

Transfusion-Related Acute Lung Injury--TRALI

WHAT IS TRALI (Transfusion-Related Acute Lung Injury)?

TRALI has emerged as a leading cause of transfusion-related morbidity and mortality. It is characterized by acute non-cardiogenic pulmonary edema with respiratory difficulty in the setting of transfusion. It occurs **during or within six hours** of a transfusion; patients have **breathing symptoms, blood oxygen drops and new chest X-ray changes** develops.

DEFINITION OF ACUTE LUNG INJURY (ALI):

- Acute onset
- Hypoxemia: Oxygen saturation less than 90% on room air
- Bilateral lung infiltration on the chest radiograph
- No evidence of circulatory overload

DEFINITION OF TRALI:

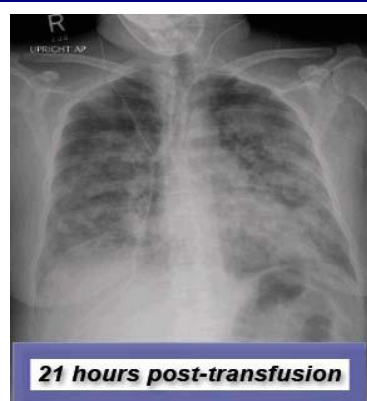
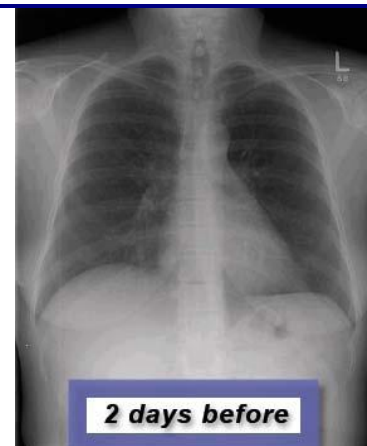
Patients with no above symptoms of Acute Lung Injury prior to transfusion, TRALI is diagnosed if:

- ◆ New symptoms of Acute Lung Injury are present
- ◆ Symptoms occur during, or within 6 hours of completion of transfusion
- ◆ No other risk factors for Acute Lung Injury

DEFINITION OF POSSIBLE TRALI

In patients with no symptoms or signs of Acute Lung Injury prior to transfusion, possible TRALI is diagnosed if:

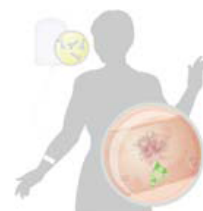
- New symptoms or signs of Acute Lung Injury are present
- It occurs during, or within 6 hours of completion of, transfusion
- There are one or more risk factors



What causes TRALI?

Two postulated mechanisms have been implicated:

1. Passive transfer of HLA or granulocyte antibodies from donor to patient; or, less commonly, HLA or granulocyte antibodies in the recipient. (Antibodies are most common in multiparous female donors as a consequence of prior pregnancies).
2. Biologically active lipids in transfused component.



How common is TRALI?

It's generally accepted that TRALI occurs around 1 in 1,200 to 5000 plasma-containing transfusions. According to Food and Drug Administration (FDA) data, it is now the leading cause

of transfusion-related death in the USA and has a mortality of 6 – 9%.

Can TRALI be treated and prevented?

Treatment is primarily supportive measures.

- provide enough **oxygen** – **mechanical ventilation** is often needed.
- **TRALI is associated with microvascular damage and not fluid overload.** Diuretic medications can make matters worse in patients with TRALI.
- Differential diagnosis between TACO (Transfusion Associated Circulatory Overload) and TRALI is vital for patient treatment plan

Prevention:

The antibodies that cause TRALI are more common in women, particularly after pregnancy. MBTS has a policy for using predominantly male-only plasma for fresh plasma products.

Tests to assess diagnosis of TRALI

When patient experience TRALI or severe pulmonary transfusion reaction, a possible role for leukocyte antibodies in the transfusion reaction should be investigated especially if the patient becomes neutropenic.

Testing for HLA antibodies and neutrophil antibodies should be requested :

- Download and fill up the «Investigation of Transfusion Related Acute Lung Injury (TRALI) Request Form» from <http://www.ssm.gov.mo/cts/Download/F16r1IH-E.pdf>
- Take 3 ml EDTA and 6 ml clotted blood sample from the patient
- Send the sample and the filled-up form to Blood Transfusion Service.

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Reference :

1. Towards an Understanding of TRALI Canadian Blood Service
2. Bux J. Transfusion-related acute lung injury (TRALI): a serious adverse event of blood transfusion. Vox Sang. 2005 Jul;89(1):1-10. [PMID 15938734](#)
3. Center for Biologics Evaluation and Research. Fatalities Reported to FDA Following Blood Collection and Transfusion: Annual Summary for Fiscal Years 2005 and 2006. Bethesda, Md: U.S. Food and Drug Administration.