NEWSLETTER OF THE FRIENDS OF THE ISRAEL HEART SOCIETY

האיגוד הקרדיולוגי בישראל
ISRAEL HEART SOCIETY

Editor's Note: Welcome to the Fall 2017 FIHS Newsletter. We wish all of our readers and members a Shannah Tovah U'metuka- a Happy and Healthy New Year.

This issue will include its usual features- a message from our President, Jeff Goldberger, announcements of Cardiology Meetings, and recently published research from Israel.

In addition, we include research papers and other news of interest to our members. Finally, we have an article on Dr. Ran Kornowski, the new President of the Israel Heart Society. There is also an article by John Gordon Harold MD from *Cardiology* on the evolution of TAVR and its relationship with Israeli Cardiology.

Please note- description of new technology in our Newsletter does not constitute an endorsement. We just want to give our readership a sense of the vast scope of Israeli ingenuity in the fields of Cardiology.

Remember, this Newsletter and Society belong to you, the membership. We look forward to enhancing this Society and the connections that we hope to foster between Israeli and non-Israeli cardiologists and their institutions. Please feel

free to email us with questions, answers, comments, criticisms, or just to tell us to keep working harder!

Our immediate goal is to try to grow our membership and participation to include any and all cardiologists and fellows from around the world who would be interested in supporting this bridging relationship. If you know of any cardiologists or cardiology fellows who we can contact, please email me (my email is jackstroh@usa.net) and feel free to forward this Newsletter.

Message from the President

We extend to all the Friends of the Israel Heart Society our best wishes for a happy and healthy new year!

The Friends of the Israel Heart Society has now been in existence for over a decade. There have been many wonderful programs and experiences that have been promoted by the Friends of the Israel Heart Society. Most importantly, the ongoing support and friendship that the Friends

of the Israel Heart Society provides to our colleagues in Israel is greatly appreciated by the Israel Heart Society.

We have been discussing with the Israel Heart Society leadership what we can do to help further support cardiology in Israel. The top item on the list is to provide further opportunities for advanced training for Israeli fellows at our institutions. This is a complex endeavor requiring both financial support for positions and institutional support for the logistics. We hope to advance a plan this year that will begin to tackle this issue.

We will continue with our current programs for fellow exchanges for conferences – we will continue to provide support for travel awards for Israeli cardiology fellows to attend the American College of Cardiology meeting. We would like to hear from you regarding further programs or ideas that you would like to initiate!

I would like to remind our membership that we have many more opportunities to get involved with the Friends of the Israel Heart Society and the Israel Heart Society. There are several cardiology conferences held in Israel encompassing various subspecialty areas and the Israel Heart Society general meeting. I can attest to the high quality of these meetings with ample opportunity for medical engagement, interaction with colleagues, and touring. Consider targeting one of these meetings for a visit to Israel. Please contact us if you have any questions.

We are also still not reaching large numbers of our colleagues who are indeed friends of the cardiology community in Israel. Please take a few moments to forward this newsletter to a few colleagues. If you have a few more moments, contact them to encourage them to sign up for membership.

We are now entering our ninth year of the newsletter. Special thanks to Jack Stroh for his continued energy and enthusiasm for leading the newsletter and kudos to all the contributors

It is also a good time to check if you have renewed your membership for 2017 - we would be delighted if you would consider a sponsorship level of support. We appreciate, in particular, those of you who have joined at one of the sponsorship levels. All the information is available on our website. Annual membership can be paid through the FIHS website at: http://www.friendsihs.org/index.html.

Finally, I want to thank all of our members who have donated their time and effort for the benefit of the Israel Heart Society. Please remember that our members are encouraged to send in news – personal and/or professional – to include in our **FIHS Heart Beats** section.

Thank you for your continued support!
Once again, best wishes for a happy and healthy new year,

Jeff Goldberger, M.D.
President, Friends of the Israel Heart Society

Meetings

International Dead Sea Symposium of Sport and Arrhythmia

Hilton Hotel, Tel Aviv

October 16-18, 2017

https://idss-sport.com/

Following the tremendous success of the 2016 IDSS which was attended by more than 700 participants from 38 countries, it is with great pleasure that we invite you to the International Dead Sea Symposium (IDSS) of Sport and Arrhythmia, scheduled for October 16-18, 2017.
The International Program Committee in close collaboration with leading scientific and sport associations is preparing a unique and stimulating scientific program for professionals on all aspects of sport and arrhythmias. The program is designed to meet the continuing education needs of cardiologists, sport & family physicians, general practitioners, military & rehabilitation physicians, orthopedic surgeons, physiotherapists, technicians in fitness centers, athletic trainers and allied health professionals.
The 2017 symposium will put a spotlight on the following topics: reasons for sudden cardiac death in athletes, screening programs and ways to prevent SCD, physiological and pathological processes related to sport activity leading to anatomical and electrical remodeling of, the contemporary approach to eligibility and disqualification from sports participation in patients with inherited arrhythmic disorders or congenital heart disease, sport activities in amateur athletes with structurally abnormal hearts, cardiac implantable devices in athletes and other hot topics.
The IDSS Sports and Arrhythmia will be held in the elegant and picturesque venue of the Hilton Convention Center Tel Aviv. It will take place concurrent to the 8th Asia-Pacific Congress on Sports Technology (APCST) 2017, which will focus on sports technologies.
We look forward to the pleasure of hosting you at what promises to be an exciting and fruitful meeting of a high scientific standard.

- **Elijah R Behr**, MA, MBBS, MD, consultant cardiologist at St George's Hospital, St George's University of London, UK.

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- **Yonatan Buber**, MD, Director of the Adult Congenital Heart Disease Service at the Leviev Heart Center at Sheba Medical Center, Tel Hashomer, Israel.
- **Riccardo Cappato**, MD, Chief Arrhythmia & Electrophysiology Center, Policlinico San Donato, University of Milan, Italy.
- **François Carré**, MD, PhD, Professor in cardiovascular physiology and exercise physiology at the Department of Medical Physiology, University of Rennes, France.
- **Naama Constantini**, MD, DFM, FACSM, Dip. Sport Med. (CASM), Professor and Director, Sport Medicine Center, Shaare Zedek Medical Center, Chair, National Council for Women's Health, Ministry of Health Exercise is Medicine Center, The Hebrew University, Jerusalem, Israel.
- **Gal Dubnov-Raz**, MD, MSc, Director, Out-patients Clinic, Sport and Exercise Medicine Service, Sheba Medical Center, Tel Hashomer, Israel.
- **Michael Eldar,** MD, Professor of Cardiology at the Leviev Heart Center at Sheba Medical Center, Tel Hashomer, Israel.
- **Rami Fogelman**, MD, Director EP and Pacing Unit, Schneider Children Medical Center, Petach Tikva, Israel.
- **Hein Heidbuchel,** MD, Profes sor and Chair of Cardiology, Antwerp University, Antwerp, Belgium.
- **Andrei Keren,** MD, Professor Emeritus of Medicine (Cardiology), Hadassah-Hebrew University School of Medicine, Jerusalem, Israel.
- **Joel Kirsh**, BASc, MSc, MD, Head, Arrhythmia Service, Director, Cardiac Outpatient Clinic, Associate Professor of Pediatrics, Pediatric Cardiology, and Cardiac Electrophysiology, Hospital for Sick Children, Toronto, Canada.
- **Robert Klempfner**, MD, Director, Cardiac Rehabilitation, Sheba Medical Center, Tel Hashomer, Israel.
- **Rachel Lampert,** MD, Professor of Medicine/Cardiology, Yale University School of Medicine, CT, USA.
- **Ronen Loebstein,** MD, Director, Institute of Clinical Pharmacology and Toxicology, Sheba Medical Center, Ramat Gan, Israel.
- **Lluis Mont**, MD, PhD, Professor of Cardiology, Head

of Arrhythmia Section, University of Barcelona, Spain.
- **Brian Olshansky**, MD, Professor of Medicine, University of Iowa Hospitals, Iowa City, LA, USA.
- **Antonio Pelliccia**, MD, PhD, Professor of Cardiology, Scientific Director, Institute of Sports Medicine & Science, Rome, Italy.
- **Raphael Rosso**, MD, Director, Electrophysiology Service, Cardiology Department, Tel Aviv Sourasky Medical Center and Sackler School of Medicine, Tel Aviv, Israel.
- **Sanjay Sharma**, MD, Professor of Cardiology, St. George's Healthcare NHS Trust, Medical Director of the London Marathon, London, UK.

