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Letter to the Editors

## Thirty Years of the Laboratory of Panic and Respiration: From Respiratory Panic to Translational Psychiatry

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# Thirty Years of the Laboratory of Panic and Respiration: From Respiratory Panic to Translational Psychiatry

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About thirty years ago, the question was deceptively simple: why can a change in breathing precipitate an overwhelming sense of imminent death? At the interface between psychiatry and respiratory physiology, that question became the scientific foundation of the Laboratory of Panic and Respiration (LABPR), established in 1997 at the Institute of Psychiatry of the Federal University of Rio de Janeiro under the leadership of Antonio Egidio Nardi. [1] What began as an investigation of panic and respiration would develop into a sustained translational program linking physiological challenge, clinical phenomenology, treatment response, and broader biological models of anxiety.

The intellectual background was already taking shape. Klein's false suffocation alarm hypothesis proposed that spontaneous panic could reflect a pathological activation of a suffocation-monitoring system.[2] Affected individuals were heterogeneous, and symptom-based analyses identified a subgroup characterized by prominent respiratory manifestations.[3] LABPR did not originate either concept. Its distinctive contribution was to help make these ideas experimentally accessible and clinically testable.

Through systematic carbon dioxide ($CO_2$), breath-holding, and pharmacological challenge paradigms, Nardi and colleagues investigated whether panic could be elicited under controlled conditions and whether experimentally induced attacks reproduced meaningful features of spontaneous panic.[4–6] The resulting work linked $CO_2$ sensitivity and challenge-test reactivity to respiratory symptom profiles, earlier onset, and greater familial prevalence of panic disorder.[4] Broader physiological and clinical syntheses subsequently placed abnormalities of breathing control within the pathophysiological discussion of panic disorder.[7–9]

This was more than a technical refinement. Experimental provocation created a bridge between subjective experience and measurable physiology. Fear, dyspnea, choking, respiratory discomfort, and bodily threat could be examined within the same experimental framework. LABPR subsequently played an important role in the clinical and experimental development of the respiratory subtype construct, examining its psychopathology, challenge-test responses, and potential treatment implications.[10–12] Panic disorder could therefore be approached not simply as a unitary diagnostic category, but as a potentially heterogeneous syndrome whose phenotypic differences might illuminate underlying mechanisms.

What followed was an expansion rather than a departure from the original question. Once panic had been conceptualized as an interaction among bodily signals, threat processing, and individual vulnerability, the same translational logic could be extended to other biological levels. LABPR research moved into inflammatory pathways, with studies demonstrating altered cytokine profiles in drug-naïve patients and examining inflammatory biomarkers in patients and their unaffected offspring.[13,14] Subsequent work broadened the field toward neurochemical and genetic factors, neuroanatomy and neurocircuitry, and technology-assisted interventions such as virtual reality.[15–17] Recent experimental work linking minocycline to attenuated panicogenic responses in a $CO_2$-induced

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model illustrates how the laboratory's original respiratory question continues to generate contemporary translational hypotheses. [18]

The tools changed; the scientific logic did not. That continuity may be LABPR's most distinctive feature. Clinical care has served as a structured environment from which research questions emerge. Standardized assessments, carefully characterized samples, challenge paradigms, biological measures, treatment studies, and longitudinal observation have allowed clinical phenomena to be converted into analyzable scientific questions. [4,5,10,13,14,19] In this model, clinic and laboratory are not competing domains. Each gives meaning to the other.

The scale of academic production surrounding LABPR should therefore be understood as a consequence of this model rather than as an achievement detached from it. Across three decades, the laboratory and the broader academic network developed around its leadership have produced an extensive body of scientific work while training successive generations of master's, doctoral, and postdoctoral researchers.

Yet citation counts, publication totals, and academic degrees cannot fully describe a laboratory's legacy. The more consequential achievement is the construction of continuity: a scientific question sufficiently fertile to survive methodological change, successive generations of investigators, and transformations in biological psychiatry itself.

Thirty years ago, LABPR began by asking what respiration could reveal about panic. Three decades later, that question has generated experimental paradigms, clinical phenotypes, biological hypotheses, technological interventions, and generations of researchers. Its history suggests that translational psychiatry depends not only on discovering mechanisms, but on building structures capable of repeatedly transforming clinical observation into reproducible knowledge.

The question began with breath. The legacy is a way of doing science.

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**Conflict of interest**

Antonio E. Nardi is Editor-in-Chief, Laiana Quagliato is an Associate Editor, and Natia Horato is an Assistant Editor of the Brazilian Journal of Psychiatry. Pablo E. P. Dutra is a doctoral candidate at the Federal University of Rio de Janeiro under the supervision of Antonio E. Nardi and Laiana Quagliato. These academic and editorial relationships are disclosed for transparency. Antonio E. Nardi, Laiana Quagliato, and

Natia Horato will have no involvement in the editorial assessment, reviewer selection, peer-review process, or decision-making concerning this manuscript, which should be handled independently by an editor without a conflict of interest. No other conflicts of interest were reported.

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**Author contributions**

P.E.P.D.: Conceptualization; Investigation; Visualization; Writing – original draft; Writing – review & editing.

N.H.: Conceptualization; Investigation; Writing – review & editing.

M.M.G.: Conceptualization; Writing – review & editing.

L.A.Q.: Conceptualization; Supervision; Writing – review & editing.

A.E.N.: Conceptualization; Supervision; Writing – review & editing.

Conceptualization and writing – review & editing were shared equally by all authors; investigation was shared equally by P.E.P.D. and N.H.; and supervision was shared equally by L.A.Q. and A.E.N.

All authors have read and approved the final version submitted and take public responsibility for all aspects of the work.

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