INNOVATION & CARE

THE LEADING ISRAELI MEDICAL CENTERS AND DOCTORS

THE JERUSALEM POST
MEUHEDETE HYBRID
Changing the world of health in Israel
Dear Readers,

As Israel is taking its first cautious steps back to some normalcy, and a few days before Passover, we look back at the last year and are compelled to say thank you. Thank you to all the medical staff around the country: We are forever in your debt.

However, we must remember that as we return to seeing friends and family once again, the medical teams are still very much in the midst of the battle, still working day and night to help those who are afflicted with the coronavirus. The dedicated teams are not yet out of the fray, but many of us have neglected to keep cheering them on.

So let’s applaud our doctors and nurses, our innovators who work hard to improve the medical treatment for all of us in Israel and around the globe. Let’s continue to take pride in their admirable talent and devotion, their care and expertise.

Wishing you a very happy and healthy holiday,

NERIA BARR
Haifa’s Rambam Health Care Campus is northern Israel’s only Level-1 trauma center and the referral hospital for 12 district hospitals. When more than 60 missiles fired from Lebanon landed within meters of the campus during the Second Lebanon War, the hospital’s administration knew it needed to find a comprehensive solution that would allow its medical teams to safely treat patients while under fire.

The challenges Rambam faced in 2006 played a critical role in the planning process for its Western Campus. It includes fortification of the first three floors of each of its buildings: the Ruth Rappaport Children’s Hospital; the Joseph Fishman Oncology Center; and the soon-to-be-completed Eyal Ofer Heart Hospital and Helmsley Health Discovery Tower.

GOING UNDERGROUND WITH THE IDF

The most intrinsic element of the plan was the construction of the Sammy Ofer Fortified Underground Emergency Hospital, a 1,500-car garage capable of being transformed into a 2,000-bed hospital within 72 hours. The largest
underground hospital in the world, it is fully fortified against biological, chemical, and conventional weapons.

Dr. Michael Halberthal is Rambam’s general director. A pediatric intensive care physician by profession, he also teaches and trains medical centers around the world how to prepare for trauma and mass casualty situations. After the COVID-19 pandemic began, he was asked by Israel’s Ministry of Health to convert the hospital’s garage into a COVID-19 care facility, with space for 770 patients. Opened in September 2020 and closed in mid-March, the underground hospital served as the country’s largest COVID-19 treatment facility. It was operated in collaboration with the IDF, marking the first time in Israeli history that the military partnered with an Israeli hospital to treat civilians. Rambam continues to treat COVID-19 patients in other designated departments.

**WORLD-CLASS INNOVATION AND RESEARCH**

Through Rambam’s Clinical Research Institute, physician-researchers conduct research in many areas, such as cardiology, oncology, and medical...
cannabis. Innovative solutions are brought to fruition via Rambam MedTech, the hospital’s technology transfer company, and MindUP, a digital health incubator launched as a joint venture of Medtronic, IBM, Pitango Venture Capital, Impact 1st Investments, and Rambam, in collaboration with the Israeli Innovation Authority.

Rambam’s collaborative partnerships with institutions in Israel and abroad such as Stanford Medicine, Memorial Sloan Kettering, and the Technion, ensure that its impact is felt worldwide.

When completed, the Helmsley Health Discovery Tower will create an environment that fuels scientific investigation and discovery. By harnessing the power of Rambam’s outstanding healthcare professionals, stellar academic institutions, and Haifa’s vibrant biomedical ecosystem, this state-of-the-art innovation hub will secure Rambam’s position as a leader at the highest global levels.
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*Excluding U·Lactin Shampoo

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The Israel Medical Association was founded in 1912 by a pharmacist and six doctors who had immigrated to Israel. The IMA's first protocol was written in Russian and included three main goals: To represent the doctors in Israel; to take care of the quality of medicine in Israel; and to promote public health.

Leah Wapner is the secretary general of the IMA. A lawyer by education, she has been its legal adviser for more than 20 years. On an international level, she is the adviser to the World Medical Association and secretary general of the European Forum of Medical Associations.

“There can be no reality in which you say the health care system will have no resources and will not be good but the doctors will be good.” Says Wapner. “Alternatively, it won’t be good for doctors and medical staff, but the system will be wonderful. Our concern is not only for good medical care and good doctors but also for health issue as a lifestyle. The founders of the IMA thought about all these aspects more than a century ago, even before the Spanish flu. Since then, the IMA has undergone many changes, but the vision and tasks they set remain a guiding principle to us.”

WHAT DOES THE IMA DO?

The IMA is first and foremost a workers’ organization, unrelated to the Histadrut. It was founded before the Histadrut. We represent the doctors in Israel. We sign collective agreements with all the doctors who work in the public system, where they define the working conditions of the doctors, which concern not only salary conditions but also quality of care, medical ethics, and related issues.

The other issue we deal with is the quality of medicine. It is expressed in three components. The first is the Scientific Council, which also has a statutory role by law. We are responsible for the world of specialization in all its aspects. It also concerns the syllabus of doctors, various committees and exams. The third component is the exams and recommendations for a specialist degree. We have 56 different medical professions.

A new topic is the Institute for Quality in Medicine, which was established six years ago. It is headed by Prof. Leonid Eidelman. His predecessors were Prof. Zimlichman and Prof. Rachmilevitch.

The latest topic is scientific journals, which are designed to engage and assist in the field of medicine.

In the realm of public health, we have departments within the IMA that deal with public health, medical policy, and everything related to decisions in the Knesset in the areas of medicine and health.

The IMA is built like a matrix. On the one hand, every doctor is a member of the association. On the other hand, they are also organized by fields. First of all, there are our associations and societies according to the scientific field, such as family medicine, internal medicine, etc. In addition, there can be a society for sports, for teenage girls, etc. We have over 200 such organizations. An organization can comprise 20 to 50 doctors or 1,000 or more. They are the ones who advise us in all areas. For example, we have set up a forum of coronavirus consultants, which includes experts on infectious diseases, public health, family medicine, and internal medicine. In each subject, we have a group of unions.

For example, if the Institute for
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Quality in Medicine wants to issue clinical guidelines on home hospitalization, then it backs up general medicine and family medicine and tries to find what is acceptable and agreed upon by all unions so they can work according to one theory, the important aspect being the scientific part.

We also have organizations by workplace. When there is a state employer, Hadassah, Clalit, it is clear that the working conditions have nuances, and we allow the organizations to organize state doctors, such as the organization of doctors of Hadassah. Our institutions enable dialogue between the institutions and the organizations. The IMA’s institutions are a secretariat that is basically a board of directors, a central committee, along with the scientific presidency and so on. We also deal with issues of policy, health economics, concern for the right funds between HMOs and hospitals and the like.

Then there is the IMA’s Bureau of Ethics, It sets the principles and guidelines of the Bureau of Ethics and instructs doctors on how to proceed. Sometimes these are issues between doctors that are social issues. As the issues become more social, we try to keep in touch with other organizations that deal with ethics in order to issue some position papers that will be acceptable not only to the medical community but something broader. The Bureau of Ethics is very active in position papers and also deals with complaints against doctors. Not in medical malpractice but ethical issues, such as how to behave and what to do.

In the end, we need to understand that this is a big operation and we are also a member organization and must take care of what employs them in the professional field. It can be at the private level, such as doctors who want to set up a private practice, how to do it, etc. Or it can be work-related issues, such as benefits and professional training. Last year, we established the online school of the IMA, where we transfer many new skills that are needed. What we did during the corona period can be instructive regarding our activity there.

When the coronavirus erupted into our lives, the first issue we had to deal with was setting up four emergency focuses. The first issue was together with the Society for Infectious Diseases. At the outset, when the doctors wanted to get as reliable information as possible, they would call and leave questions. It worked very well, but there were so many inquiries that the experts literally collapsed from the volume of questions.

Our second focus was on ethics. There were many questions of ethics in the context of corona. For example, doctors asked if they were endangering themselves when treating a corona patient. Toward the middle of the hearing about corona, the Bureau of Ethics together, with other officials, issued a position on priorities regarding administering respiration. The paper provoked much controversy. It spoke of extreme cases, in a state of scarcity when we still thought there would be a shortage of respiration machines.

The next issue was a focus of labor law. The children at home have no framework. Is it possible to stay home; is it considered a day off? We gave individual answers to everyone.

