Sheffield Teaching Hospitals NHS
NHS Foundation Trust

Output Based Specification

for the procurement of a

Trust-wide Electronic Prescribing and Medicines Administration System

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Purpose of this Document

The purpose of this document is to define the Trust's requirements for an Electronic Prescribing and Medicines Administration System in order to inform potential suppliers and aid the procurement & evaluation process.

VERSION CONTROL

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CONTENTS

OUTPUT BASED SPECIFICATION

for the procurement of a

TRUST-WIDE ELECTRONIC PRESCRIBING AND MEDICINES ADMINISTRATION SYSTEM

1. INTRODUCTION

1.1 Sheffield Teaching Hospitals NHS Foundation Trust has a requirement to procure a Trust-wide Electronic Prescribing and Medicines Administration (EPMA) System which will improve patient safety, enhance operational effectiveness, and facilitate good governance.

1.2 Therefore this Output Based Specification (OBS) aims to inform potential suppliers and support the procurement & evaluation process.

1.3 The Trust acknowledges the help received from NHS Connecting For Health's ePrescribing Functional Specification[1], as well as input provided by various NHS Trusts and commercial suppliers.

1.4 A glossary of commonly used abbreviations is at Appendix A.

2. BUSINESS CONTEXT

2.1. Sheffield Teaching Hospitals NHS Foundation Trust (STH)

2.1.1 In April 2001 the Northern General Hospital NHS Trust and Central Sheffield University Hospitals NHS Trust merged to form the Sheffield Teaching Hospitals NHS Trust. The Trust was granted foundation status on 1 July 2004.

2.1.2 STH is the largest Foundation Trust in England. It has 15,500 staff, an annual turnover of £800m, about 90 wards, and over 2,000 beds.

2.1.3 Its mission is to plan and deliver the highest quality patient care, providing services for patients not only from Sheffield but also (as a tertiary referral centre) from all parts of the UK. It treats 1.3 million patients each year, and its corporate strategy is entitled 'Making a Difference'.

2.1.3 Reflecting this, the Good Hospital Guide has nominated STH as Trust of the Year three times in the past six years. The quality of the Trust's clinical care is regarded as being amongst the best in the NHS. Waiting times are low, and the Trust's commitment to provide a safe, welcoming, caring service results in a high level of patient satisfaction. This is achieved against a backdrop of continuing prudent management of the Trust's finances.

[1] http://www.connectingforhealth.nhs.uk/systemsandservices/eprescribing/baselinefunctspec.pdf

2.2. Pharmacy Directorate

2.2.1 The STH Pharmacy Directorate forms part of Diagnostic and Therapeutic Services. Its role is to provide direct pharmacy support for:

- Royal Hallamshire Hospital (RHH), located on the Central Campus.
- Jessop Wing (JW), located on the Central Campus.
- Weston Park Hospital (WPH), located on the Central Campus.
- Charles Clifford Dental Hospital (CCDH), located on the Central Campus.
- Northern General Hospital (NGH), located on the Northern Campus.
- St Luke's Hospice, located in South Sheffield.
- Community Services, operating from various locations across Sheffield.

2.2.2 To resource this, it has approximately 300 FTE employees, and a total pharmacy service budget (excluding medicines costs) of £10.8m.

2.2.3 The Trust's pharmacy service currently dispenses 960,000 individual prescriptions per annum, but there are probably at least another 500,000 prescriptions written and supplied from ward stocks. This means that although the Trust's total annual expenditure on medicines is approximately £80m, about a third is not subject to professional oversight by the pharmacy service at the time of prescribing and first administration.

2.2.4 It is noteworthy that the Trust already has experience of managing three small ePrescribing systems, namely, MetaVision (used by general and neuro-critical care), PROTON soon to be replaced by RenalPlus (used by renal), and Chemocare (used by cancer chemotherapy).

2.2.5 These will soon be joined by two others, which are Medisoft (used by Ophthalmology) and Salud (used by Dental), although the latter will need more software development before ePrescribing is possible.

2.2.6 In addition, a new AxSys Excelicare GUM information system is about to be implemented, which is expected to be capable of generating an electronic prescription record for GUM inpatients initially, before being extended further.

2.2.7 The working assumption is that the prescribing functions of Renal and Ophthalmology would eventually migrate to the proposed EPMA system, whilst MetaVision and Chemocare would retain their stand-alone status (due to their highly specialised nature).

2.2.8 The future relationship between the EPMA and GUM systems would need to be explored when the capabilities of both are better understood.

2.2.9 The Directorate has a very positive culture of new service development and efficiency improvements. Its management team has a strong track record of successful delivery, and its staff are very supportive of modernisation.

2.3. Current Working Environment

2.3.1. The key features of the Pharmacy Directorate's current working environment are as follows:

- There is no EPR or EPMA at present, but extensive use is made of hand written drug charts, TTOs and requisitions. These are delivered to pharmacy by hand, air tube or fax.
- Likewise, hard copy items to be returned to wards are collected by ward staff, delivered by pharmacy staff, or sent by air tube.
- Administration, predominantly by nurses, is recorded on the drug charts by hand.
- Additional information such as allergies, drug reconciliation, pertinent advice, pharmacy clinical check and supply are annotated onto the drug chart or TTO by hand.
- The majority of drug charts are only 14-day, and so rewrites are frequently required.
- All relevant drug-related pharmacy documentation is sent to an external data company to be archived and indexed digitally onto disks. This information is copied onto the hard drives of a small number of computers for easier access.
- JAC is the pharmacy stock control system which is also used for labelling and retains a record of dispensed items for each patient. Patient demographics are pulled from PAS.
- Remote ward access is available for a small number of JAC programs, mainly to check stock levels for prescribed items.
- Crystal reports, both embedded and bespoke, are used for JAC financial, audit and tracking information.
- Considerable use is made of stand-alone pharmacy systems, such as the Prescription Tracking System, NetFormulary program for the STH medicines formulary, Green Card internal compliance card database, on-call logging database, unlicensed medicines database and the MiDatabank medicines information database.
- PAS, ICE, etc, can be accessed via standard PCs.
- Clinical guidelines are on the Trust Intranet, but have to be searched for individually.
- There are several electronic prescribing systems within specialist areas and at different levels of usage: fully integrated in critical care (MetaVision) and oncology (ChemoCare); basic in renal; potential in ophthalmology and dental.
- Homecare information is currently held in a variety of formats by individual directorates but, following publication of the DH Hackett Report on Homecare in November 2011[2], work is now under way to bring the management of Homecare medicines supply under STH pharmacy control.
- The Trust currently has urgent plans under way with a view to developing an electronic discharge system capable of connecting with GPs using the messaging functionality of Sunquest ICE.

2.3.2. The systems architecture which supports this situation is shown at Appendix B.

2.4. Desired Future Working Environment

2.4.1. The Trust wishes to move a system which will:

- Provide an EPMA for all patients, except those covered by MetaVision and ChemoCare.
- Link it via an electronic interface to PAS.
- Link it via an electronic interface to Sunquest ICE.
- Link it via an electronic interface to the Trust's financial system(s).
- Link it via an electronic interface to the JAC Stock Control System, if possible.
- Enable continued use of manual stand-alone pharmacy databases for the time being.
- Specifically support Trust formulary usage.

[2] cmu.dh.gov.uk/files/2011/12/111201-Homecare-Medicines-Towards-a-Vision-for-the-Future2.pdf

- Provide clinical decision support and link directly into clinical guidelines.
- Allow large areas of medicines management to go paperless.
- Provide electronic discharge information direct to GP practices, community pharmacies and commercial Homecare service providers in due course.
- Be potentially compatible with an industry-standard clinical portal in future.

2.4.2 The systems architecture which supports this vision is shown at Appendix C.

2.5. Aim of the Procurement

2.5.1. The aim of this procurement is to provide Sheffield Teaching Hospitals with an affordable EPMA system which will start to create the desired future working environment across all its locations (except Community Services and St Luke's Hospice) from April 2013 onwards.

2.6. Key Statement of Principle

2.6.1. All parties involved in the procurement process should note a fundamental principle concerning the scope and funding of this system.

2.6.2. The STH Finance Directorate has made provisional financial allocation(s) which should be sufficient to procure and operate a system with workmanlike mid-range EPMA functionality. However, there must be no scope creep beyond the functionality stated in this OBS.

2.6.3. To clarify this, it is axiomatic that the system must be capable of pragmatic development over time in a way which ensures good VFM. This may well lead to some judicious trade-offs in functionality in order to ensure that money is spent wisely now in order to avoid greater cost in the future.

2.6.4. But that is subtly different from allowing an adverse situation to develop whereby potential suppliers talk up the prospect of achieving greater levels of sophistication in future, thus encouraging STH staff to shift their expectations upwards until expensive future-proofing eventually becomes embedded in everyone's thinking as a "must-have".

2.6.5. All parties will be expected to co-operate in ensuring that when the Trust receives tender responses, these are within the range that the STH Finance Directorate is expecting and not significantly higher due to specification drift.

2.6.6. Potential suppliers will do themselves a disservice if they depart from the Trust's vision of seeking pragmatic mid-range EPMA functionality which can be improved over time in a robust and sensible way, ie there must be no slide towards expensive over-sophistication.

2.7. Business Objectives and Expected Benefits

2.7.1. **General.** The Trust wishes to achieve numerous benefits across a broad range of functionality. However, the priorities lie in ensuring patient safety, improving operational effectiveness, obtaining financial benefits, and improving communications with primary care.

2.7.2. **Ensuring Patient Safety.** The Trust expects that the system will proactively reduce prescribing errors, medication errors, and 'never' events.

2.7.3. **Improving Operational Effectiveness.** The Trust expects that the system will create a paperless environment for EPMA, eradicate unnecessary delays, speed up workflow, and improve the patient experience.

2.7.4. **Controlling Drug Expenditure.** Based on published work from other UK healthcare providers, the Trust expects that better choice of drugs will result in a reduction of between 2% and 5% in its annual £80m drug budget.

2.7.5. **Securing Income.** The Trust expects that the system will strengthen it in justifying and evidencing work claimed (eg contemporaneous compliance with NICE Guidelines, CQUIN targets, cost per case drugs, etc).

2.7.6. **Improving Patient-Level Costing.** The Trust expects that the system will make a significant contribution to achieving patient-level costing.

2.7.7. **Reducing Fraud.** The Trust expects that the system will complement its overall drive to reduce theft, stock loss, and fraud.

2.7.8. **Improving Communications with Primary Care.** The Trust attaches great importance to delivering electronic outpatient notes and discharge summaries to GPs in order to facilitate better care, reduce the risk of medication errors, and (where appropriate) explain why a patient's medications have ceased.

2.7.9. **Improving Medicines Reconciliation.** The Trust expects that the system will deliver a significant quality improvement in medicines reconciliation on (re)admission.

2.7.10. **Providing Clinical Decision Support.** The Trust expects that the system will help clinicians to be safer, more effective, and more efficient.

2.7.11. **Ensuring Formulary Compliance.** The Trust expects that the system will make available the relevant information to prescribers, reduce inefficiencies, and ultimately benefit patient outcomes and throughput.

2.7.12. **Improving Infection Control.** The Trust expects that the system will contribute to improving antibiotic stewardship, because the choice and duration of antibiotics given to patients can reduce the number of cases of cross-infection.

2.7.13. **Improving Accountability and Governance.** The Trust expects that the system will put all clinical staff on their mettle, because they will know that every prescribing action or amendment can be traced back to them.

2.7.14. **Improving Out Of Hours (OOH) Support.** The Trust expects that the system will strengthen the Trust's OOH capability and facilitate communications within the Hospital at Night team.

2.7.15. **Improving Medicines Administration.** The Trust expects that the system will assist nurses in their daily work and provide valuable support for error reduction.

2.7.16. **Facilitating the Management of Long-Term Therapies.** The Trust expects that the system will increase the visibility of patients on long-term therapies outside of the hospital environment, via a 'virtual ward' utilising the electronic medication history functionality.

2.7.17. **Facilitating Freedom of Information (FOI) Replies**. The Trust expects that the system will improve the ability to respond to FOI requests.

2.8. System Maturity and Benefits Realisation

2.8.1. Given the above list, the Trust recognises three points which impact on benefits realisation.

2.8.2. First, the expected benefits are extensive and unlikely to be achieved from Initial Go Live.

2.8.3. Second, implementing EPMA will be a very large and complex project requiring a high level of quality assurance effort at a time of constant operational pressure on STH staff.

2.8.4. Third, many suppliers employ a business model which functions on the basis of working closely with a Trust for a short period, ie in order to develop a reproducible approach, but then requires the Trust to rollout the bulk of the implementation under its own arrangements.

2.8.5. This being so, implementation is likely to take at least two years, probably three years. Moreover, developing the constituent parts into a powerful mature system will need to run in parallel and may take longer. The Trust strongly believes that the design of its EPMA system will require the close involvement of users in a bottom-up adaptive process requiring a number of years to reach maturity.

2.8.6. The Trust is therefore looking for a supplier willing to make a genuine commitment to working in partnership with the Trust over the long haul, but without incurring undue extra expense. Realistically, this may be difficult to express in tight contractual terms and may require a departure from the supplier's normal business model. For example, it may be less about spending chargeable time on site, and more about a sustained willingness to listen, give advice, and allocate the right priority to software changes/enhancements.

2.8.7. But whatever the case, the effort deployed must focus on long-term consolidation, and not on showcasing new opportunities for product development. It is essential that very busy Trust staff are helped - over a protracted timescale - to transform the initial affordable offering into a sound, robust and mature system which delivers the expected benefits. Suppliers **MUST** outline their approach to this and should note that this point is reflected in the Evaluation Criteria (see Section 7.4 below).

2.8.8. Suppliers **MUST** support the Trust in maximising the benefits of the proposed solution. They **MUST** describe what resources they will provide for this purpose over what timeframe, and they **MUST** describe their expectations of the Trust's responsibilities for the identification and implementation of benefits realisation.

2.9. Approach to the Procurement

2.9.1. The procurement will be conducted in accordance with the Trust's Standing Financial Instructions and the Trust's Capital Investment Manual. The main steps will be:

- The Trust will issue the OBS, together with an Invitation To Tender (ITT).
- Minimum of 40 days allowed for supplier responses.
- The Trust will conduct Functional, Financial and Technical Evaluations of the responses.
- At this point the Trust reserves the right to downselect as necessary.
- Site visits and/or product demonstrations will then be held, where considered necessary.
- Trust will announce preferred supplier.
- Trust will debrief unsuccessful suppliers.

2.9.2. It is envisaged that the procurement will result in the signing of two standard NHS contracts, one for purchase of the system (SYSCON) and the other for support of the system (SSCON) – See Section 7.2 *'Invitation to Tender'*.

3. TRUST INFRASTRUCTURE AND STANDARDS

3.1. General

3.1.1 This Section describes the Trust's IT environment under the following headings:

- Major Systems
- Connecting for Health and the National Programme for IT
- Patient Master Index (PMI) and Patient Identifiers
- Interfacing Standards
- Networking Standards
- Wireless Network standards
- Desktop Standards
- Printer Standards
- Server Standards
- Support Standards
- Security Standards.

3.2. Major Systems

3.2.1 The major information systems used by the Trust are as follows:

System	Supplier
PAS/PMI	iSOFT PatientCentre
Integration engine	Trust in-house environment
Order communications & results reporting	Sunquest ICE
Electronic discharge summaries	Sunquest ICE
Clinical data capture forms & care pathways	CIMS Infoflex
Theatres	iSOFT ORMIS
Finance	Integra
Intensive Care Unit	MetaVision
Laboratory Information System (Pathology)	iSOFT APEX
Pharmacy	JAC Stock Control System
Chemotherapy Prescribing	CIS Oncology ChemoCare
Maternity	iSOFT Evolution
Renal	CCL Proton, soon CHI RenalPlus
Dental	Salud
GUM	AxSys Excelicare

3.3. Connecting for Health (CfH) and the National Programme for IT (NPfIT)

3.3.1 The Trust has hitherto been committed to CfH and NPfIT, although for various reasons slow progress has been made with implementing the NHS Care Records Service.

3.3.2 The Trust operates a single PAS system which is Choose and Book (CAB) compliant, and CAB is now a live service across the Trust for all new consultant referrals.

3.3.3 Other major NPfIT implementations in the Trust have been the implementation of a replacement Radiology Information System from Accenture/HSS in March 2007 and a PACS from Accenture /Agfa in the second half of 2007.

3.3.4 In recent years the Trust has actively built the required CfH and NPfIT infrastructure in terms of Registration Authority, Role Based Access Control, Single Sign-On, etc. Potential suppliers will be required to conform to this.

3.3.5 The Trust will use the CfH Additional Supply Capability and Capacity (ASCC) framework contracts where appropriate, although it is mindful that take-up of this option has been poor across the NHS as a whole.

3.4. Patient Master Index (PMI) and Patient Identifiers

3.4.1. The Trust uses the iSoft PatientCentre Patient Administration System (PAS) for all inpatient and outpatient administration.

3.4.2. All patients on the PAS PMI are given an STH internal hospital number. In addition, PAS data is checked against the NHS Demographic Batch Service to obtain NHS Numbers. Consequently, a high percentage of patients on the PMI have NHS Numbers, but not all of them[3].

3.5. Interfacing Standards

3.5.1. The Trust uses an 'in-house' Microsoft '.NET' based integration architecture. This environment is based round the use of a central SQL Server database that is updated via transactions from the Patient Administration System (PAS). This in-house environment is used to provide interfaces between applications for all new developments and also provides interfaces to numerous departmental applications.

3.5.2. The Trust prefers new developments to use the HL7 V2 or V3 interface messaging standard. However, many of the existing interfaces do not use HL7. The Trust would be able pragmatically to consider interfacing standards other than HL7 if necessary. In particular, interim XML based interfaces may be considered if the relevant HL7 V3 standard is not available.

3.5.3. The Trust anticipates adopting the NHS Interoperability Toolkit (ITK) as the basis for all future interface developments. The ITK is an NHS-led initiative that provides a series of standards for local integration. This includes providing system vendors with a target specification to build to, as well as providing a lightweight but rigorous conformance process which requires proof of compliance. The ITK also provides a governance framework for local NHS organisations to enact when using these standards. ITK provides a specification for the essential minimum necessary to ensure interoperability. This means that interfaces are specified in detail, so that interoperability is governed by application purpose and function, as opposed to being rendered incompatible by proprietary interfaces.

[3] For the sake of completeness, please note that the Trust also operates the TPP SystmOne electronic patient record system. Following the transfer of services from the PCT during 2011, a number of Community Services Departments are now part of the Trust. These Community Services Departments (such as community nurses, occupational therapists and physiotherapists) use TPP SystmOne. SystmOne is a 'national' system which uses a PMI linked to the NHS Spine. It is entirely based on the NHS Number and does not hold the STH internal hospital number. However, SystmOne is not expected to have any form of interface link with e-Prescribing for a long time ahead, and hence this OBS makes no further reference to it.

3.6. Networking Standards

3.6.1 The Trust's data network is based around the use of Cisco components. The core network consists of eight individual VSS enabled Cisco 6500 series multilayer switches, which run all the layer 3 network services (ie four VSS pairs using a SUP720 in each chassis.) Each VSL is 2 x 10Gb off the SUP720s, and there is one 4 x 10Gb fibre meshed Etherchannel between each of the two pairs at each of the two campuses. The edge devices are layer 2 switches, which are predominantly Cisco, and migration to a full Cisco environment is in progress. The edge switches are predominantly 1Gb to the desktop with 2 x 1Gb back to the core. (Cisco gigabit models of 2960G/44 and current model 2960S/48 are used.) The small quantity of non-Cisco switches are all Fast Ethernet to the desktop, and there are a small quantity of legacy Cisco Fast Ethernet switches, all of which are planned to be replaced in the near future. The Trust is over time implementing resilient links to all the edge switches by the use of geographically separated optical fibre links from the edge device to two chassis of a VSS pair in the network core. This is almost complete. The meshed core design is all 10Gb segments with a two by 1Gb leased fibre link between the two campuses.

