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Editorial

Medication non-adherence is one of the worst epidemics of the 21st century.

Only one in ten patients buys medicines in a pharmacy. Every second in ten – buys the tablets, but does not open the medicine package. Every third in ten patients takes medicines irregularly, insufficiently, forgets about their use. If the patient is prescribed more than six medicines of different names, it is highly unlikely that he will use all prescribed medicines exactly.

The greatest medication non-adherence is in psychiatric patients. Multimorbid patients with type 2 diabetes, hypercholesterinemia and hypertension should be mentioned among those who do not use medication and, therefore, more than 150000 such patients die each year on the planet due to not using medicines, from complications of hypertension, most commonly – stroke. Non-adherence is even more apparent regarding doctor's advice on healthy lifestyle. Repeatedly we have to explain to our patient the mantra – eat less, move more, or – follow a diet, engage in physical activity. It is very difficult to make your adipose patient go to a physiotherapist and make them exercise or at least ride a bicycle. A patient-smoker is even more difficult. Specifically, the chronic obstructive pulmonary disease patient is not ready to drop smoking and start taking medication daily.

Medication inequality creates transverse pathways for doctors, reduces treatment results for patients, and yet medication non-adherence is nothing good or anything bad. Medication non-adherence

varies from full co-management to complete non-inferiority, but more frequently, it is in the middle. Once an extensive global study revealed that more than 90% of patients understood the concept “one tablet once a day”. On the other hand, 43% of patients in the doctor's office, under conditions of moderate personal stress and urgency, misunderstood or mixed “one tablet twice a day” and “two tablets once a day”. Research has shown that despite the doctor's efforts, patients leave the doctor's office having understood less than 50% of the information the doctor had told. Regardless of the patient's age, culture or education, confusion about drug use, price, effect, side effects cause serious concern and anxiety. Too often, the doctor does not address the issue of how long the patient should take the medication. If the disease is acute, the doctor determines exactly – six days. If the disease is chronic, the doctor prescribes the medication, but admits that the doses and medication will have to be changed. Often, the doctor prescribes the medicine knowing that the medicine will have to be administered to the patient for the rest of his life, though the average patient cannot even imagine it to be a fact up to the end of his days.

The issue of the global epidemic of medication non-adherence seems to be actualisable. Medication non-adherence is not an individual case, but a global phenomenon. The worst of all are activities carried out by the patient's relatives, such as parents who do not allow their children vaccination against infectious diseases.

*Dr. med. h. c. Peteris Apinis,
Editor-in-Chief of the World Medical Journal*

212th WMA Council Session, 25–27 April, 2019, Santiago

The 212th WMA Council meeting was held at the Hotel Santiago (Mandarin Oriental) from April 25–27. Around 150 delegates from 35 national medical associations attended.

THURSDAY, APRIL 25

The meeting began with the outgoing Chair of the Council, Dr. Ardis Hoven, in the chair for the last time, giving a brief orientation session for new delegates about the procedure for the meeting. Dr. Hoven was stepping down after serving as Chair of Council for the past four years.

Council

The Council session was formally opened by Dr. Otmar Kloiber, WMA Secretary General, with apologies and a welcome for delegates and new Council members.

Elections

The first item was the election of the chief officers.

Dr. Frank Ulrich Montgomery (Germany) was elected Chair of Council.

Dr. Mari Michinaga (Japan) was elected Vice Chair.

Dr. Ravindra Sitaram Wankhedkar (India) was elected Treasurer.

All the elections were unopposed.

President's Report

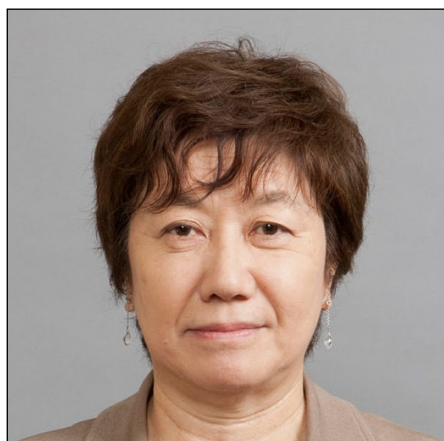
Dr. Leonid Eidelman, the President, reported on his activities over the previous six months. He referred to the global problem of increasing violence against physicians and his meeting in Taiwan on Universal Health Coverage (UHC). He talked about one of the main themes of his presidency, physician wellbeing and burnout among physicians. He had attended the 12th Geneva Conference on Person-Centered Medicine, Promoting Wellbeing and Overcoming Burnout, in March, where he talked about burnout being a global epidemic. It affected both quality of life and quality of health care.

'Physician burnout is one of the most acute challenges of contemporary medicine and endangers physicians as well as the quality

of healthcare. There is a need for studying preventive and treatment solutions'.

He had spoken at the Global Conference on Primary Health Care, in Astana, Kazakhstan in October 2018. The goal of the meeting was to renew a commitment to primary health care in order to achieve universal health coverage and the Sustainable Development Goals which were part of the UN's agenda for 2030. Strengthening of primary health care (PHC) was essential for Universal Health Coverage. The role of physicians was crucial in primary health care, from education to prevention, and in both acute and chronic care. High quality, evidence-based PHC provided by a trained team led by a physician was probably the best foundation of future medicine. However, during the Astana meeting, it was noticeable that many participants did not think the PHC model should have the physician at the helm of leadership. The conference focused on other health care providers, traditional ones such as nurses, pharmacists and social workers, and new professions, such as community health workers and healthcare assistants.

He had also travelled to conferences in Tokyo, Geneva and in Germany, where the National Association of Statutory Health Insurance Physicians in Germany organized an unveiling ceremony marking the withdrawal of the medical licenses of Jewish German doctors 80 years ago.



Mari Michinaga



Ravindra Sitaram Wankhedkar



Leonid Eidelman

Finally, Dr. Eidelman said he had spoken at a Universal Health Care International Conference, in Taipei, Taiwan and at the International Conclave on Zero Tolerance to Violence Against Doctors and Hospitals, in Mumbai, India.

‘Violence against doctors is a global problem. The speakers described causes of violence and ways to withstand it. I presented the statement of the WMA on violence against physicians and stressed that this kind of violence not only has destructive social effects but impairs the quality of healthcare that is provided to innocent patients as well. In addition, I emphasized the role of physician burnout in this intolerable phenomenon’.

Secretary General's Report

Dr. Otmar Kloiber also referred to violence in health care and said it was very clear that this was not an Indian phenomenon but a global phenomenon. ‘We have to do more to address this. It is not an isolated phenomenon but rather a general one’.

He reported on the situation in Turkey, where the Government was making life harder and harder for physicians. The Turkish board had been arrested for supporting terrorist activities. They had made a statement that ‘War is detrimental to public

health’, a statement based on WMA policy and one that every clear-thinking person would agree to. But that was enough to be arrested and sent to prison. They were out on bail and Dr. Kloiber urged national medical associations to talk to their governments to make them aware of what was happening in Turkey. What was happening was an attempt to crack down on self-government of physicians to make them a tool of the government.

Chair's Report

Dr. Ardis Hoven spoke of her incredible experience as Chair of Council.

‘I now possess a much deeper understanding of the role of medical ethics and the role the WMA plays in that field. Thanks to the secretariat’.

She added: ‘It has been a great honour to serve, lead and represent the WMA across the globe. Little did I know when I first came to the WMA, that I would meet so many wonderful and caring physicians who would give freely of their time and intellect to serve their fellow physicians and all patients throughout the world.’

‘I have learned from each and every one of you and have immense respect for your commitment to excellence in health care.

Challenges exist but I am convinced that the work of the WMA and all of its members will continue to make credible and progressive improvements on the platforms of change to which we are committed’.

Matters of Urgency

The South African Medical Association presented an emergency resolution on Medical Ethics in Sports Medicine and the case of the middle-distance runner Caster Semanya. The International Athletics Association Federation had brought in rules for women with differences in sexual development which SAMA believed were contrary to WMA policy. It was appropriate that the WMA developed statements but also engaged. It was imperative that physicians were reminded by the WMA of their ethical obligations. These rules would result in some moral crisis for doctors, as they required the administration of medicine when there was no pathology.

The Council agreed that the issue should be considered by the Medical Ethics Committee. The Chair of Council told the meeting that a press release had been issued by the WMA that morning.

Medical Ethics Committee

Dr. Andreas Rudkoebing (Denmark) was elected unopposed as Chair of the committee to succeed Dr. Heidi Stensmyren.

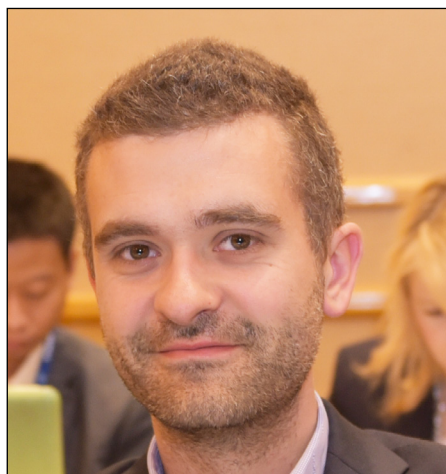
The General Secretary reported on new developments in the field of research ethics. He referred to CIOMS (The Council for International Organizations of Medical Sciences) work groups analyzing aspects of ethics in research, one on increased use of healthy volunteers in clinical research and one on research in vulnerable groups. Both issues were of relevance to the Declaration of Helsinki, and the WMA as a CIOMS member was cooperating in those work groups.



Otmar Kloiber



Ardis Hoven



Andreas Rudkoebing

Dr. Kloiber also noted that the potential use of artificial intelligence and big data to replace control groups by a virtual control collective, was an emerging issue. The WMA should examine whether this should be reflected in the principles of the Declaration of Helsinki. He highlighted the aspect of patient-centricity in clinical studies and said that that patient groups had a far bigger influence nowadays on how the research was being done.

Finally, he suggested that the committee further discuss aspects of end-of-life care apart from euthanasia and physician assisted suicide. The WMA regional discussions showed numerous problems associated with withholding or withdrawing treatment at the end of life and problems regarding respect for the will of the patient, especially when it came to ending curative treatment.

Genetics and Medicine

The Chair of the work group gave an oral report, saying that a year ago it was decided a work group should revise the WMA Statement on Genetics and Medicine. The key aim was to update the Statement regarding the increasing clinical use of genetic analyses, including large scale genome sequencing. Genetic testing was a large,

complicated and rapidly involving area. The group had decided to focus its paper around the key issue of how to facilitate the collection, storage and use of genetic information in the provision of health care.

The committee decided to circulate the work group's draft paper to constituent members for comment and agreed that Professor Reynir Arngrímsson from the Icelandic Medical Association should take over the chairmanship of the work group.

International Code of Medical Ethics

The committee received an oral report from the chair of the work group on the work done in the last months and the future work-plan. The next step was to develop a list of priority issues and possible new headlines. The work group would decide at a later stage during the revision process if the scope of the ICoME should be broadened and how detailed it should be. It proposed to organize regional expert conferences in 2020 as was done for the Declaration of Helsinki and the Declaration of Geneva revision process, and which increased the visibility of WMA policies. The work group was aiming for final approval of a revised Code from the Council in April 2022 and adoption by the General Assembly in October 2022.

Reproductive Technologies

It was reported that the chair of the work group was not able to attend this meeting, but would report back to the committee at the next meeting.

Document of Torture

The committee received an oral report from the rapporteur from the Danish Medical Association, regarding the progress of the 10-year revision of the WMA Resolution on the Responsibility of Physicians in the

Documentation and Denunciation of Acts of Torture and Ill-treatment.

The policy had been reaffirmed with minor edits and had been sent out for comments from NMAs and constituent members. But after receiving the comments, the rapporteur recommended a major revision. The committee recommended to Council that a work group be established with the mandate to work further on the revision of the Resolution.

Female Foeticide

A proposed revision of the WMA Statement on Female Foeticide was considered by the committee

Delegates agreed to one friendly amendment to the document, making it clear that sex selective abortion for reasons of gender preference was discriminatory where it was solely due to parental preference and where there were no health implications for the foetus or the woman.

The committee agreed to recommend to Council that the proposed revision, as amended, be approved and forwarded to the General Assembly for adoption.

Euthanasia and Physician Assisted Dying

The committee discussed the comments received on the WMA Statement on Euthanasia and Physician Assisted Dying. During the debate it heard from the spokesperson for the Physicians' Alliance against Euthanasia, representing 1,100 Canadian doctors, on why they were opposed to any change in position by the WMA on euthanasia. Other speakers said that it was important to define clearly the relevant terminology.

The committee decided that the policy required further work and recommended to

Council that the German Medical Association work further on the proposed Statement.

WMA Physician's Pledge

The proposed amended WMA Statement on Action to Stimulate use of the Physicians' Pledge of the Declaration of Geneva was tabled for discussion.

Several national medical associations said they had oaths with different wording. Some speakers disliked the mandatory nature of the proposed Statement.

The committee agreed to recommend to Council that the proposed Statement be circulated to constituent members for comments.

Solitary Confinement

The committee considered a proposed revision of the WMA Statement on Solitary Confinement setting out new advice to physicians. Delegates were advised of the need to review policy, and concern was raised about the mental and physical risks for children and young people from solitary confinement.

It was agreed to recommend to Council that the document be circulated for comments. The British Medical Association volunteered to be the rapporteur.

Physicians Treating Relatives and Friends

A proposed Statement on Physicians Treating Relatives and Friends was submitted by the South African Medical Association. This set out new ethical advice to physicians about the potential moral conflict between their roles as a family member and as a physician.

The committee agreed to recommend to Council that the Statement be circulated to constituent members for comments.

The South African Medical Association agreed to act as rapporteur.

Physician-Patient Relationship

The committee considered a proposed WMA Declaration on the Physician-Patient Relationship introduced by the Spanish Medical Association. This called for action for national medical associations to take to protect the long-standing physician-patient relationship which it warned was under threat. During the debate that followed, it was suggested that UNESCO should adopt the relationship as a world cultural heritage.

The committee agreed to recommend to Council that the document be circulated to constituent members for comments. The Spanish and Portuguese Medical Associations volunteered to be the joint rapporteurs.

Classification of 2009 Policies

The committee reviewed the recommendations received on revising policies which were 10 years old and it recommended that the WMA Statement on Embryonic Stem Cell Research undergo a major revision, led by the American Medical Association.

Human Rights

Ms Clarisse Delorme, WMA Advocacy Advisor, gave an oral report, highlighting the invitation by Mr Victor Madrigal-Borloz, the UN Special rapporteur on sexual orientation and gender identity, for the WMA to take part in a consultation to develop human rights guidelines on data collection about LGBT populations in the context of violence and discrimination based on sexual orientation and gender identity. The first meeting had taken place in February, when the WMA promoted

the Declaration of Taipei on data collection.

Resolution on Medical Ethics in Sports Medicine

The committee considered the proposed emergency resolution on Medical Ethics in Sports Medicine submitted by the South African Medical Association. The resolution urged the WMA to express strong reservations on the ethical validity of the 2018 International Association of Athletics Federations Eligibility Regulations for Female Classification to impose an upper hormonal limit for athletes wishing to compete in the female category in international athletics competitions.

The committee recommended that the Resolution be circulated to constituent members for comments. The South African Medical Association volunteered to be the rapporteur.

Finance and Planning Committee

Dr. Jung Yul Park (Korean Medical Association) was elected unopposed as Chair of the Committee.



Jung Yul Park

Membership Dues and Payments for 2019

Mr Adolf Hällmayr, the WMA's Financial Adviser, presented to the committee the Report on Membership Dues Payments for 2019 and Report on Dues Arrears.



Adolf Hällmayr

The committee recommended that Council approve the Reports.

Financial Statement

The committee then considered the Financial Statement for 2018. Mr Hällmayr provided an in-depth analysis of the contents of the document. He said the assets of the Association were very solid and there was no financial shortfall.

The committee recommended that the Statement be approved by Council.

WMA Strategic Plan

A draft WMA Strategic Plan for 2020-2025 was introduced. The Chair of Council reviewed the Plan, which he said would serve as the backbone document to guide the plans and activities of the WMA. He stressed that this was a living document and

that world events and other factors could affect where the WMA chose to focus its attention. He referred to various priorities, such as the Declarations of Helsinki and Geneva, and universal health coverage with access for every individual to a physician. After a brief debate, the committee agreed to recommend to Council that the Plan be approved and forwarded to the General Assembly for adoption.

WMA Statutory Meetings

The committee considered the planning and arrangements for future statutory meetings

It recommended that the theme entitled 'Transplantation and Donation/Organ Trafficking: International Scenarios' be approved by the Council for the Scientific Session of the 71st General Assembly, in Cordoba in 2020.

