

The “Journey of Life” of an Unrelated Peripheral Blood Stem Cell Donor

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Introduction

- ▶ Peripheral Blood Stem Cell (PBSC) collection is a procedure where stem cells are collected to be given to patients as part of a course of treatment for conditions such as lymphoma and leukaemia
- ▶ Stem cells can be collected from patients who will have their own cells back in an autologous transplant
- ▶ Or they can be collected from healthy unrelated donors or healthy sibling donors for an allogeneic transplant

Learning Objective

- ▶ To understand the process of PBSC collection from *healthy unrelated donors*, from initial selection through to post procedure follow-up

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In 2013, the UK's stem cell registries aligned to create the Anthony Nolan and NHS Stem Cell Registry, a single collaborative approach to the provision of stem cells from unrelated donors

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The Anthony Nolan and Stem Cell Registry Annual Review 2016

There are 4 UK registers of potential stem cell donors, Anthony Nolan (an independent charity), the British Bone Marrow Registry (BBMR) (a division of NHSBT), the Welsh Blood Service and Delete Blood Cancer UK

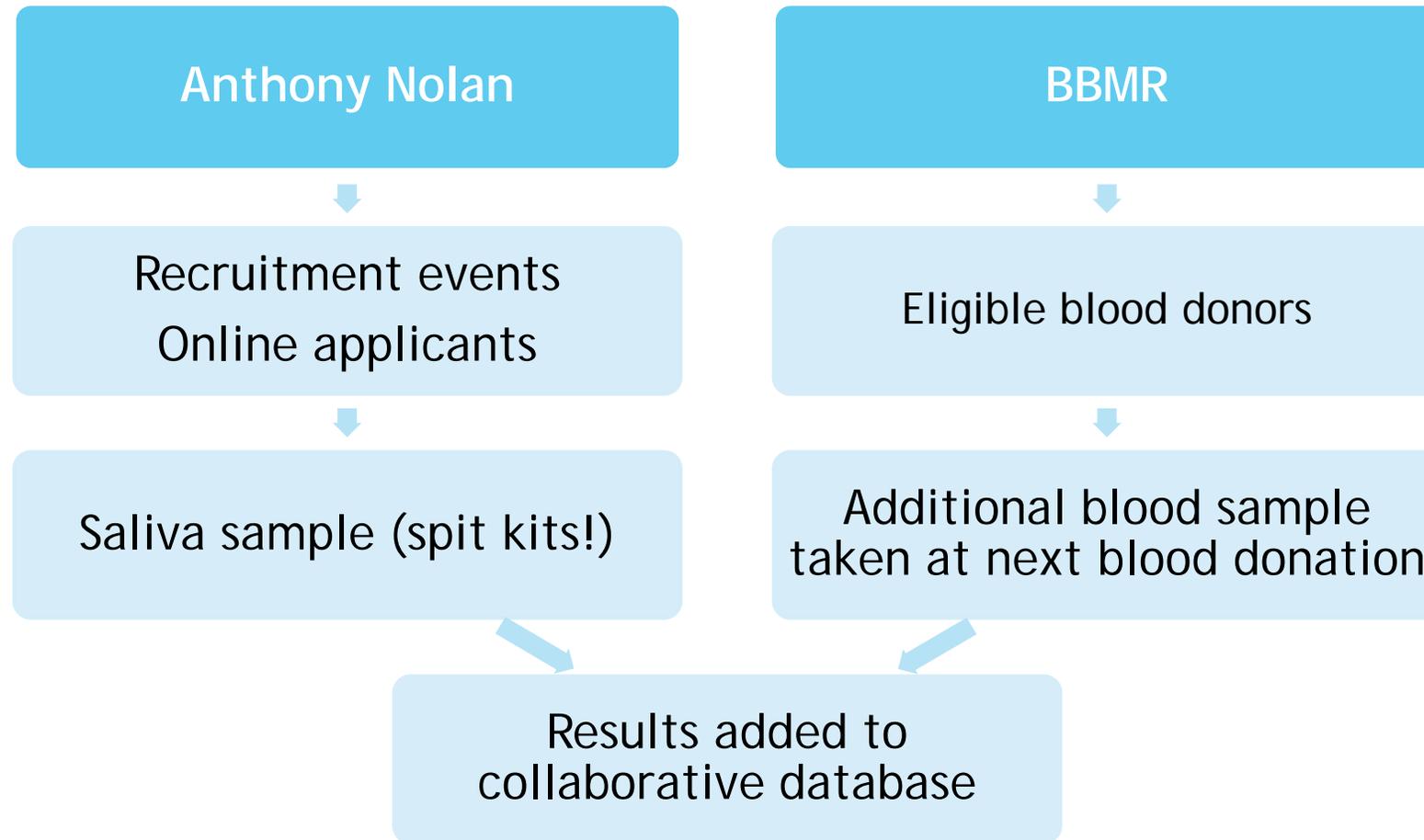
At the Sheffield Therapeutic Apheresis Unit we undertake PBSC collections from both Anthony Nolan and BBMR donors

