

BroadcastMed | Grand Rounds: Treatment Burden - A New Target For Quality Improvement Initiatives

VICTOR: Welcome to CTSA Grand Rounds. Today, I have the privilege of introducing a colleague and a friend who is visiting Mayo as part of an ongoing collaboration with the Knowledge and Evaluation Research Unit, focused on improving the care of patients with multiple chronic conditions, and this is Dr. Frances Mair.

Professor Mair is a Professor of Primary Care Research and Head of General Practice in Primary Care at the University of Glasgow. She is based within the Institute of Health and Well-Being in the College of Medicine, Veterinary, and Life Sciences. And she works part-time as a family practitioner at the McColl Medical Practice based within the Thornliebank Health Centre in Glasgow.

She is internationally known and has recognized expertise in telemedicine, telecare, and e-health. She was a member of the Royal Society working group that produced a major report in digital health care, and is a former president of the Royal Society of Medicine, Telemedicine and E-health section. She is well known for her work in understanding the difficulties that patients with heart failure have in receiving primary care and has conducted important work in this area, including qualitative research and systematic review work, some of that in collaboration with our research group. And she is the co-leader of an International Consortium on Minimally Disruptive Medicine, a consortium that we're very proud to be part of.

I understand that one of her first posts, her job was in the US Navy, and that she was voted a Civil Employee of the Year at some point in her deployment in the US Navy.

Since her arrival in Glasgow in 2005, she's been the PR co-investigator, investigating grants totaling 12 million. In this case it's not \$12 million, but it's 12 million pounds, which I understand is a little bit more. These funds have been from a number of organizations and foundations, and in all cases peer-reviewed sources, indicating clearly the success that Professor Mair has had in advancing her research career in these difficult but important areas of care.

She has a wide range of national and international collaborations. And again, we're very proud to be counted among those. Professor Mair is going to spend with us 40, 45 minutes today discussing her thoughts in relation to Treatment Burden as a New Target for Quality Improvement Initiatives. And then we're going to have a panel that would include Dr. Paul Takahashi from our primary care internal medicine group and Professor Carl May from Southampton University in the UK, who is also another co-leader in this minimally disruptive medicine consortium.

I went over my time to introduce Professor Mair, but I wanted to make sure that you understood the caliber of professional, and scholar, and person that you will have in front of you. Please join me in welcoming Professor Mair.

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FRANCES MAIR: Thank you. Thank you, Victor. Victor promised me he would just do a quick one-liner, so I'm really-- and it would be very brief. So I wonder what would happen if he said he would give me a long introduction. But thank you very much for that, Victor.

I have to say what a pleasure it is to be here and what a great honor it is to be invited to give this Grand Rounds today. And I'm really very pleased to be here.

This is my first visit to the Mayo, but it's not my first visit to the Midwest. 15 years ago I worked for a year and a half as an academic fellow in the University of Kansas Medical Center. So it's actually really nice to come back to this part of the world again. So thank you again.

My talk is going to be on the subject of treatment burden. And I'm going to be reporting work from a number of grants. So just to acknowledge our funders-- British Heart Foundation, Marie Curie, and the Chief Scientist Office in Scotland, who's funded a lot of the work I'll be discussing today.

But also to say-- acknowledge my co-investigators-- Professor Carl May, who is the developer of normalization process theory, which is really the underpinning-- conceptual underpinning of a lot-- of all this treatment work that I'm talking about this afternoon.

But also to Victor Montori, who's been a driving force for the minimally disruptive medicine group. And I have to say that we are very eager to lure him to the UK. So everybody ought to be very nice to him here at the Mayo, because we think he's really very outstanding.

But also to acknowledge the rest of the work group. And you'll recognize quite a few names from the Mayo, but also my colleagues at the University of Glasgow.

