation between muscle strength and peak flow [13] as did Hill [6] – earlier weaning from the ventilator as well as the length of ICU stay are relevant end points of nutritional support. This example relating to muscle illustrates the greater importance of improved function as a short-term goal of nutrition in critical illness than the more static anatomical measures of tissue mass. Can we improve on the protein-conserving effect of standard nutrition by the use of special substrate formulae or by the use of adjunctive hormone therapy? I think we probably can – indeed we were the first to show the beneficial effects of insulin in this respect during the 1970s (fig. 3) [14]. Campbell [15] described the problem clearly in a recent review: ‘In the severely septic and injured patient, an improvement of nutritional status or increase of lean body mass by nutritional support alone is likely to be impossible. The most one can hope for is to slow the rate of decline. If lean body mass is to be maintained, it is likely that pharmacological methods will have to be found for doing so.’

**Children**

Babies and small children have special problems of growth and brain development – clearly pediatricians have the goal to maintain such growth although it may be difficult to maintain this at a normal rate during acute illness. As I have no experience of pediatric practice. I merely mention this as an important goal.
Survival

All other factors being equal, nutrition is likely to have only a small impact on survival, this effect will probably be more marked in those with more prolonged illness. Survival, however, needs to be measured in terms of 3–6 months post-ICU and not just during ICU stay (fig. 2) [4]. It is therefore reasonable to hope that some improvement in overall survival is a realistic goal, at least in some patients. This is likely to be more marked when comparing some nutrition against none at all, but may also be a feature of the use of improved nutritional formulae or of adjunctive therapy.

Inflammation and Immune Response

Protein energy deficit is associated with an impaired immune response and an increased infection rate. Different substrate mixes may also modify the initial inflammatory response and the subsequent reduction in immune function, as others will describe in this meeting. We may therefore include modification of inflammation and improved resistance to infection among the reasonable aims of nutrition therapy. A number of studies have used infection rates and antibiotic use to assess clinical outcome of nutrition support [16]. Laboratory measures of cytokine levels and immune function are largely research tools.

Wound Healing

The healing of wounds from surgery and accidental trauma or the taking of skin grafts in burns are impaired by prior malnutrition but particularly correlate with recent and current nutritional intake [17]. Mineral and micronutrient supplementation may also be important, as Berger et al. [3] have shown. Improved healing is therefore an important goal and clearly observable.

Avoidance of Complications

It is axiomatic that the techniques of feeding, whether enteral or parenteral, should not pose a greater risk than benefit to the patient. It should be the goal of ICU doctors to reduce such complications to negligible levels as shown by good nutrition teams [18]. Such problems as aspiration, bloating and diarrhea from enteral feeding or infectious and mechanical complications of feeding lines can largely be avoided.

Hyperalimentation, i.e. giving large amounts of carbohydrate calories in an attempt to bludgeon protein catabolism into reverse, was shown to increase
demands for gas exchange, making ventilatory support more difficult. It also caused fatty liver, abnormal liver function and increased adipose tissue. Problems of the refeeding syndrome were also exacerbated. It should be our goal to avoid the consequences of such excess, reserving increased intake for the anabolic convalescent period when the patient is able to utilize higher protein and energy intake for restoration of lost tissue.

**Fluid and Electrolytes**

Some overexpansion of the interstitial compartment of the extracellular space may be, to some extent, an inevitable consequence of adequate acute resuscitation with sodium-containing fluids. Even normal subjects are slow to clear a salt and water load [19] and this is greatly exacerbated by the response to injury [20]. There is a tendency, however, to give excessive amounts of salt in maintenance fluids after the period of resuscitation, resulting in unnecessary overload with consequent edema and dilutional hypoalbuminemia [21]. Sitges-Serra et al. [22] and others have described the increased pulmonary and other complications caused by this and we have shown [23], as did Mecray et al. [24] in 1937, that even modest saline overloads of 3 kg are sufficient to inhibit a return of gastrointestinal function and the use of the gut for nutritional purposes. I even wonder, rather mischievously perhaps, whether some of the ill effects of parenteral nutrition in the Veterans’ Administration [25] and other studies, were due to the salt and water load rather than to the nutritional substrates. In enteral nutrition it is difficult to cause such overload simply because the rate of administration is limited by the tolerance of the gut. Moore and Shires [26] summarized the problem of fluid balance admirably: ‘The objective of care is restoration to normal physiology and normal function of organs with a normal blood volume, functional body water and electrolytes. This can never be achieved by inundation.’

