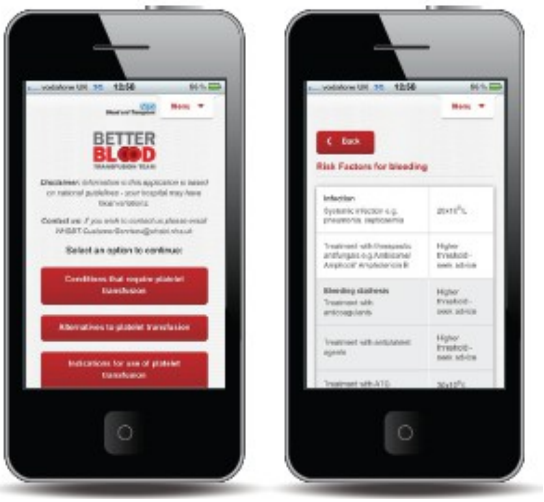
...basically, just to go in and give education to junior doctors on something which is really boring, to get them even engaged was a huge effort... the validity of samples if you want to do an electronic cross match for patients which we were trying to do and trying to make sure there were no delays ever in blood provision.



It's quite important and it took me about half an hour to explain it all and I got to the end and this junior doctor, who must have been about 22.

He said that was great information, thanks very much, I'm not going to remember it in five minutes time. If you want me to remember it and actually do something with it and be working with it every day, I need it when I'm taking the samples tomorrow, in my pocket. Then I'll always have the information so I'll always be able to get it right and you won't have to worry about delays in blood provision.

And I thought, that's brilliant, that's exactly what we need - me giving this information right now, it's not the right time, it needs to be time specific when you're actually doing the task. So it played on my mind for a while and I went and discussed it with this guy who I think is a genius - he was newly appointed to the NHS Blood and Transplant. I told him what the junior doctor had said and was there a potential to do something with apps because we were doing these huge audits in the UK so could we do something for blood transfusion.

And then to be honest, I don't know how he did it, he went back to NHS BT and pitched the idea to them. He has really good business knowledge, he has his own business when he's not working for NHS BT. He pitched the idea as a way of getting appropriate blood use from them if we could write apps for transfusion and they agreed. So then at that point they gave him some amount of money, I can't remember how much but it was not a lot of money but enough to get us started with ideas.

The first time around we wrote a platelets app for the UK. NHS BT because they were providing the money, said this is what we would like you to do / the area we would like you to target because platelets always in short supply. We wrote the app in conjunction with developers at the National Blood and Transplant Centre - their IT team. So we started with a small app, we just turned what were clinical guidelines into something you could have in your pocket. It wasn't a decision making tool - whether to transfuse or not transfuse, it was just transfusion guidelines in your pocket, that was it.

During the process of doing that, we learnt a huge amount, just because we went away and researched things like - who was using apps, what was the most popular medical app in the

UK at the time, how long was a doctor willing to use an app for in any one go before they didn't use it any longer, how quickly did they need to get the information; or what were the barriers in clinical practice to stop them from using it and that was really interesting.

How did you do the research?
There were lots of papers, people had already published quite a lot. I think Leeds had looked at this in particular but at the same time, Imperial College had just put their antibiotic policy into app format. So I think was the clinical safety centre there had already looked at stats - we knew that 100% of junior doctors had downloaded it onto their mobile phone. What the Trust hadn't looked at that point was the link between compliance guidelines and patient outcomes so we had a look at that but we knew it was used and downloaded. So for the platelets app, our biggest stumbling block was the lack of thought we had given into how to launch it and also the other thing we learnt was credibility. For clinical users, if they don't think it's credible and it's not going to stand up with them when something goes wrong, then they just won't use it.

So we didn't brand it and didn't go through but as a learning exercise it was really good. It was downloaded enough to convince NHS BT that there was a need for one. So I went back to NHS BT, pitched it, so we had managed to put the transfusion guidelines into an app and yes it was downloaded but if there was more scope and we had more money, we would do things like take it to MHRA who would make sure it was properly branded, we would do clinical evaluation of it and they gave us I think it was £60,000.

So this time, it got much more serious, it wasn't just a case of writing it with NHS BT IT department. It went out to tender for different developers and a contract appointed. So for the platelets, first time in the room it was literally myself, one consultant, the development team - myself and a colleague doing the thinking over how the information should be presented and how the clinical area would receive that - to then sitting in a room writing what we were now calling Blood Choices, with at least three consultants. Getting people on board like the head of digital health at the Royal College of Physicians to look at the clinical evaluation of the app and getting other transfusion practitioners in the room.

It's kind of snowballed and it's not quite ready yet but we've got high hopes and my colleague has already started looking at the application process with the MHRA and done a huge amount of work in the background to make sure it all works correctly. Myself and the haematology consultants have looked at whether the app does what we want it to do. Now we're just about to start to do a bit of qualitative research to start looking at how it's proceeding in a clinical area, have we answered all the questions - I'm not sure that we have. There's still a lot of learning to be done. Last night I was sitting looking at papers about experts decision making and handling uncertainty.

I'm not quite sure that we're there in terms of app development and it's still kind of limited in

the situations it can be used in, but that's where we've kind of got to.

How have you found the regulatory bit?
For me it's been really easy because I've not had anything to do with it and my colleague has done all the legwork. From a clinical point of view I think the regulatory part is fantastic because one of the things was that it didn't carry a kind of safety standard. So for example in the UK we know the most used app is the Resus council app, but it says Resus Council all over it on every page. So if you're using it you know it's from the same people who actually wrote the guidelines. So you can't really go wrong. So you're hoping that because NHSBT have fully agreed that we can put their logo on it as well as having a Blood Choices one and also hopefully MHRA approved that it will be fully credible in the clinical areas. Junior doctors won't have to worry about if I follow this advice will I ever be in trouble because they worry about professional safety as well as patient safety. We're hoping by doing the clinical evaluation of the app at the same time, to prove safety - that you can't make an error,