OK. So my talk today is going to be really in three parts. Essentially I'm going to do some scene setting. And then I'm going to be talking about what is treatment burden? And I'm going to be using the work that we've been done with multimorbid heart failure as really the exemplar for that. And then I'm going to really answer that so-what question-- what are the implications for health service delivery?

Well essentially, in the last century, the big challenge for a family practice adult like myself was really infectious disease. And if you think about pre-antibiotic era, then when we did house calls-- and we still do them occasionally in the UK-- there might not have been very much that you can do.

But the landscape has certainly changed, and the problem that faces us now is not so much acute illness but that of chronic illness. And really, in fact, the issue is not just chronic illness, single long-term conditions, but the problem of multimorbidity, the problem of people who have two or more long-term conditions. And I think this quote from Professor Sir John Bell from President Academy of Medical Sciences really makes it clear. He says, "Healthcare providers have not yet found mechanisms to adapt to the chronic disease burden, either by developing disease prevention programs or disease management pathways suitable for chronic rather than acute disease."

And essentially, we have healthcare systems that are reactive rather than proactive. And if you were developing a healthcare system from scratch-- looking at the challenges that face us in this century-- I don't think it would look very much like what we certainly have at the present time.

And really to reinforce this is the WHO has agreed for almost a decade now that multimorbidity is the biggest challenge of the century. And work from Barbara Starfield in the US and also Mary Ann van den Akker has shown that really 2/3 of those over age 65 have two or more chronic conditions.

And this is really evidenced in the fact that 94% of Medicare spending involves multimorbidity. And if you focused down on those people who have more than-- or equal to five conditions-- and you think maybe there's not that many of them-- but they account for nearly 1/5 of your Medicare spending. And you can see the high users they are of services, of physician time, of prescribing, and of hospital services.

When I tell-- when I give this kind of talk to our undergraduates at Glasgow University, I do see some of their faces glaze over and they kind of say oh yeah, but you know, I'm not really interested in being a care of the elderly physician. I'm interested in pediatrics or young people. And then I put on this slide always for them and say to them well really, the problem of long-term conditions and multimorbidity is no longer a problem of older people, but actually affects the young. And really data from the US points to a rapid increase in the number of children and teenagers with long-term conditions. Again, mostly as a response to increasing obesity.

And the problems that you see here generally migrated over to the UK just a few years later. So we are certainly in the exact same position now.

One of my departments main-- one of its main research themes is roundabout multimorbidity and complex care needs. And two of my colleagues-- Stuart Mercer and Graham Watt-- had a paper in the May edition of *The Lancet*, where they were looking at data from primary care and over a million patients in Scotland. And you can see there the increasing prevalence of people with two or more conditions by age and socioeconomic status.

So those from the more deprived areas represent the red line there. And you can see the real point of that is that those from more deprived areas have multimorbidity-- two or more conditions-- a full decade earlier than their more affluent counterparts.

And well why does that matter? Well of course it matters because of the impact on healthcare. And here you look at hospital admissions in relation to the multimorbidity. And you can see that rising curve there. Again, a worse situation for those from the more deprived parts of Scotland.

So we have the problem. The problem is the aging population, increasing problem of multimorbidity, a burden of illness-- people with lots of symptoms, lots of difficulties due to their health care conditions. And then we have the solutions that we provide to those problems, which is lots of medications to treat that. Getting the patient-- the person to come and see lots of physicians. And in our group, we've been talking-- refer to that as treatment burden.

And then we have the outcomes from that, which are the adverse outcomes that you can so often see due to fragmented care, due to quality problems. Because actually, we have all these guidelines that we follow religiously. But what evidence do we have to tell us what happens when you have six of these or more medications being taken in combination? I often say this to people. And people also who have very interesting databases, and they kind of say, well, that's just too difficult. How would you know? And I said, well, yes, but it is a real issue, thinking about the effects of polypharmacy. And do we know whether we're doing more harm than good?

