

## References

1. García-Vera C, de Dios Javierre B, Castán Larraz B, Arana Navarro T, Cenarro Guerrero T, Ruiz Pastora R, et al. Scarlet fever: a not so typical exanthematous pharyngotonsillitis (based on 171 cases). *Enferm Infecc Microbiol Clin*. 2016;34:422–6.
2. Salazar V, Escribano R. Infecciones estreptocócicas. Escarlatina. In: Cruz M, editor. *Tratado de Pediatría*. 10th ed. Madrid: Ergon; 2011. p. 522–3.
3. Sevilla Ramos P, Alba Martino R, Carrasco Torres A, Alonso Cristobo M, Blanco González JE, García de Frías JE. Escarlatina: una enfermedad actual (revisión de 165 casos). *Acta Pediatr Esp*. 2003;61:292–5.
4. Ortigosa-Gómez S, Sánchez-Buenavida A, Crehuet-Almirall M, Martínez-Roig A. Diagnóstico de escarlatina en 151 casos en el servicio de urgencias pediátricas durante 2006–2008. *Rev Enfer Infecc Pediatr*. 2011;24:154–61.
5. Herranz Jordán B, Acitores Suz E, Payá López A, Hernández Merino A. Escarlatina recurrente: presentación de cuatro casos. *Rev Pediatr Aten Primaria*. 2001;12:551–60.
6. Fernández Romero V, Rodríguez Sánchez I, Gómez Fernández G. Hallazgos clínicos inusuales en un brote de escarlatina. *Rev Pediatr Aten Primaria*. 2016;18:231–41.

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## Cardiac arrest resuscitation protocols in hospitals: A pending task<sup>☆</sup>



### La organización de la atención a la parada cardíaca en los hospitales: una tarea pendiente

Dear Editor:

Despite the advances made in recent years, cardiac arrest in children carries a high mortality. In Spain, considerable progress has been made in its management,<sup>1</sup> the dissemination of guidelines on paediatric cardiopulmonary resuscitation (CPR)<sup>2</sup> and training of clinical and non-clinical staff in basic and advanced CPR techniques.<sup>3</sup> However, significant problems remain that hinder the appropriate prevention and management of cardiac arrest in children. In order to continue to improve outcomes, the survival chain must be implemented in a coordinated manner, and a key aspect in achieving this goal is to establish a structured approach to the management of cardiac arrest. The chain of survival must be adapted to the specific needs of each child and hospital.

To assess how the management of cardiac arrest is organised, the Spanish Group on Paediatric and Neonatal CPR (Grupo Español de Reanimación Cardiopulmonar Pediátrica y Neonatal [GERCPPyN]) developed a questionnaire on some aspects of its management in children. We submitted a link to an online version of the questionnaire to paediatric and neonatal CPR instructors accredited by the GERCPPyN.

Out of approximately 800 paediatric CPR instructors, 103 completed the questionnaire. The respondents worked in 66 hospitals (11 primary care, 22 secondary care and 33 tertiary care hospitals) in 15 autonomous communities. When we received more than one response for a given centre, we pooled the answers into a single response for the analysis.

Only 33 facilities (50%) had a specialised team for the management of cardiac arrest (63.6% of tertiary level hospitals, 40.9% of secondary level hospitals and 36.3% of primary care hospitals), although the questionnaire did not offer a specific definition of cardiac arrest team. The cardiac arrest team consisted of doctors and nurses from the paediatric intensive care unit (PICU) in 40% of the hospitals, paediatricians from the emergency department or the PICU in 44% of hospitals, and other professionals (adult critical care physicians, anaesthesiologists, etc.) in the remaining 12%. In hospitals without a cardiac arrest team, cardiac arrests were managed by the physician on duty (from the PICU, emergency department or adult services, based on the hospital) in 83% of the hospitals, and by a PICU paediatrician in the remaining 17%.

When it came to the call system, a very low percentage of hospitals (39%) had a specific pager or call system dedicated to cardiac arrest; the emergency department was paged in 42%, and the PICU was contacted by a page or phone call in the remaining 19%. The call was a direct call (which saves time) in 74% of hospitals, while in the remaining 26% it went through an operator.

Only 47% of hospitals had specific emergency call buttons; in 27% of them, these were only available in the emergency department, in 27% they were only available in nurses' stations in wards, in 43% they were available at different locations of the hospital, and in only 1 hospital they were only available in rooms reserved for VIP patients.

The cardiac arrest team could be contacted directly by parents in only 11% of hospitals, and by ward nurses in 95% of hospitals. It would be advisable for any individual with sufficient training to be able to use emergency buttons.

The findings of our questionnaire are fairly representative of the situation in Spain, as we received responses from

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a considerable number of hospitals offering different levels of care and in nearly every autonomous community, and confirmed that the approach to the management of cardiac arrest in children is hardly structured and very irregular as concerns both the care teams that manage cardiac arrest and the emergency call systems.

Thus, it is essential that each hospital develop its own protocols for the management of cardiac arrest in children, including the creation of well-structured and trained cardiac arrest teams (formed by physicians and nurses), the implementation of specific and immediate call systems, training of all personnel to detect, alert of, and start treating life-threatening emergencies using early warning scores to assess the risk of cardiac arrest,<sup>4,5</sup> regular checking of crash trolleys, and the systematic documentation and evaluation of cardiac arrests and calls to the cardiac arrest team. We can only improve the outcomes of in-hospital cardiac arrest in children by improving our training and organisation.

## References

1. López-Herce J, del Castillo J, Cañadas S, Rodríguez-Núñez A, Carrillo A, Spanish Study Group of Cardiopulmonary Arrest in Children. In-hospital paediatric cardiac arrest in Spain. *Rev Esp Cardiol (Engl Ed)*. 2014;67:189–95.
2. López-Herce J, Rodríguez A, Carrillo A, de Lucas N, Calvo C, Civantos E, et al. Novedades en las recomendaciones de reanimación cardiopulmonar pediátrica. *An Pediatr*. 2017;86:229.e1–9.
3. López-Herce J, Urbano J, Carrillo A, Matamoros M, Red Iberoamericana de Estudio de la Parada Cardiorrespiratoria en la Infancia. Resuscitation training in developing countries: Importance of a stable program of formation of instructors. *Resuscitation*. 2011;82:780.
4. Maconochie IK, Bingham R, Eich C, López-Herce J, Rodríguez-Núñez A, Rajka T, et al., Paediatric life support section Collaborators. European Resuscitation Council Guidelines for Resuscitation 2015: Section 6. Paediatric life support. *Resuscitation*. 2015;95:223–48.
5. Bonafide CP, Localio AR, Song L, Roberts KE, Nadkarni VM, Priestley M, et al. Cost-benefit analysis of a medical emergency team in a children's hospital. *Pediatrics*. 2014;134:235–41.

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