The London Cancer Chemotherapy Service Audit 2013

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On behalf of the London Cancer Chemotherapy Expert Reference Group
Acknowledgements

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London Cancer Chemotherapy Service Audit
1. Summary of Recommendations

The following are recommendations that have been derived from our observations during site visits, the requirement to meet national standards for patient safety, peer review and the NHS chemotherapy commissioning strategy. Implementation of the actions will allow the London Cancer ICS to achieve best practice to an international standard.

Prescribing
All Trusts are required by peer review standards to keep a register of accredited prescribers. Trusts need to adopt competency based training and assessment, of consent and prescribing before prescribers are allowed to independently prescribe chemotherapy. Trainees on rotation cannot be assumed to be competent in a tumour site until assessed. **All Trusts need to have an agreed chemotherapy pathway and effective and systematic training** to ensure patient safety, efficient team work, and appropriate use of resources. The implementation of a competency based assessment for SPRs at Barts Health has resulted in a ten fold reduction in prescribing errors\(^1\).

All Trusts providing chemotherapy are required by the Department of Health to have electronic prescribing and operate an effective clinical governance system to ensure complete data collection and safe prescribing, dispensing, and administration. This can, and should be paper free as in Barts Health so that a complete record is generated.

Electronic prescribing programs have to be maintained by a designated person to ensure that new protocols are added efficiently, old protocols are removed and that training is maintained to reduce the risk of prescribing errors. All Trusts need to provide a sufficient resource for this or they become unable to meet the SACT requirements. Many smaller units would benefit from sharing the expertise and manpower required with a lead provider.

Chemotherapy Unit scheduling and workload
For safety and efficiency, chemotherapy prescribing must be the prescriber’s responsibility at the point of assessment of the patient. There must be a clear pathway for checking and modification of the prescription, when test results dictate or the patient status changes. There is currently **an unnecessarily large resource used in some units chasing clinical teams for prescriptions**. This should be minimised through better training and the use of electronic prescribing and **this needs to be a priority for all Trusts**.

Barts Health have demonstrated that they are effective in treating a large volume of patients by adopting a two day pathway and having a senior nurse co-ordinate the next day’s work to ensure that all chemotherapy was prescribed and made in advance. Although the system is effective, there should be plans to minimise the workload for that co-ordinator. The two day pathway may not be necessary for smaller units where patient waiting times for chemotherapy are small e.g. The Whittington. This pathway may also not suit all patients due to the distances they travel to receive specialist care. Outside of London Cancer trusts have successfully adopted telephone toxicity assessments to reduce clinic visits for patients \(^2\). **Scheduling is essential to ensure the best use of available capacity, reduce drug wastage and ensure patients are not delayed unnecessarily.** All trusts, irrespective of the scheduling system used, had to utilise administrative and nursing time to facilitate their system. Trusts that appeared to
have a low rate of non-attendances, and treated their patients on time, facilitated their scheduling system with strong pathways to manage referrals and delays. Smaller units with small patient numbers were able to effectively manage with paper scheduling and same day treatment. However, as the demand for capacity increases these trusts should plan to adopt one of the electronic systems that fits their practice.

A regular audit of waiting times and patient satisfaction will demonstrate whether the scheduling arrangements adopted by the trusts are effective.

Some trusts have invested in “point of care” machines to report full blood counts. These are valuable for patients particularly those receiving weekly treatments as they do not have to make numerous trips to hospitals to have bloods taken. Trusts with long waits for blood counts could learn from these examples and introduce local blood testing or “point of care” pathology machines to improve patient experience.

**Chemotherapy Nursing**

The role of the chemotherapy nurse is central to ensuring that patients experience holistic care and receive their treatment safely and competently. Peer review standards mandate a pre-treatment assessment to ensure that the risks of toxicity are minimised and education is delivered to the patients. Chemotherapy nurses ensure that, when toxicity occurs, patients know exactly what to do and how to manage it, or how to access the Acute Oncology Service, thereby minimising the impact and risks from toxicity. Patients also need support to help them cope with their diagnosis and treatment to minimise the psychological morbidity. Chemotherapy nurses are able to repeatedly assess the patient and their family / carer throughout their treatment and optimise the patient’s quality of life as a result of their holistic care and therapeutic communication. In order to introduce changes in treatment London Cancer must take a lead in developing the chemotherapy nurse role across the provider Trusts. Pre-assessment clinics run by chemotherapy nurses have had positive patient feedback. Outside London Cancer, proactive phone toxicity assessments have resulted in a reduced clinic burden for clinicians, reduced attendance at A&E, and greater patient satisfaction. The implementation of this would require initial investment but would result in a long-term saving².

**The Multi-Professional team**

The multi professional team required to deliver SACT needs competency based training and a standard operating procedure that comprises of the chemotherapy pathway, tumour protocols, and algorithms. It is then possible to have a highly efficient service with an agreed division of tasks and responsibilities for delivery of care. Who delivers what task can be varied according to local resources and new models of care in the future should develop the roles of the chemotherapy nurse and pharmacist to improve the service to patients. UCLH and The Royal Free utilise pharmacy staff in clinics to help prescribers use e-prescribing and provide support on trouble shooting prescribing issues. Barts Health, NMUH and The Whittington have pharmacist prescribing for oral chemotherapy however this model would require additional staff in other provider Trusts.
Nurse and Pharmacy prescribing of supportive care and oral chemotherapy has been developed successfully and could be more widely deployed.

