# Serious adverse reactions 2018

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Seirbhís Fuilaistriúcháin na hÉireann

# Findings 2018

In total **123 SAR** and **221 SAE** reports submitted to the NHO with **308** reports accepted

- 113 accepted reports fall into the category of **SAR**
- 47 SAR Reports Mandatory (38%)
- 10 SAR Reports Did Not Progress
- 17 SAR reports involving paediatric patients (infants, children, and adolescents from birth up to the age of 18) received and 14 accepted

# Findings 2018

***No reports in relation to:***

- ***Suspected transfusion transmitted infection (bacterial)***
- ***Transfusion Associated Graft versus Host Disease (TA-GvHD)***
- ***Post Transfusion Purpura***

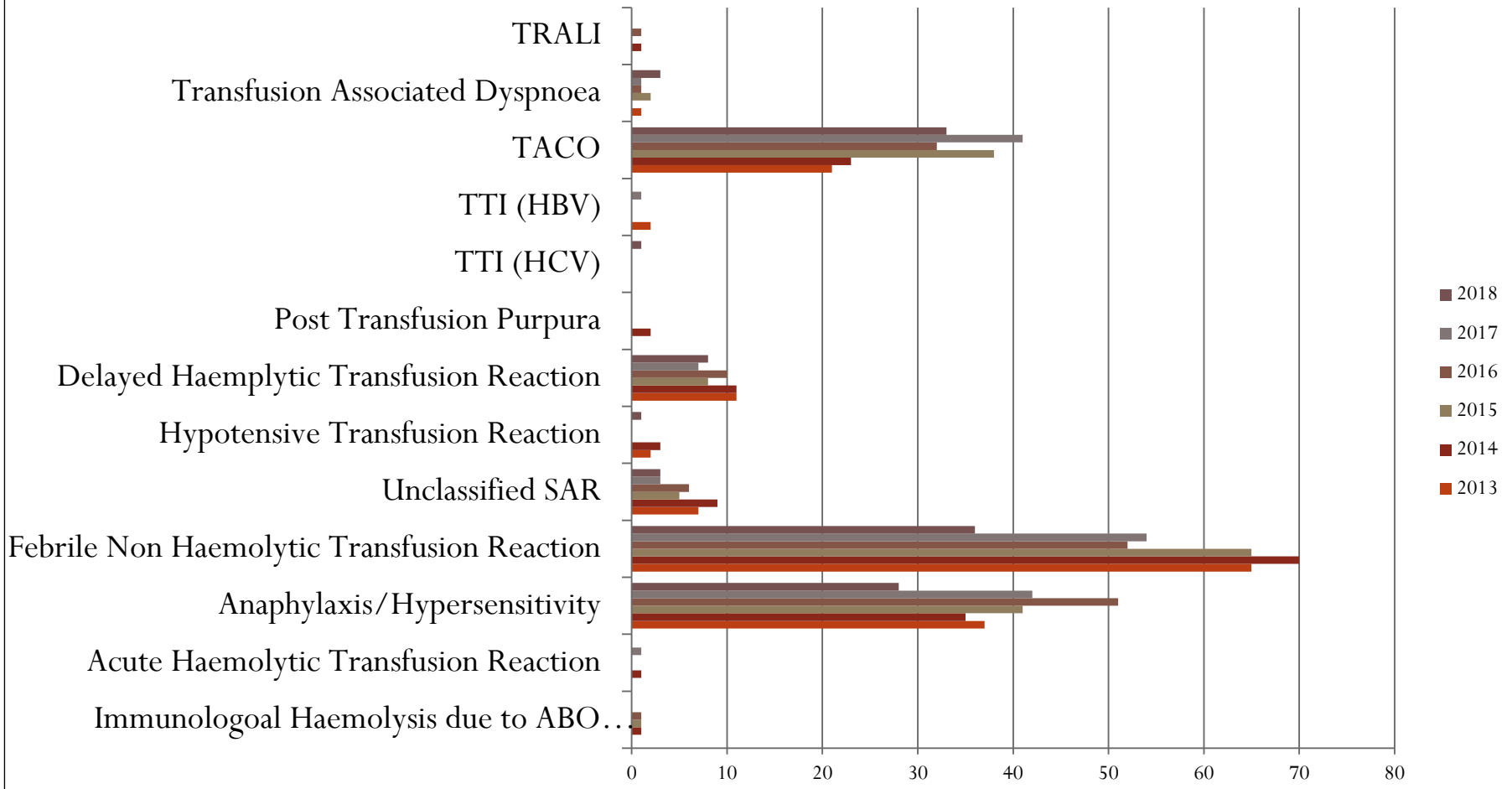
- Just under 162,000 components and SD Plasma issued from IBTS (IBTS annual report 2018)

