7^ Conferenza Nazionale dei Servizi Trasfusionali
Vicenza | 24-26 maggio 2023
SIMTI

Il ruolo della riorganizzazione della rete trasfusionale nella valorizzazione della competenza immunoematologica: rischi e opportunità

Simonetta Pupella

Centro nazionale sangue

La sottoscritta, Simonetta Pupella in qualità di Relatrice
dichiara che

nell'esercizio della Sua funzione e per l'evento in oggetto, NON È in alcun modo portatrice di interessi commerciali propri o di terzi; e che gli eventuali rapporti avuti negli ultimi due anni con soggetti portatori di interessi commerciali non sono tali da permettere a tali soggetti di influenzare le sue funzioni al fine di trarne vantaggio.

TRANSFUSION MEDICINE
Official Journal of the British Blood Transfusion Society
British Blood Transfusion Society
Transfusion Medicine | EDITORIAL

Immunohaematology: the core of laboratory transfusion practice

Immunohaematology has been the core of transfusion practice since the discovery of the ABO blood group in 1901. The field continues to be essential for ensuring the safety of transfusion and presents new challenges as chronic transfusion programmes expand and new therapies interact with testing and gain popularity.

Transfusion Medicine, 2019, 29, 143–145

Art. 5. (Livelli essenziali di assistenza sanitaria in materia di attività trasfusionale)

a) Attività di produzione:

……

- indagini prenatali finalizzate alla prevenzione di problemi immunoematologici e prevenzione della malattia emolitica del neonato e tenuta di un registro dei soggetti da sottoporre alla profilassi;
- attività immunoematologiche di riferimento per problemi trasfusionali clinici e sierologici;
- gestione di una banca di sangue congelato per le emergenze;

b) Prestazioni di diagnosi e cura in MT:

……

- esecuzione da parte dei servizi trasfusionali delle indagini immunoematologiche sui pazienti finalizzate alla trasfusione;
- ulteriori attività di diagnosi e di cura, finalizzate alla trasfusione, individuate dalla programmazione regionale e aziendale;

NEW CHALLANGES

- Programmi trasfusionali cronici
- Interazione testing – nuovi farmaci biologici
- Testing molecolare vs sierologico