The teams visited were in agreement that there is repetition in training across the Integrated Cancer System (ICS), both for pharmacists and chemotherapy nursing. Work is currently being carried out by London Cancer to harmonise the different accreditation processes for both these groups.

GCP training for some staff is necessary for the conduct of trials. UCLH has demonstrated that it is possible to adapt the long course to a shortened more relevant course for pharmacy staff. This approach should be adopted for chemotherapy nursing.

**Pharmacist Verification and Aseptic Dispensing**

Pharmacists deliver an essential safety and quality check on the prescription of chemotherapy in the pharmacy. UCLH and The Royal Free have demonstrated that pharmacists can come out of the pharmacy and add value in the clinic; contributing to patient notes, provide information regarding supportive care medicines and toxicity assessments to enable recommendations to be made regarding management of side effects. Patients receiving first cycle chemotherapy should have a drug history taken by a pharmacist particularly as the recruitment to trials increases and with the increase of patients with other co-morbidities.

**Dose banding should be more widely adopted** to enable trusts to deliver chemotherapy in a timely and cost efficient way. The initial investment in the set up can be offset against the savings in wastage. The MHRA requirements for the dispensing of investigational medicinal products can be extended between Trusts according to recent guidance to support greater access to research trials outside of the central licensed units.

**Procurement and Cost Saving Initiatives**

Pharmacists dispensing multiple doses of a high cost drugs should **vial share more cost effectively** by utilising appropriate scheduling. Development of extended expiry times for high cost chemotherapy agents would also promote vial sharing. Doses should be banded, made in one session and if a patient does not need the product it can be re-used. For unlicensed units, it may be more cost effective to **purchase high cost drugs by grouping together with other units** to enable vial sharing and there are many companies investing in extending the expiry times of their products. A trust outside London Cancer has recently moved to purchasing Azacitadine, a high cost drug used for AML resulting in a financial efficiency saving.

There are an increasing number of high cost SACT drugs that are administered either by mouth or by subcutaneous injection suitable for home delivery or home administration. All providers should **take the opportunity to reduce VAT costs by utilising this** or by other means e.g. Lloyds Pharmacy work with the Royal Free hospital enabling them to maximise VAT savings. Other trusts outside London including Warwickshire have reported to make savings of £250,000 per annum on VAT savings. **Patient satisfaction must continue to be monitored in homecare** as in hospital services.
The sharing of information about billing practices in the CERG has helped ensure that all providers across *London Cancer* are aware of what should be done to ensure that the latest tariff payments are received from NHS England and invoices are paid. However, there are also variations in how Trusts are accessing the Cancer Drugs Fund and for the implementation of NICE recommended treatments. An example of this is denosumab, a drug that is non-PBR excluded. There has been a low uptake of this drug across *London Cancer* despite the clear patient benefits from denosumab.

**The mandatory SACT dataset** applied in April 2014 requires the reporting of chemotherapy delivery and procurement codes. Providers should build these codes into their e-prescribing system as they have done at Barts Health, so that the SACT reports from the e-prescribing system contain the delivery and procurement codes. Coders can then also run reports of chemotherapy activity from the e-prescribing system and use the pre-populated codes to ensure that they are coding the chemotherapy correctly on the Trust’s coding IT systems.

In order to take advantage of the work of the London Procurement Partnership (LPP), those trusts with small volumes of the more expensive drugs should consider partnership agreements with a larger user to minimise cost and wastage.

**Governance**

All tumour pathway boards must publish their guidelines, protocols, and algorithms in order that the treatments and off protocol use can be audited.

The CERG is responsible for ensuring that all the Trusts in *London Cancer* comply with the peer review standards for clinical governance. All Trusts must supply evidence in the form of their agenda papers but not the content of their governance meetings. **All must submit reports of near misses, adverse events, off protocol prescribing, and NCEPOD deaths within thirty days of chemotherapy to the CERG** in order that they can be disseminated to the lead clinicians at each trust to share the lessons learned. An objective of the CERG will be to harmonise Governance arrangements within the ICS.

Regular local feedback of collected data is essential to improve practice and outcomes. BHRUT have demonstrated success through systematic audit in collating and feeding back thirty-day death data at local governance meetings. The feedback has resulted in an improvement in the consent of patients and their AOS service\(^7\). Lessons learned can then be translated to other tumour groups within Cancer Services.
**Actions for Trusts**

1. Trusts should create standard operating procedures to support the chemotherapy pathway. Timed appointments should be available for patients following a two-day pathway and there should be flexibility for patients that travel long distances. Formal prescriber training is essential to ensure competency.

2. Trusts should have full electronic prescribing in place that is maintained and up to date with budget coding and a paperless record of prescribing, dispensing, and administration to fulfil a complete SACT data report and billing requirement to NHS (E).

3. Develop the roles of the chemotherapy nurses to include holistic assessment before, and proactive toxicity monitoring after treatment.