International Conference for Innovations in Cardiovascular Systems-2017

December 3-5, 2017

David Intercontinental Hotel, Tel Aviv

Meeting Directors-

Dr. Rafael Beyar

Dr. Chaim Lotan

ICI Meeting 2017 – the premier International Conference for Innovations in Cardiovascular Systems (Heart, Brain and Peripheral Vessels) and High-Tech Life Science Industry, will be held in Israel, December 3-5, 2017.

The ICI Meeting is an acclaimed forum which aims to explore fuel, spark and be involved in the innovations that will shape the future of our cardiovascular systems and BEYOND. Over the last 2 decades, Israel has become a medical "start-up nation". ICI's dynamic environment which allows rich exchanges on

innovations has contributed to this process by facilitating global interaction between physicians, entrepreneurs, academia and industry and by building bridges leading to innovation.

The ICI meeting is preceded by the ICI Academy of Innovation Day – a full-day pre-conference educational workshop satellite, which trains participants in the entire medical innovation process. We then continue to a 2-day conference focusing on advanced technologies to save hearts and lives. We challenge the horizons in coronary interventions, vascular interventions, transcatheter valvular therapies, stroke prevention/intervention, electrophysiology, cell therapy and heart failure. The popular "Technology Parade" offers biomedical technology start-ups from around the world the opportunity to present their latest developments. The unique "Wall-to-Wall – East Meets West" sessions concentrate on China-Israeli cooperation in the field.

http://2017.icimeeting.com/

For the faculty-
http://2017.icimeeting.com/meet-our-faculty/

The 65th Annual Conference of the Israel Heart Society in Association with the Israel Society of Cardiothoracic Surgery, under the Auspices of the Israel Cardiology Association

David Intercontinental Hotel, Tel Aviv

April 24-25, 2018

Topics:

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- Adult Congenital Heart Disease / Pediatric Cardiology
- Basic Science
- Cardiac Imaging
- Echocardiography and Valvular Diseases
- Heart Failure
- Intensive Care / Myocardial/Pericardial Diseases
- Interventional Cardiology
- Pacing and Electrophysiology
- Rehabilitation/Epidemiology / Prevention and Risk Factors
- /Pharmacotherapy and Cardiac Pharmacology

Joint Sessions:

EUROPEAN SOCIETY OF CARDIOLOGY®

JOINT SESSION: EUROPEAN SOCIETY OF CARDIOLOGY (ESC) & ISRAEL HEART SOCIETY

AMERICAN COLLEGE of CARDIOLOGY

JOINT SESSION: AMERICAN COLLEGE OF CARDIOLOGY (ACC) & ISRAEL HEART SOCIETY

JOINT SESSION: AMERICAN HEART ASSOCIATION (AHA) & ISRAEL HEART SOCIETY

JOINT SESSION: L'ASSOCIATION FRANCO-ISRAÉLIENNE DE CARDIOLOGIE (AFICARDIO) & ISRAEL HEART SOCIETY

JOINT SESSION: SOCIETY OF CARDIOVASCULAR COMPUTED TOMOGRAPHY (SCCT) & ISRAEL HEART SOCIETY

FACULTY

Stefan Anker, Germany

Stephan Achenbach, Germany

Valentin Fuster, USA

Jeroen Bax, Netherland

Tali Porter, Israel

Ronen Durst, Israel

Nir Uriel, USA

Ariane Marelli, Canada

Stephan Windecker, Switzerland

Amit Segev, Israel

Ron Waksman, USA

Dear Friends and Colleagues,

The 65th Annual conference of the Israel Heart Society in association with the Israel Society of Cardiothoracic Surgery will take place at the Convention Center of the David Inter-Continental Hotel in Tel Aviv, Israel on April 24-25, 2018.

The upcoming meeting will combine original scientific contributions and invited talks divided into plenary and parallel sessions in the various subspecialties of cardiovascular medicine. We are also proud to host large number of distinguished, world-renowned international guest speakers and leaders from the European Society of Cardiology (ESC), the American College of Cardiology (ACC), the American Heart Association (AHA), the Society of Cardiovascular CT (SCCT), AFICARDIO (French-Israeli Association in Cardiology) and UK-Israeli joint session. According to the attendees' request, we will supplement the 2018 meeting with additional educational sessions, some novel collaborative sessions and we will continue the tradition of conducting a unique session of women in cardiology and dedicated sessions for the trainees.

While oral presentations may be presented in English or Hebrew, the plenary joint sessions of the Israel Heart Society with the joint international sessions will be spoken in English and will

include cutting-edge lectures on the latest advances in cardiology. Poster will be presented in English.
A detailed program including both invited and local speakers is available, for details click here.
An interesting exhibition of innovative devices and pharmaceutical companies will be presented in the exhibit hall within the convention site.

The meeting will take place in Tel-Aviv, a lively city combining modern facilities in a Mediterranean style. The meeting venue is located at David Intercontinental Hotel, facing the wonderful promenade of the Tel Aviv beach.
We therefore welcome you to submit your abstracts by December 31, 2017 and to join us at this exciting conference combining high quality basic and clinical research, innovative technologies in a unique and friendly scientific atmosphere.

We do hope that you will take the opportunity to participate in this esteemed scientific meeting and look forward to welcoming you on a wonderful visit to Israel in 2018.

Ran Kornowski, President

Ronen Rubinshtein, Secretary General & Treasurer

Israel Heart Society

Ehud Raanani, Chairman
Erez Kachel, Secretary
Amit Korach, Treasurer

Israel Society of Cardiothoracic Surgery

For information:

http://2018.en.israelheart.com/

For abstracts:

http://2018.en.israelheart.com/745-2/

11th International Conference Acute Cardiac Care

June 11-12, 2018

Tel Aviv, Israel

The ***11th International Conference on Acute Cardiac Care*** will be held in Tel Aviv on June 11-12, 2018. The Cardiology Conference will feature three parallel medical streams, with over 100 presentations, including: satellite symposia, keynote and plenary lectures, debates, clinical interactive case presentations and poster presentations over two days. In addition to the medical streams, there will be a parallel nursing stream. The program is diverse and includes content that will satisfy all participants interested in acute cardiac care.

The Cardiology Conference will be held under the auspices of the Israel Heart Society (IHS), and in collaboration with the ESC Acute Cardiovascular Care Association, the ERC European Resuscitation Council, the Israel Working Group on Acute Cardiac Care of the IHS, the Israeli Association for the Advancement of Cardiac and Intensive Care Nursing and the Israel Society of Anesthesiologists.

