NHS
Blood and Transplant

Donor Characterisation and Identification of Infection Transmission Risks

(Beyond *S. aureus*…)

Inês.Ushiro-Lumb@nhsbt.nhs.uk

Lead Clinical Microbiologist for Organ Donation and Transplantation

Yes I donate
ORGAN DONATION

Caring Expert Quality

Take home messages: To reflect on

- Rationale for donor characterisation and testing in order to make informed decisions
  - The old kids on the block
  - Emerging and re-emerging pathogens
  - Donors with increased risk of transmission of infection
- Importance to consider the donor as a source of infection
- Responsibility of following up donor results, conciliating donor results and acting on them as required
- Responsibility of reporting recipients events and outcomes
- Practical applications of this session!!

Microbiological donor screening

NHS Blood and Transplant

- Human Immunodeficiency virus type 1 &2
- Hepatitis B virus
- Hepatitis C virus
- Human T Cell Lymphotropic Virus type 1 & 2
- Cytomegalovirus
- Epstein - Barr Virus
- *Toxoplasma gondii*
- *Treponema pallidum*
- *Hepatitis E Virus RNA*
- Other pathogens may be tested for or testes may be added when specific risks are identified e.g.
  - *T cruzi* and *Plasmodium spp*
  - *Blood-borne-virus Nucleic Acid test*

- **How do you make sure all results have been received and reviewed?**
- **What do you do with EBV, toxo, syphilis and HEV RNA results?**
- **Do you know when to check for malaria, T cruzi, or other results post-transplant?**

USE OF ORGANS FROM DONORS WITH HIGHER RISK FOR TRANSMISSION OF INFECTION

- Organs from some donors may offer greater risk for the recipient because of certain donor characteristics
- Increased risk for what?
  - Blood-borne viruses?
  - Geographically-restricted infection?
  - An unknown/uncertain agent?

- Is there understanding of the level of acceptable risk or absence of risk?
- **Is there understanding of what needs to be done to mitigate risk of transmission or harm to recipients?**

SaBTO Guidance on follow up of Recipients of organs from increased risk donors

- Appropriate measures must be in place where a potential for transmission of infection exists
- Fully informed consent is required from the recipient when considering organs from such donors
- All measures for risk reduction must be taken, including-
  - Post exposure prophylaxis administered to recipients (when and as appropriate)
  - **Immediate post-transplant monitoring and follow-up of the infection status of recipients should be set in place and the long-term outcome of the recipient recorded centrally**

NHS
Blood and Transplant

Donor characterisation
What should recipient centres be looking out for?

- Full donor characterisation – details!
- Discussion around **initially reactive results**
- Discussion around a **donor with increased risk of infection**
- **Communication** between transplant teams and clinical microbiologists
- **Follow up** of donor results

NHS
Blood and Transplant

Post-transplant events Discretionary and post donation testing

Yes I donate
ORGAN DONATION

Is there a management 

for the following illustrative situations?

- Recipient management following a positive donor result received post-transplant
  - Positive microbiology culture of organ transport fluid *
  - HEV RNA *
- When do you check for results?
- Do you chase up outstanding results?
- When do you report an event to ODT *
- When do you consider a donor-related infection in your patient? *

Reporting of positive isolates from organ transport fluid

NHS Blood and Transplant

RAPID ALERT – Positive Transport Fluid Result

Donor Information	ODT Number	137834	Case number	[redacted]
	Forename	[redacted]	Date of Birth	[redacted]
	Surname	[redacted]		

Transport Fluid Result	**Which organ was transport fluid from:** (for example, left kidney, liver, pancreas)	**LEFT KIDNEY**
	Please attach copy or screenshot of result to email **Screenshot or copy of results attached? Y** (If this is not possible, please fill in details of isolate below)	
	Reported isolates *(full name as it appears in the report, e.g. Staphylococcus aureus)*	**Transplant transport fluid** **Specimen type: Fluid** **CULTURE** **[1][2][3][4][5]** **1) ++ Escherichia coli** **Amoxicillin S** **2)** **Augmentin S** **3)** **Ciprofloxacin S** **4)** **Gentamicin S** **5)** **Meropenem S** **Tazocin S** **Not tested on day of investigation. May affect results.** **Specimen site: Perfusion** **Authorised by: Consultant Microbiologist** **FINAL REPORT** *No need to fill in if providing report*
	Sensitivities (If available at time of report)	*No need to fill in if providing report*

