



SCOTTISH NATIONAL BLOOD TRANSFUSION SERVICE

REVIEW OF HISTOCOMPATIBILITY & IMMUNOGENETICS SERVICES

2008-2009

OUR AIM



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WHAT IS THE AIM OF THIS REPORT?

In 2008/09 there were major changes for SNBTS H&I Laboratories. This first service review has the aim of informing patients, service users and other SNBTS colleagues about key aspects of SNBTS H&I service provision. It is anticipated that the next review will expand in content. Comments on this report are welcomed to phil.dyer@nhs.net.

SERVICES

WHAT SERVICES ARE PROVIDED?

Histocompatibility & Immunogenetics service laboratories are located in SNBTS centres at:

- Aberdeen Royal Infirmary (ABE)
- Royal Infirmary of Edinburgh(EDI)
- Ninewells Hospital, Dundee (DUN)
- Gartnavel Hospital, Glasgow(GLA)

Support is provided for:

- organ donation, kidney, pancreas and liver transplantation (EDI)
- haemopoietic stem cell transplantation (ABE, DUN, EDI, GLA)
- disease diagnosis/gene polymorphism association (ABE, DUN)
- transfusion medicine (all centres)

WHY DO WE PROVIDE THESE SERVICES?

In healthy persons, human leucocyte antigens (HLA) are found on the surface of all nucleated body cells where they present peptides to T cells and so are fundamental to surveillance of and reaction to infectious agents. The high polymorphism in HLA genes leads to variability in structure of HLA molecules allowing binding of a wide range of peptides. This confers the ability of every individual to react to the many different infectious agents encountered during life. For the population, it increases the likelihood of survival during a pandemic.

These same protein HLA molecules function as antigens or 'markers of recognition' in the artificial situation of organ, tissue and cell transplantation. Clinical transplantation is only successful when the transplant recipient's immune system is suppressed with powerful drugs. In addition, testing of donor and recipient by H&I Laboratories helps limit the difference between HLA types at the time of transplantation through HLA typing, matching, HLA specific antibody screening and crossmatching. Additionally, in haemopoietic stem cell (bone marrow) transplantation, matching for HLA is essential to avoid the transplanted cells reacting to the recipient leading to graft versus host disease.

Since some white cells will always be present in transfused blood, even when leucodepleted, there is a risk that transfused patients will subsequently make harmful antibodies to non-self HLA and other antigens from the blood donor which will limit future treatment options. This is also true in platelet transfusions since platelets carry HLA and platelet specific antigens on their surface.

Susceptibility to autoimmune disorders, such as type 1 diabetes and rheumatoid arthritis, and some rarer conditions, such as ankylosing spondylitis, are associated with specific HLA types. Therefore defining a patient's HLA type can aid diagnosis and treatment.

In addition to these core activities, SNBTS H&I Laboratories provide specialised testing for a range of other genetic markers including genotyping of ABO blood groups. These tests use technologies which are well established in H&I Laboratories and so fit well with service provision.

WORKLOADS

HOW BUSY ARE WE?

The number of tests performed in year in each H&I Laboratory is shown in the table:

SNBTS H&I Laboratories: Activity 2008/09	ABE	DUN	GLA	EDI
HLA Typing				
Organ donors & recipients	13	0	0	667
Haemopoietic stem cell donors & recipients	92	22	103	151
Apheresis platelet donors	28	161	353	0
Disease association	280	840	0	0
Donor/Recipient Crossmatching	16	0	0	501
HLA Specific Antibody	251	14	145	3668
HPA Typing	610	63	576	35
Platelet antibody (HPA)	36	7	341	118
HIT	0	23	194	100
JAK2	0	297	0	0
RBC Genotyping	5	169	0	0
Platelet & granulocyte immunohaematology	311	0	0	0

The specialisation within each laboratory is reflected in the disparate H&I testing services and activity. Since some tests are more complicated, more time consuming or more costly than others, comparison of activity between numbers of tests done is irrelevant. Organ donor HLA typing and donor/recipient crossmatching is provided on a 24/7/365 basis from Edinburgh necessitating provision of an out-of-hours laboratory staff on-call service.