Steering Committee
***Joseph S. Alpert*, USA, Co-Chair**
***Yonathan Hasin*, Israel, Co-Chair**
***Doron Zahger*, Israel, Co-Chair**

***Maddalena Lettino,* President, ESC Acute Cardiovascular Care Association**

***Zaza Iakobishvili*, Israel, Secretary General**

***Shlomi Matetzky*, Israel, Scientific Secretary**

***Ofra Raanan*, Israel, Nursing Coordinator**

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***Yaron Bar-Lavie*, Israel, Critical Care**

***Giora Landesberg*, Israel, Anesthesiology**

For information contact:

https://cardiology-2018.isas.co.il/

14th International Dead Sea Symposium

David Intercontinental Hotel, Tel Aviv

October 28-31, 2018

http://2018.idss-ep.com/

TOPICS

MAIN TOPICS

Innovations in Cardiac Implantable Devices*
Innovations in Ablation Techniques*
Innovations in Imaging and Navigation Techniques*
Innovations in Non-Invasive Electrophysiology*
Heart & Brain: Newest Approaches in Brain Protection
Wireless Device Diagnostics and Therapeutics
New Implanted Devices (leadless, epicardial, subQ, etc)
Remote Monitoring of Implanted Devices
Cell-Based and Stem Cell Therapy
Sudden Cardiac Death
Atrial Fibrillation
CHF
Clinical Trials
Controversy
Entrepreneurship in Electrophysiology

SPECIAL TOPICS

Cardiac Pacing
ICD
Out-of-Hospital Cardiac Arrest
Genetic Aspects of

Arrhythmia
Arrhythmias in Childhood
Arrhythmias in Athletes
Syncope
Ablation of AF-various Techniques
LAA Occluders
Lead Extraction
Robotics in Electrophysiology
TAVI and Pacing
Basic Aspects of Defibrillation
Arrhythmias in Out-patient Clinic
Management of Recalls: Legal, Emotional & Ethical Considerations
Pacing & ICDs Registry
Healthcare Economics of Pacing and ICD

ORGANIZERS:

I. Eli Ovsyshcher
MD, PhD, FESC, FACC, FHRS, MAHA
Professor of Medicine/Cardiology
President of the IDSS

Michael Eldar
MD, FESC, FACC, FHRS
Professor of Cardiology
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Michael Glikson
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Professor of Cardiology
President of the IDSS

Israel Cardiology News

Israel's health system ranks as one of the best globally

Comparative study shows Israelis enjoy top health care, but need to work on environmental protection. (Editors note: We include this for general information, even though not exclusively Cardiac).

By Chana Roberts, 28/07/17

http://www.israelnationalnews.com/News/News.aspx/233106

A recent study ranked Israel's health care system as the ninth-best in the world, the UK's *Business Insider* reported.

The research, conducted by the London-based Legatum Institute, compared 104 variables and listed nine subindexes. The study examined three basic components of health: availability of preventive care, health infrastructure, and citizens' physical and mental health.

149 countries were included in the comparison, with Israel included in the top ten. These ten were, in order:

1. Luxembourg

One of the wealthiest nations, Luxembourg has a life expectancy of 82. Luxembourg came in first in the research's health and personal freedom subindices, and second in their safety subindex.

2. Singapore

Singapore came in first place for safety, and second for health. Its 5.6 million citizens have an average life expectancy of 83.1 years.

3. Switzerland

With mandatory health insurance, Switzerland came in third in the study's health subindex and first in the education subindex. However, the European country ranked eighth in safety and eighteenth in personal freedom.

4. Japan

With the highest average life expectancy - 83.7 -years, it may not be a surprise that Japan's health index ranked fourth highest. The Asian "Land of the Rising Sun" also came in third for safety.

5. Netherlands

Though the Netherlands came in fifth for best health, they ranked second economic quality and education, and fourth in governance. However, in 2015 the Netherlands ranked at the top of the annual Euro health consumer index, which compares healthcare systems in Europe, scoring 916 of a maximum 1,000 points.

6. Sweden

Sweden ranked sixth on the study's health index and fifth on its governance index. With the fourth highest life expectancy in the world, the average Swedish man will live 80.7 years.

7. Hong Kong

Ranking seventh in health and fourth in business environment, Hong Kong has 53 hospitals (42 public and 11 private) for its population of 7.2 million.

8. Australia

Australia ranked second in personal freedom, fourth in education, seventh in business environment, and eight in health. With the best health ranking in the southern hemisphere, Australia's life expectancy is 82.8, placing it as fourth highest globally.

9. Israel

Israel received the highest health rating in the Middle East, and its citizens have a life expectancy of 82.5 years - eighth highest in the world. The country's single-payer, multiple-provider system ensures that every citizen receives health coverage, yet insurance providers must compete in order to draw clients and receive funding.

10. Germany

Germany ranked fifth in business environment, seventh in safety, ninth in social capital, and tenth in health care and governance. With an average life expectancy of 81, Germany's citizens are some of the healthiest in the world.

In January 2016, Israel ranked as the world's eighth most powerful country, and in May of that year, the country's average life expectancy was declared fifth highest in the world. In June 2016, two of Israel's universities ranked in Asia's top 20, and six made the top 200.

Earlier this year, Israel ranked fourth in the list of best countries for expats and families.

Not all is rosy, though: Despite Israel's high ranking in health, it came in 133 - out of 149 - in the quality of the natural environment, environmental pressures, and preservation efforts.

Mending Broken Hearts: Israeli Scientists Find the Molecule that Regenerates Heart Cells

By Anouk Lorie, NoCamels June 19, 2017

http://nocamels.com/2017/06/molecule-agrin-regenerates-heart-cells/?utm_source=activetrail&utm_medium=email&utm_campaign=nc4/5/17

Heart disease remains the leading cause of death worldwide, yet the few available treatments are still mostly unsuccessful once the heart tissue has suffered damage. Mammalian hearts are actually able to regenerate and repair damage – but only up to around the time of birth. Afterward, that ability disappears, seemingly forever.

Research at the Weizmann Institute of Science has uncovered a molecule in newborn hearts that appears to control the renewal process. When injected into adult mouse hearts injured by heart attacks, this molecule, called Agrin, seems to "unlock" that renewal process and enable heart muscle repair. These findings are already pointing to new directions for research on restoring the function of damaged hearts.

Human heart cells cannot regenerate

Prof. Eldad Tzahor, who led the study with Elad Bassat, Alex Genzelinakh and other team members in the Weizmann Institute's Molecular Cell Biology Department, explains that following a heart attack in humans, the healing process is long and inefficient. Once damaged, muscle cells are replaced by scar tissue, which is incapable of contracting and thus cannot participate in pumping. This, in turn, leads to further stress on the remaining muscle and eventual heart failure.

Heart regeneration into adulthood does exist in some of our fellow vertebrates. Fish, for example, can efficiently regenerate damaged hearts. Closer relatives on the evolutionary tree – mice – are born with this ability but lose it after a week of life. That week gives Tzahor and his lab a time window in which to explore the cues that promote heart regeneration.

Looking for outside sources

Tzahor and Bassat believed that part of the secret might lay outside of the heart cells themselves – in the surrounding supportive tissue known as the extracellular matrix, or ECM. Many cell-to-cell messages are passed through this matrix, while others are stored within its fibrous structure. So the team began to experiment with ECM from both newborn and week-old mice, clearing away the cells until only the surrounding material was left, and then observing what happened when bits of the ECM were added to cardiac cells in culture. The researchers found that the younger ECM, in contrast to the older, elicited the proliferation of heart muscle cells.

A screening of ECM proteins identified several candidate molecules for regulating this response, among them Agrin.

In mouse hearts, levels of this molecule drop over the first seven days of life, suggesting a possible role in heart regeneration. The researchers then added Agrin to cell cultures and noted that it caused the cells to multiply.