# How Hospitals reported
## (transfused reactions and events)

| Hospital | Total no of cases | Total DNP | Total Duplicates | Total SAE | Total SAE Mandatory Reportable | Total SAR | Total SAR Mandatory Reportable |
|---|---|---|---|---|---|---|---|
| Blood Usage Category A (<1000 Units) | 52 | 2 | 0 | 27 | 4 | 23 | 8 |
| Blood Usage Category B (1000 - 3000 Units) | 57 | 9 | 0 | 29 | 14 | 19 | 7 |
| Blood Usage Category C (3000 - 6000 Units) | 18 | 0 | 0 | 9 | 2 | 9 | 4 |
| Blood Usage Category D (> 6000 Units) | 111 | 9 | 0 | 40 | 18 | 62 | 28 |
| | **238** | **20** | **0** | **105** | **38** | **113** | **47** |
| Subject to change | | | | | | | |

| Serious Adverse Reactions accepted by the NHO | | 2016 | 2017 | 2018 |
|---|---|---|---|---|
| Acute Transfusion reactions | Immunological haemolysis due to ABO Incompatibility | 1 | 0 | 0 |
| | Immunological haemolysis due to other allo-antibody (Acute < 24 hrs.) | 0 | 1 | 0 |
| | Anaphylaxis/hypersensitivity (AA) | 51 | 42 | 28 |
| | Febrile Non Haemolytic Transfusion Reaction | 52 | 54 | **36** |
| | Hypotensive Transfusion Reaction | 0 | 0 | 1 |
| | Unclassified SAR | 6 | 3 | 3 |
| Delayed Haemolytic Transfusion Reactions | Immunological haemolysis due to other allo-antibody (Delayed > 24 hrs.) | 10 | 7 | 8 |
| Transfusion Transmitted infection | Transfusion Transmitted viral infection (HBV) | 0 | 1 | 0 |
| | Transfusion Transmitted viral infection (HCV) | 0 | 0 | 1 |
| Respiratory Complications of transfusion | Transfusion Associated Circulatory Overload (TACO) | **32** | **41** | **33** |
| | Transfusion Associated Dyspnoea | 1 | 1 | 3 |
| | Transfusion related acute lung injury (TRALI) | 1 | 0 | 0 |
| Totals | | **154** | **150** | **113** |

# Reactions accepted 2013 - 2018



# Acute Hemolytic Transfusion Reactions (AHTR)

AHTR is defined as a reaction occurring within 24 hours of a transfusion where clinical and/or laboratory features of haemolysis are present (ISBT definition). Acute haemolysis may be caused by ABO incompatibility, other antigen incompatibility or to non-immunological factors.

# Acute Transfusion reactions

| Acute Transfusion Reactions (n=68) | Immunological Haemolysis due to ABO incompatibility | 0 |
|---|---|---|
| | Febrile Non Haemolytic Transfusion Reaction | 36 |
| | Anaphylaxis/Hypersensitivity | 28 |
| | Hypotensive Transfusion Reactions | 1 |
| | Unclassified Reaction | 3 |

