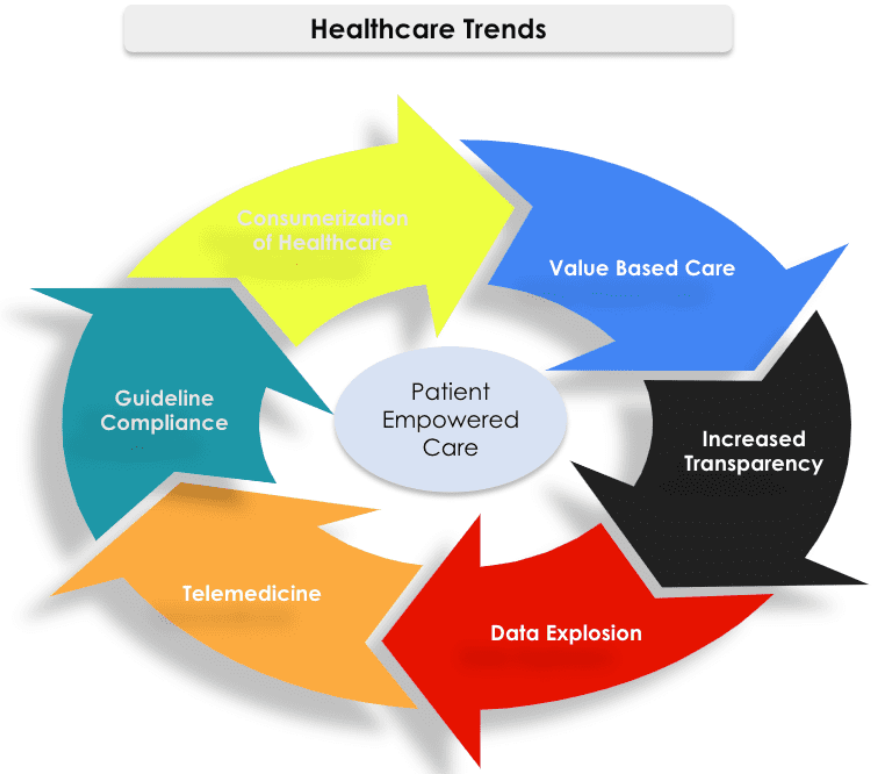
Cancerworld

Telemedicine In Cancer Care: Treatment, Tele-Oncology and Integrated Cancer Care

Adriana Albini / 5 December 2022

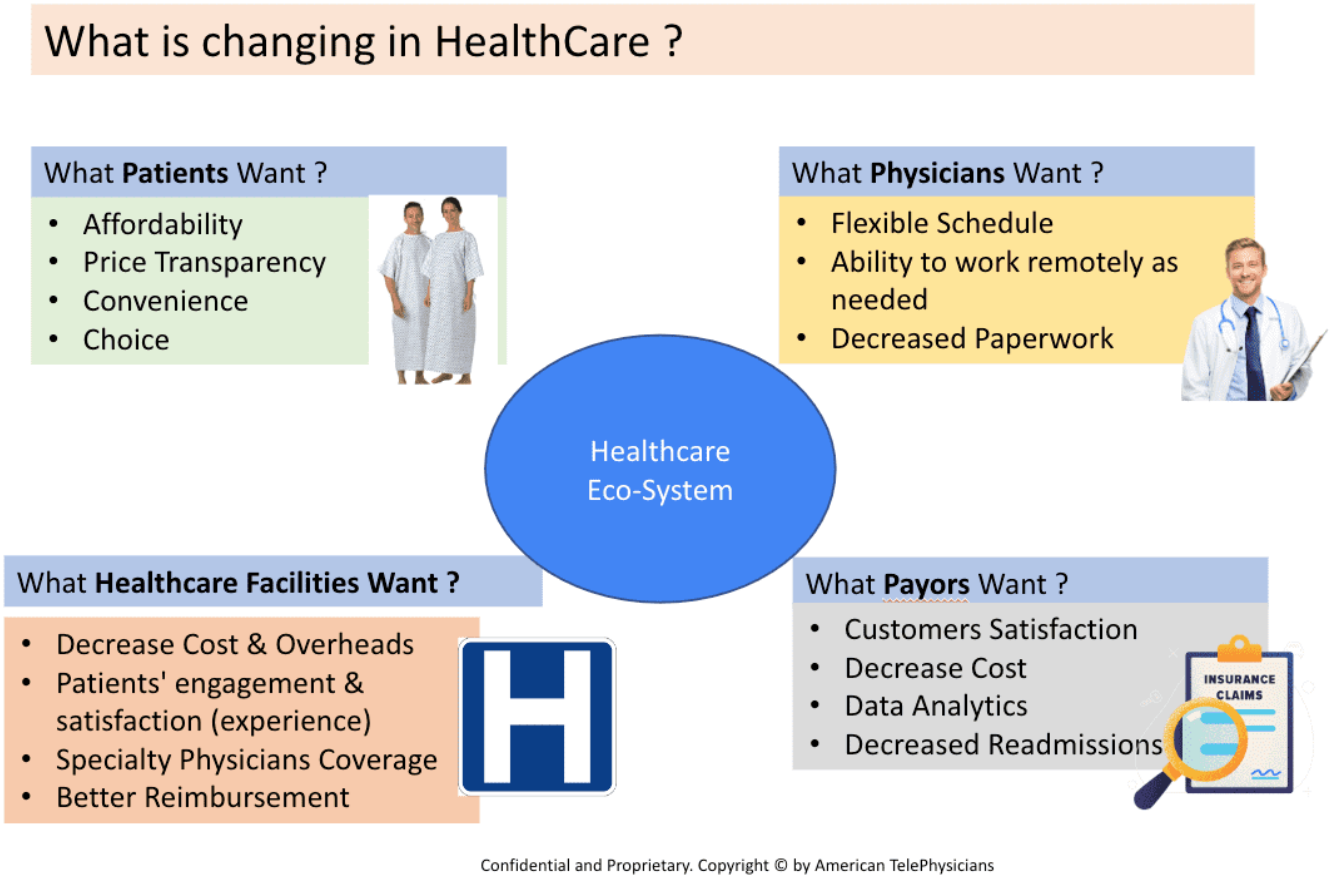


This webinar took place on 9 November 2022 as part of the Telemedicine Project Phase 2, developed by SPCC in collaboration with the American Society of Clinical Oncology (ASCO). It was chaired by **Sana Al Sukhun**, consultant in Medical Oncology/Hematology, Director of the Al Hyatt Oncology Practice, Amman, Jordan, and Chair of International Affairs Committee at ASCO. Dr Al Sukhun has been a regular speaker in the Telemedicine in Cancer Care series and has a keen interest