



#### Joint UK NEQAS (BTLP) & BBTS Blood Bank Technology SIG 20<sup>th</sup> November 2013

Grateful thanks are extended to the following companies for the unconditional educational grants received:

Bio-Rad Laboratories Ltd Deva Medical Electronics Ltd Grifols UK Ltd IBG Immucor Labcold MSoft eSolutions Ortho-Clinical Diagnostics Timestrip UK Ltd & Helapet Ltd Tutela Medical Systems

# Joint Meeting of UK NEQAS (BTLP) and

# BBTS Blood Bank Technology SIG 20<sup>th</sup> November 2013 A New Transfusion Landscape: Down to Earth or Life on Mars?







# BBTS vision of the future including the role of the consultant transfusion scientist

Martin Bruce OBE BBTS President



# In the beginning .....



It has recently been recognised that with This Certificate is aimed at MLSOs skilling, and extended hours, there is an increasing need for other staff to be trained in Transfusion Science practice.

To meet this requirement the BBTS is introducing a Certificate in Routine **Blood Bank Practice.** 

changes in scientific education MLSOs working routinely in, or "on-call" for, a are not receiving the practical training hospital blood bank, or to be used in they once did; furthermore with changes conjunction with in-service training for in hospital pathology departments such those MSLOs preparing for state as automation, de-skilling, multi- registration (for use with the CPSM Haematology/Transfusion Science or Transfusion Science/GMP log books). It could also be used for those returning to work after a career break or as an update.



#### Drivers for (Future) Service Delivery Models

- The economic recession
- Less funding for more activity at the same quality
- Demographic change an aging population requiring more access to healthcare
- New treatments requiring new products and tests
- Advances in technology, more automation, fewer staff
- Consolidation of service delivery
- Modernising Scientific Careers



### Drivers for (Future) Service Delivery Models

- microarray and related technologies will drive radical change in Hospital Transfusion Laboratories and Blood Services
- the need to make significant savings means major change is irresistible so need to work hard to achieve an optimal outcome
- Modernising Scientific Careers will drive the consolidation technology makes possible and financial imperatives demand
- MSC was designed to improve and standardise the career structure for scientists working in the NHS



#### (Future) Service Delivery - eg Microarrays. Mosaic

- several blood group genotyping platforms available now;
  solve serological typing discrepancies;
- test for antigens with no suitable antisera available (eg Diego, Dombrock, Colton, Js<sup>a</sup>);
- screen routine donors and identify high-frequency antigen negatives/ donors compatible for alloimmunized patients
- assist in the clinical management of multi-transfused patients







# ON CHANGE

### "Change is difficult.

It is always met with opposition until it becomes established, at which point those who were the fiercest opponents usually benefit most from the new order."

> Niccolo Machieavelli (1495-1527) The Prince



### (Future) Service Delivery Models

- Significantly greater multidisciplinary working
- MSC Themed Groups eg Blood Sciences encompasses:
  - Transfusion, Haematology, H&I; C Biochemistry, C Immunology
- Hospital collaboration to deliver Hub/ Spoke/ Satellite services
- NHSBT Integrated Transfusion Services approach
  - NHSBT provide and manage the hub/ spoke/ satellite hospital transfusion services and staff
- Blood Establishments will continue to consolidate/ drive out avoidable costs



### (Future) Service Delivery Models

Fewer staff overall, fewer AfC Band 7 and above

- Difficulty in recruiting sufficient medical staff specialising in Blood Transfusion
- Consultant Transfusion Scientists will replace/ take over some medical consultant duties
- The Private sector will become increasingly involved in delivering Pathology Laboratory Services
- There will be an increase in Point of Care Testing
  - Should be managed and overseen by laboratory staff?
  - Potentially more NEQAS exercises required ?



