

Speaker 1:	00:00	Welcome to the Perioperative Nutrition podcast, sharing knowledge with clinicians to ensure all patients are ready for surgery. This six episode series is sponsored by Abbott Nutrition and here's your host Dr. Paul Wischmeyer of the Duke Clinical Research Institute.
Dr. Paul W.:	00:17	So this is Paul Wischmeyer, and welcome back to the Enhanced Recovery After Surgery nutrition podcast here at the DCRI, and it is truly an honor to have Dileep Lobo, who's the professor of Gastrointestinal Surgery at the University of Nottingham and a true longstanding expert in ERAS and ERAS nutrition, joining us to talk about nutrition in ERAS. And maybe for just a moment Dileep, tell us a little more about yourself and what you do. I know you're just elected president of the Society of the Academic and Research Surgery but maybe mention just a little more about you and what you do.
Dileep Lobo:	00:57	Hi, Paul. Thanks for inviting me to participate in this podcast. As you've said, I'm a professor of Gastrointestinal Surgery at the University of Nottingham and I'm a pancreatic surgeon at Nottingham University Hospitals. In addition, I am the chair of the Scientific Committees of the Enhanced Recovery After Surgery Society and of the European Society for Clinical Nutrition and Metabolism. I've also been recently elected as president-elect of the Society for Academic and Research Surgery of the UK and Ireland.
Dr. Paul W.:	01:30	Really an honor to have you join us today. And Dileep, one of the things we really want to focus on is you have a vast experience and a long experience in helping others see the role of nutrition and understanding the data around nutrition and ERAS, and Enhanced Recovery After Surgery, and it's one of the biggest questions that and how to manage fluids from especially our US colleagues and our US centers who are trying to introduce ERAS, so it's topic of great interest and concern here, as I'm sure it's been other places.
Dr. Paul W.:	02:04	So as we think through how nutrition interacts in the ERAS protocols, tell us a bit about how you work with preoperative nutrition screening, preoperative nutrition assessment, and how to treat those patients, and what you think the importance of that is.
Dileep Lobo:	02:25	Well, Paul, I think preoperative nutrition screening is vitally important. Unfortunately, around the world, if you look at the data, this is not done in all patients and even the best data suggests that it's done in only about between 50 and 75% of patients who come in for major surgery, which is a bit of a

shame because I think identification of the patient at nutritional risk is of vital importance because that would give us an opportunity to intervene if necessary preoperatively.

- Dileep Lobo: 02:51 The nutrition screening tools are very simple. In the UK, we have the MUST, which is the Malnutrition Universal Screening Tool, and in the Europe, what's very popular is the NRS 2002 Tool. Both these tools do not assess nutritional status but they identify the patient at risk for a nutritional problem and, if the patient is identified to be at risk, then a formal nutritional assessment should be performed and perhaps some form of nutritional intervention instituted before the patient comes up for major surgery.
- Dr. Paul W.: 03:27 So if you have a patient, say coming for pancreatic surgery, who does screen in as at risk for malnutrition, how do you handle that patient?
- Dileep Lobo: 03:36 As you know Paul, the complications that patients who undergo pancreatic surgery are at risk of are quite major and therefore it's essential to minimize risk. So if I do find that patient who is malnourished, then we would institute preoperative nutrition therapy in those patients, which would be in the form of either sip feeding as supplements, or if the patient is really malnourished and cannot maintain an adequate oral intake, then we would consider tube feeding, usually by the nasogastric or the nasojejunal route. Only a very small number of patients need parenteral nutrition and those are largely the patients who have got some form of gastric outlet obstruction and cannot be fed by the oral or the enteral route easily, and we would feed them for a minimum of seven days and usually up to 10 to 14 days. There is no evidence that feeding them for longer periods makes much of a difference to outcome, and it may delay operative intervention.
- Dr. Paul W.: 04:37 Do you think this is an area we need more evidence in?
- Dileep Lobo: 04:41 It is an area we need more evidence in because ever since Studley published his landmark paper in 1936, where he showed that patients who had greater than 20% weight loss, had a tenfold greater mortality for surgery for perforated peptic ulcer than those who had a less than 20% weight loss. However, we know that malnutrition does put the patient at risk, but there is very little strong evidence to suggest that nutritional therapy actually makes a difference.
- Dileep Lobo: 05:10 If you take the example of pancreatic cancer, for instance, there was a large systematic review published a few years ago, which

looked at a few thousand patients who had undergone pancreatic surgery and the conclusion was that nutritional intervention did not make a difference, and you and I know that for some patients who undergo major surgery, if you do not provide them with nutritional support, we will increase the complication rates and perhaps also increase mortality.