So we've defined treatment burden as the work that people have to do to manage their condition, including the services they use and the work they have to do to negotiate and mobilize services for their self-care. In our work, we've been looking at the idea of illness burden. That's the work that people have to do to live with a chronic illness.

So we think of that in terms-- if we take the heart, for example, would be the symptoms of breathlessness, of ankle swelling, of fatigue. And treatment burden really being the self-care practices that people have to perform. The lifestyle changes, like salt reduction, taking their ACE inhibitors and beta blockers, attending appointments. But as you can see, those aren't totally distinct features. There is considerable overlap between them.

And really my work with Victor started from 2009, when he and Carl and I had a paper that we wrote in *The BMJ*, which was saying we needed minimally disruptive medicine. And really talking about how the patients with multimorbidity are forever loaded with more and more medications, more and more tests, and more and more investigations without much consideration of what that actually means to them and the quality of their care. And we really proposed in that that we needed minimally disruptive medicine and less, what we called, structurally induced noncompliance or non-adherence-- so really, saying that we have effective treatments.

And we know that if people take-- for specific diseases-- take the right treatments-- the ACE inhibitors and beta blockers-- then you get better outcomes. But we know that adherence is often suboptimal. And we really put forward the idea that actually some of that lack of adherence isn't just because people lack knowledge, but also because of the way that we configure healthcare services, that we make it difficult for them to be adherent.

And you know this is not an entirely new idea all. I think the WHO, again, has brought out the idea that the increasing complexity of treatment regimens has been associated with substantially lower adherence of-- you know, impairing treatment and outcomes.

So the aims of our work really were to explore the concept of treatment burden, to identify the key components, and then to try to understand the relationships, if any, between those components. Because really we thought this is an important phenomenon. If you're going to have something that you're going to say is an issue, then really you probably have to be able to measure it and know where you're going to intervene. And you can't do that unless you can conceptualize the phenomenon in quite some-- in a clear way.

So what I'm going to be doing very quickly is really running through a series of studies that we've undertaken with heart failure patients-- 110 heart failure patients in England and Scotland, some from a quite a few years ago, 60 just in the last two years-- with people with stable and end-stage heart failure with 20 of their caregivers and also with health professionals who look after them-- and also some results from a systematic review of the qualitative literature of the experience of living with heart failure.

And all of this work-- the way we've conceptualized it-- has been using Normalization Process Theory as its underpinning conceptual framework. That theory has four constructs. So just suffice to say the first is about the sense-making work people have to do to understand their treatments. The second is about the relational work that they have to do to engage others to help them with their treatments. The third being the work of an acting or operationalizing treatments. And the fourth being how people praise or assess such treatments.

So our first piece of work that we did was looking at some archived heart failure interviews we had done that weren't actually aimed at looking at treatment burden. They were aimed at looking at the patient experience of living with heart failure. And we tried to see if we could develop a typology of treatment burden using that work.

And we did. And really that had four main areas. The first being the effort people have to do about learning about their treatment center consequences. And this is probably one of the first papers that really makes it clear that people have to work to make coherent their understandings of their illness-- to learn about the different tablets to take, to understand why they should do it, to know when to seek help when their condition is deteriorating--

the work that they have to do engaging with others, which will include, for instance, getting family members to drive them to appointments, arranging for repeat prescriptions, getting other sources of help--

and then the work that they do adhering to treatments in terms of actually taking medications, enduring the side effects of medications, intending for investigations--

and finally the work they do to manage their conditions, the work they do to decide whether they're going to continue with treatment or they might reconfigure the treatment. So the classic one is the heart failure patient who doesn't take their diuretic first thing in the morning because they don't want to be running to the restroom if they have an important meeting.

Because we did that initial work with interviews that weren't designed to look at it, then we thought well, we'll do some interviews specifically looking at the issue of treatment burden. And really that further qualitative work has confirmed those kind of key concepts that I described in the previous slide.