3.6.2 The Trust has two main campuses. Within each campus, buildings are linked together with private optical cables and the gigabit backbone network structure. There are two geographically separated leased gigabit data circuits between the two campuses. The Trust has adopted a policy of using single servers or server clusters for critical applications, such as imaging or laboratories. Typically, these servers or clusters will be housed on one campus for use by all sites in the Trust. In some cases, the backup server for an application is housed on the opposite campus. There are no cross site fibre channel circuits, but the Trust is now migrating to the use of iSCSI based SANs. The Ethernet cross-campus bandwidth is adequate to support specific implementations of cross-site replication, but care is needed with the associated design. There are large SAN environments and VM environments on both campuses. Current strategy includes the implementation of full replication between these environments. The cross-city links may be increased by 1Gb to 3 x 1Gb, or a 10Gb link may be implemented.

3.6.3 The Trust has two dedicated computer rooms on each campus. Singlemode fibre-optic cables are available between the computer rooms on a given campus. Hence the use of these different computer rooms is arranged wherever possible to provide resilience. The rolling programme of upgrading and refurbishing of all four of these computer rooms is now close to completion with only an air conditioning upgrade at the Royal Hallamshire computer room on the central campus still incomplete. The cross-city links are specifically between the Northern Campus Clocktower server room and the Central Campus Jessop Wing server room.

3.6.4 The Trust's data network is an integral part of the NHS private network "N3". Inbound and outbound data flow between the Trust network and N3 is controlled by a firewall. Address translation is not normally used at this firewall. The Trust also has a direct Internet connection that is controlled to the standards required in association with N3. Internet remote access requires the use of strong authentication tokens. Internet remote access is only provided via Remote Desktop, and a full VPN network link will not normally be provided.

3.7. Wireless Network Standards

3.7.1. The Trust strategy is to implement total wireless network coverage for all STH sites during 2012/13, using the 802.11n (5 GHz variant) standard together with 802.11b/g for "PDA" or legacy devices that do not support 802.11n.

3.7.2. The Trust is not at present using RFID technology, but RFID tracking would be implemented as part of the Trust-wide wireless network. All existing tracking

systems use bar code technology. Some areas of the Trust have building Access Control with cards that use the MiFare standard (ISO/IEC 14443A).

3.7.3. Please note that this OBS specifically includes a requirement for potential suppliers to support standard machine-readable codes, such as RFID codes, so that high cost or high risk drugs can be tracked wirelessly in future, if required.

3.8. Desktop Standards

3.8.1 STH has over 7,000 desktop PCs connected to a Microsoft Windows Active Directory enabled Local Area Network. The outline current specification is:

- (Minimum) Intel P4 2.8Ghz processor
- 2 Gb RAM
- 80Gb HDD
- Optical Mouse
- Smart card Reader keyboard
- 17" TFT flat screen monitor.

3.8.2 There is a mixture of Microsoft Operating Systems (e.g. Win98, Win2K and WinXP), of which the majority are WinXP. Microsoft Vista is not being considered at present, but future plans include the deployment of Windows 7. Standard desktop software is Microsoft Office, Internet Explorer, Microsoft Outlook, and the STH anti-virus solution which is Sophos Enterprise Security and Control.

3.8.3 All new PCs or laptop computers are installed using standard PC “images”. Microsoft Operating System updates and service packs are automatically deployed to desktops.

3.9 Printer Standards

3.9.1 The Trust has a contract with Xerox to provide a managed service in relation to standard printers used in the Trust. This contract includes the provision of Xerox workgroup multifunction printer/copiers. Xerox does not support special purpose printers, such as barcode label printers or printers connected to laboratory or medical devices.

3.9.2 The Trust uses Windows Print Servers where appropriate.

3.10 Server Standards

3.10.1 Most of the Trust IT systems run under the Windows operating system. UNIX is only supported for a small number of large corporate systems.

3.10.2 All Windows Servers are incorporated into a Trust-wide Active Directory environment. This Active Directory environment is the default environment for controlling user access to networked PCs and Windows based applications.

3.10.3 The Trust uses VMware for all new Windows Server installations. Multiple VMware data-centres exist, each providing load-balancing and high-availability features. Any proposed server based installation should be installed and be fully supported by the supplier when run under the Trust’s VMware environment. If it is proposed not to use the Trust’s VMware environment, then the proposed server configuration must be agreed in advance with the Trust IT Department.

3.10.4 The Trust has found that it is not always practicable to support the concept of implementing a dedicated virtual Windows Server environment for each application

or for each system supplier[4]. Nevertheless, the Trust expects that all new software applications should be capable of running in a shared environment. New applications should use the shared Microsoft SQL Server (or possibly MySQL), IIS and file-storage environments.

3.10.5 Where a Training Environment is implemented, this should be capable of running on the same server environment as the Live Environment. The Trust also implements separate shared virtual servers for Test Environments. It should be possible easily to re-install Test Environments as required.

3.10.6 Remote access to specific server environments is normally provided via the use of Microsoft Remote Desktop Protocol. It should be possible for applications to be supported via the NHS private network "N3". The Trust also uses Internet based remote access VPN links that require the use of strong authentication tokens, but suppliers must provide reasons why it would not be possible to use N3.

3.10.7 The Trust will normally endeavour to apply critical patches to both shared and dedicated platforms within one month of release, following suitable testing in a test environment. The Trust will also endeavour to apply service packs to the same platforms within six months of release, following suitable testing in a test environment. Suppliers must be able to support all such patches and service packs, either within the above timescales or within timescales agreed in advance with the Trust IT Department, in order for the Trust to maintain the security and stability of all desktop clients and shared environments.

3.10.8 In order to guarantee the availability of security hot-fixes, suppliers must ensure their system is capable of operating correctly on a platform which is current and supported. For Microsoft products, this requires operating system and applications, such as SQL Server, to be within Microsoft's mainstream or extended supported phases.

3.11 Database and Data Storage Standards

3.11.1 The Trust uses Microsoft SQL Server for most database applications, although MySQL is also used for some applications. Individual applications are assigned to one or more of the 2008 R2-based shared SQL database environments. Full SQL Server environment administration rights are not provided to suppliers. The Trust is unable to support any database environment other than Microsoft SQL Server or MySQL. For any proposal to implement a system that uses a database other than Microsoft SQL Server or MySQL, the details must be agreed in advance with the Trust IT Department.

3.11.2 The Trust uses CommVault Simpana for data management, including backup & recovery. This software will be installed on servers as appropriate. The Trust does not support any other backup & recovery software process. The Trust undertakes standard daily backups and stores a number of copies enabling recovery from multiple points in time. If the proposed system is unable to use the Trust backup process, then the details must be agreed in advance with the Trust IT Department.

3.11.3 The Trust uses the Caringo CAStor-based Dell DX object storage platform for large volume unstructured data. Any requirement for non-database storage exceeding 50GB over the lifetime of the system should use the DX object store through integration with its native API, or through a third-party ISV integration solution. If

[4] Although the Trust's policy is to use a virtual server environment wherever possible, much depends on the specific requirements of the application. In some cases a virtual server approach is appropriate, whilst in others there is a need to use single servers or clusters of servers. In the case of the EPMA system, the server architecture will almost certainly require detailed technical discussions with the preferred supplier before any final decision can be made.

the proposed system is unable to use the Trust object storage platform, then the details must be agreed in advance with the Trust IT Department.

3.12 Support Standards

3.12.1 The NHS has adopted ITIL as the De Facto standard for Service Management. Suppliers engaged in the National Programme for IT are working towards achieving BS15000 (ISO20000).

3.12.2 The Trust has embedded Service Management principles into the IT support infrastructure through the use of the ITIL (information Technology Infrastructure Library) framework.

3.12.3 HP OpenView is the toolset used to record and monitor incidents from identification through to closure.

3.12.4 Because the EPMA system would operate on an enterprise-wide basis, support would function as follows:

The Trust's IT Services Service Desk would be the first point of contact for all incidents and requests associated with the system. The Service Desk is responsible for the recording and classification of incidents and will perform an initial triage to establish as much detail as possible, eg symptoms, impact etc.

If the incident cannot be resolved locally, then it will be passed to one of the second line support teams, eg Desktop or Network Support. Incidents that cannot be resolved at the second line will be passed to the more advanced technical support groups.

The System Manager for an Enterprise System will be part of the Informatics Directorate and will have access to HP Openview to manage and track incidents. All application-related incidents will be managed by the System Manager.

3.12.5 The Trust will expect the Supplier to develop a support contract to underpin the service to the end user and that builds on the service offered locally. The IT Department will develop a local Service Level Agreement (SLA) with the user department to ensure that the support service is robust and meets the needs of the service. This will be developed during the implementation stage and be available to all parties at the time the application goes live.

3.12.6 The IT Service Desk is currently open between the hours of 8 a.m. to 5 p.m. Monday to Friday. Outside these times an on-call service is available for urgent incidents affecting critical services, although these arrangements are currently under review with a view to moving towards a 24/7 service management model.

3.13 Security Standards

3.13.1 The Trust has implemented a single Trust-wide Microsoft Active Directory environment. This environment is the default environment for controlling user access to networked PCs and Windows based applications.

3.13.2 The Trust has implemented departmental and functional groups within Active Directory. The Trust expects that applications should use Active Directory groups wherever possible.

3.13.3 The Trust has implemented Connecting for Health (CfH) applications, such as PACS. User access to these national applications is controlled by NHS smartcards and CfH Role Based Access Control (RBAC).

4. FUNCTIONAL REQUIREMENTS

4.1 Introduction

4.1.1 This Section covers the functional requirements under the following headings:

- General Requirements
- Patient Details
- Assessment
- Viewing
- Outpatient Prescribing
- Inpatient and Daycase Prescribing
- Prescription Verification
- Drug Reference File
- Formulary and Order Sets
- Medicines Administration
- Discharge Prescribing
- Medicines Management
- Clinical Notes
- Clinical Decision Support
- Reporting
- Printing
- Specialty Specific Requirements
- Electronic Links to Other Systems
- Access to Information about GP Treatment Recommendations.
- Access to Information about the Home Care Delivery Service of Medicines.

4.1.2 This list largely follows the approach adopted in NHS Connecting For Health's ePrescribing Baseline Functional Specification. However, it has been amplified to take into account the functional requirements expressed by key STH pharmacy stakeholders at an EPMA workshop held on 7 February 2011.

4.1.3 There are a few places in this OBS where duplicate entries occur for some requirements. This is deliberate in order to make each Section flow coherently on a stand-alone basis, ie in case some readers go straight to it without reading the rest of the document.

4.2 General Requirements

4.2.1 The system **MUST** be capable of supporting a total of about 6,500 Trust users (of whom 450 would be concurrent) across all locations in RHH, NGH, CCDH, WPH and JW, but excluding Community Services and St Luke's Hospice (although integration with Community Services may be considered as a future enhancement).

4.2.2 Clinicians **SHOULD** also be able to access the system from remote places, eg satellite clinics, provided that local governance, networking, and security requirements are met.

4.2.3 The system **MUST** be characterised by mid-range EPMA functionality which can be developed over time to provide a robust Trust-wide service without undue sophistication.

4.2.4 Suppliers **MUST** give a commitment to supply and manage implementation of the EPMA system within the timescales set out below:

- Award of Contract in March 2013.
- Implementation begins in April 2013.

- Implementation largely completed by April 2015.

4.2.5 The system **MUST** support all types of prescribing, including preadmission clinics, inpatients, outpatients, day cases, discharge (including day or short leave), and all prescriber types.

4.2.6 The system **MUST** be capable of supporting complex specialty requirements (eg A&E, anaesthetics and critical care, obstetrics and gynaecology, etc).

4.2.7 The system **MUST** be capable of being used by a ward or department other than the patient's 'parent' ward, for example, a patient from Ward X needs analgesia whilst in Endoscopy for a procedure but will return to Ward X afterwards. Similar situations could arise when a ward-based patient attends for an angiogram, certain forms of radiology, etc.

4.2.8 The system **MUST** function in such a way that the prescribing and administration of medicines can be paperless in all Trust locations, if required.

4.2.9 The system **MUST** function in such a way that the prescribing and administration of medicines can be wireless-based in all Trust locations, if required, provided that the latter are capable of receiving a viable signal.

4.2.10 The system **MUST** comply with all UK legislative requirements and Department of Health guidance pertaining to medicines that may be issued, both now and in the future.

4.2.11 The system **MUST** allow for all verification procedures and ensure compliance with MHRA guidelines and legal requirements as within the Medicines Act and Misuse of Drugs Act.

4.2.12 All actions performed within the system **MUST** be date-, time- and user-stamped and be auditable.

4.2.13 It **MUST NOT** be possible to alter any patient-related data and clinical notes after a patient has been discharged. Users must not be able to edit closed historical records but should be able to annotate them.

4.2.14 It **MUST** be possible for more than one user to view a patient's medicines list at any one time, but it must not be possible for more than one user to update the active medicines list at the same time.

4.2.15 Suppliers **MUST** describe their strategies for handling concurrency collisions, ie when multiple users are entering data at the same time against the same record, and must describe the extent to which they employ record-locking in this context.

4.2.16 The system **MUST** provide facilities to utilise standard machine-readable codes (eg barcodes, QR codes, RFID codes, etc). This **SHOULD** include the facility to utilise barcode checking during the medicines administration process for selected (probably high risk) products.

4.3 Patient Details

4.3.1 The system **MUST** provide a uni-directional electronic interface capable of copying patient data from the corporate PAS/PMI into its internal Patient Index. The interface must operate in a manner that is seamless to the end user. Suppliers must explain how this interface will function, how it will handle refresh, errors, inconsistencies, amendments and merges, and how data quality will be maintained.

At minimum the download data must include:

- PMI Number
- NHS Number.
- Patient forename
- Patient surname
- Patient address
- Patient sex
- Patient date of birth
- Patient date of death.

4.3.2 If there are ward/clinic patients with the same name or surname, the system **MUST** warn users about this and suggest additional checks during prescribing and administration, eg date of birth, address, etc.

4.3.3 The system **MUST** support prescribing and administration for unidentifiable patients who have only been allocated a PMI Number.

4.3.4 The system **MUST** allow a patient to be flagged as deceased following notification via the PAS/PMI download file and must lock down the prescription to avoid any inadvertent post-death prescribing. However, it must still be possible to continue to access the full set of a deceased patient's records on a permanent basis and, where appropriate, add annotations to the record.

4.3.5 The system **MUST** allow a patient to be 'moved' from one ward or clinic to another by utilising the information received via the admission, discharge and transfer (ADT) function of the PAS/PMI download facility**.**

4.3.6 In order to cater for errors and operational problems, the system **MUST** allow PMI merges and corrections directly upon its internal Patient Index, but only as a password-restricted System Management function.

4.3.7 The system **MUST** provide mechanisms for handling periods of unavailability and downtime due to planned maintenance, system breaks, or communications problems. The system must be capable of operating independently from the corporate PAS/PMI, but with the ability of bringing the two systems back into line following restoration of the link.

4.3.8 In addition, the system **MUST** be capable of recording (manually, if necessary) and displaying the following data:

- Administration category e.g. private patient or NHS
- Ward or clinical area
- Consultant.
- BAS/BMI (see immediately below).

4.3.9 The system **MUST** support the recording of a patient's weight and height, if required. This should be date- and time-stamped and should state whether the measurement was actual or estimated. It should also include prompts for this to be updated at specified intervals. The system should calculate and display the BSA and BMI according to recognised formulae and update these calculations whenever new information is entered.

4.3.10 The system **MUST** use the corporate PMI Number (ie internal STH Number) as the primary key for patient identification. The System **SHOULD**, optionally, allow the PMI Number to be read electronically from a patient ID label using a bar code scanner. The System **MUST** also allow direct access to a patient's records by entry of an NHS Number, where this exists as a secondary key.

4.3.11 Notwithstanding the above, the system **MUST** incorporate the facility for the user to search by patient name, PMI number, NHS number, or ward/clinic. It is very important that this search process should be simple and easy. Therefore suppliers should indicate what other combinations or options are possible, eg soundex names, partial names, date of birth, etc.

4.4 Assessment

4.4.1 The system **MUST** maintain a previous medicines history for each patient. Suppliers should indicate how much flexibility exists to record the entire history in one go or line-by-line if different sources are used (eg patient, carer, GP, etc).

4.4.2 Ideally, the previous medicines history **SHOULD** include all medicines, doses, any recently stopped, where this information originated from, if the patient is on a compliance aid, and – if so - which type, and which community pharmacy they get it from. As regards drugs recently stopped, the system **SHOULD** allow the reasons for cessation to be recorded, if available. Further, the previous medicines history **SHOULD** have separate categories for prescribed medicines and over the counter medicines (eg Ranitidine).

4.4.3 Suppliers **SHOULD** indicate how the previous medicines history for each patient translates into the admission drug history and subsequent initial inpatient prescription.

4.4.4 The system **MUST** support the recording of allergies/intolerances, including a list of outcomes per drug with an indication of whether the reaction was observed or reported. Ideally, this record **SHOULD** also include the timescale of the reaction.

4.4.5 The system **MUST** support the recording of illegal/street drugs that the patient is taking outside of hospital, either as part of a medication history and/or other note.

4.4.6 The system **MUST** support the recording of smoking status and alcohol consumption.

4.4.7 The system **MUST** support the recording of Nil By Mouth (and the reason). There should be a facility to locally define which medicines can still be administered to NBM patients.

4.4.8 The system **MUST** facilitate the recording of whether a patient has been on a nebuliser at home and/or oxygen (including the type if available, eg concentrator with details of the flow rate, nebuliser diluents if appropriate, etc).

4.4.9 It **SHOULD** be possible to record a patient's preference for specific medicine formulations. Reminders within prescribing/administration pathways should guide towards the preferred formulations. The system should also support patient preference for route of administration of medicines to be defined where a preference (eg rectal or oral medicines) is expressed. This should highlight to prescribers if alternative routes are selected.

4.4.10 The renal function (creatinine and eGFR) and date measured **SHOULD** be visible to all prescribers during admission when available and updated each time a new creatinine is measured. A calculation for the patient's creatinine clearance should be performed using Cockcroft and Gault, and/or the eGFR. It should also state that these formulae estimate renal function, unless a true creatinine clearance has been measured, in which case this should be displayed in preference. Local decisions must be made as to which calculations are utilised within specialties or for specific users, given the transition that is currently underway to move to eGFR. Liver function tests should also be available if required at the point of prescribing.

4.4.11 Suppliers **MUST** indicate their future plans for recording and highlighting a patient's phenotype, eg for CYP2D6, and how this will relate to the prescription of medicines, such that reminders about metabolism problems are highlighted.

4.4.12 If a patient is pregnant or breast feeding, this information **SHOULD** be visible each time a new medicine is prescribed or medicines pathways entered and should be linked to decision support to highlight any medicines that may be contra-indicated or carry a warning. There **SHOULD** be checks within the system to ensure that the recording of pregnancy/breast feeding is questioned/removed when no longer valid.

4.5 Viewing

4.5.1 During all operational processing of patient related data, the patient's demographics and allergies/intolerances **MUST** be clearly and consistently visible on screen. Suppliers must explain what data items are displayed by their system.

4.5.2 It **MUST** be possible to access/view all current and previous prescriptions for a particular patient, whether for outpatient, inpatient, or discharge medicines. For the current admission, it must be possible to easily view the current medicines list, all dose changes, medicines stopped and started with dates, the reasons why, and the prescriber details.

4.5.3 The system **MUST** be sufficiently flexible to allow different displays of active medicine(s) to be generated which meet the varying needs of different roles, user types and activities. Possible views might include:

- Chronological and reverse chronological order of start date.
- Formulation, eg liquids, tablets, infusions/injections, eyedrops, topical medicines, etc.
- Route, eg oral, parenteral, topical.
- Specialist, eg insulin, warfarin etc.
- Short courses vs. long term vs. one off vs. 'when required' vs. repeat prescriptions.
- Therapeutic category, eg antibiotics.
- Formulary status.
- Diagnosis/ indication.
- Controlled drug status.
- Prescribed according to speciality.
- Drugs due at a particular time of day.
- Drugs missed on previous drug round.
- Drugs with alerts generated against them.
- Discontinued medicines.
- Unlicensed medicines.
- Source of initiation, ie primary care vs. hospital.
- Source of ongoing medication supply, ie hospital, Homecare provider, GP/community pharmacy, etc.
- Medicines modified.