Next, the researchers tested Agrin on mouse models of heart injury, asking whether it could reverse the damage. They found that following a single injection of Agrin mouse hearts were almost completely healed and fully functional, although the scientists were surprised to find that it took over a month for the treatment to impart its full impact on cardiac function and regeneration. At the end of the recovery period, however, the scar tissue was dramatically reduced, replaced by living heart tissue that restored the heart's pumping function.

In other words, Tzahor speculates that in addition to causing a certain amount of direct heart cell renewal, Agrin somehow affects the body's inflammatory and immune responses to a heart attack, as well as the pathways involved in suppressing the scarring, which leads to heart failure. The length of the recovery process, however, is still a mystery, as the Agrin, itself, disappears from the body within a few days of the injection.

"Clearly this molecule sets a chain of events in motion" he says. "We discovered that it attaches to a previously unstudied receptor on the heart muscle cells, and this binding takes the cells back to a slightly less mature state – closer to that of the embryo – and releases signals that may, among other things, initiate cell division." Experiments with mice that were genetically engineered to lack Agrin in their hearts further support this

idea: In its absence, newborn mice could not properly regenerate heart tissue following injury. Because mice cannot live without the other functions of Agrin, this was a technically challenging experiment to perform, adds Tzahor.

Testing on human heart cells proves successful

The team then proved that Agrin has a similar effect on human heart cells grown in culture. He and his team are now working to understand exactly what happens in the period of time between the injection of Agrin and the return of full cardiac functionality. In addition, members of Tzahor's team have started pre-clinical studies in larger animals in Germany in collaboration with Prof. Kupatt of the Technical University of Munich to determine the effect of Agrin on cardiac repair.

Among other things, the findings of this study have highlighted a role for the ECM in both directing heart growth and promoting regeneration, and this insight may help in the design of breakthrough biomedical research.

Surgeons Implant Revolutionary New Device To Treat Heart Failure

By Einat Paz-Frankel,
NoCamels September 04, 2017

http://nocamels.com/2017/09/surgeons-implant-heart-device-corolla-corassist/

More than 23 million people worldwide suffer from diastolic heart failure, a condition in which the heart fails to pump sufficient oxygenated blood to meet the body's needs. Scientists around the globe have been looking for an effective treatment for this condition for years.

Now, a unique device developed by Israeli company CorAssist gives new hope to those who suffer from this medical condition. Recently, Israel's Rambam Hospital was the first to use this device in a 72-year-old Canadian man admitted specifically for this procedure.

Heart failure symptoms include shortness of breath, tiredness, swollen legs and limited ability to exercise or perform simple physical tasks. The prognosis of heart failure is poor; more than 40 percent of heart failure patients die within five years of diagnosis.

There are several types of heart failure based on the mode of heart dysfunction. Diastolic heart failure occurs when the left ventricle fails to relax and adequately refill with blood (diastolic phase of the heart cycle), resulting in a high filling pressure, congestion and shortness of breath.

Approximately half of heart failure patients suffer from diastolic heart failure. The incidence of diastolic heart failure increases with age, and is common among women with hypertension, obesity and diabetes. According to Rambam Hospital, there is currently no effective proven treatment for this condition.

Enter Israel's CorAssist, which developed the CORolla, an elastic device that is implanted inside the left ventricle of the heart by a minimally invasive procedure on a beating heart. The device can improve cardiac diastolic function by applying direct expansion force on the ventricle wall to help the heart fill with blood.

Founded in 2003, CorAssist has so afar raised $10 million from venture capital firms Argonaut Ventures, Aurum Ventures and Evergreen Venture Partners. Its technology was invented by company founder Dr. Yair Feld, a cardiologist at Rambam Health Care Campus, together with Dr. Yotam Reisner and Dr. Shay Dubi.

Rambam's Prof. Gil Bolotin and Dr. Arthur Kerner recently led a multi-disciplinary team of cardiologists, heart surgeons, and other Rambam medical professionals in the first clinical implantation surgery on a 72-year old patient.

Robert MacLachlan had run out of treatment options in Canada for his diastolic heart failure, when his wife read about the CORolla implant on the Internet. After the surgery, the patient was discharged and is now feeling well back at his home in Canada, a spokeswoman for Rambam tells NoCamels.

The CORolla heart implant by CorAssist

According to Bolotin, while many potential applicants were interested in the procedure, no one wanted to be the first –

except MacLachlan. “This latest medical breakthrough from Rambam represents the best of Israeli health care innovation and commitment to improving the quality of life for all people,” Richard Hirschhaut, National Director of the American Friends of Rambam Medical Center, tells NoCamels. “I am proud that Rambam offers treatments to patients not available anywhere else in the world.”

Photos: Courtesy of Rambam Medical Center

Israeli Surgeons Perform Rare In-Utero Heart Operation To Save Fetus’ Life

By Einat Paz-Frankel, NoCamels July 16, 2017

http://nocamels.com/2017/07/heart-surgery-fetus-hadassah/

For the first time in Israel, an interdisciplinary team of Hadassah doctors performed a risky and delicate procedure called “aortic balloon valvuloplasty” in-utero, to save the life of a 28-week-old fetus with a severe heart defect.

Aortic valvuloplasty is the widening of the aortic valve using a balloon catheter inside the valve. This procedure was performed last week inside the womb of a woman, at Hadassah Hospital Ein Kerem in Jerusalem.

The operation, which widened the fetus’ aorta, is almost identical to an adult catheterization. One day after the surgery, the condition of

the fetus' heart improved significantly.

The surgical team was led by Dr. Azaria Rein, Director of Pediatric Cardiology at Hadassah, a world-renowned authority on embryonic birth defects.

"The diagnosis was a critical narrowing of the aortic valve, which was also accompanied by severe damage to the function of the left ventricle that was barely able to contract," Rein said in a statement. "Without treatment, the left ventricle would likely degenerate and not be able to transfer blood to the baby's body after birth."

"Trailblazers in the field of embryology and cardiology"

The surgery was performed under epidural anesthesia for the mother and anesthesia for the fetus. "We inserted a very delicate needle through the mother's abdominal wall directly to the left ventricle of the fetal heart," Gielchinsky explains. "It was a complex and delicate procedure that required maximum concentration and precision."

Then, Gavrim passed a narrow wire through the needle to the aorta, through the valve with a balloon that was inflated to enlarge the aorta. "Immediately after the operation, we saw an improvement in blood flow through the valve," he says, noting that on the morning after the surgery, the function of the left ventricle in the fetal heart improved significantly.

Hadassah Medical Organization was the first hospital in Israel to perform this

rare procedure, which is done in only a few centers around the world, according to Gielchinsky. “We are now trailblazers in the field of embryology and cardiology,” he said.

Additional doctors taking part in this complex surgery include Dr. Sagi Gavrim, Director of Pediatric Catheterization Services; Dr. Yuval Gielchinsky, Head of Obstetrics Medicine; Dr. Simcha Yagel, Director of Obstetrics and Gynecology; obstetrician and gynecologist Dr. Nili Yanai; and anesthesiologist Dr. Carolyn Weiniger.

The world’s first-ever dual robotic surgery

Recently, Hadassah Hospital Ein Kerem surgeons preformed the world’s first-ever dual robotic surgery, using Israeli technology. The 42-year-old patient who underwent the procedure is able to walk again after a heavy steel frame had fallen on him.

The revolutionary dual robotic surgery, performed earlier this year, repaired a severe spinal fracture suffered by a factory worker who had been injured when a steel object pinned him to the ground, fracturing his leg in two places and breaking six of his spinal vertebrae.

The pioneering procedure utilized two robots, Siemens’ Artis Zeego and Mazor Robotics’ Renaissance Guidance System. The latter is a screw placement system, which allows spinal implant placement with safety and

accuracy, and was developed in Israel. Mazor Robotics' guidance systems enable surgeons to conduct spine and brain procedures in a precise manner.

