# The benefits of hypofractionation in early breast cancer

An analogy is that somebody once said if aspirin was presented as a new drug today, it would be too dangerous, and it wouldn't get drugs approval. Well, I think if long course was a new treatment and short course was a conventional treatment, I think, actually, people say, why would you do Long Course - it takes more resources and is more toxic. Rapid listening, evidence-based cancer learning on the go, presented by eviQ Education. Welcome rapid listeners. Today I'm joined by two guests, and we're going to be talking about hypofractionated radiation therapy for early breast cancer. I'm joined by Dr Andrew Last and Dr Georgia Harris. Dr Andrew Last trained in medicine in Oxford and spent some time in neuroscience research in Oxford and New York. In 1994 he commenced oncology training at the Royal Marsden Hospital in London and subsequently worked 10 years in Southampton, UK as a clinical oncologist, delivering both radiotherapy and chemotherapy. In 2008, he joined the North Coast Cancer Institute team at Port Macquarie, where he's been involved in the development and implementation of a variety of cutting-edge techniques for the treatment of breast, lung and gastrointestinal cancer. Welcome, Andrew. Thank you. And also here with us today is Dr Georgia Harris. She's a radiation oncology staff specialist at the Chris O'Brien Lifehouse and a visiting radiation oncologist at Royal Prince Alfred Hospital and Concord Hospital. Georgia specializes predominantly in breast cancer, but also has a keen interest in the treatment of metastatic disease and stereotactic radiation therapy. She is passionate about technical innovation and the provision of high-quality radiotherapy treatment and patient centered care. Georgia is actively involved in clinical trials, the teaching of radiation oncology trainees and medical students, and has been involved in developing guidelines for breast cancer and palliative radiotherapy at the Cancer Institute, New South Wales. Welcome, Georgia. Thank you. So thanks so much for being here. The first thing I'm going to do is I'm going to recommend that all of our listeners take a look at our rapid learning on hypofractionated radiotherapy before they start this podcast. If you're new to radiation therapy or if hypofractionation is a term that's brand new to you, please make sure that you check this out first. Otherwise, you might have trouble keeping up with the discussion. Um, so first of all, Andrew and Georgia just so that we're all on the same page, could you just give a really quick explanation of what we mean by hypofractionation and what the differences between hypofractionation and conventional or long course radiotherapy and Georgia I might throw to you first if that's OK. No worries. So, I suppose conventional breast radiotherapy typically involves treatment which is given daily over about a five-week period. So around 25 treatments in total, whereas hypofractionated radiotherapy is where we give fewer fewer fractions and a lower dose overall, to achieve the same therapeutic effect. So this means that a treatment course for patient might be reduced to about three or four weeks compared to a five week course. Yeah, perfect. Andrew, did you have anything that you wanted to add to that? No, I think Georgia summarized it very nicely. It's just using a slightly higher dose each day, um, to get the same, um, radiotherapy effect over a shorter period of time. For the treatment of early breast cancer, is there any hypofraction regimens that are more commonly used in Australia or is it really dependent upon the patient and the facility and the prescriber and Andrew might throw to you first. So historically, they've been sort of two fractionation regimens have been commonly used, one that originated in the north of England, which was giving treatment over 15 doses over three weeks and another that originated in Canada that was giving 16 doses over three and a bit weeks. And they're they're very similar in dose, and I trained in the UK, so I tend to use the UK one but they’re fairly interchangeable in terms of their benefits and the everything else which, which is invoved. Perfect, and Georgia, do you have anything to add? Do you use anything different or the same type? No, I would agree with what Andrew said. So typically, the 15 or 16 fraction courses are the most commonly used hypofractionation schedules in Australia at the moment. So could you please describe the factors that are important for you to consider when prescribing radiotherapy treatment for women with early breast cancer? So in thinking about that, are there any patient factors that might influence your recommendation? In terms of who is a suitable for radiation of any sort, there are some specific factors, and certain other illnesses could limit our ability to give radiotherapy, such as connective tissue disease and so on, and certain medications make it more challenging. But from my view, I'm very comfortable giving hypofractionated radiotherapy to any woman who it is appropriate for and requires adjuvant breast radiotherapy. And I don't feel there's any limitation to whom we can offer it to. Georgia, do you feel the same? Are there any patient factors that you consider when you're deciding who would get hypo and who you may not offer it to? Um, I think, I mean, the big advantages of hypofractionation are that, you know, really, we have data now that supports its use for most patients. And it can be really helpful for patients that are a bit more elderly or patients that live a little bit further away from the radiotherapy center or patients that may have difficulty with daily