

Use of a Simple Contact Bipolar Electrocardiographic Lead in the Precordial Region

To the Editor

We have read the excellent article “Usefulness of a Single-lead Electrocardiographic Recording System and Wireless Transmission During the COVID-19 Pandemic”, (1) recently published in the Argentine Journal of Cardiology, which solves many problems caused by the pandemic.

Regarding this article, we would like to add some comments that could be useful for a better use of this new technology:

- Since V2-V1 precordial bipolar leads subtract signals that often have different polarities, the result is usually a high amplitude signal with better signal-to-noise ratio, facilitating the analysis which is obtained from limb tracings. (2, 3)
- The closer the bipolar electrodes, the lower the potential difference between them. Consequently, in the V2-V1 bipolar precordial leads, the optimal distance in our studies was the one between the V2 and V1 unipolar precordial leads. (4)
- Figure 1 (Figure 4B of the original paper) shows the bipolar precordial lead, which records the right-left axis in the retrosternal region. It is interesting to point out that -if necessary- a 90° rotation on the axis of this bipolar lead can be made and placed on the right parasternal border. In this way, a derivation similar to Lewis’ bipolar lead would be easily obtained (5), which is very useful for the analysis of atrial rhythm disturbances (Figure 2)

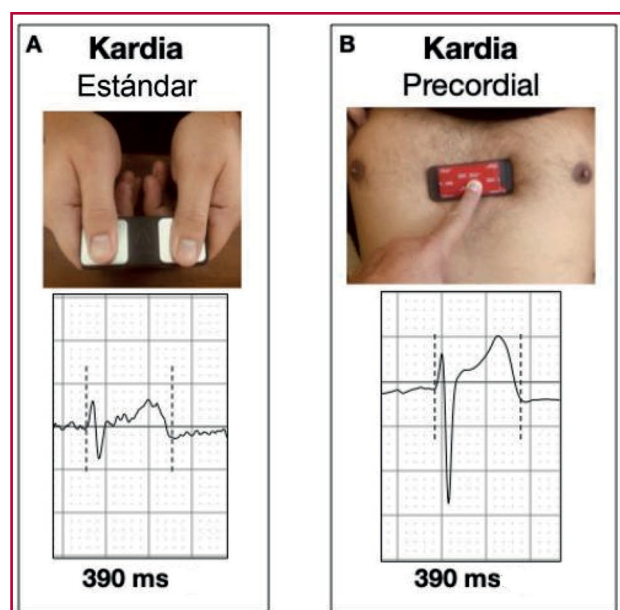


Fig. 1. corresponding to Figure 4 A of the original paper

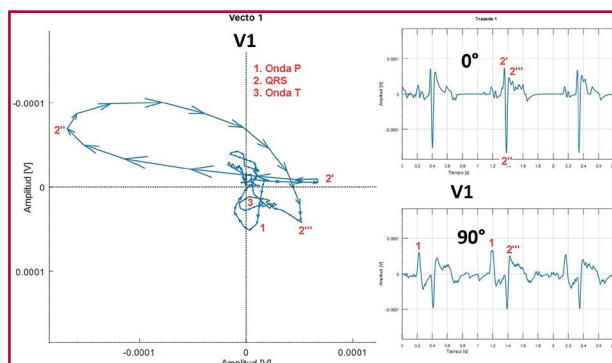


Fig. 2. Orthogonal tracing at the level of the V1 unipolar precordial lead showing the right-left axis (0°), the cephalocaudal axis (90°), and a loop representative of the local frontal plane at the V1 precordial lead placement. The P wave is clearly shown on the 90° axis. The occurrence of two simultaneous waves helps with the identification and time and amplitude assessment of the electrical phenomena. (6)

We are convinced that the new method described by the authors is not only an advance in the fight against the coronavirus pandemic, but also represents a new possibility of exploring the cardiac electrical activity in many patients.

Mario Mc Loughlin¹, Sergio Lew²

¹ Fundación Centro Diagnóstico Nuclear

² Engineer. Institute of Biomedical Engineering. School of Engineering, University of Buenos Aires.

Conflicts of interest

None declared.

(See authors’ conflicts of interest forms on the website/ Supplementary material)

Ethical considerations

Not applicable.