Transfusion Medicine, 2019, 29, 143–145

blood Review Series

TRANSFUSION MEDICINE

Transfusion-related red blood cell alloantibodies: induction and consequences

Christopher A. Tormey1,2 and Jeanne E. Hendrickson1,3

blood® 25 APRIL 2019 | VOLUME 133, NUMBER 17

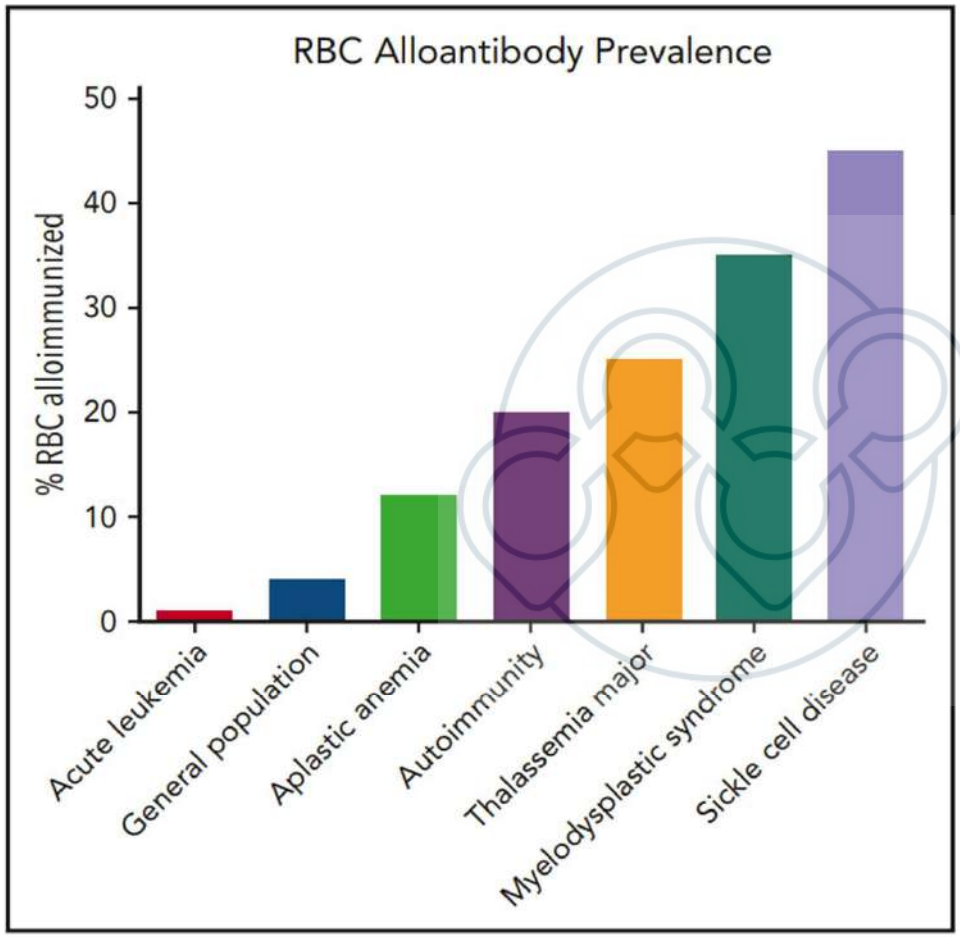
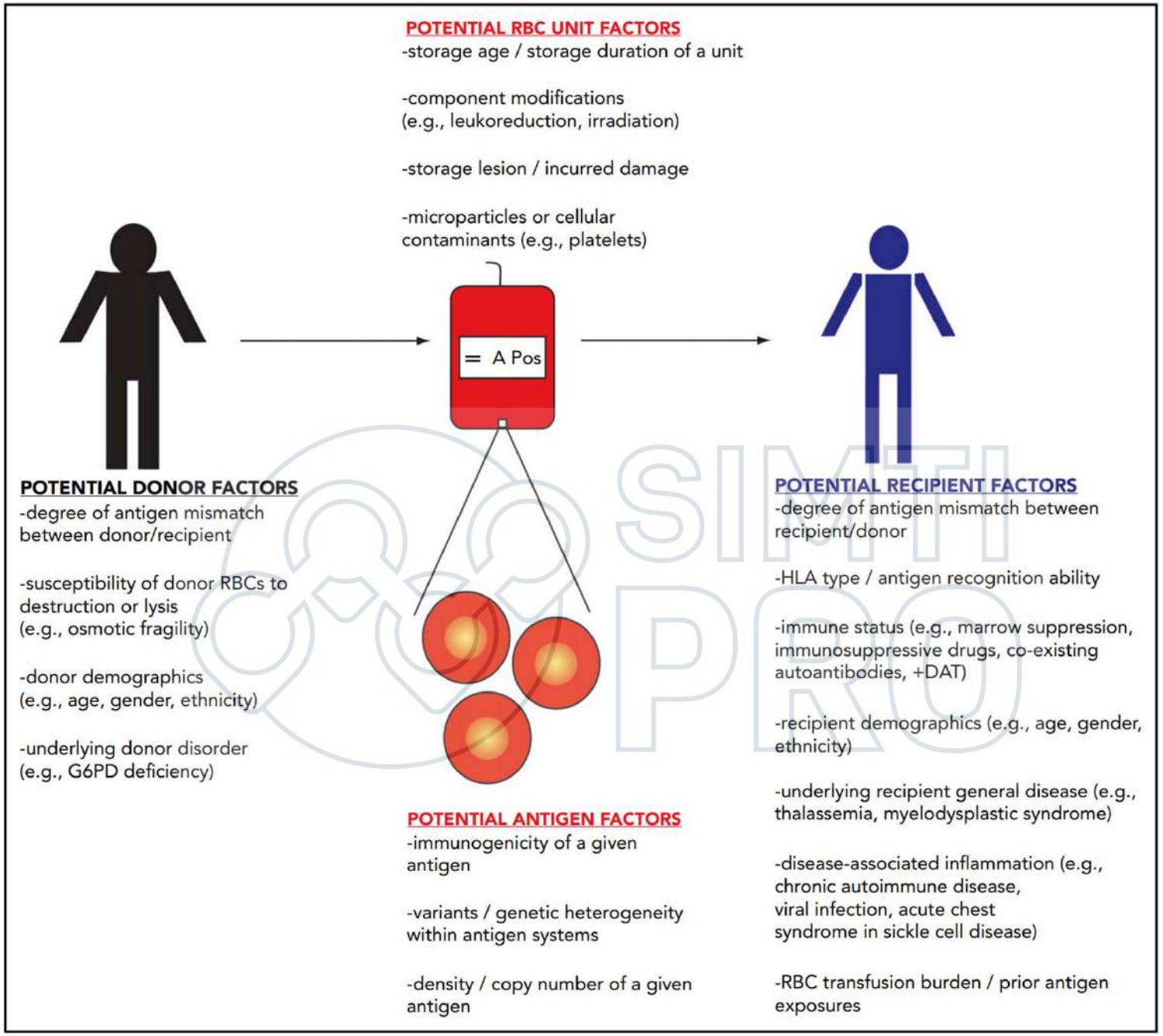


Figure 3. Approximate RBC alloantibody prevalence by representative disease status. Alloimmunization rates by disease vary significantly by study; the data shown are approximately representative.

- RBC antigen characteristics
- RBC alloantibody formation, detection, evanescence
- Clinical significance of RBC alloimmunization
- Transfusion-recipient disease
- Blood «unit» factors
- Blood donor factors



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Conclusion

Transfusion-associated alloimmunization against RBC antigens can be a clinically significant problem. Identified RBC alloantibodies and reported complications attributed to RBC alloimmunization likely represent only one-third of those that actually exist, given a combination of factors described in this review. As such, what is known about RBC alloimmunization is presumably just the "tip of the iceberg." Multidisciplinary studies, on the basic science, translational, and clinical levels, are needed to better understand risk factors for antibody development. Strategies to prevent antibody development need to be optimized, as do strategies to mitigate the dangers of existing alloantibodies. Transfusion- and pregnancy-associated alloantibodies have implications that reach far beyond the blood bank and transfusion medicine, with relevance to hematology, oncology, transplantation, obstetrics, and immunology, among other areas.