I would make a plea, therefore, for including a consideration of fluid and electrolyte balance in any nutritional prescription and for the restoration of normal balance as soon as possible to avoid the ill effects of cumulative overload.

**Gastrointestinal Function**

Although the role of gut atrophy and bacterial translocation are more clearly established in animal studies than in human clinical work, it seems a reasonable goal to introduce some enteral feeding (combined with parenteral if necessary) at the earliest possible stage with the aim of preserving gut function and perhaps the function of gut-associated lymphatic tissue.
Preoperative Care

A proportion of the ICU population usually consists of patients recovering from major elective surgery. Ljungqvist et al. [27] have shown clearly the advantages of bringing patients to surgery in a metabolically fed state and the improved outcome from a carbohydrate drink 2 h preoperatively. It is also advantageous to give a period of nutritional support preoperatively of 7–10 days in those with prior weight loss >10% [28]. Providing fluid overload is avoided, the goals of such treatment are improved physiological function and fewer complications postoperatively.

Cost Effectiveness

A reduction in length of ICU and hospital stay, reduced investigation and treatment costs, and more rapid return to a productive life may all follow if

Table 1. Goals of nutritional support in the ICU and clinical measurement of outcome

<table>
<thead>
<tr>
<th>Goal</th>
<th>Clinical measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survival</td>
<td>In ICU and 3–6 months after ICU</td>
</tr>
<tr>
<td>Muscle function</td>
<td>After ICU</td>
</tr>
<tr>
<td></td>
<td>Handgrip dynamometry</td>
</tr>
<tr>
<td></td>
<td>Peak flow</td>
</tr>
<tr>
<td></td>
<td>In ICU</td>
</tr>
<tr>
<td></td>
<td>Ventilator weaning</td>
</tr>
<tr>
<td></td>
<td>Time on ventilator</td>
</tr>
<tr>
<td>Muscle mass</td>
<td>Inspection</td>
</tr>
<tr>
<td></td>
<td>Anthropometry</td>
</tr>
<tr>
<td>Immune function</td>
<td>Infection rate</td>
</tr>
<tr>
<td></td>
<td>Antibiotic rate</td>
</tr>
<tr>
<td>Gastrointestinal function</td>
<td>Symptoms</td>
</tr>
<tr>
<td></td>
<td>Gastric emptying and aspirate</td>
</tr>
<tr>
<td>Growth (in children)</td>
<td>Length/height and weight</td>
</tr>
<tr>
<td></td>
<td>Growth velocity</td>
</tr>
<tr>
<td></td>
<td>Head circumference</td>
</tr>
<tr>
<td>Wound healing</td>
<td>Inspection</td>
</tr>
<tr>
<td>Rate of rehabilitation</td>
<td>Time to achieve physical goals</td>
</tr>
<tr>
<td></td>
<td>Time to return to normal function and quality of life</td>
</tr>
<tr>
<td>Complications, infections and other</td>
<td>Inspection and recording</td>
</tr>
<tr>
<td>General and economic</td>
<td>Length of ICU stay</td>
</tr>
<tr>
<td></td>
<td>Length of hospital stay</td>
</tr>
<tr>
<td></td>
<td>Drug and other costs</td>
</tr>
<tr>
<td></td>
<td>Costs of complications</td>
</tr>
</tbody>
</table>
the above goals are achieved. This may appeal to managers and budget holders, particularly when we are asking for more resources for nutritional care!