Israeli researchers say they have new way to combat heart disease, stroke

Ben-Gurion U and Sheba Medical Center scientists announce creation of nano-polymer that may be better than statins

By **SHOSHANNA SOLOMON**, May 22, 2017

http://www.timesofisrael.com/israeli-researchers-say-they-have-new-way-to-combat-heart-disease-stroke/

Researchers at Ben-Gurion University of the Negev and the Sheba Medical Center said they have have developed a way to treat atherosclerosis and prevent heart failure with a new biomedical polymer that reduces arterial plaque and inflammation in the cardiovascular system.

Atherosclerotic cardiovascular disease causes 56 million deaths annually worldwide, according to the 2015 Lancet Global Burden of Disease Report. Arteries are lined by a thin layer of cells called the endothelium which keep them toned and smooth and maintain blood flow. Atherosclerosis begins with damage to the endothelium and is caused by high blood pressure, smoking or high cholesterol. The resulting damage leads to plaque formation.

When endothelial cells become inflamed, they produce a molecule called E-selectin that brings white blood cells (monocytes) to the area and causes plaque accumulation in the arteries.

"Our E-selectin-targeting polymer reduces existing plaque and prevents further plaque progression and inflammation, preventing arterial thrombosis, ischemia, myocardial infarction, and stroke," said Prof. Ayelet David of the BGU Department of Clinical Biochemistry and Pharmacology in a statement.

This new nano-polymer has several advantages, the researchers said. First, it reverses arterial damage and improves the heart muscle. At present, there are several available treatment options for atherosclerosis, but no other therapy reverses arterial damage and improves the heart muscle. Also, the polymer targets only damaged tissue and does not harm healthy tissue so it has no side effect — unlike statins, which are currently the leading medication used for treating atherosclerosis.

Patented and in preclinical stage, the new polymer has been tested on mice with positive results. In a study that has been submitted for publication, the researchers treated atherosclerotic mice with four injections of the new biomedical polymer and tested the change in their arteries after four weeks.

BGU's Prof. Ayelet David (Dani Machlis/BGU)

"We were stunned by the results," said Prof. Jonathan Leor, director of the Cardiovascular Research Institute of the Sheba Medical Center and professor of cardiology at Tel Aviv University, who collaborated with David on the research study. "The myocardial function of the treated mice was greatly improved; there was less inflammation and a significant decrease in the thickness of the arteries."

"We achieved an adherence level similar to that of an antibody, which may explain the strong beneficial effect we observed," said David.

David and Leor suggested that this polymer-based therapy can also be helpful to people with diabetes, hypertension and other age-related conditions, impacting the lives of millions of people.

"We are now seeking a pharmaceutical company to bring our polymer therapy through the next stages of drug development and ultimately to market," said Dr. Ora Horovitz, senior vice president of business development at BGN Technologies, BGU's technology and commercialization company.

RESEARCH

The Prognostic Effects of Coronary Disease Severity and Completeness of Revascularization on Mortality in Patients Undergoing Transcatheter Aortic Valve Replacement

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http://www.interventions.onlinejacc.org/content/10/14/1428?sso=1&sso_redirect_count=2&access_token=EccyIPjDK33T3O5Rb317wcMLF8IKwY6D6VmxwX9vha2jr3pNBFWZLI55FZNLNo46r7sfHoOCzZbnPQ93MWNv5ENZruIN1CVPJZTQKvJXHTIh6p2axAsMIlwZ

Abstract

Objectives The study sought to examine the effect of coronary artery disease (CAD) on mortality in patients undergoing transcatheter aortic valve replacement (TAVR).

Background CAD is common in the TAVR population. However, there are conflicting data on the prognostic significance of CAD and its treatment in this population.

Methods The authors analyzed 1,270 consecutive patients with severe aortic stenosis (AS) undergoing TAVR at 3 Israeli centers. They investigated the association of CAD severity (no CAD, nonsevere CAD [i.e., SYNTAX score (SS) <22], severe CAD [SS >22]) and revascularization completeness ("reasonable" incomplete revascularization [ICR] [i.e., residual SS <8]; ICR [residual SS >8]) with all-cause mortality following TAVR using a Cox proportional hazards ratio model adjusted for multiple prognostic variables.

Results Of the 1,270 patients, 817 (64%) had no CAD, 331 (26%) had nonsevere CAD, and 122 (10%) had severe CAD. Over a median follow-up of 1.9 years, 311 (24.5%) patients died. Mortality was higher in the severe CAD and the ICR groups, but not in the nonsevere CAD or "reasonable" ICR groups, versus no CAD. After multivariate adjustment, both severe CAD (hazard ratio: 2.091; p = 0.017) and ICR (hazard ratio: 1.720; p = 0.031) were associated with increased mortality.

Conclusions Only severe CAD was associated with increased mortality post-TAVR. More complete revascularization pre-TAVR may attenuate the association of severe CAD and mortality.

TABLE 1 Patient Characteristics According to CAD Severity

	Overall (N = 1,270)	No CAD (n = 817)	Nonsevere CAD (n = 331)	Severe CAD (n = 122)	p Value
Age, yrs	81.3 ± 7.01	81.3 ± 7.14	81.1 ± 6.53	81 ± 8.31	0.169
Female	53.8	60.4	43.7	29.8	<0.001
Aspirin	64.5	57.4	76	87.5	<0.001
ACE-I	75.1	71.9	78.1	96.7	0.004
Statin	81.4	75.9	91.2	93.3	<0.001
Beta-blockers	68.4	67.6	67.5	84.4	0.332
OAC	24.2	27	19.3	20	0.145
Previous CABG	19.9	–	36.7	41.8	<0.001
Previous PCI	27.8	–	49.1	55.9	<0.001
Previous MI	14.6	–	23.4	23.6	<0.001
Frailty	17.6	19.3	14	26.7	0.216
Atrial fibrillation	26.9	29.5	22.2	23.3	0.026
DM	37.9	33.8	45.8	40.4	<0.001
Dyslipidemia	77.4	71.2	88.6	86	<0.001
HTN	87	84.4	91.1	94.7	0.001
Current smoker	13	11.8	14.4	25	0.037
Previous CVA	17.3	18	15.6	19.4	0.624
PVD	13.7	10.8	19.3	20	0.001
COPD	21.5	20.4	23.5	23.3	0.444
Femoral access	82.9	81.6	84.1	75.4	0.271
Sapien valve	36.1	36.4	34.2	38.6	0.349
NYHA functional class III-IV	84.2	85.1	83.8	86.9	0.331
eGFR, ml/min/1.73 m²	59.9 ± 24.54	62.3 ± 24.73	57.7 ± 23.84	49.8 ± 23.90	0.370
STS score	6.29 ± 4.34	5.96 ± 4.24	6.92 ± 4.48	6.12 ± 4.18	0.140
AVA, cm²	0.64 ± 0.19	0.63 ± 0.19	0.63 ± 0.20	0.74 ± 0.29	0.509
AVG max, mm Hg	73.04 ± 23.63	75.76 ± 24.50	69.31 ± 21.11	62.63 ± 22.39	0.001
AVG mean, mm Hg	45.91 ± 16.69	47.86 ± 17.51	43.04 ± 14.53	39.68 ± 15.32	0.012
EF, %	56.0 ± 22.0	57.0 ± 25.0	56.0 ± 13.0	49.0 ± 16.0	0.658
Staged PCI	–	–	88.6	94.3	0.453
SS	–	–	7.0 ± 5.8	29.0 ± 7.5	<0.001
LM	–	–	13.0	50.0	<0.001
LAD	–	–	57.8	90.9	<0.001
LCx	–	–	43.0	78.2	<0.001
RCA	–	–	58.7	67.3	0.642
VG	–	–	3.4	12.6	<0.001
1-vessel disease	–	–	38.8	2.0	<0.001
2-vessel disease	–	–	26.0	43.1	0.12
3-vessel disease	–	–	25.6	54.9	<0.001

Values are mean ± SD or %. Overall patient characteristics and stratification according to coronary artery disease (CAD) severity: no CAD, nonsevere CAD (SYNTAX score [SS] ≤22), severe CAD (SS >22).