4.5.4 It **SHOULD** also be possible to request the display of any appropriate laboratory results and/or additional views, such as the addition of sensitivity results with antibiotics, INRs with warfarin, blood sugar results with insulin, etc, and to generate trend results in relation to prescriptions over a period of time. There may be different ways in which this can be achieved, but one approach might involve displaying Sunquest ICE and EPMA data alongside each other.

4.6 Outpatient Prescribing

4.6.1 The system **MUST** support outpatient prescribing in a manner which mirrors the functionality of inpatient and daycase prescribing as closely as possible (see Section 4.7 below). The system should default to outpatient mode if the prescriber is accessing a record for a patient in an outpatient setting. The drug lists that are accessed must comply with other controls (formulary lists) used in other prescribing areas in the system, including the use of order sets.

4.6.2 The system **MUST** allow the user to populate the existing medicines list from within the outpatient clinic by referring to previous discharge medications.

4.6.3 All prescriptions written in this setting **MUST** be supported by the system's decision support functionality, as applicable.

4.6.4 The system **MUST** support a standard duration of supply for all outpatient prescriptions, with different defaults at speciality level. It must be possible for the prescriber to amend the default duration of supply for individual prescriptions.

4.6.5 The outpatient prescribing functionality **MUST** support the production of either (1) an electronic supply request to the relevant STH pharmacy department, dispensary, or a small number of designated commercial community pharmacy or Homecare providers, or (2) a paper copy which can be taken to any other approved supplier.

4.6.6 The system **SHOULD** have the option of being able to print a paper copy of the prescription for the patient to present at the STH pharmacy or dispensary as confirmation of patient identity.

4.6.7 The system **SHOULD** allow the generation of reminders to patients via text messages, mobile phone codes, or email that their medicine(s) needs collecting, etc.

4.6.8 If a medicine has not been collected by a patient, an alert **MUST** be generated which prompts follow-up by the prescribing team according to locally agreed procedures.

4.6.9 Information about what has been supplied **MUST** be transferred into an outpatient note/letter that can be forwarded to primary care, when an actual supply has been initiated. It must be possible to do this in both electronic and paper form.

4.7 Inpatient and Daycase Prescribing

4.7.1 The system **MUST** allow the user to view medicines that have been prescribed in outpatient clinics.

4.7.2 The system **MUST** allow the user to view medicines that have been given in A&E.

4.7.3 The system **MUST** support the continued prescription and administration of medicines (mainly drugs given by continuous infusion) that have been started by anaesthetists or other prescribers when a patient is transferred between wards/care settings.

4.7.4 The system **MUST** allow prescribing of medicines in advance of a planned episode of care, and to set a prescription start date and time of "on admission", such that the prescription becomes active at the time of patient admission.

4.7.5 The system **SHOULD** be able to generate a report of new admissions to a ward and filter these patients by specific parameters.

4.7.6 As each item is prescribed, the system **SHOULD** indicate whether the patient was admitted on that medication.

4.7.7 The system **MUST** allow a prescriber to repeat the prescribing of any medications issued previously. Users should be able to re-activate those drugs prescribed during previous inpatient or outpatient episodes without having to complete a new prescription.

4.7.8 There **MUST** be clear identification of the prescriber which includes relevant contact details and prescriber status (ie medical prescriber, nurse independent prescriber, nurse supplementary prescriber, pharmacist prescriber, etc).

4.7.9 The system **MUST** support protocol-driven prescribing, and prescribing from local guidelines.

4.7.10 The system **MUST** enable prescribers to prescribe not only a single medication but also sets of commonly prescribed drugs as a group (ie an order set). These sets should be locally configured. The system should also prompt for appropriate related blood tests and specify their timing in a way which supports the medicines administration process.

4.7.11 The system **MUST** support the selection of a treatment option by:

- By drug name (either generic or proprietary name or synonym).
- Diagnosis/ indication (likely to be locally derived order sets or indications in the short term).
- According to pre-defined regimens.
- And/or by locally defined limited list, eg via formulary.

4.7.12 Searching for a drug **MUST** be easy and minimise the opportunity for errors. The selected drug should be displayed to the prescriber and other users as the generic name, ie with the brand name only included if clinically indicated. When a drug has been selected, the prescriber should be faced with the smallest selection of options possible. This is potentially a problem with drugs that come in a variety of doses and formulations, such as Furosemide and Morphine. To make it safer for the prescriber after selection of a drug, they should then generally have to select a route which narrows the range of options available for that particular medication. This should result in selecting and displaying the form and strength of an individual product at the time of prescribing.

4.7.13 Once a medication has been selected, the drug name, form and strength **MUST** be displayed on screen throughout the prescribing and administration process.

4.7.14 Both adult and neonatal services **MUST** be provided within the same system. However, there must be clear separation of the prescribing functionality using a combination of access controls and decision support to ensure that prescribing is undertaken using the right pathway, eg the system should default to a neonatal formulary when prescribing for infants in Jessop Wing in order to avoid prescribers being presented with adult drugs and doses when prescribing for infants.

4.7.15 The system **MUST** support supplementary prescribing, including the use of patient group directions.

4.7.16 The system **MUST** support verbal orders (for emergency use or in environments such as theatres or A&E) and also have the ability to set verbal orders for subsequent authorisation.

4.7.17 The system **MUST** support prescribing in real time or after the event.

4.7.18 The system **MUST** allow the prescription and administration of medicines as one act, ie almost simultaneously.

4.7.19 The system **MUST** facilitate the entry of an urgent or stat order, followed by regular schedules of a medication. This may be the case for antibiotic therapy. The system should remind prescribers that stat doses may be required when daily prescriptions are written in order to ensure that the delay in receiving the first dose is not too long, and that subsequent regular doses may need amending (which connects with the configurable functionality required in Section 4.7.30 below).

4.7.20 The system **MUST** support the prescription and recording of as required (PRN) doses. Suppliers should describe what safeguards exist around PRN doses, ie what happens when the maximum safe dose has been reached.

4.7.21 The system **SHOULD** support the prescribing of a drug as a scheduled and PRN medication as a single transaction.

4.7.22 The system **MUST** meet the following minimum requirements for a comprehensive prescription:

- Drug name (generic, or proprietary if locally required)
- Drug form and strength
- Route and site (if appropriate)
- Dose
- Frequency
- Scheduled dose instructions
- Start date/time
- Duration with review date (if appropriate)
- Stop date/time.
- Reason for treatment stopping.
- Additional instructions including monitoring requirements, infusion times for IVs and diluents, etc
- Full name of prescriber
- Ward or outpatient clinic.

4.7.23 The system **MUST** notify the prescriber if a prescription is incomplete or otherwise ensure that all required data is captured.

4.7.24 The system **MUST** clearly display the dose selected at the point of prescribing. All doses shall be clearly displayed in units appropriate to the selected medicine. No abbreviations shall be permitted for units.

4.7.25 The system **MUST** allow the user to select and amend dosing frequencies for individual medicines.

4.7.26 The system **MUST** allow the configuration of default dosing frequencies for individual medicines.

4.7.27 Where a default dosing frequency exists, the system **MUST** automatically populate the selected medicine with that frequency, but any default frequency must also be editable by the user.

4.7.28 The prescriber **MUST** be able to define the date and time that they wish the prescribed medicine to become active, and the start time and date **MUST** be easily entered and editable at the point of prescribing.

4.7.29 The system **MUST** display the first administration date on the main prescribing screen and, if possible, the time.

4.7.30 The system **MUST** require the population of times for administration. The requirement for times of administration must be configurable.

4.7.31 The system **MUST** cater for non-standard frequencies with users able to select these without difficulty, eg 1000mg twice a day on two days of the week, no doses on the remaining days of the week, etc. It must be possible to set such frequencies as the default for a medicine.

4.7.32 It **MUST** be possible to define specific scheduling for particular drugs, defaulting to this during the course of the prescription, and to tailor this locally. For example, Methotrexate should only be prescribed as part of a restricted chemotherapy regimen or be limited to once weekly dosing only, according to the indication selected.

4.7.33 The system **MUST** support duration of therapy in either months, weeks, days or a number of doses. When this is specified for a prescribed drug, the order **MUST** be automatically discontinued at the expiry of that timespan.

4.7.34 The system **MUST** support the use of the Trust formulary and order sets, with appropriate controls on users according to indication or drug group.

4.7.35 If a non-formulary item is prescribed, a warning **MUST** be displayed to the prescriber who should be given the opportunity to select a formulary item from a displayed list, or to override the formulary warning, giving a reason.

4.7.36 Subject to suitable controls, the system **MUST** support free text prescribing, the prescribing of unlicensed medication or medications to be given via unlicensed routes, the prescribing of clinical trial medications, and the management of suspended medicines.

4.7.37 It **MUST** be possible for prescribers to enter clinical notes. Where clinical notes exist for a patient, the current active notes will be presented to users when the patient record is accessed.

4.7.38 The system **MUST** support the prescribing of blood products, including normal human immunoglobulins, and must be capable of recording additional information at the time of prescribing that is required by national datasets (such as the IVIG database).

4.7.39 The system **MUST** support the prescribing of dressings.

4.7.40 The system **MUST** support the prescribing of dietetic products.

4.7.41 The system **MUST** support the prescribing and administration of oral anti-coagulants, along with recording of INR results.

4.7.42 The system **MUST** allow the prescription of drugs to be given by any route, including but not limited to:

- IV medicines, including any diluents and/or flushes.

- Medical gases (e.g. oxygen and entonox).
- Nebulised medication, including driver gas and/or diluents when necessary.
- Enteral feeds (as ordered rather than prescribed).
- Enteral dugs via NG/NJ.
- IV fluid flushes.
- IV medicines (peripheral or central administration), including biological agents.
- Subcutaneous and intramuscular medicines, including vaccinations.
- Intravesical fluids and drugs.
- Patient controlled analgesia and epidurals.
- Drugs given during endoscopy.
- Contrast media.
- Radiopharmaceuticals
- Bone cement (+/- antibiotics).
- Wound care products/dressings.
- Any other medications the patient is taking (e.g. herbal or homeopathic products).

4.7.43 The system **MUST** allow the user to specify the route of administration and any associated instructions, and in particular restrict routes of administration where appropriate.

4.7.44 The system **MUST** include the following attributes for the prescription of iv medicines:

- Drug name.
- Drug dose.
- Infusion fluid (only compatible fluids should be presented to the prescriber).
- Volume of infusion.
- Rate of infusion (including variable or sliding scale).
- Route of infusion (peripheral or central line as a minimum).
- Duration.
- Frequency.
- Additional instructions.

4.7.45 For IV medicines, if a rate of infusion is prescribed, the system **SHOULD** automatically calculate the appropriate duration needed. The system must also support the pausing or suspension of fluids over a period of time. Reminders to nursing staff should trigger when logging on to the system or administration pathways, warning when the fluids are about to finish within their work area/ward according to the prescribed time. The system should also record how much liquid has been administered and relate it to the prescription.

4.7.46 The system **MUST** comply with all the legal requirements for the prescription and administration of controlled drugs.

4.7.47 The system **MUST** support safe prescribing of insulin and other high risk medications (eg vinca alkaloids, methotrexate, intrathecal medicines, etc) and restrict the schedules for some medicines and allow some medication to be prescribed for inpatient use only.

4.7.48 The system **MUST** highlight medicines that are not allowable under payment by results or that are not available on NHS prescription. It must be possible to restrict the prescribing of these drugs to specific users.

4.7.49 The system **SHOULD** warn users of therapeutic duplication but allow this under certain circumstances.

4.7.50 The system **MUST** support variable dosing (in particular insulin and warfarin), dose

loading (eg amiodarone), dose tapering (eg steroids) and cross tapering, dose rounding, and prescription according to age, gestational age, weight, body surface area, renal or hepatic function, etc. It should also be possible to enter these complex prescriptions as a single process without having to enter multiple separate orders, and the system should automatically calculate the relevant dates that dose changes apply.

4.7.51 The system **MUST** prompt users to review and convert drugs from the iv to oral route, or review and stop drugs, and should mandate the duration of treatment for some drugs (particularly antibiotics). It should also be possible to record a course length according to various criteria (eg number of days, number of doses, etc).

4.7.52 The system **MUST** allow the prescription of antibiotic prophylaxis.

4.7.53 The system **MUST** allow the prescription of high doses and increasing dose strengths under certain controlled circumstances.

4.7.54 The system **MUST** provide the ability for an authorised user to amend, suspend or discontinue a prescription or medication order (with reasons selected from a user-defined menu).

4.7.55 The system **MUST** provide the ability for an authorised user to resume a suspended prescription or medication order.

4.7.56 The system **SHOULD** allow medicines to be prescribed by class, eg prescriber selects ACEI for a certain condition, and the system then identifies what the local preferences are and suggests this to the prescriber.

4.7.57 The system **MUST** include the capability to prescribe medicines by infusion, including medicines which require reconstitution and intravenous fluids.

4.7.58 Medicines that are given by infusion often need to be diluted in a certain volume of fluid. The system **MUST** allow for the dilution of medicines.

4.7.59 The system **MUST** allow the prescribing of the final infusion as a single entity.

4.7.60 The prescriber **MUST** be able to select an appropriate infusion fluid and infusion fluid volume during the prescribing process.

4.7.61 The system **MUST** allow the user to specify the duration of treatment. The following **SHOULD** be supported:

- A fixed duration of treatment.
- A review date and time.
- Long-term therapy without a fixed duration, ie dependent on monitoring or investigation results.

4.7.62 At the point of completion of each prescription, the relevant medication **MUST** be available and displayed in the prescription chart in real time, and it should become immediately available for administration (subject to scheduling).

4.7.63 When a prescription is modified, the previous version of the prescription **MUST** still be available as part of the full audit trail and be viewable by all users.

4.7.64 It **SHOULD** be possible within the system for appropriately authorised users to suspend a prescription. Any suspension should adjust the medicine administration

schedule accordingly. The date of the start of the suspension should be editable by the user.

4.7.65 While a prescription is suspended, no administrations for this prescription **MUST** be allowed after the start of the suspension.

4.7.66 It **MUST** not be possible to alter an inpatient prescription after a patient has been discharged from hospital.

4.7.67 The system **SHOULD** support the appropriate management of black triangle medicines, ie newer medicines that are subject to more intense monitoring by the MHRA. The system should allow black triangle medicines to be flagged by the Trust and display a reminder about black triangle medicines to prescribers using the system, ie a black triangle should be displayed against the name, plus words to the effect that "All adverse drug reactions associated with these medicines should be reported to MHRA via the Yellow Card Scheme." See also Section 4.15.39 below.

4.7.68 It **SHOULD** be possible for the system to prompt the user to assign a level of urgency or priority when the medication is dispensed. This should be locally flexible to allow for authorised users to be granted access (or not) to this facility.

4.7.69 Once the prescription has been completed and approved, the system **MUST** support the immediate production of an electronic supply request to the relevant STH pharmacy department or dispensary, or to a small number of designated commercial outpatient or Homecare service providers.

4.7.70 The system **MUST** support the facility for certain prescriptions or orders to be brought to the attention of the pharmacy department on a 24/7 basis using locally-defined alerting procedures. The system must generate an alert in pharmacy when predefined products are prescribed which are either urgently needed or likely to take a long time to prepare (eg specialist eye drops). This must support diversion to on--call staff if ordered out of hours.

4.7.71 The system **MUST** present the prescription to the pharmacy or dispensary in a clear manner so that the prescriber's instructions are unambiguous.

4.8 Prescription Verification

4.8.1 The system **MUST** support the verification of prescriptions by pharmacists. This must include:

- Full information availability at the time of verification.
- Views and worklists of prescriptions requiring verification, these to be searchable by consultant, drug and ward.
- The ability to remove a verification record with a documented reason and notification to the pharmacist who verified the prescription initially.

4.8.2 The system **SHOULD** support locally tailored controls on drug administration before the prescription has been verified.

4.8.3 It **SHOULD** be possible to query or report on unverified orders per ward. This should be in real time for workplan but historical for audit and service evaluation purposes.

4.8.4 The system **MUST** allow pharmacists to change or cancel prescriptions with reasons recorded.

4.8.5 Once a prescription has been changed or cancelled, the system **SHOULD** allow the

name of the prescriber contacted or other authoriser to be logged against that change.

4.8.6 The system **MUST** provide a user-defined electronic view which presents relevant laboratory results automatically to aid dose adjustment as needed. This view does not necessarily need to be interactive, as the Trust recognises that there are a number of different technical ways - consistent with VFM - in which this facility might be made available to users. However, it would advantageous if the system could be customised to display laboratory results and offer dosing advice in such a way as to give an alert when drugs with high toxicity (eg digoxin) are being prescribed for patients known to have impaired renal or liver function.

4.8.7 Pharmacist verification status **MUST** be visible to all users. The system **MUST** be able to record and indicate against each prescribed medication whether or not it has been verified by a pharmacist and **SHOULD** be able to indicate whether this verification has been Level 1 (ie basic prescription review only, usually dispensary-based) or Level 2 (ie full medication review with access to the patient, their medical records, test results, etc, usually ward-based).

4.8.8 Prescriptions requiring dispensing by pharmacy **MUST NOT** be possible on any order until it has been clinically verified. Any inquiry on that order must identify the pharmacist who verified it.

4.8.9 It **SHOULD** be possible for pharmacists to generate alerts to identify when a drug requiring monitoring has been prescribed.

4.8.10 The system **SHOULD** support the creation of pharmacist worklists of prescriptions that require on-going monitoring, and - ideally - also the facility for pharmacy staff to create a list of urgent items.

4.8.11 The verification status of an order **MUST** be consistent throughout all areas of the System, ie prescribing, administration, etc. Where an item has previously been verified and is subsequently modified, the change in status must be reset and be visible in all areas where the item is accessed.

4.8.12 The system should be sufficiently flexible to support local development of competence amongst prescribers. For example, when the number of prescriptions requiring correction is abnormally high, the system **SHOULD** automatically track this back to individual prescribers and notify them (so that clinicians know when they make mistakes). Also, the system should record details of these corrections so that report(s) can be generated enabling the Pharmacy Directorate to trend tracks and identify prescribers making more than an acceptable number and type of prescribing errors, which may indicate an educational requirement or the need for remedial action.

4.9 Drug Reference File

4.9.1 The system **MUST** use and maintain a comprehensive drug reference file using a national drug dictionary (for example, dm+d) descriptions and identifiers. For all drugs, the file will include:

- International Non-Proprietary Name (rINN) or approved BP name or clinical trial name.
- Dose, form, strength, pack size(s) (where applicable).
- SNOMED clinical terms.
- EAN or approved auto-ID code.
- Proprietary names.

- Legal class and therapeutic classification (including BNF classification, with the ability to add free text).
- Cross reference to the Drug Tariff, where applicable
- Technical attributes of the drug to allow 'manufacture' where appropriate e.g. diluents allowed.
- Local formulary status and exceptions.
- Payment by Results high cost exclusions status.

4.9.2 All manual and automatic updates, amendments and creations in the Drug Reference File **MUST** be verified/approved by the Trust before being accessible/visible to users.

4.9.3 Use of generic drug names **MUST** be the primary mode of display within the system, unless there are well defined reasons to use a proprietary name. It must be possible to select a medicine by proprietary name but have the generic description routinely displayed.

4.9.4 The system **MUST** support changes to the way in which medicines are named when these are promulgated.

4.9.5 It **MUST** be possible to add specific notes to individual medicines within the database that will be displayed during prescribing. This function should be limited to System Administrator user(s) only.

4.9.6 All changes to the standing data of the drug file **MUST** be date-, time- and user-stamped and be auditable.

4.9.7 The system **SHOULD** facilitate access to information on the stability of various preparations and storage requirements.

4.9.8 It **SHOULD** be possible to attach information to a drug to identify alternatives available.

4.9.9 It **MUST** be possible to define locally-specific information to print with specific medicines.

4.9.10 The Drug Reference File **SHOULD** indicate the appropriate patient information leaflets that are to be used according to local requirement. It must be possible to access/produce patient information leaflets in different languages, formats, etc, eg Braille.

4.9.11 It **MUST** be possible to highlight which medicines need specific counselling. This **SHOULD** be locally customisable.

4.9.12 The system **MUST** support the facility to display and update information about specific medicines or groups of medicines based on national announcements, eg drug withdrawals, MHRA announcements, warnings, etc.

4.10 Formulary and Order Sets

4.10.1 The system **MUST** support the ordering of medicines in approved local (Trust level) formulary lists which are locally determined and easy to update. These medicines should always be listed in preference to others and when text searches result in direct matches, they should only list the formulary available medicines.