attendance for radiotherapy, for being able to get their treatment done more quickly and with less hospital visits is obviously very attractive for that reason. Um, I guess in terms of the nuances of the patient's treatment itself, I suppose at the center that I work at, we reserve hypofractionation for treating patients where they need radiotherapy to the breast only, so women where they may require nodal irradiation, we tend to favor conventional fractionation, although that's not um, necessarily something that is undertaken at all sites across Australia. That practice can vary quite widely and certainly internationally, Um, but they tend to be the main patient group that that's certainly at our center. We prefer not to hypofractionate. So Andrew, for people with early breast cancer in your center, am I understanding that you'll offer the long course and the short course? We'll discuss. Many of our patients come being fully aware of the possibility of it taking five or six weeks to have treatment. And generally they're delighted when we suggest that a comparable alternative is to have three or four weeks treatment, and so we always mention it, as often they are familiar with it. But nearly all of our patients will have treatment over overusing the short course hypofractionated version. I might just add one little comment. I agree with everything, Andrew said. I know that that myself and some of our colleagues have being a little bit hesitant to recommend hypofractionation for very young patients, so patients sort of in their early thirties for hypofractionation, just based on the fact that those patients were, that there weren't many of those patients of young age included in some of the trials of hypofractionation. But again, I think that that's something that varies from institution to institution. And often we'll discuss with the patient, with a young patient, the options of conventional fractionation or hypofractionation. And unsurprisingly, often they will choose a shorter course of radiotherapy, understanding that the data is just a little bit limited in that particular group of patients. For sure, that makes sense. Are there any patients who you feel that you just simply wouldn't offer hypofractionated radiotherapy to for early breast cancer? Are there any factors that disqualify somebody straight away, so you wouldn't even consider it in? Um, I don't think so. I guess that the main group of patients that, um historically we're being a little bit cautious in are those, as I said, requiring nodal irradiation as part of their treatment. At our center, patients who have had a mastectomy with the reconstruction we tend to prefer conventional fractionation. Um, but really, I think everybody should be considered for hypofractionation. I think some there's some concern, potentially about the risk of giving a larger dose per day to some patients that may have, for example, underlying connective tissue disorder, whether that might slightly increase the risk of side effects in those patients. But but the literature is actually a little bit divided, and I'm not sure that that's necessarily the case. So I don't think necessarily having an underlying connective tissue disorder um disqualifies someone for being considered for hypofractionation. Perfect. And Andrew, Is there any situations or any patient factors that for you would immediately disqualify somebody for consideration of hypoofractionated radiotherapy for early breast cancer? I think everybody can be considered for hypofractionation and I've spent a lot of - long time giving hypofractionation treatment for nodal disease and so on, and I've had no negative experiences. Although I understand that there are centers are are sometimes quite reticent to do it. Um, if a patient comes to me expecting five weeks radiotherapy because their surgeon says you should have you'll need five weeks radiotherapy and they're keen to have it, I think it's it's equivalent in terms of cancer control, and I'm happy to give it. But I always talk to them about the advantages of having having hypofractionated treatment as well. Andrew, I'm interested, um, given that you're from Mid North Coast, do you find that you have a lot of patients who are travelling a long way to get to treatment? And do you find that that's a factor that really comes into their decision to hypofractionate? Or is it more around the fact that you know you're you're showing you're explaining to them that you know the risks and benefits and you're outcomes are likely to be equal or if not better sometimes, what factors come into play the most do you think when patients are making decisions? I think normally patients want to do what gives them the best chance of their cancer not coming back. And if we if we have a patient who has a two hour journey and has to travel daily because they have animals at home and can't stay with us locally, um, they will still travel daily for 5, 6 weeks if that's what we want them to do. And for some cancers, we, we do ask them to do that. Um, I think when I can say with confidence that I am very happy to give the hypofractionated treatment and I think it is equivalent in every way and actually superior in others, to long course treatment, to them then that is a bonus for them. It's not something they were expecting often, but they are often delighted to be able to have a shorter course. And also having worked in metropolitan centers, I suspect somebody in some parts of Sydney will have a longer journey than some of my my regional patients to actually come in and out to the treatment centre each day. You're not wrong. True. Absolutely. Georgia, do you find it the same? It's at the end of