# Febrile Reactions (n=36)

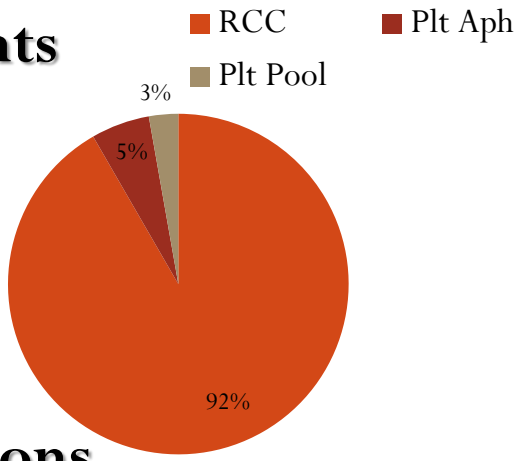
## Findings

- 40 Reports received
- 36 Reports accepted
- 0 Reports Mandatory

## Demographics

- 1-4 yr: 0
- 5-11 yr: 1
- 18-30 yr: 3
- 31-50 yr: 5
- 51-70 yr: 11
- 70+: 16

## Components



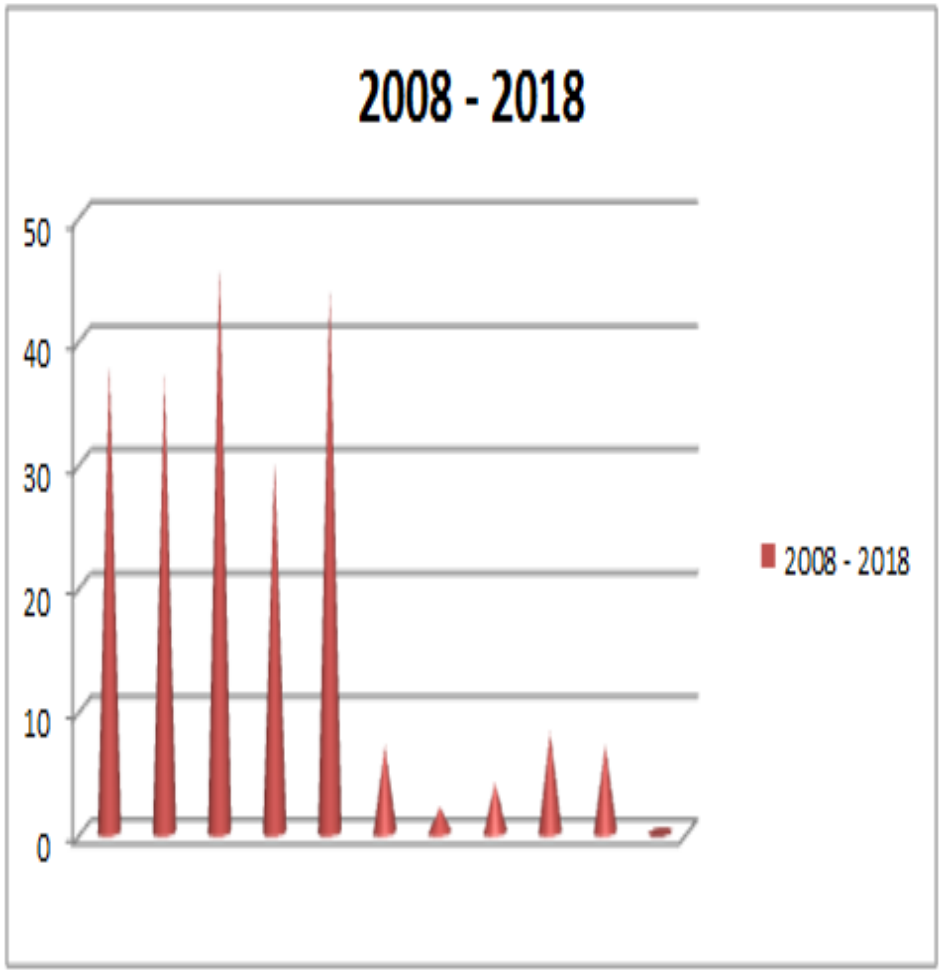

## Investigations

- Bact screening of unit: 26
- Bact screening of pt: 26
- Bact screening of both pt and unit: 22

## Clinical Outcome

- Complete Recovery: 34
- Minor Sequelae: 2

# Mandatory Febrile reactions 2008 – 2018




- **No Reports of Febrile Non-Haemolytic Transfusion Reaction (FNHTR) met the criteria for reporting to EC for 2018**

- **For the purpose of international comparisons, only the most serious cases of FNHTR should be accounted for:**

Fever ($\geq 39^{0c}$ oral or equivalent and a change of $\geq 2^{0c}$ from pretransfusion value) **and** chills/rigors

