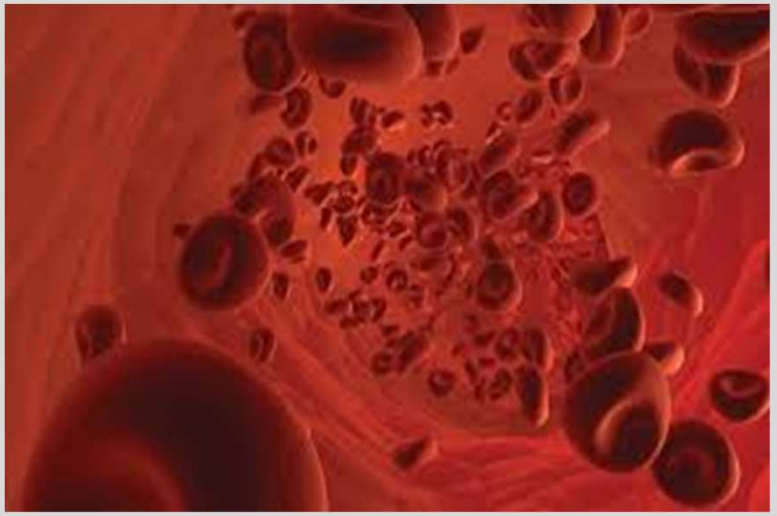
The Princess Alexandra Hospital NHS
NHS Trust