the day, It's it's the outcomes that is going to be the majority of what affects people's decision? Absolutely. And as Andrew said, lot of time patients are referred to us with an expectation based on a discussion with their surgeon or the medical oncologist that they've sort of signed up for six weeks of daily treatment. And they're prepared to do that but are usually pleasantly surprised when there's an option to, um to have treatment done in a much shorter time frame. But certainly, I think that the main motivator for patients is making sure they're getting the best outcome possible. So I I guess I've heard from both of you that often when patients have come to you, they've already got an understanding that they're likely up for 5 to 6 weeks of radiotherapy. Do you think that we might need to be educating our colleagues who aren't working directly in radiation oncology, around there are actually more options and they they are equal in terms of efficacy? Or do you find that generally, that patients don't have it set in their head what they're going to do when they come to you? Or do you find that other health professionals, are contributing to patients making up their mind before they've even spoken to you? Um, some patients come from surgeons who gives them a very clear expectation that they'll need in inverted commas five or six weeks of radiotherapy. And they're often resigned to that. And as I have said, they often delighted when I can offer them the equivalent or less and most of them will trust me as a radiation oncologist regarding radiotherapy recommendations, but ah but and it does take in my experience, a few years for the surgeons were working with to come around the idea that maybe I can achieve the same end result in terms of reducing the risk of breast cancer recurrence with just three or four weeks treatment so. But many patients just know they've got to have radiotherapy and are here and come to us to actually hear what we think they need. Perfect and Georgia, do you find the same same thing? Yeah, I would agree completely with what Andrew said. I'm interested at your centers, whether or not you have large discussions with the surgeons as part of the M D T, or if they're referred to you and you kind of see patients separately. Or maybe early breast cancer patients are typically the ones that are seen as part of an M D T. Or if it's separate referrals. Yeah. So all of our patients, um, are discussed in our MDT, which is held on a weekly basis. I must say that that those discussions are generally more sort of general treatment recommendations and to help facilitate some timely referrals to different members of the team. So often will not go have a detailed discussion during that meeting about hypofractionation or what dose fractionation schedule will be due to that patient. That's usually something that's discussed between the radiation oncologists and the patient at the time of consultation. And Andrew, how is it in your center? Yes, we have regular M D T s, sometimes two in a week with our best surgical colleagues and the medical oncologists and so on. And often the discussion is more around whether the patient needs radiotherapy rather than the the details of it, and there are some times, particularly a few years ago, when all of my colleagues weren't, I hadn't converted them to the idea of hypofractionated radiotherapy, there was always a lively discussion amongst the radiation oncologists about the pros and cons of of hypofractionated versus long course treatment. But nowadays, most of them have have used it and feel that high fractionated is a good option for patients. I'd love to be a fly on the wall during those discussions. Back then. Through all the pros and cons. Um, I guess that brings me to my next question. How have your prescribing patterns changed over time? Was it originally that you started, you know, kind of dabbling in hypo when it would only be a few patient, Um, and now you're kind of moving towards it kind of being offered to everybody. How do you feel that that's changed over time? And why is it changed? Has it been new evidence, or is it just that more comfortable with it now? And staff are more comfortable with it. And you feel have skills in house to be delivering hypo confidently? I trained long enough ago that there was only in the south of England where I trained the open inverted commas, conventional or long course radiotherapy. But one of the people I trained with was the gentleman called John Yarnold, whose been, one of the lead authors, and lead instigators and many of the big trials of hypofractionated versus conventional radiotherapy in the UK. And while I was training there, there was a lot of discussion about the pros and cons of each and I finished my training convinced that hypofractionation was a good option and then arrived in a new center as a consultant, and everybody frowned upon the idea of using hypofractionation and gradually converted them to the idea of hypofractionation and then subsequently arrived in Australia and discovered that everybody used long course and then, with the help of the Cancer Institute and the eviQ system, we got hypofractionated therapy introduced an alternative, as a possible option to consider, and I think gradually it has become more widespread and there were a few centers using hypofractionated in here in Australia when I arrived, but they were relatively few, and I think and I'm not claiming the credit for this in any way. I think I think just the just the the big trials have matured and there's been more and more publications on it, and it's now really regarded as as as an alternative convention and I'm a wary of using the