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Authors' Reply

In response to the letter from Mc Loughlin and Lew, we appreciate the comments on our recent publication, "Usefulness of a Single-lead Electrocardiographic Recording System and Wireless Transmission During the COVID-19 Pandemic". (1)

The implementation of alternative recording models to reduce the movement of healthcare personnel in the COVID-19 patient isolation areas is in line with the priority of protecting the attending healthcare personnel. (2)

Regarding the points made by Mc Loughlin and Lew in their letter, we agree with their opinion on the original design of V2-V1 bipolar precordial leads to improve the recording stability and facilitate the assessment of critical intervals in electrocardiography. The authors point out that the optimal distance for this derivation is the one between V2 and V1 unipolar leads; hence, this distance would be variable and dependent on the patient's anatomy. In our study, high quality recordings were obtained using a device with a fixed interelectrode distance, with no chances of adapting it to the patient's anatomy.

Finally, the option of placing the recording system in right parasternal position to detect atrial activity was not considered for this population, as it was beyond the scope of our work. We agree that Lewis' design of a lead in right parasternal position may be useful for the diagnosis of atrial tachyarrhythmia, (3) although validation steps with studies specially designed for this purpose should be applied.

**Carlos López,
Claudio Hadid, Carlos Labadet**

Department of Cardiology Electrophysiology Section.
Hospital Dr. Cosme Argerich

Conflicts of interest

None declared.

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Ethical considerations

Not applicable.

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Coronavirus Pandemic Makes Us (Re)Learn Our Realities

We are going through an epidemiological situation that has changed the lives of all the people in Argentina and the world; a circumstance not experienced by almost any of us; the previous pandemics, for the most part (black plague, smallpox, Spanish flu, measles, and HIV –due to their proportions) took place many years ago. On March 11, 2020, WHO declared the COVID-19 outbreak a global pandemic. Today, the world struggles between health, economy, and individual freedom. It also confronts us with our health realities.

The WHO Director-General's opening remarks on March 11, 2020, expressed:

"Regarding the pandemic [...]. Some countries are struggling with a lack of capacity. Some countries are struggling with a lack of resources. Some countries are struggling with a lack of resolve. [...] This is not just a public health crisis; it is a crisis that will touch every sector – so every sector and every individual must be involved in the fight. [...] Ready your hospitals. Protect and train your health workers. And let's all look out for each other, because we need each other."

Even with some controversy about the role of WHO in the pandemic, these phrases allow us to reflect upon public health and the conditions of our healthcare system and access to health, making some of those ideas our own.

In Latin America, the average expenditure on health is around 7% (of GDP), with figures of 8.5% (1) in Argentina, among the highest in the region, where almost 70% of the inhabitants are covered by some type of health insurance. In the region, while everyone enjoys some health protection, it is unequal and inequitable. In Tobar's words, "although the healthcare situation has improved, the gap of life expectancy between the rich and poor has increased". (2) Along these lines, Macchia et al. conclude that premature death and cardiovascular death rates were reduced between 2000 and 2010; however, the incidence and progression of death rates showed profound inequity associated with the socioeconomic status and with the different deciles of unmet basic needs (UBN). Therefore, this distribution was uneven in different geographical departments throughout the country as well as in the City of Buenos Aires (CABA). These indicators are commonly associated with the provision and fragmentation of healthcare in Argentina, as if there were several countries within one country.

The healthcare system in Argentina is multi-segmented, with three main effectors: public, (43 million people, universal) to which everyone is entitled whether or not they have other social or private coverage; health insurance (social security subsystem): 26 million people (60%); private subsystem (with significant stratification within it): 2 million people; and 4 million people with double affiliation. (1, 2, 4) The Pan American Health Organization (PAHO), the

Economic Commission for Latin America and the Caribbean (ECLAC), and the United Nations Development Programme (UNDP) fully agree with these data. People who depend only on the public system or are close to major urban centers have different access to healthcare, (5) which is the same in the provinces, (1) and those who have private healthcare insurance with their own centers have different coverage.

In 2017, Argentina had 25,751 (public and private) healthcare facilities. (6) More than 40% were public, although they reached almost 60% in some regions of the country. Among public facilities, 59% were provincial, 39% municipal, and 2% national; diagnosis and treatment facilities with no hospitalization were more common (55%), and to a lesser extent, pediatric, mother-child and mental health hospitalization facilities, all of which were unevenly distributed. The total number of beds was 220,910; there were 8,293 adult beds and 1,823 pediatric beds in intensive care units (ICU), making up 5% of the total number of beds in healthcare facilities. The number of ICU beds shows what is the situation of the healthcare system in a health emergency. Figure 1 details the number of beds per district, differentiating ICU beds and the percentage of people older than 65 years (considered as high-risk patients) per province.

Since the pandemic, the number of hospital and ICU beds has increased, particularly in the public subsystem. According to the data from the National Ministry of Health (NMH), “during the past three months, Argentina has added 2,996 ICU beds, so now there is a total of 11,517, an increase of 35%. In addition, a system was developed to monitor critical medical supplies for hospitalizations, allowing us to check the availability of beds throughout the country by means of an effective interjurisdictional joint action”. Resources are expected to continue beyond the

epidemiological emergency.