in the development of the doctor/patient relationship in the digital era, including how it affects different communities.

The future of virtual oncology care

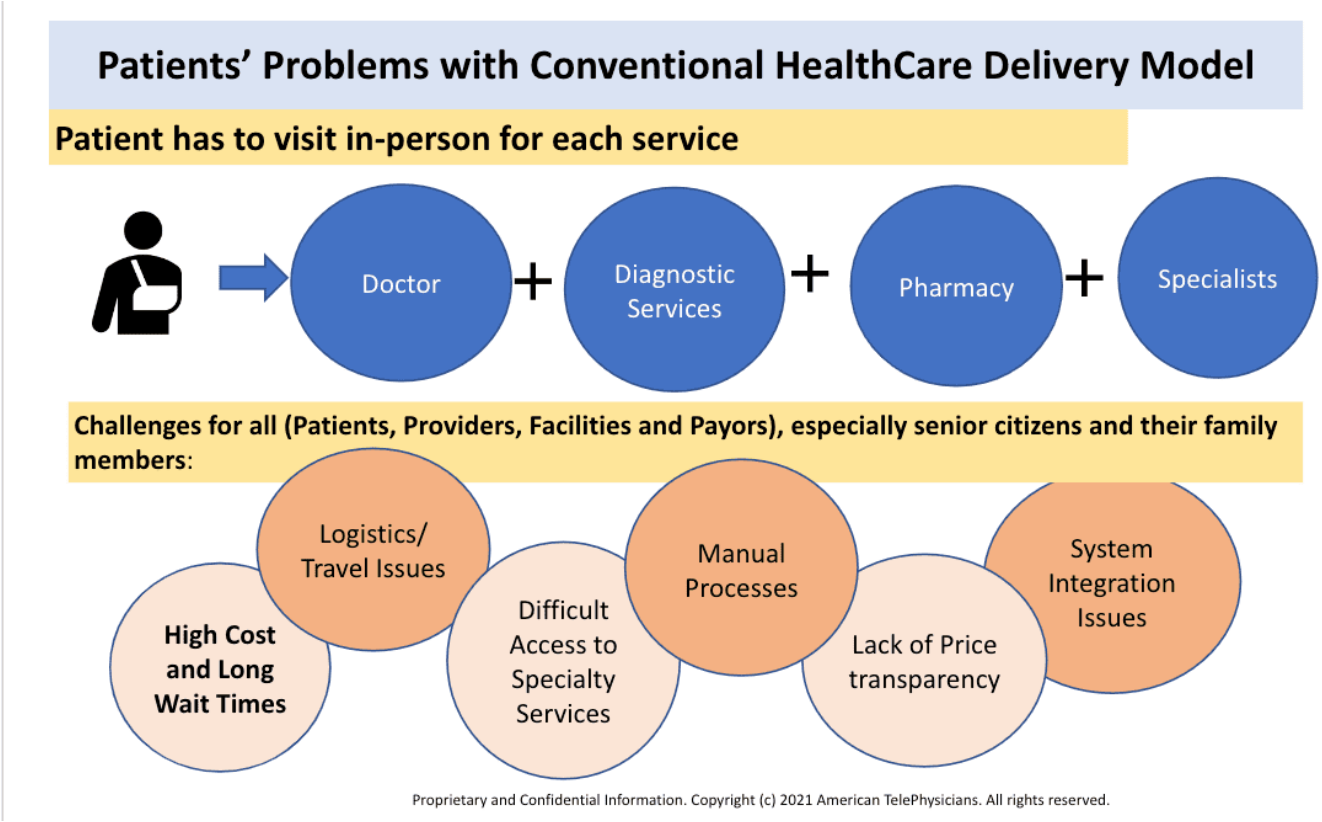
Waqas Ahmed is a nephrologist by profession and founder and CEO of American TelePhysicians, a multi-specialty physicians digital healthcare company based in Jacksonville, Florida, with operations both in the US and international markets. The company comprises various specialities, including oncology. As we know, all industries are moving online, even university campuses, and this trend has been further accelerated by Covid. Telemedicine became very popular during the pandemic,