Contact Details for Further Information	**Name of Microbiology laboratory that processed sample**	[redacted]		
	Laboratory contact Name (If further microbiology information is required)	**Consultant Microbiologist**		
	Phone number	**Via Switchboard**		
	Name of recipient centre point of contact completing the form (If further clinical information on recipient required)	[redacted]		
	Phone number	[redacted]		
	Name of and position of person completing form	[redacted]	**Date of completion**	**21/01/2019**

Results – Who to Inform:

If an organ transport perfusion fluid produces positive culture results that require reporting, email a completed copy of this form **immediately** to: odthub.operations@nhsbt.nhs.uk and they will disseminate to all relevant centres.

In broad terms, following discussions with local microbiology team, these are the isolates to report

- Candida spp, Staphylococcus aureus, Pseudomonas spp, Enterobacteriaceae sp, multi-drug resistant organisms.
- Commensal organisms and negative results do not require reporting.

RAPID ALERT – ID & Sensitivities Positive Organ Transport Fluid Result

Donor Information	ODT Number		Case number	
	Forename		Date of Birth	
	Surname			

Organ Transport Fluid Result	**Which organ was transport fluid from:** (for example left kidney, liver, pancreas)	
	Screenshot or copy of report attached? (please delete as appropriate): **Y / N** (If '**N**', please fill in details of isolate below)	
	Name of Organism(s)	
	Antibiotic sensitivities (Organism with asterisk on list below – sensitivities to follow)	*No need to fill in if attaching report*

Contact Details for Further Information	Microbiology	**Laboratory**	
		Contact name/role	
		Phone number	
	Transplant team	**RCPOC name/role**	
		Phone number	
		Name and role of person completing form	
		Date of completion	

Criteria for Communication of Results to ODT Hub according to organisms isolated

Organism	When to send the Rapid Alert
Candida spp. Filamentous fungi Mycobacteria Staphylococcus aureus Streptococcus pyogenes	Communicate these organisms as soon as they are identified; antibiotic sensitivities to follow, when available
Enterobacteriaceae Enterococcus spp. Pseudomonas aeruginosa Pyogenic streptococci (other than Group A)	Communicate organism ID and sensitivities together when both are finalised
Other organisms considered locally to be of potential clinical significance	At local laboratory discretion
No growth of clinically significant organisms' or 'No Growth'	Not to be communicated to ODT Hub

Email a completed copy of this form **immediately** to: odthub.operations@nhsbt.nhs.uk and they will disseminate to all relevant centres.

When your centre re-tests the donor blood sample…..

- What is the rationale for repeating the standard donor screening?
- Is there an agreed protocol with the Virology lab for this?
- Do you conciliate the results obtained in your lab with the ones available on the night?
  - Systematically and in a timely fashion?
- If the results are different, what do you do?

When unexpected events happen ….Importance of timely event notification

NHS Blood and Transplant

- Notification of post transplant events that are potentially significant or could be of donor origin is a regulatory requirement
- Failure to make the link to the donor is a frequent problem
- Local attempts to investigate donor origin is problematic
- Central reporting to the organ procurement organisation (ODT) is mandatory because
  - Donor information may help with diagnosis in recipient
  - Other recipient centres can be alerted
  - Other cases can be identified
  - Opportunities for appropriate intervention

Donor-derived transmission of infection - UK

Proven or Probable donor origin:

- HCV
- CMV
- HBV
- HTLV-1
- *Halicephalobus gingivalis*
- *Candida albicans*
- HHV- 8, HSV-1
- HEV

Rare but significant events

What has been your experience?

Lessons learnt?