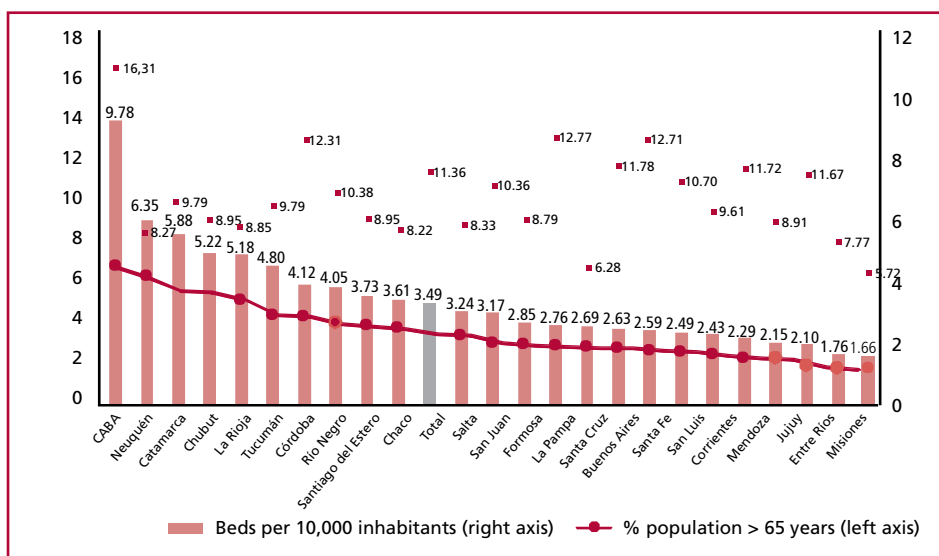
Regarding human resources (HR), according to the NMH and the Annual Urban Household Survey, there were 832,167 active healthcare professionals in the 3rd quarter of 2014, with 57% of them working in the private sector. (5, 6) The total number of physicians was 384,231 (32% of HR), and the number of nurses was 343,053, both of them unequally distributed. (6)

(6) Most human and physical resources are concentrated around the big cities, which offer better conditions for patient healthcare, better access to training centers, and more favorable living conditions for individual and family integration.

A total of 7,844 primary care centers in Argentina (in the same year) distribute resources and are the first link in healthcare, with great implication during crises. In fact, these centers were a main effector of the Remediar Program, an intervention that aimed at bridging the gap of inequality through the distribution of supplies in site in order to bring the most deprived population closer to the health system.

According to different reports, the media, and some official websites, medical salaries are in the mid and low ranges, even more so if compared to professional responsibility. Already in 2008, a study performed by the Argentine Society of Cardiology carried out through a (validated) survey on quality of life, showed greater career satisfaction among cardiologists in a linear relationship with the level of income when this was above USD 24,000 a year; on the other hand, career satisfaction was significantly lower at lower income levels. (7) Expectations about the future were not promising either, as stated in a study by Salazar et al., in which 75% of cardiologists had a regular, poor or very poor perception about their retirement. (8) Let us remember that “the level of professional satisfaction of general practitioners is a key element for the smooth

Fig. 2. Total (public and private) ICU beds per 10,000 inhabitants, and percentage of population older than 65 years per province



Source: Prepared by Oscar Cetrángolo and Ariela Goldschmidt (2020), based on SIISA, MSAL and INDEC. Published in: <https://alquimiaseconomicas.com/2020/04/07/pandemia-oportunidad-o-resignacion/> (Authorized)

running of healthcare systems". (7) This consideration is valid for normal situations, and even more so in a pandemic, which requires greater effort, dedication and commitment.

The functioning of the whole healthcare system is supported by HR in any instance of care and prevention: "Beyond the growing incorporation of new technologies, medical knowledge and the doctor-patient relationship are pillars of any successful healthcare strategy". (9) We can therefore declare that the working conditions for doctors, nurses and other healthcare professions have a key value and can condition its results.

Today, a staff physician working a 36-hour shift in CABA receives around 50,000 Argentine pesos in the lowest category (USD 700 at the official exchange rate), and nurses around USD 500, values that are lower than for other unions. The term "health is priceless" could mean that health is valuable or expensive, or that professionals should work "for free". This marks a paradigm shift in the valuation of the profession, showing also new trends such as a higher proportion of women in medical careers in Argentina, all of which illustrates a difficult framework to stand by.