although we had to make quick adaptations. **What is changing now in the healthcare system?** The philosophy is that the patient should be at the centre of care, what the patient wants should come first. And we know they want affordability, price transparency, convenience, and choice. Then we have physicians, and they want flexible schedule, ability to work remotely as needed, and decreased paperwork. Lastly, we have the wishes of healthcare facilities and payers.



Healthcare trends are moving towards value-based care, increased transparency, and there is also much more data coming in. The problem with data and AI is that it is unfiltered, and hopefully we are not moving from a paper mess to a digital mess.

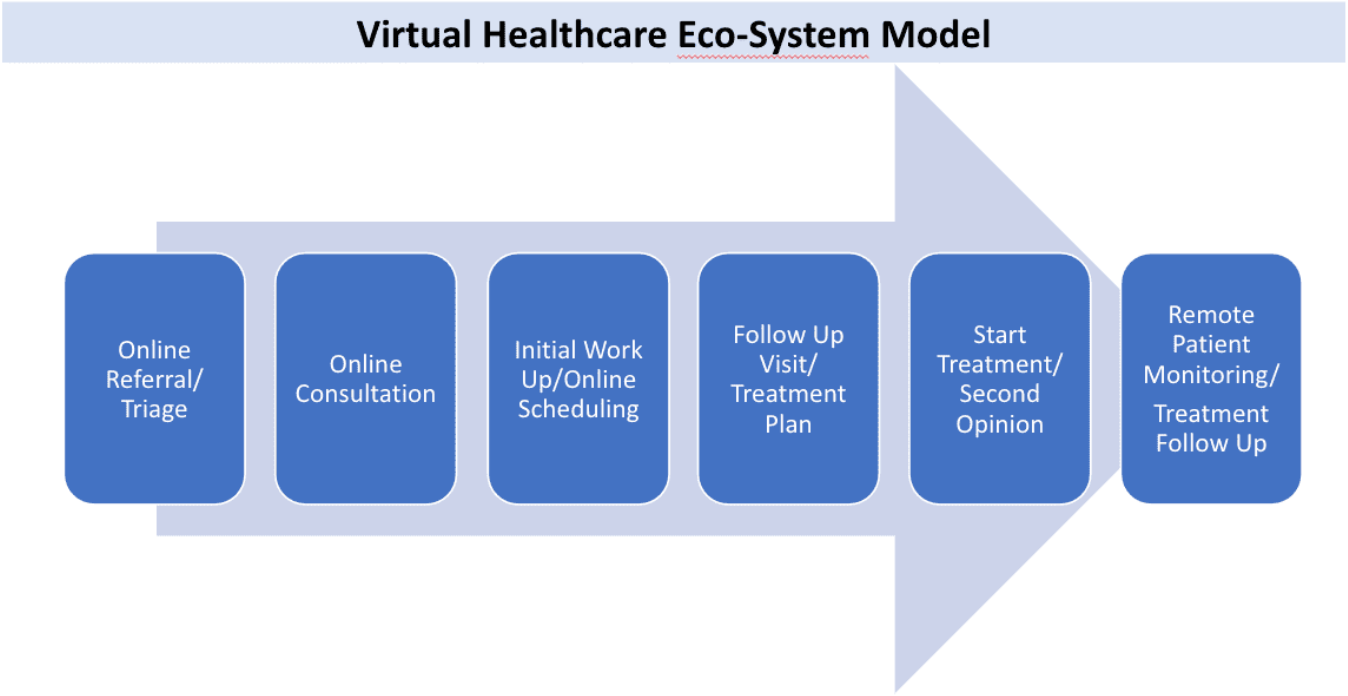
Stepping back to the conventional healthcare system model, the building process of a health establishment is expensive, requires 2-5 years from purchasing the land, construction work, staffing, to the start of services, and still has geographical barriers. One of the key problems in the traditional healthcare model, is that the patient still has to attend in person each service: finding a doctor, getting tests, prescriptions, pharmacy, specialists, etc. There are numerous challenges for everyone involved, costs, waiting time, logistics, availability of specialty services, and so on. In the case of oncology, it is even more complicated. A classic example is a patient who maybe felt a lump or found a breast mass. She needs to have a mammogram, then wait for the results, then see the surgeon for a biopsy, get breast MRI and wait again for genetics. And then, based on the size, she needs a PET or CAT scan for the staging. At this point the tumour board will gather to decide the appropriate course of treatment. This model has various flaws, such as delays from diagnosis to treatment, and consequent patients' stress and confusion. Delays, misdiagnoses, or wrong treatments also increase the financial costs.