Eligibility Criteria

Anthony Nolan	BBMR
Aged between 16 and 30 years	Aged between 17 and 40 years
Weigh over 50 kg	Male
Have a BMI of less than 40	Females only accepted from Black, Asian, minority and mixed ethnicity backgrounds (within above age range)
Be in good health	Be a blood donor

In addition to the above criteria, there are also lots of other factors that may prevent people being eligible donors; including many pre-existing medical conditions, previous or current IV drug abuse or if they live outside of the UK

Recruitment of Donors



Medical

Meet with the doctor:

- ▶ Discuss procedure, health history, travel history, consent for procedure, consent for central line
- ▶ Physical examination

Observations:

- ▶ BP, HR, RR, temp, SpO2, height, weight, BMI, vein assessment (ideally peripheral access but may need a central line insertion)

Urinalysis:

- ▶ Check for protein and blood
- ▶ Pregnancy test for women

Medical (continued)

Bloods:

- ▶ FBC, U&E, LFT, glucose, PO⁴, uric acid, coagulation screen, virology, blood group
- ▶ Sometimes research samples requested
- ▶ Additional samples if requested by transplant centre
- ▶ Additional virology depending on travel history e.g. Malaria, West Nile Virus

ECG

Chest X-ray

And as many cups of tea as they can manage!!

Granulocyte Colony-Stimulating Factor (GCSF)

- ▶ GCSF encourages the bone marrow to produce blood stem cells (known as 'mobilisation')
- ▶ In healthy donors this results in the production of extra stem cells, ready to be harvested in a PBSC collection
- ▶ Common side effects include headaches, bone pain (particularly hips and back), nausea and either diarrhoea or constipation



The Donation

- ▶ Welcome the donor and any friends or relatives (more refreshments!)
- ▶ Manage anxiety - healthy donors may never have been in hospital before
- ▶ Observations - BP, HR, RR, temp, SpO2
- ▶ Confirmation of consent and reminder of right to withdraw consent

Venous Access

- ▶ In order to perform the procedure, we need to obtain peripheral access in both arms (unless the donor is having a pre planned central line inserted)
- ▶ Ideally we use a rigid inlet needle for access (where the blood is drawn away from the donor)
- ▶ A cannula is used for the return line



The machine/procedure



- ▶ The apheresis machine we use is a Spectra Optia, manufactured by Terumo BCT
- ▶ It is a cell separator which uses the process of centrifugation to separate blood into its component parts
- ▶ Side effects of the procedure can include citrate toxicity, tiredness, light headedness, faints or chills