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NEW CHALLANGES

- Programmi trasfusionali cronici
- Interazione testing – nuovi farmaci biologici
- Testing molecolare vs sierologico

Transfusion Medicine, 2019, 29, 143–145

IMMUNOHAEMATOLOGY

Editorial

Antibody testing in patients treated with anti-CD38: there is still room for improvement

Franz F. Wagner[1]

Blood Transfus 2020; 18: 244-6 DOI 10.2450/2020.0166-20

INTERNAL MEDICINE JOURNAL

RACP Specialists. Together

doi:10.1111/imj.15934

POSITION PAPER

Guidance for transfusion management in patients receiving magrolimab therapy (anti-CD47 monoclonal antibody)

Michelle Tan,[1] Nicole Zacher,[2,3] Rae French,[4] Marija Borosak,[5,6] Samantha Lennard,[2,7] Annette Le Viellez,[2,8] Simon Benson[2,9] and James Daly[10]

BASELINE

Table 2 Action points: following commencement of magrolimab

Clinicians	Laboratory (see Fig. 3 and 4)
1 Indicate on laboratory requests in clinical notes 'magrolimab anti-CD47 therapy'	**1** Perform ABO/RhD group, antibody screen, direct antiglobulin test
2 Anticipate transfusion requirements and notify transfusion laboratory of expected weekly transfusions	**2** If there is an ABO typing discrepancy, provide group O red cells and report as 'inconclusive'
3 Preference elective transfusions at the same site as baseline transfusion investigations	**3** If interference is seen with indirect antiglobulin test, use an anti-human globulin reagent that does not detect IgG4
4 Where possible, avoid transfusion on the same day as magrolimab infusions	**4** Persistent reactivity requires liaison with transfusion medicine specialist
	5 Communicate to clinicians any difficulties in obtaining timely or appropriate phenotype-matched red cell units

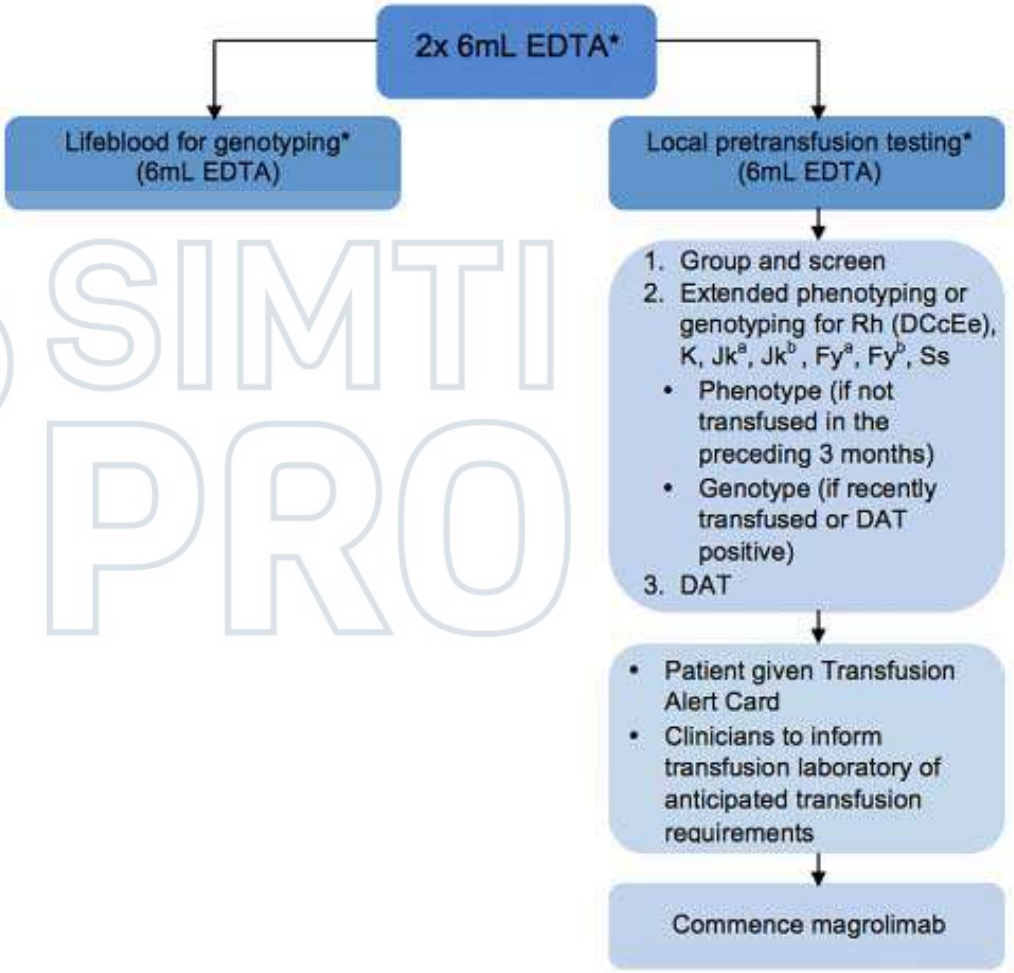


Table 2 Acti

Clinicians
1 Indicate on in clinical no anti-CD47 th
2 Anticipate requirement transfusion l expected we
3 Preference at the same transfusion i
4 Where pos transfusion magrolimab