The fourth issue we did together with the Eran, the mental hotline. We opened a special hotline for doctors who needed support. There were cases when we also enlisted the help of the Psychiatric Association, which provided help for the doctors.

We had to enter into unique collective agreements for the first period. From the beginning, especially considering that the topic of protection was still unclear, there were many cases where entire medical teams went into quarantine, and there were changes in the manpower agreements. In the first period, hospitals stopped all the elective medical activity and decided to wait and see what would happen. We had to take care of the doctors who went into quarantine by sending food baskets and other needs. Today there are fewer medical staff members in quarantine. At that time, we also contacted our retirees.

We did several things. We ran the Institute for Medical Quality, which had many discussions and issued position papers on various issues. We have been working tirelessly with the Ministry of Health, we realized that in such a severe crisis, the last thing the state and the doctors need is a plurality of votes. Different voices emerge anyway, but we tried to be as consistent as possible with them unless there were guidelines that we thought were incorrect. After all, those who sit in the Ministry of Health are also our doctors.

In addition, we set up a Corona Consultants Forum. It was founded by Prof Zion Hagay, the chairman of the IMA. There are also representatives of the unions, relevant experts from hospitals and the community. The aim is to meet every week or twice a week to discuss one of the issues, such as school openings; lockdowns and when and how to exit them; vaccinations; serological tests. We discuss all these and publish out position papers. Things have changed over the year. There are things we thought at the beginning of the pandemic that have evolved into what we know today.

At the same time, we are constantly fighting for the system to receive resources. There are two things we have learned in the context of the pandemic. The first is that such a poor investment in the health system over the years is coming to fruition. The question is not whether the health system collapsing. We will probably not reach a situation where a hospital will be closed; but if people in Israel receive less good treatment than they could have received, then that is certainly the case. If there is no place to put patients, not enough space in intensive care and not enough skilled workers, and the workers are exhausted, then it is clear what the conclusion is. We are not learning or preparing for the next pandemic. In my opinion, we should not have had a third lockdown if there were investments that were suitable in advance. In the end, money that is not invested in the health care system over the years ultimately results in a much greater expense. Because at the moment of truth, there was a hysterical reaction. They equipped themselves with unnecessary things on the one hand but did not add positions and people. For example, they said they would add 600 positions, but then said “Maybe not now. Maybe we don’t need it.”

One of the worst things that has happened to us in the field of medicine is that the line between politics and medicine has become blurred. This must not happen. What I loved in the past is that there tends to be a distinction between politics and medicine. Unfortunately, Covid-19 has blurred this thing, and we have considerations that are influenced by politics. Instead of medical considerations, there are political considerations. People must think about the comparison between Japan and us: 100 million inhabitants and the same number of deaths.

The test is not whether the decision is right or not in a new disease no one knows about. We do not have complete certainty, but the public wants to know that the decision is made in the public interest. Once the public is not sure of the decision is medically motivated and may be influenced by political considerations, we destroy public trust. Public trust is something you can destroy in a minute, and rebuilding it is very difficult.
An Outstanding Achievement for Israeli Medicine

THREE YEARS IN A ROW!

Sheba Medical Center is ranked amongst the Top 10 world’s best hospitals by Newsweek magazine

By Virtue of Our Medicine, Our Research Our Innovation & Our Steadfast Battle vs. COVID-19, We Have Attained This Accolade.

Thank you to all of our patients, who have trusted in our abilities every single day. Thank you to the dedicated Sheba medical staff and personnel, who have assisted us all along the way. It is because of them that we are providing hope without boundaries!
Professor Dan Shechtman, winner of the 2011 Nobel Prize in Chemistry and the Israel Prize for Physics in 1998, chairs the board of trustees of the Innovation Division at Beilinson Hospital, an initiative of the hospital’s CEO, Dr. Eytan Wirtheim.

In this interview, Shechtman talks about the importance of innovation and having an intra-organizational entrepreneurship center as part of the day-to-day life at the Beilinson Medical Center.

“The concept behind the innovation center initiative at Beilinson is to encourage intra-organizational entrepreneurship,” says Shechtman, who lectures on these issues around the world. “The idea is to establish a body of professionals within the medical center who will listen to ideas of the staff and sift through them and decide which suggestions warrant being promoted.”

What does that mean exactly?

In any organization, the people who really know the details are the workers in the field. Management focuses on the organization’s goals, on tactics; but on a day-to-day basis, it is the workers who know what can really make a difference. In any workplace, everyone knows their own department. So the employees of an organization have a tremendous economic value for their organization, a
value that very often is not being utilized. That value is their knowledge and their ideas about how to promote the organization in various ways. I call it 'intrapreneurship.'

Intrapreneurship means that there are already two points of view. The first is the management’s. The second is that of the employees. In a hospital, I am talking about the entire staff at all levels, not just doctors. Everyone.

Management should inform employees that it expects them to come up with ideas, solutions, and innovations. The changes they might suggest could be related to medical procedures or new equipment, ideas to refine the treatments, or a different way to organize the operating room. These types of innovations are for the benefit of the patients, the staff, and the hospital in general. That is what stands behind the management’s point of view.

In addition, management should tell employees that if someone comes up with a good idea, it will be implemented, and the person will be adequately rewarded – financially or otherwise. The employees need to know that management expects them to come up with ideas, anything that can promote the organization, streamline it, or perfect communication.

**What are some of the benefits?**

There are several benefits. One advantage is that the ideas that come from the field will advance the organization. A second advantage is that employees will feel like they are partners in the organization and are communicating with the management to improve the organization. The third thing is that if the management wants to know who deserves to be promoted, it is the people with the good ideas who deserve it. They should not only rely on the recommendation of their direct boss, but the management will know this doctor, this nurse. Employees with good ideas deserve to be promoted because they can advance their staff and the organization. That is what underlies the concept of intrapreneurship.

**How is it implemented at Beilinson?**

Beilinson is a hospital that is close to my heart because I was born there 80 years ago. When I was born, the hospital was seven years old. I also grew up in a neighborhood bordering the hospital.

A hospital is a very complex institution. The public sees only the result. A patient is hospitalized, cared for, and that’s it. But a hospital is a much more complicated organization. For all systems to work toward the benefit of the public, a lot of things have to happen; and a lot of things can fail when they are not done optimally. So in a hospital, there is a real need for intrapreneurship.

In addition, there are a lot of doctors, the people who take care of human lives. Anything that can help them to provide better care can be life-saving. And it can improve the quality of life. These improvements have social and health consequences, so it is important that everything be done in the best way possible.

Bellinson is one of the largest hospitals in the country and is a leader in some areas. There is a large team of experts in the different departments. I have been meeting with them every day. I see this as a mission.

In practice, we have a framework of six key people who help me promote intrapreneurship, There is also an advisory committee – experts in different fields. Most of them are doctors, but some are from other backgrounds, essential experts to the organization. They are wonderful people who want to help and contribute and set up a great atmosphere in the hospital.

In my opinion, this concept is important not only in a hospital but as a general idea that should be implemented in any organization. In Israel, we are very good at intrapreneurship. But it is not possible for every employee who has an idea to contact the general manager. At Bellinson, that is where my organization comes in. It is the mediator between the hospital staff and the management.

In practical terms, we sort out the proposals, decide which ones to support, and then present them to the management, recommending which ideas should be promoted. When we receive a good suggestion from an employee, it also helps us to recognize who deserves a promotion.

**PLUS ULTRA INNOVATION**

Dr. Eytan Wirtheim, director of the Rabin Medical Center (Bellinson and Hasharon) of the Clalit Group, is leading an innovation strategy that connects the medical, research and development capabilities of a hospital, together with the ecosystem of the Israeli start-up nation. That is how they are promoting the next breakthrough that will improve the lives of millions of people.

The following is what Wirtheim says on the subject:

When we talk about innovation, we always look ahead. But because innovation is also thinking differently, I choose to start by sharing a story from 500 years ago. According to mythology, in the Straits of Gibraltar the Pillars of Hercules were inscribed with the phrase “Non plus ultra” -- “Nothing farther beyond.” The giant pillars marked the boundary of the known world and warned sailors not to go any farther lest they fall off the “end of the world.” In the 16th century, to encourage Spanish explorers to sail into the ocean and discover the New World, the king of Spain coined the phrase that is Spain’s motto to this day: “Plus ultra.” The message became “Dare to go farther!” This is the vision of innovation of Rabin Medical Center, and this is the future of medicine: to always strive forward, to look beyond -- and to dare.