4.10.2 It **MUST** be possible to prevent the prescribing of a non-formulary drug completely or to limit certain drugs to specific users, grades, specialties or locations, or a

combination of these, on a local basis. Where this is the case, there must be the facility to display information to support this restriction, and this information should be customisable on a local basis.

4.10.3 It **SHOULD** be possible to locally define specific medicines or groups of medicines where their initial prescription is limited to certain specialties only, eg steroid eye drops may only be prescribed by ophthalmologists.

4.10.4 There **MUST** be the ability to enter indication- or disease-specific regimens (or order sets) into the system which can facilitate the prescribing of a mixed list of medicines within a predefined care pathway, eg for the treatment of pneumonia. Where there are a number of medicines within a regimen, each individual medicine must be selected (or not) during the prescribing act, ie it must not be possible to select the whole list in one mouse click.

4.10.5 It **SHOULD** be possible to align regimens or order sets with predefined care pathways, not just for prescribing but also for monitoring purposes so that the system checks laboratory results to assess the clinical impact of the medicines being prescribed.

4.10.6 The system **SHOULD** support the ability to predefine drugs used (ie prescribed and administered) as part of a procedure. These should be recorded in a patient's record in such a way as to allow near automatic recording once the procedure is recorded as completed, ie each item is displayed for confirmation (or not).

4.10.7 The system **MUST** facilitate the empirical prescription of antibiotics by indication according to the results of microbiology sensitivity reports in conjunction with the local formulary.

4.10.8 The system **MUST** support the specification of medicine(s) that should only be prescribed to inpatients, eg.benzodiazepines. This definition should be setup locally so that it can be applied to individual medicines or groups of medicines and can be active for an individual specialty, ward, department, or location.

4.10.9 It **SHOULD** be possible to highlight medicines that are "cost per case" Payment by Results medicines or those with other restrictions, offering alternatives and/or outlining the approval mechanism required. It should be possible to define these medicines locally.

4.10.10 The system **MUST** support restrictions (by user, user type, specialty and/or location) on who can prescribe cytotoxics in non-oncology specialties.

4.10.11 The system **MUST** highlight during prescribing those medicines selected that are unavailable on NHS prescriptions.

4.10.12 Where there are known high risks identified for certain medicines, these **MUST** be specifically addressed within the system over and above the other safety requirements described elsewhere. Examples are vinca alkaloids, methotrexate, intrathecal medicines, etc.

4.11 Medicines Administration

4.11.1 All types of medicines administration **MUST** be supported in all STH locations.

4.11.2 The system **SHOULD** support bar-coded administration of medicines, especially for selected (probably high risk) products.

4.11.3 Administration of medicines **MUST** be scheduled by the system and recorded

electronically (including date, time, patient, and user identification).

4.11.4 It **SHOULD** be possible to customise administration schedules locally.

4.11.5 Medicines administration **MUST** be paperless.

4.11.6 Users **MUST** be able to search and access the medicines administration functionality by either ward or individual patient.

4.11.7 The system **MUST** provide a mechanism for grouping patients within a ward.

4.11.8 It **MUST** not be possible to undertake administration without viewing all of the current medicines prescribed, together with all administrations within the past 24 hours.

4.11.9 The system **MUST** highlight medicines which must be given at critical times, with alerts if these times are breached.

4.11.10 When a user accesses a patient record for medicines administration, the system **SHOULD** display all outstanding doses due.

4.11.11 There **SHOULD** be warnings to identify overdue medicines. Alerts for overdue medicines should include escalation procedures and allow staff to view when the next dose is due.

4.11.12 The system **MUST NOT** allow more than one patient record to be accessed at any one time for actual preparation or administration of medicines. Also, it **MUST NOT** be possible to access administration pathways for medicines that are not scheduled.

4.11.13 The system **SHOULD** provide a global view of a given ward, displaying those patients where doses are due, and those patients up to date.

4.11.14 The system **SHOULD** provide a pictorial view of the combined prescription and administration record (like a paper drugs chart) since the patient was admitted to the hospital.

4.11.15 Prior to administration, the system **SHOULD** provide any relevant advice on the reconstitution of medicines and use of diluents.

4.11.16 The system **SHOULD** alert nursing staff to any particular medicines storage or handling requirements at the point of administration.

4.11.17 The patient's demographics, together with the drug name, form and strength selected, **MUST** be displayed throughout the medicines administration process.

4.11.18 The system **MUST** support the administration of alternative dosage forms of medicine which may or may not have been defined within the prescription. The system should support users in making an appropriate choice of alternative according to local authorisation to do so.

4.11.19 It **MUST** be possible to suspend or defer the administration of medicine, with reminders that this has been done.

4.11.20 It **MUST** be possible to administer some medicines as often as every half-hour (eg for ophthalmology).

4.11.21 The reasons for non-administration or deferred administration **MUST** be a mandatory field and **MUST** be recorded from a menu of user-defined options, augmented by clinical notes if necessary.

4.11.22 The system **MUST** support the recording of self-administration of medicines.

4.11.23 The system **MUST** link decision support to medicines administration in order to ensure that all information, warnings and notes are available at the time the medicine is to be given. Alerts that have been over-ridden by the prescriber should be highlighted and be available for acknowledgement by staff administering medicines.

4.11.24 Recording of medicines administration **MUST** be possible via both single and dual electronic signature, ie the system must include a locally-definable function for administration of doses to be witnessed (eg where controlled drugs are involved).

4.11.25 The system **MUST** support the requirement that some medicines prescribed may not be administered before verification by a pharmacist and/or in circumstances such as the use of restricted antibiotics requiring microbiologist approval.

4.11.26 The system **MUST** provide facilities for retrospective charting of medicines administration.

4.11.27 Where a dose of a medicine has been prescribed rather than the actual strength of a product, the system **SHOULD** allow the actual strength to be annotated as a note or clarification.

4.11.28 It **MUST** be possible to record the actual dose administered (eg a partial dose) and a reason for this if different from that prescribed.

4.11.29 It **MUST** be possible to record the site of administration where this is not explicit in the prescription.

4.11.30 It **MUST** be possible to record the batch number and expiry date for a locally-configurable range of medicines administered.

4.11.31 It **MUST** be possible to administer a medicine earlier than prescribed/scheduled (but within a specified timeframe).

4.11.32 It **MUST** be possible for all staff to add notes to the administration record and for this to be viewed easily. For example, it must be possible to annotate a record to show that the actual administration of a medicine was slightly different to that prescribed, eg tablets dissolved rather than swallowed.

4.11.33 The system **MUST** support the administration of medical gases (in particular oxygen and Entonox).

4.11.34 It **MUST** be possible to record details of how a parenteral medicine has been given.

4.11.35 The system **MUST** support the administration of more than one infusion being used over a period of time to complete a prescription, eg two 500 mL bags used sequentially to infuse 1L over 8 hours.

4.11.36 The system **SHOULD** support the identification of specified patients requiring administration of medicines within strictly limited timeframes (eg Parkinson's disease, Myesthenia Gravis, etc) and have appropriate alerts and escalation pathways to ensure that these patients receive their medicines on time.

4.11.37 The system **MUST** display a clear, legible and complete overview of all historic and outstanding administration events for the current admission.

4.11.38 Where a clinical note relating to medicines administration is attached to a prescription, this information **SHOULD** be highlighted to the user, preferably in full.

4.11.39 The system **SHOULD** support the generation of reminders so that staff accessing medicines administration pathways are updated to the fact that medicines have altered for one of the patients that they are caring for since the last recorded medicine administration for that patient. In certain wards or departments this reminder may be displayed when users log on, eg in intensive care.

4.11.40 The system **SHOULD** enable authorised users to initiate the replenishment of patient drugs from within the medicine administration function if ward stocks are low.

4.11.41 The system should be sufficiently flexible to support continuous professional development and local development of competence amongst medicines administration personnel. For example, when the number of prescriptions being administered late or the number of administration records needing correction is abnormally high, the system **SHOULD** automatically track this back to individual members of staff and notify them (so that they know when additional educational, training or practice improvements are required). Likewise, the system **SHOULD** also have the facility to generate report(s) which management can utilise for audit purposes.

4.12 Discharge Prescribing

4.12.1 The system **MUST** support discharge prescribing in a manner which mirrors inpatient and daycase prescribing as closely as possible (see Section 4.7 above). The drug lists that are accessed must comply with other controls (formulary lists) used in other prescribing areas in the system, including the use of order sets.

4.12.2 The system **MUST** support the transfer of discharge prescription and/or medication information to GPs, community pharmacists and a small group of designated commercial pharmacy and Homecare providers using the Trust's future messaging system as shown in Appendix C[5]. This should be done as part of the system's standard workflow processes.

4.12.3 The system **MUST** also support the transfer of discharge prescription and/or medication information electronically to other locations, eg other hospitals.

4.12.4 Discharge Prescribing **MUST** be paperless, if required. However, the system must support discharge prescription and/or medication information being given to the patient or sent to the GP on paper when electronic transfer is not possible.

[5] The Trust places great importance on creating this architecture. In recent times progress has slowed due to certain technical difficulties. However, the Trust is now renewing its effort as a very high priority in order to bring about a comprehensive discharge messaging service to Sheffield GPs, and eventually to GPs further afield. Against this background, it is of particular importance that suppliers demonstrate how their systems collate all relevant discharge medication information, log the reasons why any previous medicines have been stopped (temporarily or permanently) and automatically include this information in the discharge summary for GPs. The detailed requirements are covered in various places throughout this OBS, but this footnote seeks to highlight the Trust's current emphasis on improving electronic communications with primary care.

4.12.5 The discharge information **MUST** include:

- Drug, form, strength, dose, frequency, and duration.
- Additional administration instruction.
- Instructions for the GP about continuing the treatment, further review and monitoring.
- Additional information from the checking pharmacist.
- The reasons why any previous medicines have been stopped, whether on a temporary or permanent basis.
- The option to request any compliance aids required by the patient.

4.12.6 Discharge prescriptions **SHOULD** include an indication of when they are required by the patient, ie what the estimated time of discharge is planned to be.

4.12.7 It **SHOULD** be possible for the system to prompt the user to assign a level of urgency or priority when the TTO is dispensed. This should be locally flexible to allow for authorised users to be granted access (or not) to this facility. In this context, it would also be advantageous if the estimated date of discharge could be received electronically from PatientCentre.

4.12.8 It **MUST** be possible to pre-prescribe or partially prescribe a discharge prescription for a patient and complete/authorise it at a later date. The system must permit the prescriber to add new items to the discharge prescription, and to discontinue and modify existing ones.

4.12.9 It **MUST** be possible to generate discharge prescriptions from inpatient medicine lists, including safeguards for review of PRN, parenteral and rectal medicines.

4.12.10 If controlled drugs are being prescribed, the system **MUST** support the production of a hard copy of the discharge prescription in the required format for a handwritten signature.

4.12.11 The system **SHOULD** allow medicines to be locally highlighted if they are not to be prescribed on discharge, eg benzodiazepines. This should prompt a review by the prescriber if the medicine is selected as part of the discharge process.

4.12.12 The system **SHOULD** alert users to review the discharge prescription if changes have been made to an inpatient prescription after the discharge medicines have been prescribed.

4.12.13 Discharge information **MUST** make it clear if the patient is going home with their own medicines which they brought into hospital on admission, or already have a supply at home, or will be having their medication delivered by a specialist Homecare provider.

4.12.14 If the patient was previously taking a medicine which was stopped or suspended during admission, there **MUST** be the ability to link this discontinuation to the discharge information, such that the information will be available on discharge with the reason for stopping it.

4.12.15 If a recommendation is made to the patient to buy a certain medicine as it is a cheaper option, this information **SHOULD** be transferred to primary care as part of the discharge information or outpatient information.

4.12.16 Subject to the availability of adequate networking and security arrangements, the system **SHOULD** be able to send a copy of the discharge medicines information, in

either electronic or paper format, to the patient's regular nominated community pharmacy (as defined within the electronic prescriptions service requirements) in order to ensure continuation of supply, providing that the patient is in agreement. It is recognised that provision of this facility may not be achievable at the outset of the implementation, but it should be in place by the time that the implementation is expected to be largely completed (ie by 1 April 2015, see Section 4.2.4 above).

4.12.17 Verification of discharge medicines by pharmacists **MUST** be supported. The status of verified must be visible within the medicines record and be incorporated into discharge information communicated onwards. Transfer of prescriptions to stock control systems for supply must not occur without verification having been undertaken. It must be possible to delay discharge and/or transfer of discharge information from the system until verification has been undertaken.

4.12.18 The system **MUST** support the ability to prescribe short leave (weekend leave) medications in a similar manner to discharge medicines. These prescriptions should be identified as being different to discharge prescriptions in all views within the system. When leave medicines are prescribed, the duration of the leave must be defined either within specified time frames or for a set number of days. The system must support the automatic presentation of leave status in the drug administration record so that the nurse does not have to keep completing a record for each drug round, and all users know that the patient is on leave. If a patient returns early, it must be possible to remove the automatic administration record so that manual recording can begin again.

4.12.19 The system **SHOULD** support the ability to highlight a drug/group of drugs as being covered by a shared care arrangement, eg for diabetes, asthma, or antenatal care.

4.12.20 The system **SHOULD** record whether a patient is on a nebuliser and make this information available during the discharge process in order to highlight appropriate ordering requirements.

4.12.21 The system **SHOULD** have the option of being able to print a paper copy of the prescription for the patient to present at the STH pharmacy or dispensary as confirmation of patient identity.

4.12.22 If a medicine has not been collected, an alert **SHOULD** be generated which prompts follow-up by the prescribing team according to locally agreed procedures.

4.12.23 The system **SHOULD** allow the generation of reminders to patients via text messages, mobile phone codes or email that their medicine(s) needs collecting, etc.

4.13 Medicines Management

4.13.1 Supply requests **MUST** be generated within the prescribing system for transfer to the dispensing system, provided that the item is not identified as a patient's own medication or a ward stock. Supply requests must not be actioned in the dispensing system until the script has been verified by a pharmacist.

4.13.2 The system **MUST** support the display of costs for individual medicines, on a locally defined basis if required. There must be the functionality to support financial reporting for internal cost centres. It must be possible to generate reports that summarise/detail the costs of medicines prescribed and administered to individual patients, or groups of patients, within the system to support clinical audit, payment by results and commissioning. At minimum reporting should possible by specialty, disease group (HRGs/SNOMED codes), indication, ward, location, consultant by individual medicines or medicine therapeutic group, and over specified periods of time.

4.13.3 The system **SHOULD** facilitate the setting of a local budget for a specific medicine, group of medicines, for a number of patients for an individual user, specialty or location if required. When requested information should be generated to screen outlining the budget remaining and/or committed, this should display passively when a budget limit is approaching (as defined locally). When the budget is limited for a specific number of patients, information should be passively available on screen during the prescribing process to indicate the current status. Alerts should only be generated if limits or targets are reached.

4.13.4 It **MUST** be possible to identify the source of the medicine that a patient is utilising during an inpatient stay with this information transferring to the discharge prescription to inform the source of supply. These categories may include:

- Patient's own.
- Pharmacy supply.
- Ward stock.

4.13.5 It **MUST** be possible for the system to support the recording of the number of tablets or an approximate quantity (such as "more than 56") where a patient has of their own on admission. This information should then be available within the discharge prescription information, together with the date when the record was made, so that the pharmacy can identify which medicines may not require supply.

4.13.6 The system **SHOULD** link to emergency cupboard supplies or ward stock lists, such that:

- Medicines can be easily located when not available locally;
- And in future allow the supply within the cupboard to only be accessed following the order of a medicine that requires supply from an emergency or other cupboard.

4.13.7 The system **SHOULD** aim to move towards full ward stock reconciliation so that an order can automatically be sent to the appropriate supply source when the stock levels are low.

4.13.8 The system **SHOULD** support integration with the main stock control system in order to inform the wards and/or prescribers if stocks of a certain drug are low or have a manufacturing problem. This should generate information during the process of prescribing and administration or be available as a lookup facility. It should also be possible to attach information to identify alternatives available.

4.13.9 It **SHOULD** be possible to supply medicines from ward stock and generate over-rides to curtail any supply requests being generated.

4.13.10 The system **MUST** support interfacing to electronic supply cabinets or cupboards which allow access to the correct medicines once they have been prescribed and/ or are due to be given. Over-rides for emergency access must be in place according to local policy.

4.13.11 The system **MUST** distinguish between NHS patients and private patients for both prescribing and costing purposes.

4.14 Clinical Notes

4.14.1 It **MUST** be possible for all users (ie prescribers, pharmacists, nurses, etc) to enter clinical notes. Where clinical notes exist, the current active notes must be presented to the user when the patient record is accessed.

4.14.2 When a patient is re-admitted, the clinical notes from previous episodes **MUST** be available for review.

4.14.3 The System **MUST** support clinical notes being added to a specific medicine for viewing at the point of administration.

4.14.4 The system **MUST** support clinical notes being added to a patient record during the medicines administration process.

4.14.5 The System **MUST** not allow the deletion of any notes. Notes must be suppressed if no longer active, but they must still be accessible for review within a patient's record.

4.15 Clinical Decision Support

4.15.1 Decision support **MUST** be appropriate and applicable to UK practice.

4.15.2 Decision support **MUST** be available and active during the action of prescribing.

4.15.3 Decision support **MUST** be available during medicines administration.

4.15.4 The system **SHOULD** provide access to information via:

- Information entered by pharmacy
- British National Formulary (BNF)
- Links to the local formulary
- Links to local or national prescribing guidelines
- Links to external websites/online resources.

4.15.5 If a patient has not had any allergy information added to the patient record, eg for a new admission, the system **MUST** prompt the user to enter information regarding allergies for the patient. This should include a 'no known allergies' entry. This information must then be visible at any subsequent presentation of the patient to the Trust, whether as an inpatient or outpatient. The system **SHOULD** also prompt the user to enter details whenever a drug is stopped because of an allergic reaction.

4.15.6 Decision support **MUST** include checks on:

- Allergies
- Adverse reactions
- Intolerance
- Contraindications
- Dose range checking
- Therapeutic duplication
- Drug interactions.

4.15.7 Decision support **SHOULD** include checks on pathology results.

4.15.8 Decision support **SHOULD** include the following alerts:

- Interactions of drugs with food, alcohol, smoking, or street drugs
- Alerts in pregnancy
- Alerts in patients who are breastfeeding

- Therapeutic duplication
- Drugs that should only be given once in a lifetime, eg Streptokinase
- Alerts for blood monitoring
- Alerts of drug-related deterioration in renal/hepatic function
- Alerts for drug-food interactions
- Alerts of monitoring test results.

4.15.9 When alerts are generated, they **SHOULD** occur as soon as possible during the act of prescribing, ie they should not be triggered at the final stage of ordering if the initial selection of the medicine could have been a trigger.

4.15.10 The system **SHOULD** alert the prescriber to any possible side effects likely to occur when using a particular drug for a particular patient.

4.15.11 Users **SHOULD** be able to see all alerts generated for a patient.

4.15.12 The system **MUST** allow a prescriber or any other user to acknowledge an alert and document the reasons why it is not followed, ie by entering a user-defined reason in order to proceed. The System must record such overrides for audit purposes.

4.15.13 It **MUST** be possible to define alerts that cannot be overridden.

4.15.14 Alerts which are consistently overriden **MUST** be reportable, so that a review can be undertaken. The system **SHOULD** also allow for feedback to be generated for individual prescribers and their supervisors about their alert override pattern over a period of time.

4.15.15 The system **SHOULD** be sufficiently flexible to support local development of competence. For example, when the number of alerts for an individual is high, reports should be generated to indicate that there may be an educational requirement. Equally, if the number of alerts or overrides reduces, certain constraints - such as those around non-formulary access - may be lifted as competence may have been demonstrated.

4.15.16 Alerts **SHOULD** be reserved for high level warnings that require action to ensure patient safety, but there should also be local flexibility to manage alerts according to local clinical governance procedures.

4.15.17 Display of alerts **SHOULD** be linked to more complex information if required.

4.15.18 The system **SHOULD** facilitate the identification of those medicines that need regular blood or other tests to be performed, including baseline line monitoring. Reminders as to what tests need to be performed should be generated at the time of prescribing. An alert should be generated if the test results fall outside the recommended limits for any given drug.