Threats Arising from (Future) Service Delivery Models

- Loss of specialist skills and knowledge
  - Who provides the essential specialist training?
  - Who develops and maintains safe systems of work?
  - Reduced availability of training programmes
- Potential loss of career progression opportunities
- Loss of specialist Blood Establishment expertise
  - Ongoing closure of Blood Centres
  - hospital Hubs undertaking "reference" work
- Demographic change an aging population requiring more access to healthcare



Threats Arising from (Future) Service Delivery Models

- Future technological change will lead to further deskilling and consolidation
- Radical reorganisation of Pathology Services
- Possible regulatory risks
- The loss of fundamental parts of a fully integrated and functional blood transfusion service
- The need for effective training programmes that will support the delivery of high quality, safe and effective transfusion practice



# CHANGE Chinese Proverb





#### BBTS Specialist Certificate in Transfusion Science Practice

- Reviewed in light of ageing materials and MSC requirements, Key Findings and Solutions:
  - Certificate meets a critical need but doesn't meet needs of MSC
  - Radical upgrade of certificate is considered essential
  - BBTS Council has approved start up funding for this change
  - BBTS will develop and provide training log books
  - Two part BBTS examination process will be developed
  - BBTS feedback on assignments
  - Electronic distance learning materials will be developed
  - Will be CAT accredited by University of Manchester (~60 points)
  - Aligns well with MSC, HSST programme to follow

#### Modernising Scientific Careers: Career and Training Pathways





Higher Specialist Scientific Training Leading to Consultant Clinical Scientist Grade

"Scientists who successfully complete Higher Specialist Scientific Training (HSST) equivalent to medical Higher Specialist Training with 4 to 5 years of speciality-specific training, should be considered competent to provide consultant-level clinical scientific expertise advice and leadership."

> Shelley Heard Medical Advisor to the Chief Scientific Officer



#### "Statement" from the Academy of Medical Royal Colleges

- Recognise the importance of HSST in ensuring career progression for a highly skilled, healthcare scientist workforce
- Will work with expert scientists to develop HSST curricula
- The curricula will define scope of practice to ensure clarity of roles and create synergy between medical and scientific disciplines to promote optimal patient care.
  - It is believed that this career option is currently only open to Clinical Scientists and the number of posts will be small but.....
  - IBMS/ RCPath have developed syllabuses for Advanced Specialist Diplomas in Pathology that will ultimately result in BMS staff undertaking medical tasks – the door is open!



#### The Potential Role of The Consultant Transfusion Scientist

- Clinical significance of irregular blood group a'bodies
- Management of transfusion support in AIHA
- Management of cold agglutinin transfusion support
- Transfusion support in massive blood loss
- Specialist support for blood component development
- Management and reporting of incidents, adverse events and near misses to SABRE/ SHOT



The Potential Role of The Consultant Transfusion Scientist

- Design, validation and oversight of Blood Transfusion point of care testing programmes
- Design and maintenance of Quality Management Systems in support of MHRA/ CPA compliance
- Training and assessing the competency of medical and consultant transfusion scientist candidates
- Contributing to the management of pregnancies in patients who have clinically significant blood group antibodies







#### Joint UK NEQAS (BTLP) & BBTS Blood Bank Technology SIG 20<sup>th</sup> November 2013

Grateful thanks are extended to the following companies for the unconditional educational grants received:

Bio-Rad Laboratories Ltd Deva Medical Electronics Ltd Grifols UK Ltd IBG Immucor Labcold MSoft eSolutions Ortho-Clinical Diagnostics Timestrip UK Ltd & Helapet Ltd Tutela Medical Systems

### Human Issues in Healthcare Delivery

### Lieutenant Colonel Jim Storr PhD The King's Regiment (retired)

### I'm not a clinician



### Some Human Aspects ...

### • Take 2 captains:

- Francesco Schettino
- Chesley Sullenberger



### Some Human Aspects ...

### • Voice Procedure:

- Tenerife, 27 March 1977
- Southall, 19 September 1997
- Fire Discipline



## ... in Warfare

### Expert theory:

- 10,000 hours: Malcolm Gladwell
- Different skill levels: eg, Submarine Captains
  - Pacific, WW2:
    - 8% of all US captains accounted for 39% of all sinkings
    - (6.77 times more effective than average)
- Fighter Pilots
  - Western Desert
    - 7% of Luftwaffe fighter aces accounted for 44% of all kills
- Snipers and tank commanders
- Surgeons?