It also recommended several dates and venues for future meetings:

- the 218th Council Session to be held from 22-24 April 2021 in Seoul, South Korea;
- the 224th Council session to be held from 20-22 April 2023 in Baku, Azerbaijan pending clarification of eligibility of all WMA members to attend based on visa requirements;
- the 74th General Assembly to be held from 4-7 October 2023 in Rwanda;

WMA Special Meetings

The committee received an oral report from the Secretary General on two conferences – 'Physician 2030' in Tel Aviv, 13-14 May 2019 and 'H2O Conference' in Tokyo, 13-14 June 2019.

Constituent Membership

An application for constituent membership was received from Doctors 4 Doctors in the

Seychelles. The committee agreed to recommend that the application be approved by the Council and forwarded to the General Assembly for approval.

Associate Membership

The Chair of the Associate Members, Dr. Joe Heyman, gave an oral report on the group's activities. He said the group had 613 members from Japan and 505 from elsewhere, including junior doctors and medical students.



Joe Heyman

In his report he said that since the General Assembly meeting the group had reviewed the circulated documents and commented on all of them. Its Google group had grown to 230 members and from this group he had received more than 100 comments on the issue of physician assisted suicide from both sides of the issue. These had been distributed to the meeting.

The Secretary General congratulated the group on its impressive work.

Junior Doctors Network

The JDN Chair, Dr. Chukwuma Oraegbunam, gave an oral report on the Network's

activities, including improving the reach of the Network and increasing the participation of members in its activities. After a review of JDN work groups, some groups had been closed, while new ones were planned, including a one on global surgery.



Chukwuma Oraegbunam

Past Presidents and Chairs of Council Network

The Secretary General, on behalf of the Chair of the PPCN Network, Dr. Dana Hansen, who could not attend, gave an oral report. He said that several past Presidents and Chairs had helped in organising a number of recent conferences.

The committee received the report.

Review Committee

The committee received an oral report from the Review Committee's interim Chair. Delegates were told that past and present members of the committee believed that the function of the committee was very helpful to the organisation and were likely to recommend that it became incorporated as a more permanent body.

The committee received the report.

Procedure on WMA Council Resolutions

The Committee considered a proposed procedure for dealing with WMA Council Resolutions. With two editorial changes, the documents were agreed.

Policy Consistency

A proposed WMA Statement on Policy Formulation and Consistency among the World Medical Association and national medical associations was discussed. Dr. Kloiber explained that the content of the proposed statement was procedural, rather than policy-related. There were comments that the document was too prescriptive, which was agreed by Dr. Kloiber.

The committee recommended that the secretariat study how the document's recommendations could be implemented.

World Medical Journal

An oral report was given by the WMJ Editor Dr. Peteris Apinis, who said there had been four issues in 2018 and four issues were planned for 2019 as well.

The WMJ was mainly issued in digital form and was e-mailed to all national medical associations.

In his written report, Dr. Apinis said the Journal was embarking on a new project, to record key WMA leaders and global leaders from national medical associations in a digital film. The recorded film would then be preserved for the WMA historical record.

Public Relations

The committee received the Public Relations Report for October 2018 – March

2019. Delegates were told that the WMA had an increasing number of followers on Facebook and twitter and had issued around 30 *press releases* during the past year. This work should be, and was, complemented by the work done by Constituent Members.

FRIDAY, APRIL 26

Socio Media Affairs Committee

Dr. Osahon Enabulele (Nigerian Medical Association) was elected unopposed as Chair of the committee.



Osahon Enabulele

Secretary General's Report

Dr. Kloiber spoke about the conference being held in Tokyo in June (13-14) in conjunction with the Japan Medical Association on 'The Road to Universal Health Coverage'. This was a preconference to the G20 Summit 2019 in Japan and was preparatory to the High-Level United Nations meeting in New York in September. They had to work harder to make politicians understand that health was not an expenditure, it was an investment for their people

and for their nation. The WMA was keen to work with others to achieve the third of the Sustainable Development Goals.

Secondly, he spoke about the work the WMA was doing on the issue of a physician-led primary care. There was a growing trend to replace physicians by nurses and community health workers and the WMA would like to show examples of successful primary care models as counter arguments to the big donors. He said there were regions in the world where there were no physicians and there would not be physicians in future. So nurses would be needed to fill these gaps. But this should be first under supervision and regulated. He invited NMAs to send in examples to assist the WMA's case for physician-led primary care.

Health and Environment

An oral report on the Environment Caucus was given.

The committee was told that the WMA had been represented at the 1st WHO Global Conference on Air Pollution and Health on 30 Oct to 1 Nov 2018 in Geneva and would again be represented at the next COP meeting in Santiago on 2–13 Dec 2019.

The Associate Members section would consider and mark up two papers on chemical exposure in health care – the first on the use of ethylene oxide as a medical sterilant and the second on reducing the greenhouse gas footprint of anaesthetic gases.

WMA Network on Disaster Medicine

A progress report was given by the Japan Medical Association on the Network in the CMAAO region (Confederation of Medical Associations of Asia and Oceania). Together with several regional NMAs, the CMAAO with the Asian Medical Doctors

Association had concluded a Memorandum of Understanding on disaster medicine assistance. This was open and mutual assistance, a partnership that various different organisations could participate in and a local initiative where those who knew the locality well were best placed to provide medical assistance. The next task was to look into ways of collaborating with other regional and local groups and at the next CMAAO General Assembly, in Goa, India in September, medical associations from the regions would work further on the development of the Network.

Professional Autonomy of Physicians

The committee considered a proposed revision of the *WMA Declaration of Madrid on Professionally-led Regulation*, reaffirming the WMA's view that the medical profession must play a central role in regulating the conduct and professional activities of its members if public confidence was to be maintained in standards of care.

After a brief debate, minor amendments were agreed and the committee recommended that the document be approved by the Council and forwarded to the General Assembly for adoption.

In a subsequent debate on the wider issues, the committee was told by the British Medical Association that significant changes had occurred since the Declaration of Madrid was first adopted. This had been highlighted by the case in the UK of Dr. Hadiza Bawa-Garba, who was convicted of gross negligence manslaughter in 2015 and convicted of manslaughter over her involvement in the death from sepsis of a six-year-old boy. It was argued that professionally-led regulation could not be seen in isolation involving individual doctors. The system and pressures that doctors worked under should also be considered. There was now international recognition that where there was an investigation, the starting

point needed to be the environment. That should be part of the regulation process. There was also insufficient attention paid to the training of individuals involved in regulation work, including the problem of racial bias.

The Chair of Council, Dr. Montgomery, said these were important issues, and he invited the BMA to prepare a paper for further discussion.

Pseudoscience, Pseudotherapies, Intrusion and Sects in the Field of Health

The Spanish Medical Association presented a new draft of a proposed Declaration on Pseudoscience, Pseudotherapies, Intrusion and Sects in the Field of Health, which set out a series of measures to clamp down on pseudoscience and pseudotherapies. The chair of the work group reported that more than 95 amendments and suggestions had been made and most of these had been incorporated into the new draft.

The committee recommended to Council that the draft document be recirculated for comment.

Access to Healthcare

A proposed revision of the renamed Resolution on Access of Women and Children to Health Care was tabled. The document, which sets out to address years of gender inequality between men and woman in healthcare, was approved, and the committee recommended that it be sent to Council for forwarding to the General Assembly for adoption.

Antimicrobial Resistance

As part of the 10-years revision process, the Council in Riga in April 2018 agreed to a

major revision of the *WMA Statement on Antimicrobial Resistance*. The British Medical Association was appointed lead rapporteur for the revision and presented to the committee a draft revision.

The committee was told that this issue was a very worrying problem and a growing threat to public health in many countries. There were significant economic and human implications involved. This was a crucial time for advocacy. A lot of decisions and discussions were going on at the United Nations and approval for this revision would be very helpful.

After a brief debate, the committee agreed to add the statement that the education of a sufficient number of clinical infectious diseases specialists in every country was a fundamental requirement for tackling AMR and acquired infections.

The committee recommended that the document, as amended, should be sent to the Council for forwarding to the General Assembly for adoption.

Sodium Intake

Proposals to reduce excessive salt intake throughout the world were tabled in a revision to the WMA Statement on Reducing Dietary Sodium Intake. The South African Medical Association had acted as rapporteur on the document and spoke about the need for national and international action on educating consumers, as well as the labelling of processed food about salt intake and content. In a brief debate, the committee agreed to amend the document by deleting the word 'voluntary' in the statement that the WMA should 'support regulatory efforts involving voluntary or mandatory targets in food processing'.

The committee recommended that the document, as amended, should be sent to the

Council for forwarding to the General Assembly for adoption.

Violence and Health

As part of the 10-year revision process, the Council had agreed on a major revision of the *WMA Statement on Violence and Health*. The Nigerian Medical Association had agreed to act as rapporteur and tabled a revised Statement, warning about the increasing incidents of violent attacks against healthcare professionals and facilities.

During the debate, several delegates expressed concerns about the document. One wanted to include the sentence that 'violence is often alcohol related. Measures should be taken to restrict access to alcohol'. Other delegates wanted specific references included to stalking and to security posts in every health care facility 'as necessary'.

The committee decided to recommend to Council that the document be recirculated to constituent members for comment.

Augmented Intelligence

The American Medical Association tabled a proposed Statement on Augmented Intelligence in Medical Care. It was argued that the terminology should be 'augmented intelligence' rather than 'artificial intelligence' because this was not about replacing the physician but assisting the physician. Physicians and medical associations needed to be involved as AI was developed in order to strengthen the patient-physician relationship.

The committee agreed to amend the document to recommend 'that all healthcare AI systems be transparent, reproducible, and be trusted by both health care providers and patients'.

The committee recommended that the document, as amended, should be sent to the Council for forwarding to the General Assembly for adoption.

Medical Age Assessment of Unaccompanied Minor Asylum Seekers

Proposed new policy guidelines on medically assessing the age of unaccompanied minor asylum seekers were presented by the German Medical Association. A new draft was proposed, based on discussions at the last Council meeting and comments from NMAs. It was argued that child refugees must have the highest protection that was their due and potentially harmful procedures should be avoided. Young asylum seekers had to be given the benefit of doubt in cases where age could not be confirmed.

After a debate, the committee recommended that the document, as amended, should be sent to the Council for forwarding to the General Assembly for adoption.

Free Sugar Consumption

A proposed Statement on Free Sugar Consumption from the Kuwait Medical Association was considered. The committee was told that its purpose was to highlight the high global level of free sugar consumption and sugar-sweetened beverages.

After a brief debate, the committee recommended that the document, as amended, should be sent to the Council for forwarding to the General Assembly for adoption.

Healthcare information for all

The British Medical Association presented a revised draft of a proposed Statement on Healthcare Information for All. This

focused on the lack of access to healthcare information which acted as a major contributor to disease and death. The committee was told that access to health care information on diseases, treatments, services and health promotion was crucial for patients and for health personnel. Lack of this in some countries could lead to some of the fundamental causes of morbidity and mortality.

During the debate that followed, the committee decided to amend the document to read that 'Governments have a moral obligation to ensure that the public, patients and health workers have access to the healthcare information they need to protect their own health and the health of those for whom they are responsible'.

The committee recommended that the document, as amended, should be sent to the Council for forwarding to the General Assembly for adoption.

Medical Liability & Defensive Medicine

The Israel Medical Association submitted a proposed Statement on Defensive Medicine. The Review Committee suggested that the proposal could be incorporated into the existing WMA *Statement on Medical Liability Reform*. It therefore recommended that a rapporteur be appointed to oversee this.

The committee recommended to Council that a rapporteur from the Israel Medical Association be appointed to merge the two documents.

Classification of 2009 Policies

The committee recommended that the following documents undergo a major revision:

- Declaration of Ottawa on Child Health
- Statement on Inequalities in Health

- Statement on Guiding Principles for the Use of Telehealth
- Resolution Supporting the Rights of Patients and Physicians in the Islamic Republic of Iran
- Emergency Resolution on Legislation Against Abortion in Nicaragua

The following documents should under minor revision:

- Declaration on Guidelines for Continuous Quality Improvement in Healthcare
- Statement on Relations Between Physicians and Commercial Enterprises

Two policy documents should be reaffirmed:

- Statement on Patenting Medical Procedures
- Resolution on Task Shifting from the Medical Profession

It was agreed that one document should be rescinded: Improved Investment in Public Health

Nuclear Weapons and Health

An oral report was given by the International Physicians for the Prevention of Nuclear War.

Dr. Jans Fromow-Guerra, President of IPPNW-Mexico, (International Physicians for the Prevention of Nuclear War) expressed IPPNW's strong support for the revised WMA Statement on nuclear weapons adopted by the General Assembly in Reykjavik, which called for the ratification and implementation of the UN Treaty on the Prohibition of Nuclear Weapons. He spoke about the increasing risks for a global conflagration with nuclear weapons and the dramatic humanitarian consequences. The planetary health imperative for the eradication of these weapons therefore had even greater urgency. He said there was an even greater need to press for the elimination of all nuclear weapons. There had been a general lack of progress among nations on dis-

armament and there was now an ongoing escalation from the risks of a new cold war. These risks included the situation between India and Pakistan, the new cold war between Russia and the US and NATO, and the issue of the Iran deal.

They now faced a world in which there might soon be no treaty-based limit on the expansion of a fully-fledged arms race between the nuclear super powers. As medical professionals, they had to remind the public and world leaders that they would not have a second chance if even a minor nuclear conflagration in any part of the world took place.

Dr. Fromow-Guerra urged the WMA and NMAs to move to a period of action to carry out specific activities to press for the elimination of nuclear weapons. He requested the WMA and each of its members individually to take action to promote the signature and ratification by all governments of the United Nations Treaty on the Prohibition of Nuclear Weapons.

They had to consider all nations' health concerns, as critical as they were, required a basic condition for their own survival and the survival of life on the planet that could be extinguished in a moment of anger or from a horrible mistake by a few individuals with the power to launch nuclear weapons.

As doctors, it was their duty to do all they could to eliminate this threat.

Hypertension

The American Medical Association submitted a paper for information on hypertension. It described how hypertension was the most important risk factor for cardiovascular disease in every region of the world and a major cause of global morbidity and mortality and it was time for the WMA to develop policy on the issue. The AMA gave notice that it would be working on a proposed statement for the October meeting.

SATURDAY, APRIL 27

Council

The Council meeting opened, unusually, with any other business.

Vaccination

A proposal was submitted to the Council for a Resolution on vaccination. The Australian Medical Association said that the WMA had strong policy on the effectiveness, appropriateness and necessity of vaccination as something that saved lives. It was time for the Association to reaffirm its policy in the light of global reports on the rise of measles. They needed to ensure that all governments were doing what they could to ensure vaccination. This was particularly important because they now lived in a global village with increased mobilisation. In Australia 35 babies under 12 months had contracted measles and this was very concerning. They had had more than 200 cases of measles already this year.

In the debate that followed, there was a discussion about whether the motion should refer specifically to migration and to the anti-vaccination campaign. On balance, delegates decided against this, but rather to include a reference to misconceptions about vaccination.

In a vote, the Council agreed the following motion:

‘The WMA is extremely alarmed at the current increasing reports of measles outbreaks in many parts of the world. It is clear that increasing global travel by less than appropriately protected individuals and the misconceptions about vaccinations pose a significant challenge for health authorities of all nations. It is in this current climate that the WMA strongly reaffirms its 2012 Statement on the Prioritisation of Immunisation.’

The Council went on to consider reports from the committees.

Medical Ethics Committee

Physician-Patient Relationship

The Council considered the proposed Declaration on Physician-Patient Relationship and the committee’s recommendation that this be circulated to constituent members for comments. The American Medical Association argued that this issue warranted more attention than simply circulating the document. In many parts of the world this relationship was under attack by governments, insurance companies and others who wished to minimise the importance of the relationship, which the profession regarded as the foundation of medical care. The AMA argued that it merited a work group to be set up to look at all the threats to the relationship and to produce a document that could be used as a tool for each NMA to push back against these threats. Other delegates agreed that this was one of the largest threats facing the profession. The Council agreed that the document should be circulated and that a work group should also be set up.

The Council agreed to forward the following document to the General Assembly for adoption:

- Statement on Female Foeticide
- The Council agreed to circulate the following documents:
- Declaration of Reykjavik: Ethical Consideration Regarding the Use of Genetics in Medicine
 - Statement on Action to Stimulate use of the Physicians’ Pledge of the Declaration of Geneva
 - Statement on Solitary Confinement
 - Statement on Physicians Treating Relatives and Friends
 - Resolution on Medical Ethics in Sports Medicine

The Council agreed to set up a work group to work further on the revision of the Resolution on the Responsibility of Physicians in the Documentation and Denunciation of Acts of Torture and Ill-treatment.