# Case Study - FNHTR

**Background**

- 23 yr old male patient with underlying oncology disorder received 1 unit RCC for anaemia (Hb: 7.8 g/dl)

**Symptoms** (70 mins into Transfusion):

- Temp rise 37.2$^{0c}$ - 38.6 $^{0c}$
- Tachycardia 113bp - 126bpm

**Investigations**

- DAT Negtaive
- Bilirubin, Haptoglobins & LDH stable
- Chest clear
- Bacterial screening of product and patient negative

**Intervention**

Patient required IV Tazocin,anti-pyretics and IV Vancomycin

**Clinical Outcome**

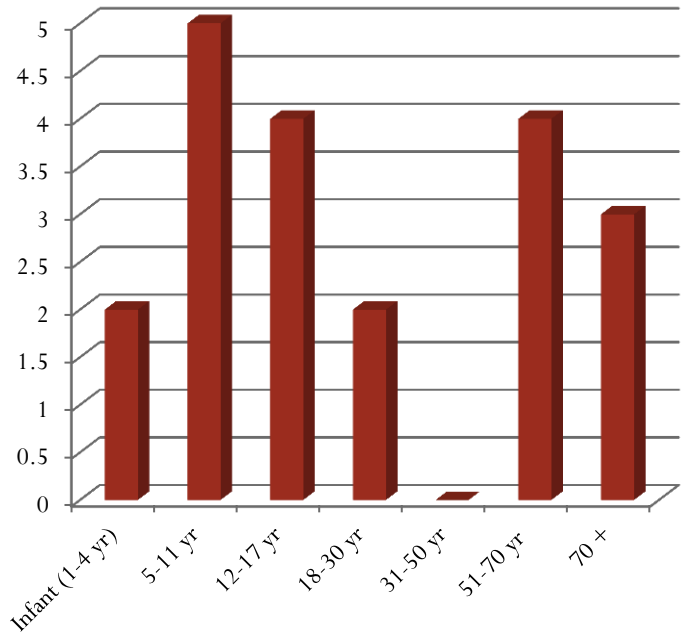
Complete recovery after 2 days

# Anaphylaxis/Hypersensitivity (n=28)

## Findings

- 31 Reports Received
- 28 Reports Accepted
- 20 Mandatory

## Demographics




## Components

- RCC: 3
- Plt Aph: 21
- Pooled Plt: 4
- Multiple Components: 0

## Investigations

- IgA levels: 13 (all NAD)
- Bact screening unit: 8
- Bact screening pt: 7

## Clinical Outcome

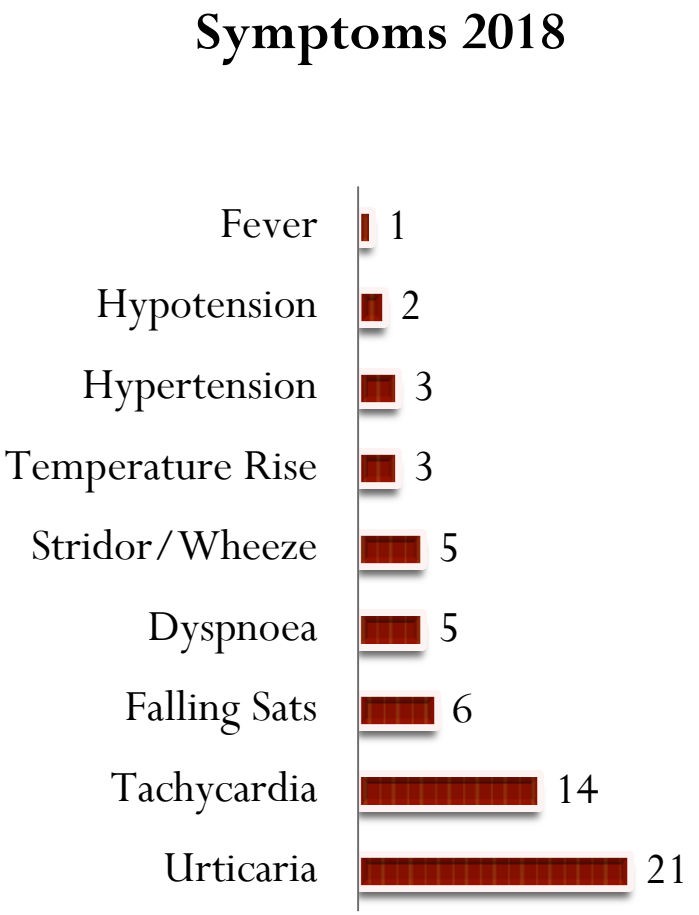
- Complete Recovery: 27
- Death: 1 (unrelated to transfusion)