NHSBT Organ Donation and Transplantation Incident Investigation Summary – 2012 to date

Donor Derived Infection	Number of incidents
Human Herpes Virus 8 (HHV8)	7
Hepatitis E (HEV)	3
Herpes Simplex Virus (HSV)	1
Halicephalobus gingivalis	1
Hepatitis C (HCV)	2
Escherichia coli (E.coli)	2
Candida albicans	1
Total	**17**

Under investigation	Number of incidents
Human Herpes Virus 6 (HHV6)	1
Human Herpes Virus 8 (HHV8)	2
Herpes Simplex Virus (HSV)	3
Total	6

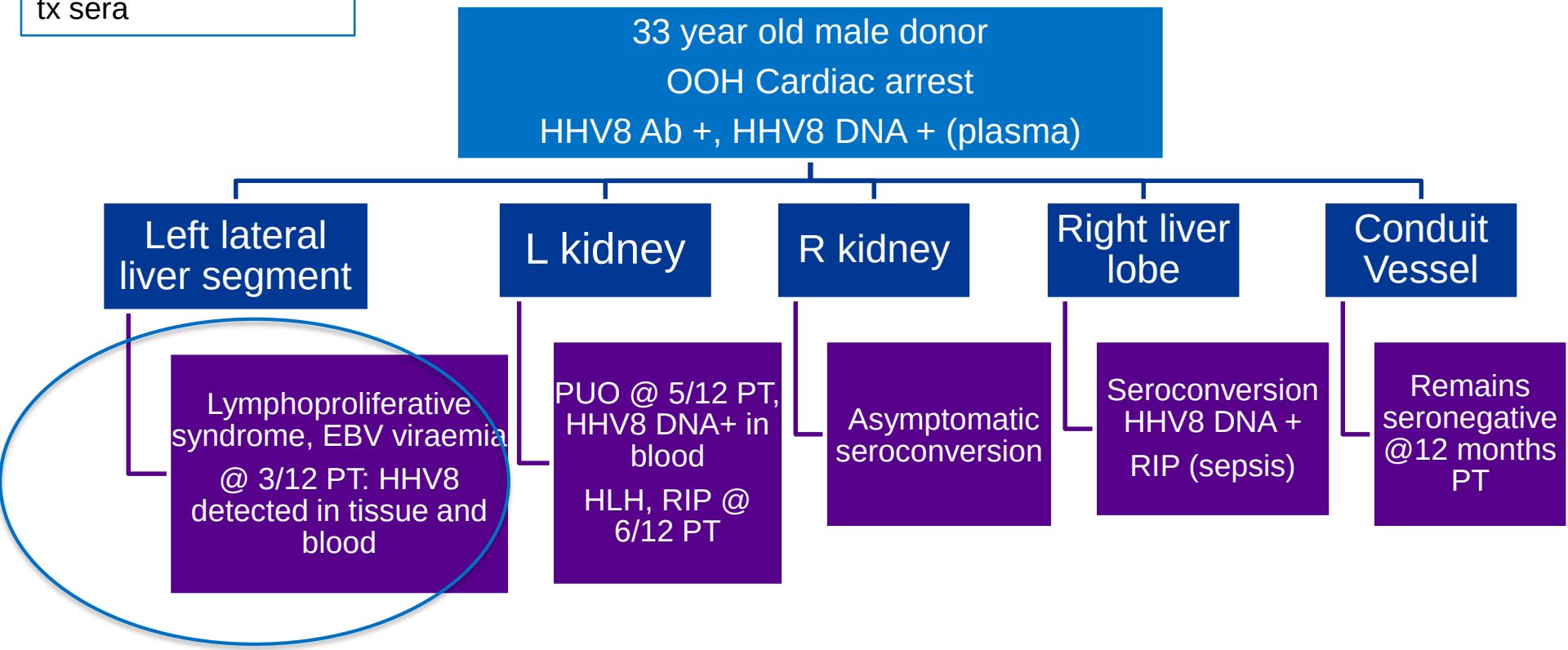
Investigated as potential donor derived infection	Number of incidents
Adenovirus	1
Human Herpes Virus 8 (HHV8)	3
Parvovirus B19	1
Hepatitis E (HEV)	3
Herpes Simplex Virus (HSV)	3
Hepatitis B (HBV)	2
Hepatitis C (HCV)	1
Klebsiella spp	1
Coccidiodomycosis	1
PCP	1
Fungal Sepsis/TB	1
Candida albicans	1
Strongyloides	3
Total	**22**