**Conclusion**

We may therefore summarize (table 1) the goals of nutritional care in critically ill patients by emphasizing its role in the preservation of function and achieving a more rapid recovery from illness, with fewer complications from either the illness or its treatment. Preservation of muscle mass and function and of immune resistance to infection are major goals. In some cases, improvements in survival may be expected, but these are likely to be modest compared with effects on the rate of recovery. In assessing outcome, we must consider the whole course of the patient’s illness in which the ICU stay may be an episode, recognizing that management in the ICU may influence subsequent outcome.

**References**


**Discussion**

*Dr. Peeters:* I have heard that we should be more humble in our goals when treating an intensive care unit (ICU) patient. We used to make him better, now we try to keep him in a steady state. We set our goals on long-term as I understood, which is very good, and which is explained by the fact that we probably could not achieve our short-term goals. I think here is an important factor that comes into the game, that is the psychological stress that you have to take into account when you look at long-term goals, certainly in burn patients this might come into the discussion. Again the last thing that I remember very well is that we are going back to the basics and trying to look again at salt and water, something that has been forgotten for several years. This lecture is open to discussion.

*Dr. Chioléro:* I have a question concerning patient populations since clearly in the ICU we have trauma, septic and postoperative patients. I think this is an important point since when we go from goals to nutritional support, we clearly have to use different solutions and different regimens as highlighted for example by the metaanalysis of Heyland et al. [1] on immunonutrition which could harm some specific populations and be good in others. So how can we be a bit more specific in our goals?

*Dr. Allison:* I think this is a gradual process, there is no getting away from planning proper studies, and we are not going to fix this one in a short period of time. I think there are certain groups of patients who are better studied than others, I think we
know a great deal about burns and cardiac surgery. Some of the others are less well known, and I think we just have to plan careful studies in the future and look at each one in isolation, not necessarily by throwing cocktails of this and that at people but carefully looking at each substrate at different stages and building up a picture over the next 10 years. Getting this funded is part of the problem. Of course if these were some cardiac drugs then a company could afford to pay a million dollars to fund an enormous study but these kinds of nutritional studies are not going to yield enormous financial benefits. Now I think there is genuine difficulty about obtaining proper studies at the national or international levels through the EU to solve this sort of common place question.

Dr. Bozzetti: Congratulations on your very clear and excellent presentation. I would like to come back briefly to the paper of Van Den Berghe et al. [2] that you reported and which was recently published in the New England Journal of Medicine. I would like to have your opinion about the interpretation of this study. I want to stress that the control group maintained a median glucose level of about 153 mg/dl, that is a value lower than that able to impair the host defense, which is roughly about 200 mg/dl. So my question is: was the mechanism of the beneficial effect of intensive insulin therapy in this study different from the simple prevention of hyperglycemia-associated infections?

Dr. Allison: I think this is the great question of that study. I think the great value of that study was that it showed for the first time that a drug or a hormone, which we know has perhaps some desirable biological effects, actually has a beneficial effect on outcome in contrast to the growth hormone studies, for example. Although we discussed yesterday how there are perhaps groups in whom growth hormone will be beneficial, there are others in whom it will not, particularly children in the former instance. So I don't think we know the answer. We know from the work of Bistrian [3] and others that hyperglycemia predisposes to infection. We know in studies of diabetic patients undergoing myocardial infarction that controlling the blood sugar very tightly has a beneficial effect on outcome; but of course insulin does other things, it affects protein, it affects fat metabolism and it affects salt and water metabolism as well. Following the effect on salt and water excretion in burn patients I actually did a study on patients with severe heart failure, some of whom where about to undergo cardiac surgery, and one showed the same effect of insulin on severe heart failure with abrupt and rapid excretion of salt and water. There is a recent review by Parsonage in one of the heart journals in which he looked systematically at the effect of insulin on cardiac output, and then beneficial cardiovascular effects. So in the Van Den Berghe study [2], with 63% of the patients being post-cardiac surgery, I would expect the insulin to have more effects on that group of patients than just control of the blood sugar, although I accept that control of blood sugar is desirable. Perhaps we need to design a study where you control blood sugar by restricting carbohydrate and then you give carbohydrate plus insulin to the other group so that you have 2 groups comparable in blood sugar control, and see whether there is any difference between them. I think like all good studies, it suggests further studies.