term conventional to describe what I would call long course radiotherapy. But I think hypofractionated is now generally regarded as as worth considering for for all early breast cancer patients. Georgia, did you have anything you wanted to add to that? Have your prescribing patterns changed over time with changes in evidence? Yes, so, I trained in Australia and, you know, as Andrew sort of suggested, which might be controversial to say, but but I do think that we have tended to be a little bit more conservative historically in terms of adopting hypofractionation and certainly, I think, particularly in the last five years, as being a shifting practice where people are much more comfortable with hypofractionation and in fact, sort of favoring hypofractionation for early breast cancer. And, I think you know that the reasons for that are maturation of the evidence and international guidelines that they have also, um, modified in the in the last couple of years to be more inclusive in terms of their patients, um, criteria to consider hypofractionation. So I think generally people just feel a little more comfortable with it. Yeah, i agree with that. I think my experience very much at international conferences is the UK and Europe are very gung-ho and Australia is kind of not as, quite. Yeah. And I think the ASTRO, I mean, the American guidelines only really were updated in 2018 to include essentially, you know most, the vast majority of patients with early breast cancer really should be considered for hpofractionation. And prior to that, you know, they had a few patient groups that they were quite cautious about, including patients who were young or who'd had chemotherapy or some paralogical risk factors as well. Although that has, you know, that that hasn't really been born out in the evidence so that people are much more comfortable, hypofractionating those patients now. Could I make a comment? Yeah, of course. Yeah, and, just harking back to the history of hypofractionation, it wasn't invented de novo in in the late eighties. It was something that due to the shortage of machines in the north of England and the distance that many patients had to travel in Canada, had been used as a pragmatic solution to getting patients to actually accept any form of breast radiotherapy or getting them on treatment in a reasonable timescale and um I've communicated with colleagues from the units in in in Manchester, and, Canada who who in the fifties and sixties were using hypofractionated radiotherapy. So the experience of using it in the UK and Canada was goes back many, many years. So I think that probably explains the confidence with which it's being accepted. And I think Georgia is right. I think Australia was a little more conservative and many would argue, wisely so, to look for, to wait for the long term follow up results in many of these studies before recommending it widely. But I think there's a good body of evidence to make us confident that it's safe now. And I think it's funny that you mentioned that it was kind of a system driver, really, which was kind of pushing the moved to hypo. Um, in your centers, what was the what was the main driver of hypofractionated radiotherapy? Was it mainly around benefits for patients in regarding to less travelling to appointments? Or was it regarding the efficacy of the technique and outcomes and potentially some outcomes being superior? Or was it system drivers that kind of implemented it? I arrived in Australia to a small new regional center with one machine, one very busy machine and with the not only the the local number of breast cancer patients being referred but also other cancers our machine was overwhelmed and our waiting list blew out. I knew from experience that that hypofractionation was a good alternative option and not only in terms of treating patients over three weeks to save their them long journeys and long travelling times. Many of our patients used to have to travel to Sydney to get radiotherapy and would decline it rather than rather than travel to Sydney, so being able to do it locally was a victory in itself. But to get them treated in a reasonable time scale, hypofractionation gave us the ability to do that because we were treating nearly twice as many patients with the same number of of treatment machine appointments, and, I wouldn't have felt comfort comfortable doing that if I hadn't known what a good treatment it was in terms of not only efficacy but actually less toxic in many ways than the longer course treatment. Yeah, so it sounds like a good combination of all three. That it all seems like pointing in the direction that it's something that can be done. It's safe to do. It's going to save people time. It's going to save resources. So it's kind of a win win win. Georgia. What was your experience, um, in your facilities? What were the main drivers for increasing the use of hypofractionation or encouraging the use of hypofractionation? So I've been at the institution where I work presently for about three years now. And And when I started here, they were hypofractionating the vast majority of patients and, which which was good to see. And again, I think, the main drivers that I mean, I work in a busy metropolitan center. We have five linear accelerators, and fortunately, haven't had the same concerns with resources and waiting lists. I think it was really driven by you know, the evidence which, um, show that this was a really effective and equivalent option for patients in terms of their cancer, breast cancer outcomes, but also potentially improved toxicity, and side effect profiles and all the advantages of having shorter treatments, which obviously, you