Transfusion Alert Card

THIS PATIENT IS RECEIVING MAGROLIMAB THERAPY (ANTI-CD47 MONOCLONAL ANTIBODY) FOR THE TREATMENT OF

_____

PLEASE PROVIDE LOCAL BLOOD BANK WITH A COPY OF THIS CARD. NOTIFY BLOOD BANK URGENTLY IF TRANSFUSION MAY BE REQUIRED

Dear Healthcare Provider,
ABO typing may show inconclusive results in patients receiving magrolimab. Antibody screen may show positive results due to interference, even in the absence of clinically significant RBC antibodies.
If emergency transfusion is required, uncrossmatched group O red cells can be issued as per local institutional policies.

Name: D.O.B:

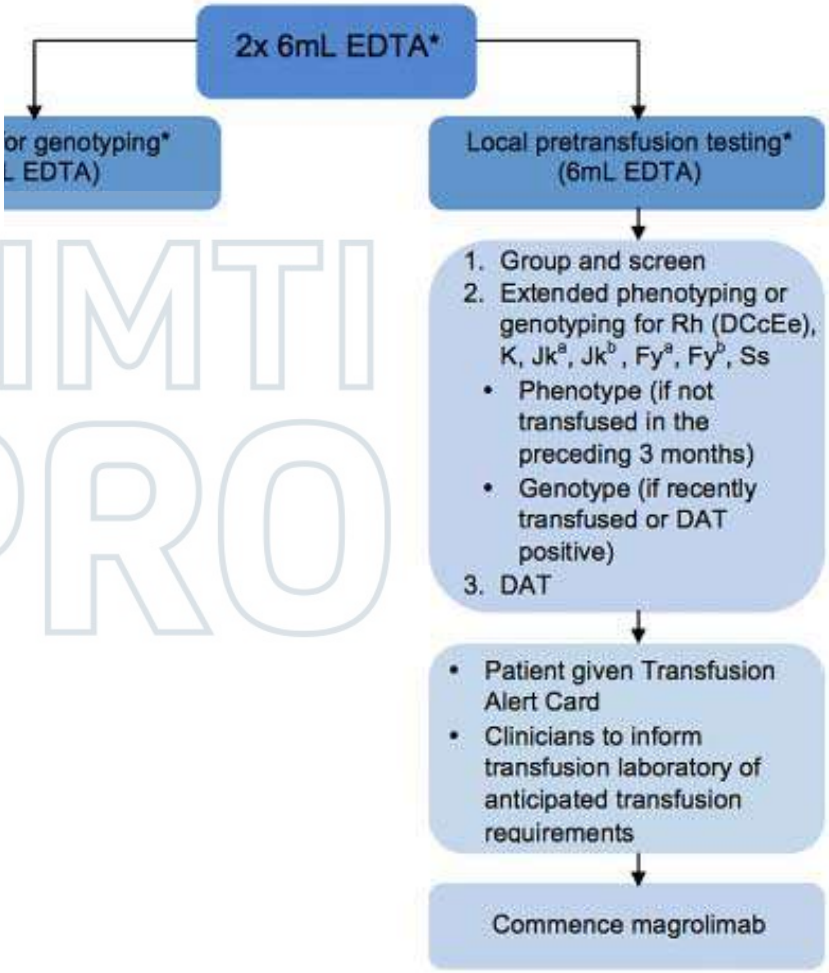
Address:

ABO/RhD group:

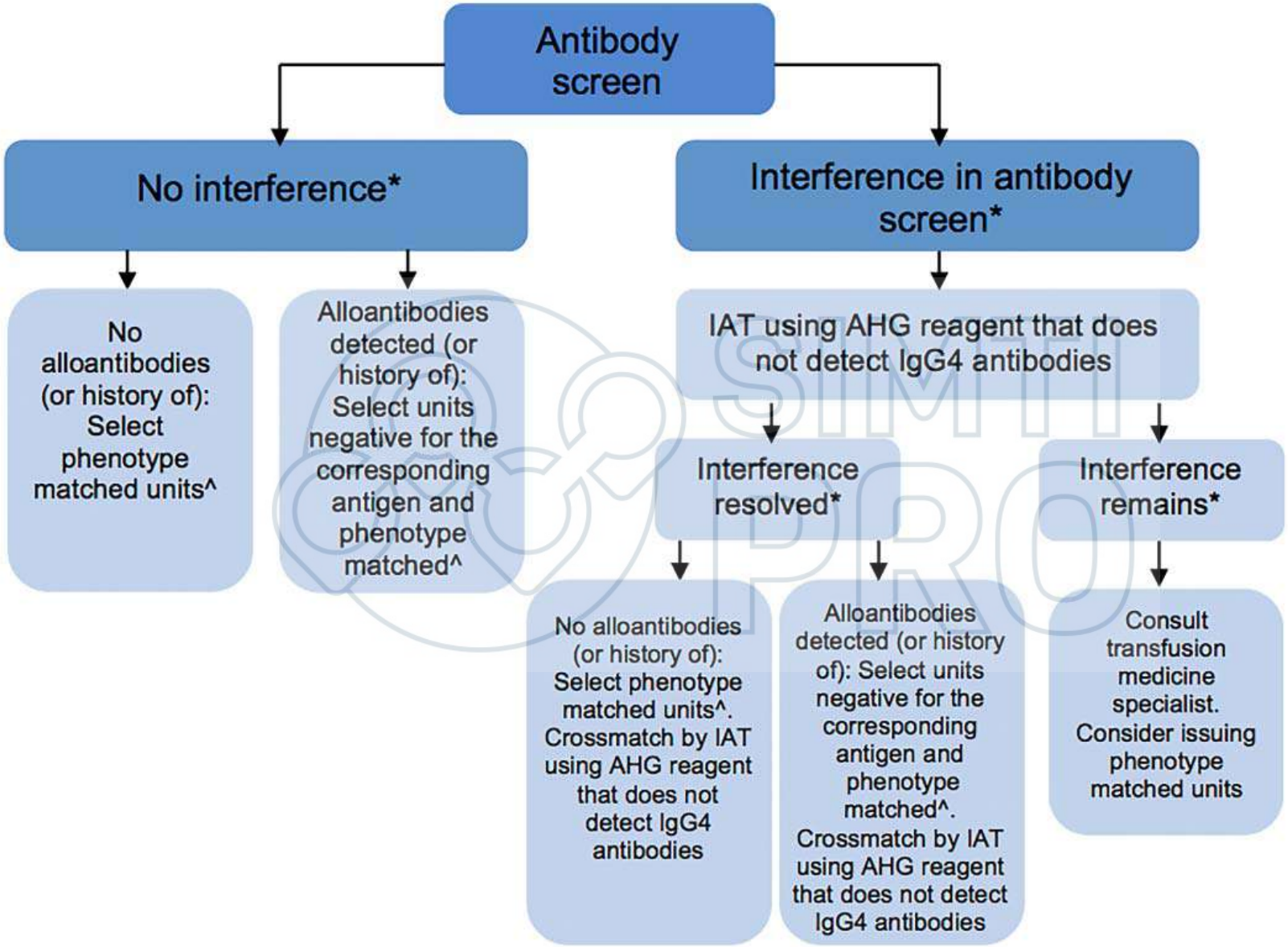
Known red cell antibodies:

Contact details of laboratory where pre-transfusion blood tests were performed:

NOTE: Information above is an alert only and does not replace transfusion laboratory investigations. Please liaise with initial testing laboratory for correspondence.



Internal Medicine Journal **52** (2022) 2165–2171



Internal Medicine Journal **52** (2022) 2165–2171

NEW CHALLANGES

- Programmi trasfusionali cronici
- Interazione testing – nuovi farmaci biologici
- Testing molecolare vs sierologico

Transfusion Medicine, 2019, 29, 143–145

Banking with Precision: Transfusion Medicine as a Potential Universal Application in Clinical Genomics

Much like every other discipline in medicine and biology, transfusion medicine was transformed by the introduction of genotyping technologies – the next revolutionary blood grouping technique since Karl Landsteiner described ABO hemagglutination in 1900 [1]. Genotyping has become a valuable part of the blood bank laboratory toolkit, both as a complement and as an alternative to conventional serology. Its advantages in the clinical setting are widely documented, including blood group determination in recently-transfused patients, detection of rare blood antigens for which commercial serology is unavailable, blood typing in patients receiving monoclonal therapies that interfere with serology, determination of paternal zygosity, noninvasive fetal blood typing, and streamlining complex antibody workups [2*].

Curr Opin Hematol. 2019 November ; 26(6): 480–487.

Current advances in transfusion medicine 2020: A critical review of selected topics by the AABB Clinical Transfusion Medicine Committee

7 | MOLECULAR IMMUNOHEMATOLOGY

Key Points

7.1 | Large-scale genotyping

RBC genotyping is possible by various test platforms,[42],[43] and mass genotyping of patients and donors holds the potential for multiple improvements in clinical TM.[44] However, for genotyping platforms to be universally adopted, a test has to be comprehensive, scalable, cost-effective, and paired with a software that can provide automated interpretation.

Transfusion. 2021 September ; 61(9): 2756–2767.