ACE-I = angiotensin-converting enzyme inhibitor; AVA = aortic valve area; AVG = aortic valve gradient; CABG = coronary artery bypass graft; COPD = chronic obstructive pulmonary disease; CVA = cerebrovascular accident; DM = diabetes mellitus; EF = ejection fraction; eGFR = estimated glomerular filtration rate; HTN = hypertension; LAD = left anterior descending artery; LCx = left circumflex coronary artery; LM = left main coronary artery; MI = myocardial infarction; NYHA = New York Heart Association; OAC = oral anticoagulant; PCI = percutaneous coronary intervention; PVD = peripheral vascular disease; RCA = right coronary artery; STS = Society of Thoracic Surgeons; VG = vein graft.

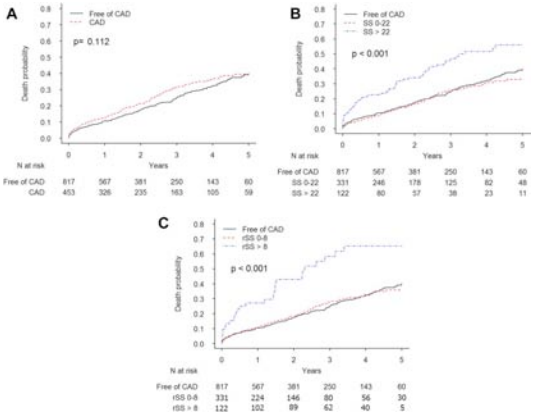

Figure 1

Kaplan–Meier Curves for Post-TAVR Mortality

Kaplan-Meier curves for post–transcatheter aortic valve replacement mortality. (A) coronary artery disease (CAD) status (no CAD, black line; CAD, red line); (B) CAD severity (no CAD, black line; nonsevere CAD, red line; severe CAD, blue line); (C)revascularization completeness (no CAD, black line; "reasonable" incomplete revascularization, red line; incomplete revascularization, blue line). rSS = residual SYNTAX score; SS = SYNTAX score.

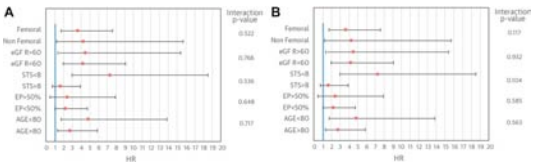

Figure 2

Subgroup Analysis

Subgroup analysis of the effect of (A) high-severity CAD (e.g., SS >22) or (B) incomplete revascularization (ICR) (e.g., rSS >8) on mortality according to access route, Society of Thoracic Surgeons (STS) category, renal function, ejection fraction (EF), and age group. eGFR = estimated glomerular filtration rate; other abbreviations as in Figure 1.

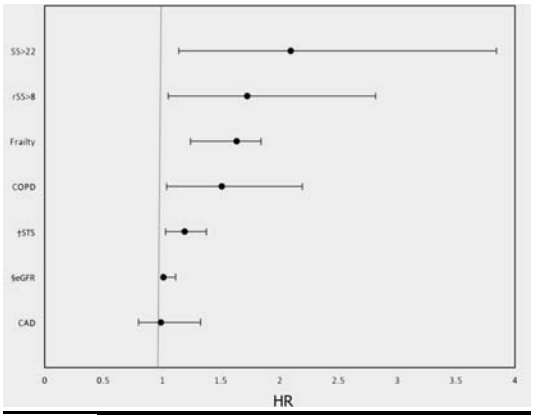

Figure 3

Independent Predictors of Post-TAVR Mortality*

Independent predictors of post–transcatheter aortic valve replacement mortality. *Hazard ratio (HR) and 95% confidence interval for baseline characteristics that were independent predictors of post–transcatheter aortic valve replacement mortality. †Per 1-point increase. §Per each decrease of 1 ml/min/1.73 m^2. *Adjusted for age, frailty, STS score, left ventricle EF, access route, eGFR, past cerebrovascular accident, atrial fibrillation, chronic obstructive pulmonary disease (COPD), diabetes mellitus, hypertension, dyslipidemia, and peripheral vascular disease. Abbreviations as in Figures 1 and 2.

Table 2
Hazard Ratios for Mortality Post-TAVR

	Hazard Ratio	95% CI	p Value
No CAD	Reference	—	—
CAD	0.988	0.736–1.326	0.937
Nonsevere CAD	0.832	0.591–1.170	0.290
Severe CAD	2.092	1.140–3.841	0.017
“Reasonable” ICR	0.749	0.492–1.141	0.178
ICR	1.720	1.051–2.814	0.031

Hazard ratios for post–transcatheter aortic valve replacement (TAVR) mortality according to CAD status, CAD severity (nonsevere: SYNTAX score [SS] ≤22; severe: SS >22), and revascularization

completeness ("reasonable" incomplete revascularization [ICR]: residual SS ≤8; ICR: residual SS >8). Hazard ratios were adjusted for age, frailty, STS score, left ventricular EF, access route, eGFR, past CVA, atrial fibrillation, COPD, DM, HTN, dyslipidemia, and PVD.

CAD = coronary artery disease; CI = confidence interval.

Ran Kornowski, President of the Israel Heart Society

(Editor's Note: Our newsletter usually interviews the incoming President of IHS at the start of his/her 2 year term. Ran Kornowski was recently interviewed by Cardiovascular News, and since it includes all we would want to know, we are running it here.)

Ran Kornowski (Department of Cardiology, Cardiac Catheterization Laboratories, Rabin Medical Center, Petach Tikva, Israel) talks to *Cardiovascular News* about his career mentors, his research interests, and his role as president-elect of the Israeli Heart Society. He also talks about his most memorable patient—a man who saved hundreds of Jewish people from the Nazis during the Second World War.

Why did you decide to go into medicine and why, in particular, interventional cardiology?

Medicine has been my desired profession since I was a teenager. I was fascinated by the ability to help people in need and was also very much attracted by the science and innovation involved in medicine. As a medical student, I was stunned by cardiology in general, and by interventional cardiology in particular, after observing a catheterisation procedure for the first time. I interviewed a patient with chest pain during my internal medicine rotation in 1985 and accompanied him to observe his catheterisation procedure. He had tight obstructive left main coronary artery disease and I distinctly remember thinking: "This is it. This is what I want to do!"

The rest of my career has been devoted to achieving my professional goal of being an academic cardiologist and an interventional cardiologist.

Who have been your career mentors and what advice of theirs do you still remember?

I am fortunate enough to have had several outstanding physicians for mentors. Dr Yoram Levo (head of the Internal Medicine Department, Tel Aviv Medical Center, Tel Aviv, Israel) identified my passion for cardiovascular medicine early

on and allowed for my foray into research during residency. Dr Gad Keren trained and instructed me at the cardiology department of Tel Aviv Medical Center between 1994 and 1996 and contributed significantly to my clinical and academic career.

It would be remiss of me not to mention Dr Alex Battler, with whom I made my first steps in the basic research laboratory. Later on, he asked me to join the Rabin Medical Center and to become the youngest chief of interventional cardiology in Israel. This opportunity is the reason I left Washington DC with my family in the year 2000. It has also shaped my national and international career during the last 16 years.