know, minimizes time away from work and more time for patients to spend with families. And so there are all those other advantages of hypofractionation as well. So I guess for our other radiation therapists out there when we're talking about the toxicity profile and that hypo could be superior, what type of organs at risk are we talking about? And what types of toxicities are we talking about? So I guess the main toxicity that we worry about the breast tissue itself. So, um, you know fibrosis, which can potentially be a bit uncomfortable. So where the skin loses some of its elasticity and, the breast tissue can become hard or firm, and sometimes that can be associate with some discomfort or breast swelling or lymphedema as well. And um those things can also potentially affect the cosmetic appearance of the breast. So they're what we would call late effects in terms of the potential side effects from radiotherapy. The other organs at risk, I suppose, which sit close to the breast tissue are the underlying lung and potentially the heart for for ladies require radiotherapy to their left breast just because anatomically our heart's located quite close to the to the left chest wall, um, so I I guess, um the the main structures that we worry about and that we counsel patients about in terms of the potential risk of radiotherapy. But fortunately, with improvements in some of our techniques and the way that we can design and plan radiotherapy, um, we can try and minimize that those risks. I know when you know I've been looking into alpha beta ratios and all these types of things that it initially seemed counterintuitive to me that you would get a better toxicity profile when you're giving a higher dose per fraction. Is anybody game to give a quick explanation of why we might end up with a superior toxicity profile when we're using hypofractionated prescription? I'll take a volunteer for that. I will hand over to Andrew, but you know, my understanding will be that, that we're giving a lower overall dose. So I think that that's probably partly to to play and that the overall treatment does is actually lower when we hypofractionate. And, therefore allows for a slightly reduced toxicity profile. I think, look, radiobiology is a dark and complex art. Don't go there. I've worked with people who are much cleverer than me. But what hadn't been expected when when lots of the big trials were done in the nineties, um, and early this century was that actually, the way that the breast tissue and breast cancer responds to radiotherapy means that using larger doses for each daily fraction is actually beneficial, both in terms of of controlling the cancer but also reducing the the the the side effects on the normal breast tissue. And as as as Georgia says the the the late effects, like the cosmesis and of the breast you know how the best looks at the end of all the treatment actually favor hypofractionated treatment in terms of getting a better outcome and um, that's and the funny thing is, I don't think anyone set out doing hypofractionated radiotherapy back in the fifties and sixties because they thought it would give them better cosmesis, they were being practical about it, but it actually is a major bonus for the patients. Absolutely huge, huge benefit. So I guess we've talked a lot about the benefits of hypofractionated radiation therapy. But were there any challenges that either of you experienced when when implementing it in your facility or when increasing the use, did you get any resistance from staff? Or were there any concerns regarding use of technologies in order to implement and then also maintain the technique? Look there was, there was resistance. Not, not so much from the radiation therapists who, if we explained why we were doing it, were happy to implement it. The actual planning is is very similar, just just the doses are different. There was certainly resistance from both my radiation oncology colleagues, who, um, some of them, frankly, said it was dangerous, you know, and shouldn't be done and you shouldn't give it to anybody under 70 and it was risky. And and, that's when I had to get out my clever radiobiology friends and explained to them that actually, with the lower total dose, it's actually safer in many ways. So the resistance, largely came from fellow radiation oncologists who had trained in Australia. Had been taught this very conventional and and to be fair, generally safe way of treating breast tissue. And this was a new way of doing it, which, which they weren't familiar with, and as we alluded to earlier, many of the surgeons tell their patients they're going to get six weeks of radiotherapy. And when their patients came back saying they only had three weeks radiotherapy, I got some complaints that said why are you only giving them half the dose. And again, just a lot of education was required of my of my non radiotherapy colleagues and and I pointed out gently to them that I don't tell them how to operate on a breast, so please don't tell me how to irradiate one. That's a very good point. Um, Georgia, have you experienced any any resistance or any challenges that you've had to overcome? Well, I guess it does depend a little bit on where people completed their training and basically just their, their comfort level with hyperfractionation and their experience with it. So, um, certainly I think it's being done much more routinely now than even when I was a trainee, which wasn't actually all that long ago. Um, so and I think that that that shift in in practice has just been people, as we described earlier, just becoming a little bit more comfortable with longer follow up data from some of the trials. And, um, in