4. Develop the roles of nurses and pharmacists in the clinical assessment and prescribing of chemotherapy.

5. Ensure pharmacy maximises efficiency with vial sharing, dose banding, procurement partnerships, home delivery, and access to the CDF, ICDFR and NICE resources.

6. Ensure that there is local clinical governance to collect and report; off protocol prescribing, serious adverse events, and 30 day death NCEPOD data to the CERG for sharing within *London Cancer* providers.

Figure 1. A Generic Chemotherapy Pathway

- **Decision to offer treatment with SACT (as per MDT)**
- **Patient given info on the proposed therapy to consider**
- **Patient decision to Proceed and Consent taken**
- **Referral Form for treatment on Day Care**
- **Pre-treatment Blood test**
- **Pre-treatment Medical/Toxicity review & Prescribing of treatment on e-prescribing system**
- **Pre 1st Cycle patients attend pre-assessment visit where patients have opportunity to ask further questions about treatment**
- **Pre-assessment Visit**
- **Pre-treatment Medical/Toxicity review & Prescribing of treatment**
- **Prescription Screened and Verified by Pharmacist**
- **Patient has the opportunity to report toxicity or benefits of treatment**
- **Oral Chemotherapy Dispensed by Pharmacy and understanding of schedule is re-checked**
- **Patient takes treatment**

**Oral Chemotherapy Counselling**

- **On 1st Cycles patients are counselled by Pharmacy or Nursing regarding oral treatment**
- **Holistic Needs Assessment – Carried out at diagnosis**

**IV Chemo**

- **IV Chemotherapy Prepared/Dispensed by Pharmacy Aseptic Unit**
- **Patient Receives Treatment**
- **Patient given appointment for next treatment**

**Administration**

- **Patient understanding of treatment rationale and side effects rechecked**
- **Patient has opportunity to report any toxicity or benefits to treatment**

**Production and Dispensing**

- **Prescription Verified by Pharmacist**

**Scheduling Treatment**

- **Review and Prescribing**
- **IV Chemotherapy**
- **Scheduling Treatment**

**Patients who receive oral and IV treatment will have both IV and oral aspects of this pathway combined.**
2. Introduction

The demand for chemotherapy treatment for cancer patients has been increasing year on year because of the increasing numbers of new treatments that improve cure or long term remission rates for some and prolongation of life and/or improvements in quality of life for others. There are now more lines of treatment available to patients who experience a recurrence and thus they will continue to attend for retreatment years after their initial diagnosis.

A patient’s experience of the chemotherapy service at an organisation will commence at the point of referral by a clinician for chemotherapy. The pathway is then defined in figure 1. For IV and Oral Chemotherapy

The purpose of the chemotherapy Service audit was to

1. Improve patient experience of chemotherapy throughout the London Cancer ICS
2. Reduce variation where possible in the chemotherapy services across London Cancer
3. Demonstrate to trusts the ways to improve capacity that will be necessary to improve efficiency and increase numbers of patients recruited to trials
4. Share best practice across trusts
5. Demonstrate to individual trusts where improvements can be made in their service.
6. Develop new commissioner and provider models for modernising chemotherapy services such as chemotherapy closer to home.

3. Methods

A questionnaire was developed by the Chemotherapy Expert Reference Group (CERG). The questionnaire examined the whole Chemotherapy pathway with respect to prescribing, scheduling, dispensing and administration of chemotherapy. There were also questions relating to clinical governance and recruitment to clinical trials.

The questionnaire was sent to the 10 NHS trusts that have chemotherapy services across London Cancer. When the preliminary results were analysed the CERG agreed that the results would be strengthened by further data collected at site visit by a London Cancer Lead Pharmacist and a Lead chemotherapy nurse volunteer.

A National Chemotherapy Patient Experience survey was undertaken between February and June 2013 by Quality Health. Reference has been made to the results of this survey within this document.
## The London Cancer Provider Trusts Delivering Chemotherapy

