SPEAKER NOTES

Foundations of Recovery

Dr David Reiner

01 Title

If any of you see me next week, it means you're in a really bad way. It means you need an operation — on your brain, or on one of your joints.

BEAT

Because next week I'm back in the hospital, where I've been for the past 20 years, working as an anaesthesiologist. One patient at a time, one room. Over 20,000 operations.

And do you know what I find really interesting? These are people at the most anxious, most vulnerable moment of their lives. And they're not asking about dying.

They're mildly worried about being seen naked, or someone making fun of their body. But the question I actually get, over and over, is: how quickly can I go back to being functional?

The last thing almost every patient says to me before sedation is never about the operation. It's about afterwards. When can I go for a walk again. When can I get back to the gym. When can I drive. When can I lift my granddaughter.

And I think that says something. None of us want to spend our lives thinking about disease, or treatment. We want to be functional.

For most of those 20,000 patients, I gave a reassuring answer without any real idea whether it was true. A standardised guesstimate. Because I was trained to get patients through surgery, not to get them back to their lives. Nutrition was not something I ever focused on, or cared about. That was someone else's domain.

What I've realised is that with some education, some changes in practice, and a broader scope, I could change the outcome for thousands of people coming through those theatres.

But that crosses domains. And it's the opposite of how medicine is taught. We're siloed. The anaesthesiologist doesn't speak to the dietitian, or the nutritionist, or the naturopath, or the pharmacist about what happens to that patient six months later. Nobody owns the long-term outcome.

That's a shame. And that's what I want to talk about today.

Thank you to Rener and the team for having me

02 Personal hook

Three years ago, at Bondi, my seven-year-old son asked me to keep my t-shirt on at the beach. He asked me quietly. Then he moved down the sand to sit with his mates. Further away from me.

I want you to sit with that for a moment. Because I did. [gesture to LEFT photo] That's me. Argentina, family holiday.

One hundred and two kilograms. My knees hurt. My HbA1c was creeping into the pre-diabetic range. [gesture to MIDDLE photo] And that's also me.

With every drug in the formulary at my disposal, and not one of them going to fix any of it. What fixed it wasn't a drug. It was everything most of you in this room already knew. Sleep.

Movement. Protein. The foundations. Twenty-four kilograms lost.

Seventy-eight kilos, held for three years. Because knowing how to lose weight is the easy problem. Keeping it off is the hard one. And every one of you is about to face that problem, at scale, with your GLP-1 patients.

Ozempic. Wegovy. Mounjaro. They're losing weight, and they're losing muscle.

What they need is what I needed. Foundations. Protein. Maintenance.

The wisdom in this room has been ahead of my profession for decades. Modern medicine is finally catching up. That's the talk you're about to hear., Optional lines if the room feels right: 'And the part that surprised me most, I finally feel better naked at forty-eight than I did at forty.'

/ 'This isn't a weight-loss story. It's a maintenance story.'

03 Disclosure

Quick disclosure before we go any further, because it's important for a CPD talk and because I want you to trust what I'm telling you. I hold shares in Nutraviva, an Australian collagen company. I mention that upfront so it's not something you find out later. You'll see their relevant products come up naturally through the talk, where they're actually relevant, rather than saved up for one slide at the end.

But this is not a Nutraviva presentation, and I won't be recommending brands from up here. What you will see is the clinical evidence, peer-reviewed studies from major research groups, that underpins why I care about this topic and why I think it matters for your practice. Where I share protocols, they're what I do for my own surgical patients. They come from the literature, not from marketing.

With that out of the way, let's begin.

04 This is a protein talk

Before anything else, I want to tell you what this talk is about. It is about protein. Not one protein, not one brand, not one powder. Protein as a class of nutrient, and what it does for a body that is trying to repair itself.

A protein is a chain. Amino acids linked together, and the order of the links is what makes one protein different from another. And for the tissue I care about, the tissue that holds you together, three of those links do most of the work. Glycine.

Proline. Hydroxyproline. Hold those three names. Everything else today hangs off them.

05 Muscle is anchored

Here is the picture I want in your head for the rest of the talk. A muscle is not a free-floating thing. Flex your bicep. That muscle spans two bones, and it does not touch either of them directly.

At each end it becomes tendon, and the tendon is what grips the bone. So when a patient tells you their shoulder hurts, or their knee gives out, or their Achilles has gone, they are almost never telling you about muscle. They are telling you about the anchor. Muscle is contractile tissue.

Tendon, ligament, joint capsule and bone are connective tissue, and connective tissue is collagen. You can build all the muscle you like. If the anchors are not built with it, the whole thing fails at the join.