And it became clear to us that the core components of treatment burden were really about the coherence work, the sense-making work that people have to do to make sense of their diagnosis, its implications, and self-management issues, but also the work they have to do-- put into operationalizing their treatments.

And really our interviews with the heart failure patients made it clear that incoherence and uncertainty was really pervasive throughout their illness careers, really from when they got diagnosed with heart failure right through to the last days and weeks of their life. And that was really quite striking.

And they seemed to be reclaimed-- recounted to us that discussions with health professionals suggested a lack of frankness, which added to that feeling of uncertainty. And that these people really didn't appreciate their deteriorating course, and this persisted throughout their illness careers. As I said, really till the day that they died.

And here's a quote from a patient who says, "I think it seems to me not like cancer, where they say you've got five months to live or you've got a year. But nobody has said that. I wonder whether that is a good strategy or what. I don't know. But I really like answers, but it's because we've always been in control of our lives and now we are not so." And a week later this patient died.

And I think we would think, for instance for cancer patients, that that wouldn't really be acceptable. But this was really pervasive in the accounts there. And this is what I mean about this idea-- about the suggestion there was a lack of frankness in conversations with health professionals. So a patient saying-- having had a discussion with the heart failure liaison nurse-- saying, "So they said, would you like to go to the hospice? And I said the hospice? That's for people who are dying and things like that. Why are you sending me to a hospice? And she said it's just a sort of social thing. Just to talk to other people in the same sort of environment as you."

And this isn't really to be damning of health professionals at all. When we spoke to the health professionals, one of the things that they said which really resonated with all this, they said yes, that there was this pervasive uncertainty. They agreed with that, and they talked about the way health services were configured that made it difficult for them to have these conversations-- people having too short appointment times, problems of discontinuities so they saw a person once and then not back again, and this problem of fragmentation making it difficult to have these kinds of conversations.

So this really wasn't just that they didn't understand the conditions, it made them difficult to understand their treatments. And if you think of heart failure, over the last two decades there have been considerable advances in terms of pharmacological and also known non-pharmacological therapies-- so the device therapies, implantable defibrillators, biventricular pacemaking. And these posed particular challenges.

So if you think of the medications. You know, a patient here is giving an example of how they struggled to learn all their medications. They memorized all the colors of medications. And then they went to their Long's Drug Store, and they went to get the repeat prescription. And then it was a whole different color of medications, and how difficult this was and challenging for them.

But then when you think of the devices that we have-- are now using increasingly for patients with heart failure. And really with good reason-- they make big-- a difference in outcomes in terms of quality of life. But patients not really appreciating what these were for.

So this is a carer talking about a cardiologist saying, "And then he says the defibrillator-- he didn't say he was taking it out. He says he was going to switch off the reset button. And I said to him, why are you doing that? And he says, because it's mainly it can be very distressing. If x takes a heart attack and it doesn't bring him round, it would keep going off and you'd get into an awful state. And I said, well, I'm quite willing to take that chance. I'd just prefer you to leave the defib as it is."

Now this is somebody who had had a discussion about end-of-life issues, who had chosen to be a DNR, a not resuscitate. But there's this issue of a patient saying well, you know, I don't want somebody to be working on me for hours in the emergency room. But you know, if I went into ventricular fibrillation in my home and one shock would bring me around, I want that. So there were these issues about the technology.

And certainly people also expended a great deal of time negotiating with friends, family, and outside agencies to help them with their care. We asked patients-- these are the end-stage heart failure patients who were asked to keep a diary of all the people they were in touch with in their final days and weeks. And you can see it's quite a daunting group of people. And their work was made harder because of this uncertainty. Because they often felt that asking for help wasn't really legitimate, because they-- nobody had-- they weren't really that ill.

The other thing that came up was really the issue of operationalizing treatments, the issue of taking medications. And people had all sorts of complex ways they tried to remember. You know the average number of medications our heart failure patients were on in these studies was 14. And I would challenge any of you to be able to take, for instance-- and some of them are like 21 medications-- to take 21 medications at different times of day and carry on with your normal life. So I don't think this can be underestimated.