There is no doubt that Dr Martin Leon has most profoundly impacted my career. He trained me at the Washington Hospital Center between 1996 and 1998, which was followed by a faculty position as head of experimental revascularisation at the centre between 1998 and 2000. I truly believe I would not be where I am today without his guidance and the opportunities he afforded me. I have learned so much from him and we have maintained a close relationship throughout the years. He is not just a mentor but also a close personal friend.

I also have to mention Stephen Epstein with whom I worked closely in the basic research laboratory. I formed my basic

research skills working alongside him. Lastly, over the course of the last decade, I was fortunate to serve as a board member of the European Association of Percutaneous Cardiovascular Interventions (EAPCI) and EuroPCR throughout the directorship of Dr William Wijns. I am constantly inspired by Dr Wijns' exceptional attitude towards cardiovascular research and education.

During your career, what has been the most important development in interventional cardiology?

In my view, it has been the invention of the catheter-based techniques for cardiac valve implantation. The transcatheter aortic valve implantation (TAVI) revolution is probably the first step, and the entire field is heading towards more research and expansion—we have yet to see the full impact of this revolution.

Aside from that, I have been fortunate to witness and become involved in multiple changes and improvements in interventional cardiology over the last 20 years. Among them have been the introduction of improved stents and drug eluting stents, atherectomy devices, intravascular imaging of coronary lesions and physiology assessment tools. I have also seen intra-procedural and post procedural pharmacotherapies improve.

Overall, cardiac patients can now be treated more efficiently and safely compared with the past.

What has been the biggest disappointment? ie. Something you thought would change practice but did not?

In the late 1990s and through the early 2000s, I conducted with my co-workers a great deal of research in the field of intra-myocardial therapeutics. Specifically, our group pioneered the transcatheter laser direct myocardial revascularisation technique but failed to show any therapeutic benefit in a large blinded randomised trial. Soon thereafter, we worked on the experimental concept of progenitor cell transplantation and gene-based intra-myocardial therapy to promote therapeutic angiogenesis and/or myocardial regeneration among patients with refractory myocardial ischaemic and/or ischaemic cardiomyopathy. I was fascinated by the scientific research and became intimately involved with the translational work needed. My hope was to carry this therapy over from the research lab to the clinical arena for the benefit of cardiac patients. However, after several years of research, the economic crisis of 2007/8 hit and this drained our research budget. I believe this field will revive again as there is still plenty of high-quality research activity. I hope to be part of this renaissance in the near future.

Of the research you have been involved with, what do you think has had the biggest impact on clinical practice?

I have contributed to the field of TAVI by initiating the international valve-in-valve registry that was later branded as the "VIVID registry". Back in 2009, I performed my first valve-in-valve TAVI procedure at our department and was stunned by the profound and immediate clinical impact of the procedure. At the time, there were no systematic large-scale data about the technique.

Therefore, I initiated a global registry to document and monitor the characteristics and outcome measures of the valve-in-valve procedure. The VIVID registry, currently headed by Danny Dvir (an ex-fellow of mine who now works in Vancouver, Canada), have become an important project and data from the registry has appeared on multiple publications, including *JAMA, JACC* and *Circulation*. I am proud to say we incepted this project at Rabin Medical Center before expanding elsewhere.

What are your current research interests?

I am involved in multiple research projects but for brevity's sake, will focus on two. I am currently exploring a new method that empowers angiograms so we can

obtain fractional flow reserve (FFR) data. It is done without a pressure wire and/or infusion of adenosine and was developed at our medical centre as a translational bio-mechanical project. The initial clinical validation was very promising and we launched a start-up company— CathWorks— to further promote this technology. Hopefully, it can become commercially available for everybody soon.

In the basic research laboratory, our team is working on a mice model that allows, by a specific mutation of the αMUPA allele, a spontaneous restriction of the caloric intake causing profound weight reduction and extended animal longevity. We investigated the response of the mutated animals to ischaemic myocardial injury and found the mice to be less susceptible. We also dived into the basic mechanism of cardio-protection in those animals and found it mediated through endogenous leptin pathways. We are very excited about these findings, which may have therapeutic implications.

As well as CathWorks, you have co-founded two other start-up companies. What have been the main benefits and challenges of these experiences?

I have consulted on several start-up companies, as well as capital venture and private equity firms, for many years in Israel and

abroad. Eventually, I lost interest in consulting and decided to start my own companies. I teamed up with smart engineers to promote some of my ideas. I co-founded CathWorks, for example, after I recognised a true medical need—eg. angiography-based FFR.

The second start-up company, NitiLoop, has developed a unique catheter-based solution for chronic total occlusion recanalisation and the third, RadSense, focuses on achieving a precise radial artery patent haemostasis following catheterisation. I am also involved with another company dealing with an aesthetic hair-transplant technique.

I find it challenging to convert an idea or even a solid patent into a company. It takes a lot of effort and expertise. It is also heavily dependent on investors and the specific business model. The most gratifying part of the entrepreneurial work is witnessing a theoretical concept becoming a clinical reality, while keeping in mind that the safety of patients always comes first.

Ran Kornowski

You are the president-elect of the Israeli Heart Society. What are your goals for the society?

My first goal is to deliver a message of commitment to the highest quality of care among all members of our society. Second, I intend to maintain—if not strengthen—our international relations with the professional societies and colleges around the world. The president of the Israel Heart Society is a sort of "foreign minister" for our professional community and I will do my best to represent our society before our international collaborators.

Lastly, I am going to invest in the next generation of cardiologists in Israel, promoting their professional education, expanding their training options and helping to build their careers for the benefit of our patients. I also intend to initiate campaigns to improve the lifestyle of the Israeli population, encouraging people to quit smoking, take up regular exercise, and adopt healthy diet habits.

You have worked in the USA as well as in Israel. Did you see any differences in the way that interventional cardiology was practised?

Most interventional cardiologists in Israel, including myself, were trained in the USA or in Canada. However, many of them are deeply influenced by European practices. The result is a hybridisation of

Europe and North America with mutual influences and some important local adaptations and contributions. There are outstanding interventional cardiologists in Israel, using advanced technologies and techniques in most catheterisation laboratories across the country.

We are a population of eight million people with some 30 catheterisation labs across Israel, performing some 48,000 catheterisations a year with a 50% percutaneous coronary intervention (PCI) rate. Israel has an advanced interventional cardiology programme for acute coronary syndrome patients, which has led to intense quality improvement over the last decade with in-hospital mortality figures dropping from 8% to less than 4% among ST-segment elevation myocardial infarction (STEMI) and non-STEMI (NSTEMI) patients. We have a periodic national survey to monitor and document our acute coronary syndrome results (ie. ACSIS project). We have conducted a multicentre TAVI registry showing excellent results and interesting temporal trends among treated aortic stenosis patients. There are additional outstanding national collaborations in the fields of electrophysiology, chronic heart failure, cardiac imaging and interventional cardiac pharmacotherapy.

What has been your most

memorable case and why?

This is a difficult question to answer. There are so many memorable cases that have made a profound impact on me. I have learned from my successes as well as my failures.

However, I will pick one that touched me on a personal level—a 94-year-old male patient who had a successful TAVI procedure indicated for symptomatic aortic stenosis two years ago. During the Second World War, he was the director of a hospital in the Jewish Ghetto of Budapest, Hungary. He was able to save hundreds of Jewish people, children and adults from, deportation to the concentration camps by the Nazis. He told me his amazing personal story during his rehabilitation from the procedure.