general, just more centers around Australia being keen to adopt hypofractionation, and it just sort of being accepted as a, as a, very effective and and equivalent and potentially better treatment option for some patients. So I think it's just sort of taken time for the for people to feel more comfortable with the practice. Yeah, agreed. For any centers who are thinking about implementing hypofractionated radiotherapy for early breast cancer, that really is a mouthful, I can see why we want to call it short course. Do you have any advice for for centers or is there anything that you implemented locally, which helped your center uptake the use of hypofractionated radiotherapy for early breast cancer? Yeah, it's a good question. I mean, certainly our center. We have our own departmental protocols for different tumor sites and they are heavily influenced by a national and international guidelines, which all all really, um, now say that we should be adopting hypofractionation and that hypofractionation is usually the norm. And to not hypofractionationate, um, is, you know, the the unusual recommendation, I guess. So you know, for centers that they don't feel comfortable with it, certainly from a technical perspective, as Andrew said, for the for the planning process and the radiation therapists, um that there's nothing really additional that that's involved from that perspective. I think some of the resistance may come from a lack of comfort or experience with hypofractionationating, and just encouraging people to be guided by the evidence and that the fact that you know, we have good um, you have strong evidence and guidelines that promote its use now. Andrew, was there anything that you implemented locally? I know that you came to eviQ and got a protocol up. But apart from that? Just encouraging and always raising it in MDT meetings and other meetings as a viable alternative and and just trying to educate my surgical colleagues and my radiation colleagues to and my medical oncology colleagues to talk to patients about radiotherapy can be done over three or four weeks. It doesn't have to be five or six weeks. So the patients didn't immediately come and feel they've been told something wrong or were being sold something different than than they had been warned by by their earlier specialists. Uh. Sure. So it was more around making sure that, um, having discussions and making sure that colleagues are comfortable and sending people back to the evidence rather than it being a technical limitation which you had to overcome, that there's maybe not special equipment that's required. It's more about changing perceptions and people's comfort levels with prescribing hypofractionated. Yes. And early on, when I first arrived in Australia, lots of the big trials weren't that mature. There was less than 10 years follow up on some of them and many of my colleagues said, well, you know, let's wait till we got 10 or 20 year follow up and we've now got 20 year follow up on some of them, and there are still people saying we need longer follow up, you know, and there's there is quite good evidence that most of the serious toxicities are apparent in the first five or so years if they're going to happen and but we've now got very good follow up for for hypofractionated breast, and we know and we know it to be safe. Um, I guess the last thing that I wanted to explore is that we saw the five year results for the Fast Forward trial published earlier this year, and it was reported that 26 grey in five fractions over one week is non inferior to 40 grey in 15 fractions over three week for local tumor control and is as safe in terms of normal tissue effects up to five years for early breast cancer. So I understand we've just been talking about we usually try and wait for 10 or 20 year data before people make a move. But considering that's five years worth of data, do you think that we're going to start seeing a move to this to this new prescription? Or do you think it will remain as ah as, the three-week kind of prescription for a while and uptake might take a little longer? Look, we were very interested in that data, and it's It's an extension of the work that some of the larger groups who did the big hypofractionated studies had already started. And we're impressed by that data and impressed enough that we're already doing it for some patients and particularly in light of the pandemic. And the patients, we're not wanting to start patients on long courses of treatment when we weren't sure if we, how easy it was going to be to continue those treatment courses. We've used it successfully on a number of patients. We're being cautious. We're not recommending it for everybody. So generally, the older patients who are less likely to run into problems with late side effects of treatment. But we've got every reason to believe from the radiobiology of that study that it isn't going to be a problem. That's so exciting. I wasn't going to bring up COVID in case everybody was COVIDed out. But now that you have brought it up, do you think we're going to see prescribing patterns change as a result of the pandemic, or do you think it might go back to status quo eventually and we'll be moving back to those to those conventional prescriptions or long course prescriptions as you say, Andrew. Look, I think the weight of evidence in favor of three week hypofractionated treatment is very good. I think there's the data is mature enough, and I think there was a very substantial move to away from long course towards three-week hypofractionation already. So I very much doubt anyone's going to want to go back to long course. There's an analogy is that somebody once said if aspirin