Classification of 2009 Policies

The Council agreed that the Statement on Embryonic Stem Cell Research should undergo a major revision.

Finance and Planning Committee

Strategic Plan

The Council agreed to several amendments to the strategic plan. The first was to add to the list of priorities promoting physician wellbeing, including advocacy to reduce physician burnout. A second was to include the promotion of safe and respectful workplaces, to reduce work related diseases, violence, bullying and harassment. And a third was to monitor the expanding use of new technologies by patients in self-management and how this impacted on the work and role of doctors as well as the doctor-patient relationship.

The Council approved the Strategic Plan, as amended, and agreed that it should be forwarded to the General Assembly for adoption

The Council approved the following reports:

- Membership Dues Payments for 2019
- Dues Arrears
- Interim Financial Statement for 2018
- Application for constituent membership of Doctors 4 Doctors Seychelles to be forwarded to the General Assembly for approval
- Planning and arrangements for future statutory meetings
- The theme of the Scientific Session of the 71st General Assembly, in Cordoba in 2020 should be Transplantation and Donation/Organ Trafficking: International Scenarios
- Amendments to the Procedure on WMA Council Resolutions and Resolutions

Socio Medical Affairs Committee

Resolution on Access of Women and Children to Health Care

The Council considered a proposal to change the Resolution on Access of Women and Children to Health Care to a Statement. It was agreed to change the title of the document and to forward it to the General Assembly for adoption.

Augmented Intelligence

The Council considered the proposed Statement and agreed it should be made clear in the text that the document was about 'augmented' intelligence rather than 'artificial' intelligence'.

This was agreed by the Council and it proposed that the document be forwarded to the General Assembly for adoption.

Minor Asylum Seekers

The Council considered the proposed Statement on Medical Age Assessment of Unaccompanied Minor Asylum Seekers and the sentence 'The WMA underscores that any medical methods that could involve a health risk for the applicant, e.g. radiological examinations without medical indication, or that infringe upon the dignity or privacy of an already potentially traumatized asylum seeker, e.g. genital examinations, should be avoided'. The Council agreed that the sentence should be amended to read 'must' rather than 'should'.

The Council agreed that the proposed Statement, as amended, be forwarded to the General Assembly for adoption.

The Council agreed to forward the following documents to the General Assembly for adoption:

- Proposed revision of the Declaration of Madrid on Professionally-led Regulation
- Resolution on Women and Children to Health Care and the Role of Women in the Medical Profession
- Statement on Antimicrobial Resistance
- Statement on Reducing Dietary Sodium Intake
- Augmented Intelligence in Medical Care
- Statement on Medical Age Assessment of Unaccompanied Minor Asylum Seekers
- Statement on Free Sugar Consumption and Sugar-sweetened Beverages
- Statement on Healthcare Information for All

The Council agreed that the following documents be circulated for comment:

- Declaration on Pseudoscience and Pseudotherapies in the Field of Health
- Statement on Violence and Health

The Council agreed that the proposed Statement on Defensive Medicine be incorporated into the *Statement on Medical Liability Reform* and be renamed Statement on Medical Liability Reform and Defensive Medicine and that a rapporteur be appointed to undertake the revision.

Classification of 2009 Policies

The Council agreed to the classification recommendations recommended by the committee.

Any Other Business

Advocacy and Communications Panel

An oral report was given from the Advocacy Panel. The Chair, Dr. Ashok Paul, highlighted the need to help smaller NMAs attending these meetings with extended briefings and more material on the website. It was also important to ensure that material sent to NMAs actually reached

the members. He also referred to the need to see how smaller NMAs might be better represented on the Council. He spoke about the inability of smaller NMAs to become members, particularly from the Asia-Pacific region and the African continent. Other speakers supported his comments about the membership of Council.

The Chair of Council said these matters would be discussed in the Executive committee. He also reminded the Council that the two-year mandate of the Panel had ended and he would be appointing new members and a new Chair.

World Health Assembly

Oral reports were given to the Council about this year's World Health Assembly. Among the issues to be discussed at the Assembly and in side events were universal health coverage and primary health care.

This led to a lengthy debate on the gradual move and support for using community health workers instead of physicians in primary health care.

Speakers expressed concern about the developing trend and the need for the WMA to increase its activities to support a physician-led primary health care system. It was argued that there was a need for more concerted lobbying by the WMA. Examples were given from several countries about other health workers, such as nurses and dentists, taking over from physicians. Some governments were supporting this to reduce costs. But they were not taking into account the outcome and cost effectiveness of the issue. Using physicians in primary health helped to reduce the cost of hospitalization.

In a detailed response to the speakers, the Secretary General outlined the history of how the WHO initially published a good strategy on physician-led primary care, only to see the politicians and governments

overturn this with an alternative health care system that was pushed as a cheap option. The western governments has failed to oppose this approach. Dr. Kloiber said the problem on physician-led primary care did not lie with the WHO, but with the large international donor organisations, who had huge financial resources and were making their funding conditional on supporting the use of nurses and community health workers over doctors. They were setting the scene because they had the money. It was they who were saying that they were not going to invest in doctors because they were too expensive. He stressed that the WMA accepted community health workers as an addition, but not as substitutes for physicians.

Finally, Dr. Kloiber appealed again to NMAs to lobby their governments and to send in to the WMA arguments and examples to back up their case of why physician-led primary care was a very successful model. This would counter the bombardment of

studies they were confronted with, setting out to show that community nurses and health workers could do physician work.

‘Crazy Socks for Docs’

Delegates were asked to support an Australian social media campaign, ‘Crazy Socks for Docs’, to highlight the issue of physician wellbeing and mental health. This was supported in particular by the Indian Medical Association. India had a big problem with suicides among junior doctors and the Indian Medical Association had started a programme on the emotional wellbeing of doctors and medical students.

Sudan

On behalf of the Coalition of African Medical Associations, the Nigerian Medical Association thanked the WMA for the

strong statement it had issued on Sudan. The Coalition was very appreciative of the solidarity given to physicians who were being assaulted, undermined, intimidated and harassed in the course of undertaking their responsibilities as physicians. The WMA's efforts had contributed to the stabilization of the situation in Sudan.

Tribute to Dr. Ardis Hoven

The meeting ended with a video montage of photos of Dr. Hoven during her term as Chair of Council.

The Council meeting was then adjourned and the Secretary General thanked all those who had contributed towards making the meeting such a success.

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World Health Assembly – Geneva, May 20–28



Nigel Duncan

WMA leaders, past and present, were much in evidence at the 72nd World Health Assembly in Geneva from 20 to 28 May.

Past President Sir Michael Marmot was presented with a Health Leaders Award by World Health Organisation Secretary General Dr. Tedros Adhanom Ghebreyesus for his work on the social determinants of health and in recognition of his outstanding leadership in global health.

Side Event on Primary Health Care

Meanwhile, the current WMA President Dr. Leonid Eidelman and WMA Secretary General Dr. Otmar Kloiber hosted with the Taiwan Medical Association a joint side event on Primary Health Care (PHC).

The well attended seminar at the Intercontinental Hotel was a mark of the WMA's support for Taiwan, which for the third

consecutive year was not invited to the World Health Assembly.

Opening the meeting, Dr. Kloiber said he was fully aware that there were many regions of the world where there were not enough physicians. He said the WMA valued the work of other health professions and he stressed the importance of team work. But in arguing for physician led primary care, the WMA was recognising that diversity required different skills and education.

Dr. Eidelman said that primary health care was one of the most important issues in the world of medicine and in the world of universal health coverage (UHC). It was a corner stone of health care systems and a major component of UHC. There was an increasing demand for health care worldwide because the number of people aged 60 years and over was increasing dramatically. People were suffering from more and more chronic diseases and they needed more health care.

Primary health care was a fundamental human right and included all kinds of care, including prevention, treatment, rehabilitation and palliative care. Yet at least half the world's people still lacked full coverage of essential health services. A fit for purpose workforce was essential to deliver PHC. And yet there was an estimated shortfall of 80 million health workers globally.

He referred to the Declaration of Astana, envisioning governments and societies that prioritised, promoted and protected people's health and well-being at both population and individual levels, through strong health systems.

He said person-centred primary care depended on accessibility, continuity and comprehensiveness. Team-based care meant a strategic redistribution of work among members of a practice team, all members playing an integral role in providing patient care and the physician and a team of other health workers sharing responsibilities for better patient care.

Dr. Eidelman concluded that the future of healthcare meant a move from hospital to community settings, and a move towards a team-based model. It also involved technological development and an urgent need to strengthen team based PHC under physician leadership. He said the physician was the most suitable health professional to lead the healthcare team.

A number of speakers from Taiwan, including Taiwan's Health Minister Chen Shih-Chung, spoke about community primary care in their country and the roles and tasks of primary care physicians promoting advance care planning.

Another speaker, Dr. Lyndah Kemunto, a general practitioner from the Kisii Country Government in Kenya, talked about why doctors needed to be at the centre of primary health care. She said that PHC teams should be physician-led because of doctors'

clinical skills, as well as skills for capacity building, critical thinking and collaboration. The benefits of physician-led PHC included better health outcomes, cost reduction, increased efficiency, reduced inequality and integrated and continuity of care.

The symposium concluded with Dr. Kloiber saying it was deplorable that Taiwan was again being banned from the World Health Assembly. It was a very sad situation and he hoped that next year things would be different.

WMA Signs UHC2030

The following evening in a special ceremony in Geneva Dr. Eidelman signed the UHC2030 Global Compact for a safer, fairer and healthier world by 2030. In doing so he committed the world's 12 million physicians to promoting the benefits of universal health coverage across the globe.

Dr. Eidelman said that universal health coverage was key to reaching the World Health Organisation's 'triple billion' targets - one billion more people benefitting from universal health coverage, one billion more people better protected from health emergencies and one billion more people enjoying better health and well-being.

'The World Medical Association embraces the concept wholeheartedly, and we are keen to see quality primary care provided by multi-disciplinary teams at the core of strong and comprehensive health care systems. In our view, UHC is the biggest step forward ever made by WHO, and we are firmly part of the movement.

'In parts of the world where health systems are close to UHC we can show that this is for the benefit of everybody - for our patients, our colleagues and the communities we serve. UHC is an ideal platform, not only for providing curative care, but also for providing prevention, rehabilitation and palliative care'.

Dr. Eidelman said that investing in universal health coverage was not only a strong humanitarian move, it was also a sound economic development to create viable and value-adding services for communities.

UHC2030, run by the WHO and the World Bank, involves building and expanding equitable, resilient and sustainable health systems, funded primarily by public finance, and based on primary health care.

WMA Interventions

Throughout the World Health Assembly meeting, WMA policy interventions were being presented to the Assembly by members of the Junior Doctors Network. These included statements on public health emergencies, access to medicines and vaccines, and water, sanitation and hygiene in health care facilities.

One of the most significant interventions was on universal health coverage, when the WMA welcomed the WHO's message that in order to implement UHC, more investment in the health workforce was needed. The WMA argued that this financial commitment should prioritize closing the predicted 18 million health workforce gap, by increasing the number of students, enhancing education and specialization as well as improving working conditions.

The statement added: 'The Global Strategy on Human resources for health: Workforce 2030 recommends that countries should plan for their health workforce as a whole, rather than segmenting planning and related programming and financing efforts into single occupational groups. The current international debate focuses mainly on prompt ways to meet the HP shortage through the replacement of physicians by community health workers (CHW) or nurses. The latest data available shows that 76 countries still have less than one physician per thousand population. It is unac-

ceptable that patients with cancer in some countries cannot access adequate care because there is no oncologist in the country.

'In its report, WHO emphasizes that CHW are not a cheap alternative to close the gap of health professionals and that governments should adopt service delivery models in which CHW are assigned general tasks as part of integrated primary health care teams. For many years, WMA has been advocating for the need of health care teams with various cadres, including community and social workers. Each profession has its own scope of practice and clear responsibilities with one team member having the overarching responsibility. This should be reflected in the WHO Global Competency Framework for Universal Health Coverage. We know there is still a long way to go, but the aim must be that in the end everybody who needs a physician will be assisted by physician. If you give up that aspiration Universal Health Coverage will not come true'.

In its intervention on antimicrobial resistance, the WMA reiterated the need for the adoption of a One Health approach in National Action Plan development, but more importantly in its implementation. And on human resources for health, the WMA noted that in many countries, including the wealthiest ones, there was a shortage of physicians. A major reason for this gap was a failure to educate enough physicians to meet the health needs of the country's population. As a response to this shortage, many countries encouraged international recruitment and the WMA emphasized the need to regulate those recruitments by calling on Member states to implement the international code for recruitment of health professionals. It urged member states to refrain from coercive measures restricting the mobility of health professionals.

On the promotion of health of refugees and migrants, the WMA said the WHO Global Action Plan failed to address key issues necessary to ensure proper access to health care to migrants and refugees in line with

human rights and medical ethics standards. It said an explicit reference should be made to the human right to health of refugees and migrants, regardless of their legal, civil or political status. The Plan should also address the ethical challenge physicians faced and should condemn any practice involving their participation to non-medically justified examination, diagnosis or treatment, such as sedatives to facilitate easy deportation, or bone examination for age assessment.

Yassen Tcholakov presented the WMA statement on climate change, welcoming the draft WHO global strategy, and in particular the proposal to address the wide spectrum of climate change impacts on health, through cross-sectoral action on determinants of health and a health-in-all-policies approach. It supported the recommendation to strengthen the health sector leadership and governance and recommended developing further on ways to equip and educate the health workforce, including physicians, to promote a better environment, address patients' needs, and transmit health knowledge regarding environmental risks to policymakers and communities.

But the WMA also considered that greater emphasis should be placed on the need for health impact assessments of new trade agreements being negotiated in multilateral settings in order to protect, promote and prioritize public health over commercial interests and secure services in the public interest, including those impacting on health and environment. It suggested that the WHO should act as a global role model through the adoption of climate change performance indicators of its own activities, which could inspire the wider UN community.

Nuclear Weapons

The WMA was also involved in a side event on nuclear war. Entitled "Nuclear Weapons Today: An Update of the Humanitarian Consequences of Nuclear War and the

Medical Role in Preventing it", the event was organised by the International Physicians for the Prevention of Nuclear War, and supported by the WMA and the World Federation of Public Health Associations.

WMA Advocacy Advisor Clarisse Delorme gave an update on the humanitarian consequences of nuclear war and the role of health professionals in preventing it and took part in a panel discussion. Speakers said that the use of nuclear weapons brought disproportionate suffering to vulnerable categories, such as woman, children and indigenous populations. There was a need to focus on the health and climate consequences of nuclear weapons. The WHO, it was argued, should once again become a voice against nuclear weapons.

Burnout

On the final day of the Assembly, the WMA issued a press release giving a warm welcome to the decision by the Assembly to classify work related burnout as a problem that influenced health status and to include it in the new version of the international code of diseases

WMA President Dr. Eidelman said: 'For too long burnout among physicians has been largely ignored. Emotionally exhausted physicians are a danger to patients and a danger to themselves. The cost in terms of human lives and money is appalling.

'The number of suicides among doctors resulting from burnout is a scandal and I hope that the WHO's new classification will shine a spotlight on this disgraceful situation.

I hope that the World Health Assembly's decision will lead to a new approach that addresses multiple factors including working conditions for physicians around the world'.

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MEDICINA DEL 2030. El Futuro Esta a la Vuelta de la Esquina Prepárate!



Anibal Antonio Cruz Senzano

Protagoras student of Socrates and Aristotle (2,500 BC) said that "MAN IS THE MEASURE OF ALL THINGS", predict the future without remembering the principle would lead us to make mistakes, as doctors understand that there can be nothing more noble than Protect your health or understand your illness.

Man is the only being with a known past who lives his present and plans the future, he is the one who creates the story and the end of it.

In Mesopotamia medicine was based on magic to bring out the evil one, in Egypt the priests and fortune tellers treated diseases, it was Hippocrates who started the scientific medicine based on experience and carefully observing the patient.

Galen makes dissections of corpses knowing their anatomy and physiology.

The Romans installed the first hospitals to care for their war wounded and municipal hospitals were born.

Albucasis removes the goiter with crude instruments, using cautery to treat wounds. Medieval medicine is characterized by plagues, the Catholic Church influences disease as punishment for sins and condemns scientific research, Pasteur talks about the germs and bacteria that passed from one individual to another causing the disease.

Röntgen discovers X-rays, the basis for exploring the interior of the human body. It took many centuries for the concept that the doctor should not only cure diseases, but should also prevent them.