At Bellinson and Hasharon
hospitals (Rabin Medical Center), we provide the best medicinal attention every day, and we think about tomorrow’s medicine every day. That is the only way to promote medicine, research, and innovation. As part of our strategy, we have established the Innovation Division – a spearhead that will enable us to continue the innovations and achievements that have been made here for more than 80 years.

We have recruited the best people. Prof. Dan Shechtman, a great scientist and Nobel laureate in chemistry, serves as chairman of the board of trustees of the Innovation Division. Prof. Ran Kornowski, director of the Cardiology Department, a leading cardiac catheter expert and world-renowned researcher, chairs an advisory committee with 12 leading physicians. Dr. Leor Perl returned to us from Stanford, the world’s leading center in medical innovation, and brought with him the outline for an incubator of innovation and integrative connections. The result is the creation of a unique model, which places us as the medical-technological spearhead of the Start-Up Nation.

Innovation flows in the blood of medicine. Without entrepreneurship, courage, and huge investment, the world would not have been vaccinated against a deadly virus in less than a year since its inception. This is the medical innovation of the 21st century: the ability to bring about change that will directly affect human life. Therefore, innovation is located at the core of our strategic compass in the medical center as a cross-cutting component, affecting every field and creating the DNA of the organization: free thinking, continuous improvement, and connection of capabilities that will bring the next breakthroughs.

In this spirit, we have established an incubator for development and innovation. It is based on the understanding that solutions grow from the field and encourage all our employees to identify needs, promote ideas, and embark on a path that may end in patent registration, establishing a start-up, and sustainable products. Led by Dr. Perl, a vibrant innovation center has been built that connects physicians, researchers, and academics, as well as industry, entrepreneurs, and investors. The combination of a clinical environment, studies, medical staff at the patient’s bedside, and a rich database creates great value. In the age of digital health and big data, it is the perfect laboratory for developing solutions that see the patient throughout his or her medical journey.

Our innovation system has other layers. For example, basic and translational research at the Felsenstein Institute, affiliated with Tel Aviv University and the Clinical Research Authority – an area in which we’re leading with about 1,000 new studies that passed the Helsinki Committee in 2020. Breakthrough technologies that our senior physicians develop and implement, which place us at the forefront of medical progress. International connections with leading centers such as UTSW in Dallas, an institution with six Nobel Prize winners, and an annual research budget of half a billion dollars. Digital health, big data, and artificial intelligence -- the future of medical innovation that we promote with in-house teams and with the help of Clalit's support, which allows us to create platforms of algorithms and deep learning through constant diagnosis and treatment that is more exact than ever before. Customized medicine which we will launch here this year at Clalit’s genomic flooring center, and next to it a tissue bank that will complement the research capabilities in complex diseases. Integrated diagnostic capabilities that connect information and data from imaging systems, pathology tests, omics (genomic information and functional information at the protein level) and other modules.

The picture is clear: Rabin Medical Center is not only Clalit’s flagship branch, but it is also the ‘aircraft carrier’ of innovative medicine, whose staff and the tools on it can decide a battle. This war is being waged for the health of millions of people, and we intend to win it.
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FOUR HEADS OF CORONA UNITS AND THE MEDICAL DIRECTOR OF INNOVATION AT SOROKA MEDICAL CENTER, PART OF CLALIT HEALTH SERVICES, SUM UP A YEAR OF CORONA

PROF. LEONID BARSKI

Head of the Internal Medicine Department
The department was the first at Soroka to become a corona department.

During our normal work on normal days in the inpatient wards, we are confronted with people of all ages in all situations – including ventilated patients, connected to machines. We are in close contact with the community, and this knowledge created our ability to adapt quickly and become a corona ward.

When the pandemic broke out and we were asked who was willing to take on the task, I volunteered. To my great joy, most of the doctors and nurses in my department joined me, as well as those from other departments. We have learned how to cope and how not to become infected.

The entire team worked together as one. It is not only the patients and their families that need emotional and physical support, the staff also need a lot of support.

Our treatment of corona patients included keeping in touch with the families, especially families of elderly patients who were in critical condition. Our family care team included a social worker, nurses and doctors. When treating a corona patient, a protected team enters, and they all help each other. The doctors, nurses, and physiotherapists support each other because we must treat the patients quickly.

Another important element that helped us cope was the support we received from the hospital management – administrators, logistics, computing, spokespersons. All the other departments gave us tremendous support. They all worked in coordination and together. For example, our unique corona department, with all the special technologies and the construction of the tele-medicine (remote medical system), was built very quickly.

Thanks to all this, we believe that in the end we will defeat the coronavirus and return to a normal life.

DR. AMIT FRENKEL

Critical care outreach team, General intensive care unit, and the medical manager of Soroka’s innovation directorate

Soroka is leading hospital in Israel, and the only hospital serving the Negev region, with a population of over one million people. Therefore, with the outbreak of the corona pandemic, it was clear that in order to continue to lead in the level of medical care, all of the hospital’s staff may be involved in care, alongside innovative technology as a force multiplier.

First, the hospital’s computing unit was tasked with introducing technologies that enabled corona wards to be viewed using CCTV cameras, including the use of voice capabilities to make remote calls. A situation room was set at the entrance of the ward, where the medical staff can monitor patients from afar. These monitors included heart monitors, respirators, and automatic medication injection pumps.

At the same time, we began intensive collaboration with the aerospace industry to establish a project called the ‘cockpit.’ This project uses technology from the world of military aviation, according to which the critical information is projected in real time in front of the pilot’s eyes.

Robots were used as a communication relay with the patients. Capable of connecting to the Internet, driven remotely, they were brought into the corona wards and carried medical equipment with them, while photographing what was happening there.

The hospital continued to provide the best care for corona patients, despite the heavy workload on the various departments, while demonstrating flexibility, openness, and technological creativity that will continue to accompany us in the years to come.
PROF. VICTOR NOVACK
Director of the Department of Internal Medicine H.
Head of the Research Authority

During the corona period, the Internal Medicine Department became the corona department for 4 months, while during the rest of the year we were treating an ever-increasing number of other patients. It was a very challenging year for the whole team. A health system is not unlike the military: in the same way that the military trains all year round for war, the health system trains for medical emergencies. Now a medical crisis has come, and I think we have fulfilled our mission exceptionally well.

In my position, as a head of the research authority, I work closely with other hospitals all over the world. In general, despite all the criticism about the government’s conduct during the corona crisis, I think our health system has managed to deal with the crisis with excellence. Despite the intimidation, we were never on the verge of collapse. We know how to function in stressful situations and be very effective on a daily basis, despite the fact that health spending in Israel is relatively low compared to many other countries. In a way, our national health system turned to be well prepared to deal with the crisis of such a proportion. Yet, we must admit – without a change in the approach to medical care on the governmental care, in the near future we will be not able to deliver the best of medical care to our patients.

We must remember that we have not yet dealt with the complications of the recovery. Some patients have recovered from the coronavirus, but their long-term health consequences can be severe. I believe that many people who suffered severely from COVID-19 may experience chronic conditions for a long time, possibly a lifetime.

Dealing with this disease has had a humbling effect on us. We know today that there are things we do not understand. We do not always have answers. The coronavirus does not always behave as expected. We just have to learn to say we do not know. That is fascinating to me. The fact that I don't know is an important starting point to start exploring.

The pandemic gave a boost to research processes and now we need to leverage what we have learned. Innovation in the medical system is critical and corona taught us that we can significantly shorten the time from the laboratory development to the patient bed.

PROF. YANIV ALMóg
Head of the Internal Medicine Intensive Care Unit for COVID-19 patients

The medical intensive care unit of the hospital was basically converted into the corona intensive care unit. We treat the most critical patients. When they come to us most patients already suffer from collapsed lungs and cannot breathe on their own. These are difficult and challenging patients because their condition often deteriorates fast and the mortality rates are high.

I feel that we are coping well, but the duration of the process has an important impact, adding to the difficulty, unlike other emergency situations that we have grown accustomed to, which usually end after a few days or weeks. We need to cope with a very intensive period that continues over many months, and the fact that the end is not visible, makes it even more challenging. Although the economy is slowly opening up, the struggle has not really ended, and the end is very far.