What is the solution? A digital and virtual healthcare eco-system model. If universities can build online campuses, the idea of healthcare online campuses seems quite attractive. Of course, it is a challenging proposition because there are so many players involved. But once we look at the workflow from this prospective, it is actually doable. The gold standard is still the physical location, but we can create a virtual campus where we deliver care to patients at their doorstep, including doctors, pharmacy, labs, and all the available diagnostic services. American TelePhysicians started building an online campus model with the listings of local clinics, online clinics, access to labs, radiology, and so on. The online care portal technology was customised for each specialty and designed by physicians in that field. ATP devised a healthcare booking platform for patients where they can see and book all the services: doctors, labs, radiology centres, specialists; and another technology platform for physicians to practise remotely. This gives them more flexibility and productivity from their own location, of course keeping in mind all the legal aspects, licencing and so on.

ATP launched various platforms such as **Cancierge** for oncology, **NeuroX** for neurology. The idea is that patients go online, find a specialist, and get an initial appointment within 24 to 48 hours. One of the biggest problems for patients in the traditional system is the waiting time after they have been diagnosed, to see primary doctors, oncologists, etc. Patients have to wait for every step of their care. With the digital system all the steps are available online to the patient or family members. In the US, you can download the app **Cura4U**, which is very simple to use, and find all of the services you need, ranging from doctors to labs and radiology. ATP partners with about 3500 lab centres in the US, 1000 radiology centres, doctors online and even home care companies. Specifically in the oncology care, there are three main benefits to this. It is possible to schedule appointments within 24 to 48 hours and see a physician who writes all the lab orders. Then the patient can access the portal again and schedule all of the services needed. They can see the pricing, if they want, with or without insurance. They can also have reminders, track what tests have been ordered and what has not yet been done. Taking again the example of the breast mass, where in the traditional system the average time from initial screening to treatment is 24 days, this platform reduces the waiting time by 50%. Oncology practices have their own EMR systems, but one of the key things often missing is remote

patient monitoring. After treatment has started, whether it is chemotherapy or something else, some patients may develop more complex conditions. It is very important that they are monitored at home for any change in their vital signs or for early signs of sepsis. ATP integrated the system with many devices, such as smart watches and blood pressure monitors, and made this platform available to physicians' practises, so they can enrol their patients into the programme before, during, and especially right after treatment. Physicians can also obtain a lot of data analytics within the same platform, but it needs to be filtered, so it does not become overwhelming. The ATP system has filter capability, the user can set when alerts need to be generated. It also has data analytics capability allowing clinicians to filter patients based on their disease or comorbidities. This way they can predict which patient will be high-risk based on some data points, for instance if they are giving chemotherapy to someone with a chronic kidney disease stage-4 or with CHF, who has a much higher risk of hospitalisation. So, we can combine diagnoses to filter those patients and monitor them closely.



ATP also started working on setting up an onsite clinic model in rural areas, as well as in senior living facilities. Many seniors living facilities are in urban areas, and it is very challenging for the residents to travel to the doctor's office. This technology infrastructure can be combined with teleclinics where patients can still come and see a nurse or medical assistant. The elderly population generally prefers to see someone in person and may not be tech savvy. ATP can solve this problem by giving them virtual access to physicians or specialists, who will be able to see them in a much shorter period of time. This way more physicians are brought into the workforce, benefitting the whole ecosystem. Virtual care reduces time and costs and increases patient satisfaction by giving them access to all the services and engaging their family in the process. ATP's platform is customisable to suit each market, including international: once you understand the local workflows, the standard technology is the same. Pilot programmes were launched in Australia, Pakistan, Nigeria, and currently there are talks with Malaysia and Thailand.