In the XX and XXI century many drugs that cure, prevent and control diseases, electronic devices capable of diagnosing, transmit important patient information, these rapid advances allow a better and better life for people, increasing their life expectancy.

What is the future of Medicine?

5 medical technologies could change the world:

- Drugs and anti-aging treatment (molecular repair to organ replacement),
- 3-D and 5-D impressions,
- bionic implants (nanotechnology),
- Prenatal genetic manipulation (avoiding the development of mutations)
- personalized medicine, all this accompanied by Big Data and artificial intelligence.

5 Nobel Prizes in Medicine tell us about the future of medicine:

- Erwin Neher (1991) "the bugs that invade us have key (Micro biome) the

missing link, certain bacteria can influence the appearance of diseases.

- Richard J. Roberts (1993). CRISPR system (the short genetic stick, modifies the genes at your convenience, introduces changes in the DNA for treatments of many diseases.
- Ferid Murad (1998). The Bio-impression 3-D, the challenge of creating hearts is a present reality, very close to the manufacture of artificial blood and organ culture for transplants using stem cells.
- Jules Hoffman (2011). Inverse vaccinology, 500 diseases will be erased forever, deciphering the genome of bacteria, also particle accelerators to study the structure of the virus.
- Randy Schekman (2013). Immunotherapy the vaccine against cancer, combines the genetic profile of the tumor achieving more personalized therapies. Immunotherapy helps our defense system detect cancer cells and attack them in a selected way.

Personalized medicine determines that each person is unique and the same happens with their pathology, this allows that the genetic study of a person is the ability of genetic editing to correct their mutation.

The main reason for this article is:

- to show that the vertiginous advance of technology is leaving behind the human part of medicine.
- We ask ourselves: What about human values ? ...
- Disease is a bio-psycho, social component, the disease not only attacks the organism, it also has environmental and social factors, influences the family and the environment, aspects that we must not neglect from the human point of view.
- 70% of the world population does not have access to a full health system, which allows the human right of equal attention without considering

economic, racial or political factors, the latter being used by unscrupulous governments as a speech to conquer the population.

- We continue with an important poverty map highlighting:
 - poverty, malnutrition, collapsed hospitals, limited access to medicines,
 - precarious infrastructure, lack of supplies and human resources in health, desolation and death.

This is the true reality with which we will face and is the challenge of the medicine of the future.

How should we prepare for the medicine of the future ...?

Technology must not dehumanize medicine, on the contrary, it must be accompanied by ethical and deontological principles.

This is an important responsibility of medical schools where teaching with values determines that the main thing is the patient and the resolution of their illness in an integral way. Always trumpet our governments and health administrators, the human right of free and equal access to health according to the basic principles of the Hippocratic Oath.

- *We must make a more human medicine! ...*
- *We must make the doctor-patient relationship intangible heritage of Humanity...!!!*

From the CONFEMEL space, we demand from the world and health institutions this right, unconditional commitment to professional competence, altruism and the trust of society.

“TRUST DEPOSITED IN THE CONSCIOUSNESS”.

- Let's put all our hands together to look at the future and from all the institu-

tions: **CONFEMEL, ISRAEL MEDICAL ASSOCIATION (I.M.A.), WORLD MEDICAL ASSOCIATION (W.M.A.).**

- Propose to the world and UNESCO that the patient medical relationship should be the beginning and the end of the medical act, for that reason and human values we must name the doctor-patient relationship “**INTANGIBLE CULTURAL HERITAGE OF HUMANITY**”.

We end this article with the thought of Hippocrates 5th century BC:

Life is short, extensive science, the fleeting occasion, the insecure experience, the difficult judgment. It is necessary not only to prepare to do what is due, but also to collaborate: the patient, those who assist him and the circumstances, external.

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WFME Conference: Quality Assurance in Medical Education in the 21st Century

Seoul, Korea, May 2019

The 2019 World Federation for Medical Education (WFME) Conference, held in Seoul, Korea from April 7-10, hosted more than 800 participants from 57 countries. There were 300 presentations that included 12 Plenaries, 48 Symposia and 10 Workshops. 84 Paper presentations and 146 Poster presentations in 35 thematic sessions were all related to the Conference theme “Quality Assurance in Medical Education in the 21st Century”.

In support of this theme, WFME focused on critical activities in the immediate years to come. The three main topic areas were: the WFME Recognition of Accreditation

Programme, the next edition of the WFME Standards, and quality assessment of Postgraduate Medical Education.

WFME Recognition of Accreditation Programme

One of the aims of the conference was to discuss accreditation and to dispel misinformation that has been circulating in many countries world-wide about the meaning and process of the WFME Recognition Programme. **WFME does not accredit individual medical schools.** Medical schools are accredited by an accrediting agency,

which can be a government or independent organisation. Through the Recognition Programme, WFME evaluates the legal standing, accreditation process, post-accreditation monitoring, and decision-making processes of an accreditation agency for programmes or schools of basic medical education.

Currently, there are 18 agencies with Recognition Status, 12 agencies in various stages of the recognition process and more than 10 additional organisations are in active communication with WFME regarding their application.

WFME often receives enquiries about possible solutions for various countries, agencies, or medical schools. Often a school asks what to do about the Educational Commission for Foreign Medical Graduates (ECFMG) 2023 deadline (see below) when the agency in their country is not yet recognised or when there is no accrediting agency

operating in the country. WFME strongly discourages schools from pursuing accreditation from a recognised agency outside the country without verifying that the agency is also recognised by the relevant authority in their country. The agencies with Recognition Status are **only** recognised by WFME for operation in countries where they are mandated by the government, or by the relevant professional or scientific authority, to perform accreditation of medical education.

For countries where an accrediting system has not yet been set up, WFME suggests any of the following:

- Setting up an accrediting system in consultation with experts in accreditation, or with representatives of an already functioning agency from a different – yet reasonably comparable – country, or
- Creating a regional accrediting body in cooperation with neighbouring countries, or
- Reaching out to an already functioning agency in a country that is geographically or culturally close and consider giving this agency a mandate to perform the accrediting function on behalf of the government, or on behalf of a relevant professional or scientific authority, or both.

To avoid any conflict of interest, WFME is not able to recommend individual experts in accreditation, but can provide a list of possible experts from which anyone working to set up a new agency can choose. The experts on this list may also be used to provide independent advice to an agency considering an application in the WFME Recognition Programme.

For more information on the WFME Recognition Programme please visit: wfme.org/accreditation/recognition-programme

Agencies that wish to apply for Recognition or get more information can contact WFME at accreditation@wfme.org. This email address also serves for any other enquiries about WFME Recognition.

The list of agencies with Recognition Status can be found on the WFME website wfme.org/accreditation/accrediting-agencies-status. WFME also announces all newly recognised agencies in the News section on the website and on Twitter ([@wfmeorg](https://twitter.com/wfmeorg)) and Facebook. Currently these are the only sources of updated information about the Recognition Programme.

Accrediting agencies report many reasons as drivers to apply for WFME Recognition. WFME Recognition Status is seen as a mark of quality – and although it is not mandatory to go through the process, accrediting agencies see value in external evaluation of the core of their activity. Almost all accrediting agencies that have achieved Recognition Status report that their policies



and procedures have benefited from independent appraisal. Recognition Status also acknowledges a globally comparable quality of accreditation while supporting the use of country-specific standards that are tailored to the local needs and context.

Medical schools, students and graduates are understandably primarily interested in the WFME Recognition process because of its connection to ECFMG policy.

Barbora Hrabalová

WFME Head of External Relations

Preparing for the ECFMG 2023 policy deadline

The World Conference discussed the Educational Commission for Foreign Medical Graduate (ECFMG) policy, that states that, starting in 2023, individuals applying for ECFMG Certification must be a student or graduate of a medical school that is appropriately accredited. More specifically, the school must be accredited by an accrediting agency that is officially recognised by the WFME. ECFMG has planned a 4-phase implementation process leading up to the 2023 deadline (see picture 1).

For continuous update on the progress towards 2023, visit ecfm.org/accreditation.

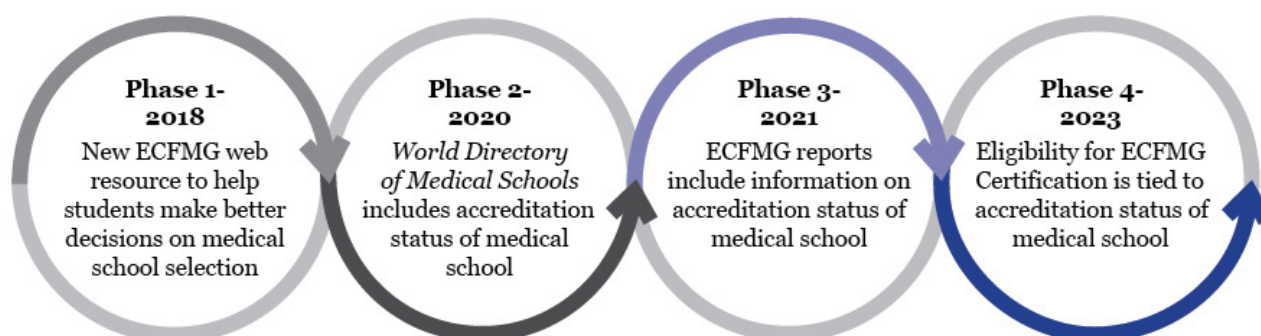
The above diagram refers to the *World Directory of Medical Schools*, which is managed jointly by WFME and the Foundation for

Advancement of International Medical Education and Research (FAIMER). It is important to note that listing of a medical school in the *World Directory* does not denote recognition or endorsement by WFME or FAIMER, or the eligibility to apply for ECFMG licensure. Information about the eligibility of graduates from any particular medical school to apply for ECFMG or Medical Council of Canada licensure is **currently** located in the Sponsor notes in the school's page on the *World Directory* website (wdoms.org). As the 4-phase plan progresses, the *World Directory* will gradually include information about accreditation and WFME Recognition, as well.

For information about *World Directory of Medical Schools* listings, visit the website or contact info@wdoms.org.

WFME Standards: New edition for basic medical education

As overviewed at the World Conference, since their first publication in 2003, the WFME standards have regularly been updated, reflecting the conditions and changing values in medical education. The next edition of the standards for basic medical education is due for publication in 2020. The new standards will continue to encompass



Picture 1

mission and objectives, educational programmes, assessment, selection roles and support for students, academic staff and resources, programme evaluation, governance and administration, and continuous renewal. However, the emerging style in development of standards means that standards will move away from detailed specification and toward streamlined reference frameworks that ask how institutions make their decisions, rather than whether they comply with set practices. This allows the locally-based standards to reflect the diversity of political, professional, health, education and social contexts that exists among countries and in their corresponding healthcare and educational resources and values. This allows local relevance within a global framework that is one of the baseline tenets of the World Health Organisation's transformative education policy. It will ensure local choice and contextual relevance in educational design and action.

The revised standards will guide institutions to take ownership and address the necessary components of curriculum purposes, outcomes, processes, management, and quality while enabling each institution to reach its own contextually appropriate designs and processes and enable regulators to make relevant and constructive decisions about the quality of medical education offered.

*Professor Janet Grant
Special Adviser to the WFME President*

Quality assessment of Postgraduate Medical Education (PGME): National Examples

Another key element of the World Conference was a discussion on quality assessment of Postgraduate Medical Education ("Graduate Medical Education" in North American terminology). PGME training and evaluation varies in different countries and so does the form of oversight and qual-



ity control. Examples of PGME regulations were shared at the conference by representatives from three countries:

- **Theanne Walters** presented a form where basic medical education and PGME are monitored by the same body, the Australian Medical Council (AMC).
- **Jung-Yul Park** from Korea discussed a complex situation where the responsibility for regulating PGME is divided among several bodies, making it difficult to provide any unified and consistent oversight.
- **Thomas Nasca** from America presented the activity of the long-established body that monitors PGME in the USA, the Accreditation Council for Graduate Medical Education (ACGME).

These three examples show that quality assessment of PGME can take varied forms and before striving for any global comparison and overarching criteria, a comprehensive study to map the situation world-wide is needed.

The Junior Doctors Network, serving as the international platform for junior doctors to facilitate an open dialogue of global events

and activities that are relevant to their postgraduate training, is currently organising a survey among residents to identify the specifics and needs of PGME training worldwide, and to identify the elements that need to be included in any global PGME accreditation criteria.

WFME is aiming to coordinate this global discussion and will be reaching out to stakeholders world-wide to join in the process. PGME quality assessment will be one of the main themes in the next World Conference which will take place in 2022.

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Now is the Time for Physicians and Medical Associations to Prepare for Augmented Intelligence in Health Care



David O. Barbe

Note: This article was adapted from presentations given by Dr. Barbe at the World Medical Association's (WMA) Medical Ethics Conference in Reykjavik, Iceland, on October 2, 2018, and at the WMA/Israeli Medical Association's Physician 2030 Conference in Tel Aviv, Israel, on May 13, 2019.

Technology and Medicine

Throughout the history of medicine, technological innovation has changed the physician practice environment and improved patient care. Think of the thermometer, stethoscope, microscope and the X-ray. These were all watershed innovations of their time and dramatic improvements over what had existed before.

Transformative changes continue in digital health, from big data to wearable devices to telemedicine to artificial intelligence. At the AMA, we use the term augmented in-

telligence (AI), because we emphasize the fact that this technology is to be designed to *enhance human intelligence* rather than replace it. While physicians welcome these advancements and believe in their potential to improve patient care, at the same time, we must take care to ensure that technology is thoughtfully designed and deployed so that it enhances instead of undermining the important patient-physician relationship.

This means physicians – and medical societies – have an important role to play. We must be knowledgeable about technological trends and engaged in the ideation, development, validation, and delivery re-design and integration of new technologies, rather than responding after the fact.

As a leader in American medicine, the AMA is working to help set priorities for AI, to collaborate with other stakeholders to ensure that the physician perspective is integrated into the design and implementation of AI, and to facilitate understanding of the promise and limitations of AI throughout the medical and health care communities.

AI in Health Care

AI is defined as “the ability of a computer to complete tasks in a manner typically associated with a rational human being – to function appropriately and with foresight in its environment.”

The term AI covers a range of methods, techniques, and systems. Common examples of AI systems include, but are not limited to, natural language processing,

computer vision, and machine learning systems. In health care, as in other sectors, AI solutions may include a combination of these systems and methods. AI is expected to transform health care by enabling physicians to diagnose and treat patients more quickly and more effectively.

As a research discipline, AI has been around for 70 years. The underlying techniques, methods and knowledge are not new. However, there are two new forces that are fueling the rapid advances in AI. First, is the inexpensive and ultra-fast computing power that allows us to supercharge these core methods to create applications that have the potential to transform the way we deliver health care.

The second, market trends indicate that AI will change health care and the practice of medicine in significant ways in the next 10 years. This has resulted in an immense infusion of capital into AI related activities. Since 2013, there have been more than 570 health care AI deals worth \$4.3 billion, according to CB Insights.

Physicians may already be familiar with the following examples of AI applications:

- **The Cardiogram app** works with heart rate sensor of the Apple Watch to detect hypertension and sleep apnea. In a clinical study involving more than 6,000 patients with UCSF, Cardiogram (app on the Apple Watch) and its machine learning system, DeepHeart, detected hypertension and sleep apnea with 82 percent and 90 percent accuracy, respectively. The Apple Watch Series 4 and later versions include an electrical heart rate sensor that can take an electrocardiogram using an ECG app.
- **The Human Diagnosis Project (Human Dx)**, a nonprofit and public benefit corporation, is an online platform that uses machine learning algorithms to help physicians achieve an accurate diagnosis and receive specialist consults for their patients. Human Dx also pro-

vides a platform for medical education through its Global Morning Report teaching cases, which are accessed by medical residents.

- Advances in the field of **surgical robotics** allow surgeons to perform surgeries with fine detail and fewer tremors than with the human hand. AI might one day allow surgical robots to perform surgical procedures autonomously.

Opportunities, Challenges and Questions Raised by Health Care AI

The strong momentum behind AI applications brings a number of opportunities and challenges for physicians and patients, and raises important questions physicians must confront. These are detailed in a 2018 report by the AMA's Council for Long Range Planning and Development <https://www.ama-assn.org/sites/ama-assn.org/files/corp/media-browser/public/hod/a18-clrpd-reports.pdf>

Opportunities:

- AI technology could increase physician productivity by **automating** office functions such as scheduling and order entry.
- AI could be used for **data mining** to surface the right data at the right time and improve Electronic Health Records.
- AI could be used to analyze all the known data about the patient and produce insights helpful to **diagnosis**.
- AI could be used to analyze the diagnosis and all other known data and produce best-practice **treatments**.
- AI could free up time for physicians to spend with patients by **automating** certain functions.
- AI could **improve patient experience** and aid behavioral change and treatment compliance.
- AI could assist in **medical education** by surfacing needed information, requiring

less memorization and continuously assessing competencies.