4.15.19 The system **MUST** support dose checking against national dosing recommendations (including those for age), with appropriate tolerances or additional rules being allowed where there is flexibility around dosing (eg diamorphine 100mg is appropriate for opiate tolerant patients but may not be for opiate naïve patients). If doses are inappropriate or outside of the parameters, then alerts must be generated. It must be possible to override these alerts, provided that a record is kept for audit purposes.

4.15.20 The system **SHOULD** facilitate and display information to support dose conversions from one drug to another. It should suggest equivalent doses of different preparations for drugs such as opiate and steroids.

4.15.21 Where more than one strength of a formulation is available, reminders **SHOULD** be in place to help avoid mis-selection when a formulation is to be selected. For example, depot injections commonly utilise the lowest volume injection but may not display first in a list.

4.15.22 Information on pregnancy or breast feeding **SHOULD** be linked to decision support and updated as required. The system should generate reminders to check/counsel about pregnancy when drugs are prescribed to women of child bearing age that could be dangerous to the foetus, e.g. methotrexate. The system must facilitate the selection of medicines for an individual based on their pregnancy status.

4.15.23 The system **SHOULD** support the implementation of action plans to respond to NPSA safety notices and recommendations.

4.15.24 The system **SHOULD** support dose reductions in the elderly and patients with hepatic or renal impairment.

4.15.25 The system **SHOULD** use nationally validated warfarin prescribing programmes to support the prescribing and dose calculation of warfarin using a patient's INRs and indication.

4.15.26 The system **MUST** identify alerts for trauma patients taking anticoagulants with prompts to measure coagulation.

4.15.27 The system **SHOULD** warn prescribers if there is therapeutic duplication within the same class of medicine in prescribing, eg two statins are prescribed at the same time.

4.15.28 Decision support **MUST** track the cumulative dose of a medicine over time and generate warnings when a certain dose is reached.

4.15.29 Prescribers **SHOULD** be warned when there is more than one formulation available.

4.15.30 The system **MUST** identify and alert to drug–disease and drug-age contraindications, eg beta blockers in asthma, aspirin in under-16 year olds, etc. It must be possible to override these warnings with reasons.

4.15.31 The system **SHOULD** offer guidance on dosage adjustment for patients on different types of dialysis.

4.15.32 The system **MUST** support the routine recording of a VTE risk assessment for all inpatients and the automatic prescription of prophylaxis for those at significant risk, according to local policy. It must be compulsory to complete this assessment before prescribing non-emergency drugs. It must also be possible to update the VTE risk assessment after 24hrs, if the Trust requires that functionality to be set up, or should the condition of the patient change during their in-patient experience.

4.15.33 The system **SHOULD** prompt iv to oral switches, and it should be possible to configure this locally.

4.15.34 The system **SHOULD** facilitate the checking of iv fluids for drug/fluid, fluid/fluid and drug/drug incompatibilities. Warnings and alternatives should be displayed.

4.15.35 The system **SHOULD** support the calculation of cardio vascular risk factors so that these can be used to outline which locally defined medicines may be considered for individual patients.

4.15.36 For patients on IV aminophylline, vancomycin and other drugs with a narrow

therapeutic index that require individual dosing, decision support **SHOULD** provide dosage guidance and prompts reminding when drug levels are to be taken. The system should also offer guidance on the conversion of IV aminophylline to oral theophylline.

4.15.37 The system **SHOULD** remind prescribers of routes that may not be recommended for individuals due to specific concurrent conditions, e.g. IM (Intramuscular) injection in a patient with haemophilia.

4.15.38 The system **SHOULD** support the use of cytochrome p450 profiling to aid prescribing and the results incorporated into the system.

4.15.39 The system **SHOULD** support the electronic reporting of adverse drug reactions to the MHRA at any point within the system. They should be reported electronically using the patients details as the Yellow Card Scheme layout requires. This may only need to be a link to the MHRA website. In particular, this regime should prompt for reports to be sent for reactions to new medicines (black triangle) and all adverse reactions in children under the age of 18 years. Established medicines should generate a lesser reminder suggesting that 'serious' reactions should be reported. See also Section 4.7.67 above.

4.15.40 More information **SHOULD** be offered to prescribers and people administering a medicine if the medicine is not one that is prescribed frequently. The system should have the ability to learn what is, and what is not, prescribed regularly.

4.15.41 The system **SHOULD** automatically identify and generate reminders about patients that require regular medicine-specific tests due to the medicine that they are taking, eg audiometry, sight tests, liver function tests, urea and electrolytes.

4.15.42 It **MUST** be possible to check the algorithms used in the system at regular intervals, so that parameters can be adjusted as necessary to meet changes in practice, etc.

4.15.43 Decision support **MUST** be re-run whenever new information is added to a patient's record.

4.15.44 The System **MUST** identify who is responsible for maintaining the information that drives the decision support and its continual update.

4.16 Reporting

4.16.1 The system **MUST** be sufficiently flexible to enable full reporting for both clinical and management requirements with not only bespoke reports being available but also the tools to locally tailor data output.

4.16.2 Reporting **MUST** not interfere with the normal working of the system.

4.16.3 The system **MUST** store all data items used within the system. Users must be able to define reports on any of the stored data items. The system must provide flexibility for the extraction, combination, analysis and reporting of data recorded in all functionality provided by the system, such as prescription modification, pharmacy validation, medicines administration, missed administrations, costings, etc.

4.16.4 Specifically, it **MUST** be possible for users to report by:

- Patient
- Drug/medicine (individual and also by therapeutic/BNF classification)
- Diagnosis/disease

- Intervention
- Clinician
- Pharmacy
- Financials.

4.16.5 The system **MUST** provide a full audit trail which enables reports to be generated and printed down to individual event level linked to both the patient and member of staff involved.

4.16.6 The System **MUST** allow for the recording of a user definable text string to identify the Trust's corporate title, so that it is available for display on all report headings.

4.17 Printing

4.17.1 The System **MUST** allow reports to be printed on any industry standard desktop printer, without any requirement for specialised printing hardware or software.

4.17.2 The System **MUST** allow any report to be printed upon any specified printer, and individual printer tray, catalogued within the System, whether that printer is attached directly to the originating PC, or attached to a separate PC, or is attached directly to the network.

4.17.3 The System **MUST** allow the contents of a screen to be printed at any time.

4.17.4 The System **SHOULD** provide functions to enable the printing of reports off-line in batches at pre-determined times, as well as individual on-line requests.

4.17.5 The System **SHOULD** provide the ability to print in hard copy, as well as download the contents of reports into standard desktop software (eg Microsoft Office) and print from there.

4.17.6 The System **MUST** allow any print job to be aborted without adversely affecting the system.

4.17.7 The System **MUST** always print the PMI Number and NHS Number as standard upon any correspondence with patients, GPs or other Healthcare professionals and organisations, and upon operational and management reports about individual patients.

4.18 Specialty Specific Requirements

4.18.1 Suppliers **MUST** indicate how their system supports accident and emergency medicine.

4.18.2 Suppliers **MUST** indicate how their system supports anaesthetics and critical care.

4.18.3 Suppliers **MUST** indicate how their system supports obstetrics and gynaecology.

4.19 Electronic Links to Other Systems

4.19.1 Suppliers **MUST** indicate how they would set about providing an electronic link with iSOFT PatientCentre PAS for the purpose of downloading demographics (see Appendix C) and state any relevant previous experience of this.

4.19.2 Suppliers **MUST** indicate how they would set about providing an electronic link with Sunquest ICE for the purpose of downloading lab results (see Appendix C) and state any relevant previous experience of this.

4.19.3 Suppliers **MUST** indicate how they would set about providing an electronic link with the Integra Finance System for the purpose of uploading the quantity and cost of drugs (see Appendix C) and state any relevant previous experience of this.

4.19.4 Suppliers **MUST** indicate how they would set about providing an electronic link with the CACI service line reporting system for the purpose of uploading specific patient-related drugs records (see Appendix C) and state any relevant previous experience of this and/or any other Patient Level Information Costing Systems (PLICS).

4.19.5 Suppliers **MUST** indicate how they would set about providing an electronic link with the JAC Stock Control System for the purpose of ordering, dispensing and stock control (see Appendix C) and state any relevant previous experience of this.

4.19.6 Suppliers **MUST** indicate how they would set about providing an electronic link with the Sunquest ICE messaging capability for the purpose of sending prescribing and discharge medication information to GPs (see Appendix C) and state any relevant previous experience of this.

4.19.7 Suppliers **MUST** indicate how they would potentially set about providing an electronic link with any industry standard Clinical Portal which the Trust might wish to adopt in future (see Appendix C) and state any relevant previous experience of this.

4.19.8 Suppliers **MUST** indicate what relevant previous experience they have of migrating renal prescribing from the RenalPlus system to their system. It is acknowledged that most suppliers regard this as an implementation matter which is entirely the responsibility of the Trust to carry out as part of its rollout plan, but any previous experience in this area would be helpful.

4.19.9 Suppliers **MUST** indicate what relevant previous experience they have of migrating ophthalmology prescribing from the MetaVision system to their system. It is acknowledged that most suppliers regard this as an implementation matter which is entirely the responsibility of the Trust to carry out as part of its rollout plan, but any previous experience in this area would be helpful.

4.19.10 Suppliers **MUST** indicate what relevant previous experience they have of migrating dental prescribing from the Salud system to their system. It is acknowledged that most suppliers regard this as an implementation matter which is entirely the responsibility of the Trust to carry out as part of its rollout plan, but any previous experience in this area would be helpful.

4.19.11 Suppliers **MUST** indicate what relevant previous experience they have of migrating GUM prescribing from the AxSys Excelicare system to their system. It is acknowledged that most suppliers regard this as an implementation matter which is entirely the responsibility of the Trust to carry out as part of its rollout plan, but any previous experience in this area would be helpful.

4.20 Access to Information About GP Treatment Recommendations

4.20.1 In the longer term the Trust is keen to obtain the benefits offered by electronic access to GP treatment recommendations. It is not envisaged that this functionality will be immediately available as part of this procurement, ie the viability and cost of this functionality would need to be explored with the preferred supplier and then planned as a future enhancement. However, suppliers **SHOULD** state their attitude and approach to this.

4.21 Access to Information About the Home Care Delivery Service

4.21.1 The Trust is keen to obtain the benefits offered by electronic access to information about the home care delivery service of medicines, ie the viability and cost of this functionality would need to be explored with the preferred supplier and then - if necessary - planned as a future enhancement. However, suppliers **SHOULD** state their attitude and approach to this.

5 SYSTEM REQUIREMENTS

5.1 General

5.1.1 This Section covers the system requirements under the following headings:

- Trust Technical Standards
- Expected lifespan of system
- Flexibility of application software
- Reference tables
- System look and feel
- Dates and times
- On-Line help and validation
- System access
- Audit trail
- Separate live, training & testing environments
- Data integrity
- System administration.

5.2 Trust Technical Standards

5.2.1 All equipment and software provided **MUST** be compatible with the Trust IT standards as described in the document entitled "STH IT Technical Standards and Questionnaire for Networked Devices or Systems" at Appendix D. This Questionnaire forms a key part of this OBS and **MUST** be completed for all aspects of IT infrastructure, security or support that will be relevant for the proposed equipment and software. Please note that it incorporates a requirement to complete the on-line NHS Standards Enforcement in Procurement (STEP) questionnaire.

5.3 Expected Lifespan of System

5.3.1 The system **MUST** be capable of lasting for an asset life of at least 8 years of continual heavy daily usage.

5.4 Flexibility of Application Software

5.4.1 The Trust regards the flexibility of application software after its implementation as being an issue of fundamental importance. The Trust recognises that Suppliers are likely to base their proposals on off-the-shelf application software, and indeed encourages such an approach for reasons of cost-effectiveness, reduced risk, etc. The particular issue is the ease with which suitably trained users are able to effect modifications for themselves on a day-to-day basis, in keeping with changes to clinical care processes and protocols. Users may wish to:

- Make amendments to data collection screens
- Set up screen based or printed reports as required

- Set up and/or amend shortcuts for particular users in accordance with the way they wish to access screens
- Implement and/or amend clinical pathways
- Implement and/or amend alerts and reminders
- Introduce reference files.

5.4.2 The Supplier **SHOULD** explain how such local investment will not be lost when new versions of the product are introduced.

5.4.3 The above requirement for flexibility is not to be confused with the Supplier's responsibilities for enhancing and updating applications, etc.

5.5 Reference Tables

5.5.1 The system **SHOULD** be flexible and consistent with other Trust systems through the provision of user-defined tables of codes and reference data.

5.5.2 It is important for the Trust to maintain consistency of coding standards among corporate systems for common reference data, such as Specialties, Consultants, Wards and other Locations, and to minimise the volume of reference data that needs to be manually re-keyed. The Supplier **SHOULD** supply details of any such data files and items, where it would be advantageous for them to be loaded electronically, subject to feasibility and agreement of a detailed specification, together with any constraints that would apply.

5.5.3 The system **MUST** allow for the use of national coding standards, where they exist, but **SHOULD** also allow locally defined codes to be used, where appropriate. However, any outputs from the System **MUST** comply with national coding standards as documented in the NHS Data Dictionary, NHS Information Standards Notices (ISNs – previously DSCNs), and other similar official publications. Such compliance **MUST** be achieved at no extra cost beyond the Supplier's annual software support charge.

5.5.4 The system **SHOULD** provide assistance with operational data entry through readily accessible context related help functions.

5.5.5 The system **SHOULD** provide the ability to display and select from sorted lists of reference codes and associated meanings where operational data entry is required.

5.5.6 The system **SHOULD** provide system management facilities for viewing and printing reference data files and should allow flexibility in selection of data, sequence and format.

5.5.7 The system **MUST** allow electronic loading of reference data files as an alternative to manual data input where such data is either published as a national resource or is already available within the Trust.

5.6 System Look And Feel

5.6.1 The system **SHOULD** be consistent across all modules and functions with regard to screen design, and the use of keyboard stokes and mouse clicks.

5.6.2 The system **SHOULD** enable access to functions via navigation through a structured menu but should also allow a fast-path route to commonly used functions.

5.6.3 The system **SHOULD** minimise the need for repeated data entry by retention of context data, such as a patient's identifying details, for re-use at a higher level when a lower level function has been invoked and completed.

5.6.4 The system **MUST** operate with UK terminology, characters, date and time formats etc.

5.6.5 The Trust, as an equal opportunities employer, employs individuals with disabilities. Suppliers **MUST** show how a range of disabled personnel can access the system.

5.7 Dates And Times

5.7.1 The system **MUST** record the current date and time from a central clock for the whole System, not from clocks on individual PCs.

5.7.2 The system **SHOULD** allow default recording of the current date to "today" and time to "now" for activities which are normally performed on-line.

5.8 On-Line Help And Validation

5.8.1 The system **SHOULD** provide extensive on-line Help functions, both in context and indexed.

5.8.2 The system **SHOULD** ensure that all data items are subject to appropriate and comprehensive validation for format, length, range and cross-data item compatibility, and **SHOULD** always display a meaningful error message on screen in the event of invalid data input.

5.8.3 The system **SHOULD** ensure that clinically important data items are subject to further validation checks for range, and **SHOULD** display a meaningful warning message where data entered is valid, but outside of a normal range.

5.8.4 The system **SHOULD** allow local flexibility in the definition of whether the recording of data items is mandatory or optional, where this does not compromise overall data integrity.

5.9 System Access

5.9.1 The system **MUST** only allow access following entry of a valid User Name and associated secret Password.

5.9.2 The system **SHOULD** integrate with the Trust Microsoft Active Directory environment so that the Active Directory user details and password are used when accessing the System.

5.9.3 The system **MUST** provide password access to the system, and this **MUST** be capable of being applied to the various functional areas and modules of the system in accordance with user access profiles.

5.9.4 If not using Active Directory passwords, then the system **MUST** allow for the stipulation of a locally defined minimum standard for choice of password.

5.9.5 If not using Active Directory passwords, then the system **MUST** allow individual users to define their own passwords, subject to system-wide minimum standards, and to change their password at any time.

5.9.6 If not using Active Directory passwords, then the system **MUST** force a change of password after the elapse of a locally defined period of time.

5.9.7 Passwords **MUST** be stored in an encrypted form.

5.9.8 Passwords **MUST** not be displayed on screen.

5.9.9 The system **MUST** only allow the System Manager or other designated 'Super User' to create new User Names and allocate security access profiles.

5.9.10 The system **MUST** only allow access to those functions enabled within the security access profile associated with the User Name.

5.9.11 It **MUST** be possible to uniquely identify all users of the system.

5.9.12 The system **SHOULD** provide a rapid, but secure, function to enable rapid change of User.

5.9.13 Access to the system database by third party query tools **MUST** be password controlled.

5.9.14 The system **SHOULD** automatically logout users after a user-defined period of inactivity without affecting system integrity.

5.9.15 The system **MUST** limit the number of attempted login failures, providing an intruder detection and lockout facility.

5.9.16 All security functions **MUST** be controllable by a system administrator.

5.10 Audit Trail

5.10.1 The system **MUST** record a comprehensive Audit Trail of all significant database updates, which **should** include date, time, terminal, and user.

5.10.2 The system **MUST** provide functions to allow enquiry, reporting and printing from this Audit Trail, subject to appropriate access rights.

5.10.3 The system **SHOULD** provide flexibility within these functions to allow parameterised analysis by combinations of period of time, individual patient, and individual user.

5.11 Separate Live, Training and Testing Environments

5.11.1 The system **MUST** provide separate database and access environments for live operations and for user training.

5.11.2 The system **SHOULD** also provide a third database and access environment to enable the controlled testing of new software releases and developments.

5.11.3 The system **SHOULD** provide the ability to copy, in a controlled manner, reference data between the Live, Training and Test environments, but otherwise the databases **SHOULD** be mutually discrete and secure.

5.12 Data Integrity

5.12.1 The Supplier **MUST** describe how their offering handles record merging and deletion of erroneous records. This description **SHOULD** include details of facilities for appropriately trained users to merge records, and details of manual or automatic procedures to reconcile conflicting data items.

5.13 System Administration

5.13.1 The system **MUST** have a mechanism for validating incoming data (eg new codes, new reference tables, etc) prior to it being loaded into the system. The System Administrator must be provided with sufficient information to enable investigations of failed record loads to be completed.

5.13.2 The system **SHOULD** have a way of informing the System Administrator or "super-user" group when the proposed interfaces are not operational. If appropriate, the system should also inform users when they first log onto the system, and a message should be sent to users already logged on.

5.13.3 The system **MUST** ensure that when interfaces are re-activated, the system will handle retrospective interface file feeds in a controlled and strictly chronological manner.

5.13.4 The system **MUST** allow authorised administrator(s) – subject to suitable access rights – to redefine existing levels of user access and add new users.

5.13.5 The system **SHOULD** produce a report detailing each user's access rights.

5.13.6 The system **SHOULD** enable further ad hoc analysis and reporting using SQL or third party reporting tools.

6 SUPPORT REQUIREMENTS

6.1 General

6.1.1 This Section covers support requirements under the following headings:

- Implementation Support.
- Post-Implementation Support.

6.2 Implementation Support

6.2.1 Project Management

6.2.1.1 Suppliers **MUST** explain their approach to a project of this size and scope.

6.2.1.2 Suppliers **MUST** be willing to adapt their project management procedures to mesh with the Trust's pragmatic use of PRINCE2.

6.2.1.3 The Supplier's Project Manager **MUST** be experienced, pro-active, visible and readily contactable throughout the implementation process. A CV **SHOULD** be provided with the Supplier's response.

6.2.1.4 In case of absence, the Supplier **MUST** provide appropriate deputising arrangements and cover.

6.2.2 Approach to Implementation

6.2.2.1 Suppliers **MUST** outline their approach to providing support for the initial implementation. This support **SHOULD** include:

- Configuration of the base product to meet the specific needs described in this OBS.
- Procedural, organisational and documentary change.
- Realisation of benefits, especially clinical benefits.
- On-site support for the initial go-live period (eg 'floorwalkers').
- On-site and rapid response support for the immediate post go-live period.

- Data file pre-population.

6.2.2.2 Suppliers **MUST** state how the support for the initial implementation will be delivered (eg how many staff will be available, and for how many days?), and explain which are included in the price quoted.