WORKLOADS

WHAT HAS CHANGED?

Two Consultant Clinical Scientists were appointed in the latter half of 2008/09, one as Director of SNBTS H&I Services and one a Director of the Edinburgh H&I Laboratory.

An agreement was reached such that the SNBTS H&I Laboratory in Glasgow will work closely with the Gartnavel General Hospital H&I Laboratory including supervision by the newly appointed Consultant Clinical Scientist from the Gartnavel General Hospital H&I Laboratory.

Provision of 24/7 organ donor HLA typing at Aberdeen ceased in March 2009 with the service moving to Edinburgh, since activity was infrequent.

HLA typing is now routinely done using the state-of-the-art, X-Map (Luminex) platform and sequence specific oligonucleotide probes which give high resolution results to meet the needs of haemopoietic stem cell transplantation and exceeds the resolution required for solid organ transplantation.

The role of detecting and defining post-transplant donor HLA specific sensitisation in kidney and pancreas transplantation is now established and a testing service was introduced. Overall, 199 tests using X-Map (Luminex) Single Antigen Beads were done to support effective organ transplantation through post-transplant antibody monitoring.

QUALITY

WHAT IS THE QUALITY OF SERVICES PROVIDED?

All SNBTS H&I Laboratories actively participate in relevant external quality assurance programmes and throughout the year satisfactory performance was achieved. The following schemes were participated in by laboratories as indicated:

Scheme	Test	Laboratory
1A	HLA Phenotyping	ABE, EDI
1B	HLA-B27 typing	ABE, DUN
2A	Cytotoxic Crossmatching	EDI
2B	Flow Cytometry Crossmatching	EDI
3	HLA Specific Antibody Analysis	ABE, EDI
4A	HLA DNA Typing	ABE, DUN, EDI, GLA
6	Antibody Detection	ABE, DUN, EDI, GLA

In addition some laboratories participated in educational schemes and other specialist NEQAS schemes when relevant to service provision.

PEOPLE

HOW ARE H&I LABORATORY STAFF SUPPORTED?

H&I Laboratory staff participated in international, national and local training and professional development meetings and congresses. In particular the annual conference of the British Society for Histocompatibility & Immunogenetics (www.bshi.org.uk) in Bath in November 2008 was well attended. Visiting guest speakers Dr Craig Taylor, Addenbrookes Hospital, Cambridge and Dr Paul Sinnott, BSHI Chairperson, Barts and the London, London attended the Edinburgh H&I Laboratory to deliver seminars reviewing developments in organ transplantation. These visiting seminars were open to H&I staff from all SNBTS centres and allowed extensive time for informal discussions. Further seminars with visiting speakers are planned and these will rotate round SNBTS H&I Laboratories.

A case has been submitted to NHS Education Scotland (NES) for support to establish national H&I supernumerary trainee Clinical Scientist posts. The aim is for trainees to be trained broadly with placement in all Scottish H&I Laboratories to achieve the BSHI Diploma and HPC Registration within 4 years.

WHAT IS PLANNED FOR THE FUTURE?

A project management team has been established to develop a bespoke IT system to support SNBTS H&I Laboratories. A key feature will be electronic interaction with clinical users, NHSBT Organ Donation & Transplant and others.

Following publication of the Specialised Laboratories Medical Services (SLAM) report, a bid to form a Scottish H&I Network (SHINe) is being submitted to the National Services Advisory Group. This Network will aim to establish effective shared working across all Scottish H&I Laboratories to provide high quality support for patients and for staff working in H&I in Scotland.

The Scottish Transplant Group has invited representation from H&I services to ensure that the exciting initiatives set out in "Organs for Transplants" to significantly increase organ donation in Scotland are supported by H&I service developments.

During 2009/10 the aim is for SNBTS H&I Laboratories to submit for accreditation by the European Foundation for Immunogenetics and will maintain accreditation by Clinical Pathology Accreditation UK Ltd.