<table>
<thead>
<tr>
<th>Provider Trust</th>
<th>Overview</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Barking, Redbridge and Havering University NHS Trust (BHRUT).</strong></td>
<td>The trust operates over two sites, Queens and King George's Ilford Hospitals.</td>
</tr>
<tr>
<td><strong>Barnet and Chase Farm Hospitals NHS Trust (BCF).</strong></td>
<td>This trust has three chemotherapy sites at Barnet, Chase Farm and provides shared care with The Finchley Memorial.</td>
</tr>
<tr>
<td><strong>Barts Heath NHS Trust (BH).</strong></td>
<td>The trust has four chemotherapy sites, Barts 7a (Solid tumour oncology), Barts 4b (Haem-oncology), Newham and Whipps cross.</td>
</tr>
<tr>
<td><strong>Great Ormond Street Hospital NHS Foundation Trust (GOS).</strong></td>
<td>The trust delivers chemotherapy to children under 12.</td>
</tr>
<tr>
<td><strong>The North Middlesex Hospital University NHS Trust (NMUH).</strong></td>
<td>Intrathecal chemotherapy for PAH patients is made and administered at this site.</td>
</tr>
<tr>
<td><strong>Princess Alexander Hospital NHS Trust (PAH).</strong></td>
<td>The trust delivers chemotherapy over two sites, The Royal Free and Finchley Memorial.</td>
</tr>
<tr>
<td><strong>The Royal Free Hospital NHS Foundation Trust.</strong></td>
<td>The trust is affiliated with 30 health centres across Haringey and Islington.</td>
</tr>
<tr>
<td><strong>The Whittington Hospital NHS Trust</strong></td>
<td>The Trust delivers oral chemotherapy to only approximately 10 patients a year.</td>
</tr>
<tr>
<td><strong>Homerton University Hospital NHS Foundation Trust (HUH).</strong></td>
<td>The trust has two chemotherapy delivery suites, one for young adults and one for adults. The trust also has a separate ambulatory care unit and a clinical trials unit which add a small amount of activity to those included in this document.</td>
</tr>
<tr>
<td><strong>University College Hospitals NHS Foundation Trust (UCLH).</strong></td>
<td>This joint shared care venture by the Royal Free Hospital and Barnet and Chase Farm. This is a nurse led service open for less than 1 year. Patients are eligible for treatment from cycle 2 onwards at this chemotherapy unit enabling delivery of chemotherapy closer to home. Treatment for patients is prescribed at their base site and delivered at Finchley.</td>
</tr>
<tr>
<td><strong>Finchley Memorial Hospital Infusion Suite</strong></td>
<td></td>
</tr>
</tbody>
</table>

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4. Results

4.1 Prescribing

4.1.1 Training and Accreditation

Each Trust is individually responsible for the training and accreditation of its chemotherapy prescribers and the maintenance of an agreed formulary and the clinical governance of prescribing according to peer review standards. We did not collect data on prescribing, except for the timing of prescribing with respect to the chemotherapy visit however this should be the subject of a future audit and safety and efficiency assessment.

Observations

Trusts were asked to describe training of the prescribing consultants and registrars. We enquired about training in consent taking, chemotherapy knowledge training and technical training with regards to e-prescribing.

Each site had developed prescriber training differently. **Best practice should include both knowledge training and competency assessment** in all these areas there was great variation in practice. Chemotherapy education was provided by some trusts, and eight of the ten have e-prescribing and provided training on their particular e-prescribing program.

<table>
<thead>
<tr>
<th>Trust</th>
<th>BHRUT</th>
<th>BCF</th>
<th>Barts Health</th>
<th>GOSH</th>
<th>NMUH</th>
<th>PAH</th>
<th>Royal Free</th>
<th>Whittington</th>
<th>UCLH</th>
<th>HUH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of training and accreditation</td>
<td>Training provided on ARIA</td>
<td>Training provided on Chemocare at Royal Free and Barnet</td>
<td>Training provided on ARIA Competency based training based on 25 prescriptions.</td>
<td>Prescribing is restricted to Consultants trained on Chemocare</td>
<td>Training provided on Chemocare with written assessment</td>
<td>Paper prescribing by UCLH and TT UH staff</td>
<td>Training provided on Chemocare After a knowledge based competency assessment has been completed</td>
<td>Training on Chemocare at UCLH On Site training for SPrs based at the trust</td>
<td>Training provided on Chemocare</td>
<td>Paper prescribing</td>
</tr>
<tr>
<td>Register of prescribers held?</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<td>✓</td>
<td>✓</td>
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</table>

**Table 1. Training Provided at London Cancer Providers**

**Best practice**

All Trusts are required by peer review standards to keep a register of accredited prescribers. Training for prescribers should incorporate two elements, how to use the e-prescribing system and also provide tumour specific training. Some trusts have adopted a competency based assessment of consent and prescribing whereby doctors were required to prescribe a number of regimens under supervision before they were allowed to independently prescribe chemotherapy. **Trainees on rotation cannot be assumed to be competent in a tumour site until assessed.** All Trusts need to provide and keep a record of effective and systematic training to ensure patient safety, efficient team work, and appropriate use of resources. The
implementation of a competency based assessment for SPRs at Barts Health has resulted in a tenfold reduction in prescribing errors\(^1\).

### 4.1.2 Electronic Prescribing Implementation

Electronic chemotherapy prescribing offers significant advantages over paper-based systems in terms of patient safety and the efficient and effective use of resources. It also offers a potential solution to the challenges of increasing demand on chemotherapy services as a result of the higher cancer incidence (due to the ageing population) and the introduction of new more complex chemotherapy treatments. Electronic prescribing is a requirement in the NHS England Chemotherapy Service Specification that every trust holding an NHS contract must follow. Failure to do this will result in a derogation notice to the trust. Each trust in London not complying with the service specification has been asked to compile a one year action plan to detail how their trust will meet their contractual requirement.

The following are advantages of a fully implemented e-prescribing system for chemotherapy:

- Immediate and permanent communication between all members of the medical, pharmacy and nursing staff at all sites in the network to ensure efficient and safe treatment of the patients 24/7.
- Complete list of approved protocols for treatment and inclusion of supportive care drugs
- Built-in safety features to prevent errors in calculating dosages and drug reconstitution
- Provision for monitoring of dose modifications
- Provision of a facility for clinical audit, financial monitoring, and complete SACT reports.
- Automatic scheduling of patient care if this option is selected by the trust
- Remote prescribing facility

Table 2. shows the different prescribing systems that are used across London Cancer. All trusts apart from Homerton, have purchased an e-prescribing system. Homerton, on average treats 10 patients a year with oral chemotherapy only. The trust has strong procedures enabling the safe prescribing and dispensing of oral chemotherapy. It is unclear whether they will be required to comply with the NHS requirement. The only trust yet to implement their purchased system is Princess Alexandra Hospital.

