THE DONOR

Winter 2019

SICKLE CELL STORY

Meet Miai and her mum Lisa

Getting on board with emergency blood

Zoe's first donation

Save a life
Give blood

NHS
Blood and Transplant

A message from Betsy Bassis, Chief Executive

Hello and welcome to the winter edition

In this issue, we're celebrating collaboration.

Be it the combined efforts of blood donors and paramedics to save people's lives when they've had serious accidents, or the families who come together at the toughest possible moment to make life-saving decisions on organ donation, collaboration is always at the very heart of what we do.

Chief Executive Betsy Bassis

In that spirit, we've invited our esteemed friends at the Great North Air Ambulance Service to talk about the power of blood and plasma – since 2015, they've kept them on board helicopters for emergency situations and seen a huge improvement in patient outcomes as a result.

Plasma is the largest component of blood, making up more than half its volume, so we asked some of our colleagues to explain more about it and how donations are made. Elsewhere, we look at the hard work that's been going on behind the scenes to make blood donation more sustainable. We are delighted that we've already reduced our carbon emissions by 25 per cent in the last five years.

Similarly, our responsibilities to each other, so wonderfully illustrated by donors every single day, must include a vision for the donors of tomorrow, and so this issue also features an update on our digital services.

We've added a few new features to the appointment search feature of our app and website to make it easier for you to save lives.

Then there are mums Emily and Lisa. Emily meets one of the donors whose blood she was given when she was fighting for her life after a car accident. Meanwhile, Lisa talks about the need for more black blood donors to support the 15,000 people in the UK with sickle cell disease, one of whom is her daughter, Miai.

There are more stories of collaboration, community and co-operation in the issue (including some from the animal kingdom!), so, please, enjoy all it has to offer.

"collaboration is always at the very heart of what we do"

I'm sure, as we look forward to a new year and a new decade, we can all agree that the world around us could use some more of the compassion, kindness and collaboration that donors show every day, and so may I take this opportunity to thank you for your dedication to making the world a better place.

Thank you and may you have health and happiness in 2020,

Betsy.

Write and tell us your news, views and interesting or unusual donor stories. The Editor, The Donor, NHS Blood and Transplant, 14 Estuary Banks, The Estuary Commerce Park, Speke, Liverpool, L24 8RB or email thedonor@nhsbt.nhs.uk

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NHS Blood and Transplant

Zoe at our West End donor centre

Zoe's first donation

Zoe Ball, Radio 2's Breakfast Show host, recently headed to our West End Donor Centre to give blood for the first time

Once her morning shift was finished at the BBC's Wogan House studio – just a hop, skip and a jump away from our donor centre on Margaret Street – Zoe was greeted by staff and, in just a few minutes, the Ball blood was in the bag.

She told us, "Do you know, I can't believe it's all so quick and actually so straightforward. My mum's been donating blood for years, and she'd always say she was going off to do it and I'd think 'Yeah, I must do that, I must do that', but it's life isn't it – those things that you always say you're going to do and just never get round to.

"It was only when a listener had sent in a message saying they were going off to give blood that I think all the paths crossed, and you guys called to say 'yes please do!' I'm so glad I did!"

Surprised

Zoe was surprised at just how little time she spent in the donation chair.

"From the moment of coming in the door, giving blood (which took 6 minutes 56 seconds – I'm quite proud of that time!) and having my biscuit and a little rest, it took, what? 15 minutes? 20 minutes?

"It's actually a really pleasant experience, really straightforward, very easy … and more people need to do it. We need more young men giving blood, and also lots of different ethnic groups. I think if you realised how easy it is to do it, and how every few months it would just take you half an hour to help save somebody's life … I think more people would hopefully jump at the chance."

"We need more young men giving blood, and also lots of different ethnic groups… …every few months it would just take you half an hour to help save somebody's life"

She added, "It's actually quite fun and the biscuits are very delicious…I went for a mint Club!"