6.2.2.3 Suppliers **MUST** outline their expectations of the Trust's responsibilities for supporting the initial implementation.

6.2.2.4 Suppliers **MUST** provide a draft implementation plan, incorporating:

- Clearly defined project milestones that logically progress the completion of the overall project.
- Clearly defined Supplier and Trust responsibilities to meet each milestone, including resourcing, and the overall project timescale.

6.2.2.5 Suppliers **MUST** be willing to develop the approach and plan for implementation in partnership with the Trust, ie to generate a jointly agreed plan to be approved by the Trust's Project Board.

6.2.3 New Ways of Working

6.2.3.1 Suppliers **MUST** outline their expectations of the Trust's responsibilities for the identification and implementation of change.

6.2.3.2 Suppliers **MUST** be willing to support the Trust in defining current ways of working ('as is' processes) and undertaking a comprehensive assessment of opportunities for new ways of working ('to be' processes).

6.2.3.3 Suppliers **MUST** be willing to support the Trust in the development of a change management plan.

6.2.4 Approach to Hardware / Infrastructure delivery

6.2.4.1 The Trust has a policy of sourcing its own hardware. Hence Suppliers **MUST** explain their approach to the provision of any required hardware (eg Is this to be purchased by the Trust? Or is it to be purchased by the Supplier? Or can it be rented? What warranty is provided?).

6.2.5 Installation & Technical Support

6.2.5.1 Suppliers **MUST** explain their approach to installation of hardware and software.

6.2.5.2 Suppliers **MUST** explain their expectations of the Trust's responsibilities for providing any resources, expertise and facilities in order to enable installation and configuration of hardware, system and application software.

6.2.5.3 Suppliers **MUST** support implementation of the system through the provision of technical consultancy services to install application software and also, if required, to configure the hardware and system environment.

6.2.5.4 Suppliers **MUST** supply software development resources, whose deployment is coordinated within the project plan, to provide any local customisation or development of the existing application software which are agreed as part of the Contract.

6.2.6 System Configuration & Setup

6.2.6.1 Suppliers **MUST** explain their approach to system configuration and setup.

6.2.6.2 Suppliers **MUST** outline their expectations of the Trust's responsibilities for system configuration and setup.

6.2.6.3 Suppliers **MUST** support the Trust in understanding how the solution could be used to meet its requirements.

6.2.6.4 Suppliers **SHOULD** provide a configuration template.

6.2.6.5 Suppliers **MUST** provide standard code tables that meet nationally defined minimum standards as part of system configuration and setup.

6.2.7 Interfaces

6.2.7.1 Suppliers **MUST** carefully explain what interfacing is included in their offering, and what is the responsibility of the Trust to provide.

6.2.7.2 Suppliers **MUST** explain their approach to the provision and testing of required interfaces, and **MUST** outline their expectations of the Trust's responsibilities for interfaces.

6.2.7.3 When required, the supplier **MUST** act as the prime contractor for all interface matters and to deal with any third parties directly.

6.2.8 Data Migration

6.2.8.1 No data migration is envisaged during the initial implementation. However if suppliers perceive a need and propose it, they **MUST** explain their approach to the migrating and transformation of data (eg how will the migration be managed and what requirements are there for testing of data migration in advance, during, and immediately after the migration?).

6.2.8.2 Suppliers **MUST** be willing to act as a prime contractor and to deal with any third parties directly, if required.

6.2.8.3 Suppliers **MUST** outline their expectations of the Trust's responsibilities for data migration.

6.2.8.4 Suppliers **MUST** be willing to test as much as required by the Trust in order to enable data to be successfully extracted, transformed and then imported into the EPMA system.

6.2.9 Training

6.2.9.1 Suppliers **MUST** explain their approach to providing user training (e.g. What is the level of training support for the system? On-site? Off-site? How many days? Any external courses involved? Any follow-up training at a later date? What arrangements for training the system administrator? Who pays for travel and accommodation costs?).

6.2.9.2 Suppliers **MUST** outline their expectations of the Trust's responsibilities for training.

6.2.10 Business Continuity & Disaster Recovery

6.2.10.1 Suppliers **MUST** support the Trust in developing robust Business Continuity and Disaster Recovery plans, and the testing and subsequent revision of such plans as necessary.

6.2.11 Documentation

6.2.11.1 Suppliers **MUST** supply appropriate, complete, up to date and sufficient copies of either electronic or paper manuals and other documentation to enable effective operation of the system, and to conduct required support activities.

6.2.11.2 The documentation **MUST** cover all products supplied, including those originating from third parties, and **MUST** include:

- Technical description and specification of hardware
- Hardware operation and maintenance
- Operating System software operation and maintenance
- Application software operation
- System screens, data dictionary or data structures/items
- Codes, reports, and functions for local tailoring and parameterisation
- Technical specification and operating instructions for interfaces to other systems.

6.2.11.3 All documentation **MUST** be updated for any changes made to the system during implementation. Subsequent releases of software **MUST** be accompanied by timely changes to the relevant documentation.

6.2.11.4 Suppliers **MUST** provide appropriate training documentation for system managers/administrators and for end users.

6.2.12 System Go-Live & Verification Period

6.2.12.1 Suppliers **MUST** explain their approach and planning for migration to the Trust's live environment for the new system.

6.2.12.2 Suppliers **MUST** support the Trust throughout the Go-Live period and outline how this will be delivered.

6.2.12.3 Suppliers **MUST** explain their approach to system acceptance and verification.

6.3 Post-Implementation Support

6.3.1 Handover to Operational Management

6.3.1.1 Suppliers **MUST** outline their approach to moving from the implementation phase to an operational phase and how they will support the Trust in making a seamless transition.

6.3.2 Post-Implementation Support & Maintenance

6.3.2.1 Suppliers **MUST** outline what technical support & maintenance arrangements are available (e.g. gold, silver, bronze levels). However, pricing details should not be included in your response here but instead should be separately shown in the Pricing Schedule.

6.3.2.2 Suppliers **MUST** explain their UK-based service organisation and processes (e.g. how many support staff are available? Where are they located? How many can reasonably be expected to cover Sheffield? What is the approach towards

conducting periodic SLA reviews? What escalation routes exist? How are issues resolved?).

6.3.2.3 Suppliers **MUST** explain the expected lifespan of the proposed solution and **MUST** undertake to provide support throughout this period.

6.3.2.4 Suppliers **MUST** explain what replacement equipment and/or software will be provided on loan in the event of being unable to rectify fault within a specified time period.

6.3.2.5 Suppliers **SHOULD** be willing to allow the Trust to continue using the EPMA system, even if support is outsourced to a third party or taken in-house.

6.3.3 Hardware Refresh

6.3.3.1 Suppliers **MUST** outline their expectations for the need for a hardware refresh during the lifespan of the proposed solution.

6.3.4 Product Development

6.3.4.1 Suppliers **MUST** explain the approach to and management of software upgrades which would normally be expected to be part of the contract and state whether these are at no extra charge or incur any additional costs.

6.3.4.2 Suppliers **MUST** explain the approach to and management of minor/major enhancements and state whether these are at no extra charge or incur any additional costs.

6.3.4.3 Suppliers **MUST** detail their future development plans for the system's functionality and, if possible, provide their current roadmap.

6.3.5 Ongoing Training and Product Support

6.3.5.1 Suppliers **MUST** explain their approach to ongoing user training and product support. This should include:

- Ongoing training for new end-users.
- Support and training for replacement system managers/administrators.
- Refresher training for system managers/administrators and for end-users.
- Specific training for major upgrades.

7 COMMERCIAL REQUIREMENTS

7.1 General

7.1.1.1 Suppliers are asked to provide details of:

- Company name
- Registered address
- Company locations
- A brief summary of the company's history and experience in the NHS market for information systems
- A brief summary of the company's core business interests and a percentage breakdown of the revenue these interests generate, including that of the proposed solution.
- Details of any sub-contractual and third party suppliers contributing to the proposed solution

7.1.2 Overview

7.1.2.1 Suppliers **MUST** provide an overview of the proposed solution, including:

- The name of the proposed solution.
- A brief history of the origin and development of the solution.
- A full list of reference sites for the proposed solution, if necessary in an Appendix.
- Size of the current user base.

7.1.2.2 Suppliers **MUST** outline examples of how the solution has provided benefits/efficiency savings within NHS organisations and how those benefits have been realised.

7.1.2.3 Suppliers **MUST** provide details of any areas of the proposed solution which they would like to develop in partnership with the Trust and if there are any incentives associated with this potential partnership.

7.1.3 Software Licences

7.1.3.1 Suppliers **MUST** explain the range of licences required as part of this proposal (e.g. How many licences will be needed? For application software? For operating systems?).

7.1.3.2 Suppliers **SHOULD** offer a Trust-wide (site) license for the proposed solution.

7.1.3.3 Suppliers **SHOULD** offer a perpetual license for the proposed solution.

7.1.4 Management & Maintenance of Contract

7.1.4.1 Suppliers are asked to provide a single point of contact who will be responsible for the delivery and maintenance of the contract(s) for the lifetime of the solution.

7.1.4.2 Suppliers **MUST** agree a process with the Trust that will enable contractual changes to be appropriately considered, and where agreed incorporated into the contract(s).

7.1.5 End of Contract Support

7.1.5.1 The Supplier **MUST** undertake to support the Trust to migrate from their proposed solution to an alternative solution at the end of the contract(s) (ie in the event that the new contract(s) are not renewed with the same supplier) by providing data extract(s) to a pre-defined and documented specification. Suppliers **MUST** outline their approach to this.

7.1.5.2 The Supplier **MUST** maintain their data extract functionality in line with system developments.

7.1.5.3 The Supplier **SHOULD** provide documentation to allow transformation of the data following extract.

7.1.6 Extension to Contract Term

7.1.6.1 Suppliers **MUST** explain their approach to extension of contract(s) at the end of the contract period.

7.2 Invitation to Tender (ITT)

6.5.1 The Trust reserves the right not to award any contract(s).

6.5.2 We envisage that any contract(s) awarded will be in accordance with the standard NHS Terms and Conditions for the purchase of systems (SYSCON) and support for systems (SSCON). The format of both contracts can be provided electronically on written request to the Authority's Point of Contact (see Section 7.6 below). The Authority reserves the right to utilise a replacement equivalent national contract, if the standard NHS Terms and Conditions for the purchase of systems (SYSCON) and support for systems (SSCON) are superseded during the procurement process.

6.5.3 The main terms and conditions of these contracts will be non-negotiable, although the Schedules attached to them will be subject to negotiation and customised to meet the specific needs of the Trust and the Preferred Supplier.

7.3 Response to OBS Requirements

7.3.1 Suppliers **MUST** provide a specific response to each Business, Functional, System, Support and Commercial Requirement documented within this OBS.

7.3.2 Where the words '**MUST**' or **'MUST NOT'** are used, any failure to comply will result in the Supplier being excluded from any further involvement in the procurement process.

7.3.3 Each response **MUST** be embedded within the Schedule following each paragraph and **MUST** be presented in ***Bold Italic Script using Arial 10 Point font.***

7.3.4 Each response **MUST** specify either ***"Compliant", "Not Compliant", or "Partially Compliant"***, validating where necessary with substantive evidence.

7.3.5 Suppliers may add explanatory text or additional information, but **MUST** do so in the case of a "***Partially Compliant***" response.

7.4 Evaluation Criteria

7.4.1 The Tenders received will be appraised in accordance with the Directive and the award of any contract(s) will be based on the most economically advantageous tender taking into account the following award criteria:

Evaluation Criteria	Weighting	Score (0-10)	Total (Weighting x Score)
Fit with STH Business Vision of how System Maturity and Benefits Realisation will be achieved (See Section 2.8).	5%		
Functional Requirements – Compliance with Specification	30%		
User Acceptability - Demonstrations to Staff	20%		
Technical Requirements	20%		
Support Requirements	20%		
Commercial Requirements	5%		
POTENTIAL MAXIMUM TOTAL	100%		

The score assigned to each evaluation criteria will be the average weighted score

relating to each of the requirements set out in this specification. Each individual requirement is identifiable by the use of '**MUST**' for mandatory requirements and '**SHOULD**' for desirable requirements. If a mandatory requirement is not currently met, the supplier must outline how this functionality will be developed. Suppliers are advised to provide sufficient information to allow their response to each individual requirement to be objectively assessed.

7.4.2 Cost Benefit. Financial evaluations will be undertaken on both affordability and value for money. In respect of value for money, financial costs will be subjected to a discounted cash flow assessment over the life of the project, using the applicable discount rate advised by the Department of Health. The net present costs from this calculation will then be divided by the weighted score from the evaluation shown above to calculate a cost benefit per point.

7.5 Downselection

7.5.1 In the event that some suppliers do not meet the Trust's requirements in full, the Trust reserves the right to hold two rounds of evaluation.

7.5.2 The first round will employ the Evaluation Criteria as shown above but omitting user acceptability and demonstrations to staff. After this first round, some suppliers may be excluded from any further involvement in the procurement process.

7.5.3 Those Suppliers remaining will then be taken forward into the second round of evaluation, which will include user acceptability and demonstrations to staff.

7.5.4 Given the differences between these two rounds, the Evaluation Criteria will be adjusted so that they always total 100% of the final score.

7.6 Point of Contact

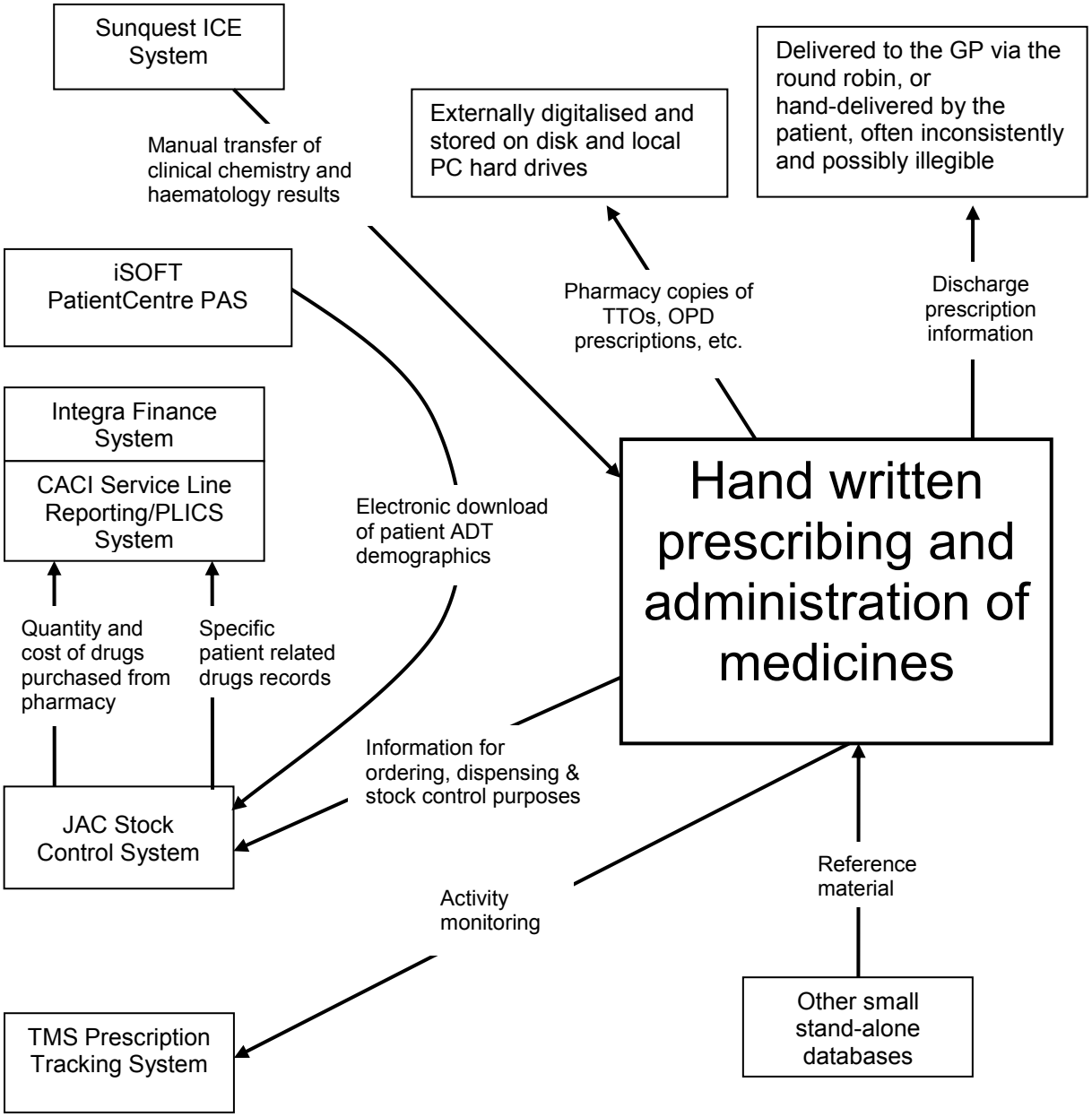
7.6.1 All queries must be addressed to the sole point of contact for potential suppliers, who is:

APPENDIX A – GLOSSARY

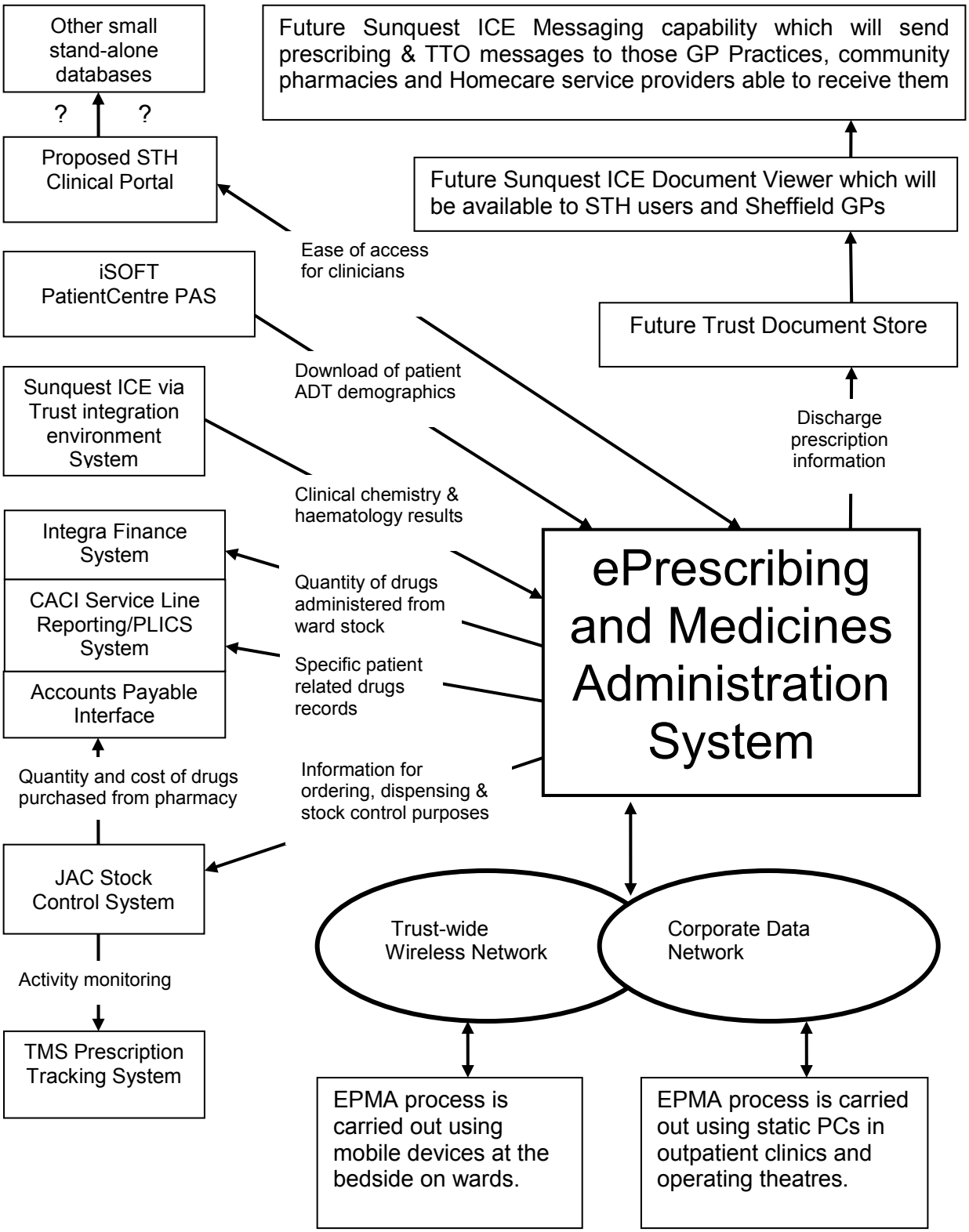
BMI	Body Mass Index
BSA	Body Surface Area
CCDH	Charles Clifford Dental Hospital
CfH	NHS Connecting For Health
EPMA	Electronic Prescribing and Medicines Administration
EPR	Electronic Patient Record
FOI	Freedom of Information
GUM	Genito-Urinary Medicine
JW	Jessop Wing
ITT	Invitation To Tender
MHRA	Medicines and Healthcare Products Regulatory Agency
NGH	Northern General Hospital
NPfIT	NHS National Programme for Information Technology
NPSA	National Patient Safety Agency
OBS	Output Based Specification
OJEU	Office of the Journal of the European Union

PAS	Patient Administration System
PLICS	Patient Level Information Costing System
RHH	Royal Hallamshire Hospital
TTH	(Discharge drugs) To Take Home
TTO	(Discharge drugs) To Take Out
SLA	Service Level Agreement
SQL	Structured Query Language
STEP	NHS Standards Enforcement in Procurement
STH	Sheffield Teaching Hospitals
WPH	Weston Park Hospital

APPENDIX B – DIAGRAM OF CURRENT SYSTEMS ARCHITECTURE



APPENDIX C – DIAGRAM OF FUTURE SYSTEMS ARCHITECTURE



APPENDIX D – STH TECHNICAL QUESTIONNAIRE

Sheffield Teaching Hospitals NHS Foundation Trust (STH)
IT Technical Standards and Questionnaire for Networked Devices or Systems
VERSION 2.5

The purpose of this questionnaire and the associated technical sign-off process is to ensure that the proposed system is compatible with the Trust's IT infrastructure and that the system will be adequately maintained and supported. Part 1 of this questionnaire (and Part 10 if appropriate) should be completed by the user department and Part 2 and the relevant sections of Parts 3 to 9 of the questionnaire should be completed by the system supplier. Part 10 must be completed for imaging devices or systems.