Challenges:

- Data structure, integrity and security;
- Technological mistrust (why transparency is needed);
- Need to demonstrate that AI can reduce costs, support the patient-physician relationships, and improve care;
- Implement and integrate AI into clinical practices and patient care;
- Uncertain long-term unemployment outlook for health care professionals;
- Susceptibility to training bias, malfeasance, and technical problems;
- Questions as to who will benefit, and who may lose? For example, what is best for an individual is not always best for public health, especially when limited resources are available.

Questions raised by AI:

- What evidence is needed to demonstrate value, utility, and trust?
- How does AI intersect with other emerging health care capabilities, such as genomic medicine?
- How will regulatory bodies and professional organizations provide proper oversight for AI benefits and risks, and communicate these to the public?
- How can public and systemic expectations be managed, and concerns allayed?
- What education and training will health care professionals need to acquire in order to understand how AI solutions might help them, and their patients in clinical settings?
- What can health systems considering AI opportunities do now to maximize their chances of success for gaining efficiencies, improving care, and integrating into clinical workflows?
- How will risk be allocated, given the "black box" nature of AI systems?
- How will legal, policy, and regulatory implications, including standards for professional services, intellectual property

rights, and FDA oversight be monitored and addressed?

Health Care AI Equity and Access

The use of various AI technologies also raises a number of equity and access considerations, as covered by recent articles in the *AMA Journal of Ethics*.

Data sets used for health care AI are created by human agents and are imperfect. For example, data sets based on clinical trials include or exclude participants based on certain characteristics, and the data may not adequately reflect characteristics of marginalized populations with less access to care. Biases within the data may unintentionally be reproduced by AI applications.

As noted here <https://journalofethics.ama-assn.org/article/can-ai-help-reduce-disparities-general-medical-and-mental-health-care/2019-02>:

"Advances in [AI] and machine learning offer the potential to provide personalized care by taking into account granular patient differences."

"However, this same ability to discern among patients brings with it the risk of amplifying existing biases, which can be especially concerning in sensitive areas like health care."

There is also concern that AI is already outpacing the policy and ethics governing its development and use. As noted here <https://journalofethics.ama-assn.org/article/ethical-dimensions-using-artificial-intelligence-health-care/2019-02>:

"Nonetheless, this powerful technology creates a novel set of ethical challenges that must be identified and mitigated since AI technology has tremendous capability to

threaten patient preference, safety, and privacy.”

“However, current policy and ethical guidelines for AI technology are lagging behind the progress AI has made in the health care field.”

The need for policy and ethical guidelines around AI in health care necessitates the involvement of physicians.

AMA policy on AI

Understanding that physicians must be involved in the disruptive technology of AI, the American Medical Association adopted policy directives on AI at its Annual Meeting in June 2018. In the same way, the World Medical Association (WMA) is in the process of developing a Statement on AI. The Statement, approved by the WMA Council in Santiago in April 2019, will be considered by the WMA Assembly in October 2019.

Outlined below is a summary of the AMA’s policy. We believe these are principles that medical associations should consider as they address the development of AI in their countries.

Under our current policy, the AMA will:

1. Leverage its ongoing engagement in digital health and other priority areas for improving patient outcomes and physicians’ professional satisfaction

to help **set priorities for health care AI.**

2. Identify opportunities to **integrate the perspective of practicing physicians** into the development, design, validation and implementation of health care AI.
3. **Promote development** of thoughtfully designed, high-quality, clinically validated health care AI that:
 - a. is designed and evaluated in keeping with best practices in user-centered design, particularly for physicians and other members of the health care team;
 - b. is transparent;
 - c. conforms to leading standards for reproducibility;
 - d. identifies and takes steps to address bias and avoids introducing or exacerbating health care disparities including when testing or deploying new AI tools on vulnerable populations; and
 - e. safeguards patients’ and other individuals’ privacy interests and preserves the security and integrity of personal information.
4. **Encourage education** for patients, physicians, medical students, other health care professionals, and health administrators to promote greater understanding of the promise and limitations of health care AI.
5. **Explore** the legal implications of health care AI, such as issues of liability or intellectual property, and **advocate for appropriate professional and governmental oversight** for safe, effective, and equitable use of and access to health care AI.

Conclusion

As health care technology and AI advances continue to transform the physician practice environment, there are two possible futures: One in which health care technology and AI work for physicians and patients – and one in which they don’t. The difference depends on the degree to which physicians are involved in shaping that future. Physicians and medical associations must work to shape the new environment rather than simply react to it – and we must do it . . . **right now.**

As we do this work, we must remember the most important relationship in health care: **the physician-patient relationship.** We must continue to work with policymakers, physician innovators, technology companies and other stakeholders to ensure the development of clinically sound AI systems that will enhance the quality of care and support the physician-patient relationship, rather than detracting from it.

The American Medical Association has made involvement in AI development, policy and equity a key priority and encourages other medical associations and interested physicians to do the same.

For more information about the AMA’s work on AI, visit: ama-assn.org/ai.

*David O. Barbe, MD, MHA
Immediate Past President
American Medical Association*

Identifying Training Needs for Healthcare Organisation



Michael Mncedisi Willie

Introduction

The healthcare sector is an ever evolving and changing environment and some of the key changes are largely driven through technology. It is therefore vital for healthcare organisations to continue to invest in people, by upskilling them in areas that will also give the company a competitive advantage. This includes training on technology and tools that seek to improve business processes and efficiencies. Knowledge management, training and development are the key attributes to organisational growth and development [10]. Most entities develop policies and procedures around this, to ensure that there is continual training of staff on key aspects of the business [9].

Continued Training and Development

One of the most competitive advantages to a health organisation is its workforce, and thus continuous training and development is re-

quired, with efforts to respond to business demands [4]. According to Maimuna, training and development is an instrument that aid human capital in exploring their dexterity as a result training and development is vital to the productivity of an organization's workforce [19]. Healthcare companies should continue to view training as a strategic investment, as it enhances and improves customer experience, throughout the value chain [21].

The identification of training needs at organisational level needs to be aligned to key strategic objectives and goals. Approaches such as Gap analysis, SWOT or a Risk Assessment framework are key in assisting the development of proactive strategies whereby a healthcare organisation can optimise their product offering and service delivery model. It further assists companies, based on needs assessments to identify the resources and the systems needed.

Other methodologies of identifying gaps could be through conducting surveys; through using questionnaires which could comprise a series of questions and other prompts, for the purpose of gathering information from respondents [25,27]. One typical example could be that an organisation wants to reduce costs associated with fraud, waste and abuse or by developing cost containment strategies, which could be achieved through proactive identification of potential culprits. This information could be obtained by conducting a survey where key questions are sourced for fraud, waste and abuse, that could be identified through assessing the responses.

Respondents could also propose new approaches and provide further pointers to new sources of fraud in healthcare and could also provide methods that could be used to pro-actively identify potential incidents of fraud.

Training Needs on Health Record Keeping

The keeping of medical records is a key attribute for the efficiency of a health system. In the main, it provides profiling and traceability of patients and customers. The keeping of medical records is also important for ensuring that there is adequate care coordination when a patient is transferred from one provider or facility to another. There are numerous studies that show that a lack of training in patient record keeping is more prevalent in the public healthcare sector where there are no systems nor suitable human resources to manage and monitor this function. Inadequate training is often stated as one of the reasons that impacts negatively on patients' records processing.

There is also a culture issue, where there needs to be commitment and support from the top structure of a healthcare company. Marutha and Ngoepe investigated the role of medical records in the provision of public healthcare services [15]. The study found that ninety percent (90%) of respondents lacked adequate training on policies, procedures, norms and standards for managing records and that only six percent (6%) of the respondents stated that they had received training in those areas. The other key feature regarding health records is data security; particularly where confidential patient information is concerned. Healthcare management companies should ensure that they put processes and training programs on data breaches and the proper guard of patient information in place, as these could negatively impact an organisation.

Training Needs on Supply Chain Management

One of the main strategies to reduce cost and wastage in the healthcare sector is improved contracting and supply chain management processes. SCM is also regarded as one of the tools when effectively employed

could have a significant impact on reducing costs and improving performance in health care organizations [18]. A recent article by Mathew, John and Kumar depicts approaches to optimize costs in healthcare supply chain operations, which includes the virtual centralisation of supply chains, supply utilisation management practices, the use of RFID technologies, the use of analytics and streamlining workflow [17].

The author further classifies stakeholders into three major groups, namely:

- Producers;
- Purchaser, and
- providers.

Producers (comprise medical and surgical supplies, medical devices, and pharmaceuticals) who distribute these to the purchasers (wholesalers, distributors and GPOs). Purchasers then distribute them to the providers (hospitals, IDNs, physicians, clinics, pharmacies, and nursing homes). Ryan, further elaborates on the addition to the complexity of the system, where there is involvement and participation from governmental institutions, regulatory agencies, and insurance companies [23]. All these key components of supply chain management need to be integrated into an effective healthcare management system.

Training Needs of Products Offered

Product simplicity in healthcare is a very difficult concept to quantify. There is also the issue of information asymmetry, where there is not enough detail about products. Health generally, is not considered a public good, because of non-paying individuals (without health insurance, healthy food, etc.), and this makes it even more complex than other products. Information in this regard is key for choice optimisation by consumers, when they purchase health insurance plans. For example, consumers who are often not aware of the potential for receiving subsidies for their premiums and cost shar-

ing, might choose not to enrol in coverage. Similarly, consumers who enrol in plans with expected spending greater than alternative plans could end up spending far more on their health care requires, during the year, than they otherwise would have.

In a medical insurance setting, members enrol and purchase a product in the form of health care plans so to be able to access care. In the main, these products are often too complex for the purchasers to understand. The level of complexity is also twofold and it affects, both the member and the medical service provider. Various studies also show that the purchase of care by citizens who have low healthcare system literacy may result in a struggle for them to make key decisions. The more complex the product is, the greater the risk is of it not being fully understood by the purchasers.

During 2017, there were two hundred and seventy-eight (278) registered benefit options operating in eighty-one (81) medical schemes in South Africa; thus choosing a benefit option remains a big challenge, as there are many benefit options are often not standardised [3]. Kaplan and Ranchod contend that the number of benefit options available in the medical scheme market creates complex environment impacting decision making [13]. An annual survey con-

ducted in 2017 depicted that consumers were unsure of their own medical scheme details and of the benefits that they were entitled to [11].

The complexity of products offered by health insurance companies has a positive correlation with complaints and customer satisfaction scores. It is thus critical for health insurance and medical schemes to invest in programmes that will educate and train enrollees on the benefits and the products being offered.

Training Needs of Patient Centredness and Customer Care

Effective patient-centred care has become a central aim for the nation's health system, yet patient experience surveys indicate that the system is far from achieving it [26]. Based on interviews with leaders of patient-centred organisations and initiatives, this report identifies seven key factors for achieving patient-centred care at the organisational level [26]:

- Top leadership engagement;
- A strategic vision, clearly and constantly communicated to every member of the organisation;
- The involvement of patients and families at multiple levels;

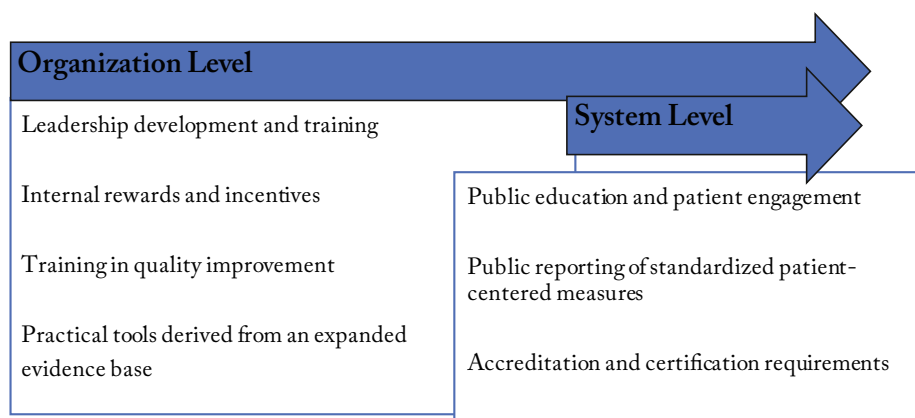


Figure 1.

- A supportive work environment for all employees;
- Systematic measurement and feedback;
- The quality of the built environment; and
- Supportive information technology.

The two main strategies that have been identified as necessary to overcome barriers and to help leverage widespread implementation of patient-centred care at both the organisation and at system Levels. Figure 1 depicts the characteristics of these.

There is comprehensive theoretical work being done on customer care, customer service, quality and how these impact on customer fulfilment, organisational performance and customer retention. According to Sheahan, customer service in health care is not the same as in other industries, because customers are the receivers of the medical services that are critical to their health [28]. As such, healthcare industries must maintain a good customer service relationship with their customers [28].

Mosadeghrad highlighted ten determinants that could lead to better quality of service, which, in turn, will lead to better customer care [22]:

- Reliability - consistency of performance and dependability.
- Responsiveness - the willingness or the readiness to provide service.
- Competence - having the required skills and the knowledge to perform the service.
- Access - approachability and ease of contact.
- Courtesy - politeness, respect, consideration, and friendliness of contact personnel.
- Communication - keeping the customers informed in a language that they can understand and listening to them.
- Credibility - trustworthiness, believability, being honest.
- Security - freedom from danger, risk, or doubt.
- Understanding - knowing that the health care provider is making the effort to understand the customer's needs.
- Tangibles - the physical evidence of the service.

Knowledge Management

According to Chong, knowledge management is a broad subject with many facets, ranging from databases to patents, from the intranet to the mentor, from coldly technical to warmly personal concepts [4]. Different academics and practitioners presented a review of the literature, which concluded that there is no clear definition and concept of knowledge management [7]. Salleh and Goh agreed that it is difficult to define knowledge management since various perspectives and schools can define different dimensions and meanings of knowledge management [24]. A different perspective on the concepts of knowledge can lead to different definitions of knowledge management [4].

Knowledge management is crucial for enterprises to determine where they are going and for organisational survival in the long run; given that knowledge creation is the core competency of any organisation [4]. The human resources function in organisations needs to drive knowledge management and create an enabling environment, thus by creating a knowledge-sharing culture, nurturing and "learning-by-doing" can yield to competitive advantage [2].

Financial Management in healthcare

The primary role of financial management in healthcare organisations is to manage budgets and to ensure that financial risk is mitigated. Companies need to be able to have adequate systems to ensure that there is adequate working capital management, assurance on cost reduction and available funds, to ensure that the organisation runs effectively [29]. Furthermore, the financial management staff of any healthcare or other form of healthcare organisation should ensure that the organisation can meet its strategic goals, through proper planning and budgeting processes. According to Deloof,

financial management includes evaluation and planning, long-term investment decisions, financing decisions, working capital management, contract management, and financial risk management and risk; in a way that this helps to achieve the financial goals of the organisation [6]. When a healthcare organisation has strong and organised financial management plans, which are also managed efficiently, they are able to provide efficient healthcare to all their patients.

Learning Organisation

The 'learning organisation' is a concept first described as an organisation where people continuously learn and enhance their capabilities to create the results that they really care about [1].

It consists of five main disciplines:

- team learning;
- shared vision;
- mental models;
- personal mastery; and
- systems thinking.

Al-Abri and Al-Hashmi further elaborates that all five disciplines are dynamic, and they interact with each other [1]. Furthermore, there are some educational concepts and theoretical models, which are of relevance to the learning organisation, and can thus provide a framework for managerial decisions. The aim of professional health care education is to educate health care personnel with up to date knowledge and skills; either by theoretical learning through attending courses or practically, through training programmes. The core purpose of health care education is to promote quality in health care services by providing competent and safe personnel. Health care managers are obligated to acquire and to maintain the expertise needed to undertake their professional tasks. Additionally, they are also obligated to undertake only those tasks that are within their competence and to acquire technical knowledge in their field of work.