The staff members draw strength from each other and from understanding the magnitude of what it is that stands before them, the importance of the mission.

We also draw strength from the inner cohesion of the intensive care team. This is a significant coping resource. Losing patients is painful, but we draw strength from those we manage to save, and there are many of them. As a doctor in intensive care you need to balance things out, to choose what you take home with you at the end of the day, and patients who recover and come back to visit later, give us strength.

Covid-19 is a serious disease, and recovery from it is very complex. These are very slow and long processes. There are many patients who have seemingly
recovered from the life-threatening stage, but they are left with many side effects, such as oxygen dependence and a host of other manifestations such as confusion, pain, and general weakness.

Overall, as a result of the pandemic, I don’t think that medical procedures will change, but some things will happen. I believe the volume of telemedicine will occupy a much larger share. Telemedicine can shorten appointments, as treatment in outpatient clinics can be done that way. We now have the ability to give treatments without the patient going out of the house or ward.

Another thing is our ability to deal with accepting situations beyond our control. I think that life in general and medicine in particular present many situations that are out of our control. Doctors are not omnipotent, and I think the coronavirus emphasizes that. It asks us to take an in-depth look at our ability to live in peace with situations that are beyond our control. Perhaps that will reshape the way we confront the medical world.

Our life during the corona period has been a trajectory of ups and downs and various trends. We have gone through closures, a period of enthusiasm about the vaccine, and now many believe that everything is behind us and that life is getting back on track. It is very gratifying. But when I look at my wards, we are still very busy. We see patients of all ages, from 20 to 80 and both departments are full. The reason is that we have a large number of patients from a population that has not been vaccinated.

Working in the Corona Department poses very difficult physical and emotional challenges for the whole team. The emotional loads are very deep for several reasons. We are faced with a disease for which we have very few tools. It is a disease that deceives us. It is very destructive, and patients can deteriorate rapidly. A serious illness and a toolbox that is not efficient enough is a frustrating combination. Added to that is the fact that some people still say it is the flu, which is something I cannot understand. The coronavirus is a disease that causes rapidly deteriorating severe pneumonia, ending in many cases with irreversible lung destruction - respiratory failure and death. The rapidity and the high rate of mortality when respiratory failure is presented has not been familiar to us.

One way to deal with the situation is to have a change of scene from time to time. You have to go up to a regular ward for a period of time to refresh yourself. Even I, who have 30 years of experience as a doctor and have gone through many difficult times and dramatic events, I must say that this is the challenging time in my life. Not so much professionally but more emotionally and

DR. CARMI BARTAL
Head of the Corona Departments
Director of the Internal Medicine Department.

We have weekly group meetings with various experts from our center and outside to help the staff deal with the difficulty, and it works very well. The team is solid in regard to personal and emotional resilience. The political system must find a way to strengthen the internal departments in the country. Fortunately for Israel, the teams that make up the health system are our X factor. That is what gives us the strength to work under conditions and provide quality medicine at a high level. The question is how long we will be able to keep it up.
IF ONLY IT WERE ALLOWED,
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Benign enlargement of the prostate often causes urinary symptoms and significant impairment of quality of life. The problem is quite common, especially in middle-aged and older men. It can reach up to 50% at age 50; 60% at age 60; and 70% at age 70 and up. In some cases, despite a significant increase in prostate volume, the patient does not feel the symptoms and does not require treatment.

**WHAT ARE THE SYMPTOMS?**
Common symptoms include difficulty starting urination, a feeling of a lack of emptying, frequent urination, especially at night, straining to urinate or weak urine stream, urinary retention that may require catheter insertion, and impotence as a side effect of the medications that can treat the problem.

The recommended treatment depends on the severity of the symptoms. There is a wide selection of treatments, ranging from medication to surgery. Without proper treatment, benign prostate enlargement can lead to dangerous complications.

**WHAT IS PAE?**
“Embolization of the prostate arteries is an innovative and minimally invasive treatment for the problem,” explains Dr. Itzhakov.

The purpose of the procedure is to block the blood flow to the prostate. Without blood flow, the prostate degenerates and shrinks.

Dr. Itzhakov is a pioneer in prostate artery embolization and is the most experienced professional in the country.
The treatment is approved by the English National Institute for Health & Care, Excellence, and in the US by the FDA.

“The procedure takes about two hours,” continues Dr. Itzhakov. “During PAE, local anaesthetic and mild sedation medication is given, a catheter is inserted into an artery while using image guidance. The catheter is directed to the arteries on both sides of the enlarged prostate gland. Then small beads are injected to block the blood flow to the prostate, which results in the gland’s shrinkage. Unlike surgery, PAE avoids access through the urethra, anesthesia, and hospitalization.

CURRENT EVIDENCE

According to a position statement from interventional radiology professional societies in the US and Europe, PAE is a safe, effective, and minimally invasive treatment for enlarged prostate and should be presented as a treatment option for appropriately selected patients. The Societies recommend PAE as a valuable minimally invasive option for patients who cannot tolerate or who have failed medical therapy, as well as those who are poor surgical candidates or refuse invasive surgery.

Recent studies, revealed that the new treatment has shorter recovery and fewer complications than traditional surgery and improves symptoms and quality of life to a greater degree than medical therapy. Furthermore, the position statement says that PAE is “a definitive treatment option for multiple under-served patient groups who may not have satisfactory urologic treatment options.” These patient groups include older patients with multiple medical conditions; patients with very large prostates; patients with bleeding from the prostate; patients with long-term bladder catheters; patients who cannot stop anti-coagulation therapies; and patients who desire to preserve sexual function. “These patients are often poor candidates for surgery but can be excellent candidates for PAE,” the societies say in the statement.

“Most patients feel no pain during the procedure. During the first days after the procedure, patients may experience a few minor symptoms such as mild pelvic pain, frequent urination and burning sensation in the urethra and anus, that can be easily relieved with pain killers,” says Dr. Itzhakov.

Recent studies show that patients who underwent embolization of the prostate arteries did not experience impairment in their sexual function. Such damage usually occurs after surgery.

SAFETY AND EFFICACY

PAE is safe and effective for treating enlarged prostate. Following embolization, the volume of the prostate decreases which results in significant improvement of the urinary symptoms.

For more information, visit www.endorad.com.
Dr. Daniela Katz is a specialist in internal medicine and a medical oncologist. She trained at Hadassah Ein Kerem and completed a two-year fellowship at MD Anderson in Houston. Dr. Katz specializes in the translation of genetic testing to personalized therapies in breast cancer and sarcoma. Until recently, she was the head of breast and sarcoma services at the Assaf Harofeh Medical Center. She is a leading sarcoma specialist. Katz is an active member of the EORTC sarcoma group and serves as a reviewer of several journals, such as Annals of Oncology.

Why did you choose to work in the field of cancer?
What attracted me was the ongoing relationship with the patient. When you are a doctor in the field of internal medicine, you are used to taking care of all the patient’s problems. That is, you are the patient’s doctor, and you accompany the patient all the way. In the field of internal medicine, you can specialize in a wide range of fields. But this way, you are actually treating a narrow part in a very specific area and are seeing the patient only through that prism. In oncology, you remain the patient’s doctor and you are in constant contact with the patient, which is what I wanted. That is why I chose oncology. But because the field is very broad and has a lot of subspecialties, I chose breast cancer and sarcoma.

What happens when you break bad news to cancer patients?
From my experience over the years, I have realized that what patients and families lack is close professional guidance. We know that when patients receive the news of a cancer diagnosis, their world is turned upside down. They enter a new world with a new vocabulary. When the doctor gives the patient the news for the first time, in most cases the patient is not really able to hear and absorb what is being said. The stress is too great.

I once heard a lecture by Dan Ariely, who said that when patients are in a state of stress, they lose up to 15 IQ points. The stress and the anxiety interfere with their ability to understand and remember what was said. Many times patients say to me ‘Why didn’t they tell me?’ But they probably did say it; the patient just couldn’t remember. That is why I always recommend writing down every word the doctor says.