NHS
Blood and Transplant

Examples of donor-derived transmission of infection

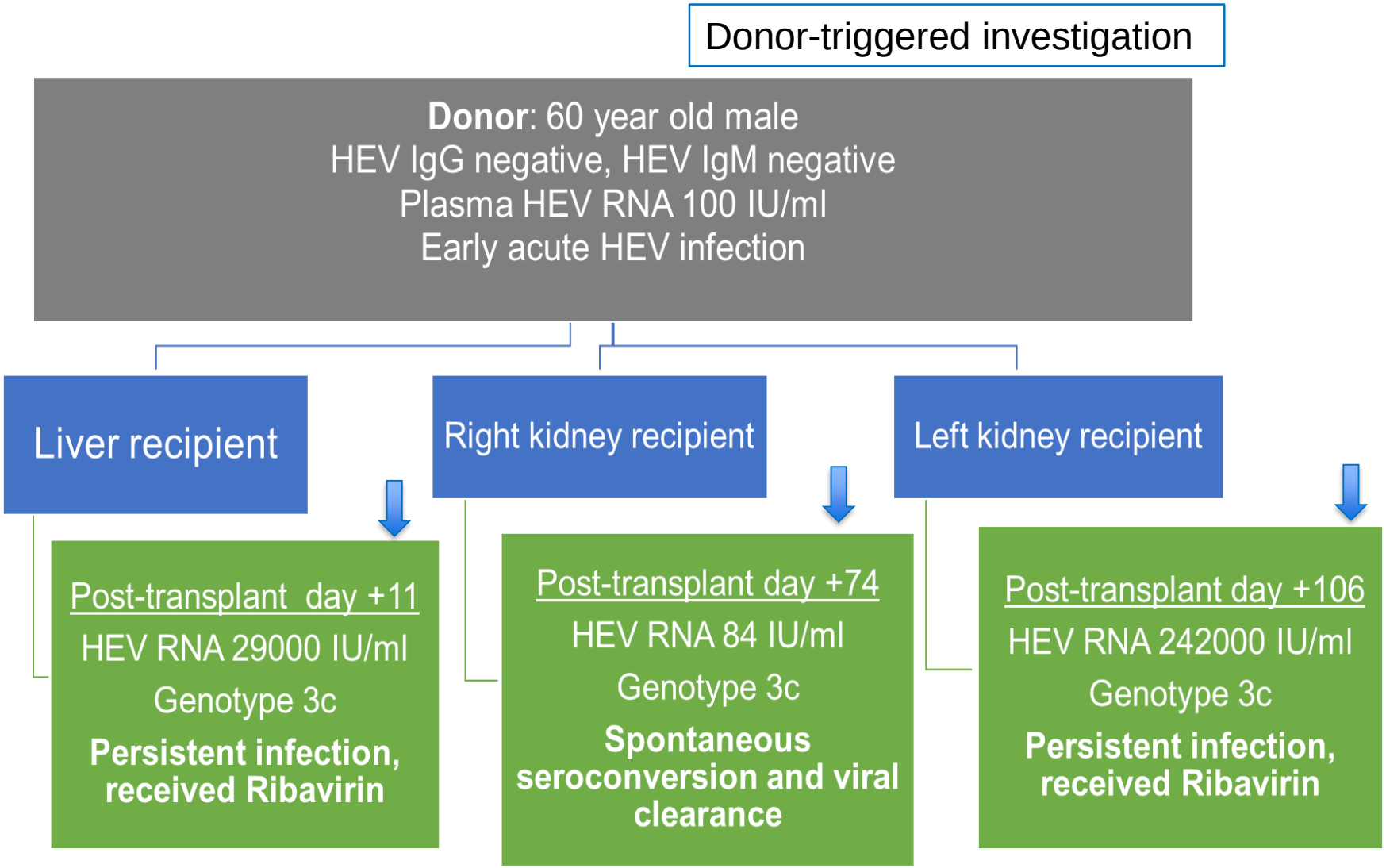
Human Herpes Virus type 8 also known as Kaposi's Sarcoma-associated Herpes Virus