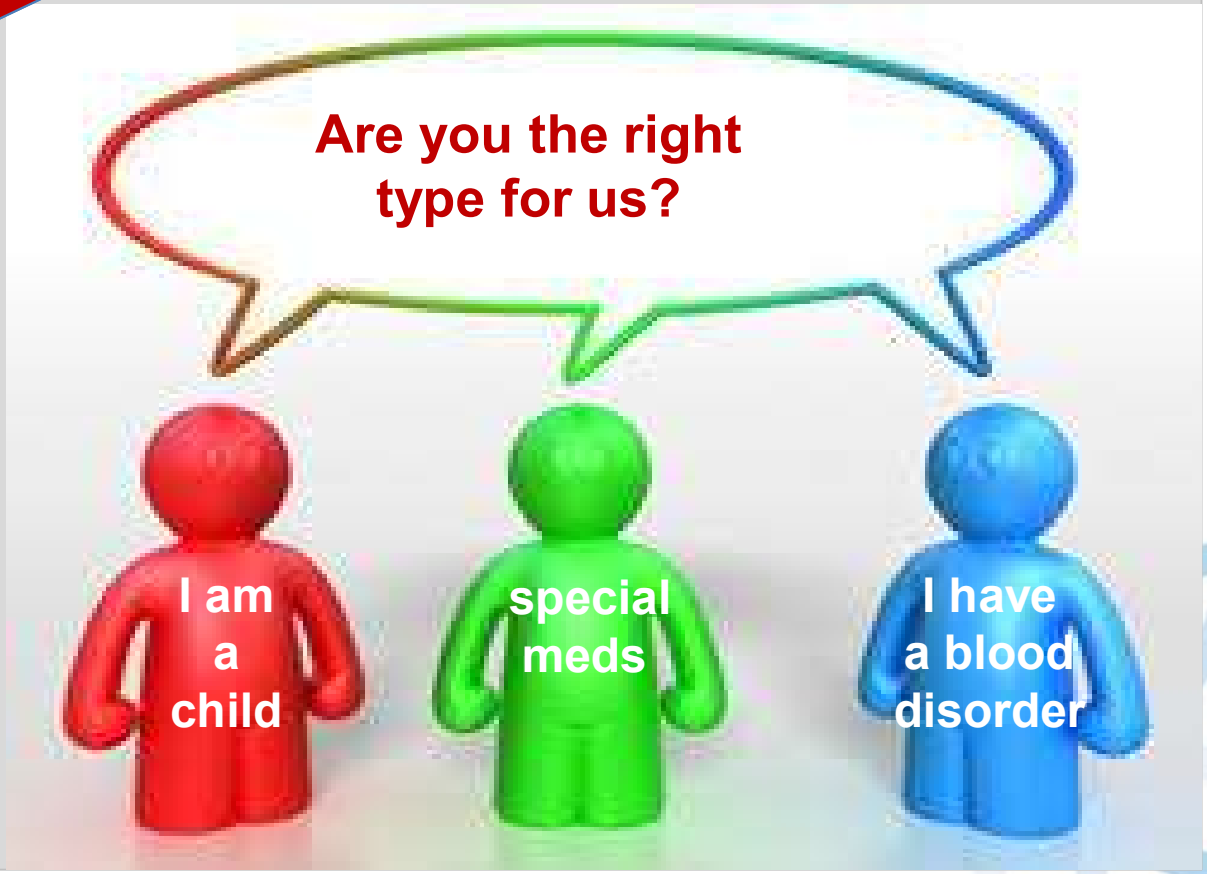
Special Requirements



BMS Study Day 24th April 2018
Tracy Nevin - RGN
Blood Transfusion Specialist Practitioner

Building for excellence

“Don’t worry you are in good hands, the Clinical staff and the Transfusion Scientists will make sure I am”. They wouldn’t want you to have any reaction or serious adverse event”.



Special Requirements

- Red Cells
- " Club 96 – Platelets & Frozen Plasma Products
- Granulocytes
- Irradiated
- CMV
- HEV

IUT & Exchange Transfusion

	Rationale	Specifications	Special requirements
IUT	HDFN – D positive foetus RBCs being destroyed by mothers sensitised immune system. (usually due to D / Kell)	○ Plasma reduced in CPD, ○ Group O with low titre haemolysins (HT neg)/ ABO typed to fetus ○ D & Kell negative, ○ Negative for maternal alloantibodies ○ IAT XM compatible with maternal plasma ○ Leucocyte-depleted ○ <5/7 old - reduce risk of Hyperkalaemia ○ Sickle Screen negative	○ Irradiated – shelf life 24 hours ○ CMV negative ○ HEV negative
Exchange	**Neonates** with severe anaemia and hyperbilirubinemia usually caused by **HDFN** Rare procedure since introduction of prophylactic anti-D,	○ As for IUT ○ Plasma reduced with Haematocrit of 0.5-0.6 to reduce the risk of post-exchange polycythaemia	○ Same as for IUT ○ Irradiated if history of IUT exchange ○ Warmed 37°C with blood warmer

Should be performed in a specialist centre & planned beforehand with NHSBT

Haemoglobinopathies

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	Rationale	Specifications	Risks
Sickle Cell	Mainly affects African ancestry. Make rigid, sticky and sickle shaped cells which do not bend easily and can get stuck. Transfusion is used to prevent SCC / long term complications such as: Pregnancy (anaemia) Stroke, Surgery, (reduce the number of HbS Cells in circulation)	○ HbS negative ○ Match with – ABO, D, C.c, E, e and Kell ○ **Top up** - <10 days old ○ **Exchange transfusion** – 7 day old	○ Alloimmunisation - European donor population ○ SC patients often have Ro (cDe), not found in European population ○ Majority of alloantibodies to Kell, D,C ○ Acute / Delayed TR often treated as Sickle Cell Crisis ○ Multiple transfusion - multiple alloantibodies
Thalassaemia	Widespread throughout Africa, the Med, Middle East, India and Asia. 2 types alpha & beta (reduction/ absent production of normal a or $^{\beta}$ - globulin chains, reducing levels of adult HbA **Beta-thalassaemia major** - apparent by 3-6 /12 after birth with severe anaemia. Transfusion dependent - resulting in iron overload requiring chelation therapy.	○ 'extended phenotyping' before 1st transfusion ○ Match with - D, C, c, E, e and K antigens to reduce alloantibodies developing ○ Preferably < than 14 days old	○ Risks in childhood as HbF production declines & unable to produce HbA ○ Childhood – some cure with HSCT ○ Most common alloantibody D & Kell with long term transfusion

Found in high frequency where malaria is endemic and they probably offer some protection

"Club 96"

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- Food chain deemed safe from vCJD
- Protect children (potentially safe future donor population)
- Extended age group now young adults
- More awareness required by Lab and Clinical staff

SABTO advice on reducing risk of vCJD

2007 / 8 – requirement for 80% of Platelets Apheresis, all products are leucocyte depleted

2013 – reconsidered their decision, better understanding of vCJD risk, 80% minimum provision of apheresis platelets no longer necessary. Both pooled and apheresis platelets should be re-suspended in Platelet Additive Solution (PAS).