**Observations**

Seven out of ten trusts use, or have purchased ChemoCare® and 2 of the 10 use Aria® Med Oncology. With the roll out of London Cancer chemotherapy algorithms and guidelines it would be more efficient if trusts that share a common system, could adopt a similar process for setting up regimens. Ideally, London Cancer would have a common networked system similar to other networks e.g. North East of England. Networking could also improve the uptake of clinical trials across the London cancer trusts.

However, a more pragmatic solution would be to group trusts together and network the system between sites as done between Barts, Whipps Cross and Newham, or between Royal Free,
Barnet, Chase Farm and Finchley Memorial. Networking would improve efficiency and safety between GOS and UCLH which share chemo-rad patients. They are both on the same e-prescribing system but with separate licensing so that the patient has an incomplete electronic prescribing record at both trusts.

Princess Alexandra Hospital has not been able to implement their e-prescribing system because of a lack of resource and personnel with the necessary expertise and could achieve considerable savings in the cost and time for set up if they were networked with NMUH or UCLH hospitals.

The implementation of the e-prescribing systems is variable as displayed in table 2 and consequently the full benefits are not being realised by most trusts. Maintenance of the e-prescribing systems is demanding as reflected in the lack of the upgrades necessary for SACT compliant reporting in many trusts and requires a dedicated member of staff (an e-prescribing system manager) which again supports the case for greater networking between clinically linked trusts.

**Best Practice**

All Trusts providing chemotherapy are required by the Department of Health to have electronic prescribing and operate an effective clinical governance system to ensure: complete data collection, safe prescribing, dispensing, and administration. This can, and should be paper free where no paper prescription is generated and the computer record is the only record of prescribing and administration as in Barts Health, so that a complete record is generated.

Electronic Prescribing in Hospitals – Challenges and Lessons learned, is a report published by the NHS in 2009. It highlights the reason for initial resource requirement in implementation, and also a continued resource for maintenance of e-prescribing. Trusts need to have a dedicated IT manager and/or pharmacist time in place to manage day to day issues that arise with the e-prescribing system. They are responsible for training, building the protocols in a safe and organised manner, implementing upgrades and maintaining systems.
<table>
<thead>
<tr>
<th></th>
<th>BHRUT</th>
<th>Barnet and Chase Farm /Finchley</th>
<th>Barts Health</th>
<th>GOSH</th>
<th>NMUH</th>
<th>Princess Alexandra</th>
<th>Royal Free/ Finchley</th>
<th>Whittington</th>
<th>UCLH</th>
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<tbody>
<tr>
<td>ChemoCare®</td>
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</tr>
<tr>
<td>IV SACT on e-prescribing</td>
<td>Partial not all tumours and Clinical trials and in-patientson paper</td>
<td>✓</td>
<td>✓</td>
<td>Partial Further resource required to build complex trials</td>
<td>✓</td>
<td>None</td>
<td>✓</td>
<td>✓</td>
<td>Partial Paediatric shared care protocols not on ChemoCare</td>
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<td>no</td>
<td>✓</td>
<td>N/A</td>
<td>✓</td>
<td>Partial</td>
<td>✓</td>
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<td>Hormonal treatment e-prescribed e.g. abiraterone</td>
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<td>No</td>
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<td>N/A</td>
<td>no</td>
<td>N/A</td>
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<tr>
<td>SACT data from e-prescribing system</td>
<td>Partial Plus manual supplement</td>
<td>Partial Upgrading to 5.3.4—to be fully SACT compliant</td>
<td>Full</td>
<td>Partial Upgrading to 5.3.4—to be fully SACT compliant</td>
<td>Partial Upgrading to 5.3.4—to be fully SACT compliant</td>
<td>5.3.4 has been bought by the trust however not implemented</td>
<td>Full</td>
<td>Partial Upgrading to 5.3.4—to be fully SACT compliant</td>
<td>Partial Upgrading to 5.3.4—to be fully SACT compliant</td>
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<tr>
<td>Designated e-prescribing service manager</td>
<td>No</td>
<td>✓</td>
<td>IT manager and pharmacist</td>
<td>✓</td>
<td>Pharmacist</td>
<td>✓</td>
<td>IT manager and pharmacist</td>
<td>No</td>
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</tbody>
</table>

Table 2. Characteristics of the E-Prescribing Programs at the London Cancer trusts
3.2 Chemotherapy Unit scheduling and workload.

3.2.1 Scheduling

There is a great deal of variation in the size and organisation of chemotherapy units across London Cancer as displayed in Table 3. The larger units have had to adopt a greater level of systematic organisation of their chemotherapy pathway. Barts Health, BHRUT, UCLH and The Royal Free had documented pathways while the smaller units delivered their service apparently successfully without this. The problem for the smaller units is the maintenance of a skilled workforce and avoidance of service breaks due to sickness or leave. In addition the increasing complexity of treatment and the requirements for clinical governance and SACT reporting make small units more difficult to support.