06 Why I’m here

A word about why I care about this, because I think it matters for what follows. I trained conventionally. Medical school, anaesthesia training, echocardiography, the system I came up in is very good at treating organs. Cardiology treats the heart.

Nephrology treats the kidneys. Anaesthesia looks after the physiology during surgery. It works. It saves lives every day.

But when you stand at the operating table for enough years, you start to notice something. You notice that the patient who eats well and sleeps well and moves before their surgery, that patient recovers well. And the patient who doesn't, the one who's been fasting for eighteen hours pre-op, who's malnourished, who's lost muscle mass in the six months before we operate, that patient struggles. For weeks.

Sometimes for months. You start to notice that the biggest levers on how someone actually recovers are almost never the drugs we're most excited about. They're the boring, ancient things. Sleep.

Movement. What the patient ate for the last month. The building blocks in their bloodstream when we cut. And you realise something else, which is that everyone in this room already knew this.

The naturopaths in the audience, you've been saying it for decades. The nutritionists, this is your entire clinical world. The pharmacists, you see the patients on twelve medications who would benefit more from a single conversation about protein than from another script. So I'm not here to tell you something new.

I'm here to give you the clinical evidence, the trial data, that supports what many of you have already been practising. And to talk about where it fits in the perioperative space, which is where I spend my working life, and where the evidence is stronger than most clinicians realise. That's the bridge I want to build today.

07 Roadmap

Here's the arc of the next forty minutes. First, the protein problem. Why global protein demand is exploding, why the supply is under strain, and why the market has narrowed the conversation down to muscle when it should be much bigger than that. This sets up why collagen matters at all.

Second, what collagen actually is. And I mean this literally. What is it, where does it live in the body, what amino acids does it deliver, and how does it differ from whey and plant proteins. Because you can't recommend something to a client if you can't articulate what it does.

Third, clinical applications. This is where we spend real time. Tendons and ligaments. Sleep.

Bone. Skin. The over-forty injury pattern that every practitioner in this room sees weekly. Fourth, perioperative nutrition.

This is my clinical wheelhouse. This is where I'll show you what I do for my own surgical patients, and I'll walk you through the studies that back it up. If you take one thing away from this talk that changes your practice next Monday, I hope it's this section. And fifth, bridging.

Foundations. How the naturopath, the nutritionist and the pharmacist in this room can actually work together on the same patient. Because that's the point of this conference. Twenty minutes of questions at the end.

Bring the hard ones. Let's start with the problem.

09 Four forces

Four forces are driving global protein demand higher than at any point in modern history. The first is simple demographics. We are eight billion people now, and by 2050 we'll be closer to ten. Every one of those additional two billion people will eat protein.

The base of the pyramid is expanding, and it's expanding into economies that are also getting wealthier, which historically means more animal protein consumption per person, not less. The second driver is the GLP-1 medications. Ozempic, Wegovy, Mounjaro, Zepbound. These drugs are extraordinary at driving weight loss, but as many of you already know, that weight loss isn't only fat.

It includes a significant proportion of lean tissue. And that's why, quite suddenly, millions of people are being told by their doctors, their trainers, and their dietitians that they need to focus on protein to preserve muscle while they lose weight. This has genuinely shifted the conversation. The third driver is the culture.

Open any social media platform and you'll see it. Protein is having a moment. Every fitness influencer is talking about it. Every athlete is measuring it.

And it has flowed downstream to the general public in a way we haven't seen with any nutrient before. And the fourth driver, the one that concerns me, is the food industry response. Protein is now added to everything. Ice cream, cereal, snack bars, drinks, chips.

And this is where I want us to pause.

10 “Cigarette” quote

Adding protein to a cigarette doesn't make it healthy. I say that a little provocatively, but I want it to land. Because we've reached a point where a chocolate bar that used to sell on taste now sells on grams of protein. A cereal that's mostly refined starch now advertises its protein content on the front of the box.

Ice cream with twenty grams of protein per serve. Protein-enriched sodas. Protein chips. None of that food is more nutritious because protein has been added to it.

What's happening is that a genuine physiological need has been converted into a marketing opportunity, and the food industry is very good at that. The point I want to make is that the modern protein conversation has become obsessed with one number, grams per day, and lost sight of what actually matters. Which proteins. From which sources.

Delivering which amino acids. To which tissues. For which clinical outcomes. That's the conversation we're going to have for the rest of this talk.

11 Where protein comes from

Food first, always. Meat, fish, eggs, dairy, legumes. That is complete protein plus everything else that comes packaged with real food, the iron, the zinc, the B12, the fibre, and no supplement reproduces that. So the order of operations is simple.

We optimise the diet first. Supplements fill a gap the diet cannot close, they do not replace it. If someone genuinely can't meet their protein needs through food, a protein supplement can help. That's it, that's the whole rule.