Dr. Douglas: I just wanted to make a comment about the work that we have undertaken in Edinburgh, and we have actually found that in patients 3 months after discharge from intensive care, a third remained nutritionally depleted. Furthermore we found that handgrip dynamometry, our tool for assessing function, is actually very poor in this population, and the reason for that is anticipated to be critically ill initiated neuropathy. Do you have any suggestion on how we can further assess the function of these patients at this time?

Dr. Allison: That is a very good question. I suppose we can employ, or perhaps we need to design quality-of-life scores. We tend to take quality-of-life measurements...
off the shelf, like going into buy a suit, we take it ready-made and we try to adapt it from one situation to another. Maybe we need quality-of-life scores that are appropriate to particular patient groups. I would have thought that some measure of the ability to fulfill physical tasks hence the Ancel Keys study, which is perhaps the great classic of nutritional depletion in normal subjects. They employed a kind of fitness score in carrying out a number of physical tasks. I think that the mood score issue is an important one. This is one we use very regularly on our patients. I don't have a really clear-cut answer to your question. I think that what you say also reflects on the article by Beattie et al. [4] in postoperative patients, whereas Hessov showed that giving nutritional supplements after discharge from hospital increased the weight by 2 or 3 kg at 3 months, but had no effect on function. However he was looking at a well-nourished population. When Beattie et al. selected out those who had been depleted subsequent to their acute illness and gave it to them, they found not only anthropometric improvements but also functional improvements. I don't know whether anybody else has any suggestions for assessing these patients after discharge, 3 months down the line, and how they do it. We heard a bit about the burns yesterday but does anybody else have any thoughts about that?

Dr. Peeters: I think it is very difficult to make the assessment when you just take into account the somatic situation of a patient and my own work in burn patients showed me through the years that quality of life is a very important topic for the patient, maybe much more important in survival, and I think that over the last 10 years we have put our interest more in this field. I think it is not so important that you keep the patient alive, I think that you have to take into account the quality of life that they will have afterwards, which is a very difficult question that will probably not be answered today, but I think the psychological situation of the patient is as important as his somatic situation.

Dr. McClave: This is more of a comment than a question really. The goals that I think about are the concept that we can attenuate the stress response, that we can strike and do several changes in major strategies that would set them on a different curve in the stress response. If you attenuate the stress response usually there are fewer complications: in head injury there is a faster return of cognitive function, the patients get out of the hospital sooner, sometimes you effect survival, and the question to ask as a nutritionist is what are the other tools, we have to do that. I think Dr. Berger showed yesterday how an antioxidant cocktail during the N phase, certainly getting enteral feeding going early, attenuates the stress response, and the question whether there are other things like paying attention to anxiety, controlling pain, maybe the salt and water inundation you are talking about, is an additional stress or so. Paying attention to these strategies that put them on a different stress curve is important. After the stress is gone, attacking the pick of the curve is kind of fruitless, it is setting their course ahead of time.

Dr. Allison: I think this is a crucial point and maybe nutritional support is an old-fashioned term. What we should be talking about is integrated nutrition and metabolic care because I find it totally impossible to prescribe nutrition to a patient for whom I don't have a comprehensive understanding of everything else that is going on, and indeed some degree of control, either direct or indirect, through agreement with colleagues. What you say reflects the fact that over the last 30 years the energy expenditure of these patients described in the literature has dropped dramatically due to such factors as earlier surgery in burns, control of infection and pain and anxiety. Without integrating our nutritional and metabolic care with all these other things, we just fly blind. So I think you make a very important point, maybe we should rather talk about integrated nutrition rather than nutritional support.

Dr. Rosenfeld: You point out that water and salt balance in critically ill patients is related to the amount of sodium these patients receive. But we have been following
patients who were not given huge amounts of sodium and after starting nutritional support these patients developed a hyperosmolar state, increasing urea too. We hypothesized that these patients are not able to excrete all the osmolar amount, the osmolar charge nutritional support is giving to these patients. So high amounts of proteins must be metabolized and generate high amounts of osmolar charge. We think these patients can't excrete this osmolar charge and so they develop a hyperosmolar state. We stopped the nutritional support for 5 or 7 days, increased the amount of water and they returned to a normal osmolar state, and we gave these patients less protein and they didn't develop a hyperosmolar state anymore.