### Some Human Aspects ...

- Nosocomial Infection:
  - Semmelweiss, 1846
    - Perinatal mortality reduced from 16% to 3%
    - 100-year battle to get, and keep, hospitals free from infection
  - 'Dirty, Deluded and Dangerous':
    - Doctors claimed to have washed their hands 73% of the time;
    - In fact it was 9%.
    - Availability and effectiveness of antibiotics systematically undermined standards of hospital cleanliness
      - Gary French, Professor of Microbiology at King's College, London; & Consultant in Microbiology and Clinical Lead in Infection Control at Guy's and St Thomas' Hospitals
      - BMJ, 22-9 Dec 2012
    - This has nothing to do with antibiotics

### Some Human Aspects ...

### • Patient Safety:

- 40,000 people die due to avoidable human error in British hospitals every year
- A small number of simple interventions would reduce that number dramatically; eg
  - 'Read back'
  - Protocols for speaking up
  - Better focussed, rather than more extensive, checking procedures

# ... in Warfare

# **OODA: the Boyd**

Cycle



### A reasonable model for social interaction of many kinds What happens if important aspects of feedback are missing?

### The Harassed Clinician at 2am...

#### Ward staff:

- 'This is an urgent problem
- 'Could you just ...'

#### Laboratory staff:

- Tries to be helpful
- Can't break protocols, for good reason

- Gets angry
- Slams phone down

- Gets defensive
- Feedback loop is broken



### Leadership

- 'It's in the blood'
- Managers are not necessarily leaders, but ...
- 'Two O'Clock in the morning' courage ...
- OxStar / OUHT interventions



# Personality and Type

- 'Type': preference and trend, not character
- The Myers-Briggs Type Indicator
- E-I, S-N, T-F, P-J
- More 'E's than 'I's; females more 'F's than 'T's

Extraverted Energized by others or Introverted Energized by ideas, emotions, memories

Sensing Using the five external senses or INtuition Using gut or instincts

Thinking Logical, problem solvers *or* Feeling Consider others, compassionate

Perceiving Taking in information *or* Judging Organizing information and making decisions

# Personality and Type ST SF NF NT

- Type: preference and trend, not character
- The Myers-Briggs
  Type Indicator
- E-I, S-N, T-F, P-J

	ISTJ	ISFJ	INFJ	INTJ J
	ISTP	ISFP	INFP	INTP P
	ESTP	ESFP	ENFP	ENTP P
	ESTJ	ESFJ	ENFJ	ENTJ
ISTJ	ISFJ	INFJ	INTJ	
------------	-----------	------------	------------	
Inspector	Protector	Counsellor	Mastermind	
ISTP	ISFP	INFP	INTP	
Crafter	Artist	Idealist	Architect	
ESTP	ESFP	ENFP	ENTP	
Promoter	Performer	Champion	Inventor	
ESTJ	ESFJ	ENFJ	ENTJ	
Supervisor	Provider	Giver	Executive	

### Who's your character? STAR WARS MBTI chart









The Counselor

Palpatine

The Mastermind

Have original minds and great drive for implementing their ideas and achieving their goals. Quickly see patterns in external events and develop long-range organize a job and carry it through. Skeptical and independent, have high standards of competence

explanatory perspectives. When committed and performance - for themselves and others.



The Architect

Seek to develop logical explanations for everything that interests them. Theoretical and abstract. interested more in ideas than in social interaction. Quiet, contained, flexible, and adaptable. Have unusual ability to focus in depth to solve problems in their area of interest. Skaptical, sometimes critical always analytical



#### The Inventor

Warmly enthusiaetic and imaginative. See life as full of possibilities. Male connectors between events and information very guickly, and confidently process. How the patients they ase. Ward a lot of based on the patients they ase. Ward a lot of people. Bored by routine, will seldom do the same thing the same way, apt to turn to one new interest



#### The Executive

Warm, empathetic, responsive, and responsible. Highly Frank, decisive, assume leadership readily. Quickly seturated to the emotions, needs, and motivations of others. Find pathetical extensions, event to help others fulfil their potential in evenyone, event to help others fulfil their potential. May act as catalysts for Individual solve organizational problems. Englo bangetone and the seturation of planning and goal setting. Usually well informed, well read, enjoy expanding their knowledge and passing it on to others. Forceful in presenting their ideas.

#### The Inspector

dependability. Practical, matter-of-fact, realistic, and responsible. Decide logically what should be done and Thore work toward it steadily, regardless of distractions. Take pleasure in making everything orderly and organized - their work, their home, their life. Value traditions and lovalty.

Quiet and serious, earn success by thoroughness and Quiet, friendly, responsible, and conscientious. Committed and steady in meeting their obligations Thorough, painstaking, and accurate, Logal and considerate, notice and remember specifics about people who are important to them, concerned with how others feel. Strive to create an orderly and harmonious environment at work and at home.