And the gaps are real, older patients with poor appetite, post-surgical patients who can't eat enough, people on GLP-1s eating half of what they used to. Then there is the third column, and it's the one this talk is really about. Collagen isn't there to build muscle. It delivers glycine, proline and hydroxyproline, and it feeds the tissue that holds you together.

Different amino acids, different tissues, a different job.

13 Most abundant protein

Roughly thirty percent of the total protein in your body is collagen. That's more than any other single protein, more than the muscle proteins like actin and myosin, more than the enzymes, more than the immunoglobulins. If you added up every gram of protein in your body, nearly a third of it would be collagen. And it lives in exactly the places you'd expect.

Bone is roughly ninety percent collagen by dry weight, before the minerals go in. Skin, most of it is collagen. Tendons, essentially collagen fibres organised for tensile strength. Ligaments, same.

Cartilage in your joints. The lining of your gut. The walls of your blood vessels. Now think about what this list has in common.

These are all the structural tissues. The tissues that hold everything else together. And they're the tissues that, when they fail, a tendon rupture, a ligament tear, thinning skin, weakening bone, a leaky gut, cause an enormous amount of clinical suffering. Whey doesn't reach these tissues in a meaningful way.

14 Signature amino acids

If collagen were a fingerprint, these three amino acids would be the ridges. Glycine, the smallest amino acid there is. Around twenty-two percent of collagen is glycine. In most other proteins glycine is a minor player.

In collagen, it's the dominant residue. And glycine matters beyond structure, it's involved in sleep regulation, in the health of the gut lining, and in the synthesis of glutathione, the body's master antioxidant. Proline, thirteen percent. Proline is unusual because it kinks.

That's structurally essential for collagen, because collagen is a triple helix, and it needs those regular kinks to wrap around itself in the right geometry. Hydroxyproline, ten percent. This is proline enzymatically modified with a hydroxyl group after the protein is made. That enzyme requires vitamin C, which is why vitamin C deficiency, scurvy, causes collagen to fail.

It's basically unique to collagen. If you measure hydroxyproline in someone's bloodstream, you're measuring collagen turnover. Now the punch line. Add these three up.

Forty-five percent. And you get almost none of them from muscle meat. A steak is mostly the anabolic amino acids. So even if you eat a lot of muscle protein, you can still be relatively glycine-deficient.

This is why collagen exists as a category.

15 Two pathways

This is the slide I want to burn into your memory, because it changes how you think about the entire conversation. Whey delivers leucine. Leucine binds to a sensor called mTOR inside muscle cells. mTOR wakes up, and the muscle cell starts building new muscle protein.

That is the pathway. That is why whey is so effective at driving muscle growth. It's not magic, it's a very specific molecular trigger. Collagen delivers glycine, proline, and hydroxyproline.

Not much leucine at all, comparatively. But those three amino acids get taken up by fibroblasts, the cells that make connective tissue, and used as raw substrate to build new collagen fibres. When you supplement with collagen, you're providing the building blocks they need in the ratios they need them. So whey drives muscle growth.

Collagen drives connective tissue synthesis. Different pathway. Different cells. Different tissues.

Different clinical outcome. Not competitors. Complements. If you're a young person who wants to build muscle, take whey.

If you're recovering from a tendon injury, take collagen. If you're forty-five, active, and want to maintain both, take both.

16 Whole-food origin

Something worth remembering when we talk about supplements. Collagen isn't a modern invention. It's not synthetic. It's not a research chemical.

It's something humans have been consuming, on and off, for thousands of years. Bone broth is essentially concentrated hydrolysed collagen. When you slow-simmer bones, the heat and time break down the collagen matrix and release the peptides into the liquid. That's what makes a well-made stock rich and glossy.

Chicken feet are, essentially, a delivery vehicle for collagen. Every traditional cuisine that used them, Chinese, Filipino, Caribbean, French, was extracting the collagen. David Sinclair, the Harvard longevity researcher, has spoken publicly about boiling chicken feet as one of his approaches to getting collagen from a food source. It's cheap.

It works. It's also, in his own words, a bit of a hassle. Fish skin, fish scales, the same story. Rich in collagen.

Traditionally consumed. Modern industrial food processing threw most of them away. What the supplement industry has done is take the nutritional content of these traditional practices and made it accessible. You don't need to keep a stockpot on the stove for eighteen hours.

For the naturopaths in the room, this is important. This isn't modern food science replacing whole food. It's modern food processing making something ancient available again.