Telemedicine in cancer care – does Reality match the Hype?

Mark Lawler is Associate Pro-Vice-Chancellor, Professor of Digital Health and Chair in

Translational Cancer Genomics at Queen's University Belfast, and Scientific Director of DATA-CAN, the UK's Health Data Research Hub for Cancer.

We have focused on telemedicine in the context of the pandemic, where it has proved to be very productive for many stakeholders. It has changed the way we view and deliver healthcare. However, despite the hype surrounding it during the pandemic, telemedicine has been around for a long time. An interesting example in the field of oncology: back in 1999 the Ireland-Northern Ireland-National Cancer Institute (NCI) Cancer Consortium was formed between the governments of Ireland, Northern Ireland, and the US. One of the initiatives driven by the NCI at the time was the **TELESYNERGY®** system. Telesynergy suites were installed in Belfast City Hospital, St Luke's Hospital in Dublin, and in a number of satellites across the whole of Ireland. This system, which included a precursor to digital pathology, acted as a great convener of both cancer care and cancer research on the island of Ireland, but also supported cross-Atlantic activity. For instance, Prof. Lawler remembers a case in the Telesynergy suite in Belfast. It was a rare T-cell lymphoma that had never been seen in Ireland before. The oncology team were able to reach out to Elaine Jaffe at the NCI, Bethesda, who was an expert in rare T-cell lymphomas and leukemias, and could lend her expertise. A pathology slide from the patient was set up on the microscope in Belfast and the image was then available to be viewed and evaluated by Dr Jaffe and her team in Bethesda. This was an early example of what we might call cross-Atlantic consultations. This approach was employed on a number of occasions in the early days because there were very rare tumours never or rarely seen on a small island like Ireland, with an overall population of just over 6 million at the time. This platform allowed doctors in Ireland to avail of international expertise in the diagnosis of rare tumours that could help clinicians and scientists to reach a diagnosis, but also to promote research interactions between Ireland, Northern Ireland and the NCI. Telesynergy was definitely ahead of its times. It revealed the power of a digital approach, particularly in the diagnosis but also in the management of cancer patients.

Digital pathology has been one of the drivers of telemedicine, an early adopter of the technology, and has revolutionised the field, especially for molecular pathology. It has enhanced both cancer research and cancer service delivery and has been a hotbed of innovation. The island of Ireland has developed a lot of expertise in this area, with for example the Precision Medicine Centre of Excellence led by Manuel Salto-Tellez at Queen's University Belfast. Much of the technology was driven by **PathXL** digital pathology software. PathXL was a Queen's University Belfast spin-out, subsequently acquired by Phillips and then by CIRDAN. Also, in the South, under Prof Liam Gallagher's leadership, **Oncomark** was developed, which is another digital pathology company. More recently, Dr Darragh McArt founded **Sonrai Analytics** in Belfast, another Queen's University spin-out.

It is interesting how digital pathology has been a driver of telemedicine, particularly in the diagnosis of cancers, but also for monitoring patients during their care. Technology allows us to drive innovation in this area and use it for more accurate diagnosis. Also, scanning quite large numbers of samples will enable us to come up with particular diagnostic or prognostic criteria that can help us in the management of patients, in deciding which type of therapeutic interventions they would best respond to.

There have been similar advances in the area of radiotherapy, particularly in terms of image capture, but also in automatic systems. These innovations help to drive a more digitally enabled health data science culture. Among the things that we have seen in recent years is the ability to capture and deploy health-relevant data, which tends to be multimodal, coming from various different sources. One of the challenges is how to link the data together. An area we have worked on both at Queen's and as part of DATA-CAN, the UK's Health Data Research Hub for Cancer (of which Prof Lawler is Scientific Director) is how to link different data modalities to the electronic health

record. This has been a very important step, particularly to find ways in which we can capture data and use it to influence patient care. What we start seeing now is the ability not only to capture data on treatment, but also on follow-up, quality of life, etc. However, a lot of the time these types of data are not captured well enough to be used in the management of our patients, for instance to predict what sort of side effects may be the result of particular types of treatment. An area which Prof. Lawler has focused on in the past few years is how to move away from the silo mentality we have tended to have so far, because it stops us from maximising the potential of health information and from using it to enhance patient health. A key requirement is to have data or digital systems that talk to each other. It sounds simple, but data systems procurement in the health sector has been notoriously siloed, or short-sighted and lacking in strategic vision. This can happen even within the same institution, where different systems do not interact with each other.