But it's not just the medications. It's also the lifestyle changes that people are asked to enact and the impact that this has on them. So we often tell our heart failure patients to restrict their salt intake. We talk to them about fluid restriction as well. And here's somebody whose day is really dominated by knowing that they've only got to have two jugs of water a day and how they have to work through judging how much measuring out what they're drinking so that they don't go above that amount.

And then it's not just taking tablets, getting blood tests. It's all about the other things that make things easier for these kinds of patients. So this is in the UK. Like here we have disabled badges so people can park near the hospital entrance or whatever. And this is a patient talking about how she hadn't known that she was eligible for this, because not appreciating the seriousness of her condition that she could get a disabled badge. And what a difference it made to her life when somebody had pointed the site to her.

And so then this problem of fragmentation-- this problem of you've got to explain all your illnesses over and over again to a new doctor. And the thing was it wasn't just that they had to repeat their accounts, it was the fact that there was often disagreement. So they might see somebody-- the cardiologist might be seen and say, well actually you're doing very well. And they might be doing very well compared to the last time they were seen when they were in hospital and they were moribund and looked like they were going to die. The very fact that they've walked into his or her clinic means that relatively speaking they're doing well.

But then it makes it more difficult if you have the heart failure liaison nurse or the family practice doc who is then saying well, you know, we need to think about end of life issues or about advance directives. And they think, well you know my cardiologist says, I'm doing great. And there's these tensions that people have in relation to this.

And people also have problems about lack of coordination of care. So here's somebody saying he's down at the same department three times in a week and it could be done in one day. Now that maybe doesn't seem a big deal to you, but if you're a patient with end-stage heart failure, you're breathless at rest, the very act of moving is a major effort. And then this is really a military operation getting you down to the hospital.

And I always like this quote from one of the patients. And being a Scottish patient, they said, you know, "Aye, I feel it's for the institution. It's not for the patient. Everything is geared for smooth running. That means it's from the hospital point of view and not the patient's view, right or wrong. What do you think?"

So we really describe the components of treatment burden. And the question is well, why does that matter? These things are familiar to you and you kind of think, yes, well we kind of know about some of these issues. So what we tried to do was to map the different components of treatment burden and to develop a conceptual model of it and trying to look at the interrelationships. And our model suggests a set of contingent, but possibly consequential, relationships between the different elements.

So essentially if you don't understand your condition. If you're having a lot of work getting on making coherent your diagnosis and its treatment, then it makes it harder for you to engage with others and enroll them to help you with those treatments. It also makes it harder for you to adhere to those treatments if you don't really understand the benefits and you don't really know when you should be seeking help.

But also it's a kind of two-way street. The way that healthcare services are configured can exacerbate that uncertainty-- so problems of lack of continuity, problems of poor coordination of care, problems of not considering multimorbidity. You need to remember that 97% of patients with chronic heart failure have more than one other chronic condition. So in fact, it's only a real rarity that you're going to see somebody who just has heart failure.

So that really-- you can see then that there are real points of intervention. And I think that's what's really of interest and interest to us in the direction we're going.

I thought when I put the slides together and I looked at it, and I thought well, if I was you and I was looking at that, I would say, well this is all very well. And you're talking about problems in the way that healthcare services are delivered and configured. But your health service in the UK is entirely different from those of us in the US. And so some of the problems you're talking about-- problems of continuity and fragmentation-- may not be such a problem for us.

And that was really the rationale for us doing a systematic review of all the international literature, the whole set of literature on the experience of people living with heart failure.

So we did all the usual things with the systematic review. And in fact we have Pat Irwin here at the Mayo who designed our search strategy. And like any systematic review, we have our PRISMA flow chart there. And if you get down to the bottom, after we had gotten through thousands of papers, we had 20 papers that were just about treatment burden and another 36 which had substantial information about treatment burden, but also dealt with illness burden.