All recipients seronegative for HHV8 lytic Ab in pre-tx sera



Recipient triggered investigation

Hepatitis E virus



Other cases of recipient triggered investigations

- Hepatitis C virus infection discovered through
  - routine pre-clinical trial testing (5 years post-tx)
  - routine haemodialysis screening (~2 months post tx)
- Rare tropical infection in SOT recipients
- Disseminated tuberculosis
- Fulminant herpes simplex hepatitis
- Kaposi sarcoma diagnosed 18 months post transplant

Summary- Post-transplant recipient follow up

- Reporting of events that may be linked to the graft
- Reporting of unusual disease or disease presentation
- When accepting organs from a donor at increased risk of infection
- For BBV risk, test recipient by NAT at 4 and 6 weeks post transplant or when clinically indicated
- For malaria, include malaria in the differential of any episode of fever within 4 months from transplant
- For HEV RNA positive donor, test recipient pre-transplant and post transplant

Conclusion

NHS
Blood and Transplant

- Organs from all donors will carry some degree of uncertainty and risk
- Understanding and using information from donor characterisation decrease uncertainties
- Post-donation information can be very useful and should be interpreted and shared in a timely manner
- Some infections may manifest several months after the transplant and reporting to ODT remains important
- Where a possibility of donor-derived disease exists, reporting to ODT should not be delayed whilst awaiting confirmatory diagnosis or local investigations
- Where transmission cannot be avoided, mitigation of harm to recipients may be possible if action is taken in a timely and planned manner.
- Learning from unexpected transmission events can improve patients' outcome

Thank you

NHS
Blood and Transplant

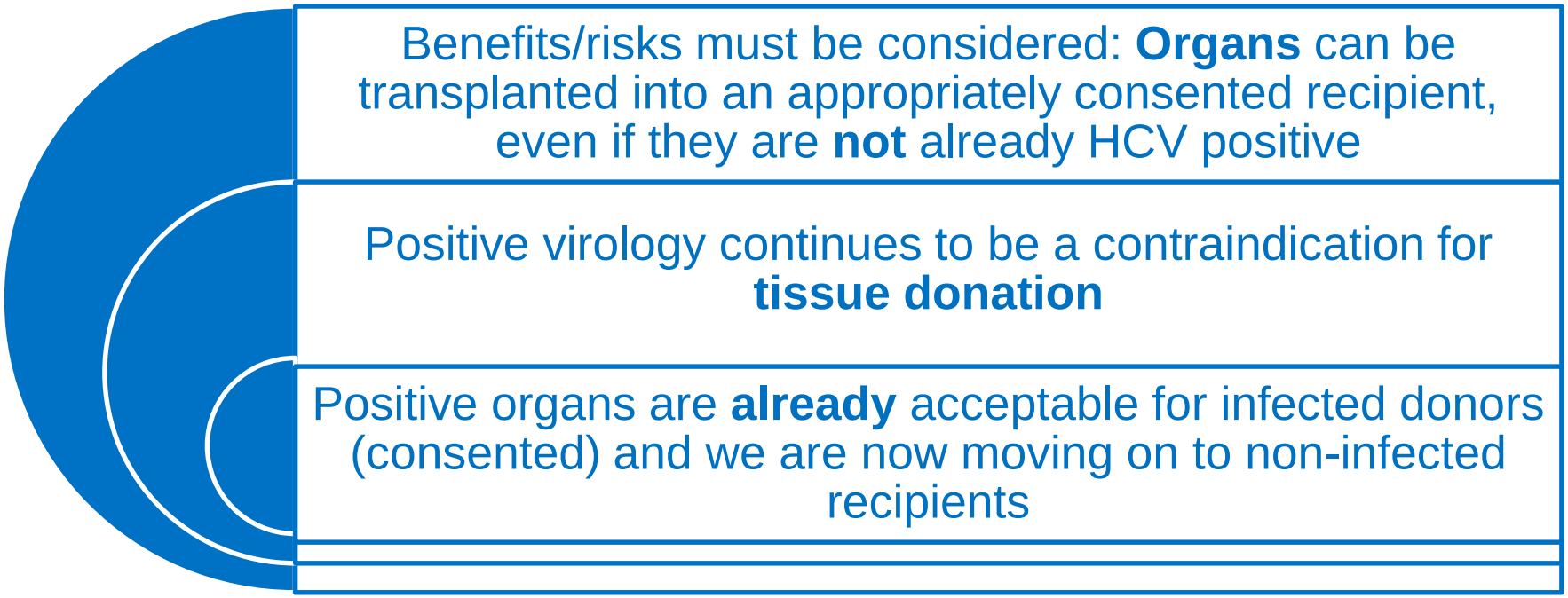
Hepatitis C Positive Potential Organ Donors

