

# 1 **Sodium monitoring in infants**

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3 Sebastiano A. G. **Lava**<sup>1</sup>, Mario G. **Bianchetti**<sup>2</sup>, Carlo **Agostoni**<sup>3,4</sup>, Gregorio P. **Milani**<sup>3,4</sup>

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5 <sup>1</sup> Pediatric Cardiology Unit, Department of Pediatrics, Centre Hospitalier Universitaire  
6 Vaudois (CHUV), and University of Lausanne, 1010 Lausanne, Switzerland;

7 <sup>2</sup> Università della Svizzera Italiana, Lugano, Switzerland;

8 <sup>4</sup> Pediatric Unit, Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico, Milan,  
9 Italy;

10 <sup>5</sup> Department of Clinical Sciences and Community Health, Università degli Studi di  
11 Milano, Milan, Italy.

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13 **Corresponding author:** Gregorio P Milani, Pediatric unit, Fondazione IRCCS Ca' Granda,  
14 Ospedale Maggiore Policlinico, via della Commenda 9, 20122 Milan, Italy. Email:  
15 milani.gregoriop@gmail.com

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## 17 **Email address of all authors**

18 Sebastiano A. G. Lava: webmaster@sebastianolava.ch

19 Mario G. Bianchetti: mario.bianchetti@usi.ch

20 Carlo Agostoni: carlo.agostoni@unimi.it

21 Gregorio P. Milani: milani.gregoriop@gmail.com

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23 CORRESPONDENCE

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25 Dear Editor:

26 We would like to congratulate Storey C et al. [1] for the excellent report entitled  
27 “Hyponatremia in children under 100 days old: incidence and etiologies”. The authors  
28 find that in infants 100 days of age or less this electrolyte disturbance is rather common,  
29 hospital-acquired in >85% and iatrogenic in >30% of the cases.

30 The report does not state the method used for sodium testing. This electrolyte is  
31 nowadays measured using either the direct or the indirect potentiometric technique [2,  
32 3]. Direct potentiometry, which does not require sample dilution prior to measurement, is  
33 used in point-of-care blood-gas analyzers, while indirect potentiometry, which requires  
34 sample dilution prior to measurement, is used in main laboratory analyzers [2-4].

35 Clinicians usually assume that the mentioned techniques may be used  
36 interchangeably and generally place more trust in results from the main laboratory  
37 analyzers rather than point-of-care instrument [2-4]. However, the two methods show  
38 good agreement exclusively as long as circulating protein and lipid concentrations  
39 remain normal. Direct potentiometry is unaffected by altered protein and lipid levels but  
40 indirect potentiometry is affected [2-4]. Reduced levels of circulating proteins such as  
41 clotting and anticlotting factors and immunoglobulins, which ~~is~~ are common in  
42 newborns and infants, may spuriously increase sodium level. Between 2013 and 2018,  
43 we measured sodium both by direct and indirect potentiometry in 93 consecutive  
44 newborns infants with a community acquired infectious disease, as shown in figure 1.  
45 Median sodium level was lower by 3 mmol/L ( $P<0.001$ ) when measured by the direct (134  
46 mmol/L) as compared with the indirect (137 mmol/L) method. Similar results have been  
47 observed in adults and in a neonatal intensive care unit [5, 6].

48 Because of these substantial differences, pediatricians and neonatologists should  
49 preferentially use the direct technology or, at least, exclusively a single type of  
50 measurement, as recommended by many authorities [2-4].

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