Table 1. Difference between corporate and clinical governance

Clinical governance: Role of the Board	Corporate Governance: Role of the Board
<ul style="list-style-type: none"> • endorse policies and clarify expectations regarding the desired outcomes for the CEO and the management team, with respect to patient safety and quality. • receive, review and react to regular reports on clinical performance from the CEO and the management team. • expect that such reports should be sufficiently detailed so that the board can assure itself that the organisation is performing in accordance with formally recorded expectations, but not be so exhaustive that potential problem areas are lost or disguised in the detail. • Assure themselves that appropriate remediation steps are activated for problematic areas. 	<ul style="list-style-type: none"> • appointment and evaluation of the CEO. • engagement with the CEO and senior management in setting-up the strategy of the organization. • identification and management of any real or perceived conflicts of interest among directors and/or officers. • assessment of the contributions of each individual board member, as well as the collective performance of the board. • enabling the chairman to effectively discharge this/her special responsibilities as a "first among equals". • ensuring that new board members are thoroughly oriented to the organization and the operations of the board. • underscoring that the interests of the stakeholders are paramount (in the case of a healthcare entity, this is the community the institution serves).

Source: King IV compliance supplementary report [14]

Governance for Healthcare Managers:

Corporate governance involves more traditional managerial tasks of finances and budgets, procurement and supply-chain management, human resource management, and infrastructure [16]. The principles underpinning corporate governance include fairness, accountability, responsibility and transparency [5]. At a global healthcare ecosystem level, healthcare managers ranging from practice managers, policy makers to governments, need to ensure that there are enough two-way engagements and adequate communication, where corporate governance is concerned. Furthermore, there needs to be adequate access to information on corporate governance policies and continuous training and development in this regard. The ability to understand and to influence corporate governance issues in the healthcare space is complex, as most healthcare practitioners are mainly trained more to practise healthcare than in an oversight role. Studies have

shown a clear distinction between clinical and corporate governance. Maxwell and Carswell depicts a clear linkage between corporate governance and clinical governance [20]. The authors further depicts that the management team should implement clinical governance systems which ultimately get reported to the board. The table below depicts a distinction between corporate and clinical governance [20].

Conclusion

Healthcare management is a complex sector to manage, this is mainly due to the risks associated with it, ranging from financial management and sustainability, business improvement processes to the health and the safety of patients or customer involvement. The top structure of these organisations operates in a continually changing business environment, ever-evolving technology, complex regulatory requirements and changes in the profile of patients, such

as an increasing age profile and the burden of disease.

All these require complex and demanding health management; in order to manage health organisations in an efficient, cost-effective, competent manner. Health managers require various leadership and managerial skills and they need to be familiar with the problems that exist in the health care system. Continued identification, analysis, and assessment of health management training needs are pivotal, for the survival of healthcare organisations [8].

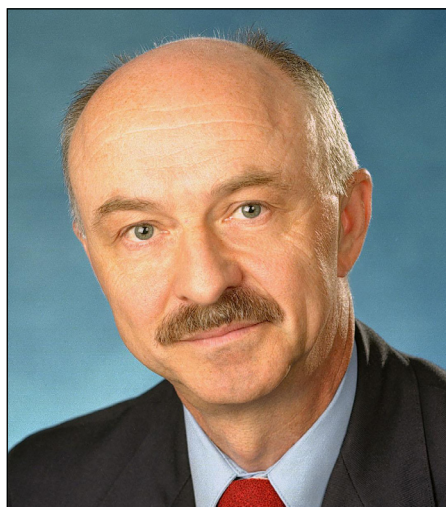
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In-Flight Medical Events: an Excellent Application to Support Onboard Medical Volunteers



Claude Thibeault

In 2017 I had the pleasure to write an information paper on in-flight medical events at

the request of your association. Since then the subject has remained and will continue to remain an important and often misunderstood issue. One of the issues I raised in the article was the lack of familiarity of most physicians with the details of the flight environment. I mentioned that the Aerospace Medical Association (AsMA) has produced a document called 'Managing in-flight medical events' to provide guidance to health professionals that are called to help during an in-flight medical event. While I also wrote that an application for Android and Apple (iOS) had also been created to provide guidance on how to deal with the in-flight medical events, I feel I did not insist enough on this relatively new product that can now be downloaded totally free of charge on Apple Store or Google Play. The app is updated regularly. It has been designed by medical professionals knowledgeable

able in medical emergencies and aerospace medicine under a non-profit organization. Information can be found on the following web site: <http://airrxmedical.com/index.html>. AirRX provides quick guides for the 23 most common medical emergencies, information regarding the legal right to treat patients, lists of available equipment and medications, and much more. Once downloaded on the mobile phone, the application does not require internet access to operate it, which is clearly an advantage when on an airplane. As can be seen on the web site, that application has already been downloaded in over 87 countries, but it is felt that it could help a lot more physicians around the world if it was better known, hence this note so your association and its members could spread the good news.

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Primary Amoebic Meningoencephalitis as a Cause of Headache and Fever – a Global Waterborne Disease



Kevin Sherin



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Introduction

Naegleria fowleri, also known as Primary Amoebic meningoencephalitis, is a deadly global waterborne disease, which infects the brain of young children or adults, and which requires immediate diagnosis and treatment for successful outcomes.

Early recognition in Australia led to naming of the organism attributed for Dr. Malcolm Fowler from Adelaide Children's Hospital in Australia [1]. Overland warm water pipes in Australia were a factor in producing the infection there and the USA southwest.

Global cases

Medscape has reviewed this deadly brain infection in 2019 [1]. Globally, over 310 cases had occurred by 2012 [2]. Recent cases from China and Pakistan are also illustrative of its global nature [3, 4]. Pakistan currently has an outbreak of 11 cases at Karachi alone [4]. Indeed cases have been seen on the six major continents of the world.

Presentation

If patients present with a headache and fever, particularly in warmer months, physicians globally should consider the diagnosis of primary amoebic meningoencephalitis (PAM). Careful history, special laboratory testing, and special treatment may be urgently needed to save the lives of these patients [1, 5, 6, 7]. The authors are including elements of a summary letter published recently in the *American Family Physician* by Sherin, Linam and Jett [5].

Risk factors for Naegleria infection

PAM is caused by *Naegleria fowleri*, a thermophilic free-living ameba that occurs naturally in warm freshwater. The trophozoite form is believed to be the most infective. Risk factors for infection include participation in freshwater-related activities such as swimming underwater, diving, and head-dunking; other similar activities that could cause water to go up the nose; and nasal irrigation for medical or religious purposes [1, 5]. Wakeboarding is another risk

sport. The organism is believed to cross the nasal cribriform plate and enter the olfactory bulb and frontal lobe region to cause the disease.

Tap water and freshwater supplies

N. fowleri has also been detected in public drinking water supplies. Even garden hoses, water splash parks and artificial water rafting activities have been implicated. Irrigation of the nose other than with distilled or saline water carries substantial risks.

Trends in the Geographic Range

Recently, the geographic range of PAM has expanded, with cases identified as far north as Minnesota and Indiana since 2010 [5]. Climate change may be a factor in this disease being reported in more temperate zones. Widespread use of nasal ablution or rinsing is a factor without proper distillation. Tap water or river water are both

grossly insufficient for safety for this nasal procedure. These nasal techniques are often done with *Neti* pots.

Rapid diagnosis is essential

Effective treatment and cure is however possible without residual sequelae, rapid diagnosis is therefore essential [1, 6, 7]. The first step is identifying at-risk patients: those presenting with fever, headache, and recent freshwater exposure. A preliminary diagnosis can be made by observing motile amoebae in a wet mount of cerebrospinal fluid (CSF) or visualization of the organisms on CSF *Wright* or *Giemsa* stain. N multiplex tests can add *Naegleria* antigen to a CSF antigen panel.

Immediate treatment

Treatment requires immediate administration of a combination of systemic and intrathecal antibiotics such as Amphotericin B and including oral miltefosine, which is available commercially, and by contact for guidance from the Centers for Disease Control and Prevention (CDC) [7]. If you have a patient with a suspected infection, you can call the CDC's 24/7 emergency consultation telephone to: 001-770-488-7100 for diagnostic and treatment recommendations. Laboratory confirmation is not necessary before consultation or treatment. The CDC can confirm the organism from a CSF sample or N multiplex *Naegleria* antigen assay. Equally important is the management of cerebral edema, which is typically severe and requires critical care management. Strategies to reduce intracranial pressure include: steroids, CSF drainage, hyperventilation, hyperosmolar therapy, mannitol, and hypothermia [1, 6]. The *Medscape* 2019 reference provides an excellent overview of these points [1].

Future directions

Currently, only three USA states specifically require reporting of PAM cases (Florida, Louisiana, and Texas). No nations yet require reporting of PAM.

Readers of *The World Medical Journal* are urged to learn more about this deadly but highly treatable disease and promote prompt effective treatment. WHO could set up a passive case reporting system as a next step. We urge considerations of global surveillance, active reporting of cases, and sharing of treatment enhancements. Warning labels on *Neti* pots for nasal ablution or rinsing are also suggested along with posting health warnings at warm water swimming points in lakes or rivers for bathers or religious worshippers.

A summit on *Naegleria* is being streamed from Orlando FL USA on September 13, 2019 and will have an ongoing link. The links are here:

<http://hospitalchurch.org/sermons/watch-live/> after the Summit the recordings will be here: <http://hospitalchurch.org/sermon/> just look for Amoeba Summit 2019.

This conference is supported by the Jordan Smelski Foundation and named in Jordan's honor. Jordan Smelski, a young healthy boy, died of *Naegleria* in 2014 after a family vacation to Central America. No cases of *Naegleria* had ever been reported in that region before.

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**British spelling of Amoeba is used throughout. Ameba and Amebic is also correct.*

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Statement by Frank Ulrich Montgomery. “Physician 2030: the Future is around the corner”



Frank Ulrich Montgomery

When the German Emperor, Kaiser Wilhelm II, saw a motor vehicle for the first time, he said that he was sure that “...*the horse would prevail over the motorcar*...”.

And when the world’s first train crawled from Nuremberg to Fürth, the medical society of Bavaria published a sharp warning that there was scientific evidence that speeds over 25 kilometers per hour were extremely dangerous to humans.

And Dr. Watson, the first CEO of a firm named Integrated Business Machines – better known as IBM – risked the prognosis that no more than 5 “supercomputers” of the post-war period would ever be built or needed.

Humans have always been reluctant to easily accept progress. On the other hand, there were visionaries...

In 1925, just over a century before the year we have been asked to envision today, inventor and futurist Hugo Gernsback was

already dreaming about a device that would allow physicians to treat their patients from afar at the touch of a button.

This contraption, which he called the Tele-dactyl, would allow the “doctor of the future...to be able to feel his patient, as it were, at a distance”. The instrument he described would have both visual and haptic elements. Doctors would see their patients on a screen, while also physically examining and reacting to the patient using remote-controlled arms.

What would Kaiser Wilhelm or Hugo Gernsback say when they looked at our society and our situation today?

They didn’t know the words, but they were faced with the three key issues of today’s meeting.

Digitalization, Migration and Globalization.

Gernsback’s vision, it turns out, was not that far off from what we are technically capable of doing now. While modern virtual communication as we know it today and the implementation of robotics and augmented intelligence in medicine were more or less the stuff of science fiction in 1925, the germ of an idea of what the future of medicine could look like had already begun to form. Nowadays DaVinci robot techniques and teleconsultations have become unspectacular normality of medical practice. Digitalization is already over our doorstep!

And the future is closer than ever. Today we have been asked to look not 100 years into the future, but rather just over a decade, to the year 2030. As a point of com-

parison, ten years ago Google wasn’t yet a teenager. Dr. Google hadn’t even applied for medical school. The iPhone was but a toddler and a fledgling messaging service called WhatsApp had 250,000 active users (that number, by the way, is now 1.5 billion). The world, and the way we communicate, is changing at lightning speed. There has been a fundamental shift in the way we interact with each other, and the medical profession is, of course, not immune to that fact.

In ancient Greek this was called “panta rhei” everything flows. This was always the case – only the speed of change has altered!

The developments we have seen in the medical profession in recent decades extend far beyond communication, which is an issue I’ll return to later. To understand what the future might hold for the patient-physician relationship, it is important to first take stock of where we are today and how we got here.

Advancements in medicine, state-of-the-art medical devices and modern treatment options mean that certain diseases that were once more or less considered a death sentence for patients have now been transformed into manageable, treatable chronic conditions. Just look at cancer and HIV. And many patients are surviving long enough to have the “chance” to be diagnosed with a second formerly fatal disease. In the past they would have died of the first and not lived to the diagnosis of the second.

Demographic changes in the form of aging populations are a fact that cannot be ignored in any country of the world. The demographic shift has an impact on society as

a whole, the healthcare system and the way it is organized and financed. And it has an impact on migration. You don't find skilled health care professionals in Sub-Saharan Africa but you do find them in richer societies.

And by the way, demography doesn't exclude our profession: Just as our patients are aging, physicians in the more affluent countries of this world have been getting older, too, and the number of physicians is growing too slowly to compensate for the challenges that lie ahead for our healthcare system.

And governments are hesitant to react to this shortage in a sensible manner: instead of increasing the number of students in universities and the number of training posts for specialization, they opt for cheaper alternatives instead.

One approach which is often touted by national governments and other authorities as a solution to personnel shortages in the medical profession is that of task shifting.

The World Health Organization defines task shifting as

"A process of delegation whereby tasks are moved, where appropriate, to less specialized health workers. By reorganizing the workforce in this way, task shifting can make more efficient use of the human resources currently available."

But in the eyes of the medical community, this is a fallacy. Patients deserve physicians. Quality of medical care and the right of access to a fully trained doctor are basic human rights. Of course – in cases where there is no physician – it is helpful to have a nurse on hand. And of course, where there is a lack of nurses, community health workers might come in handy. No one denies that – not even us. But we cannot accept that governments or international organizations like the WHO or the World Bank promote the

training of nurses and community health workers rather than fully trained physicians. This is equivalent to denying patients access to quality health care. We must be clear and firm that under a concept of Universal Health Coverage, health care must involve physician-led teamwork and this must be thoroughly financed.

And let's be very clear: a patient-physician relationship demands a physician – not a substitute or surrogate.

Physician shortages are not a problem facing lower-income countries alone. One change I continue to campaign for in Germany is at least a 10% increase in the number of slots available for students to study medicine. And I mean thorough training of students at Universities.

This is not without pitfalls: As Richard Riley, Secretary of Education under Bill Clinton once said: *"...we are currently preparing students for jobs that don't yet exist, using technologies that haven't yet been invented, in order to solve problems we don't even know are problems yet"*.

And this is where our approach to globalization comes in. We have to maintain and develop standards we do not even know of (yet)....

But the overarching issue however is the human relationship between a patient and his or her physician. All these modern techniques that we talk of, are only tools in this relationship, they cannot be substitutes. And we have to recognize this as well in medical training. The trend to blended learning institutions of training with "home studies" at your own computer and some practical training in local hospitals, is not equivalent to a decent University or Medical School training curriculum. Our students need more practical experience; we need more direct contact between student and teacher and we definitely do not need more electronic "Open Universities" in medicine.

I firmly believe that if we do not actively address physician shortages now, the situation for patients will deteriorate in the years ahead.

In addition, efforts must be made to increase the attraction of going into general practice, since this is precisely where we are falling short. Models in which rural hospitals cover tuition and, in exchange, medical students must agree to work at said hospital for a certain number of years – could help insure that the patient-physician remains balanced and robust despite challenging demographic changes.

What we must avoid at all costs, however, is the impracticable expectation for overworked physicians to add more consultation hours to their schedules.

As I mentioned at the very top of my address, technological advancements have not only had a positive impact on the types of medical treatments available and, by extension, patient outcomes, but also on how patients access this treatment and how doctors and patients communicate with each other.

Digitization is ubiquitous.

It is changing how we read, how we order products and how we consume media content. And now it is changing how health services are delivered, how patients book doctor's appointments, follow up on medical exams and order medicine.

In the best cases, technology improves efficiency and reduces the burden of administrative work for physicians and their colleagues – all while ensuring quality of care and maintaining the highest standards of medical excellence.

In the worst case it substitutes human empathy with "artificial intelligence".

When Hugo Gernsback conjured up the Teledactyl more than a century ago, it was

as if he had foreseen modern-day telemedicine. The World Medical Association defines telemedicine as “the practice of medicine over a distance, in which interventions, diagnostics and treatment decisions and recommendations are based on data, including voice and images, documents and other information transmitted through telecommunication systems.”

The digital tools we now have at our disposal – from medical apps to wearables to online portals for making appointments – offer tremendous opportunities to enhance the healthcare experience for our patients. But we have to keep in mind: they are only tools, not substitutes.

And whether we wanted it or not – they have become a reality. And whether we like it or not, younger generations use them today like we used Walkmans and cassette players when they were the latest invention, leading our parents to shake their heads over all these new – in their eyes totally useless – modern gadgets...

But what impact do these new techniques have on the patient-physician relationship?