# Allergic Reactions

- 1-3% of transfusions
  Usually plasma or platelet products
- Symptoms:
  - Pruritis/hives
  - Localized or widespread
  - Localised angioedema

Recommendation

- If effective in relieving symptoms, restart component slowly



# Recommendation

*Patients with mild isolated febrile reactions may be treated with oral paracetamol (500–1000 mg in adults).*

*Patients with mild allergic reactions may be managed by slowing the transfusion and treatment with an antihistamine*

*(BSH Guidelines 2012)*

# Hypotensive Transfusion Reactions (n=1)

- The NHO received 1 reaction under the category of Hypotensive transfusion reaction for the reporting year of 2018.
- This reaction involved a 63yr old male with an underlying oncology condition requiring 1 unit of RCC for anaemia. 40 minutes following the commencement of the transfusion the patients blood pressure dropped from 92/63 mm/Hg to 62/40 mm/Hg. Patient not on ACE Inhibitors. Patient was reviewed but due to the patients palliative condition no intervention was required. The patient passed away 2 days later unrelated to the transfusion.

# Unclassified Reaction (n=3)

**Definition**

- Unclassified SAR is the occurrence of an adverse symptom / sign with no risk factor other than the transfusion and which on its own does not allow the reaction to be classified within the defined categories of SAR.

**Findings**

- Reports of **3** unclassified reactions were received which is the same amount as was received in 2017. All reports involved Red Cells and all involved adult/elderly patients. There was one report initially categorised as Anaphylaxis/Hypersensitivity however following review the category was changed to unclassified.

**Commentary**

- ***Reporting establishments are advised to continue reporting cases with unusual symptoms or those reactions which may not fit into the criteria already in place***

# Mandatory Unclassified Serious Adverse Reactions 2018 (n=3)

| | Component Transfused | Age Profile | Imputability | Description |
|---|---|---|---|---|
| **Reaction 1** | Red Cells | **Elderly (70+)** | Possible | **Nausea and weakness, chills, hypertension** |
| **Reaction 2** | Red Cells | **Elderly (70+)** | Likely/Probable | **Hypertension** |
| **Reaction 3** | Red Cells | **Adult (31-50 years)** | Possible | **Hypertension , Rash to torso and groin** |

# Unclassified Reaction (Transfer from Anaphylaxis/hypersensitivity)

## Background

- An elderly surgical patient received 1 unit RCC following a PR bleed

## Symptoms (4 hrs into Transfusion)

- BP increasing from 160/52 mm/hg to 211/83 mm/hg
- Rash to torso and groin

## Intervention

Patient was treated with IV Hydrocortisone and IV Piriton

## Clinical Outcome

Complete Recovery

***Report initially captured as Anaphylaxis/hypersensitivity reaction, however as the reaction did not fit this criteria it was accepted and closed as an unclassified reaction***

# Delayed Transfusion Reactions: Immunological Haemolysis due to other allo-antibody (delayed n=8)

- 8 Reports received
- 8 Reports accepted

**Age Range**

All reactions ranged from 12 years to 70+ year age group with a mean age of 62yrs