What is the benefit from taking a second opinion?
After receiving the bitter news, I think it is very important for patients to get a second opinion. Not because they don’t trust the doctor – we have great doctors in Israel and excellent medicine. But another opinion can help the patient understand things in depth and accurately. After, the news sink, more questions arise that can be referred to another doctor. In many cases, simply to know that what was recommended is correct and up to date. In the field of oncology there are constant developments and studies and new methods. Sometimes it is important for patients just to hear that they are in good hands and are being treated well. Sometimes when they hear more data, they can brainstorm with the doctor about more treatment options and find out if the information they received is complete and how they can get through everything more easily.

Many people will wonder, what is the thing you like most in your job, if such a thing exists?
Not everything is gloomy in my field. I most enjoy informing patients good news. If after a few weeks of treatment, we meet and the results of the CT scan show that the treatment is working and the tumor has shrunk, that is excellent news to break. And there’s nothing more rewarding than giving a patient good news.

And when the news is less good?
The most important thing is to keep hope alive. We must not take hope from the patient. Even when negative news is are delivered, we must deliver it and, at the same time, open a door to the world of hope - meaning that there is something to be done and suggest the next practical steps. When a person is told that there is nothing to do, it is worthwhile getting another opinion. It is possible there are other options. Sometimes, genetic information can help with unique treatments tailored to the patient or abstracts presented at recent medical meetings. As doctors, we have to be empathic but at the same time be paternalists and outline a map with practical steps. I believe this is when we have to look for things out of the box.

What is your experience with patients seeking for second opinion?
When I am asked for a second opinion, I always request to be given all the material in advance so that I can go through it and sort out the essential information. It is important for me to make sure I don’t miss anything. When the patient arrives, I can devote all my time to discussion. From my experience, patients are very comfortable with this concept feeling that they really made good use of the consultation time. Many times they leave relieved as they better understand their disease and treatment options.
My role as a Medical Oncologist is to reassure patients that nothing is overlooked and they are getting the best therapy that will make them better.

Dr. Katz receives patients in Jerusalem and Tel Aviv. All HMOs except Maccabi reimburse the services provided by Dr. Katz. To schedule an appointment, call 050-404-8867 or email dkatzd1370@gmail.com. For more information, visit the website https://www.dkatzmd.com/katavot.
Oded Gazit is the owner of Amos Gazit Ltd., a company that imports, sells, and distributes medical and personal protective equipment.

This is what he has to say about masks in general and Livinguard masks in particular:

Masks are here to stay. Whether we are on the street or in a crowded place, we don’t know who has been vaccinated and who has not. In addition, we don’t know whether those who have been vaccinated can infect others, and moreover – Covid-19 isn’t the only disease out there. As long as there are people who have not been vaccinated, we will have to protect ourselves. We don’t want to be infected or infect others, especially children, so masks will be with us for quite some time.

There is also the issue of traveling abroad. There are countries where the situation is more difficult, and the dangers are extreme, not to mention the flight itself. It is therefore important that we always have at least one reliable mask in our pockets.

When we buy a mask in a store, it is difficult to know which type is safe and which is not. Most of the masks we use are not hermetically tight from the sides and bottom, thus we are breathing unfiltered air, prone to infection.

Professional terminology makes a distinction between a mask that protects us from infecting others and a respirator that protects us, those who wear. Both are called masks, but we want the one that will both protect us from the surroundings and protect others from us.

This winter, we understood how well masks help prevent infection. We saw the proof in the dramatic drop in flu morbidity. We wore masks, and the number of flu victims decreased significantly. There were hardly any cases. It is important to remember that the flu is an unsympathetic disease that can be severe. We have found that wearing a mask helps to prevent infection in virtually any disease.

If the price of being healthy is to walk around wearing a mask, especially in crowded places where the risk of being infected is higher, it is not a bad solution at all. It is very important in crowded places such as airports, sporting events, and mass cultural events. Perhaps getting used to wearing a mask is not such a bad idea.

We need a reliable, high-quality mask. It is important to choose one that has been scientifically proven to destroy bacteria and viruses. Livinguard, the masks our company imports to Israel, are being sold all over the world. The mask was developed in Switzerland and has an ingenious solution. It protects the wearer without the use of toxic metals or toxic substances.

The mask’s unique technology destroys the virus and almost every bacteria, virus or fungi. The mask is made up of three layers. The inner layer and outer layer are made of high-quality cotton that is soft to touch and treated with the anti-viral properties. In the middle, there is a filter that filters up to 99.9% of viruses and bacteria, alongside other particles. The fabric from which the mask is made is treated with substances that cause viruses (whose ions in their shell are negative) to be “magnetized” to the mask and become neutralized upon its surface.

The mask can then be washed with warm water, but not in a washing machine. The mask maintains its filtration and antiviral qualities for up to 7 months and up to 30 rinses with water.

Livinguard comes in two sizes: large (adults) and medium (women and children). Unlike other masks, it is completely opaque at the top, so eyeglasses don’t get fogged up.

Researchers from the Free University of Berlin at the Institute for Animal Hygiene and Environmental Health have now been able to demonstrate that textiles treated with Livinguard Technology can destroy 99.9% of SARS-CoV-2 (the virus that causes COVID-19). These scientific results follow on similar findings from the University of Arizona, Tucson.

Livinguard masks are available on the company’s website, as well as at Shufersal Be stores.

www.gazit.co.il * 5787
The ARC (accelerate, redesign, collaborate) Innovation Center at the Sheba Medical Center in Ramat Gan accentuates a unique strategy. It accelerates innovation and redesigns health care by collaborating with partners.

“Our mission is to transform health care delivery and improve patient care through innovation,” says Professor Eyal Zimlichman, deputy director general, chief medical officer, and chief innovation officer at ARC Sheba Medical Center.

Professor Zimlichman is an internal medicine physician, healthcare executive, and researcher who focuses on assessing and improving health care quality and value, patient engagement, and patient safety. As chief innovation officer at Sheba, Zimlichman leads the enterprising ARC center.

“About five years ago, we started looking for ways to channel innovation for the improvement of medical services on a global scale. There are many gaps between what modern medicine can offer patients and what actually reaches the patients. We wanted to find ways of bridging these gaps in a proactive way,” Zimlichman explains.

“Very often, we wait for a start-up company to reach us with ideas, but we are being proactive – we want to turn the vision into reality by looking for solutions to problems. We have invested a lot of effort, together with our international partners, to create the medical vision for 2030. This is a very ambitious goal. In order to reach it, we developed ARC – Accelerates innovation T

By Neria Barr

Professor Eyal Zimlichman
and Redesigns health care by Collaborating with partners – which will help us get there," he asserts. The concept is based on four principles, he elaborates. “The first principle is focusing on the transformation to digital medicine. We look for innovation in other fields, such as pharma and medical equipment, but the focus is on digital medicine. The second principle is open innovation, meaning that we work with the industry, not against it. Our third principle is creating a global ecosystem – partnering with international organizations that have similar visions and goals, with a focus on innovation. We were very busy in the last years looking for the right partners. The fourth principle is the infrastructure. Innovation needs infrastructure – both physical and in terms of data – as well as creating a legal and financial base. After all, innovation and development need funds," he says.

“In recent years, we’ve managed to enlist many international partners who connected with our vision. Today, we work with more than 100 partners who are now part of ARC, such as leading hospitals and medical centers in North America and around the world, through partners in the industry, as well as more than 70 start-up companies," he adds.

**INNOVATION HUBS**

Within digital medicine, says Zimlichman, ARC focuses on specific hubs. ARC has established five innovation hubs to foster the development of unique digital health capabilities across the spectrum of care. Each is headed by a clinical champion: big data and artificial intelligence (AI); precision medicine (aka personalized medicine); telemedicine; virtualization in medicine; and innovations in surgery and rehabilitation.

Telemedicine received a lot of attention recently, when many hospitals started using it to treat corona patients. "We recognized the importance of telemedicine five years ago. So when the COVID-19 pandemic broke out, we were ready to launch. The fact that we started a few years ago prepared us for the pandemic. Sheba was ready when the pandemic hit us, and were able to administer treatment using telemedicine," says Prof. Zimlichman.

"Personalized medicine, virtual reality, and augmented reality may take center stage beyond just training, rehabilitation, and physiotherapy. We talk about using these techniques for the treatment of pain, anxiety, and depression. These techniques are part of the digital medicine that ARC is involved in developing."

**THE FUTURE OF SURGERY**

Two other hubs include the future of surgery and rehabilitation. Both are from the focal point of digital medicine. "Digital medicine will completely transform the future of surgery and rehabilitation," says Zimlichman.