was presented as a new drug today, it would be too dangerous and it wouldn't get drugs approval. Well, I think if long course was a new treatment and short course was a conventional treatment, I think actually, people say, why would you do long course? It takes more resources and is more toxic. And so I think short course as in three week treatment, is here to stay. I think there's a definite role for super hypofractionated, the sort of one-week fast forward type treatment in some patients, and with experience, and it will take years of experience, will feel more confident using that in more patients. But I think there's already a role for it and it's a really nice thing to be able to offer those patients who would struggle even with three weeks of travelling. Definitely. Georgia have you have you dabbled yet in super hypo? And do you think that that the pandemic might have changed the kind of prescribing patterns that we're that we're seeing? Yeah, so, certainly the data from the Fast Forward trial was very exciting, very compelling, and as Andrew said, it is something that we have adopted for selected patients, and they have tended to be, um, sort of more elderly patients or more frail patients where they haven't been quite so concerned about the risk of late side effects. Obviously, we need longer follow up data, which will take years in terms of, you know, assessing the longerterm safety of the extreme hypofractionation. But certainly I think there is a select group of patients that we feel comfortable using it, and that can potentially really benefit from this treatment approach and with regards to COVID, It was timely when this publication came out, right as COVID hit um, in Australia, but certainly I think it will perhaps give more centers a bit more comfort using the three week course of radiotherapy. I think most centers have been keen to hypofractionate to avoid the risk of treatment interruptions for patients and to complete patients' treatment more quickly to minimize their, um, you know, hospital visits and potential risk of exposure, etcetera, with the COVID pandemic. So I personally would not be surprised if we do see a big change in prescribing patterns where people just feel much more comfortable adopting a three or four week course of radiotherapy as opposed to the six weeks, um, conventional or long course treatment. I know that we're here to talk about breast, but I can't help myself. Do you think that we're going to see more and more use of hypofractionation across other sites? And are there any site in particular that you think is going to get more uptake than others, that may be the evidence isn't quite there yet? Certainly, I think it's something that's being looked at in a lot of different tumour sites and particularly with some of the concerns of COVID and the potential implications of the COVID pandemic on the health care system, I think a lot of centers have looked at their treatment schedules and ways to effectively balance the potential threat of COVID interrupting their optimal cancer treatment. As well as you know, making sure the patients are getting the best treatment possible. Um, so certainly that has been the case at our centre for i think prostate cancer and there a lot of clinical trials looking at large hypofractionation for prostate cancer, which is promising and also head and neck cancer. Um, we have seen that adopted at our center, particularly during the COVID threat. So I do think it's something that is relevant to lots of different tumour sites. I agree with Georgia. I think there's very good evidence now that for prostate cancer you can treat effectively using a four-week treatment. There's also good evidence that pancreas is a site where to convention, we use five or six weeks of radiotherapy and we can now treat over a week. So we're doing that for some patients. And uh, there'll be a number of other sites, and head and neck is one where we can use shorter hypofractionations and then new, super accurate techniques like like steroetactic radiotherapy enable us to treat some lung cancers over just a handful of doses over a couple of weeks instead of five or six weeks treatment. So there's a lot of scope for hypofractionating, and in some areas you do need, ah, lot of additional technology to stay within safe doses to the founding tissues. But for some sites, you can use fairly conventional techniques and still hypofractionate safely. Definitely. And I think we've all discussed that early breast cancer is probably one of those. Well, I could sit here and quiz you both all day, but we should wrap it up for our listeners. So just before we go, is there anything, given that you're both very experienced in the use of hypofractionation for early breast cancer, Is there anything that you would want to tell our listeners or your colleagues out there who might be thinking about doing hypofractionation? Any last words of advice that you want to give? Give it to some patients that you feel confident to give it to. And you'll be delighted with how well they tolerate it and how easy it is in terms of both acute on late side effects and, the patients will generally be delighted with it. And, you'll gain confidence in using it on more and more patients. Good advice. I think, you said that perfectly. Hit the nail on the head. There you go. Tthat's right. Well, thank you both, so so much for being here. Really, really appreciate you giving me your time. And we'll have to keep you in mind for future episodes where we talk about Hypo. This is a production of the Cancer Institute New South Wales. A pillar organization of New South Wales Health. For more information visit cancer.nsw.gov.au.