17 Hydrolysis

There's a fair objection that gets raised about oral collagen. The objection is: you eat a protein, you digest it into amino acids, so how is eating collagen any different from eating any other protein? It's a good objection. And the honest answer is that if hydrolysis didn't do something special, oral collagen wouldn't work any better than any other protein source.

But it does work. And here's why. Native collagen, the collagen in bone broth or a raw cut of meat, is a huge molecule. Three hundred kilodaltons, roughly.

Way too big to be absorbed intact. Traditional cooking hydrolyses some of it, but not all of it, and not consistently. Modern hydrolysis breaks the collagen down further, into peptides. Chains of just two to five amino acids.

Small enough to be transported across the intestinal wall by specific transporters called PEPT1 and PEPT2. And the ones that get through, particularly Pro-Hyp and Hyp-Gly, actually appear in the bloodstream after ingestion. That's been shown in humans, repeatedly, using mass spectrometry. And once those peptides are in the bloodstream, they do two things.

They act as substrate, raw material that fibroblasts can take up. And there's growing evidence that they also act as a signal, so fibroblasts increase their synthetic activity in response. Both mechanisms combine to produce the clinical effects we'll cover in the next section.

18 One molecule, three forms

Here's something most people, including a lot of practitioners, don't realise. Bone broth, gelatin and collagen peptides are all the same molecule. They all start from the same raw material, the bones, hide and connective tissue of the animal. The only difference is how far that collagen has been broken down.

Simmer bones slowly in water and you get bone broth, a food that carries some collagen along with everything else in the pot. Extract the collagen with heat and you get gelatin, large chains that set when they cool, which is why it makes a jelly. Break those chains down further with enzymes and you get collagen peptides, small enough to dissolve in cold water and not set at all. Same molecule, three levels of processing, three very different products on the shelf.

19 Which form, for whom

So why would someone buy bone broth instead of gelatin or collagen peptides? It comes down to who the person is and how they'll actually use it. Bone broth is the whole-food option. It's savoury, warming, and it comes with minerals and flavour, which makes it ideal for someone who prefers food over supplements, or for gut-focused support.

The trade-off is that the collagen per serve is lower and less consistent. Gelatin is the cook's option. It gels, so it goes into jellies, homemade gummies, sauces and stews. It's economical and great for families.

But it needs heat to dissolve and it sets, so it doesn't go into a cold smoothie. Collagen peptides are the convenience option. Unflavoured, dissolves in coffee, water or a shake, hot or cold, with a consistent, measurable dose every scoop. That's why they're what's used in the clinical trials, and it's the one to reach for when you want a reliable ten to twenty grams a day.

None of them is the wrong answer. The best form is the one your patient will actually take every day.

20 Bovine vs marine

Two main sources on the market. Practitioners get asked which one to recommend, so let me give you the useful version. Bovine collagen is made from cow hides. It's Type I and Type III.

And it's worth being precise about that, because it isn't just bovine does everything. The Type I side gives you the joint, tendon and bone support. The Type III fraction specifically is what's behind the gut lining, blood vessel and skin benefits. It's the more cost-effective option, cattle hides are produced in enormous volume as a by-product of the meat industry, so raw material supply is abundant.

Bovine is the everyday workhorse. For a client with joint pain, tendinopathy, general recovery, over-forty wear and tear, bovine works well. Marine collagen comes from fish skin and scales, usually from species farmed for their meat. It's predominantly Type I collagen, the same type that dominates in skin.

Marine peptides tend to be slightly smaller on average than bovine peptides, and there is some evidence, though the head-to-head trials are limited, that this improves bioavailability for skin-related outcomes specifically. It also carries important dietary flexibility: it's compatible with halal, kosher, and pescatarian dietary patterns. Marine is generally more expensive. So when practitioners ask me which should I recommend, my honest answer is: for most people, bovine does the job at a better price point.

For a client whose primary concern is skin, or who has religious or dietary restrictions around beef, marine is the better fit. Both are legitimate. Both work.

21 How much protein per meal

Almost every practitioner in this room has heard the rule. Twenty-five grams of protein per meal is the ceiling. Anything more than that gets wasted. I've been telling clients that for years.

Many of you have been telling clients that for years. It's in every mainstream sports nutrition guideline. The rule turns out to be wrong. This paper, published in 2023 in Cell Reports Medicine, comes from Luc van Loon's group at Maastricht University.

Van Loon is one of the world's leading protein metabolism researchers. His lab used intrinsically labelled protein, tagging the amino acids with stable isotopes, and followed them through digestion, absorption, and incorporation into tissue over twelve hours. They compared twenty-five grams against one hundred grams in the same young men. One hundred grams produces a greater and longer anabolic response.

There was no ceiling. The muscle protein synthesis response was still elevated at twelve hours post-meal. Amino acid oxidation, the supposed wastage, was negligible. And importantly for us, connective tissue protein synthesis was also elevated, and also dose-dependent.