She paused. "Two mint Clubs … and some sea salt crisps!"

Thank you to Zoe for doing something amazing – we look forward to seeing you again soon!

Animals can give blood too!

It's not just human donors who save lives. Animals can also come to the rescue when a fellow creature is in need

Next time you give blood, spare a thought for a little pangolin called Fortunate. The scaly mammal was recently treated with a blood transfusion from a fellow pangolin after he was rescued from traffickers.

These animals are sadly being pushed towards extinction by poachers, because of demand for their meat and scales.

After his rescue, Fortunate needed a plasma transfusion to treat a life-threatening health issue, but the team at Johannesburg Wildlife Veterinary Hospital were only able to give him whole blood. Sadly, although Fortunate initially seemed to be making a good recovery, he later died. However, the treatment, believed to be the first of its kind, has given vets invaluable new medical insights into this highly endangered animal.

Above: It seems mosquitos prefer to bite those with the O blood type

Doggy donors

Pangolins aside, blood transfusion medicine goes back centuries and the first successful recorded blood donation was not human to human, but dog to dog. In 1665, a physician named Richard Lower successfully performed a blood transfusion between two dogs, some 150 years before the first successful human to human exchange was managed.

It may have been an experiment, but 350 years later, doggy donors are still helping to save lives. Pet Blood Bank has been running canine blood exchanges since 2007 and provides veterinary surgeries with blood needed for poorly pets. Similarly to humans, dogs also have different blood types and will either be DEA 1 positive or negative.

The donor dogs are brought in by their owners and have local anaesthetic cream applied to help to keep them comfortable while blood is taken. Over 10,000 life-saving dogs are registered with Pet Blood Bank to date.

The service is also working on launching a blood bank service for cats, and it's good news for those with slightly more exotic pets too: Pet Blood Bank processes blood donations from alpacas as well!

Mosquito magnet?

One creature that has been "borrowing" blood for millions of years is the mosquito. They live on nectar but female mosquitos require the protein in blood to produce eggs. This ancient insect has evolved to respond to several aspects of human biology – smell, skin temperature and also… blood type.

A 2004 study found that mosquitos landed on people with type O blood nearly twice as often as those with type A, with type B somewhere in between. It's not clear why mozzies have this preference, but if you're one of the 48 per cent of people in the UK with type O blood, you might want to invest in some repellent.

Human evolution

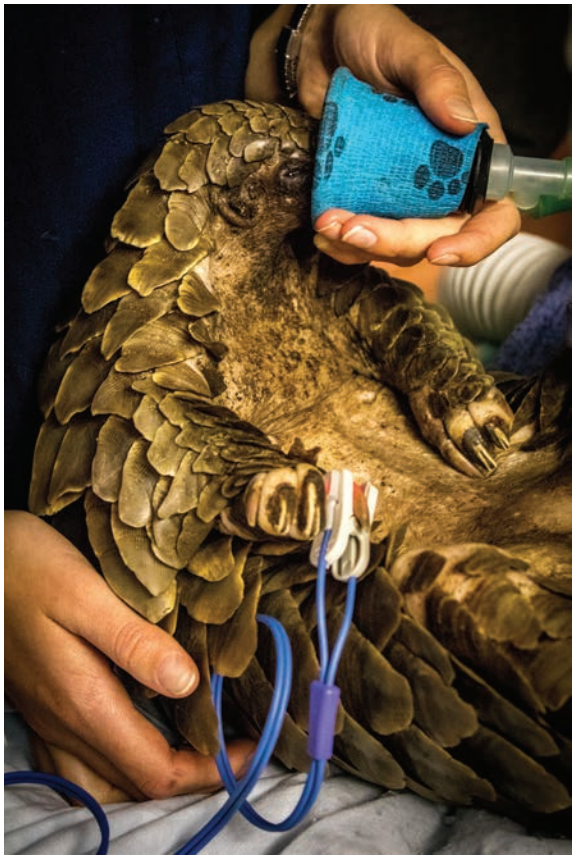
From an evolutionary standpoint, mosquitos may not have changed very much in millions of years, but they have led to adaptations in humans.