**Clinical Outcome**

- 3 out of the 8 reported reactions made a complete recovery
- There were 4 cases of minor Sequelae as the reported clinical outcome
- There was 1 report of death which was unrelated to transfusion (oncology end stage)

| Case No. | Age | Gender | Findings | Antibody identified | Outcome | Timeframe for developing antibody | Reaction caused by error |
|---|---|---|---|---|---|---|---|
| 1 | Adolescent (12-17 yrs) | Female | ↑HB<br>↓Haptoglobins<br>+ DAT | **Anti E** | Complete Recovery | 8 Days | No |
| 2 | Elderly 70+ years | Male | ↓Haptoglobins Jaundice<br>↑LDH, ↑Bilirubin<br>Haematuria | **Anti $Jk^a$** | Minor Sequelae | 11 Days | No |
| 3 | Adult (51 - 70 years) | Female | ↑LDH,<br>↓Haptoglobins | **Anti $Jk^b$** | Minor Sequelae | 11 Days | No |
| 4 | Elderly 70+ years | Female | ↓Haptoglobins<br>↓Hb, | **Anti $Jk^a$** | Minor Sequelae | 2 Days | Yes * |
| 5 | Adult (51 - 70 years) | Female | ↓Hb,<br>+DAT,<br>↓Haptoglobins | **Anti $Jk^a$** | Complete Recovery | 11 Days | No |
| 6 | Elderly 70+ years | Female | Jaundice | **Anti $Jk^a$**<br>**Anti C** | Complete Recovery | 9 Days | No |
| 7 | Adult (51 - 70 years) | Male | ↑LDH, ↓Haptoglobins<br>↑Bilirubin | **Anti E** | Death ** | 21 Days | No |
| 8 | Elderly 70+ years | Female | ↑LDH, ↓Haptoglobins | **Anti K**<br>**Anti C**<br>**Anti Cw** | Minor Sequelae | 11 Days | No |

***Incomplete antibody investigation on a patient with previous multiple antibodies***

****Death unrelated to transfusion (6/52 post implicated transfusion)***

# Delayed Transfusion Reactions

**Most commonly implicated antibody**
**= Anti $Jk^a$**

**Recommendations**

- Lifesaving transfusion should not be withheld due to a history of alloantibodies.
- Robust methods of recording patients antibody history should be developed and supported with patient education

# Transfusion Transmitted Infection (n=1)

| Serious Adverse Reaction | Age | Gender | Imputability | Red Cells | Fresh Frozen Plasma (FFP) | Platelets Apheresis |
|---|---|---|---|---|---|---|
| **Transfusion transmitted viral infection (HCV)** | Adult (51 - 70 years) | Male | **Possible** | Yes | Yes | Yes |
| **Transfusion transmitted viral infection (HCV)** | Adult (51 - 70 years) | Male | Excluded(all 18 implicated donors returned negative) | Yes | Yes | |

# Case Study – Possible Transfusion transmitted viral infection (HCV)

**Summary Of Events**:

- Oct 2018 NHO received notification from IBTS of suspected TTI – HCV
- Patient had received multiple units in 1994 following RTA
- Rapid alert initiated
- HPRA informed
- Recepient Tracing Unit (RTU) involved

# Investigation Suspected TTI

- 39 donors implicated
- 36 donor returned more than 12 months following implicated donation
- 3 donors had not returned:

➢ One donor subsequently returned for testing and tested negative

➢ Second donor not traceable, archive sample 7 months post implicated transfusion was tested – negative

➢ One final donor – RIP (archive sample not available as this donor donated before commencement of archiving)

# Outcome

- Information received very minimal
- Unknown to NHO where patient presently is/was
- Unable to out rule donor who had passed away
- Due to one donor not traceable - imputability of ***Possible*** assigned

# STTI Recommendations

- *Inform NHO, IBTS Quality Department, IBTS Consultant on call or Medical Scientist on call ASAP in cases of STTI to protect the blood supply*

- *Where a recall involves blood components which have been transfused, hospitals should have a robust system in place which should include a review of the patient.*

**Transfusion-associated circulatory overload (TACO)**

**Definition (2018)**

*International Society of Blood Transfusion*
*Working Party on Haemovigilance*

*in collaboration with*
*The International Haemovigilance Network*

*And AABB (formerly the American Association of Blood Banks)*

# Change to Definition

- 2018 definition represents a revision of the previous international TACO definition published by the International Society for Blood Transfusion Haemovigilance working party and International Haemovigilance Network: http://www.isbtweb.org/fileadmin/user_upload/Proposed_definitions_2011_surveillance_non_infectious_adverse_reactions_haemovigilance_incl_TRALI_correction_2013.p
- 2018 Data analysed using updated 2018 definition