The COVID-19 pandemic confronts us with our own realities and weaknesses, making structural problems visible in our country (and in the world). It is announced that "everything will be different" in health. This requires a deep analysis and discussion of today's rules. It is necessary to clearly put the issue "on the public agenda", and *create a new agenda*. The State has the ultimate authority and the non-delegable function of stewardship.

We deserve to think about a single health system – a truly supportive system – with coordination between its public and private sectors, taking advantage of resources, providing equal opportunities to access healthcare, not depending on income and employment status, and with a fully functioning high-level public hospital. It is our unpaid *domestic debt*. The 1853 Constitution mentioned the right to health ("...general welfare..."); the 1994 reform confirms this right. It is written.

The pandemic has displayed health on the "front page". The crisis (re)updates the structural problems. Prioritizing this issue is first and foremost a political decision, which will encounter conflicting interests from various actors involved in the health field. (5) It means recognizing the real situation, the multi-segmentation at all levels, the failures in coordination, the inefficient use of resources and, mainly, the inequity of the system with enormous differences in access to health and quality of care according to the place of residence, income level, and other socioeconomic variables. *This is our chance to change*.

Adriana Salazar

Center for Medical Education and Clinical Research (CEMIC),
Department of Cardiology
E-mail: aisalazar32@gmail.com

Conflicts of interest

None declared.

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Ethical considerations

Not applicable.

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Rev Argent Cardiol 2020;88:368-370. <http://dx.doi.org/10.7775/rac.v88.i4.18749>

Vaccination in Patients with Heart Failure in Argentina: Results from the ARGENT-IC. Real Data, far from Clinical Practice Guidelines

The Argentine Registry of Acute Heart Failure (ARGENT-IC) is a prospective, multicenter, national study carried out in 50 institutions, which included patients diagnosed with acute heart failure from August 2018 to March 2019, with a 12-month follow-up.

We have recently published data of 909 patients provided by 74 researchers from 18 Argentinian provinces. (1) Patients aged 72.2 years (SD: 14), 60.5% male, 33% with a history of diabetes, and 26% with ischemic-necrotic etiology, were enrolled in the study. In 77.6% of cases, patients were admitted to the Critical Care Unit, with an overall median hospital stay of 8 days and 7.9% overall mortality rate.

We noticed the low percentage of patients who had received the influenza and pneumococcal vaccines, despite many of them had indication due to their health history or risk factors. Only 33.3 % of the population had received the influenza vaccine, 24.6 % the pneumococcal vaccine and 3% both vaccines prior to hospitalization. Within the group of patients with a history of heart failure, only 43% had been vaccinated.

Currently, the National Ministry of Health (<https://www.argentina.gob.ar/salud/vacunas>) recommends who should be vaccinated to prevent diseases which have been associated with the risk of poor prognosis in patients with heart failure. (2) The Argentine Society of Cardiology Consensus on chronic heart failure makes a strong recommendation in favor of influenza and pneumococcal vaccines in patients with this condition. (3) People aged > 65 years and those with chronic obstructive pulmonary disease (COPD) are a vulnerable population and require both vaccines. The table below shows the low percentage of patients admitted with heart failure who had received both vaccines despite their comorbidities.

The relationship between the level of vaccination and health coverage was also analyzed. No statistically significant difference in the vaccination rate according to health coverage was observed. In contrast, educational level seems to have some relationship with vaccination.

Current available data seem to demonstrate that influenza vaccination could reduce cardiovascular mortality. Vaccination can reduce the incidence and/or severity of respiratory infections, and consequently decrease exacerbations, hospitalizations, increased costs and morbidity and mortality. (4, 5)

Alberto Fernández ,
Adrián J. Lescano ,
Alfredo Hirschson Prado

Department of Cardiology Electrophysiology Section.
Hospital Dr. Cosme Argerich

Comorbidities for which vaccination is indicated	Percentage of ARGEN_IC patients who had received the influenza vaccine	Percentage of ARGEN_IC patients who had received the pneumococcal vaccine
Age > 65 years	36.7	35.6
Diabetes (33%)	37%	
Obesity (15%)	28%	
AMI (17%)	36%	
Previous HF (37%)	37%	
Previous CABG/PCI (20%)	34%	
Ischemic stroke (8%)	33%	
COPD (14.6%)	43%	34%
CRF (18.5%)	50%	

AMI: Acute myocardial infarction. HF: Heart failure. CABG/PCI: Coronary artery bypass grafting/Percutaneous coronary intervention, COPD: Chronic obstructive pulmonary disease. CRF: Chronic renal failure.

Conflicts of interest

None declared.

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Ethical considerations

Not applicable.

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Rev Argent Cardiol 2020;88:370-371. <http://dx.doi.org/10.7775/rac.v88.i4.18663>