So we really had 56-page papers to look at. And importantly, there-- and this maybe doesn't-- oh, it shows reasonably well-- you can see that most of those papers are coming from the United States. So we then looked at that-- these papers. And you can see the population that we're looking at, fairly typical of heart failure patients. These were mainly interview-based studies that we were using-- so qualitative studies.

And I think the thing for us-- I'm not going to go through lots and lots of quotes about it-- but it's just to say that the key issues that we had found in our interviews with patients in England and in Scotland really fitted within the same conceptual framework.

So we did have the same problems that were coming up in the literature again and again about how people worked to make sense of their condition, how they link the symptoms, its cause, and actions to avert problems. They had the same kind of engagement work enrolling others to help them manage their condition, and the same difficulties in acting their treatments, and also the different difficulties faced through multimorbidity and combining treatment regimens with lifestyle advice for other diseases.

I'm just going to give you a couple of examples. And you'll just see that they are almost identical to the ones that we had from the UK. So respondents giving extensive accounts of the work they had to perform to be able to obtain house adaptations and other services.

So you know patients with heart failure are often very breathless, can't make it up the stairs-- might need stairlift, or other adjustments. The subject of ICDs came up-- the subject of ICDs and the option of deactivation rarely being addressed.

This issue about adapting to lifestyle changes-- "those with severe heart failure are struggling against an invincible need to drink, failing to keep to the restriction in drinking water, and cannot find anything that helps to slake their thirst for more than a short time."

And again, this issue about lots of different doctors. "It seems like a heart doctor will look at your heart, but if you have any other problems, the doctor will just tell you, go to that clinic, go to this clinic, go to that clinic." So again, the same issues internationally.

So I guess that takes us really up to the kind of so-what issue. And how can we lessen treatment burden? And this is the thing that's particularly of interest to us. And I think it frustrates Victor because we spend quite a lot of describing time. And he wants to get in there with the interventions.

But I think the stage has been important for us to be able to be clear of what we're going to be doing. And really the next stage of our work is really looking at developing a kind of toolkit of interventions.

But you know, I think something that people can often say to this is actually you're asking for things that we can't do. You're asking for us to have a whole system change. And that's never going to happen because there are so many vested interests, and there's all sorts of difficulties. And, you know, change of the magnitude that you're speaking about is really impossible.

Well I guess one of the things that we're saying is well, maybe that's right. And certainly the experience in the UK is when you certainly are trying to do massive change, that it can have its difficulties. But that doesn't mean there aren't things that we can do, like that we can chip away at treatment burden in manageable bites.

So you can think right away that we could lessen treatment burden by looking at the issue of polypharmacy. Now that's not to say that patients don't need any of their medication. Certainly we know that if you didn't give heart failure patients their ACE inhibitors and their beta blockers-- the right treatments-- then, you know, they would do less well. And they would probably have greater illness burden of symptoms.

But equally, you know, we're very keen-- certainly I try and follow the heart failure guidelines religiously. So I get people on their ACE inhibitors and I up-titrate them to the top dose that they can tolerate. And I do the same with beta blockers.

But you do need to take into account the effect that has on patients. Because I do remember a very nice gentleman who was coming to see me and he liked to golf. And he went golfing every day. And I was up-titrating his beta blocker. And one day he came in and he said, you know, stop. Just stop. And actually he was feeling so fatigued-- since I'd been up-titrating very enthusiastically-- that actually he hadn't been able to go to his golf at all. He was just at home.

So I do think you have to think about these issues, rather than just following the guidelines. And it's also about thinking about how we arranged for tablets. You know, those 21 different tablets-- can we get them done once a day? And do they really need all of them? Can there be rationalization? And then there's the issue of polypills. So there are things that we can do to make life easier.