International Society of Blood Transfusion

IHN International Haemovigilance Network

# TACO – Points to note

- The NHO continue to collect reports of TACO where patients exhibit clinical signs and symptoms of overload following transfusion and do not meet the strict criteria of ISBT Definition

- The NHO following review and discussion will make a decision if the reaction fits the ISBT Definition criteria

# Transfusion Associated circulatory Overload (TACO) n=33

**Findings**

- 34 Reports received
- 33 Accepted
- 11 Mandatory

**Demographics**

- 18-30 yr: 1
- 31-50 yr: 1
- 51-70 yr: 9
- 70+: 22

**Components**

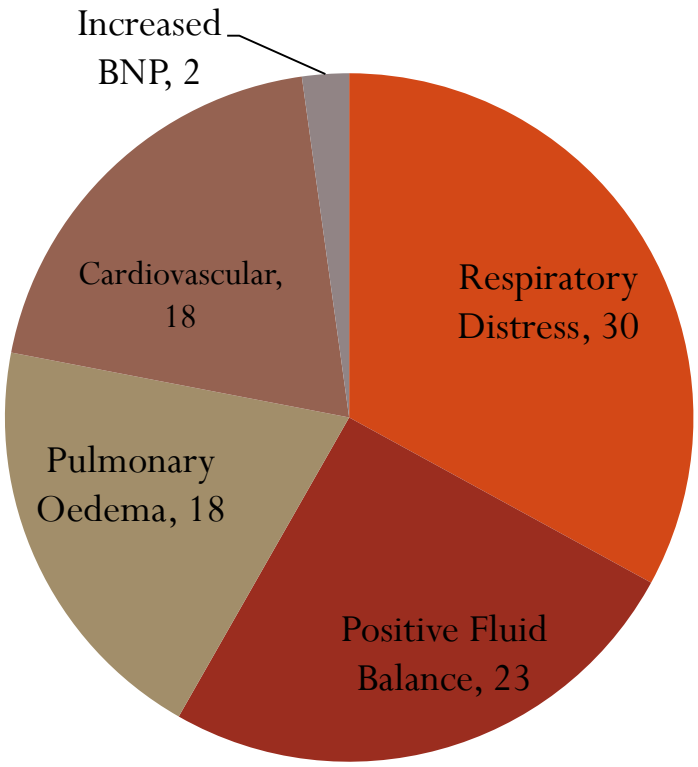
- RCC: 31
- SD Plasma: 1
- Platelets: 1
- Multiple Components: 2

**Clinical Outcome**

- Complete Recovery: 23
- Minor Sequelae: 7
- Serious Sequelae: 1
- Death: 2 unrelated to transfusion

# Transfusion Associated circulatory Overload (TACO)

## Clinical Features TACO




## Reason for Transfusion

- 28/33 transfused for anaemia
- WHO defined Chronic anaemia as lower than 7-8g/dL in adults.
- Only 8 of these patients had a Hb below 7g/dL
- **Note: Review transfusion requirements**

# TACO as a result of an error

4 out of the total TACO cases reported occurred as a result of an error with **Human Failure** been identified as the cause of error

# TACO Case

## Background

- Female 65 admitted with septic arthritis and anaemia (Hb of 7.9mg/L)
- Patient history of pulmonary fibrosis, CCF, Hypertension, Afib
- Patient weight: 40-49kg and unit prescribed and transfused over 2-3 hrs

## Symptoms (over 3 hrs into Transfusion RCC x1)

- O2 saturations dropped to 90% on 100% 02
- Crepitations on auscultation
- Falling urine output
- Nauseated
- Mottled and cold

## Investigations

- Chest Xray performed and was consistent with interstitial pulmonary oedema
- Patient and unit cultures negative
- BNP not performed
- Fluid Balance '***unable to locate***'

## Intervention

- Patient required IV Lasix and admission to ICU (not ventilated).

**Clinical Outcome:** Major Sequelae

- Patient remained as an in-patient in ICU for 2 days prior to transfer back to the ward.