#### Seek meaning and connection in ideas, relationships. and material possessions. Want to understand what motivates people and are insightful about others. Conscientious and committed to their firm values. Develop a clear vision about how best to serve the common good. Organized and decisive in implementing their vision.

idealistic, loyal to their values and to people who are

possibilities, can be catalysts for implementing ideas.

important to them. Want an external life that is

unless a value is threatened

congruent with their values. Curious, quick to see

Seek to understand people and to help them fulfill their potential. Adaptable, fieldble, and accepting

The Champion

affirmation from others, and readily give appreciation

The Giver

provide inspiring leadership.

STP 122 Chewbacca Bail Organa Luke Skuwalker **Hode** The Idealist The Crafter The Artist

Tolerant and flexible, quiet observers until a problem appears, then act quickly to find workable solutions. Analyze what makes things work and readily get through large amounts of data to isolate the core of practical problems, interested in cause and effect. organize facts using logical principles, value afficiency.

The Promoter

focused on immediate results. Theories and

they can be active with others. Enjoy material

comforts and style. Learn best through doing

The Supervisor

Practical, realistic, matter-of-fact, Decisiva, quickly

move to implement decisions. Organize projects and

people to get things done, focus on getting results in

the most efficient way possible. Take care of routine

details. Have a clear set of logical standards, systematically follow them and want others to also

Forceful in implementing their plans.

Han Solo

Darth Vader

Quiet, friandly, sensitive, and kind. Enjoy the present people who are important to them. Dislike

moment, what's going on around them. Like to have their own space and to work within their own time frame. Loyal and committed to their values and to disagreements and conflicts, do not force their opinions or values on others.



The Performer

Flexible and tolerant, they take a pragmatic approach conceptual explanations bore them - they want to act energetically to solve the problem. Focus on the sense and a realistic approach to their work, and here-and-now, spontaneous, enjoy each moment that make work fun. Flexible and spontaneous, adapt

Nickel

Outgoing, friendly, and accepting. Exuberant lovers with others to make things happen. Bring common by trying a new skill with other people.

of life, people, and material comforts. Enjoy working readily to new people and environments. Learn best



The Provider

Warmhearted, conscientious, and cooperative. Want harmony in their environment, work with determination to establish it. Like to work with others to complete tasks accurately and on time. Loyal, follow through even in small matters. Notice what others need in their and group growth. Loyal, responsive to praise and the to provide it. Want to be approvided criticism. Sociable, facilitate others in a group, and lives and try to provide it. Want to be appreciated for who they are and for what they contribute

www.geekinheels.com





>80%

-		· · · · · · · · · · · · · · · · · · ·		
	ISTJ Inspector <10%	ISFJ Protector <10%	INFJ Counsellor ≈1%	INTJ Mastermind ≈1%
	ISTP Crafter ≈10%	ISFP Artist <10%	INFP Idealist ≈1%	INTP Architect ≈1%
	ESTP Promoter ≈10%	ESFP Performer >10%	ENFP Champion 2-3%	ENTP Inventor <2%
	ESTJ Supervisor >10%	ESFJ Provider >10%	ENFJ Giver ≈2%	ENTJ Executive <2%

#### Nurse?



ISTJ	ISFJ	INFJ	INTJ
Inspector	Protector	Counsellor	Mastermind
ISTP	ISFP	INFP	INTP
Crafter	Artist	Idealist	Architect
	Hairdresser?		
ESTP	ESFP	ENFP	ENTP
Promoter	Performer	Champion	Inventor
ESTJ Supervisor	ESFJ Provider	ENFJ Giver	ENTJ Executive Field Marsha

## Conclusions

- War, warfare, & healthcare delivery are dominated by human behaviour
- Human behaviour in healthcare (& war) is poorly described, let alone studied
- Skill levels, social interaction, leadership, & personality type are all key issues
- It's not rocket science; some fairly simple interventions can help



### **Biomedical Laboratory Scientists**



How our parents see us



How the patients see us



How our friends see us



How we see ourselves



How the world see us



What we really do

### **Questions?**



(Claire told me I must not over-run my timings)





#### Joint UK NEQAS (BTLP) & BBTS Blood Bank Technology SIG 20<sup>th</sup> November 2013

Grateful thanks are extended to the following companies for the unconditional educational grants received:

Bio-Rad Laboratories Ltd Deva Medical Electronics Ltd Grifols UK Ltd IBG Immucor Labcold MSoft eSolutions Ortho-Clinical Diagnostics Timestrip UK Ltd & Helapet Ltd Tutela Medical Systems