The reason? Malaria. Humans who evolved in areas with high rates of malaria benefited from a gene mutation called sickle cell. This gene changes the shape of red blood cells to sickle shape, but crucially also alters the blood's chemistry. Scientists now think the gene protects against malaria not by stopping the infection but by preventing it from taking hold after infection has happened.

The downside of the gene is that inheriting two copies (one from each parent) leads to sickle cell disease, a painful and life-threatening condition that often requires blood transfusions and hospital treatment. Inheriting a single copy (passed on by one parent) of the gene confers malaria protection but without the disease and is called sickle cell trait. This advantage explains why the gene has persisted.

Malaria has always been most prevalent in parts of Africa, and the persistence of the sickle cell gene explains the high rates of sickle cell disease amongst black people in all parts of the world. Patients rely on regular blood transfusions to keep them well but this also means donations must come from donors with similar genetic backgrounds. So more black blood donors are needed all the time. ●

* (SOURCE: NEW SCIENTIST 5.05.2011)



Above: Fortunate the pangolin receiving medical treatment

Improving your online service

More donors than ever are using our online service at blood.co.uk and the NHS Give Blood mobile app

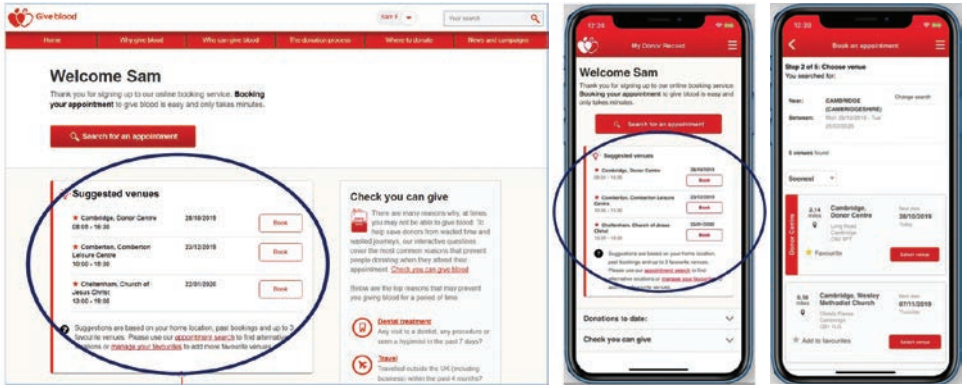
To help make things easier for you, we've been working hard to make improvements to both the website and the app based on the feedback we have received.

'Suggested Venues' feature

When you log in, you will now see suggested venues and dates to help you book your next appointment more quickly. The suggestions are based on where you usually donate blood, and any 'Favourite' venues you have chosen. If any of the suggestions are suitable, simply click the 'Book' button and you will be taken straight to a list of the available appointment times at that venue and date.

You can then quickly select a time and confirm your appointment. Your appointment details will display on your 'My Donor Record' page each time you log in.

If you don't have any suggestions to begin with, select the 'Add To Favourites' star next to any venue when you are searching for an appointment and you will start seeing that venue come up in the suggested venue box.



We have listened to your feedback and improved many features on our app and website

Updated appointment search

We know that occasionally you might want to search for an appointment at a venue or on a date that doesn't appear in your 'Suggested venues' box, so now you can do a custom search: just click on 'Search for an appointment' on your 'My Donor Record' page. You can now easily choose a place and date range for your search.

The updated 'Advanced Search Filters' will also help you refine the process.

Updating your donor account and preferences

It's easier than ever to update your donor account too. Just use the menu at the top of the page and click 'Manage My Account' to access a range of features. Here you can instantly update your personal details, change your password, or manage your favourite venues.