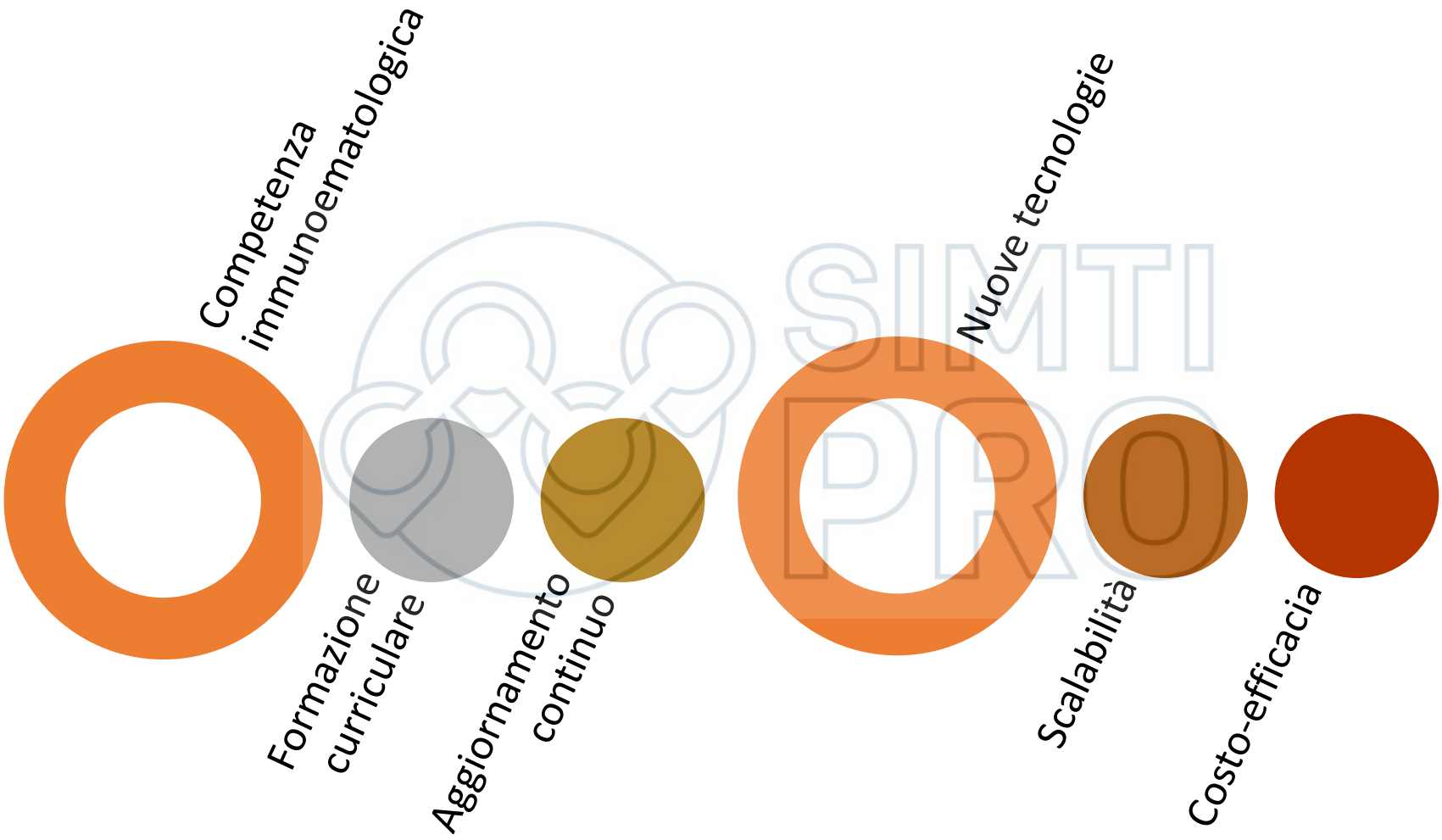
Banking with Precision: Transfusion Medicine as a Potential Universal Application in Clinical Genomics

TRANSFUSION GENOMICS FROM THE BLOOD COLLECTOR PERSPECTIVE

Using genomic sequencing technologies to predict blood group antigen phenotypes in blood donors is a different venture given that it targets an essentially healthy population. Targeted NGS approaches are particularly attractive to circumvent concerns about secondary findings, improve alignment precision compared to untargeted genome-wide short read sequencing methods, achieve the highest possible throughput, and reduce the data storage burden (Table 1). Further work is needed to evaluate the cost-effectiveness of NGS versus repeated serologic and targeted genotyping tests to provide antigen-negative blood for patients.

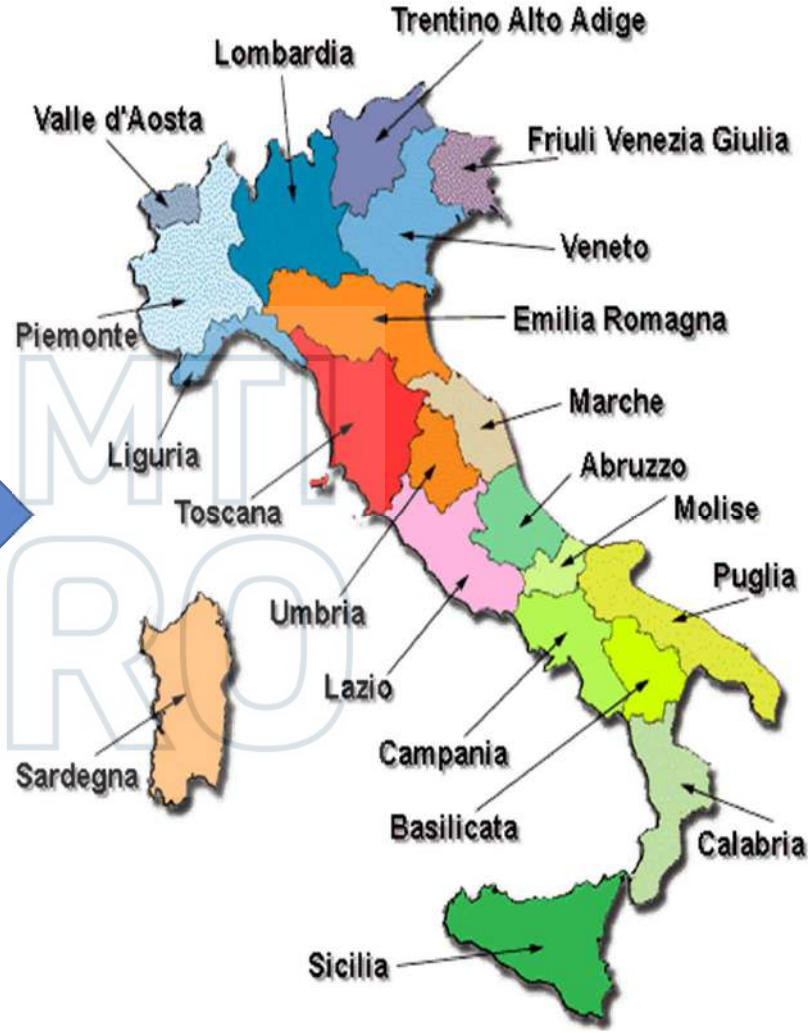
Curr Opin Hematol. 2019 November ; 26(6): 480–487.