## The Lone Worker Out-Of-Hours... A new Transfusion Landscape!

Catherine Almond MSc CSci FIBMS Chief Biomedical Scientist in Blood Transfusion Kent and Canterbury Hospital



## Communication



## Belief that it's possible!



## **Realistic Training Schedule**



## **Realistic Review Schedule**



## Phone a Friend!



# **Contingency Plan**



## **Routine Rotas**



# Support to do further studying



## **MHRA Inspections!**



## Where next?







#### Joint UK NEQAS (BTLP) & BBTS Blood Bank Technology SIG 20<sup>th</sup> November 2013

Grateful thanks are extended to the following companies for the unconditional educational grants received:

Bio-Rad Laboratories Ltd Deva Medical Electronics Ltd Grifols UK Ltd IBG Immucor Labcold MSoft eSolutions Ortho-Clinical Diagnostics Timestrip UK Ltd & Helapet Ltd Tutela Medical Systems



#### How can the transfusion team integrate?

Liz Still Lead Transfusion Practitioner



Serious about health. Passionate about care.

#### Hub and Spoke Model – BMI Healthcare

- 64 Hospital sites Plus 4 clinics
  - 5 Scotland
  - 1 Wales
  - 58 England
- 27 sites supplied by one out-sourced pathology provider
  - 6 Hubs with multiple spokes
  - 2 Stand alone Hubs

Remainder – Single NHS provision



#### Scotland / North England / Midlands / East





Serious about health. Passionate about care.

#### London / South







Serious about health. Passionate about care.

#### **Service** configuration

- Cold surgery in general
  - Cardiac / Spinal / Vascular associated risks
- No obstetric requirement
- Minimal Paediatric service.
- No trauma services
- Post op ITU provision
- Cell salvage



#### **Component provision at Spoke**

- Red Cells
  - Blood Audit and Release Fridge on each outsourced site
  - Electronic release by Hub
  - Compatibility label printed on site at Fridge and attached to component
- Plasma components straight to patient, labelled by Hub

- Training
  - Fridge process Hub
  - Assessment of competence Spoke as NPSA
  - Q cards



#### **Considerations**

- Reporting responsibilities SABRE / SHOT
- Policy -
- Standard Operating Procedures from supplier to bedside
- Request Common Form / IT / patient ID
- G&S timelines / 2 sample to enable safe EI
- MBOS
- O neg supply held on spoke site / wastage / fridge mapping / return
- Transfusion Pathway
- Hospital Transfusion Committee
- National Comparative Audit
- Agreement re product supply Transfusion lab / Pharmacy?
- Anti D traceability / entry to pathology record?
- Provision for Massive Haemorrhage supply CQC timelines
- Agreement re emergency / adhoc provision SLA local NHS Trust, couriers
- Gap analysis of current practice / process enabling collaborative solutions

#### B/II Healthcare

#### Serious about health. Passionate about care.

#### Spoke - Policy / SOP

- Policy common approach?
  - Gap analysis enable collaboration
    Common Practice / Process / Training / Competency
- QMS for blood transfusion activities on site. (MHRA expectation) -Spokes must have evidence of QMS SOP's for site specific activity.
- Examples of Clinical SOP's
  - Training strategy for the collection of components
  - Traceability of blood components
  - Request for components to meet special requirements
  - Transfusion reaction recognition and reporting
  - Transport of blood components
  - Recall of blood components
  - Quarantine of blood components
  - Verbal request for blood components



#### **Hospital Transfusion Committee**

- Collaborative HTC Hub and Spokes
- Common Agenda and core members.
  - Standing agenda items should include
    - Usage and wastage
    - Incidents with details of actions and trend analysis
    - Traceability
    - Training and competency
    - Audit
    - Budget
    - IT issues labeling, BARS etc often pose a recurrent problem
    - AOB
- Expectations of Pathology Provider in presenting data
- Adverse Events and Reactions reporting?
- Clarify HTC / HTT function within the Spoke Part of Quality and Risk / Senior Management Function?



- Clear expectations,
- Roles and responsibilities of all parties and
- Collaborative approach



Thank You

#### elizabeth.still@bmihealthcare.co.uk Tel: 07809 594540



Serious about health. Passionate about care.