The reason we all believed the twenty-five gram rule for two decades is that every previous study had used doses of forty-five grams or less, and measured for six hours or less. Why does this matter? First, if a client wants thirty or forty grams of collagen at breakfast alongside thirty grams of whey, as I do myself, most mornings, that is not wasted. Second, the dose-dependent effect on connective tissue synthesis is direct mechanistic support for what we're about to discuss.

03 Sleep

SLIDE 22

Section three. Sleep. Short section, but it applies to every person in this room.

23 Sleep

Quick one, but it applies to every single person in this room, because poor sleep is common regardless of anything else going on. Glycine, the amino acid we just talked about, has a role in sleep regulation. And an evening glycine load is a simple, low-risk thing to try with a patient whose recovery has stalled for no obvious reason. Sleep first, then everything else moves.

It's not a big claim. It's a cheap, safe one. And it's foundational rather than an afterthought.

04 Exercise

SLIDE 24

Section four. Exercise and sport recovery, and this is one I want to spend real time on.

25 Exercise is surgery in miniature

Here's the analogy I want you to leave with. Exercise is a much smaller version of the physical stress the body goes through in surgery. Same basic idea, physical stress, followed by a repair-and-adapt process, just at a much smaller scale. And it applies whether we're talking about running, gym training, yoga, someone just starting out, or chair yoga for an eighty-year-old.

All of it is stress the body needs to recover from and adapt to. All of it benefits from the same building blocks. So everything I'm about to say about surgical recovery, you can scale down and apply to the person in front of you who has just started walking three times a week.

26 Recovery building blocks

Three building blocks, and they map onto three different parts of the job. Protein, for the muscle doing the work and the repair afterward. Creatine, for restoring what gets used up. Creatine stores get depleted through exercise and need replacing, and this is genuinely one of the best-evidenced, cheapest, most underused supplements out there for exactly that.

Five grams a day, no loading phase required, and the safety record is about as long as any supplement we have. And collagen, for the tendons and ligaments carrying the actual mechanical load, which matters more as people age and injury risk goes up. This is where I want every one of you thinking about recovery and injury prevention as one and the same conversation, not two separate ones. The person who comes to you with a niggling Achilles and the person who comes to you after a knee replacement are, physiologically, on the same spectrum.

27 Creatine in muscle and recovery

Creatine deserves its own slide, because it's the most researched sports supplement there is and it's still badly underused outside the gym. Here's how it works, simply. Muscle stores creatine as phosphocreatine, which is the fastest way the muscle has to regenerate ATP, the energy currency, during short, hard efforts. More creatine stored means more energy available for those efforts.

That lets people do a bit more quality work in each session, and over weeks of resistance training that translates into greater gains in strength and lean muscle than training alone. And stronger muscle is the foundation of recovery, whether that's from a session, an injury or an operation. The stores get depleted with exercise and tend to be lower with age and in people who eat little or no meat, so replacing them is the point. Three to five grams a day of creatine monohydrate, every day, taken any time.

No loading phase needed. It's one of the best-evidenced, cheapest, safest supplements we have, and it pairs naturally with protein and collagen.

05 Perioperative Nutrition

SLIDE 28

Section three. Perioperative nutrition. This is where I spend most of my clinical time, and where the evidence surprised me.

29 His protocol

Here's what I actually do for my surgical patients. This isn't the guideline. It's what I've come to over the last few years, blending the enhanced recovery after surgery protocols, van Loon's protein work, and the trials I'm about to show you. Two to four weeks before surgery, when I meet the patient in preadmission clinic, the first thing I do is ask about protein intake.

Not weight. Not exercise. Protein. What did you eat yesterday.

How much fish, meat, dairy. Because the number of patients coming into elective surgery with a protein intake below their basic requirement is genuinely shocking. I aim for 1.2 to 1.6 grams per kilogram per day, starting weeks before we operate. The night before surgery, this is where I've moved away from tradition.

I don't fast my patients from midnight. That fifteen-hour fast, sometimes eighteen, that we've done for decades, it's not physiologically necessary and it drives catabolism straight into the theatre. My patients have a protein plus carbohydrate load at ten pm and a clear carbohydrate drink two hours before induction. They come to surgery fed.

This is standard ERAS practice now, but I mention it because it isn't universal. From day zero to day fourteen post-op, this is the intervention. Adequate protein plus collagen. The protein delivers the leucine that drives muscle protein synthesis and prevents wasting.