Get the app for Apple or Android

Our app is the simplest way to use your online account. It can do all the things you can do online, plus there are some extras in there too! For example, you can only view your digital donor card via our app.

Search for 'NHSGiveBlood' in the relevant app store for iOS and Android devices.

Once you have downloaded the app, simply sign in using your online account details.

If you have any comments or new ideas, we would love to hear from you. Email us at customer.services@nhsbt.nhs.uk or complete an online form.

Helping little Ezrah

How one little boy is being treated for sickle cell disease

Serena Pink's son, Ezrah, was diagnosed with sickle cell disease not long after birth. The inherited blood disorder is so called because sufferers have sickle-shaped red blood cells, which can get caught in blood vessels, blocking blood flow and triggering painful crises.

"It's very traumatising to watch your child go through that," says Serena. "It was ten times harder because Ezrah was a baby, I didn't know what was hurting him and he couldn't verbalise what was hurting him. He was screaming in pain."

Ezrah experienced his first sickle cell crisis a year ago. Serena noticed his hands and feet had become a swollen – a sign of a sickle cell crisis – and he was taken to hospital. She now recognises the distinct cries he makes from the pain of sickle cell and gets him treatment as fast as she can.

Complications

The disease can lead to complications such as stroke and organ failure, and patients have to constantly manage their lifestyles and watch their health.

Many people with sickle receive regular or occasional blood transfusions. Ezrah received his first transfusion in April 2019 and it was transformative.

"He started to brighten up, he seemed more lively, and full of energy. He seemed happier," says Serena. "His eyes had been jaundiced and they went back to normal. But if the crises become more regular – and he has had quite a few in a short space of time – they (doctors) might have to put him on another drug, which is quite strong. He might also need more transfusions."

Ezra was diagnosed with sickle cell disease as a baby

When asked about the need for more black blood donors, Serena, from Beckenham in Bromley, says, "I think in black culture it's like a taboo subject. We are not going to give blood and organs. It's just not what we do. Until you go through it or somebody close to you is affected by it, I think that's the only thing that opens up people's eyes."

Matching blood types

Sickle cell patients often need transfusions, and the more they receive, the more closely the blood they are given has to match their own.

There is a far greater chance of a closer blood match among people of similar genetic backgrounds. The Ro subtype, for example, is more than ten times more common in black blood donors than it is in white donors. When a patient with the Ro subtype needs multiple transfusions for a condition like sickle cell disease, a donor with the same subtype is needed.

That's why more black blood donors are needed to help patients like Ezrah.

Ezrah is walking and talking now and doing well. But, says Serena, "He has penicillin twice a day and folic acid once a day and he will have them for the rest of his life."

Currently, there are 15,000 people in the UK living with sickle cell disease. You can find out more about sickle cell and the need for black blood donors at blood.co.uk.

LISA PHILLIP

Humans of Blood Donation

This is where you tell us your wonderful and heart-warming stories about blood donation. Here Lisa Phillip talks about her daughter, Miai, who has sickle cell disease

I found out I carried the sickle cell trait when I was 11, during a routine surgical procedure. It didn't seem serious as I was hardly contemplating motherhood, but fast forward 21 years and I'm rocking my baby bump, painting the spare room yellow and sounding out baby names. And when I finally got to hold my little girl, she was so beautiful I couldn't put her down.

We named her Miai. Her father and I were aware that being carriers of the sickle cell trait meant there was a one in four chance of our baby inheriting full-blown sickle cell but mistakenly thought the stats were in our favour. And they seemed to be, until the results from the heel prick blood test revealed there was a problem. It was a sickle cell nurse who broke the news and I felt defeated.

"Many people mistakenly believe all blood is the same and therefore it shouldn't matter who donates it, but Miai's blood type is B and this is more commonly found in black people."