Each UK blood service should set their own level of apheresis to collect.

Platelets

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	Rationale	Specifications	Special Requirements
NAIT	NAIT – similar to HDN, maternal alloantibodies increased risk of intra cranial bleeding	○ HPA compatible with Maternal alloantibody ○ Hyper-concentrated ○ Slow transfusion – slower than IUT of RBCs due to risk of stroke	○ Apheresis ○ Irradiated if previous IUT (keep their shelf life) ○ CMV negative
recurrent severe allergic / febrile reactions to standard platelet transfusions	Washed to remove most of the Plasma and then suspended in PAS	○ Shorter shelf life to 24 hrs when prepared ○ Some platelets lost in the process ○ Contains approx. 10mls residual Plasma	○ PAS – specially ordered at NHSBT
HLA	Failure to increment following platelet transfusion **Immune** Platelet alloantibodies:- HLA, HPA, Other antibodies:- Platelet auto antibodies, Drug-dependent platelet Antibodies, ABO Immune complexes **Non immune** – sepsis/infection, bleeding, splenomegaly, DIC, medications	○ Assess transfusion response ○ Test for HLA / HPA (if no response) alloantibodies ○ Trial HLA Platelets ○ If no increment check compatibility and see if there is a Non-immune causes ○ Trial HPA Platelets ○ Still not incrementing liaise with NHSBT H&I for advice	○ Apheresis ○ Irradiated (keep their shelf life) ○ NHSBT – keep panel of HLA typed donors

Frozen Plasma Products

	FFP (adults)	SDFFP (Octaplas) Born after 01.01.1996	MBFFP
Where	UK	NON - UK	NON UK
No. donors	Single donor	Several hundred	Single donor Previously tested for HLA in past 2 years (Male / **Female**)
Made	Separated from whole blood donation -	Treated with Solvent Detergent	(Methylene Blue treated at NHSBT)
Storage	Freezer 3 years Fridge - 24 hours post thawing	Freezer 3 years Fridge - 24 hours post thawing	Freezer 3 years Fridge - 24 hours post thawing
Thaw time	15 minutes	15 minutes	15 minutes
Dose	15mls / kg (dry weight)	15 - 20mls/kg	15 - 20mls/kg
Rate	30 minutes per pool	10-20ml/kg/hr (child) 30 minutes per pool (Adult)	10-20ml/kg/hr (child) 30 minutes per pool (Adult)

Cryoprecipitate

	Adults	Born after 01.01.1996
Where	UK Plasma -	Non UK Plasma
No. donors	1 pool = 5 donations	1 pool = 6 donations due to the lower quantity of Fibrinogen
Made	UK from thawed Plasma	(Methylene Blue treated at NHSBT)
Storage	Freezer 3 years 20-24°C, use by 4 hours post thaw	Freezer 3 years 20-24°C, use by 4 hours post thaw
Thaw time	15 minutes	15 minutes
Dose	2 pools	5-10mls / kg (child)
Rate	30 minutes Unless stat in emergency	10-20ml / kg (child)

MB Products have been treated to inactivate bacteria and most encapsulated virus, reducing the risk vCJD

Granulocytes

	Rationale	Specifications	Risks
Granulocytes	**Given to patients with impaired bone marrow function.** Such as:- ▪ Leukaemia ▪ Chemotherapy, ▪ Congenital Neutrophil condition - can cause severe bacterial / fungal infections	**Buffy coat:-** ○ *WBC & Platelets left once RBC and Plasma has been removed **Pooled Buffy Coat:-** ○ Less Red Cells and Plasma, suspended in male plasma reduces risk TA-GvHD **Apheresis:-** **Non stimulated** ○ Selected donors who do not receive GCSF – given to children <30kg **Stimulate** ○ Relatives & Friends donors given GCSF & steroids to increase production	○ Increase in haematocrit and Platelets ○ Increase risk of reaction – patients require close monitoring ○ *Small amount of RBC and Platelets in Buffy Coat ○ Must be ABO & D typed ○ Adult dose is 10 pools (bags) ○ children between 30-50kg dose of 10ml/kg