A few months later, following his full recovery, his grandson sent me a link to the Yad Vashem website (www.yadvashem.org). Each year, during the official Holocaust Martyrs' and Heroes' Remembrance Day ceremony (5 May in 2016) that takes place at Yad Vashem, six torches representing the six million Jews murdered during the War are lit by Holocaust survivors. My patient was one of the six torch lighters due to his valiant rescue efforts.

I am a third generation to the holocaust. My grandfather was deported from Paris during the war

and he was burned in Auschwitz. Therefore, I was particularly moved by my patient's story of survival and courage and was pleased that my treatment revitalised him.

Outside of medicine, what are your hobbies and interests?

I like to travel and do so as much as possible. I enjoy sightseeing, exploring art, consuming good food and even better wine. I like listening to music, especially jazz and classical music and I am fond of reading books and biographies as well as watching movies and plays. I cherish the time I spend with my family and friends.

My main interest outside of medicine is art, both classic and contemporary. I am an ardent patron of art Institutions, museums and galleries around the world. I read a lot about art and various artists, and I find art to be immensely inspiring.

Factfile

Notable appointments and achievements

Present—full professor of Cardiology, Tel Aviv University, Tel Aviv, Israel

Present—chairman of the department of Cardiology and Cardiac Catheterization Institute, Rabin Medical Center, Petach-Tikva, Israel

President-elect—Israeli Heart

Society (presidency to start in mid-2017)

2014 and 2016—Two healthcare management courses, Harvard Business School, Boston, USA

Immediate past chairman of the Israeli Working Group on Interventional Cardiology (Israeli Heart Society)

2007–2011—head of the Research Authority, Rabin Medical Center, Petach-Tikva, Israel

1996–2001—fellowship/faculty position, Washington Hospital Center, Washington DC, USA. While at the centre, headed a unit that was dedicated to developing novel experimental revascularisation and therapeutics

Published more than 400 peer-reviewed publications

Co-founded of three start-up companies: CathWorks, NitiLoop, and RadSense

I would also encourage Israeli programs to let our membership know about happenings and offers for training in Israel: Please email these to me at jackstroh@usa.net.

FIHS Heart Beats

Are you a member of FIHS and have major news you would like to share with our readers? Have you published a book or been honored by your Society? Share it with us all! Please email these to me at jackstroh@usa.net.

That's it for this issue of the newsletter of the Friends of Israel Heart Society. Special thanks as always to **Batia Ziv** for being our "eyes and ears on the ground" in Israel. Special thanks in America to our Society Administrators- **Janice and Larry Brown**!

Have any ideas to make this a better tool for our Society? Share them with us!
Tell your friends that we want them to join our mission to be a bridge between Israeli Cardiology and the world. If you have any questions, comment, criticisms (my favorites!) please email me at jackstroh@usa.net.

Special New Year wishes from the leadership, team, and members of the Israel Heart Society!!

John Gordon Harold, MD, MACC
Editor-in-Chief, *Cardiology*

The Evolution of **Transcatheter Aortic Valve Replacement**

The prevalence of calcific aortic stenosis increases with age, and approximately 2.5 million people in the U.S. over age 75 suffer from this disease. Before the introduction of transcatheter aortic valve replacement (TAVR), open-heart surgical aortic valve replacement (SAVR) was the standard of care for treating patients with severe aortic stenosis. However, given the operative morbidity and mortality secondary to advanced age and comorbid disease, many patients were deemed inoperable.

The first catheter-based approach of balloon aortic valvuloplasty (BAV) was developed by **G. Alain Cribier, MD, FACC,** in 1985 in a 77-year-old woman with inoperable severe aortic stenosis. The main limitation of this procedure was restenosis, which impacted most treated patients within one year post intervention.

> "We are far from the end of the TAVR's odyssey and **the potential of this disruptive technology remains explosive.**"
>
> **G. Alain Cribier, MD, FACC**

In 1989, **Henning Rud Andersen, MD,** speculated that a balloon-expandable valve could be placed in a manner similar with stenting a coronary artery. He created a handmade metal stent, onto which he sutured porcine aortic valves, with a deflated balloon placed inside the valve in 1992. The crimped stent/valve apparatus was then inserted across the native aortic valve of a live pig. He unfortunately was unable to find a company to further develop this approach.

Meanwhile, Cribier continued working on the concept of percutaneous valve replacement based on observations that high-pressure balloon inflation during BAV could open calcified aortic valves in a circular manner. He and fellow investigators felt that a valvular structure could be inserted with a balloon-expandable stent to mimic native valve structure and function. After numerous failed attempts to develop a commercial interest, a startup company named Percutaneous Valve Technologies (PVT) was formed in 1999 with offices in New Jersey and Israel. Founding partners of PVT included Cribier, **Martin B. Leon, MD, FACC,** Stanley Rabinovich and Stanton J. Rowe. Israeli engineers from PVT designed the models for a balloon-expandable transcatheter heart valve and Cribier continued animal experimentation until his first human percutaneous implantation on April 16, 2002 in Rouen, France.

This first TAVR was performed in a 57-year-old inoperable patient with critical calcific aortic stenosis. The patient had presented in cardiogenic shock with a left ventricular ejection fraction of 12 percent, severe aortic stenosis and multiple comorbidities that were a contraindication to SAVR. BAV had failed in this patient and he suffered from severe peripheral vascular disease. After TAVR, he had remarkable hemodynamic improvement, but died four months later due to non-procedure-related complications. Cribier had confirmed the feasibility of TAVR via a transseptal approach and the technology was rapidly expanded to other patients. PVT was acquired by Edwards Lifesciences in 2004, leading to further evolution of new delivery systems and approaches to TAVR.

Today, subsequent clinical trials, including PARTNER, have validated the clinical use of TAVR in a variety of patient settings. Globally, TAVR procedures are expected to exceed 300,000 by 2025. The evolution of TAVR has been driven by the heart team, rapid technology enhancement, simplification of the procedure and a striking reduction in complications.

The ACC has and continues to play a critical role in ensuring appropriate use of TAVR. Working with The Society of Thoracic Surgeons (STS), the Society for Cardiovascular Angiography and Interventions (SCAI) and other professional societies, several clinical documents and recommendations have been developed over the years to help clinicians effectively and appropriately use this new therapy. In addition, the STS/ACC TVT Registry continues to serve as an important source of clinical data regarding TAVR. The College's Succeed in Managing Heart Valve Disease (SIM-Valve) Initiative has also brought together medical specialties, industry, patient groups and other stakeholders to help with the development of patient and clinician tools.

Just 15 years after the first procedure in man, TAVR has become the standard of care for patients with symptomatic heart disease due to severe native calcific aortic stenosis who are judged by a Heart Team, including a cardiac surgeon, to be at intermediate or greater risk for open surgical therapy. What's next? With three ongoing trials in younger population groups, Cribier hopes to see an expansion of TAVR to all patients who could benefit. "We are far from the end of the TAVR's odyssey and the potential of this disruptive technology remains explosive," he says.

The historical origins of TAVR were celebrated during the 60th anniversary of the Israel Heart Society in 2013 with the issue of a commemorative stamp titled "Israeli Achievements in Cardiology." One of the three stamps designed by **Meir Eshel** highlighted the evolution of the percutaneous heart valve through the efforts of Israeli engineers working with colleagues around the world. I had the privilege of attending the ceremony with **Eugene Braunwald, MD, MACC**, and other dignitaries when the stamps were presented by **Chaim Lotan, MD, FACC**, to Israeli President **Shimon Peres**.

Chaim Lotan, MD, FACC, presents a commemorative stamp to **Shimon Peres**, president of Israel.

One of three stamps issued in 2013 to commemorate Israeli achievements in cardiology and developing percutaneous heart valves.