- Dileep Lobo: 05:37 The problem with a lot of studies, both surgical and medical, in the field of nutrition is that there are a number of confounding factors. It is not so easy to blind the assessors or the patients, and a number of studies have just got small groups of patients, and systematic reviews on small groups of patients don't work terribly well because you don't get a very strong endpoint.
- Dr. Paul W.: 06:03 True, true. I think it's definitely an area all of us want there to be more data in very soon. And what are your thoughts on immunonutrition, say in colorectal surgery where there's a lot of data? Do you think the data's there to support that?
- Dileep Lobo: 06:20 Well, again, if you look at the data from the systematic reviews and meta-analyses, there is a suggestion that immunonutrition may reduce postoperative infective complications. There is no strong data to suggest that when you look at all postoperative complications there is a reduction, but the reduction in infectious complications may also help reduce hospital stay. The problem with the studies on immunonutrition is that people have accumulated a mixed bag of patients, having all types of surgery, the immunonutrition given to patients in the various trials has been preoperative, perioperative, or postoperative, and so there's a lot of noise in the studies.
- Dileep Lobo: 07:04 We did a postoperative study a while ago and we found that it took up to five days for patients to achieve the desired dose of immunonutrition, and this may not be feasible. But if you look at the preoperative immunonutrition studies, if patients are given immunonutrition for more than three days, preferably between five and seven days, then it certainly does reduce postoperative complications, and we presented some data at ESPEN last year on this and it was well-received, and we are in the process of writing this up as a full paper at the moment.
- Dr. Paul W.: 07:40 Excellent. I saw that data it is really exciting addition to the literature. So now moving to the immediate preop period, how do you use carb-loading or do you use carb-loading in your patients, and do you give it just the morning before surgery or I know some in the UK, Monty Mythen and the like, advocate giving it the night before and the morning before. How do you handle carb-loading for your patients?

Dileep Lobo: 08:05 Well Paul, before we talk about carb-loading, we need to look at the concept of preoperative starvation, and most anesthetic societies throughout the world recommend that patients should be starved for six hours for solid food and two hours for clear fluids. Even nowadays, despite these guidelines, a lot of patients are starving for much longer periods of time, and it is not unusual to get patients come to theater having been starved for 12 or sometimes even 18 or 24 hours before an operation, and that to me is unacceptable in the modern day and age of perioperative care. If you starve a patient, especially for liquids, for long periods, then that patient usually comes to the operating room in a state of dehydration and that leads to other problems at the time of induction of anesthesia.

Dileep Lobo: 08:59 If you look at the data on carbohydrate loading, there is conflicting evidence available. Most of the studies that have used carbohydrate loading have given 100 grams of carbohydrate the night before surgery and 50 grams on the morning of surgery, two hours before the induction of anesthesia. The study suggest we shouldn't give any ordinary carbohydrate, but it should be usually a complex carbohydrate such as a maltodextrin, which helps increase preoperative insulin release and therefore decreases postoperative insulin resistance. Now when you look at the data, some studies have suggested that postoperative insulin resistance is decreased, others have suggested that this makes no difference to postoperative insulin resistance. And so, it is very difficult to sift out the data because most of the studies that have used the clamp, which is the gold standard to measure postoperative insulin resistance, have included very small groups of patients. The meta-analysis suggests that postoperative complications are not reduced with carbohydrate loading, so again the real advantage of carbohydrate loading is not known. However, if patients are given carbohydrate loading they continue to drink until up to two hours before the operation, then that itself may be beneficial.