Dr. Allison: I think you make an important point. Many studies in the literature have shown that giving critically ill patients more than 0.2 or 0.25 g nitrogen/kg/day merely increases urea production. You also make the point about water. Unfortunately I think some people don't distinguish between the salt-containing fluids necessary to correct the volume and to resuscitate in the acute phase and the maintenance fluids necessary to maintain what Bernard beautifully called the volume obligatoire. If you give them salt and water you don't increase the urine volume unless you are correcting volume depletion. All you do is put them into more and more cumulative sodium balance. It is not just sodium, I think chloride is the hidden villain in this. We don't understand the excretion of chloride quite so well as we understand that of sodium. Certainly there are probably advantages of Ringer lactate over saline in this respect, you excrete the sodium from Ringer lactate more readily than you do from saline. So I think that what you are emphasizing here is the interplay between fluid and electrolyte balance and the substrate you are giving, and the fact that you cannot consider any prescription for nutritional support without also considering the sodium, water, potassium, chloride and all the rest. It is part of the integrated nutrition approach.

Dr. Bouletreau: You made a very important point. Certainly in some studies like the Griffiths et al. [5] study, which is long-term, nutritional support had a very long-term effect on survival. I am still a little bit surprised and I wonder why a very short amount has such a striking effect in the very long term. It is very different from the Beattie et al. [4] study in which they give long-term supplementations. Do you think this improvement in lean body mass, which is always modest in these patients, could be the only reason, or what other reasons could be evoked?

Dr. Allison: I don't think it is the lean body mass but I don't know what it is either. I don't know if anybody else has got any idea, whether you are causing some kind of enzyme induction or gene expression. This is one of the great puzzles: why does the patient with the short-term cytokine and neuroendocrine storm develop a catabolic process which goes on for weeks, and why some intervention has an effect weeks later, I have no idea.

Dr. Nitenberg: I don't know how it is in the States or in Britain for ICU patients especially, but I know how it is in France because it is my work. The problem is not to convince myself or my colleagues working on nutrition that nutrition is important for patients. My problem is to convince other teams, then other ICU workers that nutrition is important for the patients. And when I want to convince my coworkers in France that it is important, they always ask me the same question: what is the benefit for the patients. This is the only key question that we have to answer. I think we have many studies in which we can prove that there is an improvement in mood, that there is an improvement in metabolic parameters, and there is an improvement in immunological parameters. OK, that is good. When you are dealing with mechanical ventilation you can show that there is an improvement in PO2, an improvement in frequency, but the only amelioration that is important for ventilation is that when, for example for low tidal volumes, you reduce the length of ventilation then you reduce the morbidity of
ventilation. I think it is exactly the same problem in the ICU. We have to show that. So I do think that, especially with modern management and especially when we are speaking about immunonutrition or pharmaconutrition, we have to do exactly the same as we are doing with drugs and with maybe ventilatory support or the use of catecholamines for example. So don’t you think that we have to focus only on outcome parameters such as length of stay in the hospital, not in the ICU. Because everybody knows that the patient only comes out of the ICU when he/she is better, when the anguish of the doctor is not too high, when you have some room, in other words. It is very difficult to measure this and perhaps also to measure the infectious parameter mortality, because mortality is I think a more important value than medical economical parameters because if you are dying you don’t care about medical economical amelioration, you want to survive. For example I come back to what Dr. Bouletreau said about the Griffith study. The Griffith study is fantastic. However, when you look carefully at the survival of the patients in the long-term you can see that 2 patients died, 1 from pulmonary embolism and 1 from pulmonary myocardial infarction. I can’t imagine that death is related to the 5-day use of glutamine 6 months earlier, it is very difficult to accept that. If I compare this with the results obtained recently by Déchelotte et al. [6], for example, in the same kind of study with glutamine, there is an improvement in early infection and no improvement in late survival. So you can’t shake the statistics bottle and pick out what you want to explain the results and systematically put away the other results. Could you comment on this long provocative sentence?