"There are more than 50 people working in ARC, all of whom focus on innovation. They facilitate the work. Later, the people who will implement the new technologies will be the doctors and nurses. They are the ones who also come up with the ideas. They tell us what they need," he says.

One of the concepts that Prof. Zimlichman is leading currently is the control tower. "Hospitals are very intricate organizations. There are many characteristics that a hospital and an airport have in common; but while an airport is run in a very meticulous and effective way, hospitals are not. We want to build a control tower of sorts for hospitals that will become the new standard of running a medical center," he says. The underlying idea is that while in an airport the commuters and staff have a systemized path they move through, in a hospital things are not as well organized.

Another project focuses on the future of the surgical arena. "We believe that in 10 years’ time, most surgeries will be done by robots. Much like the automatic pilot that flies airplanes. Just as pilots still sit in the cockpit for emergencies, so will robots perform most parts of the surgery. This will improve the quality of medicine that we will be able to offer patients in the future," he states.

Prof. Zimlichman stresses that robotics will help reach more patients and administer better medicine to remote parts of the world. "The surgeon can be in Shiba, while the patient may be in Safed. This project will make access easier for patients living in remote areas," he explains.

Another ambitious ARC project is being developed in Chicago. "We have just signed an agreement to build a new ARC center in Chicago," says Prof. Zimlichman. "The project is creating a lot of enthusiasm. There, the focus will be on healthy living. The idea is to implement new technologies and digital medicine in areas such as healthy lifestyle and improve conditions in lower-income neighborhoods."
Daniel Koulikov and Alexander Charny are founders of MedAssist, a streamlined organization that helps people access medical services quickly and efficiently.

Mr. Koulikov spoke to us and explained first why he and his partner decided to establish MedAssist’s unique medical service and its smooth operation:

Mr. Koulikov: “Technologically, Israel is at the forefront of world medicine. However, it suffers from a few problems, and it was the period of the Covid-19 pandemic that revealed several difficulties that exist between medical services and the people who require it.

There are three main problems that make it difficult for patients to access medical services: (1) The complex administration – i.e, the bureaucracy; (2) the long waiting time for medical procedures; (3) the lack of communication among the various establishments, such as insurance companies, organizations that administer treatments, clinics, testing institutes.

When an institute doesn’t talk to a clinic, or a hospital doesn’t communicate with an insurance company, the patient has to run between them, and there is no single uniform platform that enables information to be transferred efficiently and securely.

People with private health insurance need to fill forms. But the information is not easy to gather, especially when there are a few medical establishments involved. If the patient cannot for some reason take care of transferring the medical files in the correct way, this may cause delays and other difficulties. The problem is even more complicated when the patient is not an Israeli citizen or is a new immigrant who doesn’t speak Hebrew.

Five years ago, after we had worked in the private medical field and had set up medical departments in Israel and abroad, we decided to create something new - a platform that would enable anyone to have access to Israeli medical services quickly and efficiently: MedAssist.

We have built something that consists of technological tools, as well as a human approach and appropriate manpower. Anyone who requires any type of treatment simply has to contact MedAssist, and we will take the matter into our own hands. We accompany patients all the way, regardless of which company they are insured with or if they pay for the treatment out of pocket. We work with insurance companies from Israel and abroad. And we can usually solve any medical problem, be it a test or treatment, within 72 hours.

Here is an example. A man who had been in Israel for several months for work had a car accident. He called his insurance company abroad and was told that he had to take care of being flown home on his own. But the patient was hospitalized and was not mobile. He contacted us, and we took care of everything. We took care of the financing from the insurance company, filled out all the paperwork in English, and translated the medical documents. We also helped his family members, which included coordinating their arrival from abroad and meeting them at the airport.

Another case involved a 35-year-old Israeli career woman who discovered a lump in her breast. She was under a lot of stress and tried...
PERSPECTIVES

He requires a quote in English to send to the insurance company, but they can't give it to him. The bureaucratic process can take weeks. So the patient contacted us, and we took care of everything.

We don't leave an issue until we receive a commitment from the insurance company. If necessary, we make the interim payment for the patients, accompany them to treatments, and inform them at every stage. Sometimes it is simply a matter of knowing where to transfer the disk with the results or filling out the form correctly. As far as we're concerned, the patients are having enough difficulty as is, so they shouldn't have to do any of the leg work. They just have to call us, and we will arrange everything for them, usually within 72 hours.

Some time after we opened MedAssist, we realized that there were some issues for which we hadn't found solutions. For example, certain tests have very long waiting times. That is why we opened our own medical centers, in which we have specialists and experts in many medical fields, such as neurological clinic, a specialist clinic, and an ultrasound clinic, and more. Our specialists include doctors from a variety of fields, from pediatrics to breast health.

We treat 600 to 700 patients a month. Some of them are people who just don't have the time to sit on the phone to make an appointment. People work long hours, and long lines at clinics don't fit into their schedules. So people contact us if they need an appointment for a test or to collect test results. These are just some of the many problems we take care of. Our hotline operates 24 hours a day, seven days a week.

Sometimes, if we have to pay the treatment organization before the insurance company has made the payment, we pay and then collect from the insurance. If the patient pays out of pocket, we have a payment plan. First we take care of the patient's medical needs, then we deal with the payment.

The Covid-19 pandemic really exposed and highlighted the problems that the Israeli public health system suffers from. At the beginning of the pandemic, many people were wary of going to clinics or laboratories. Because we want to solve our patients' problems, we found a way to make medical care accessible to patients. We were able to reach patients with tests, and even with tests such as ultrasound. In general, alongside all the sorrow and suffering and pain, the pandemic taught us a lot. We have greatly improved in everything related to logistics and reaching patients. We have learned to be more effective and efficient. During the pandemic our service became very popular, and we doubled our number of employees.

When talking about medical situations, and in regard to Israeli and foreign insurance companies, as well as medical institutions, patients may lose precious time contacting and receiving service. We know how to contact the companies, obtain the information, and explain to the patients what their conditions are, what they have to pay, what the insurance company will pay, etc.

We have created a mechanism that works effectively and connects systems that fail to communicate with each other. The management of our company consists of experts in the field of private medicine. The expertise of each of us has enabled us to develop new mechanisms and learn from what exists in hospitals around the world. We learned things and were able to integrate them here. We are very proud of what we have created. We were able to develop methods that enable people to go through the entire process without having to log in to an app or search online. All they have to do is contact us by phone, WhatsApp or fax. We provide service in Hebrew, English, French and Russian.

We are on the constant alert for tourists, travel companies, and international insurance companies. We have become a veritable one-stop shop. From tourism companies to insurance companies around the world, many of them contact us and ask us to solve problems.

People can apply to MedAssist directly or through their insurance company. We are also very active online, but I must admit that most patients come to us through the recommendations they have received from our clients.
We can’t discuss innovation in medical care without mentioning AI. Machine intelligence is increasingly becoming a tool to assist doctors in the analysis of medical imaging. The idea here is twofold: To reduce radiologist workload by taking the more monotonous tasks off their hands, thus boosting efficiency and enabling physicians to detect incidental findings and assist with the actual analysis of medical imaging scans. Leveraging advanced algorithms to offer human doctors incredibly thorough and beneficial patient care.

As of today, AI medical imaging analysis when implemented in population health can support chronic disease management and early detection of heart disease and osteoporosis. When looking at the largest expenses in global healthcare, 90% of the US $3.5 trillion healthcare spend is for chronic conditions according to the CDC.
During a global pandemic, when routine checkups aren’t performed regularly and healthcare systems are deeply burdened and backlogged, AI can assist by “mining” information in rich medical images to identify patients with undiagnosed/underdiagnosed conditions without the need for additional tests.

Such AI-based population health screening tools “can detect disease, alert it immediately and help promote better patient care and lower costs as diagnosed patients are referred for preventative care treatment.

One of the most interesting and common cases of population health is Osteoporosis early detection and prevention, an area which Zebra-Med has made huge progress—from securing CE and FDA regulatory clearances, to running joint programs with Oxford University, NHS in Scotland, and even publishing its first research on Nature magazine. In the case of bone health, a fully-automated identification of vertebral compression fractures enables physicians to more swiftly detect potential osteoporosis fractures. As such, it’s easier to diagnose osteoporosis in patients, meaning a greater number of patients with the condition are actually treated for it early on. Treatment for osteoporosis is crucial, as it can prevent morbidity and mortality associated with hip fractures. When it comes to treatment for such conditions, the earlier, the better.