This questionnaire should not be used with "Trust standard equipment or software" – i.e. a PC, laptop or printer or Microsoft software purchased via the Trust IT Department. Details of Trust standards for PCs and client or server software are given in Parts 3 to 9. "Non-standard" networked devices or application software refers to any device such as a PC, imaging system, laboratory analyser, clinical or administrative software application etc not purchased via the Trust IT Department.

Terminology

The following key words are to be interpreted as described in Internet Engineering Task Force RFC 2119.
MUST: This word, or the terms "REQUIRED" or "SHALL", mean that the definition is an absolute requirement of the specification.
MUST NOT: This phrase, or the phrase "SHALL NOT", mean that the definition is an absolute prohibition of the specification.
SHOULD: This word, or the adjective "RECOMMENDED", mean that there may exist valid reasons in particular circumstances to ignore a particular item, but the full implications MUST be understood and carefully weighed before choosing a different course.
SHOULD NOT: This phrase, or the phrase "NOT RECOMMENDED" mean that there may exist valid reasons in particular circumstances when the particular behaviour is acceptable or even useful, but the full implications SHOULD be understood and the case carefully weighed before implementing any behaviour described with this label.

Where the system does not meet requirements given as "**SHOULD**" or "**SHOULD NOT**", then the supplier **MUST** give the reasons.

Please note that until the questionnaire has been completed and the details agreed with the Trust IT Department, then the system will not be connected to the network and application software will not be installed.

When completing the questionnaire, please allow boxes to expand as required.

PART 1. TO BE COMPLETED BY USER DEPARTMENT
1.1 Product name or project title
1.2 Trust department and contact
1.3 Number and location of users

PART 2. TO BE COMPLETED BY SUPPLIER

2.1 Supplier details	
Supplier Name	
Supplier Address	
Supplier contact details (name, telephone number, e-mail)	

2.2 Date and contact details	
Date that this form was completed	
Contact details of person completing this form (name, telephone number, e-mail)	

2.3 Outline specifications of proposed system

2.3.1	Please provide an overview of the basic functionality of the proposed system.
2.3.2	Are specific (IT related) options included in the proposal? If so please provide details.
2.3.3	Are significant (IT related) changes or enhancements to the product/s or system expected within the next year? If so please provide details.
2.3.4	Are third party companies or subcontractors required either for implementation or for support of the system? If so please provide details.
2.3.5	Please summarise the (IT related) tasks associated with implementing the system. Further details of installation tasks associated with PCs, servers or other networked devices should be given under the appropriate sections below.
2.3.6	Does the proposed system include the use of portable devices such as laptop PCs, notebook PCs, PDAs etc? If so, please provide details of devices under Section 3.1 and please give details of data encryption processes under Section 8.2

PARTS 3 TO 10 – RELEVANT SECTIONS TO BE COMPLETED BY SUPPLIER

PART 3. "Client" computer hardware and software

Please complete this section if any hardware or software relating to PCs, laptops, netbooks or other types of computers will be provided. This includes any device or equipment that incorporates an operating system capable of supporting communication via the Trust cabled or wireless data network – for example wireless networked hand held devices or medical equipment that incorporates embedded PC hardware.

3.1 Hardware and software details

PLEASE REFER TO SECTIONS 3.2 TO 3.6 AND ALSO COMPLETE SECTIONS 3.7 and 3.8

3.1.1 Hardware: Please give details including model numbers and quantities. Please provide data sheets or links to web sites where data sheets can be obtained. Note that the IT Department can only support PCs purchased via the IT Department. Any other PC **MUST** be covered by a maintenance and support contract in association with the system to which it connects.
3.1.2 Software: Please give details of PC client software requirements. (Database and data storage requirements should be given under Part 5.)
3.1.3 Please give details of any other PC related installation requirements.
3.1.4 Please confirm that support and maintenance arrangements for any items listed above are fully detailed in Part 9.

3.2 Trust requirements for standard and non-standard networked devices

3.2.1 Requirements for non-standard networked devices

Sheffield Teaching Hospitals uses Microsoft Active Directory for network user management and for management of all devices that run Microsoft Windows.

The Trust IT Department does not provide support for any devices other than PCs or other products that use the Microsoft Windows operating system. Suppliers **MUST** provide full support for systems or devices that use other operating systems such as Linux (where this support **MUST** include patching and keeping up to date against security vulnerabilities).

3.2.2 Minimum requirements for any networked device or system that incorporates the Windows operating system:

EITHER:
The device **MUST**, from a network security perspective, be isolated from the network by use of firewall processes that are agreed in advance with the Trust IT Department;

OR:

a) The device **MUST** be made part of the Trust Active Directory Domain;
b) And **MUST** at present run the Windows XP operating system with Service Pack 3;
c) And operating system upgrades **MUST** be provided as part of the support contract;
d) And the Windows operating system **MUST** become part of the standard Trust patching and upgrading process – where it is planned to commence the programme to migrate to Windows 7 in the first quarter of 2012.
e) And the device **MUST** use the Trust standard anti-virus software and anti-virus software updating process;

3.3 Trust Desktop Computer Standards

3.3.1 STH has over 7,000 desktop PCs connected to a Microsoft Windows Active Directory enabled Local Area Network. The outline current specification is:

- (Minimum) Intel P4 2.8Ghz processor
- 2 Gb RAM
- 80Gb HDD
- Optical Mouse
- Smart card Reader keyboard

- 17" TFT flat screen monitor.

3.3.2 The Trust has standardised on Windows XP with SP3. Microsoft Vista is not being considered at present but future plans include the deployment of Windows 7. Standard desktop software is Internet Explorer v7, Microsoft SCCM, Snow Software Asset Management and Sophos Enterprise Security and Control. Microsoft Office will be deployed when a general productivity package is required but the IT Department **MUST** be made aware of any dependency on Microsoft Office.

3.3.3 Networked PCs will normally be purchased through the IT Department. PCs not purchased through the IT Department will not be supported by the IT Department. Arrangements for the support for any PC not purchased via the IT Department **MUST** be made with the IT Department and confirmed in writing. The PC will not be connected to the network before these arrangements have been agreed with the IT Department.

3.3.4 Any PC connected to the STH network that uses the Microsoft Windows operating system **MUST** use a supported version of the Windows operating system. The Trust normally applies Microsoft updates on a monthly basis.

3.3.5 All new PCs or laptop computers are installed using the Microsoft SCCM OS deployment feature. Microsoft Operating System updates and service packs are automatically deployed to desktops.

3.3.6 Note that if a PC on the network develops a fault, then the Trust IT Department may re-install the default Trust PC image. Any information stored on the PC would then be overwritten.

3.3.7 **Automated Deployment of application software.** Unless agreed in advance with the Trust IT Department, all software requiring installation to a client PC **MUST** be capable of installation in a fully automated and non-interactive manner by systems management software such as Microsoft SCCM. The automated installation **SHOULD** have the capability of being pre-configured with all essential settings the application requires prior to use. Suppliers **SHOULD** fully support deployment in this manner.

3.3.8 **Application Virtualisation.** In line with industry trends the Trust is planning to implement a Virtual Desktop Infrastructure (VDI) in association with all PCs on the Trust network. The Trust will be increasingly deploying client software using application virtualisation technologies from Microsoft (such as App V). It is planned that the migration to a virtual desktop environment will take place during 2012 and 2013. Suppliers will not be expected to support or assist in the application virtualisation process but **SHOULD** commit that support will be delivered for applications deployed in this manner and that the use of application virtualisation will not be used as justification for declining support requests.

3.3.9 **Remote Desktop Services.** The Trust makes extensive use of Server Based Computing (Remote Desktop Services). Client applications **SHOULD** be both compatible with a multi-user environment and supported when installed on RDS servers (32 and 64 bit). Where this is not possible due to driver issues or other dependencies, then this **MUST** be clearly stated below under 3.7.5.

3.3.10 The following table provides a list of Trust requirements for client software. If the PC software environment does not meet the "Expected" requirements, then the proposed software **MUST** be agreed in advance with the Trust IT Department.

Software	**Expected**	**Desirable**
Operating System	Windows XP SP3 Windows 7 Professional Windows Server 2008 R2 Remote Desktop Services	Microsoft Virtual Desktop Infrastructure (VDI)
Web Browser	Microsoft Internet Explorer 7.0	*Microsoft Internet Explorer 8.0, 9.0*
Installation process	Silent	MSI
Deployment	Microsoft System Centre Configuration Manger 2007 R2	**UNDER REVIEW**
Compatibility	**Expected**	**Desirable**
Microsoft Office	Microsoft Office 2003	Microsoft Office 2010

	Service Pack 3	
Future Windows Upgrade	Support new version of Windows within 1 year of release	Support new version of Windows with 6 months

3.4 Trust Anti-virus software

At present, the Trust uses Sophos Enterprise Security and Control anti-virus software, although the Trust reserves the right to change to different anti-virus software in the future. The Trust deploys anti-virus software and anti-virus software upgrades via automatic processes. Any PC on the network **MUST** either have automatic processes in place to ensure that approved anti-virus software is properly updated on a daily basis **or MUST** be protected by a process agreed in advance with the Trust IT Department. Suppliers of applications running on Trust PCs **MUST** provide written confirmation that their application would not be affected by the Trust anti-virus software. If there is a justifiable reason for not using Trust anti-virus software and alternative protection processes such as a firewall are not used, then the supplier **MUST** arrange and support installation, license renewals and all other processes relating to the anti-virus package.

The Trust is not able to guarantee that malicious network-borne exploits such as viruses or worms will never be present on the network. Where equipment is compromised by such exploits, then suppliers **MUST** be prepared to support the equipment in the same way as for hardware failure. Suppliers **MUST** be prepared to offer a support contract that would cover costs associated with restoring their equipment in this situation in the same was as for hardware failure. The support contract **SHOULD** provide clarification of this.

3.5 Special purpose interfaces

If a PC has special purpose interfaces installed in it, then there **MUST** be a detailed written agreement in place covering its use and support before that PC would be connected to the STH network.

3.6 PCs and PC based software used with medical equipment

Any PC that is used as part of clinically related equipment (such as for physiological monitoring, imaging or laboratory analysis) effectively becomes part of a clinical environment. This means that any fault associated with the PC or the application running on it could have an impact on the test results or the treatment involved. If such a PC were connected to the STH network, then there would be a risk that faults or computer viruses associated with the network could impact on the reliable running of the PC. This would then impact on maintenance arrangements, supplier liability and Trust liability in any clinical or legal situation that arises. Hence any arrangement to connect a PC in this situation to the Trust network **MUST** be agreed in writing in advance with the company involved, the Trust Informatics Department, and where appropriate, the Trust Bio-Medical Equipment Department and any other Trust department involved.

3.7 Trust requirements for client software and for non-standard networked devices

In each case, please provide information as requested. Please confirm compliance with specific requirements and give full details of any non-compliant aspects of the system.

3.7.1	Please provide details of any aspects of the product or system that are not compatible with the Trust software update and patching processes and anti-virus software as detailed in Sections 3.2 to 3.4.
3.7.2	Please state if there is a warranted environment with any requirement to protect the application from operating system patches or updates.
3.7.3	Please state if the system has any known compatibility issues with other PC applications – for example Microsoft Office.
3.7.4	If an office package is required for the operation of the System, then the supplier **SHOULD** offer alternatives to the use of Microsoft Office and **MUST** highlight the dependency to the IT

	Department.
3.7.5	The Trust may choose to move to a "virtual desktop" environment using thin client technology. Please specify if there would be any issues with deploying the System in such an environment.
3.7.6	For applications on standard Trust PCs, the client software **MUST** work under standard Windows user privileges.
3.7.7	For applications on standard Trust PCs, the client software **MUST NOT** require a lowering or modification of Active Directory global security rights.
3.7.8	For applications that may be installed on portable devices (e.g. laptop computer or PDA), the client software **MUST** function correctly on an encrypted device using technologies such as McAfee SafeBoot, Sophos SafeGuard or Microsoft Bitlocker.
3.7.9	If the client computer has an encrypted hard disk drive then the client software **MUST NOT** store data on an unencrypted volume.
3.7.10	For applications on standard Trust PCs, the client software **MUST NOT** require anti-virus to be disabled at any time – including for installation.
3.7.11	For applications on standard Trust PCs, then it **SHOULD** be possible to support Microsoft updates within 1 month of release. If relevant, please give details of the procedures for supporting Microsoft updates and state if there is any reason why the Trust would not be able to apply Microsoft updates within 1 month of release.
3.7.12	It **SHOULD** be possible to support .NET and JAVA latest minor versions within 6 months of release. If relevant, please give details of the procedures for supporting .NET and JAVA updates and state if there is any reason why the Trust would not be able to implement latest minor versions within 6 months of release.
3.7.13	For applications on standard Trust PCs, unless agreed in advance with the Trust IT Department, the client software **MUST** be provided with an installation package that allows unattended installation and update, and where this installation package will function correctly using standard user privileges on the client device. It **SHOULD** be possible to deploy all new applications using Microsoft System Center Configuration Manager. Please provide details of the installation package that will be provided.
3.7.14	When the Trust Virtual Desktop Infrastructure (VDI) is fully in place (i.e. end of 2013), then any devices connected to ports on a PC (Serial, USB or Firewire) **MUST** be able to function with the Trust VDI infrastructure and it **MUST** be possible to automate installation and management of any associated software.
3.7.15	For applications that are designed to run on PDAs or mobile devices, the supplier **MUST** provide details of the procedures associated with software upgrade.
3.7.16	For applications on standard Trust PCs, the installation **MUST** register correctly with Add/Remove Programs

3.7.17	For applications on standard Trust PCs, it **MUST** be possible for any post-installation configuration to be applied remotely via centrally managed processes.
3.7.18	The supplier **SHOULD** indicate how often the application software is upgraded and provide details of how upgrades are applied.
3.7.19	For applications on standard Trust PCs, it **MUST** be possible to fully uninstall the client software silently without the requirement for any manual clean up.
3.7.20	For applications on standard Trust PCs, activation of client software **MUST NOT** require the use of hardware dongles (e.g. parallel port or USB devices). Please give details if any kind of activation dongle is required with the client software.
3.7.21	For applications on standard Trust PCs, the application **MUST NOT** require individual clients to be activated via Internet based servers. Please give details if any form of activation is required via the Internet.
3.7.22	Where appropriate, user Data Settings **SHOULD** be stored in either the registry under HKEY_Current_User, %AppData%\Roaming\ or a central database.
3.7.23	Legacy NetBIOS **MUST NOT** be required for name resolution.
3.7.24	Please give details of any other aspect of the proposed system that is not compatible with the Trust's client computer standards described in Section 3.1 to 3.6 and not already covered in Section 3.7

3.8 Trust requirements for user access to applications

In each case, please provide information as requested. Please confirm compliance with specific requirements and give full details of any non-compliant aspects of the system.

3.8.1	The supplier **MUST** provide details of how user access is controlled. The system **SHOULD** have the ability to specify password formats (minimum lengths etc) and force periodic changes. System administrators **MUST** be able to deactivate user accounts and reset passwords. Users **SHOULD** be able to set and reset their own passwords. Failed login attempts **SHOULD** be logged and repeated failures **SHOULD** suspend the account.
3.8.2	Passwords **MUST NOT** be displayed on screen.
3.8.3	The system **MUST** allow authorised administrator(s) – (i.e. System Manager or other designated 'Super User') – and no other user – to create new User Names and allocate or redefine security access profiles (i.e. levels of user access).
3.8.4	The system **SHOULD** integrate with the Trust Microsoft Active Directory environment so that the Active Directory user details and password are used when accessing the System.

3.8.5	If not using Active Directory passwords, then the password **MUST** be stored in an encrypted form.
3.8.6	It **MUST** be possible (within the system or audit trails) to uniquely identify all users of the System.

PART 4. Server based software and associated hardware

Please complete this section if any server related hardware or software will be provided as part of this system.

4.1 Trust server standards

4.1.1 Most of the Trust IT systems run under the Windows operating system. UNIX is only supported for a small number of large corporate systems.

4.1.2 All Windows Servers are incorporated into a Trust-wide Active Directory environment. This Active Directory environment is the default environment for controlling user access to networked PCs and Windows based applications.

4.1.3 The Trust uses VMware for all new Windows Server installations. Multiple VMware data-centres exist, each providing load-balancing and high-availability features. Any proposed server based installation **SHOULD** be installed and be fully supported by the supplier when run under the Trust's VMware environment. If it is proposed not to use the Trust's VMware environment, then the proposed server configuration **MUST** be agreed in advance with the Trust IT Department.

4.1.4 The Trust has found that it is not always practicable to support the concept of implementing a dedicated virtual Windows Server environment for each application or for each system supplier. The Trust expects that all new software applications **SHOULD** be capable of running in a shared environment. New applications **SHOULD** use the shared Microsoft SQL Server (or possibly MySQL), IIS and file-storage environments.

4.1.5 Where a "Training Environment" is implemented, then this **SHOULD** be capable of running on the same server environment as the "Live Environment". The Trust implements separate shared virtual servers for "Test Environments". It **SHOULD** be possible easily to re-install Test Environments as required.

4.1.6 Remote access to specific server environments is normally provided via the use of Microsoft Remote Desktop Protocol. It **SHOULD** be possible for applications to be supported via the NHS private network "N3". The Trust also uses Internet based remote access VPN links that require the use of strong authentication tokens, but suppliers **MUST** provide reasons why it would not be possible to use N3.

4.1.7 The Trust will normally endeavour to apply critical patches to both shared and dedicated platforms within one month of release, following suitable testing in a test environment. The Trust will also endeavour to apply service packs to the same platforms within six months of release, following suitable testing in a test environment. Suppliers **MUST** be able to support all such patches and service packs either within the above timescales or within timescales agreed in advance with the Trust IT Department in order for the Trust to maintain the security and stability of all desktop clients and shared environments.