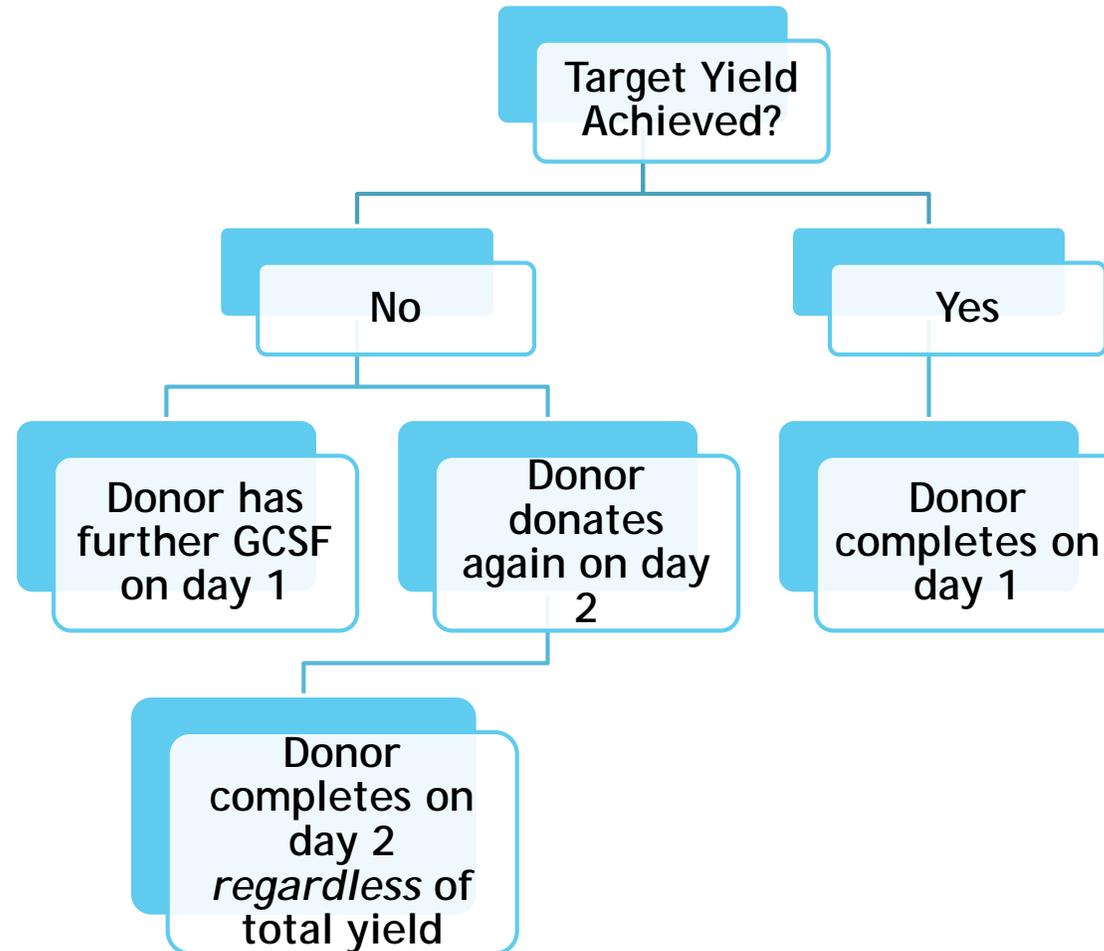
The Yield

- ▶ The Stem Cell and Immunology (SCI) labs process the product that we send to them and perform a count of how many stem cells we have obtained
- ▶ This yield is expressed as:

$$\text{CD34} \times 10^6/\text{kg}$$

- ▶ CD34 is the stem cell marker so when the result is reported this is a number (e.g. 4.17) which is then multiplied by a million (10^6) per kg of the *recipient's* weight, e.g. $4.17 \times 10^6/\text{kg}$
- ▶ In the above example this would be 4,170,000 stem cells per kg!

What happens next?



In Summary

- ▶ PBSC donation can be an intense process for healthy donors who would normally have no need to set foot in a hospital
- ▶ It requires them to be generous and flexible with their time throughout the process
- ▶ None of this would be possible without the willingness of the donors and the support they receive from their family, friends and employers

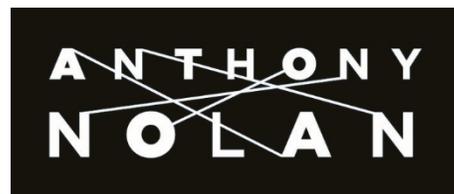
- ▶ And don't forget the tea and biscuits.....!!



Further information is available at:

▶ www.anthonynolan.org

▶ www.nhsbt.nhs.uk

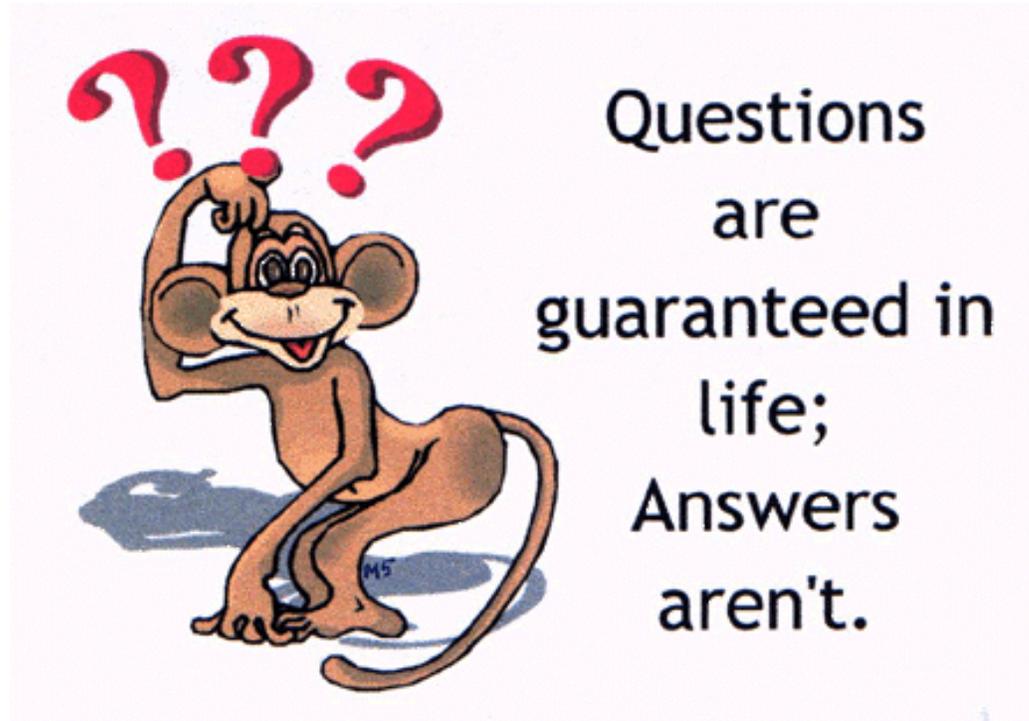


saving the lives
of people with
blood cancer

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Thank You for Listening!



But please feel free to ask me anyway!