

## 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)

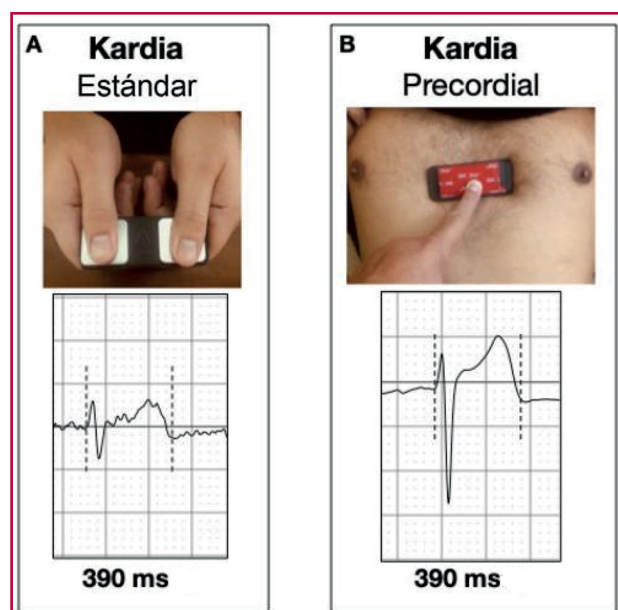


Fig. 1. corresponding to Figure 4 A of the original paper

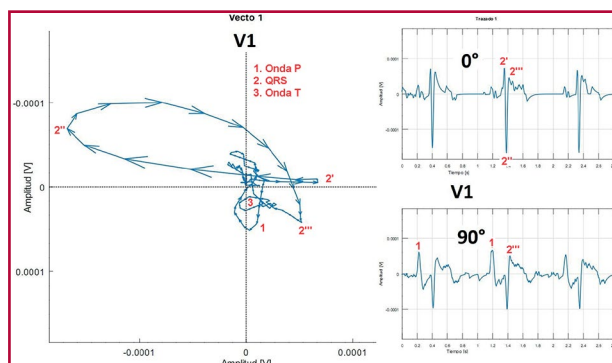


Fig. 2. Orthogonal tracing at the level of the V1 unipolar precordial lead showing the right-left axis (0°), the cephalocaudal axis (90°), and a loop representative of the local frontal plane at the V1 precordial lead placement. The P wave is clearly shown on the 90° axis. The occurrence of two simultaneous 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 Loughlin<sup>1</sup>, Sergio Lew<sup>2</sup>

<sup>1</sup> Fundación Centro Diagnóstico Nuclear

<sup>2</sup> 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.

### REFERENCES

- López C, Hadid C, Di Toro D, et al: Utilidad de un sistema de registro de una derivación electrocardiográfica y transmisión inalámbrica durante la pandemia por COVID-19. *Rev Argent Cardiol* 2020;88;211-15. <http://dx.doi.org/10.7775/rac.es.v88.i3.18000>
- Mc Loughlin MJ, Lew S, Tello de Meneses G: *New ECG Methods: A Study Based On Precordial Bipolar Leads* (English Edition) Amazon, 2019.
- Mc Loughlin MJ, Lew S, Tello de Meneses G: *Nuevos métodos electrocardiográficos: Un estudio basado en derivaciones precordiales bipolares* (Spanish Edition) Amazon, 2019.
- Mc Loughlin MJ. Precordial bipolar leads: A new method to study anterior acute myocardial infarction. *J Electrocardiol* 2020;59:45-64.
- Baker AL, Nijkerk G, Groenemeijer BE, et al: The Lewis Lead. Making Recognition of P Waves Easy During Wide QRS Complex Tachycardia. *Circulation*. 2009;119:e592-e593. <https://www.ahajournals.org/doi/10.1161/CIRCULATIONAHA.109.852053>
- Lew S, Mc Loughlin MJ: Hand -held ECG Device: A New Approach Based on Unipolar and Bipolar Precordial Leads. XVI Congreso Mundial de Arritmias, Buenos Aires. 2019

## 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.

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

### Ethical considerations

Not applicable.

### REFERENCES

1. López C, Hadid C, Di Toro D, Celano L, Antezana E, Heffner L, et al. Utilidad de un sistema de registro de una derivación electrocardiográfica y transmisión inalámbrica durante la pandemia por COVID-19. *Rev Argent Cardiol* 2020;88:211-5. <http://dx.doi.org/10.7775/rac.es.v88.i3.18000>. <https://doi.org/10.7775/rac.es.v88.i3.18000>
2. Chirico F, Nucera G, Magnavita N. COVID-19: Protecting Healthcare Workers is a priority. *Infect Control Hosp Epidemiol* 2020;17:1. <http://dx.doi.org/10.1017/ice.2020.148>
3. Baker AL, Nijkerk G, Groenemeijer BE, Waalewijn RA, Koomen EM, Braam RL, et al: The Lewis Lead. Making Recognition of P Waves Easy During Wide QRS Complex Tachycardia. *Circulation* 2009;119:e592-3. <https://doi.org/10.1161/CIRCULATIONAHA.109.852053>

## 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