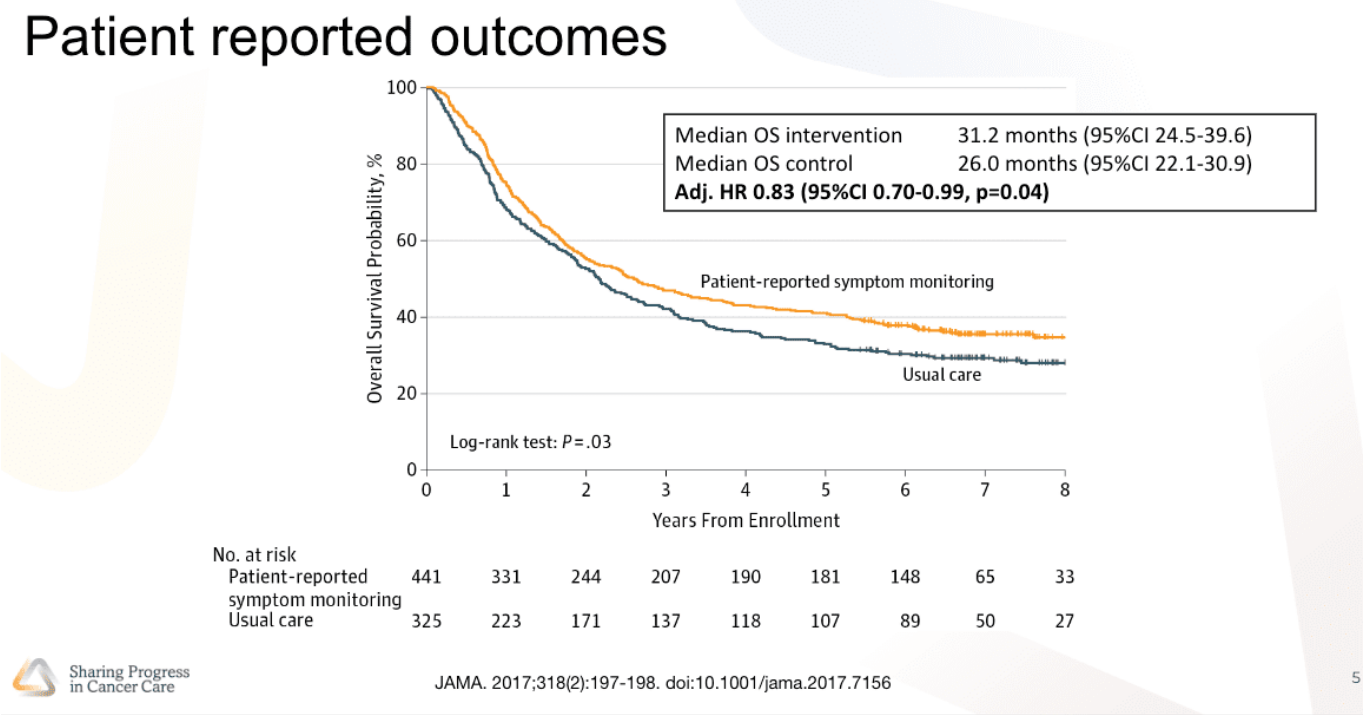
Telemedicine came to the fore during Covid-19 and we soon realised that the pandemic would have a profound impact on the doctor-patient relationship. Alongside cancer, we also learned lessons from other diseases. One of them was **cystic fibrosis**. Patients in that community advocated virtual consultations or a hybrid approach to minimise infections even before the pandemic happened, especially in the United Kingdom. During the pandemic patient consultations were streamlined into a virtual process. The idea of a patient-driven digital consultation approach is really important. We have moved towards a telemedicine-empowered digital consultation service and to generating the approach most suitable to patients. However, remote consultations can be somewhat limited. For instance, in a video call a doctor cannot easily see and perceive certain cadences and habits of the patient with the same clarity as in a face-to-face consultation. It is important to weigh up where a remote visit can work well and where face-to-face is more desirable. This hybrid approach, like the way scientific and medical conferences are now delivered, is probably the way forward.

In the post-treatment phase of cancer survivorship, we have had a significant shift from face-to-face to virtual consultations. This has made a huge difference in patient care and their quality of life. A number of studies led by Kathy Oliver and her colleagues from the International Brain Tumour Alliance, surveyed brain tumour patients and their caregivers, asking them whether they preferred face-to-face or virtual consultations. Over 60% of patients were more nervous or unwilling to attend medical appointments. We have also accumulated a substantial body of literature showing the benefits of telemedicine, particularly in the management of psychosocial and physical effects, particularly for improving fatigue and cognitive function. There may be less evidence on the use of telemedicine in the preventive surveillance for recurrences and new cancers, as well as in the management of chronic medical conditions, but evidence is starting to accumulate.