In an ideal world, physicians should always provide medical consultation and treatment to patients through direct, personal contact. That is the “Gold Standard”.

However, as we saw earlier, this is not always as simple as it sounds, particularly in remote areas where physician shortages are and will likely continue to be an issue going forward.

And we also have to accept a generational change in our societies. The smartphone has become a constant companion of our days. It has become an extension of our senses. And digital natives don't understand why we conventional, old-fashioned gruffies prefer a look in the eyes, a touch on the skin or physical examination.

Question is: WHO has to change? I believe:

We have to adapt. We have to learn.

For years it has been permissible in Germany for physicians to use communications media only to supplement, but not replace in-person patient care. Last year's German Medical Assembly, however, paved the way for physicians, at least in individual, medically justifiable cases, to provide medical consultation or treatment exclusively via communications media. Generally speaking, there is no difference in the responsibility for the medical act of a physician. He or she must know what they are doing – and this applies to electronic consultation just as much as to conventional physical contact.

Virtual treatment raises important ethical questions which we must continue to address in the years ahead. And we have to be aware that there are still impediments associated with this type of contact, which place more responsibility on doctors' shoulders.

In addition to concerns about data privacy, it could, if used incorrectly, undermine the relationship of trust or at the very end depersonalize the relationship between physicians and their patients.

Some might argue that some forms of technology – for example, the use of robotics in surgery and AI, could render doctors obsolete in the future.

Here's why I think that will not happen:

The physician-patient relationship has been evolving for generations from a paternalistic model, in which the patient was essentially expected to do what the physician said, no questions asked, to a model of shared, participative decision making.

Digital technology has increased patients' access to – and hunger for – information. It has made them more informed and empowered participants in their medical destiny and contributed to symmetry of communication between patients and physicians.

However, there is a downside to the flood of information patients have at their disposal. As we see on a daily basis, social media – for all its positive aspects – can also be used as a breeding ground for misinformation.

A prime example of this is anti-vaccination discourse, which is having a serious detrimental impact on public health.

Patients will always need physicians to be a source of professional expertise and empathy – perhaps even more so as sources of dubious online health content are called into question.

And we have to maintain and fight for our position as serious information brokers to our patients.

We will not win this battle by simply calling electronic evidence from Dr. Google, Watson or whatever “poppycock”.

We have to seriously engage as reliable translators of a lot of nonsense to discriminate good from bad for our patients. They need – and mostly want – our help!

And of course, every disruptive change in a healthcare system brings with it the potential for failure of mutual trust and respect between physicians and patients. This is something we must always keep in mind and actively resist.

For this reason, it is essential that we continue to adhere to – and update where necessary – the key ethical guidelines that unite our profession, like the WMA's Declaration of Geneva and the WMA International Code of Medical Ethics. For example, the newest version of the DoG incorporates greater emphasis on the autonomy and self-determination of the patient.

A positive patient-physician relationship based on mutual trust is good for patient health outcomes and it is good for physicians, too. Physician well-being is another

issue that was integrated into the revised version of the DoG, as there is a direct correlation between self-care of physicians and their ability to provide care of the highest standards.

Modern technologies, new techniques of communication and robotics tend to frighten us and the public, when they are brand-new. That's a fact – and that is normal.

But the key ingredients of the patient-physician relationship have not changed. And they must not change. After some time we often realize that what once frightened us has become a useful, sometimes inevitable tool of our profession. It became part of patient-physician partnership.

That's why I am not afraid of the future.

And I am sure the future will be bright – actually it has to be, because looking at my own age I will in the future definitely have more physician-patient encounters from the other side of this relationship.

It sometimes opens your eyes when you change sides.

And medicine is extremely successful.

And it will stay to be.

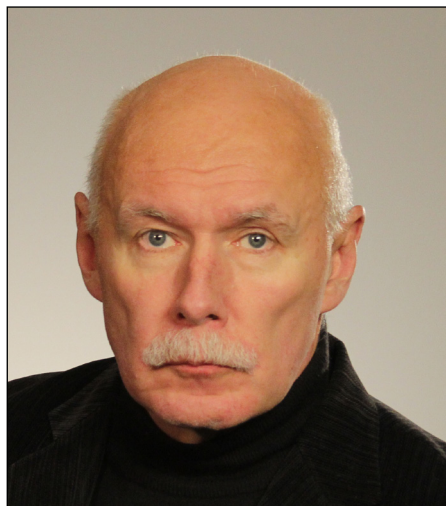
In the most affluent countries of the world the average life-expectancy of the people will increase by four years over the next two

decades. So having listened to me at this conference has increased your personal life-expectancy for at least ten minutes. I hope it was worth it.

For centuries, our profession has understood the importance of adhering to ethical codes – from the Hippocratic Oath to our modern-day WMA policies. And this will still be the case in 2030 and beyond, so long as we safeguard professional autonomy, respect patient self-determination and remain focused on the primacy of patient health and well-being as the cornerstone of our profession.

*Prof. Dr. Frank Ulrich Montgomery
Chairperson of the WMA
Council, at the conference*

Physician in 30 years from Now – will Technology and Politics Change Physician – Patient Relationships or Change Doctor's Place in Society and Medicine?



Peteris Apinis

One of two WMA conferences this year was dedicated to the future of medicine, namely, medicine round the corner. The conference took place in Israel, Herzley, in

May 2019, and was organised by WMA President, Professor Leonid Eidelman, together with the Israel Medicine Association. Fantastic lecturers were welcomed who considered future medicine from very different viewpoints, both geographic (Japan, Brazil, Kenya, Israel, USA, Germany, etc.) and medical (primary care, prevention, radiology, functional diagnostics, etc.). I requested a number of lecturers to share their views in WMJ.

Inspired by conference reports and articles in different medical journals of the world on medical futurology, I have outlined some vision of where to medicine and health care will develop in the next 10-30 years. Unlike clinical medicine or molecular biology, medical futurology approaches vary from country to country. Writing this article, to a large extent, is due to impressions I have from the lectures and publications by the President of the CPME, Chairman of the

Council of the World Medical Association Frank Ulrich Montgomery and the Secretary General of the World Medical Association Otmar Kloiber, representing the views of the world leading medical organisation.

There are many people talking and writing about where medicine is going to develop. Everyone, who writes about the future, looks into the past, and their assumptions are based on different axioms and theories. Discussions and conferences on the future directions of medicine are dominated by precision or personalized medicine, genome research and gene therapy, modern technologies (diagnostic geeks) and artificial intelligence, new drugs and personalized drugs.

For a physician to make any forecasts for the future is a dangerous project. On December 7, 1835, after the first train in the world crashed on its way from Nuremberg to Fürth, the Bavarian Society of Doctors

published a sharp warning of scientific evidence that speed exceeding 25 kilometers per hour is extremely dangerous to human health. Dr. Watson, the first head of the company *Integrated Business Machine*, once forecasted that no more than 5 supercomputers will ever be built in the world because nobody will need it. The company's name was shortened to IBM, but computerization has taken over the entire world.

Describing future medicine (a view in the 30-year future – 2049), the key words are:

- (i) biochemistry and biology;
- (ii) business;
- (iii) chemistry;
- (iv) mathematics and computer science;
- (v) engineering and nanotechnology;
- (vi) genomics.

In 2049, medicine will be personalised, predictable, preventive, co-sustainable, with high technology, high data processing, informatics and artificial intelligence involved. The three major discoveries that will rapidly advance medical development over the next 30 years will include:

- (i) artificial lungs (or rather artificial gills): very close supersensitive membranes, blood flowing between them and oxygen-rich air or liquid on the other side;
- (ii) artificial blood, a fluid that will be able to flow through the blood vessels and to attract and return oxygen to tissues;
- (iii) stem cell studies, gene engineering and 3D printing or *in vivo* breeding abilities in another organism will certainly allow the development of such important structures as kidneys, liver, and I believe, even lungs. Certainly, in 2049 you won't be able to print or grow new brains.

It is essential that among basic medical employments – diagnostics, treatment, rehabilitation, prevention, the emphasis in the future will shift to rehabilitation (currently the emphasis is placed on diagnosis, often paying more attention to diagnosis than treatment or rehabilitation facilities).

A Modern Doctor's Viewpoint on Medicine in 2049. A 2049 Doctor's Viewpoint on Medicine and Healthcare in 2019

For those reading this article, I suggest imagining oneself in 2049. Let us agree that all those doctors, who now are 50-55 year old, will work as doctors also in 2049 because not only society, but medicine, too, will grow old globally, and working life will be long. But all those, who are over the age of 55, should imagine that in the doctor-patient dialogue they will take the patient's part. It is essential that life expectancy has increased significantly, and according to social determinants of health, a retired doctor will live in good conditions, in a good urban area, will move a lot, eat healthily, be well diagnosed and treated, so will live for over 100 years. For all those, who have adopted these rules, I would add that they will also have to experience the demographic global megatrends: the ageing of the planet's people, urbanisation and an increase of total wealth, which will lead to three global pandemics: dementia, depression and diabetes affecting everyone – all three together or one by one.

I recommend to everyone today, in 2019, to remember medicine in 1989, it means 30 years back:

- (i) even though single use tools and equipment had already entered the world, most of the world's blood transfusion systems, injection syringes, surgical needles, endotracheal tubes were sterilized and used many times;
- (ii) the world had learned something about HIV/AIDS, but knew nothing about hepatitis C;
- (iii) penicillin was administered to muscular injections for 2 million six times a day;
- (iv) invasive cardiology and invasive angiological diagnostics took first steps and was ultimately not available daily;
- (v) resection in the event of gastric bleeding;
- (vi) there were no ventilation units on emergency ambulance cars;
- (vii) had to look in the arthroscope and endoscope instead of looking at the screen;

(viii) a lot of small hospitals with a very long hospital treatment time. Hospital as a social assistance institution.

Each of us has our own memories of 1989, but more than half of the drugs that were available and used in medicine at the time are not manufactured and used today, but some have been found to be harmful and dangerous.

Now let us imagine ourselves living in 2049. How would we remember the 2019 medicine? What will we think of the public health of 2019?

- (i) The majority of the diseases for which we treated our patients were chronic non-communicable diseases, but health care had remained the one created in the early 20th century to treat injuries and acute diseases;
- (ii) Treatment was determined not by the doctor's knowledge and patient participation, but by hospital, a large unfriendly building. The patient had occasionally to stay in hospital only for one non-essential diagnostic or medical manipulation;
- (iii) Occasionally you couldn't see a doctor immediately once you were in hospital. There were waiting lines for medical treatment and diagnostics. There were practically no options for talking to a doctor in a digital environment;
- (iv) The digitalisation of health data was so different that the majority of data in medicine was not available in other countries, but often – in another medical institution of one country;
- (v) Medical hardware and devices were huge and scary, patients had to travel to perform a CT or MRI;
- (vi) The drugs were produced by *BigPharma* companies, which for decades were preparing the same drugs and trying to sell the same doses to millions of people. Everyone got the same pills – no personalised medicines;
- (vii) Inventing of new treatments and health-care techniques, but mainly registering them, took a lifetime. Patients died waiting for a new treatment because of the lack of officials to register methods and

medicines. Clinical trials – long and incredibly expensive. The medicinal product was tested on real patients;

(viii) The patient was not only treated while in hospital, but also got new infections in hospital;

(ix) In hospital, professionals often made mistakes because of the lack of algorithms, depletion of physical resources, fault of the medical organisation. In 2019, medical errors were the third or fourth most frequent cause of death;

(x) Epidemiological studies were slow and many were completely redundant;

(xi) Cancer was considered a dramatic life event, not a chronic disease.

You have the opportunity to supplement this reflection from the perspective of your specialty and the ability to look into the future.

Key Factors Determining Medicine and Public Health Over the Next 30 years

In terms of the future of medicine, many known and unknown factors have to be taken into account. I have chosen 10 essential factors that will determine medicine and population health over the next 30 years, and ranked them by personal sense:

(i) climate change. It is climate change that will cause a very significant humanitarian crisis in Subsaharan and North Africa and possibly South Asia over the next 15-20 years. This humanitarian crisis will cause migration of more than 200 million people, with very high pressure on health systems of the migration target countries;

(ii) planet pollution. Household chemicals as poison, excessive armament and military actions as planet degradation factors. Endocrine disruptors will be a birth limiting factor further affecting the loss of flora and fauna global biodiversity. Excessive use of chemical substances will also result in an increase in hereditary pathologies and inherited defects;

(iii) overuse of pesticides, fungicides, herbicides as well as antimicrobial therapies used in medicine and veterinary medicine will affect the characteristics and resistance of bacteria. Pathogenic bacteria resistant to all antibiotics will develop. Antimicrobial resistance will lead to very serious morbidity and mortality. The control of infections will be based on vaccination against antibiotic-resistant micro-organisms. Over the next 30 years, one or more global epidemics caused by viruses will spread around the world. People will start avoiding hospitalization afraid of contagion risk;

(iv) the overpopulation of the planet and demographic changes, a significant increase in life expectancy (in both rich and poor countries). This will lead to a number of consequences:

- medical treatment, provided it has sufficient resources, might ensure extending the life of each individual very significantly;
- each individual will claim a very large amount of the money resources to extend their individual life and, regardless of the country's economic wealth, medicine will start to run out of funds in a catastrophic way;
- any resource (medical knowledge, intuition, experience, working time, premises, hardware, medicines, money) that will be invested in health care, specific prevention, diagnosis, medicine and rehabilitation will extend the human lifespan and improve the quality of life;
- the fundamental paradox of medicine will come true: if greater sums are invested in health care, the longer people will live and more resources will be needed for health care. Consequently, there will be public discontent in all countries with the health care system and its financing;

(v) an ever greater role of social determinants between the rich and the poor, educated and uneducated – the predictable length of human life will be more determined by the ZIP code than the genetic code (in any country in the world, a wealthy and educated person lives on average a significantly longer life than poor and uneducated);

(vi) the ageing of the population – both patients and doctors. Epidemics of chronic diseases, multimorbidity (patients with multiple diseases) and polypragmasia (a patient taking many different drugs at the same time);

(vii) lack of doctors and medical professionals;

(viii) digital technologies, particularly in diagnostics; artificial intelligence as a key element of diagnostic and screening;

(ix) rehabilitation as the leading medical sector;

(x) healthcare, medicine and pharmaceutical market (together) as the main economic sector of any country with a share of at least 25% of gross national product.

Ranking all this in different order, removing one piece of the puzzle and replacing it by another, anyway, the conclusion is that the worst that may characterise medicine in the 21st century is the following: overpopulation, new deadly global fast-spreading viruses, antimicrobial resistance, medical errors and lack of clinicians, but demographically: a senior patient with chronic diseases, multimorbidity and polypragmasia.

The positive scenario rests upon the fact that medical development, state-of-the-art diagnostic equipment and modern medical treatment will translate diseases previously considered a death sentence for patients into treatable chronic diseases such as cancer or HIV/AIDS. Many patients with these diseases will survive long enough to await the diagnosis of another deadly disease. In the past, they would have died from their first diagnosis and would not have lived long enough to learn about another fatal diagnosis. In the past, it was easier to create mortality statistics, but thirty years later, the pathologist will find it difficult to state clearly from which disease the patient died.

Thirty years later, immortality would not be achieved. Everyone who will be born will die sooner or later. Human organs from

one's own cells and genes will be "grown" after some 15-20 years, but not all body cells and organs will be replaced.

In the next thirty years, the main vector in medicine will be doctor-patient relationship. Politicians, officials and journalists use two expressions – "team work" and "patient-centered" in this situation. The concept of "team work" is synonymous with "I don't know what to say, but I want to pretend to be smart". The concept of "patient-centered" means the personal experience of a politician or an official in hospital, dental chair, pharmacy or ambulance, which is generalized and based on a complete lack of knowledge. This lack of knowledge is accompanied by an inability to believe that the doctor has undergone training for many years and therefore understands human anatomy, physiology, health, disease, drug use, motion, thinking, brain activity and internal secretion, immunology, cell symbiosis, microbiome and many other things at a completely different level and in a completely different context. Therefore, a politician and an official responsible for global health quickly is exposed to the disease of a second year medical student, caused by thinking about money, magnetic resonance, ibuprofen and hospital repair. The ignorance of both – the average politician and the average official – will increase in the next 30 years, with only a negative impact upon medicine. Any disruptive change in the health system (usually referred to as reforms) undermines mutual trust and respect between doctors and patients.