The chemotherapy unit size with respect to beds and chairs is displayed in figure 2, however this does not show the complexity of treatments and the turnaround of patients through the units. There is a great variation in number of patients per chair per day at each trust.

Observations

In all the units there was a common problem with ensuring that the prescribing practice of the doctors was timely; error free and clearly communicated between clinical teams and chemotherapy units so that treatment could be delivered efficiently. This needs to be urgently addressed in the training. The Royal Free has recently carried out a process mapping exercise of its chemotherapy unit and as a consequence introduced a morning multi-disciplinary handover of all patients for treatment that day. The role of the senior nurse has been extended to ensure all prescriptions for next day treatment are available in advance.

Chemotherapy unit opening times were recorded and questions were asked relating to quiet and busy times. The central London hospitals appeared to have quiet times in their earlier slots i.e. 8am. This may be due to expensive public transport and distance to travel by car. The trusts in outer London found the earlier slots were the ones in demand. However, many of these outer London trusts, e.g. PAH and BHRUT could not accommodate chemotherapy patients in these early slots due to pharmacy production or prescribing issues. The problem with pharmacy delays could be readily resolved by the use of dose-bandung, although these units scheduled a large proportion of their non-chemotherapy patients for treatment at the times where chemotherapy could not be administered.

Many units have introduced a two day chemotherapy pathway that separated the clinic assessment from the treatment day to enable ordering, confirming and dispensing of the treatment in advance. This minimised patient waiting times and enabled scheduled time slots in the chemotherapy day unit, and uses the facility more efficiently. At Barts it was found that patients and staff expressed a strong preference for this in comparison with their previous same day practice when the patients spent a long and unpredictable time waiting for treatment. Smaller units can offer a more rapid provision of chemotherapy and have not needed to organise their pathway or scheduling to the same degree. Other challenges faced by London trusts wishing to adopt a two day pathway would be the distance a patient travels over the two days to receive their treatment. Chemotherapy services could be modernised
across *London Cancer* by the delivery of treatment closer to home and proactive monitoring of progress over the telephone which would remove the need to travel to the treatment centre twice. (Section 3.3)

**Best Practice**
For safety and efficiency chemotherapy prescribing must be the prescriber’s responsibility at the point of assessment of the patient. There must be a clear pathway for checking and modification of the prescription when test results dictate or patient status changes. There is currently an unnecessarily large resource used in some units chasing clinical teams for prescriptions. This should be minimised through better training and the use of electronic prescribing and this needs to be a priority for all Trusts.

Barts Health demonstrated that they were effective in treating a large volume of patients by adopting a two day pathway and having a senior nurse co-ordinate the next day’s work to ensure that all chemotherapy was prescribed and made in advance. Although the system was effective, there should be plans to minimise the workload for that co-ordinator. UCLH and The Royal Free utilise pharmacy staff in clinics to help prescribers use e-prescribing and provide support on trouble shooting prescribing issues. Barts, NMUH and The Whittington have pharmacist prescribing of oral chemotherapy however this model would be difficult to replicate without additional staff in other providers.

Efficient, effective scheduling is essential to ensure the best use of available capacity. All trusts irrespective of the scheduling system used had to utilise administrative and nursing time to facilitate the system. Trusts that appeared to have a low rate of non-attendances, and treated their patients on time facilitated their scheduling with strong pathways to manage referrals and delays. Smaller units with small patient numbers were able to effectively manage with paper scheduling system and an efficient same day treatment pathway. However as the demand for capacity increases these smaller units should plan to adopt one of the electronic systems that fit their practice.

The *London Cancer* CERG is planning to introduce waiting time audits and real time patient satisfaction surveys to assess what changes need to be made to improve the chemotherapy patient expereince and track their impact to ensure a consistency across *London cancer*. 
<table>
<thead>
<tr>
<th>BHRUT</th>
<th>Barnet and Chase Farm /Finchley*</th>
<th>Barts Health</th>
<th>GOS</th>
<th>NMUH</th>
<th>Princess Alexandra</th>
<th>Royal Free/Finchley*</th>
<th>Whittington</th>
<th>UCLH adult*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queens KG</td>
<td>Barnet Chase Barts Newham WX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>13</td>
<td>15</td>
<td>24</td>
<td>80</td>
<td>(Barts 7a= 60,</td>
<td>10</td>
<td>25</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7</td>
<td>Barts 4b=20)</td>
<td></td>
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<td>30</td>
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<td>15</td>
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<td>20</td>
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<td>No of</td>
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<tr>
<td>chemotherapy</td>
<td></td>
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<td>patients per</td>
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<td>day</td>
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</tr>
<tr>
<td>Scheduling</td>
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<td></td>
<td></td>
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<td>system</td>
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<td></td>
<td></td>
<td></td>
<td>Chemocare)</td>
<td>in-house system)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff involved in scheduling</td>
<td>0.6WTE booking clerk Nurse co-ordinator involved in rescheduling delays</td>
<td>Nurse co-ordinator</td>
<td>1 WTE nurse co-ordinator for Barts site.</td>
<td>Nurse co-ordinator</td>
<td>0.5WTE Nurse co-ordinator</td>
<td>Nurse co-ordinator</td>
<td>Nurse co-ordinator</td>
<td>Senior Nurse</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportion of patients with their chemotherapy appointment on the same day as clinic</td>
<td>0</td>
<td>90%</td>
<td>5%</td>
<td>95%</td>
<td>0</td>
<td>0</td>
<td>50%</td>
<td>20%</td>
</tr>
</tbody>
</table>

Table 3. The Scheduling Systems used across London Cancer

*UCLH also has an ambulatory care unit that treats approximately 10 patients a day and a Clinical Research Facility for early phase studies treating 6-10 patients per day.