To optimise the benefits of telemedicine we must better define design considerations for its services and interventions. We must determine for which patient groups it is a suitable option; promote telemedicine uptake by cancer survivors and caregivers where appropriate; address implementation barriers and incorporation of effective facilitators for remote interventions; define the standards we need to look at in relation to delivery of telemedicine; constantly monitor and collect intelligence to ensure best practice and long-term sustainability. Covid has shown us we can think and act in many different ways we previously thought were not possible. We have a significant opportunity. To go back to the “old normal” would be a regression. We need to think about being innovative, in everything that we do. Innovation is not necessarily expensive. It can be economic, doing things in a straightforward, effective way. But it must involve co-creation with patients. Then we can really deliver a telemedicine approach that is patient relevant, and patient centred.

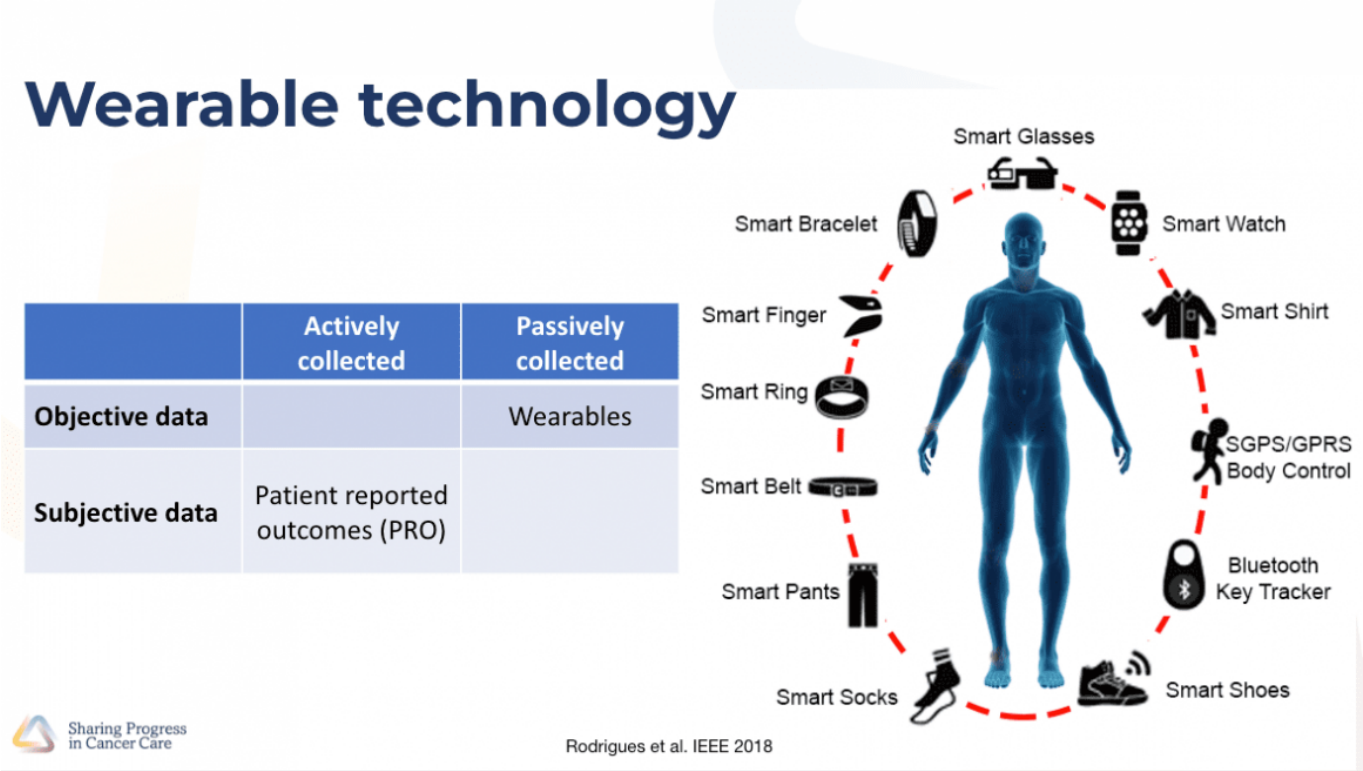
Tackling toxicity: comprehensive ambulatory monitoring platforms during