Collagen delivers the glycine, proline, and hydroxyproline for the wound healing, the tendons the patient is stressing during rehab, the skin that has to seal. I aim for at least 1.2 grams per kilogram per day, total protein, split roughly equally. Beyond fourteen days, I keep the collagen going. Because tendons and skin remodel over months, not weeks.

And because glycine at night helps sleep, and sleep drives everything else about recovery.

30 Catabolic stress

Before we look at the trials, I want to make sure we're all on the same page about what surgery actually does to a patient's physiology. Surgery is a controlled injury. The body responds to it exactly the way it would respond to any other significant trauma. There's a stress response, cortisol goes up, catecholamines go up, inflammatory cytokines flood the system.

And in that state, the body switches from build mode to break-down mode. It starts pulling amino acids out of skeletal muscle to feed the wound, feed the immune response, feed the acute phase proteins the liver is churning out. That muscle loss is faster than most clinicians appreciate. Van Loon's group and others have shown that a patient can lose one to two kilograms of lean mass in the first week after major surgery.

That's most of the muscle in a quadriceps. For a frail older patient, that difference is the difference between walking out of hospital and going to rehab. And older patients pay the highest price. Anabolic resistance is a real phenomenon.

The same dose of protein that would build muscle in a twenty-five year old barely holds the line in a seventy-five year old. So older surgical patients need more protein per kilogram to achieve the same anabolic effect, but they're the group most likely to be under-eating protein at baseline. Feeding the patient well is not something we do alongside the surgical intervention. It is part of the surgical intervention.

31 Trial · Bruno 2026

This is a 2026 paper from Bruno and D'Antimi, a plastic surgery group in Rome. Aesthetic Plastic Surgery, an ISAPS journal, legitimate, indexed, peer-reviewed. Two hundred patients, non-bariatric, all having full abdominoplasty. Not the population you'd expect to be malnourished.

Middle-aged, generally healthy, elective surgery. The intervention arm got at least 1.2 grams of protein per kilogram per day, either as whey isolate or as hydrolysed collagen peptides, starting within twenty-four hours of surgery, for at least fourteen days. Control got no supplement, usual care. Wound dehiscence, six percent in the protein group, seventeen percent in the control group.

p equals 0.018. Nearly a two-thirds reduction with a food. Seroma, nine versus eighteen percent. Cut in half.

Time to complete healing, sixteen point eight days versus twenty point five. Nearly four days faster. And on multivariate analysis, protein supplementation was an independent predictor of faster healing, with a beta coefficient of minus 2.94. Independent of age, BMI, comorbidities.

If you gave your patients a drug that halved wound dehiscence, you would be handing it out. This is that drug. It costs almost nothing. Whey OR collagen worked.

Both were effective.

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32 Trial · Saleh 2023

Same story, different specialty. This is Saleh, Williamson and Passias, published in Spine in 2023. A randomised controlled trial in older adults, age fifty-five and up, undergoing elective lumbar spine surgery. One hundred and three patients.

The intervention was a protein shake, twice a day, from post-op day zero through two weeks after discharge. Not fancy. Not expensive. A protein shake.

In-hospital minor complications, wound drainage, electrolyte problems, hypotension, ileus, DVT, two point one percent in the protein group. Twenty-three point two percent in the control group. That's a ten-fold reduction. p less than 0.01.

Wound healing complications specifically, three point four percent versus seventeen point nine percent. Same pattern. Now look at these two trials together. Bruno 2026, abdominoplasty, wound dehiscence six versus seventeen.

Spine 2023, lumbar surgery, wound complications three versus eighteen. Different surgeons, different patients, different countries, different journals. Same finding. If we saw these numbers with a pharmaceutical, it would be first-line therapy within a year.

And it's protein. And most hospitals in Australia are still fasting elderly patients for fifteen hours pre-op and sending them home with no nutritional plan. I don't say this to be provocative. I say it because I have to look these patients in the eye at follow-up.

That's on us as clinicians. And it's fixable.

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33 Trial · Witard 2025

If a review from 2025 could pull all of this together for us, this is it. Oliver Witard and colleagues, King's College London, Manchester, Nottingham. Experimental Physiology, 2025. Open access, you can find this tonight if you want to read it.

It's a narrative review of protein-based perioperative nutrition across the orthopaedic surgery spectrum. Total knee replacement. Total hip replacement. Hip fracture.

Anterior cruciate ligament reconstruction. All the operations where a patient loses substantial muscle around the time of the procedure. They conclude what our earlier trials suggested: essential amino acids and whole protein supplementation reliably improve muscle mass, strength, and function in the perioperative period. HMB, beta-hydroxy-methylbutyrate, is emerging as an interesting adjunct, though the evidence is still developing.

Their honest conclusion is one I share. The literature is consistent. The intervention is boring, safe, and cheap. The obstacle is implementation.