Dileep Lobo: 10:20 A recent study from Italy has shown that if patients are given carbohydrate loading, the need to give them postoperative insulin to maintain blood sugar within the normal range is reduced, and that may be a benefit of carbohydrate loading. But at the moment, the evidence is not firm enough and even the meta-analyses do not suggest a benefit to patients with regard to postoperative complications.

Dr. Paul W.: 10:45 What do you think of the length of stay data, because I know there is some hint of reduced length of stay in that meta-analysis released from the Cochran analysis.

Dileep Lobo: 10:54 The length of stay reduction is less than a day. It is about 0.8 days, and that is statistically significant but again, we don't know if that is a direct effect of the carbohydrate loading or the fact that patients have been put through an enhanced recovery program and there is a sort of [00:11:09] effect in other parts of the treatment are better. And that is one of the problems with the evidence in enhanced recovery, there are multiple interventions involved and it is very difficult to sift out the individual contribution of a single intervention.

Dr. Paul W.: 11:25 That's true. It's a challenging field and continuing to need more data for individual interventions, I think for sure. So now, I think as you move past when your patients are entering the postoperative phase, one of the big challenges, maybe uniquely, but maybe not uniquely, we have in the US is we have in our surveys the longest period of time until we start feeds. It is often two to three or even four days until we start any nutrition at all and we know, at least from the European data I've seen, that there is quite a benefit to nutrition being started as early as the recovery room. Are you able to succeed in early nutrition delivery postoperatively and what tricks do you have to accomplish them, and how do you work on a culture that isn't used to doing that?

Dileep Lobo: 12:14 Paul, most of the data available about early postoperative oral nutrition is from colorectal surgery, and there are several factors that have helped enable this. In Europe not all patients, but certainly more than 70% patients are able to maintain an adequate oral intake on the first postoperative day. There are several factors that help this, and the first of all, which to me is the most important, but we've got the least evidence on, is incorporation with the patient into the recovery pathway and the patient understands what is expected of them, they are more likely to contribute, and so preoperative counseling of the patient is vital. Secondly, we have to actively prevent and treat nausea and vomiting, because we know that the patient who is nauseous or who is vomiting is not able to eat. We moved away from using nasogastric tubes because again nasogastric tubes are of very little benefit to patients. In fact, there is no real benefit of putting in a nasogastric tube in the postoperative period for patients undergoing colorectal surgery, but nasogastric tubes do impede oral intake.

Dileep Lobo: 13:22 Avoidance of fluid overload is also important, because if patients are fluid overloaded, they sometimes are not able to eat or drink adequately. So if you've controlled for these factors, then a lot of patients can drink in the early postop period, and again a word of caution here is that you've got to

wait for the patient to recover from the anesthetic and to be adequately awake, because the last thing you want to do is let a patient who is drowsy drink, and you don't want to increase the risk of aspiration. However, if the patient is alert and comfortable, then you can make the patient drink a few hours after the operation and, as I said earlier, about 70% of patients who have colorectal surgery can eat adequate amounts on the first postoperative day, and even if they are not able to eat, they can tolerate sip feeding or nutritional supplements.

- Dileep Lobo: 14:13 The important thing to remember with ERAS strategies is that they don't work for all patients, and there will always be the odd patient who needs to be managed with traditional care, and this is more so in patients who undergo emergency surgery. In patients who undergo pancreatic surgery, we know that about 15 to 20% of them can develop a condition that we call delayed gastric emptying, and it may be quite difficult to feed those patients orally after an operation if they do develop delayed gastric emptying postoperatively, and so we have now moved to putting down nasojejunal tubes across the gastroenterostomy or duodenoenterostomy, and we start early feeding in these patients. Again, we try and feed them on the day after surgery with about 25 mL/oz with the tube and gradually increase this. And if the patients do not have nausea and the aspirate from the nasogastric tube is not high, we remove it and institute oral feeding.
- Dileep Lobo: 15:16 The advantage of having a nasojejunal tube in is that if the patient does develop gastric emptying, then we don't have to worry about nutrient delivery and we can continue giving them adequate amounts of nutrition through the nasojejunal tube.
- Dr. Paul W.: 15:31 I think some of the key messages I like here the best is that NG tubes are not useful devices in most patients. As a past surgical patient, having had many operations myself, they are the most dreadful part of an operation, I think, for the patient in many cases, and we've been taught for many years that they aren't useful but yet we still see them all the time. And the other thing I really liked was the use of NJ tubes, especially in the larger, the pancreatic surgeries and some of the other large surgeries. I think that is something, at least on the nutrition side, we love to see and would love to see more of because that is a huge advantage to us, getting those patients fed as well and returning the gut to function. So I think those are really excellent things that everyone needs to continue to hear to improve our patient care and improve the patient experience.