Irradiated, Cytomegalovirus & Hepatitis E Virus

TREATMENT	HOW	WHY
Irradiated	To inactivate lymphocytes in cellular components (RBCs & Platelets) from multiplying and causing harm. Either by:- ▪ Gamma Irradiation ▪ X-Ray irradiation	Minimise risk of Transfusion related Graft versus Host disease (TA-GvHD) in the immune-compromised patient
CMV	Herpes virus:- ○ Mild flu like symptoms ○ 50 -60% - adult population are life-long carriers ○ Donor blood screened for CMV AB in their blood when requested by Hospital	Can cause:- ○ Hearing loss ○ Cerebral Palsy ○ Primary infection that can lead to spontaneous abortion, stillbirth and foetal hydrops ○ Cataracts, blindness, Chorio-retinitis
HEV	1st May 2017 –all Blood products are screened by NHSBT for HEV AB MB products are HEV screened	○ Virus that affects the liver can infect both humans & animals. 4 types of virus. ○ Causes mild symptoms such as: jaundice, fever, nausea, vomiting, loss of weight & appetite. ○ Transmitted by faeco-oral route. ○ Undercooked pork products , shellfish and via transfusion / Organ transplant

In Summary

Indication	CMV	IRRADIATED	HEV
Pregnancy	Yes	No	No
During delivery	No	No	No
Transfusion -1st degree relative	Yes	Yes	No
IUT	Yes	Yes	Routine
Neonatal exchange	Yes	Yes unless emergency	No
Neonates up to 28/7 post EDD	Yes	No unless previous IUT (6 months)	No
Granulocyte Transfusion	No	Yes	No
HLA selected components	No	Yes	No
Receiving Purine Analogues (Fludaribine, Cladrabine) Newer ones	No	Yes Indefinitely - Yes until further data	No No
Hodgkins Lymphoma	No	Yes for life	No
T-cell immunodeficiency	No	Yes	No
BMT /SCT Allogenic HSC Autologous	No	Yes – 6 months post-transplant Yes- 7 days prior to harvesting HSC Yes- 7 days prior & during HSC, Start of conditioning / 6 months if Total Body Irradiation	Yes Yes Yes
Aplastic anaemia on Immune suppressants ATG/anti-CD52	No	Yes	No
SOT on ATG/anti-CD52	No	Yes	Yes
Acute Leukaemia	No	No	Yes if for transplant
Extracorporeal (dialysis)	No	No	Yes

NHS Blood and Transplant

I am at risk of transfusion-associated graft-versus-host disease

If I need to have a blood transfusion,
cellular blood components
(Red Cells, Platelets and Granulocytes)
MUST BE IRRADIATED
Please inform the blood transfusion laboratory

CMV, HEV Bags to be updated June/ July 2018

Irradiated sign soon to change to blue

Risk reduction by NHSBT

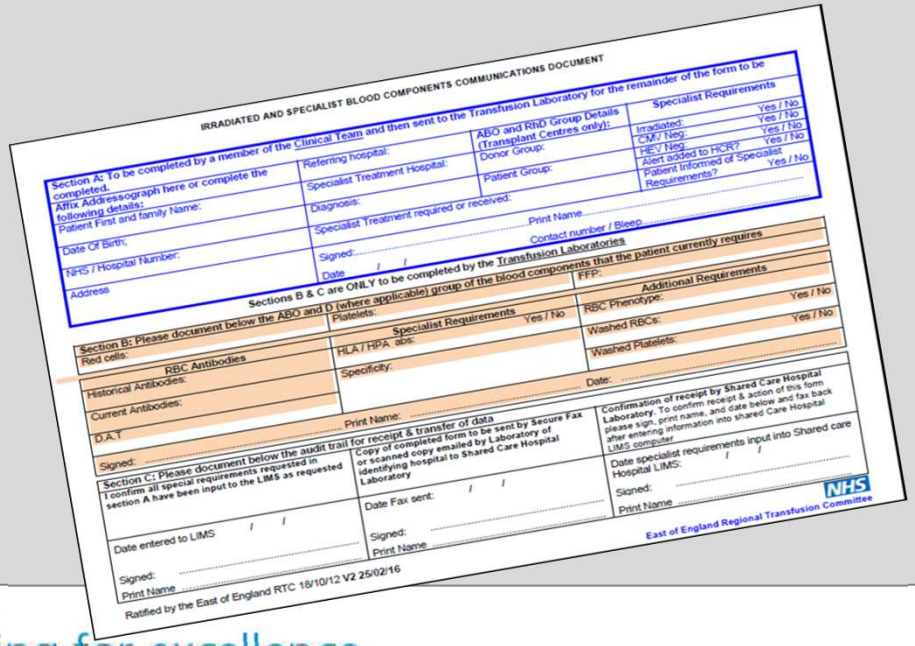
- ✓ Excluded “at risk” donors – including those who have had a transfusion or solid organ transplant since 1980
- ✓ Leucocyte depletion
- ✓ Importing plasma from US; MB treated plasma
- ✓ 2012 decision made to continue to provide MBFFP for all recipients born on or after 1996
- ✓ 1st May 2017 decision to ensure all products are HEV negative