Trials show it works. Wards don't reliably do it. Which is why you're the people who can move this forward. You're the touchpoints closest to the patient.

34 Van Loon hospital gap

I want to spend a minute on this slide because it's the one that changed my practice more than any other. Luc van Loon's group has been going into actual hospitals, not research units, not metabolic wards, and measuring what patients actually eat. The guideline is nought point eight grams per kilogram per day. That's what hospital dietitians are prescribing.

It's already too low for the elderly, but let's put that aside. The real intake, measured by weighing food trays, before and after, on wards, is nought point five grams per kilogram per day. About sixty percent of what's prescribed. The consequences are what you'd expect.

Patients lose about one point four kilograms of lean tissue in the first four days of an inpatient stay. They're being fasted for around fifteen hours overnight, from dinner to breakfast, every single night. Now, I include this slide with some hesitation, because I don't want it to sound like an attack on hospital dietitians, who are working within tight budgets and impossible caseloads. But I do want us to sit with the fact that this is the reality of hospital nutrition today.

And it's why a protein shake twice a day makes such a dramatic difference in the trials I've just shown you. It's not that the shake is magical. It's that the baseline is that broken. Van Loon's group has practical ideas, cheese cubes with the evening meal add twenty percent to daily protein intake.

Every one of us has an opportunity to close that gap.

35 Economics quote

I want to close this section with a slide that a few colleagues told me not to include. I'm going to include it anyway, because I think the audience in this room will understand what I mean. We, and by we I mean modern hospital medicine, my world, will spend twenty thousand dollars on a targeted therapy for a patient after a major operation. We will spend hundreds of thousands on a course of a novel drug.

We are extremely comfortable investing in molecules. We are not comfortable spending fifty dollars on protein for the same patient. That's not a caricature. That is, in many hospitals in this country, the actual state of affairs.

Nutrition is treated as a cost centre. Drugs are treated as an investment. And the trials on the last six slides say, very clearly, that this is not a rational allocation of resources. Halving wound complications with a protein shake is not a small effect.

Cutting length of stay by a day in cancer surgery is not a small effect. I say this to a room that includes a lot of naturopaths and nutritionists because I want you to know that we, inside the medical system, are starting to see what you've been saying for decades. I'm hopeful the next generation of surgeons and anaesthetists will treat nutrition the way our generation started treating pain, not as an optional add-on, but as a core part of the surgical service.

36 GLP-1 companion case

I want to slow down on one modern case, because it's about to define most of your caseload if it hasn't already. Every practitioner in this room is now seeing more clients on GLP-1 medications week by week. Ozempic. Wegovy.

Mounjaro. Zepbound. The prescribing volume has doubled in Australia in the last two years and is still climbing. And these drugs work.

Fifteen to twenty-two percent total body weight loss in the pivotal trials. But here's what the numbers don't show a client at first glance. Between twenty-five and forty percent of the weight coming off is not fat. It's lean tissue.

Muscle. In the STEP-1 trial with semaglutide, forty-five percent of the weight lost was lean mass. In SURMOUNT-1 with tirzepatide, twenty-six percent. Older drugs like liraglutide, up to sixty percent in some cohorts.

This is a huge issue, and most GLP-1 patients don't know about it. Their doctor didn't mention it. Their scale doesn't show it. What's actually happening is that they're becoming sarcopenic.

And when patients discontinue GLP-1s, roughly two-thirds do within two years, the weight comes back as fat, on a body that now has less muscle. That's the setup for lifelong sarcopenic obesity. The answer is what you already know. Prioritise protein intake, one point six to two grams per kilogram per day during the rapid weight loss phase, and consider protein supplementation where it's needed.

That's genuinely hard because these drugs suppress appetite, so this is where you come in. Resistance training two to three times a week, minimum. Load matters more than steps. And measuring body composition, not just weight.

They're on the drug. You're the safety net for the muscle.

06 Bridging Foundations

SLIDE 37

Section four. Bridging foundations. This is the part that matters most, what happens on Monday morning, and how we work together from here.

38 Where disciplines meet

I want to talk about what this room actually is. Because it's not just a CPD event. It's four professions in the same space, and I don't think we appreciate often enough what that means. The naturopaths in this room hold the whole-person view.

You see how food and sleep and stress and movement all interact. You've been talking about foundations for decades, the profession I trained in has spent that same decade chasing new drug protocols and only now starting to circle back to what you always knew. The nutritionists know what a client actually eats. Not what the guideline says they should eat.

What they actually consume. That's a professional skill that most doctors don't have. And in the perioperative context, where malnutrition rates in elective surgical patients are between thirty and fifty percent, that skill is genuinely underused. The pharmacists in this room see the recovering patient at a moment when nobody else does.