systemic therapy



Martijn G. H. Van Oijen is Associate Professor at Amsterdam UMC, Netherlands. In his presentation, prof. Van Oijen talked about two different ways of using ambulatory monitoring platforms. **Data can be actively or passively collected**. Passively collected data, such as from wearables, is **objective**, while actively collected data, as in Patient Reported Outcomes (PROs) is **subjective**. Both are needed together. To take an example, if someone uses a wearable or checks their temperature with a digital thermometer after running a marathon, the device will probably indicate a fever, but the active subjective data will say they are doing well, albeit a little fatigued. In 2017 at the ASCO Conference in Chicago, Ethan Basch from Memorial Sloan Kettering in New York, presented the findings of a randomised control trial. The participants were cancer patients who had initiated chemotherapy. They were randomly divided into a PRO group and a usual care group. The first group was asked to report on 12 common symptoms on a weekly basis using a web-based interface called **Symptom Tracking and Reporting** (STAR). If their symptoms worsened, an email alert was automatically sent to their clinical nurse. A report profiling the symptom burden history of each patient was then generated. Participants in the usual care group received the standard procedure, in which symptoms were discussed during clinical visits, or by a phone call to the office if patients were concerned. The median overall survival in the intervention group amounted to more than five months longer than in the control group, simply because patients proactively reported their symptoms. Another study on PROs, carried out in France by Fabrice Denis and his team, obtained similar results. Moreover, a paper published in 2019 by Thibaut Lizée and his group showed that surveillance of lung cancer patients using web-based PRO was cost-effective compared to conventional monitoring. Five months exceeded overall survival in lung cancer is more than any of the new therapies have provided. And this system is also cost saving. **So, why are we not doing this?** Implementation in clinical practice is hampered by clinical care pathways; most of the platforms used are standalone, which is useful when doing research, as they can be tweaked accordingly. But we need fully integrated platforms within hospital medical records for doctors to effectively see how their patients are doing. And an upfront financial investment is required. The investor needs to believe in a platform, in an integration that will work. Also, we know that this system worked in New York and in various centres in France, but how do we know it will work at our

institution? **We need local feasibility studies**. And that is what prof. Van Oijen and his team did. They started a couple of feasibility studies, and the results were very interesting. But, as mentioned earlier, they did not want to rely only on patient reported outcomes. They wanted to add some wearable technology.



Over the years many different wearables have been developed, from smart watches down to smart shoes and socks. For clinical purposes we are mostly interested in smart watches and tools that monitor blood pressure, temperature, sleep. Prof. Van Oijen's group began their research into this concept by doing two systematic reviews on the use of wearable technology, the first was on the association between wearable activity monitors and performance status in oncology, and the second focussed on clinical outcomes. The team was quite surprised at how little clinical evidence was available on these topics. They found only 14 studies they could include in a systematic review on the association between activity tracked by wearables and performance status – i.e., how well the patient functions and how many cycles of treatment they are likely to tolerate. The group also found a high risk of bias in most studies because the trials were underpowered. On the basis of this limited research the team could only glean moderate evidence for a weak to moderate positive association for various wearable activity monitor metrics and a moderate to negative association for sedentary behaviour. Moreover, participants in each group were very heterogeneous, with all types of cancer and different ages included, making it difficult to determine the magnitude of the effects, and consequently to translate the results into clinical practice. For clinical outcomes, there were slightly more studies and 31 of them were included. Again, they were quite heterogeneous. There were studies on progression, on fatigue, and four studies on overall survival that showed an association between active vs. sedentary lifestyles and overall survival.

When we add a wearable activity monitor, for example a step counter, to the clinical practice, we have an extra parameter to measure patient performance status. We can also see not only how they are doing when they walk into the outpatient clinic, but also how they were doing over the past months. Of course, this varies from country to country but, at least in the Netherlands, an increasing number of patients not only uses the tools provided by the clinic but would even ask for instructions to use their own gadgets. After publishing these reviews, the team decided to carry out their own study. Together with a tech company, they created a comprehensive ambulatory monitoring platform combining three devices: an app for patient symptom reporting, the Fitbit Versa smart watch, and the Withings thermometer. The results were presented at the ESMO Congress 2022. Because it was a feasibility study, the crucial part was to assess the level of compliance. The team followed patients for three months and asked them to read their thermometer every morning of every single day during the course of their therapy. 76% of participants were compliant. They were also asked for weekly symptom tracking, like the study by Ethan Basch, and there was an 86% compliance. The third request was to wear the Fitbit for at least eight hours per day, and almost 100% of patients were compliant with that. The results show that, compared to none, daily step counts were significantly lower in patients who reported a grade 3 or higher adverse event – specifically for fatigue, shortness of breath, and even for headache. Looking at column charts from individual patients, we can see the level of activity preceding, during and after hospitalisation, but it would be very difficult to manually draw a line to connect the data points. We need artificial intelligence tools to help us with that, to find an individual pattern for a patient and see whether or not they deviate from it.

In the future we should see hospitals becoming more like airports that monitor all the planes around us. We should monitor all the patients around us. We need new care delivery systems, including digital doctors. We need comprehensive ambulatory monitoring systems. Finally, to quote Eric Topol, we should stop saying “the doctor will see you now,” and say instead, “the patient will see you now.”