Imagination is Always Ahead of Science

La imaginación va siempre por delante de la ciencia

The Argentine Journal of Cardiology dedicates the last issue of 2017 to "cardiovascular imaging." Given the importance of images in our daily practice, we have included in this edition a variety of topics related to the techniques that will have the greatest impact in the future.

Undoubtedly, great advances are glimpsed in the field of sciences, and in response to this, the world also prepares important projects, such as that of Saudi Arabia to create a science fiction city called "Neom" in the desert. This futuristic mega city will have more robots than humans, smart homes and streets and 100% of its non-polluting renewable energy provided by the sun and the wind. Possibly the origin of its name comes from the Greek word "neon" which means "new."

But let's go back to the present. In the field of cardiovascular imaging there are many novelties and different developments that until now also seemed impossible. The fusion images between CAT, MRI, echocardiography and nuclear medicine are already being used in some laboratories around the world. There are others that promise to have clinical application in the coming years through the use of modeling, simulation and artificial intelligence, with teams that with new technologies will be able to do many things better than a human being, fulfilling tasks that only the best specialists can do. Other advances are based on the use of live 3D echocardiographic holographic images, with interaction technology to guide minimally invasive cardiac procedures. Three-dimensional virtual echocardiography promises to navigate non-invasively within the cardiac structure. Magnetic resonance imaging, PET and CAT will neither be left behind, and new computational tools will assist us to improve the diagnostic capacity and minimize errors.

Is it a utopia to imagine that within 5 or 10 years in Neom and other developed cities, some cardiological studies, especially those related to images, could be performed by a robot and/or with a fully automatic analysis? It has been shown that the evolution of machines is faster than that of the human brain; while devices undergo an accelerated growth, the natural evolution of the brain seems to have practically stopped. Undoubtedly, all these innovations will save work, give us more diagnostic and possibly also prognostic information; but machines and artificial intelligence systems have no true feelings or ethics, so their behavior will depend on programming and not on rationality.

Nor do we believe that a technique can be absolutely automatic, since in addition to providing all the algorithms, a human being must control, correct and permanently approve the data obtained by machines, and will certainly have the last word.

Probably there are no limits to new advances, and as Julio Verne said, "Everything a person can imagine, others can make it happen."

Within a few years several of the works in the RAC will refer to these new projects, but in the meantime we must land and share today this series of reproducible works in most of our laboratories. In this issue, Marcelo Luiz Campos Vieira analyzes the study by Ariel Karim Saad et al. on left ventricular function by 3D echocardiography in lupus erythematosus. In addition, Lawrence G. Rudski comments on M. Guadalupe Romero et al.'s registry in which they analyze the quantification of right heart chamber diameters in relation to body surface area. Paolo Colonna examines the work of Diana Romero Zertuche et al. who demonstrate that it is feasible to evaluate the functional reserve of the left atrium during exercise eco-stress.

In "Sisyphus's Dilemma" Ignacio Bluro et al. show that the measurement of ventricular-arterial coupling by echo-Doppler predicts better than catheterization the incidence of right ventricular failure after heart transplantation. Tonino Bombardini and researchers from Italy and Serbia led by Eugenio Picano analyze the prognostic value of the relationship between pressure-volume and preload recruitable stroke work in the triple image contractility analysis performed in the eco-stress laboratory. On the other hand, Marta L. Nacke et al. study the degree of severity of mitral regurgitation. Also in this edition, Arturo Evangelista makes a review on bicuspid aortic valve and its relationship with ventricular dysfunction and dilatation of the aortic root. In the brief communications section, Agustina Amenabar et al. present their experience in the negative correlation between pulmonary systolic pressure and right atrial strain, and Gastón Rodríguez Granillo et al. demonstrate the prognostic value of overall plaque load nomograms estimated by conventional chest computed tomography. As always, the reader will find interesting comments in the sci-

entific letters and current thoughts in RAC director's letter and SAC president's letter. This special issue of the Journal is completed with the critical analysis of the outstanding publications in cardiology by Dr. Jorge Thierer.

We are living a new stage of cardiology with the concept of complexity in the field of medicine, where mathematics, physics, and computational calculations play an important role. We support Dr. Jorge C. Trainini's concepts in his opinion article "Complexity in medicine" where he explains why sciences will not evolve if their concept is only linear (cause-effect). Could it be that the deterministic model we are used to for evaluating outcomes should be substituted by a stochastic process? Can artificial intelligence aid in this complex challenge?

Undoubtedly, all the branches of medicine, and imaging is not an exception, will benefit from all these new algorithms, but a holistic and integrative interpretation by the cardiologist will be necessary, without forgetting that it is always essential to consider the human factor at the patient's bedside.

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