On the cardiovascular crucial front, 1 in 3 American adults dies from a cardiovascular event. The detection and analysis of coronary artery calcium on chest CT scans allows for the stratification of patients at risk for a cardiovascular event in the next 5 years. AI technology is able to highlight those at risk early on and direct them to preventative behavior and pharmaceutical intervention. The preemptive strike against any kind of cardiovascular event starkly lowers these patients’ risk for coming face to face with one.

AI’s potential in medical imaging and population health management will be one of the fastest moving medical developments as we continue into 2021 and beyond, as it has far-reaching implications for both physicians and patients, more so than any Triage solution ever introduced in the medical imaging AI industry. Beyond the chronicled benefits that quite literally improve the lives of patients, AI analysis in medical imaging is only the beginning. Machine learning algorithms will eventually transform medicine altogether, and Zebra Medical Vision is happy to be leading the charge.
PERSONALIZED CANCER TREATMENTS
NO LONGER A DREAM
WITH NEW MEDICAL TECH

ADVA X3 IS A DEVICE THAT CAN CREATE LIFE-SAVING DRUGS AUTOMATICALLY AND CUSTOMIZED FOR EACH INDIVIDUAL PATIENT

BY TALIA LEVIN

In the past, when biologists and other scientists were asked what their greatest dream was, almost all of them would reply that, without a doubt, their greatest ambition was to find a cure for cancer. Now, at a time that many researchers are currently working diligently on COVID-19 issues, it might surprise some people to know that there already is a cure – or at least a partial cure – for some types of cancer.

CAR-T (aka Chimeric Antigen Receptor) cells are T cells that have been genetically engineered to produce an artificial T-cell receptor for use in immunotherapy. This breakthrough came three years ago, following more than 20 years of research.

Here is how it works. White blood cells harvested from a person are activated, expanded and genetically engineered. Afterward, these resulting CAR-T cells are re-infused into the patient so they can attack and destroy tumors. This method for curing cancer is already being used to combat certain types of leukemia, has received FDA approval and has been added to Israel’s healthcare basket. In addition, hundreds of clinical trials are currently being carried out for other cancers and autoimmune diseases.

This is undoubtedly the beginning of a revolution. For the time being, however, these treatments will be available only to a tiny group of terminally ill cancer patients for whom no other treatment has been beneficial.

Fewer than 2,000 patients have been treated using this innovative method over the last three years. The reason is a combination of cost, logistics, lack of technology and conservative outlook.

“To date, this drug has only been manufactured manually in large clean rooms in the US or Europe, and not in hospitals,” explains biologist Dr. Ohad Karnieli, the founder and CEO of ADVA Biotechnology, which developed the ADVA X3, a device that can create these same life-saving drugs automatically and customized for each individual. The ADVA X3 can do this efficiently, while also dramatically reducing manufacturing costs, which would make these treatments accessible to a much larger number of patients. As it stands today, even if a patient is entitled to this drug, he or she most likely will not receive it, since the process for producing it is complex and can take months. With ADVA X3, the drug can be produced on-site in a few weeks. Why has such a small amount of the drug been produced over the last three years?

“First of all, the treatment costs $500,000 per patient. As a result, even though theoretically we have a practical solution for patients with leukemia and autoimmune diseases, there’s almost no chance that they will actually receive the drug unless the patient is extremely wealthy and also very lucky. But it’s not just a matter of money. Granted, Israel’s healthcare basket allocated tens of millions of shekels for this drug last year, but this amount can only help a few dozen patients due to the complicated logistical issues.”

Five years ago, Dr. Karnieli, who has a PhD in genetic engineering and stem cells, recognized that the CAR-T cell cure was an effective treatment. But in order to make the treatment accessible to as many patients as possible, he understood that a technological revolution must be initiated.

“On the one hand, my field is stem cell research, but I also have a technological background. It was crystal-clear to me that this was the winning combination.”

Dr. Karnieli’s solution is a printer-like machine that replaces the biological process of cell engineering, which up until now could only take place in a lab. You add the patient’s blood to one side, and the contents that enable the cells to be genetically engineered to the other. The process takes seven to 10 days, at the end of which you have ready-made, customized engineered blood that can be re-infused into the patient. This device provides a customized, high-quality solution at a much lower cost than has been available up until now and with much greater accessibility.

“On the one hand, my field is stem cell research, but I also have a technological background. It was crystal-clear to me that this was the winning combination.”

According to Noam Bercovich, VP of development of ADVA Biotechnology, “The biggest advantage of the ADVA X3 is that it considerably lowers manufacturing costs, since you no longer have to send the blood overseas with a large team of biologists trained in this field so that they can engineer the blood and then bring it back. With the ADVA X3, you have a machine that sits on top of your table and any technician working in a hospital can operate it.”

ADVA Biotechnology was created four years ago when Karnieli and his partners realized that the methodology that pharmaceutical companies were currently following was illogical and could not be adapted to modern personalized medicine.

“Imagine if we could put a few
of these machines in every hospital,” continues Karnieli. “They could then be used to produce a specific customized drug for each cancer patient. This would be tantamount to a revolution, not only by making this treatment accessible to every single patient, but by changing the model according to which the industry functions.”

**How would you characterize the pharmaceutical industry as it stands today?**

“Pharma companies carry out their manufacturing in large factories and charge thousands of dollars for each dose of this treatment. Once this drug can be manufactured in hospitals or at small local labs owned by pharmaceutical companies, this will make production and transport much more accessible than it is today.”

Some of the challenges experienced thus far are no longer obstacles. The technology that will replace the manual method used in labs up until now already exists.

“The machine works and we have already completed quite a few runs, so this stage is now behind us,” says Karnieli. “Now, we need to overcome the next challenge: marketing and sales. Our model enables all of the market players to improve access to this life-saving medicine. Hospitals and medical centers will be capable of producing the drug on their own, which will make treating patients so much simpler.

“In addition, this also provides pharma companies with an excellent solution. One option is that they can produce and distribute just the API [Active Pharmaceutical Ingredient], the component that enables genetic manipulation, and then the production can be carried out in hospitals. A second possibility is that pharma companies will build a number of centers in certain countries, which would still be simpler than how the drug is manufactured today in large clean rooms and then distributed worldwide. In this model, there'd be a decentralized distribution network that produces customized drugs in closer proximity to patients.”

**Is there a demand in hospitals for this service?**

“Yes. A number of hospitals around the world are already using our device. At Sheba, for example, they’ve been using our device for a few years already. They are using the regular manual method, in the hope that soon they too will be able to use our machine to increase the hospital’s ability to treat more patients. In practice today, many hospitals are producing a small amount of medicine since the large companies are failing to meet demand.

“Think about it this way: Pharma companies have invested millions of dollars to build factories that produce this drug, but in actuality they’ve only managed to produce less than 2,000 doses over the last three years. They are far from meeting demand. Even if people have the money to pay for the treatment, it’s not always manufactured in time. This was the impetus behind our development of the ADV A X3, which makes this life-saving drug so much more accessible.”

**How realistic is your model?**

“In our opinion, it’s extremely realistic, since our machine will work well in the scenario in which production will take place inside hospitals, with the API being supplied by pharmaceutical companies, and also for the possibility that the pharma companies will carry out production in local centers [there will be one for all of Israel, for example]. Both of these scenarios will become much simpler.
when used in conjunction with our machines.

“The ADVA X3 will simplify production and ensure that immune cell therapy will be more cost effective and speedier,” explains Karnieli. “Instead of pharma companies having one massive factory with lots of employees who are carrying out the production of the drug manually, it will employ many of these devices, which will greatly speed up output. Imagine how much quicker it will be if we have a center here in Israel that could supply doses to all of our hospitals. This will solve the problem of long lead time and the complicated logistics of transporting materials overseas and then back to Israel.”

**What kind of savings are we talking about?**

“Production in hospitals will cost one-quarter of the current price. They won’t... take $300,000, but less. And we want to be able to produce much more than 2,000 doses over three years. Why should a cancer patient have to suffer through such a long battery of treatments and then still have to wait for his turn to perhaps receive a dose of this unique treatment when there’s a way to overcome this obstacle? And once patients learn about this treatment that can save their life, why would they be willing to suffer through extensive and difficult treatments when they know there’s very little chance of it being effective? Why not give patients the chance to receive the drug at an earlier stage in the disease? It’s not just an issue of money. Only pressure from the public will influence the regulator to approve production.”