Dr. Allison: I agree with everything you have said. I think at the bottom line we could say that for the patient who is in the ICU because of asthma and is out in 24–48 h, nutrition is irrelevant. The patient with major burns, inhalation problems, on a ventilator for 2, 3, even 4 weeks sometimes, may not survive without feeding. They just waste away and die. I challenge my colleagues to quote me any control trials of ventilation in respiratory failure where you allocate some to be ventilated and some not? Can you quote me any controlled trials of hemodialysis in renal failure where you let the creatinine go on? The bottom line here is that sooner or later you die from malnutrition if you don’t eat and that process is accelerated by injury. If we start from there then we begin to focus and start to play around with the substrates and give them earlier or later, a bit more of this, a bit less of that, does that make a difference? I agree with you that we have to show improved survival even though it might be small but no other measures in the ICU are being asked to produce big changes in survival because we know that any advance gives you a small improvement. The rate of recovery is extremely relevant to the patient and to the cost of the hospital and reducing the complications and so on. But apart from that, we are in agreement really.

Dr. Nitenberg: Isn’t it dangerous to make a statement saying a patient coming to the ICU with asthma will be out in 48 h. Perhaps he will be out in 48 h, so maybe you should still take nutrition into account in case if he stays for 4 weeks.

Dr. Allison: You can afford to delay the decision for a day or two for instance, particularly if the referral occurs to me, as it often does, on a Friday evening and the weekend is coming up. I think you can spend the weekend in adjusting the fluid balance, and on Monday I would consider some nutrition.

Dr. Peeters: A very good point is made about the length of stay. In our hospital patients do not leave the ICU on a Friday evening, or on Saturday or Sunday. So when they are staying for 10 days, you add. They stay with about 20% just to keep them over the weekend. I think a patient who dies in the ICU makes a very important contribution to the economics of health care. It is a bit cynical.
Dr. Cynober: To continue this debate. Perhaps there is a problem of semantics and credibility because when you claim a goal is to reduce the length of stay at the hospital, people can think that these nutrition people have very important drugs to enable a reduction in the stay. In fact, perhaps the true message is to limit the increase in length of stay related to malnutrition or inappropriate nutrition, because I cannot imagine that even with pharmacological nutrition you have an absolute effect even on the primary pathology which is responsible for the hospitalization.

Dr. Allison: Absolutely. We can be asking too much of nutritional support. I think, on a philosophical note, we should remember that colleagues talk about natural recovery, and maybe it is natural to have starvation. What they forget is that most of the patients coming to the ICU would have died without critical care. Our response to illness was never designed to allow us to overcome severe illness. Nature is the statistician which allows us to overcome minor injuries but if we are holding up the tribe with a severe injury we are designed to die. So in the ICU we are looking at patients who are designed by nature to die. We are starting from a zero position, and therefore to talk about some kind of natural response being appropriate after 5 days in the ICU is nonsense. We are dealing with a totally unnatural situation where we have to explore the complexity of it and try to intervene in a way which produces better outcome.

Dr. Chioléro: Another aspect concerns the patient who should not receive nutritional support, is able to have a short starvation resuming oral feeding after some days. What is your view on ICU and starvation assignment?

Dr. Allison: I don’t know. You can detect early changes, starvation for 48–72 h produces significant physiological changes. For example your thermoregulatory capacity is impaired by starvation from over 48 h. I think what we don’t understand is whether short periods of starvation are clinically significant or not. They may be, particularly in the perioperative context. Early oral intake after elective surgery may be a very important issue, but I have tried to keep away from that because I regard the ICU patients by definition as unable to eat normally. If we get into normal eating I could go on for another 20 min.

Dr. Peeters: Thank you very much. I think the issue was, do we have to feed patients or not. I think maybe we should reverse the question to those who don’t agree that you have to feed them. Perhaps they have to prove that you don’t have to feed them, although some living beings don’t need to be fed, you can go into hibernation and you are not fed for several months.

References