Risks for Lab and Clinical Staff

- Do you have frozen products in your freezers that were issued to your Hospital prior to 1st May 2017
- Added confusion for clinical and Laboratory staff to remember all the various products
- ?Treated at a Specialist Unit no historic data on your LIMS
- Poor communication from Specialist Centre to the patient / referring Hospital

Risk Reduction in the Hospital setting

- Effective training for all relevant staff especially Clinicians and Nursing staff – use of lanyard, posters, handbooks, transfusion pathway
- Shared Care Form for any Special Requirements, LIMS and SOPs cover all elements
- Request form (paper / electronic) is it user friendly and cover all / relevant special requirements,
- Use of DATIX & lessons learnt from Serious Incidents used in Training – very effective way to get the message across



IRRADIATED AND SPECIALIST BLOOD COMPONENTS COMMUNICATIONS DOCUMENT

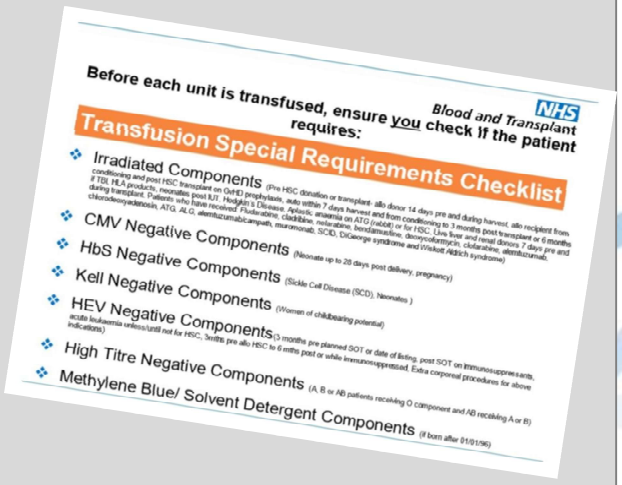
Section A: To be completed by a member of the Clinical Team and then sent to the Transfusion Laboratory for the remainder of the form to be completed.
Affix Addressograph here or complete the following details:
Patient First and family Name:
Date Of Birth:
NHS / Hospital Number:
Address
Referring hospital:
Specialist Treatment Hospital:
Diagnosis:
Specialist Treatment required or received:
Signed: Print Name:
Date / / Contact number / Bleep:
ABO and RhD Group Details (Transplant Centres only):
Donor Group:
Patient Group:
Specialist Requirements
Irradiated: Yes / No
CMV Neg: Yes / No
HEV Neg: Yes / No
Alert added to HCR? Yes / No
Patient Informed of Specialist Requirements? Yes / No

Sections B & C are ONLY to be completed by the Transfusion Laboratories

Section B: Please document below the ABO and D (where applicable) group of the blood components that the patient currently requires
Red cells:
Platelets:
FFP:
Specialist Requirements Yes / No
RBC Antibodies
Historical Antibodies:
Current Antibodies:
D.A.T
HLA / HPA abs:
Specificity:
Additional Requirements
RBC Phenotype:
Washed RBCs: Yes / No
Washed Platelets: Yes / No
Signed: Print Name: Date:

Section C: Please document below the audit trail for receipt & transfer of data
I confirm all special requirements requested in section A have been input to the LIMS as requested
Copy of completed form to be sent by Secure Fax or scanned copy emailed by Laboratory of identifying hospital to Shared Care Hospital Laboratory
Confirmation of receipt by Shared Care Hospital Laboratory. To confirm receipt & action of this form please sign, print name, and date below and fax back after entering information into shared Care Hospital LIMS computer
Date entered to LIMS / /
Signed: Print Name
Date Fax sent: / /
Signed: Print Name
Date specialist requirements input into Shared care Hospital LIMS: / /
Signed: Print Name
NHS East of England Regional Transfusion Committee

Ratified by the East of England RTC 18/10/12 V2 25/02/16



Before each unit is transfused, ensure you check if the patient requires:

NHS Blood and Transplant

Transfusion Special Requirements Checklist

- Irradiated Components (Pre HSC donation or transplant- allo donor 14 days pre and during harvest, allo recipient from conditioning and post HSC transplant on GvHD prophylaxis, auto within 7 days harvest and from conditioning to 3 months post transplant or 6 months if TBI, HLA products, neonates post IUT, Hodgkin's Disease, Aplastic, anaemia on ATG (rabbit) or for HSC, Liver, liver and renal donors 7 days pre and during transplant. Patients who have received Fludarabine, cladribine, nelarabine, bendamustine, deoxycoformycin, clofarabine, alemtuzumab, chlorodeoxyadenosin, ATG, ALG, alemtuzumab/campath, muromonab, SCID, DiGeorge syndrome and Wiskott Aldrich syndrome)
- CMV Negative Components (Neonate up to 28 days post delivery, pregnancy)
- HbS Negative Components (Sickle Cell Disease (SCD), Neonates)
- Kell Negative Components (Women of childbearing potential)
- HEV Negative Components (3 months pre planned SOT or date of listing, post SOT on immunosuppressants, acute leukaemia unless/until not for HSC, 3mths pre allo HSC to 6 mths post or while immunosuppressed. Extra corporeal procedures for above indications)
- High Titre Negative Components (A, B or AB patients receiving O component and AB receiving A or B)
- Methylene Blue/ Solvent Detergent Components (If born after 01/01/96)

Scenario 1

AGE: 15 months

Diagnosis:- Joint care with GOSH,
Neuroblastoma - currently on Chemotherapy.
Due to have stem cell harvesting at some point

Request:- for red cell and platelet transfusion,

Weight:- 16kg

1. What Red Cells would you issue?

2. What Platelets would you issue?

Red Cells

What Red Cells would you issue?

A. Neonatal Red Cells, XM, O neg / ABO compatible, CMV neg

B. Adult Red Cells, XM, ABO compatible

AB. Adult Red Cells, XM, ABO compatible, request for SCF

O. Adult Red Cells, XM, ABO compatible, Irradiated, CMV neg,

Platelets

What Platelets would you issue?

A. Neonatal Platelets group specific

B. Apheresis Platelets, group compatible with SCF

AB. Apheresis group A Platelets

O. Apheresis, Irradiated, CMV neg

Scenario 2

AGE: 2 days old

Diagnosis:- Pre term 33 weeks 4/7days, Sepsis, deranged clotting,
on Gentamycin suspected NEC

O/E: lethargic, pale, increased respiratory effort, breathing pauses, cyanotic,
changes in BP and heart rate

Weight: 2 kg

Bloods on admission:
Hb 228, Platelets 75, Prothrombin time 34.4, INR 2.0, APTT 75.0, Fibrinogen 1.1

Plan:- For Plasma transfusion 15 - 20mls/kg, request placed with the Laboratory.
Component was defrosted and placed in the Blood Bank fridge.
The porter was paged, given the babies details and asked to collect the Plasma.
The unit was transfused to the baby.

Plasma product

The ticket showed that MBCryo had been transfused instead of MBFFP, what do you think the root cause (s) were?

A. Someone had put MBCryo into the MBFFP drawer in the freezer

B. Senior BMS did not routinely work in the Department, covering a night shift. Recalled that children and neonates have MB products and selected the wrong one

AB. The drawer for MBCryo and the drawer for MBFFP were next to each other

O. The BMS on the late shift had already put the unit into thaw and printed the labels, the night BMS failed to check the label against the unit

Any questions?

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