On Remote Communication Between the Doctor and the Patient, Called Telemedicine (WhatsApp, Apps, Skype and e-Health)

Let's return in the past to look at the future. In 1925, namely, nearly a century ago, the German inventor and futurist Hugo Gernsbach

described a device of the future that would allow doctors to treat their patients from a distance, and the doctor would do so by touching the button. Gernsbach called his futurological prediction a teledactyl that would allow the future doctor not only to see, but also to feel his patient from a distance, using long-distance hands. Gernsbach's vision is pretty close to modern telemedicine and da-Vinci's surgical robot.

WMA defines telemedicine as a medical practice from a distance where interventional, diagnostic and medical decisions and recommendations are based on voice communication, data, images, documents and other information transmitted through telecommunication systems.

Digitization is ubiquitous. Changes affect the extent healthcare services are provided and the way patients reserve or apply for their visit to a doctor, how doctors and patients follow medical examinations and organise the medical treatment process. At best, technology improves efficiency and reduces the burden of administrative work for physicians, while ensuring the quality of care for all patients and maintaining high medical standards. At worst, it replaces human empathy with notional artificial intelligence. Medical politicians' fascination with the digitization of medicine often puts the computer in the centre of health care, but the patient and doctor are expelled from the centre.

Remote communication is an instrument, not replacement of a doctor. Avoiding doctor-patient communication is impossible, and communication via computer or mobile phone will become a commonplace way of communicating between a doctor and a patient.

How do the new communication methods affect patient-doctor relationships? In an ideal world, the gold standard means that a doctor should always provide medical advice and treatment to patients through direct, personal contact. At the same time, for patients a visit to a doctor means spending a

lot of time and financial resources. The doctor's workload is heavy enough and to save time short advice provided on the internet might be preferred.

The smartphone has become a constant guide in our daily life. Digital oriented young generation does not understand why doctors due to old-fashioned traditions should prefer looking into eyes, touching skin, conversation in a low-pitched voice about individual health history, auscultation, percussion or physical testing rather than conversation in *WhatsApp* or *Skype*.

Different types of remote communication between a doctor and a patient will become commonplace worldwide, developing continuously together with the technological developments. The world and the way we communicate are changing very quickly. The fundamental change takes place in the way we interact one with another, and the medical profession is certainly not immune to general trends.

Virtual conversation between a doctor and a patient, virtual diagnostics and treatments create new ethical challenges. The biggest concern is data privacy. Virtual diagnostics and treatments, used incorrectly, can undermine confidence in the doctor-patient relationship or even depersonalize relationships between the doctor and the patient. In addition to the benefits of communication between the doctor and the patient in the internet environment, there is a concern that the computer will be fully positioned between the doctor and the patient. The digitalisation and remoteness of diagnostics from the treating physician, and particularly the direct transfer of the examination data to the patient, leads to leaving the patient alone with their health problems, complaints and numerous worries.

In this situation, artificial intelligence comes in, or in a simple case an algorithm, which allows data to be analyzed: there is something too much here, too little here,

some sort of formation in the picture, etc. It is important – who has sent the patient to a diagnostic test – a GP or a specialist. Unfortunately, a CT or MRI study, as a law, has been performed a few weeks or even months after administration, the examination result is ready in a few more days, and now is stored somewhere in the depths of *DataMed*. The patient hopes that someone is following what happens with this study, but the GP does not even know about the existence of any other test appointed by a narrow-sector specialist. If the patient on his own initiative finds and receives the answer of the radiologist or laboratory, the examination and diagnostics will continue or the treatment started. If a patient has been referred for testing by a narrow-sector specialist, there are concerns whether the indications in the study's response to pathology under the responsibility of another narrow-sector specialist will be evaluated. In this case, the only one capable of helping, directing diagnostics and treatment is a doctor of general practice – a GP.

In addition to supporting the system of general practitioners, its development, the development of expertise, and for the search of optimal organisational forms no effort should be spared both in professional organisations and in national ministries, and parliaments. Supporting family doctors means additional funding, additional support of municipalities, additional training, serious red tape reduction. A doctor of primary care or a GP will be needed and will be a key stage in medicine even after thirty years, regardless of how the profession will be called.

Digital technology has increased patient access to information. Digital technology has made patients more informed and empowered over their health and health care and promoted symmetric communication between patients and doctors. The claim that a patient can be as informed as a doctor is exaggerated because it is more difficult for a patient without medical knowledge to distinguish between honest, modern medi-

cal information on social networks and internet portals from erroneous messages or fake news.

Over the next thirty years, patients will need doctors as a source of professional experience and empathy, particularly when a patient sees highly questionable online health content. The doctor will have to be a middleman for information between the digital information platform and the patient in the future.

The biggest lie is replacing a doctor with an app. Every day, an average of 100 new medical or health applications are created in the world, while on average one person uses 10 to 20 applications on his mobile phone, even if he has installed a hundred. The creation of apps is synonymous with the extortion of money.

Regardless of enjoyment or trouble, data storage and analysis will play a huge role in the future. The digitisation of health data will open the possibility of legally, semi-legally or illegally manipulating a huge array of health data, both for marketing purposes and in optimising insurance issues, more or less ethically questionable, acceptable or unacceptable research, etc.

As well as attempts to digitize everything – from a doctor's and patient's direct or imaginative recording and a full MRI study in digital form to self-sensing and temperature readings, the need to hide the information will appear. Sooner or later, the doctor will need not to provide the whole world with information on decision-making, reasoning, risks. The problem of keeping a doctor's secret separate from the huge global data cemetery will have to be addressed.

This will be the matter of significant difference between the European and Chinese approaches: in China, all medical documentation will be available for research, including the gene map of each citizen. Due to legislative differences, China's medical

science will have great breakthrough opportunities in the near future. And there is no envy or regret: Europeans and Americans prefer to take care of their data security rather than global achievements.

Task Shifting – Attempts of the World Politicians and Financiers to Replace a Doctor With a Nurse or Public Health Worker as Preparing Physicians Seems too Expensive

Artificial intelligence will not replace the doctor, but will slowly push the human factor out of digital diagnostics and medicine. The world health care is not driven by money and new technologies, but by the doctor-patient relationship. The eternal question in medicine is about the main decision maker: who is it – the doctor, patient, doctor and patient (and relative), payer?

Demographic changes and population ageing are some of the essential factors to be taken into account for distant and not too distant future, visualizing national or even world development scenarios. Demographic change – population ageing, drain of working population to cities or global megalopolis – have an impact on society as a whole, the health system and the way healthcare is organised and funded.

The demographic impact is equally felt on the whole of society, including the age of medical specialists. Doctors in the richest countries of the world are aging, but the number of doctors increases too slowly, and this increase does not compensate for the growing health care problems. At European level, governments are hesitant to react sensibly to this situation, namely, to address the lack of medical staff by increasing the number of students and residents in universities, but supports the redeployment of the workforce from (slightly or significantly) poorer countries. The other solu-

tion, included in their strategy by national governments and politicians, is the change of tasks or task shifting. The World Health Organisation defines the task shifting as a delegation process, where appropriate, the tasks and functions of medical treatment are delegated to less specialised healthcare workers. This redeployment of workforce allows task shifting using the currently available human resources more efficiently.

Task shifting means delegation of a function to someone else. For example, at the beginning of the 20th century it was hard to imagine that a doctor might not perform an injection. At the beginning of the 21st century, this function is entirely delegated to a nurse, whose training is shorter and cheaper. Initially, only the doctor was entitled to measure blood pressure, do cupping and apply leeches, make incisions and perform other similar manipulations. Later these functions were assigned to nurses, paramedics or nursing assistants with some training. Governments are interested in making task shifting their strategy. There is the illusion that funds will be economised in this way. As a rule, governments take over from one another only the negative experience. A variant of the task shifting are efforts to reduce the professional autonomy of physicians and pharmacists. There are attempts to allow physicians to sell drugs or pharmacists to prescribe drugs.

To a large extent, task shifting is also promoted by a global document such as the 2018 WHO Declaration of Astana (now Nursultan), which directs universal and global medical coverage. The Astana conference was dedicated to the 40th anniversary of the AlmaAta conference.

Since the AlmaAta conference in 1978, the World Health Organization has set the task of providing primary care for every citizen of the planet. It is known as universal coverage and it became the basis of the Astana declaration. This document is carefully prepared, but the feeling still remains that its creators did not know or did not want to

know about social determinants, the document reminds of a debut in a global race. The document was produced by many governments and financial donors, but the result goes against the intent of the document: Instead of building stable health systems with high-quality primary care at the centre, the document looks like an excuse for a minimalist approach.

Patients around the world deserve physicians care. The quality of medical care and the right to access a fully trained doctor is a fundamental human right. Of course, in cases where there is no doctor (e.g. in certain African countries), it is helpful if there is at least a nurse in the village. And, of course, where there are no nurses (in the poorest countries of Africa or small islands), it might seem good if there is a public health worker trained for at least three months.

States should forget their pipe dreams that overloaded and burnout doctors will add even more working hours to their schedules. States should make every effort to increase the attractiveness of the GP service because it is this area that provides universal coverage and it is in this area that there are many opportunities for medicine to develop in every country of the world.

Future Medicine Means High-Quality Training of Students and Residents

Those, who after thirty years will be professors, specialty leaders in clinics and top specialists are finishing medical faculty or residency right now. In the world's richest countries, the average lifespan of people will increase by 6-10 years over the next thirty years, and in developing countries by 12 years. Advanced technologies in diagnostics and treatment, new communication techniques in medicine, but especially robotics tend to frighten both doctors and society only as long as they are completely

new. After a while, we often realize that what frightened us has become a useful tool in our profession. Science is increasingly distancing from everyday practices. There is no much difference for a general practitioner whether or not a particular patient has a certain genotype. Even if a doctor knows from the gene analysis that a particular patient is likely to develop obesity and hypercholesterolemia, he would suggest more moving around and sticking to a diet, just like he advises all other patients.

The more we will know and acquire knowledge via computer, the less we will understand what to do with this knowledge: we will diagnose a rare disease or a rare virus, but we will treat with bed rest and additional fluid intake, or we will ask permission and genotype every person on the planet, but 99.9% will not be able to use this information. Therefore, empathy and medical ethics should also be at the heart of the training process for future doctors. There is no reason to think that thirty years later devices like mobile phones and computers will have taken a full fledged place between a doctor and a patient. The main components of the doctor-patient relationship have not changed. They must not change, and it is unlikely to change in the next thirty years. A positive relationship between a doctor and a patient based on mutual trust is and will be an important factor for the patient health outcomes, and will always be good for doctors. For centuries, doctors in their profession have understood the importance of the code of ethics – from the Hippocratic Oath to the political documents of the World Medical Association. They define the professional autonomy of doctors as a cornerstone of the profession for ensuring patient health and well-being.

Physician autonomy and/or professional freedom are integral to ethics, empathy and deontology. A key prerequisite for this is high-level education, intelligence, integrity, courage and other virtues of the doctor himself. Artificial intelligence will also

come into post-graduate training and professional evaluation of doctors and it will be assessed not only by the number of conferences and lectures visited, but also based on such criteria as education, empathy, courage and integrity. On the other hand, the doctor's own well-being and attending to his health are finally included in the Declaration of Geneva because there is a direct correlation between the doctor's state of health, well-being and the ability to provide high standards of health care.

Future Hospitalisation – Change of the Direction from the Patient – the Medical Device to the Medical Device – the Patient

Today's hospital largely rests on the paradigm – devices are big and expensive, so the patient should go to hospital for examination or treatment. The future hospital will be a hospital at home:

- (i) future hospitals will be designed around the patient, not around the diagnostic devices. So, a hospital at home;
- (iv) a large part of the investigations will move from hospital to outpatient institution or, rather, home hospital;
- (iii) hospitals will be intended only for the critically ill;
- (iv) hospitals will be smaller than they are now, and there will be many intensive therapy beds, but very few other beds. Hospitals will look more like a hotel.

Future Pharmaceuticals – More Personalised Medicines, Digitized Administration and Computer Virus as a Real Threat of a Global Deadly Epidemic

Future medicine will largely advance to personalized medicine; a genome reader will enter medicine that will be able to read a

human genetic code within minutes. This information will play a key role in determining specific doses of medicines and choosing alternative medicines. Medicines prepared for an individual patient with a specified dosage and administration time will be common practice as commerce will be involved. In richer countries, drug dosing will be fully automated. The types of administration will change, but in any case, the share of oral medicinal products will be proportionally greater than that of parenteral products. New ways of medicine administration will appear. The increase of polypragmasia will be attempted to be put on brakes by the preparation of individual polydrug capsules. If people monitor smart devices, and they will not only report health problems but also administer medicines, these sensors, devices and systems will be networked, then the computer virus will be much more dangerous because it can actually kill someone. Cyber security will be much more significant.

Future Medical Triad: Doctor-Device-Patient

A future rank-and-file doctor is most easily to be imagined with expensive, small size and sophisticated tools. The following medical and diagnostic technology can be predicted with the highest probability:

- (i) miniature portable laboratories;
- (ii) substantially increased use of ultrasound in diagnostic and visualization, miniature ultrasound machines;
- (iii) dermatoscopes for each doctor, but with a high resolution image and immediately transmittable on the internet;
- (iv) a computer-like object used increasingly in daily diagnostics collecting a variety of data (genetic, laboratory, clinical);
- (v) the genome sequencing so cheap that it will allow the detection of disease-causing genes at a very low cost; it may be assumed that the genome will be determined at birth.

Medical and diagnostic patient technologies will be worn (clothes, glasses, footwear with

sensors), implanted or installed at home or workplace. It will be the internet of things in combination with fee-based intelligence in the sense that the flow of information will be exposed to artificial intelligence analysis, turning a stream of raw data into a thin, highly personalized knowledge beam. Digital companies with phenotyping (an *Amazon* phenotype that already knows everything about your shopping habits today) will transfer skills to digital medicines, but they will also let someone know what medicines the patient needs, how the body responds to medicines and specifies digital medicines. As a result, the data will become more specific, accurate and usable instead of general, variable and entertaining. Focusing on the reliability of data in health care will make it possible to focus on data compatibility arising from many different signals about the consumer life flow, which is much more important information for health-care knowledge than the payer's cash flow, a digital record with a doctor or a doctor's schedule.

Technology will therefore continuously measure patients' physiological and biochemical parameters by observing their behaviour, eating, breathing, elimination and living space. A patient will visit his GP with an even greater amount of data, especially about biochemistry and genetics. And it is still going to be screened with artificial intelligence. The data amount that will be provided by a universal coverage of patients and their environmental sensors, combined with genome and microbiome information, will be much greater than the ability of the human (doctor) to understand and summarize. Most of the futurological articles admire smart computer like small objects that will diagnose, monitor, report problems to the doctor today and in the future. It will indeed be a reminder of the need for tablets or other medicines, healthy lifestyle and proper eating, but following advice of the gadgets, like that given by medical practitioners of today, will be mostly determined by the patient cooperation, the ability to listen to the views on regular drug use, recommended sports ac-

tivities and non-smoking. It can be assumed that smart computer like small objects would serve more as an indulgence for not doing anything for the benefit of one's own health.

Therefore, even after 30 years, talking with a doctor (both a family doctor and a specialist) will be a "gold standard", but virtual reality will come into this discussion (probably not more than 10 years left for mobile phones). GPS 6 will replace avatars. 30 years later, there will be already expanded reality. The main megatrend that will transform medicine is digital technology.

The Answer to the Headline Question: will Technology and Policy Change the Doctor-Patient Relationship or Change the Doctor's Place in Society and Medicine?

Technology will affect physician-patient relationships, they will become increas-

ingly remote, and a computer or a similar smart object in different forms will be increasingly in the middle. Artificial intelligence will enter diagnostics, show potential diagnoses in radiological examinations, laboratory parameters, but decision-making and further treatment will remain between doctors and patients. In medicine, if not through the door, global digital technology and programming will come through the window to analyse the patient's genome, viruses, drug effectiveness, risks and treatment scenarios by taking a large part of the funding. But here too, for at least the next thirty years, the decision will be taken and upon action decided between the physician and the patient during their conversation.

With the population ageing, the proportion of chronic patients increasing, combined with multimorbidity and polypragmasia, the number of doctors will grow globally, at both absolute and relative rates, and after 30 years on average doctors will be signifi-

cantly older than today. Unfortunately, the role of each particular doctor in society will be reduced, while the overall share of medicine in national economy will grow: health-care, medicine and pharmaceuticals together will be the main economic sector exceeding 25% of gross national product. Today, the global health care industry is estimated at seven trillion. Half of the earnings, with the largest share of the profit, are in the USA. By 2049, globally, there will be forty trillion dollars worth of vodsels hardware, tools and pharmaceutical industry, and more than half of that, with most of its profits in Asia and more than 15% in Africa. Global megatrend is the globalization of the free market and capitalism; health care and medicine will move toward population growth over the next 30 years.

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