Finchley Memorial scheduling is the responsibility of their base trust.
<table>
<thead>
<tr>
<th>Trust</th>
<th>BHRUT</th>
<th>Barnet and Chase Farm /Finchley*</th>
<th>Barts Health</th>
<th>GOSH</th>
<th>NMUH</th>
<th>Princess Alexandra</th>
<th>Royal Free/Finchley*</th>
<th>Whittington</th>
<th>UCLH</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Open Monday to Friday?</strong></td>
<td>Queens KG Barnet Chase Barts Newham WX</td>
<td>✔ ✔ ✔ ✔ ✔ 2 days ✔</td>
<td>✔ ✔ ✔ ✔ ✔</td>
<td>✔ ✔ ✔ ✔ ✔</td>
<td>✔ ✔ ✔ ✔</td>
<td>✔ ✔ ✔ ✔</td>
<td>✔ ✔ ✔ ✔</td>
<td>✔ ✔ ✔</td>
<td></td>
</tr>
<tr>
<td><strong>Open pre 9am</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>And beyond 5pm</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Open at weekends</strong></td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Specific time slots for non-chemotherapy activity?</strong></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td><strong>Holistic needs assessment carried out as pre-assessment?</strong></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td><strong>Numbers of chemotherapy trained nurses per unit per day</strong></td>
<td>7 3 3 3 18 2 5 7 5 5 7 3 11 4.5</td>
<td>✔ ✔ ✔ ✔ ✔ ✔ ✔ ✔ ✔ ✔ ✔ ✔ ✔ ✔ ✔</td>
<td>✔ ✔ ✔ ✔</td>
<td>✔ ✔ ✔ ✔</td>
<td>✔ ✔ ✔ ✔</td>
<td>✔ ✔ ✔ ✔</td>
<td>✔ ✔ ✔ ✔</td>
<td>✔ ✔ ✔</td>
<td></td>
</tr>
<tr>
<td><strong>HCAs employed to assist with supportive care</strong></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>X</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>X</td>
</tr>
</tbody>
</table>

*Table 4. Characteristics of the Chemotherapy Units*

*Table 4.1 data available for Finchley Memorial*

| Open Monday to Friday? | ✔ |
| Open pre 9am And beyond 5pm | X |
| Open at weekends | X |
| Numbers of chemotherapy trained nurses per unit per day | 3 |
Finchley Memorial trust has the capacity to treat 40 patients per week. The proportions are currently 50% chemotherapy and 50% non-chemotherapy. They are on average treating 40 patients a week.
### 3.2.2 Blood Tests Prior to Chemotherapy

<table>
<thead>
<tr>
<th></th>
<th>BHRUT</th>
<th>Barnet and Chase Farm /Finchley</th>
<th>Barts Health</th>
<th>GOSH</th>
<th>NMUH</th>
<th>Princess Alexandra</th>
<th>Royal Free/ Finchley</th>
<th>Whittington</th>
<th>UCLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted validity period for FBC For cycle 2 onward</td>
<td>48-72 hours</td>
<td>48-72 hours</td>
<td>48-72 hours extended for patients that have clinic on a Thursday and treatment on Monday.</td>
<td>Protocol driven</td>
<td>48-72 hours</td>
<td>48 hours</td>
<td>48-72 hours</td>
<td>48-72 hours</td>
<td>48-72 hours</td>
</tr>
<tr>
<td>Accepted validity period for U&amp;Es For cycle 2 onwards</td>
<td>7 days</td>
<td>7 days</td>
<td>7 days</td>
<td>7 days</td>
<td>7 days</td>
<td>7 days</td>
<td>7 days</td>
<td>7 days</td>
<td>7 days</td>
</tr>
<tr>
<td>Do patients have local bloods*</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Does the trust have a point of care machine</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>If a patient had paclitaxel days 1, 8 15. How many visits in total per cycle would this mean?</td>
<td>7</td>
<td>3</td>
<td>4</td>
<td>N/A</td>
<td>3</td>
<td>8</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

**Table 5. Trust Acceptable Timing Parameters regarding blood results**

* Local bloods refer to when a patient has bloods taken at either their GP surgery, by a district nurse or at a local hospital. The results will be fed back to the chemotherapy delivering unit.
Observations
Blood results are sometimes a delaying factor in a patient’s chemotherapy pathway. The majority of trusts are consistent with their SOPs for blood results. There is variability in the time taken for Trust pathology services to report blood results. Some trusts have long delays particularly for biochemistry results. The smaller trusts, where pathology labs are on site seem to have a relatively fast blood result turnaround time.