NEW CHALLANGES: clinical and laboratory practice



NEW CHALLANGES: clinical and laboratory practice

Rinforzare la competenza immunoematologica



Attraverso interventi continui che raggiungono tutti gli operatori

NEW CHALLANGES: laboratory practice

RETE CONSOLIDATA di laboratori di immunoematologia (LI) con diversi e crescenti livelli di expertise per lo studio IEM di casi complessi

INTERFACCIA di riferimento nazionale e internazionale per i casi complessi

Creare una rete interregionale di LI/LBM di riferimento per:

- tipizzare su larga scala e/o svolgere le indagini IEM complesse (eritrocitarie e piastriniche)
- mantenere nel tempo programmi di tipizzazione
- ottimizzare le risorse disponibili

IMMUNOEMATOLOGIA COMPLESSA

Raccomandazioni per l'impiego delle metodiche molecolari in immunoematologia

Società Italiana di Medicina Trasfusionale e Immunoematologia

SIMTI

Edizione 2018

Si raccomanda che i laboratori che eseguono indagini di immunoematologia molecolare per gli antigeni eritrocitari e piastrinici:

- appartengano a Strutture Trasfusionali autorizzate e accreditate
- abbiano un Responsabile con almeno cinque anni di esperienza in immunoematologia avanzata e almeno due anni in immunoematologia molecolare

Si raccomanda che i Laboratori di Immunoematologia Molecolare di Riferimento:

- eseguano almeno 500 tipizzazioni molecolari/anno complessive in pazienti e donatori
- dispongano di due metodiche differenti di analisi molecolare per i principali sistemi antigenici.

LIR*

- almeno **100** indagini immunoematologiche complesse / anno
- in grado di gestire le indagini non effettuabili con le procedure di routine

LIR = Laboratorio immunoematologia di riferimento

LBM*

- almeno **500** tipizzazioni molecolari/anno complessive in pazienti e/o donatori
- dispone di due metodiche differenti di analisi molecolare per i principali sistemi antigenici eritrocitari e piastrinici

LMB = Laboratorio di riferimento per i test di biologia molecolare

The EHA Research Roadmap: Transfusion Medicine

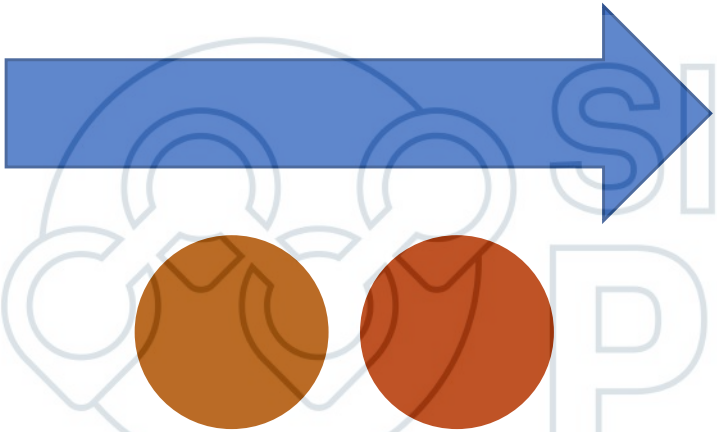
IMMUNOLOGICAL TRANSFUSION COMPLICATIONS (ALLOIMMUNIZATION/TRIM/HEMOVIGILANCE)

Introduction

Blood transfusions are biological interventions. A new encounter with a cognitive antigen by transfusion, pregnancy, or transplantation can cause morbidity and mortality. The overall prevalence of alloimmunization across Europe is unknown and varies between patient categories and according to the numerous antigens expressed on blood cells and blood substances. Molecular genotyping of most blood cell antigens is now possible,[25,26] and cost-efficient genotyping of donors are real advances happening now in transfusion practice. Taken together, the next 5 years will see a paradigm shift in matching abilities for transfusion practice.

NEW CHALLANGES: laboratory practice

Finalizzare le nuove tecnologie



Scalabilità

Costo-efficacia

Consolidando il network

Standard per i Laboratori di Immunoematologia di Riferimento (LIR) e di Biologia Molecolare (LBM)

1ª Edizione - 2021

"L'impiego di tecniche di analisi molecolari impone elevata esperienza e competenza in questo campo, così come richiesto per l'utilizzo delle indagini sierologiche."

