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### Guidelines and consensus

# Transfusion therapy evidence-based recommendations for the pediatric cancer patient<sup>☆</sup>



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#### ABSTRACT

**Introduction:** Transfusion therapy is probably one of the most widely used therapies with poor supporting evidence, despite the long years of practical clinical use.

**Objective:** To adapt the evidence-based recommendations on the use of blood products to the Colombian setting: red blood cells, platelets, cryoprecipitates and irradiated blood products in cancer patients under 18 years of age.

**Methods:** Standard methodologies were followed in the development of recommendations. First, the clinical questions were addressed, and the evidence-based clinical practice guidelines were identified, graded and selected to answer the clinical questions. A systematic methodology was used to qualify, obtain and describe the relevant information to generate recommendations based on the SIGN system. The results were then presented and discussed in a group of experts to establish the practical value of the evidence and to adapt the recommendations to the Colombian environment.

**Results:** Out of 107,441 preliminary titles, 56 studies were analyzed, and from them 3 clinical practice guidelines and 4 Cochrane systematic reviews were selected. This evidence was evaluated using AGREE II and AMSTAR. Red blood cells transfusion support is recommended using the restrictive strategy. Prophylactic platelet transfusion is the recommended indication. Cryoprecipitate is recommended when fibrinogen levels fall below 100 mg/dL, and indications on irradiated blood products were established.

**Conclusions:** This paper is an evidence-base approach on the recommendations for transfusion therapy in children with cancer.

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## Recomendaciones basadas en la evidencia de terapia transfusional en el paciente oncológico en pediatría

### RESUMEN

#### Palabras clave:

Transfusión sanguínea  
Sustitutos sanguíneos  
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Revisión

**Introducción:** La terapia transfusional es quizá una de los tratamientos de mayor uso sin buen respaldo de evidencia, a pesar de muchos años de uso en la práctica clínica.

**Objetivo:** Adaptar recomendaciones basadas en evidencia al contexto colombiano sobre el uso de hemocomponentes: glóbulos rojos, plaquetas, crioprecipitados y hemocomponentes irradiados en el paciente oncológico menor de 18 años.

**Métodos:** Se utilizaron metodologías estándares para el desarrollo de las recomendaciones. Primero se formularon las preguntas clínicas, se identificaron, calificaron y seleccionaron las guías de práctica clínica basadas en la evidencia que respondían las preguntas clínicas, utilizando una metodología sistemática se realizó la calificación, extracción y descripción de los aspectos relevantes para generar recomendaciones usando el sistema SIGN, luego se realizaron exposición y discusión de los resultados obtenidos con un grupo de expertos para seleccionar la utilidad de la evidencia y adaptar las recomendaciones al contexto colombiano.

**Resultados:** De 107.441 títulos preliminares, se analizaron 56 estudios, y de estos se escogieron 3 guías de práctica clínica y 4 revisiones sistemáticas Cochrane. Se evaluó esta evidencia con AGREE II y AMSTAR. Se recomienda soporte transfusional de glóbulos rojos usando la estrategia restrictiva, la estrategia transfusional profiláctica de plaquetas es la indicación recomendada. El valor de fibrinógeno menor de 100 mg/dl es el recomendado para utilizar crioprecipitados y se determinaron las indicaciones sobre hemocomponentes irradiados.

**Conclusiones:** Este trabajo representa un enfoque basado en la evidencia sobre las recomendaciones de terapia transfusional para niños con cáncer.

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## Introduction

Notwithstanding the current knowledge on the principles of immunology that govern allogeneic transplants from a temporary tissue and the strict biological principles including molecular techniques aimed at minimizing any potential transfusion therapy risks; transfusions are not totally safe. This is why additional evidence is needed to determine the most appropriate instance for using transfusion therapy in pediatric cancer patients. Key documents such as the "European Cancer Anemia Survey" that evaluated 15,367 patients to establish the incidence and the prevalence of this condition, reported 39% prevalence and an incidence of 53.7% in six months. Moreover, 38.9% of the anemic patients were treated, of which 14.9% were transfused; hence the importance of establishing specific indications for transfusion therapy.<sup>1</sup>

Moreover, since 2009, the World Health Organization (WHO) reports indicate that the lowest blood donation rates are seen in developing countries (2.3 per 1000 inhabitants).<sup>2</sup> Although, specifically in Colombia these rates have grown consistently as compared to the other countries of the region, the availability of blood products is inadequate (12 units per 1000 inhabitants).<sup>3</sup> When considering the transfusion-associated adverse events, as listed in the clinical practice guidelines of the 2012 American Association of Blood Banks (AABB), the risk

of Human Immunodeficiency Virus (HIV) transmission was 6,8/10 million transfused blood products from 2007 to 2008 and the residual risk for Hepatitis B virus transmission was 1/282,000 transfused blood components. Additionally, the incidence reported in 2009 for non-infectious transfusion-related adverse events of acute pulmonary injury was 0.81 (95% C.I., 0.44–1.49) per 10,000 transfuse blood products.<sup>4</sup> So we may conclude that currently there is a big need to collect the best evidence regarding the most common practices in transfusion therapy of the pediatric cancer patient.

To accomplish the objectives herein established, a set of evidenced-based recommendations was adapted to the Colombian environment to assist in decision-making.

## Methodology

Evidence-based recommendations for transfusion indications in pediatric perioperative cancer patients were developed, according to the standard international methodologies. The systematic reviews in the literature were identified, using the SIGN methodology for making recommendations,<sup>5</sup> aimed at answering four research questions of clinical value in pediatric oncology. These questions were discussed and approved by the research team and a group of pediatric cancer hematologists.

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