Dr. Paul W.:	16:20	If you were going to leave the audience with a few thoughts, one question I would have is where do you think the greatest research priorities should be to build our data for the role of nutrition in ERAS, if you were going to pick one or two areas?
Dileep Lobo:	16:35	I think first, whether it is in a research study or not, I think the most important thing for us to do is to influence process change where every patient coming in for major surgery should have nutritional screening done at the very least, and I think that's vitally important and we should aim to achieve this in 100% of patients.
Dr. Paul W.:	16:54	Amen.
Dileep Lobo:	16:55	Once we identify a patient who is at nutritional risk, we probably ought to do a proper nutritional assessment and then try and reduce the risk for that patient preoperatively by either giving them immune-enhancing nutrition or ordinary nutrition to build them up and try and reduce complications. And I think if we are going to do studies to see the importance of immunonutrition or the importance of standard nutrition preoperatively in these patients, we probably ought to do large multicenter studies with outcomes that are important for patients, and there is no point in doing small studies because they don't really answer any questions. I think the way forward is to have multicenter, multinational studies looking at the same thing. However, these are expensive to run and they require a lot of coordination, and as you know with most good quality randomized controlled trials, they take a long time to finish.
Dileep Lobo:	17:56	So we need to get more and more centers involved so that we can recruit an adequate number of patients over a relatively short duration of time and come up with answers fairly quickly, because there is no point waiting for five years to get an answer from a randomized controlled trial, because then other aspects of surgical care or perioperative care would have changed in five years, and that answer may not be valid in five years' time.
Dr. Paul W.:	18:21	Any other last thoughts you want to leave with the audience that you think would be useful for them to hear as they think about this topic?
Dileep Lobo:	18:30	Yeah, I think ERAS has come to stay. However, at the moment it is complicated and people are a bit reluctant to institute all the measures that are recommended in the ERAS pathway. However, we must remember there are a number of measures now more or less standard in clinical pathways, such as preoperative antibiotic prophylaxis, warming of the patient

during surgery, thromboprophylaxis, and we don't need to worry to much about these as long as they are part of the standard practice in hospitals. In the studies which I've used regression analysis, they found that the most important parts of ERAS are to prevent prolonged preoperative starvation, to educate the patient and make the patient part of the recovery pathway, to avoid fluid overload, and I think these are the important things we need to do.

- Dileep Lobo: 19:22 The other thing that is shown to be of benefit is laparoscopic surgery, because the inflammatory response provoked by laparoscopic surgery is less than that provoked by open surgery, and there is evidence that laparoscopic surgery wherever feasible helps, but again we need a word of caution over that, and if laparoscopic surgery is to be part of ERAS pathways, it needs to be done by experienced people and there needs to be a continuous audit to show that actually this benefits patients.
- Dr. Paul W.: 19:51 All right, I think that's excellent. Dileep, I want to thank you again for taking time out of your busy schedule to join us and helping enlighten people around the world on how best to think about using ERAS and nutrition as part of ERAS in their care and again, it has really been a joy having you.
- Dileep Lobo: 20:09 You're welcome, Paul, and on a final note may I add that a successful ERAS program is dependent on a team approach and it also needs buy-in from the managers of the hospital because the initial program requires a little bit of investment, both in terms of money and personnel, but once the program starts running it pays for itself very quickly, and therefore there needs to be a change in culture in the hospital and among the staff and there needs to be collaboration and cooperation between the various healthcare professionals who look after the patient.
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