15,000 sufferers

In the UK there are approximately 15,000 people living with full-blown sickle cell. Unfortunately, it's an illness that often falls under the radar because it predominantly affects the BME (Black and Minority Ethnic) community and does not always attract the funding or generate the public interest that other conditions might.

Sickle cell disease affects the shape and function of the red blood cells, resulting in crippling pain called a 'crisis' and chronic anaemia. Organ failure, gallstones, acute chest syndrome, pulmonary hypertension, stroke, leg ulcers and eye damage are among many of the complications of sickle cell; in more serious cases it can prove fatal.

Sickle cell requires lifelong treatment with medication. Patients are encouraged to lead a healthy lifestyle but there is no widely available cure yet. There has been some success with bone marrow and stem cell transplants and scientists are now looking into gene editing.

There is a whirlwind of emotions that comes with being a parent of a child with a chronic illness. From guilt to anger, hopelessness to fear.

Miai's pain can start instantly - we can go from playing in the park to reaching for the 'mobile' pain medications (never leave home without them) in a heartbeat - and reacting quickly can often quell a mini-crisis from escalating into a drawn out hospital admission.

It's a helpless feeling having to just trust that the medical team know what they are doing.

I've cradled my little girl while she whimpers, despite being hooked up to tubes pumping in maximum strength painkillers, oxygen, antibiotics and fluids. On many occasions real progress is only made when a blood transfusion is given.

Eight transfusions

Miai is now nine and has already had eight transfusions; every time I've witnessed the benefits first hand. Before the donated blood she is usually quiet, withdrawn, and weak. Within the hour she starts to get her zany personality back. She's much more energetic, cheeky and engages in banter with hospital staff. I often need to nag her to keep the volume down because "There are sick children about!"

Many people mistakenly believe all blood is the same and therefore it shouldn't matter who donates it, but Miai's blood type is B and this is more commonly found in black people. It is therefore very important that we encourage the black community to please donate to ensure there is enough supply to meet demand and help individuals like Miai.

It is one of the most rewarding things a human being can do and the actual whole blood collection only takes between five to ten minutes – a 'loo break' no less! My needle phobia and my false belief that carriers of the sickle cell trait couldn't register stopped me for many years until August 2018 when I made my first

Left and main picture: Lisa and her daughter Miai

donation. I felt like I came full circle and I could finally return the favour to some stranger in need.

Hearts of gold

For those who can and are willing to donate blood, or if you're a regular donor, please be reassured that each bag of blood gives hope not only to the patient receiving it but to their loved ones too. It's an invaluable lifeline donated by real life super s/heroes. There are no capes, masks or high-tech getaway cars, just beautiful people with hearts of gold who selflessly give the gift of blood, hope and life to grateful beneficiaries.

Miai says blood donors are super heroes!

Above: Mum Lisa says Miai has big dreams

Thank you just doesn't seem to go far enough.

It's because of blood donors Miai can lead a 'normal' life and there really is nothing that she cannot do. She has big dreams of being an actor, author, entrepreneur, dancer, illustrator and violinist (depending on what day you ask her) and has also made it her mission to spread more awareness about sickle cell too.

Her sheer resilience indicates she will achieve all those things and more, but I'm just proud to be her mum.

Happy and alert

Miai says: The blood transfusion makes me feel so much better. Before, I am miserable, tired, attached to wires and can't get out of bed. Afterwards, I am happy, alert and I can then take little strolls around the ward or visit the goldfish. When I have enough energy, I like to go to the playroom.

"There are no capes, masks or high-tech getaway cars, just beautiful people with hearts of gold who selflessly give the gift of blood"

I don't even mind pulling the IV drip with its tangled wires and sometimes I go to the canteen with mum.

Donating blood can save lives so you should donate too. It only takes a few minutes and the nurses give you a biscuit afterwards, so if you've got a sweet tooth that alone makes it worth it.

Stand aside Super Girl, Spider Man and Black Panther, blood donors are the real life super heroes, saving up to three lives per donation!