New UK position statement and the implications for organ donation

Yes I donate
ORGAN DONATION

Caring Expert Quality

HCV is NOT an Absolute Contraindication to Organ Donation



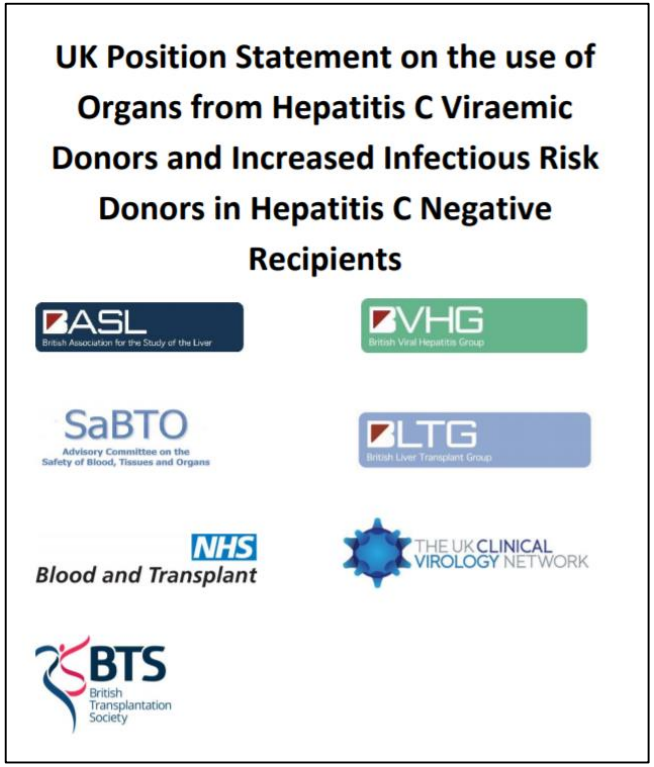
- Highly effective and well tolerated Direct-Acting Antiviral (DAA) therapy-cure >95% of HCV infected patients
- Evidence indicates that greater use can be made of organs from HCV infected donors
- UK guidance has been developed to address this issue

UK Position Statement

NHS Blood and Transplant

- In some clinical situations, organs from HCV infected donors may be transplanted into **uninfected** recipients

- Key elements of the guidelines
  - **selection** of appropriate donors
  - a policy for ensuring the **intended recipient** gives fully **informed consent**
  - guidance for **testing** of the **donor**
  - guidance for the **testing and treatment of recipients** as indicated
  - **availability of drugs for recipient treatment**



Indicators of Possible HCV Infection in the Potential Donor and Recipient Follow up

As identified through the donor characterisation process:

- Already known HCV infection
- Positive HCV serology at time of donation
- High social risk
- Such donors need to be tested for HCV RNA (and HIV, HBV)
- Recipient to be tested for HCV RNA at post-transplant week 1, 2 and 6
- Immediate confirmation and start of treatment if positive for HCV RNA

NHS
Blood and Transplant

Donor characterisation
What should recipient centres be looking out for?

- Full donor characterisation – details!
- Discussion around **initially reactive results**
- Discussion around a **donor with increased risk of infection**
- **Communication** between transplant centres and clinical microbiologists
- **Follow up** of donor results
- Appropriate **recipient management**
- Event/Incident reporting