They walk in to pick up a script two weeks post-op. They're a bit slower, a bit tired, they've lost weight. That thirty seconds at the counter is a touchpoint that no other health professional gets. And it costs the system nothing.

And the doctors and surgeons, my colleagues, have the trust of the patient at the highest-stakes moments. Pre-admission clinic. In hospital. Post-op review.

We have the authority. We need to use it to prescribe nutrition the way we prescribe medications. None of us has the whole picture alone. Together, we do.

39 Monday morning

Here's what I want you to do on Monday morning. These are small, specific, cheap. None of them requires a system change. All of them sit inside your existing scope.

If you're a naturopath, ask every over-forty client one question that most of them are not being asked anywhere else: how much protein did you eat yesterday. Not weight. Not exercise. Protein.

If they can't tell you, that's your intervention. And if they mention they've got an operation coming up, start the conversation four weeks before. If you're a nutritionist, screen perioperative patients for baseline protein intake. And when you set targets, use 1.2 to 1.6 grams per kilogram per day for older adults, not the RDA of 0.8.

For recovery clients, combine whey and collagen, both mechanisms, both pathways. If you're a pharmacist, that thirty seconds at the counter matters. Ask the recovering patient how they're eating. Learn your SKUs, which of your products are bovine, which are marine, which are hydrolysed.

And for older clients complaining about sleep or joint pain, nightly collagen is a low-cost, low-risk intervention with real evidence behind it. If you're a surgeon or GP, prescribe protein at pre-admission clinic. Write it down like you'd write down a medication. Stop the fifteen-hour pre-op fast.

And at every post-op review, ask about nutrition. Not once. Every time. And every one of these actions applies doubly to your GLP-1 patients.

No new certifications. No new fees. Just better care.

40 Practitioner protocols

Three protocols come out of everything we have covered, and they are written up so you can take them rather than reconstruct them from my slides. The first is perioperative. Two to four weeks of protein optimisation, a fed state at induction, whey plus collagen for the first fortnight, collagen continuing beyond it. The second is GLP-1 companion nutrition.

Your semaglutide and tirzepatide patients are losing weight and losing muscle with it, at small appetites and small volumes, so protein density per mouthful is the whole game, plus resistance work and creatine. The third is sleep. Glycine at night, dosed before bed, for the patients whose recovery is stalling because they are not sleeping. Each one names the product that fits it, so you are not guessing at the dispensary.

Ask the Rener team for the printed sheets.

41 Nutraviva range

And these are the products that sit behind those protocols. Nutraviva is an Australian company, based in Bathurst, founded and run by Bruno Rossitt. Grass-fed and grass-finished sourcing, no fillers, no gluten, no dairy, no GMOs. HASTA certified for the athletes in your practice.

Collagen Hydrolysate is the everyday workhorse, bovine, Type I and Type III, ten to twenty grams a day, and it is the backbone of the perioperative and sleep protocols. Marine Collagen is wild-caught cod, for skin-focused indications or clients with dietary restrictions around beef, halal-certified and pescatarian-friendly. Multi-Collagen is Types I, II and III together, a broader spectrum where joint and cartilage concerns sit alongside skin and gut. And Creatine Monohydrate, five grams daily, coming soon, for exactly the muscle-preservation problem the GLP-1 protocol is built around.

I am not going to make specific product recommendations from up here. If you want the protocols, the evidence packs or the practitioner resources, speak to the Rener team.

42 What to remember

Three things to remember about collagen. It has its own job, glycine, proline and hydroxyproline feed the tissue holding you together, not your muscle, so it isn't a protein substitute, it's a different tool. Match the type to the job, bovine for joint, tendon, bone and gut, marine for skin. And there's no meaningful ceiling, ten to twenty grams a day, dose-dependent, still working at twelve hours.

Two things about creatine. It restores what exercise and ageing both deplete. And it's one of the best-evidenced, cheapest, most underused things in this entire room's toolkit. One thing about bone broth.

If someone would rather get this from a bowl than a scoop, that's not a lesser option, it's the same mechanism, in the form our grandparents already trusted. Protein, recovery, collagen, creatine, bone broth. None of it is new. All of it is foundations.

The only thing standing between your patients and better recovery is whether someone in this room actually says it out loud. Say it out loud.

43 Thank you / Q&A

Thank you. I'm going to pause there and open it up. Twenty minutes for questions. The harder the question, the better.

If you disagree with something, tell me. If you want more evidence on a specific point, ask. If you have a clinical situation you're not sure how to handle, throw it out and we'll workshop it together as a room. The whole point of this talk has been that this room already contains the expertise that patients need.

Let's use it.