Believe me, the blood transfusion really helps, it gives me energy and I feel so much stronger.

Without this donated blood, I probably wouldn't be here today.

If you have a way with words and want to share your story – be it about your first donation or your five hundredth – then please get in touch by emailing thedonor@nhsbt.nhs.uk, including your name and contact details.

FOCUS ON Plasma

We asked our resident experts Mike Wiltshire and Lucy Bower to explain this vital component

It makes up most of the blood flowing through our bodies, but how much do you know about plasma? You're probably a bit more familiar with red blood cells and platelets and how they are used to treat patients, but plasma is vitally important in saving and improving people's lives too.

So what is plasma?

Plasma is the clear, yellow liquid portion of blood that remains after the cellular components are removed: red cells, white cells and platelets. Plasma makes up approximately 55 per cent of the volume of blood and contains important proteins including antibodies, enzymes and coagulation factors.

What does plasma do?

Plasma carries out a variety of functions within the body including the transportation of cells and vital proteins that enable blood to clot and fight disease. Plasma is especially useful clinically because it contains coagulation factors that work together with platelets to form a blood clot. So these life-saving proteins can help to stop uncontrolled bleeding in patients.

How is plasma donated?

In England, both whole blood and platelet donors provide plasma. During processing, whole blood is separated into components, including plasma. During component donation, both platelets and plasma can be collected directly from the donor into separate bags. The rest of the blood is then returned to the donor.

Donated plasma is frozen to preserve its quality and function. This component is known as fresh frozen plasma, or FFP. FFP can be issued to hospitals or further processed into a more concentrated component that is rich in certain clotting factors called cryoprecipitate.

Plasma can also be separated out into individual proteins using a variety of industrial processes known as fractionation. These individual proteins are then used to make medical products.

How is plasma tested?

Before plasma is used for transfusion or fractionation it is tested to ensure it's safe to use. These tests check for diseases such as HIV and hepatitis, and all donations are tested for blood group. This is to ensure that patients receiving FFP or cryoprecipitate get transfused with plasma that will not react with the their own blood.

Doing our bit for the planet

health and wellbeing for staff and donors, plus improved waste management and land use. Other green features include electrical vehicle charge points and solar panels.

A similar system, capable of delivering 30 per cent of the site's peak electricity demand, has been installed on the roof of our Manchester Blood Centre. Installation of electric vehicle charge points at other sites is underway, too.

How we are reducing our impact on the environment

We at NHS Blood and Transplant are working hard to become greener. Back in 2015 we set ourselves a ten-year Sustainability Strategy. Targets included a 50 per cent cut in carbon emissions, sending zero non-clinical waste to landfill and building a sustainable supply chain for the products we need to save lives.

So far, we've reduced our carbon emissions by 25 per cent through measures like lighting controls and LED and modernising inefficient equipment, including air conditioners and refrigerators. We've also diverted around 95 per cent of waste away from landfill through our waste contractor and we aim to procure more sustainable items and cut unnecessary waste production.

But there's more to do.

Purpose-built

Our new site in Barnsley will move us from two dated, inefficient buildings into one that's purpose-built. That means more efficient use of water and energy, better

Solar panels and electric car points are all part of our plan

Keeping you informed

We will also be keeping blood donors and staff members better informed about what happens to waste from donation sessions.

You can of course help us to save lives in a greener way by bringing a reusable cup or travel mug to sessions, taking waste you've brought with you home to recycle, and following correct waste segregation with the items on session. If you haven't already, you can also let us know your email address so we send your session invitations digitally, reducing printing and postage.

If you are considering eating less meat for environmental reasons, you can learn about which foods can help to boost your iron levels at blood.co.uk.

Do you have any tips or suggestions for reducing the environmental impact of donation sessions?
Share yours with us by emailing thedonor@nhsbt.nhs.uk, including your name and donor ID.