# Recommendations

- Include **a formal pre-transfusion risk assessment** for TACO in hospital transfusion policies.
- **Fluid Balance**
- Elderly particularly at risk
- Patients receiving large volume transfusion in emergency situations even young patients are at risk of developing TACO and need to be monitored accordingly.
- Is the patient on regular diuretics
- Patients with chronic anemia should be prescribed one unit at a time
- Consider body weight for dosing
- Check hemoglobin between units
- Empower nurses and medical scientists to challenge prescribing/requesting at inappropriate thresholds or with inappropriate numbers of units.

ARE THERE ANY ALTERNATIVES??

# Transfusion Associated Dyspnoea (TAD)

## TAD (ISBT definition)

”TAD is characterized by respiratory distress within 24 hours of transfusion that do not meet the criteria of TRALI, TACO, or allergic reaction. Respiratory distress should not be explained by the patient’s underlying condition or any other cause”

## Findings

- The NHO received 3 reports of TAD in 2018. One case having initially been reported as a TACO, following review has been closed out as a TAD.

# TAD Case History

## Background

- 88 yr old patient received 1 unit of RCC post a cardiac procedure.

## Symptoms (20 minutes into Transfusion)

- Back Pain
- Severe Dyspnoea
- Restlessness/Anxiety
- Frothy Sputum

Case Initially reported as a TACO

## Investigations

- Chest Xray performed and was clear
- Fluid Balance was not recorded

## Clinical Outcome

- Complete Recovery

No evidence of TACO, collected as a TAD with an imputability of possible following review.

# Discussion

- Reactions received in the NHO may be moved between categories particularly if the descriptions do not meet the definition criteria.

- It is helpful when reporters are able to provide as much detail as possible

# Core Hours and transfusions administered outside of core hours

| | | | |
|---|---|---|---|
| **Transfusion Start Time** | **In core hours: 84** | **Outside core hours: 28** | |
| **Emergency/Routine transfusion** | Emergency: 10 | Non-Emergency : 76 | Unknown: 26 |
| **Non-Emergency Outside Core Hours** | | Total: 19 | |

The majority of reactions were non-emergency and the transfusion commenced within core hours. To summarise:

- 84 reactions occurred within core hours
- 28 (25%) of reactions occurred after 20.00
- 19(17%) of the reactions outside of core hours were non-emergency

# Mortality and morbidity data by category 2018

| | Death (unrelated to transfusion) | Death probably related | Death possibly related | Major Sequlae | Minor Sequlae | Complete Recovery |
|---|---|---|---|---|---|---|
| Anaphylaxis/hypersensitivity (AA) | 1 | | | | | 27 |
| Immunological haemolysis due to other allo-antibody (Delayed > 24 hrs) | 1 | | | | 4 | 3 |
| Hypotensive Transfusion Reaction | 1 | | | | | |
| OSR - Febrile Non Haemolytic Transfusion Reaction | | | | | 2 | 34 |
| OSR - Transfusion Associated Circulatory Overload (TACO) | 2 | | | 1 | 7 | 23 |
| OSR - Transfusion Associated Dyspnoea | | | | | | 3 |
| OSR - Unclassified SAR | | | | | | 3 |
| Total | 5 | | | 1 | 13 | 93 |

# Mortality 2007-2018

- 76/2673 (2007-2018) reported a clinical outcome of death
- 66/76 Reported that the death was unrelated to transfusion
- 7/76 reported death **Possibly** related to transfusion (all TACO)
- 3/76 reported death **Probably** related to transfusion (all TACO)

# Basics


- ✓ Stop/Slow down the transfusion (where applicable)
- ✓ Treat Symptoms
- ✓ Keep IV line open
- ✓ Monitor Vital signs and symptoms
- ✓ Report reaction to medical staff, blood bank and IBTS
- ✓ Identification details should be checked
- ✓ Collect appropriate specimens and send to lab
- ✓ Return blood bag and admin set to bloodbank

(Local policy should be in place)

# Why do we collect reports

- Legal obligation
- Protect the safety of the blood supply
- Prevent transfusion of any related products (in event of serious reaction)

- Recognising signs and symptoms of adverse reactions – with timely lab evaluation – is essential to the potentially life-threatening nature of transfusion reaction

# Acknowledgements


- NHO Team
- Vigilant reporters and hospital staff
- RTU Team
- IBTS Quality team
- For further information please find us on www.giveblood.ie