And when I think of tablets-- just before I go into this-- you know, in heart failure, really not very much evidence that statins are going to help you. And especially end-stage heart failure-- no evidence at all that a statin is beneficial. All the end-stage heart failure patients were on a statin. So you know, we do need to think about whether we can stop some things if it's actually not helpful.

But then there's also the issue about trying to rationalize the way health services are configured. You know, merging investigations, making appointments, making things more efficient for patients. And this doesn't require massive changes.

So for instance, I can give an example in Scotland that a year ago, it used to be when I had a new heart failure patient or I thought that was the diagnosis, you know, I'd have to send them for the ECG. I'd have to get their blood work. And then they'd come back for the results. And then I'd send them for their echo, so da, da, da, da. We now have a rapid access service so that we-- they can go and get the blood, and the ECG, and the echo, all in one visit and see the cardiology if it's not-- abnormal. So you can see how that makes life a bit easier.

But again, we do have to look at the guidelines that we're using to treat these individuals and think about whether-- the problems that we have implementing them. Because the guidelines that we have just now don't take account of multimorbidity. And my colleague, Stewart Mercer at Gannon, in the last week's edition of *The BMJ* has a paper about adapting clinical guidelines to take account of multimorbidity.

And Boyd and others in 2005, in *JAMA* had a paper, which really described a multimorbid patient. And said if you applied, you know, all the guidelines religiously, the type of harm you would do.

And you know I think we're all fairly smart people. And I think it shouldn't be beyond our ability to think about whether we couldn't bundle some guidelines-- you know, heart failure patients commonly have diabetes and chronic obstructive pulmonary disease-- to try and get some guidelines and actually take multimorbidity into account.

But I think the bottom one is really key here-- improving continuity of care and coordination of care and really thinking about that as an issue. You know, we send people for investigations, and appointments, and referrals, and we really don't give it a second thought.

And we could make it better by improving communication across the interface. In the UK, primary care is virtually all electronic health records. And I can send a letter to the hospital of referral. And I just type it in, and it goes through our portal, and the hospital has it that day.

But in fact, I still get snail mail letters back from the hospital specialists. So people can come and see me, and they've seen the specialists last week, and I may not get that letter for weeks. And then they come and see me again. And that's really just not very efficient. And we actually have the technology to make this more straightforward, to make sure that we have that information to hand.

And the idea of multidisciplinary teams, and care coordinators, and these other issues are really things that we need to take on board as being possible points of intervention.

So my key message is around this is really that I think that the components of treatment burden are readily identifiable. I think that's important because actually if you can identify the components, then there's a real scope for saying that you can measure it.

And really what I wanted to put forward to you today is my main argument really is that I think the treatment burden should be seen as a barometer of quality of care from the patient perspective. And it is an aspect of care quality that is largely ignored to the present time. And I think it's really not acceptable for us to not to try and address this issue more seriously. And I think, again, when you can see-- when you can see what the components are of something or if you can measure it, then you can clearly see the points of intervention. And then you can also assess whether actually you're making a tangible difference.

So I guess what I'm saying here is the Mayo Clinic has as its vision to have patient-centered care, and what I'm really suggesting is that you need to take account of the issue of treatment burden and think about this idea of minimally disruptive medicine or minimally disruptive health care that puts the patient at the center. It's too much. At the present time, we have very disease-centered care. And while that works well when you look at diseases-- and the evidence we have is from very single disease-type randomized control trials-- but it's really not adequate for the health challenge that is facing us at the present time.

And so I really see that the folly of unintegrated care is that the confused bear here-- or patient-- could go and see all the specialists and really be in a bit of a pickle and not know where to go. And that's not because I'm against specialists. I'm married to a cardiac electrophysiologist, so it's not I'm trying to be anything negative on the specialist side. What I am saying is, though, we do need to have better coordination of that care and coordination between the different services that are working, and that we do need some way to integrate care and to consider that as something of importance.

Thank you.

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