Organizzare la diagnostica immunoematologica alla luce delle conoscenze e delle tecnologie disponibili in un **ottica di rete**

Integrare in modo strutturato le indagini sierologiche e le indagini molecolari in un **ottica di efficacia e sostenibilità**

Rete Nazionale Donatori Rari (RNDR)

Rete trasfusionale

DATABASE NAZIONALE di Donatori Rari
- per antigeni ad alta incidenza
- per combinazione di antigeni

INVENTARIO NAZIONALE di sangue raro congelato

VALORIZZAZIONE delle unità di sangue raro negli scambi interregionali

Pazienti trasfusi

RETE CONSOLIDATA di laboratori di immunoematologia (LI) con diversi e crescenti livelli di expertise per lo studio IEM di casi complessi

INTERFACCIA di riferimento nazionale e internazionale per i casi complessi

Medicina trasfusionale

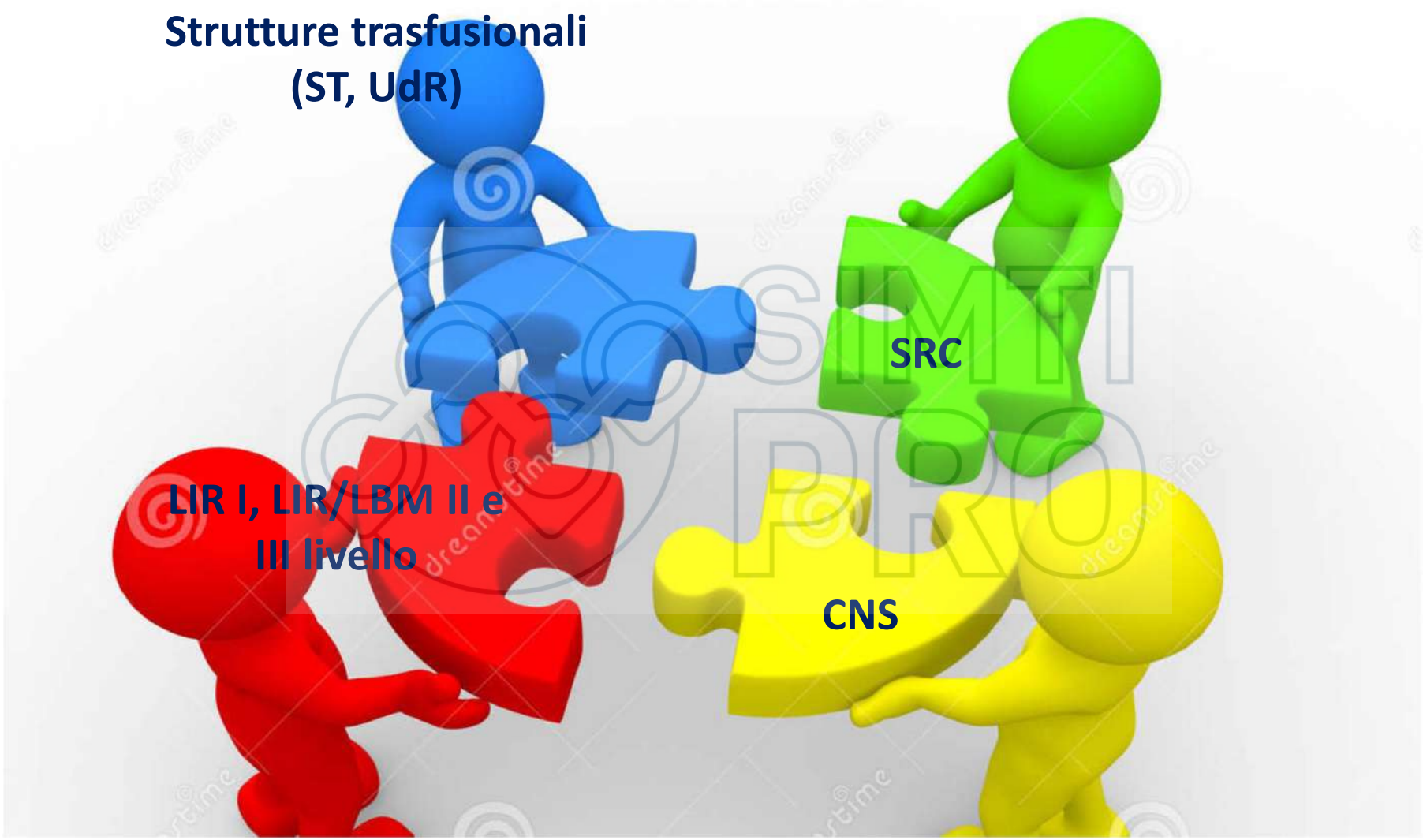
STANDARDIZZAZIONE delle procedure operative di laboratorio

VALORIZZAZIONE delle unità di sangue raro negli scambi interregionali

FORMAZIONE CONTINUA

PROGETTI DI RECERCA E SVILUPPO

ATTORI DEL NETWORK



Riorganizzazione della rete trasfusionale nella valorizzazione della competenza immunoematologica