4.1.8 In order to guarantee the availability of security hot-fixes, suppliers **MUST** ensure their system is capable of operating correctly on a platform which is current and supported. For Microsoft products this requires operating system and applications, such as SQL Server, to be within Microsoft's mainstream or extended supported phases

4.1.9 The following table provides a list of Trust requirements for software installed in a Server environment. If the Server software environment does not meet the "Expected" requirements, then the proposed software **MUST** be agreed in advance with the Trust IT Department.

Software	Expected	Desirable
Operating System	Windows Server 2008 x64 Service Pack 2	Windows Server 2008 R2 Service Pack 1

4.2 Server details

4.2.1	Please give details of servers including model numbers and quantities. Please provide data sheets or links to web sites where data sheets can be obtained. Please give details of the expected server hardware specification required to run the system effectively.
4.2.2	Please give details of server software requirement. Please state which server operating system (OS) is required. (Note that database and data storage requirements should be given under PART 5.)
4.2.3	Please give details of any other server related installation requirements.

4.3 Trust requirements for server environments

In each case, please provide information as requested. Please confirm compliance with specific requirements and give full details of any non-compliant aspects of the system.

4.3.1	The system **MUST** be compatible with the Trust's server standards described in Section 4.1 *'Trust Server Standards'*. Please state any discrepancies between the requirements of the proposed system and the Trust server standards as in 4.1.
4.3.2	Please give details of any Warranted Environment and provide details of any requirement to protect the operating system from patches or updates.
4.3.3	Please give details of any known compatibility issues with other server applications – for example antivirus software.
4.3.4	The system **SHOULD** have the ability to use a current Microsoft main stream supported operating system or application such as Windows.
4.3.5	Please give details of the extent of the commitment to ensure compatibility with future OS releases or service packs and state the timescale within which any necessary product upgrade would be made.
4.3.6	Wherever possible shared servers and shared database environments **SHOULD** be used. Please state if the system will require a dedicated OS instance or if any server components could use shared OS instances or a shared web server. If a dedicated instance is required, then the reasons why this is necessary **MUST** be provided here.
4.3.7	The Trust uses VMware virtual servers. It **MUST EITHER** be possible for any server or database components of the system to be run in a VMware virtual environment **OR** the proposed configuration **MUST** be agreed in advance with the Trust IT Department. Please give details of any issues relating to server virtualisation.
4.3.8	When using VMware, then the Supplier **MUST** be able to support the System when running in a VMware environment. This support **SHOULD** include the ability to load test the System when running in a VMware environment. It **SHOULD** be possible to simulate full load on a test environment. Please give details of any issues relating to the support of the system when

	running in a VMware environment.
4.3.9	The Supplier **SHOULD** be able to support the major version of VMware within 6 months of release and VMware security patches within 1 month of release. Please provide details of the arrangements for supporting a VMware environment
4.3.10	Any software installed on a server **MUST NOT** require anti-virus to be disabled at any time including for installation unless agreed in advance with the Trust IT Department.

4.4 Interfacing Standards

In each case, please provide information as requested. Please confirm compliance with specific requirements and give full details of any non-compliant aspects of the system.

4.4.1	The Trust uses an 'in-house' Microsoft '.NET' based integration architecture. This environment is based round the use of a central SQL Server database that is updated via transactions from the Patient Administration System (PAS). This in-house environment is used to provide interfaces between applications for all new developments and also provides interfaces to numerous departmental applications. Please give details of all interfaces associated with the proposed system.
4.4.2	New developments **SHOULD** use the HL7 V2 or V3 interface messaging standard. However, many of the existing interfaces do not use HL7. The Trust would be able pragmatically to consider interfacing standards other than HL7 if necessary. In particular, interim XML based interfaces may be considered if the relevant HL7 V3 standard is not available. Please give details of interface standards associated with the proposed system.
4.4.3	The Trust anticipates adopting the NHS Interoperability Toolkit (ITK) as the basis for all future interface developments. The ITK is an NHS led initiative that provides a series of standards for local integration. This includes providing system vendors with a target specification to build to, as well as providing a lightweight but rigorous conformance process which requires proof of compliance. The ITK also provides a governance framework for local NHS organisations to enact when using these standards. ITK provides a specification for the essential minimum necessary to ensure interoperability. This means that interfaces are specified in detail so that interoperability is governed by application purpose and function, as opposed to being rendered incompatible by proprietary interfaces. The Supplier **MUST** indicate the extent of their commitment to implement interfaces compatible with the NHS ITK.

4.5 NHS National Standards

In each case, please provide information as requested. Please confirm compliance with specific requirements and give full details of any non-compliant aspects of the system.

4.5.1	In future years some Trust systems may be migrated under the NHS national procurement arrangements. The Supplier **SHOULD** take NHS national developments into account.
4.5.2	Suppliers **SHOULD** be familiar with the NHS data standards (located at http://www.isb.nhs.uk/library/all) and **SHOULD** comply where appropriate. The Trust will

	detail specific requirements where relevant in other associated system specification documents.
4.5.3	For developments where this would be relevant, then suppliers will be expected to follow the NHS Standards Enforcement in Procurement (STEP) process. Where the STEP process is relevant, then suppliers **MUST** complete, as indicated by the Trust, either the on-line NHS IT Standards Questionnaire or the Trust extract from the NHS IT Standards Questionnaire. Information about STEP, including the supplier registration process, can be found at http://www.connectingforhealth.nhs.uk/industry/step. The Supplier should contact the Trust in the first instance in relation to any queries about the questionnaire or its use in this procurement. (Note that suppliers are able to create "default" STEP Questionnaire responses that can be used or modified to suit procurements from other NHS organisations.)

PART 5. Database and data storage

Please complete this section if there are any database or data storage requirements associated with the system.

5.1 Trust database and data storage standards

5.1.1 The Trust uses Microsoft SQL Server for most database applications – although MySQL is also used for some applications. Individual applications are assigned to one or more of the 2008 R2-based shared SQL database environments. Full SQL Server environment administration rights are not provided to suppliers. The Trust is unable to support any database environment other than Microsoft SQL Server or MySQL. For any proposal to implement a system that uses a database other than Microsoft SQL Server or MySQL then the details **MUST** be agreed in advance with the Trust IT Department.

5.1.2 The Trust uses CommVault Simpana for data management, including backup & recovery. This software will be installed on servers as appropriate. The Trust does not support any other backup & recovery software process. The Trust undertakes standard daily backups and stores a number of copies enabling recovery from multiple points in time. If the proposed system is unable to use the Trust backup process, then the details **MUST** be agreed in advance with the Trust IT Department.

5.1.3 The Trust uses the Caringo CAStor-based Dell DX object storage platform for large volume unstructured data. Any requirement for non-database storage exceeding 50GB over the lifetime of the system **SHOULD** use the DX object store through integration with its native API, or through a third-party ISV integration solution. If the proposed system is unable to use the Trust object storage platform, then the details **MUST** be agreed in advance with the Trust IT Department.

5.2 Database and data storage details

5.2.1	Please give details of any server database requirements. If a relational database is used then please specify which is required or supported. Please give database version numbers that are supported.
5.2.2	Please state if the system will be used to store Personal Identifiable Data. Please give an outline of what data is stored in association with the product or system. Please give data storage sizing requirements for the product. For example please quantify storage space required for year 1,2, 3 etc.

5.3 Trust database requirements

In each case, please provide information as requested. Please confirm compliance with specific requirements and give full details of any non-compliant aspects of the system.

5.3.1	The System's internal database **MUST** be compatible with the Trust's database standards as described in Section 5.1 *'Trust database and data storage standards'*.

5.3.2	The System's internal database **SHOULD** be based on Microsoft SQL Server (although the use of MySQL may be considered). The Trust uses Microsoft SQL Server. Will the database run as part of a shared Microsoft SQL Server installation? If so, with which versions of Microsoft SQL Server (2008 R2 is preferred)?
5.3.3	Where Microsoft SQL Server is used then the system **SHOULD** run on a shared server.
5.3.4	The System's internal database structure **SHOULD** be ODBC compliant.
5.3.5	For systems holding patient data, it **MUST** be possible for the Trust to extract any data item that has been entered by the Trust from any database table for transfer to the Trust's clinical portal. This would typically be carried out by running a report overnight or by a process based on database replication. The structure, format and contents of the System's data items and database tables or report files **MUST** be provided in sufficient detail to facilitate this data extract.
5.3.6	The supplier **SHOULD** be willing to agree to facilitate exporting selective data in a format suitable for long term use at the final termination of the support contract.

5.4 Backup and recovery procedures

In each case, please provide information as requested. Please confirm compliance with specific requirements and give full details of any non-compliant aspects of the system.

5.4.1	The system **MUST** incorporate full backup and restore facilities. Audit trails for backup and restore activities **MUST** be easily accessible, for inspection purposes. The backup and restore facilities **MUST** be compatible with the Trust's backup standards described in Section 5.1 '*Trust database and data storage standards'*. Please provide full details of the recommended backup and restore processes. Please provide details of recommended data archiving policies and methods.
5.4.2	The system **SHOULD** provide the facility to carry out backups with the system in full functional and operational use. Please state how this is done and what effect this has on the system, data integrity and performance.
5.4.3	The process for checking and ensuring the successful completion of an unattended backup **SHOULD** be automated, with errors or exceptions reported to the appropriate Trust IT Support staff. Please provide details of the recommended process.
5.4.4	Please provide details of any automated actions the proposed backup processes will employ when a fault or error in performing the backup occurs.
5.4.5	If data will be archived or copied to any other device than central Trust data stores, then please provide full details. Please state what security measures will be taken to ensure that the process meets NHS information governance requirements. For example, all removable media including USB memory sticks, CD/DVDs etc **MUST** be encrypted. Please give details of encryption processes.
5.4.6	In the event of disk or other storage failure, the supplier **MUST** allow for the Trust to destroy

the unit or cleanse in accordance with its own Information Governance procedures.

PART 6. Printers

Please complete this section if the system will interact in any way with printers.

6.1 Trust printer standards

6.1.1 The Trust has a contract with Xerox to provide a managed service in relation to standard printers used in the Trust. This contract includes the provision of Xerox workgroup multifunction printer / copiers. Xerox do not support special purpose printers such as barcode label printers or printers connected to laboratory or medical devices – and such printers are supported by alternative procedures.

6.1.2 The Trust uses Windows Print Servers where appropriate.

6.2 Trust printer requirements

In each case, please provide information as requested. Please confirm compliance with specific requirements and give full details of any non-compliant aspects of the system.

6.2.1	The Supplier's offering **MUST** be compatible with the Trust's printer standards described in Section 6.1 '*Trust printer standards'*.
6.2.2	For applications running on standard Trust PCs, then the application or system **MUST** be able to support standard Windows printers.
6.2.3	The system **SHOULD** use built-in Microsoft Print Drivers where possible.
6.2.4	The system **MUST** allow any print job to be aborted without adversely affecting the system.

PART 7. Network standards

Please complete this section if the system will connect in any way to the Trust cabled or wireless network.

7.1 Trust network standards

7.1.1 The Trust's network is based largely round the use of Cisco components. The core network at each campus consists of 2 meshed Cisco VSS enabled 6509 pairs. The edge devices are layer 2 switches which are mainly (80%) Cisco devices and migration to a full Cisco environment is in progress. The edge switches are 75% 1 Gbps to the desktop with the remainder at 100 Mbps. The Trust is over time implementing resilient links to the edge switches by the use of geographically separated optical fibre links from the edge device to the network core. Priority is being given to critical areas such as imaging or laboratories.

7.1.2 The Trust has two main campuses. The Central Campus comprises Royal Hallamshire Hospital (RHH), Jessop Wing (JW), Charles Clifford Dental Hospital (CCDH) and Weston Park Hospital (WPH). The Northern Campus is the Northern General Hospital (NGH). Within each campus, buildings are linked together with private optical cables and the gigabit / 10 gigabit backbone network structure. There are two geographically separated leased gigabit data circuits between the two main campuses. The Trust has adopted a policy of using single servers or server clusters for critical applications such as imaging or laboratories. These servers or clusters will be housed at one site for use by all sites in the Trust. In some cases, the backup server for an application is housed at the other campus. There are no cross site fibre channel circuits but the Trust is now migrating to the use of iSCSI based SANs. The Ethernet cross site bandwidth is adequate to support specific implementations of cross-site

replication but care is needed with the associated design. There are large SAN environments on both campuses. Future strategy includes the implementation of full replication between these environments.

7.1.3 The Trust has two dedicated computer rooms on each campus. Monomode fibre-optic cables are available between the computer rooms on a given campus. Hence the use of these different computer rooms is arranged wherever possible to provide resilience. One computer room is almost full, and another computer room is at present being upgraded. Hence the choice of computer room is sometimes constrained.

7.1.4 The Trust's data network is an integral part of the NHS private network "N3". Each campus has its own N3 connection. Inbound and outbound data flow between the Trust network and N3 is controlled by a firewall at each campus. Address translation is not normally used at these firewalls. The Trust also has a direct Internet connection and also a connection to Sheffield University that are controlled to the standards required in association with N3. Internet remote access requires the use of strong authentication tokens. Internet remote access is usually provided via Remote Desktop and a full VPN network link will not normally be provided.

7.2 Trust Wireless Network Standards

7.2.1 The Trust is planning to commence (during 2012-13) a 2 year programme to implement a comprehensive wireless networking infrastructure. At present, the Trust is only implementing wireless networking on a trial basis. The strategy is to implement total wireless network coverage for all Trust sites, using the 802.11n (5 GHz variant) standard together with 802.11b/g/n (2.4 GHz) for "PDA" or legacy devices that do not support 802.11n.

7.2.2 The Trust is not at present using RFID technology but RFID tracking would be implemented as part of the Trust-wide wireless network. All existing tracking systems use bar code technology. The Trust is implementing building Access Control using the MiFare standard (ISO/IEC 14443A).

7.3 Networked hardware not included in Parts 3 or 4

In each case, please provide information as requested. Please confirm compliance with specific requirements and give full details of any non-compliant aspects of the system.

7.3.1	The system **MUST** be compatible with the Trust's networking standards described in Section 7.1 'Trust network standards' and Section 7.2 'Trust wireless network standards'.
7.3.2	Please provide a system/technical specification to allow the Trust's IT Services to confirm that the proposed System will work across the Trust's network.
7.3.3	Will any other networked hardware be provided or required? If so, please give details including manufacturer, part numbers and quantities of each item. Please provide data sheets or links to web sites where data sheets can be obtained. Data sheets **SHOULD** show physical (dimensions etc) and electrical (power requirements etc) specifications.
7.3.4	Does any of the network connected hardware contain an embedded operating system – and if so, which operating system is used and how is the operating system protected from network viruses and other security threats?
7.3.5	Please specify the network protocols and IP packet types that would be used.
7.3.6	What is the network bandwidth implication associated with the product or system? Please indicate the volumes of data that would be transferred via the network.

PART 8. Security and Information Governance standards

Please complete this section if the system will be used to capture or store data relating to patients or staff – or other types of data that would relate to Information Governance.

8.1 Trust Security and Information Governance standards

8.1.1 The Trust expects Information Security standards associated with systems used in the Trust to be compliant with the controls detailed in ISO/IEC 27001:2005 and conform to the Code of Practice as detailed in ISO/IEC27002.

8.1.2 Systems used in the Trust **SHOULD** be compliant with the Information Governance Assurance Framework (IGAF). Where data encryption is required, then AES 256 bit encryption compliant with FIPS 140-2 **SHOULD** be used.

8.1.3 The Trust has implemented a single Trust-wide Microsoft Active Directory environment. This environment is the default environment for controlling user access to networked PCs and Windows based applications and **SHOULD** be used wherever possible.

8.1.4 The Trust has implemented departmental and functional groups within Active Directory. The Trust expects that applications **SHOULD** use Active Directory groups wherever possible.

8.1.5 The Trust has implemented Connecting for Health (CfH) applications such as PACS. User access to these national applications is controlled by NHS smartcards and CfH Role Based Access Control (RBAC).

8.2 Security standards

In each case, please provide information as requested. Please confirm compliance with specific requirements and give full details of any non-compliant aspects of the system.

8.2.1	The proposed system **MUST** be compatible with the Trust's security standards described in Section 8.1 *'Trust Security and Information Governance standards'*.
8.2.2	Information Security standards associated with the proposed system **MUST** be compliant with the controls detailed in ISO/IEC 27001:2005 and conform to the Code of Practice as detailed in ISO/IEC27002.
8.2.3	The supplier **MUST** indicate an understanding of the NHS Information Governance standards. These standards include, for instance NHS Spine based Role Based Access (RBAC), single sign-on, etc, and the supplier **SHOULD** when appropriate be able to provide compatible options for system access (e.g. bar codes, swipe cards, smart cards, RFID, etc).
8.2.4	Please provide details of any encryption standards used by or associated with the proposed system.

PART 9. Support standards

Please complete this section if the proposal includes IT support and maintenance arrangements.

9.1 Trust IT support standards

9.1.1 The NHS has adopted ITIL as the De Facto standard for Service Management. Suppliers engaged in the National Programme for IT are working towards achieving BS15000 (ISO20000).

9.1.2 The Trust has embedded Service Management principles into the IT support infrastructure through the use of the ITIL (information Technology Infrastructure Library) framework.

9.1.3 HP OpenView is the toolset used to record and monitor incidents from identification through to closure.

9.1.4 There are two support models in operation:

Support for Departmental Systems:

A local System Manager is identified to manage the application, control access and act as the interface between end users, IT Services and Third Party Suppliers.

In this model the System Manager is the first point of contact for end user incidents and requests. The System Manager will deal with all application issues and will pass any relevant issues to the third party.

Any IT infrastructure issues (eg peripherals, networking or server issues) will be passed through to the IT Services Service Desk for investigation.

Support for Enterprise Systems:

The IT Services Service Desk is the first point of contact for all incidents and requests associated with these systems. The Service Desk is responsible for the recording and classification of incidents and will perform an initial triage to establish as much detail as possible e.g. symptoms, impact etc.

If the incident cannot be resolved locally then it will be passed to one of the second line support teams e.g. Desktop or Network Support. Incidents that cannot be resolved at the second line will be passed to the more advanced technical support groups.

The System Manager for an Enterprise System will be part of the Informatics Directorate and will have access to HP Openview to manage and track incidents. All application related incidents will be managed by the System Manager.

9.1.5 The Trust will expect the Supplier to develop a support contract to underpin the service to the end user and that builds on the service offered locally. The IT Department will develop a local Service Level Agreement (SLA) with the user department to ensure that the support service is robust and meets the needs of the service. This will be developed during the implementation stage and be available to all parties at the time the application goes live.

9.1.6 The IT Service Desk is currently open between the hours of 8 a.m. to 5 p.m. Monday to Friday. Outside these times an on-call service is available for urgent incidents affecting critical services.

9.2 Support and maintenance

In each case, please provide information as requested. Please confirm compliance with specific requirements and give full details of any non-compliant aspects of the system.

9.2.1	How is support for the product or system organised? For example, is there a company helpdesk and if so for what hours is that available? Is there any requirement for IT Department staff to have special training in relation to system support? Please provide copies of related documentation or of any support contract that would be associated with the system.
9.2.2	How frequently is a new version of the product or system software released? What is the process for upgrading the software?
9.2.3	Is there a requirement or advantage in using remote network access for system support? If so, please give further details. Does the support company have direct connection to the NHS network N3?

PART 10. Imaging devices or systems

Please complete this section if the system will connect in any way to the Trust cabled or wireless network.

10.1 Information required in relation to imaging devices or systems

Trust department to provide details for Section 10.1
In each case, please provide information as requested.

10.1.1	Approximately how many imaging studies will be performed each year, and what is the average size of a study?
Studies/Year = Average size of study = MB/Study	
10.1.2	Has it been confirmed that the proposed device or system is compatible with the Trust PACS environment? [It is expected that this would require either live on-site testing or the inspection by Trust imaging technical specialists of the DICOM conformance statements for the proposed system.]
10.1.3	Have connection costs to the Trust PACS been included? Please give outline details here and state where full details have been given.
10.1.4	If the device or system does not come with its own client software, then has it been verified that the Agfa Impax client software is capable of correctly displaying the images produced?
10.1.5	If the system will not use the Trust PACS for storage, can the system use the Trust DX object storage platform, either through the DX native API, or by using a third-party ISV integration solution?