#### Joint UK NEQAS (BTLP) & BBTS Blood Bank Technology SIG 20<sup>th</sup> November 2013

Grateful thanks are extended to the following companies for the unconditional educational grants received:

Bio-Rad Laboratories Ltd Deva Medical Electronics Ltd Grifols UK Ltd IBG Immucor Labcold MSoft eSolutions Ortho-Clinical Diagnostics Timestrip UK Ltd & Helapet Ltd Tutela Medical Systems Development of a Blood Transfusion Knowledge Based Competency Assessment Scheme

Clare MilkinsScheme ManagerJenny WhiteDeputy Scheme ManagerBill ChaffeSenior EQA Scientist



West Hertfordshire Hospitals NHS Trust



## **IT Specification**

- Preferred supplier engaged after tender process completed
- Phased work project agreed
- Objective: To develop a specification, project plan and future vision for a system whose ongoing development and management would be self funding


### CONTRACT FOR MinimumViable Product (MVP) and FUTURE DEVELOPMENT

Signed 01 August 2013

### 8 months until launch!!!



November 2013

West Hertfordshire Hospitals NHS Trust

## **TACT 'User' stories**

- Working project title is 'Training, Assessment and Competence Tool' (TACT)
- User stories cover the detail of scenarios in which the planned system will be used
  - general concepts
  - probable features
- User stories help inform the basis of the functional specification



We are currently mapping all areas of the system and defining relationships between objects to develop an 'intelligent' database in which to create the assessments.





### 'User Stories'

- Each aspect of 'use' has a story developed
  - serology
  - fridge / equipment failures
  - major incident management
  - lab manager use of TACT (dashboard)
  - Registration process for TACT
  - 'Dashboard' assessment monitoring
  - UK NEQAS BTLP performance review facility



# TACT – System concepts and vision

- Virtual lab computer game style concept
- Visual using multi media
- Free form can do what want
- Will NOT lead the user
- Elements of scenarios may be randomised
- Real time monitoring
- Knowledge assessment (guideline)
- Local policy/procedure assessment facility
- CPD facility



## **Minimum Viable Product**

- 'Launch product' to meet budget available
- General serology cases moved through a virtual laboratory
- Two fold assessment
  - Integral questions based on national guidelienes and best practice
  - Local assessment of textual input by participants



### **Critical processes**

#### In order to inform which critical processes should initially be included in any assessment scheme please complete the following table.





West Hertfordshire Hospitals NHS Trust



### It's that 'Pearl and Dean' moment!!!



UK NEQAS

West Hertfordshire Hospitals NHS Trust

### **Registration and costs**

- Laboratories or individuals able to register
- Registrants will be termed 'SUBSCRIBERS' and be identified by their 'SIN' – Subscriber Identification Number
- Anybody completing assessments will be termed 'MEMBER' and have a hidden identitiy
- 'Members' will be anonymous to staff at UK NEQAS BTLP
- Cost is per 'member' whether individual or part of a laboratory 'subscriber' contract group
- Registration renewable annually



### Ownership, Snoops and transferability

- UK NEQAS BTLP will be responsible for hosting the scheme, managing the content and providing national comparative data
- Laboratory manager will be responsible for ensuring staff are satisfying the local requirement for knowledge based competency
- Record of individual members is to be transferable between organisations



### Timescale

- 2 year pilot project 🙂
- Survey Monkey pilot in autumn 2012
- Certus 'live' demo to UK NEQAS/BBTS Sig 1 day meeting 2013
- Minimum Viable Product development
- IT pilot late 2013 / early 2014
- Advance registration from Jan 2014
- Launch April 2014



## Acknowlegements

Thanks to our 'sounding' panel:

- Dan Pelling training co-ordinator Imperial
- Carol Cantwell, Lab Manager St Mary's Hospital
- Helen Barber, Lab Manager Barnet Hospital
- Matt Ginger, Snr BMS Watford General Hospital
- Anna Capps-Jenner, Lab Manager Ealing, TDL







### Joint UK NEQAS (BTLP) & BBTS Blood Bank Technology SIG 20<sup>th</sup> November 2013

Grateful thanks are extended to the following companies for the unconditional educational grants received:

Bio-Rad Laboratories Ltd Deva Medical Electronics Ltd Grifols UK Ltd IBG Immucor Labcold MSoft eSolutions Ortho-Clinical Diagnostics Timestrip UK Ltd & Helapet Ltd Tutela Medical Systems