Emily and Karl met up in Birmingham

intensive care and another three weeks on the ward.

Almost a year later, Emily and Karl met at our Birmingham Donor Centre.

"I'm quite intrigued about meeting Karl," said Emily before the two were united. "It doesn't feel odd at all. I want to give him a big hug and say thank you. Obviously I wouldn't be here without blood donation. If you don't have blood you don't live."

"I want to give him a big hug and say thank you"

How one woman survived a horrific car crash and met up with the donor who helped save her life

Before the 120-mile-an-hour car accident that nearly took her life, there was no connection between Emily Pringle and the blood donors who saved her life, but when she got to meet Karl Kellner, it's no surprise that a grateful embrace was the first thing on her mind.

Emily, a 42-year-old mum and divorce consultant from Gloucestershire, was driving on the A40 near Cheltenham when her Audi collided with another car at a combined speed of 120 miles an hour in June 2018.

The accident broke 27 bones in Emily's neck, back, and legs and ruptured her carotid artery. Her life was saved with the help of the five units of blood she received at the scene and after being taken to hospital by helicopter.

Special meeting

One of those units came from Karl He had given blood at his local Stafford session, about 100 miles from Bristol, where Emily was treated. She spent eight days in

Top: Emily and daughter Isabel
Above: Emily's pelvis X-ray after the accident

After sharing a hug and a chat with Emily, Karl gave blood at the centre, joined by Emily's partner Neil.

Thirty-four-year-old Karl, who started giving blood at university, said, "I was quite nervous before the meeting, but it was an amazing experience to meet someone that you have helped. It was a very special day and one I will remember forever. Every time I go to donate from now on, I'll think that this is something that will change another person's life.

"I know it's important that men especially get out there and donate. Men's blood can be used for more products like plasma and platelets.

"One blood donation can save up to three adult lives."

Dr Rachel Hawes and one of the GNAAS aircraft

"We've now used this on over 300 patients and seen a huge improvement in outcomes"

with many patients surviving life-threatening injuries who might have died without this treatment.

The patients are also much more likely to have normal blood clotting when they arrive at hospital, which helps to stop the bleeding earlier.

Getting on board with emergency blood

Carrying blood and plasma on board their aircraft has transformed how the Great Northern Air Ambulance Service (GNAAS) cares for accident victims. The service was one of the first to start carrying blood, back in 2015. We talk to the GNAAS doctor who was behind the move, Dr Rachel Hawes, OBE.

Where did the idea of carrying blood and plasma transfusions on board come from?

Dr Rachel Hawes: I first saw this used during my time in the military in a pre-hospital setting whilst deployed in Afghanistan. I recognised the life-saving benefits of early treatment and realised that this was something that could really benefit the NHS too.

By using balanced ratios of red blood cells and plasma - one unit of blood to one unit of plasma - you can improve the outcome for bleeding patients.

Had this ever been done on an air ambulance before you introduced it?

Red blood cell transfusions had been carried on three other air ambulances when the Great North Air Ambulance Service started using it, but we were the first to carry thawed plasma on board.

What's the difference between blood and plasma transfusions?

Both red blood cell and plasma transfusions are vitally important. Red blood cells carry oxygen round the body and plasma contains the clotting factors, which are proteins that make a blood clot and can stop bleeding. Together they equate more or less to whole blood. The idea is that if a patient is bleeding and they are losing whole blood, this needs to be replaced with whole blood.

What does carrying blood on board mean for patients?

We've now used this on over 300 patients and seen a huge improvement in outcomes,

Top and above: Carrying blood and plasma on board has helped to save lives

What has the impact been on the level of care offered by the charity?

These new services have meant that rather than patients waiting to arrive in hospital to get the urgent care that they need, it starts on the roadside. This level of care then continues until they arrive at hospital, and many of the patients who would have otherwise died at the roadside are now surviving the journey to hospital and going on to live their lives.

What type of blood is transfused and why?