**What type of personnel are needed for this type of production?**

“In hospitals, biologists are in charge of the production process. Doctors choose which patients are eligible for the treatment, and they instruct us regarding their goal so that we can understand how to engineer the cells exactly as needed for each individual patient.”

It’s pretty amazing to realize that in 2021 we have the capability not just to prolong cancer patients’ lives, but to heal them. Now the challenge for ADVA Biotechnology, which develops and manufactures its products here in Israel, is to convince the world that the next big thing is enabling everyone who needs their drug to have access to it.

“Two years ago, we were busy filling bottles and tubes. We lit our burners, began recruiting people to join our team, and then founded our company. Our clients around the world include pharmaceutical companies, hospitals and universities. We produced the treatment for them, proving that our machine is capable of producing the same exact drug in a much more efficient, cost-effective and simpler way. Over the next year, these institutions will receive one of our machines so they can begin experimenting with them. The next stage will hopefully be large-scale production.”

**What’s your vision?**

“To make these amazing life-saving treatments accessible to patients,” says Ofra Toledo, VP of business development for ADVA Biotechnology. “To offer everyone the opportunity to receive the best treatment that has been personalized just for them. It’s already happening. We are targeting both the Israeli and international markets. We have quite a few interested clients in Europe, the US and the Far East, and we are currently introducing our product into hospitals and medical centers here in Israel.”

**What has the response been like?**

“Absolutely fantastic! We’ve had such great feedback from medical professionals, industry leaders and investors, too. Our biggest challenge is penetrating such a conservative market. Biologics are so much more complex than chemical drugs. They are live cells that need to be re-engineered so that they can attack an extremely specific cancer. Most scientists are conservative and are extremely cautious when it comes to this type of technology, since they are used to working a certain way.

“We totally get that lab work is not industrial, but what we can accomplish with our device does not completely eliminate the need for lab work. We have a challenge before us. No hospital or company has told us our device is amazing, but that’s okay because it takes time for people to get used to using new methods. We are planning to carry out a number of pilot programs here in Israel, as well as overseas, so that our clients can experience the success of our platform first-hand. Then we will start manufacturing on a larger scale.”

*Translated by Hannah Hochner.*

_This article was written in cooperation with Adva._
A year into the pandemic, infection rates are falling. Hospitals are quieter; morgues are emptier. Emboldened by vaccines, we’re dropping our masks and stepping closer. Slowly we’re reopening indoor dining, theaters, museums and schools.

Will we declare victory over COVID-19?

No, say public health experts. But we’ll negotiate an uneasy truce. Rather than completely eliminating the virus, we can create a strict containment strategy, building public health bulwarks to help fend off an enemy that is wily, adaptive and enduring.

This means accepting a certain level of risk as society returns to normal, they add.

“Here’s what we can call ‘victory’: Learning how to live with this virus in a way that allows us to continue to enjoy life,” said Dr. John Swartzberg of UC Berkeley’s School of Public Health.

Over time — as vaccines improve, death tolls fall and we adopt new behaviors, like wearing masks when we’re sick — we’ll accommodate it, just as we do with other deadly infectious diseases, he said.

In the past year, there have been unimaginable strides against the virus. With accelerated plans for manufacturing vaccines, President Joe Biden now promises enough vaccine supply for every adult in America by the end of May. Some states, such as Texas, are already racing to fully reopen.

But there is increasing consensus that COVID-19 is here to stay, causing intermittent, limited outbreaks in countries with well-developed vaccination programs but causing significant ongoing disease in parts of the world where access to vaccines is more limited.

“Unless you’ve completely eradicated a disease, you’re always at risk for having an outbreak,” said Stanford infectious disease epidemiologist Dr. Yvonne Maldonado.

Why is eradication so hard? It’s because pathogens, once established, hardly ever go extinct.

The easiest diseases to control are those that are quickly diagnosable or recognizable, according to the American Society of Microbiology. But COVID-19 is hidden, spreading before people get sick. And up to 40% of cases are surreptitious, causing no symptoms. Additionally, a COVID-19 diagnosis requires testing by skilled medical professionals.

A disease can also be readily controlled if, like polio, it lives only in humans and has no animal “reservoir” where it persists. That’s not COVID-19, which is presumed to have originated in bats. With COVID-19, “it’s definitely not about getting to zero risk. Because that’s not feasible,” California’s surgeon general Dr. Nadine Burke Harris said this past week.

So what is an acceptable number of deaths?

It’s likely that we’ll accede to a disease that behaves like influenza, public health experts say. While deadly, especially for elders, the flu isn’t seen as a special threat that requires an exceptional societal response.

“We just seem to take it, on faith, that every year there’s going to be a flu epidemic,” said Maldonado.

Dr. Joshua Adler, vice dean for clinical affairs at UCSF, imagines a day “when the incidence of COVID declines to the level where we no longer need to have special processes. It becomes like another infectious disease that’s part of our general environment.”

“We will simply have a number of patients that may have COVID, just like we have a number of patients that have flu, or severe herpes infection, or what have you,” he said.

In the meantime, we should set intermediate goals, said UC San Francisco epidemiologist Dr. George Rutherford.

One goal is to prevent another surge of cases, so hospitals aren’t overwhelmed. Additionally, we need to offer better medications,
Dr. Fischer recently introduced a new line of Effective Care hand and body creams. They may well be an ideal gift for your host this holiday season.

The creams, enriched with hemp oil, contain cotton, avocado, coconut, and argan oils, as well as cocoa butter. The cream not only smell divine but are also truly effective. All the creams were tested in European labs and were proven to hydrate the skin for 72 hours.

The Effective Care line is made with triple-active formulas to provide optimal and intensive hydration, preventing dryness, which is common during the winter and spring.

Hemp oil, which is rich in omega 3 and omega 6 acids, has a rehabilitating effect on the skin due to the fact that its composition is similar to the oil-acids we have in our skin. The creams absorb quickly, leaving the skin moist and instantly relieved.

The Effective Care cream enriched with cocoa butter is made with a unique formula that is rich in omega 9 and omega 6, antioxidants, and vitamins.

In addition, Dr. Fischer’s U-Lactin line for very dry skin has introduced Forte hand cream, which can fill the bill for those in the midst of Passover cleaning. Targeting dry, rough skin, the U-Lactin line includes body butter that is very effective. It is enriched with a special formula that contains 0.5% lactic acid and 7% urea, which help balance moisture in the skin, as well vitamins and an oil complex. Daily application of U-Lactin creams relieves dryness and skin irritation.

so people who become infected rarely die. Currently, patients hospitalized with COVID-19 face nearly five times the risk of death than those with the flu, according to a major study published last December.

And when variants emerge, we must be poised to respond, Rutherford said.

Then, like influenza, “new strains will fade into the background and become part of the milieu, transmitted every year but at much, much lower levels,” he said.

Over time, the risk will recede, experts predict. That’s because the COVID-19 vaccines are better than flu vaccines, and can be promptly modified.

“I am confident that things will get quite a bit better than they are today. Does that mean that you can live completely risk-free? I don’t think so,” said Adler. “But it may be a low enough risk that most of us feel comfortable with it.”

Eventually, so-called community immunity, or “herd immunity,” will protect us.

At that point — when 70% to 90% of the population is protected through vaccination or prior illness — it is much harder for the virus to move through a population. The risk to people who cannot get vaccinated drops dramatically. That’s when it feels safer to go back to our cherished gatherings. Think big weddings. Football games. Music festivals.

Right now, that’s a challenging target. Why? Children account for about 22% of the population and they won’t be vaccinated until clinical trials are completed later this year. Reluctant adults could represent another shortfall.

According to U.S. Census data released in late January, about 14% of adults said they would “probably not” get vaccinated.

Yet even as we work toward more complete vaccination, we’ll slowly inch toward safety. Even partial herd immunity can save lives.

But managing our new relationship with COVID-19 will require constant monitoring, potential revaccination, treatment of isolated cases and rigorous contact tracing.

“It’s not over,” said Adler, “but it’s certainly heading in the right direction.”

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