We carry O negative blood as it's considered to be the 'universal donor' and can be given to a patient in an emergency before we know their blood group. We carry A positive or AB positive plasma as this is similarly considered the safest to give in an emergency.

Finally, how did you feel, getting an OBE?

It was such a shock but a total honour to be recognised for the work that we have done, which of course wouldn't have been possible without the whole team.

It's been so satisfying to have an idea that may help save lives get established into NHS practice, especially in a financially constrained environment. To then see it being used on patients and improve outcomes is just so rewarding – for me and the whole team. ●

The Donor Crossword

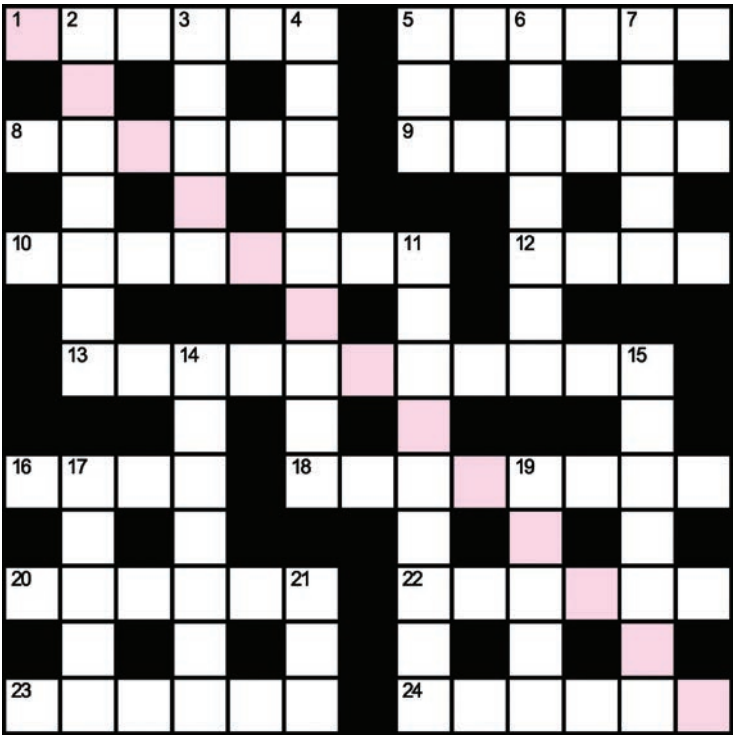
Complete the crossword. The squares running diagonally from square 1 spell out a word defining certain medical experts. Send the word on a postcard or in a letter together with your name, address and daytime phone number to: Crossword Competition, The Editor, The Donor, NHS Blood and Transplant, 14 Estuary Banks, The Estuary Commerce Park, Speke, Liverpool, L24 8RB. You can also email your answer to thedonor@nhsbt.nhs.uk. You could win an NHS Blood and Transplant prize. All entries must be received by January 31st 2020.

ACROSS

1 Cover for plants (6)
5 Optical illusion (6)
8 Fasteners with threads (6)
9 Tyrant (6)
10 Expressed great happiness (8)
12 Notion (4)
13 Healthy regimen (3-4,4)
16 Agitate (4)
18 Metallic element with symbol W (8)
20 Type of song (6)
22 Christmas decoration? (6)
23 Not to be revealed (6)
24 Thick-skinned mammals (6)

DOWN

2 Relating to milk (7)
3 Set of beliefs (5)
4 US seaboard adjacent to the Atlantic (4,5)
5 Crazy (3)
6 Italian composer of operas (7)
7 Little garden man? (5)
11 Device to initiate explosion (9)
14 Small songbird (7)
15 To that (7)
17 Commercial exchange (5)
19 Egyptian peninsula (5)
21 Small spot (3)



WE HAVE A WINNER!

Congratulations to Lenka Priessnitzova from Bristol who successfully solved last issue's crossword. The solution is: SERUM ALBUMIN