Best Practice
Some trusts have invested in “point of care” machines to report full blood counts. These are valuable for patients particularly those receiving weekly treatments as they do not have to make numerous trips to hospitals to have bloods taken. Trusts with long waits for blood counts could learn from these examples and introduce “point of care” pathology machines to improve patient experience.

Smaller units, including Barnet and Chase Farm and the Whittington report that they rarely suffer from delays as a result of blood tests. This allows them to offer patients same day treatment.

The data for the following figure is taken from the “National Chemotherapy Patient Experience” survey and it depicts the waiting time for blood results when taken in the hospital on the same day as chemotherapy.

![Figure 3. Results taken from the “National Chemotherapy Patient Experience Survey” regarding blood results.](image)

3.3 Chemotherapy Nursing

3.3.1 Chemotherapy nursing role

Numbers of patients receiving chemotherapy are rising year on year and London Cancer is committed to reducing variation and increasing access across all providers with increasing numbers of patients entering clinical trials – much of which will involve chemotherapy. The role of the chemotherapy nurse has developed extensively and in some chemotherapy units many aspects of the service are nurse-led including:
• patient assessment and counselling
• chemotherapy administration recording
• Supportive care.

Despite a significant growth in the use of chemotherapy and many developments in chemotherapy nursing roles there has been no further national guidance relating to the role of chemotherapy nurses since the RCN Clinical Practice Guidelines, published 2nd Jun 2000. The chemotherapy peer review measures acknowledge the wider role of chemotherapy nurses beyond ‘competence in chemotherapy administration’. However in the absence of a national chemotherapy nursing strategy; London Cancer needs to define how it should develop within the multidisciplinary team. Patients should be able to expect the same standards of nursing care and support irrespective of where in London Cancer they receive their treatment.

The National Chemotherapy Patient Experience Survey Report 2013

The national survey was analysed for the London Cancer trusts. It was reported that on average 10% of patients have their chemotherapy appointment re-scheduled due to inadequate staffing. When patients were asked whether the nurse giving the chemotherapy asked about side effect that the patient might be experiencing patients from BHRUT, Barts Health, the Royal Free, NMUH and Whittington Health gave considerably lower scores compared to the national average of 91%.

The capacity of the unit was addressed in the survey. The survey asked “if there was a member of staff available to assist them, if they needed help when they had their last chemotherapy”. Patients from BHRUT, Barts Health, NMUH and Whittington Health had poorer performance compared to the national average. Patients from Barnet and Chase Farm gave a score of 100% for this question. It is worth noting that although Chase farm hospital appears to have a high ratio of patients compared to nurses this is reflective of the treatment that it is administered at this site, mainly bortezemib for myeloma which is a short treatment.

Observations
In some chemotherapy units the nurses have developed excellent assessment skills and tools relevant to the patient receiving chemotherapy. However other units and centres have not developed services in the same way. Figures 4 and 5 depict the numbers of chemotherapy and non chemotherapy patients in a unit on any given day and the ratios of patients per nurse. These figures give a general picture of each unit however they can not be used for fully assessing the workforce utilisation of a unit. A major factor that impacts capacity is the complexity of a chemotherapy treatment. As an example a bolus injection can take a chemotherapy nurse approximately 20 minutes to administer whilst an infusion can be connected in only a few minutes and left whilst a nurse attended to another patient. C-PORT is a tool available to assess the complexity and workload of regimens and the workforce of a chemotherapy unit. Of the London Cancer trusts BHRUT are the only site that use the tool. They have been able to utilise the tool and change nursing workflow to meet demand. With the ageing population and numerous lines of treatment that
are now available patients are likely to have more co-morbidities when receiving chemotherapy e.g cardiac disease or diabetes and require more complex care.

**Best Practice**

The role of the chemotherapy nurse is central to ensuring that patients experience holistic care and receive their treatment safely and competently. Peer review standards mandate a pre-treatment assessment to ensure that the risks of toxicity are minimised and education is delivered to the patients to ensure that, when toxicity occurs, they know exactly what to do and how to manage it, or how to access the Acute Oncology Service thereby minimising the impact and risks from toxicity. Patients also need support to help them cope with their diagnosis and treatment to minimise the psychological morbidity. Chemotherapy nurses are able to repeatedly assess the patient and their family/carer throughout their treatment and optimise the patient’s quality of life as a result of their holistic care and therapeutic communication.

The Royal Free have demonstrated an improved patient experience after the introduction of a chemotherapy nurse led pre-assessment clinic. Outside London Cancer, proactive phone toxicity assessments have resulted in a reduced clinic burden for clinicians, reduced attendance at A&E, and greater patient satisfaction. The implementation of this would require initial investment but would result in a long-term saving².

The nursing workforce planning on the chemotherapy day units needs to be organised using capacity modelling tools. C-PORT demonstrated to be successful at BHRUT however many trusts have struggled with allocating the correct resource for the maintenance and setup of the tool. There may be other tools available that that include all the functions necessary for the holistic care of patients.

Nurse prescribing has been implemented to a varying degree and is restricted to supportive care drugs in some units but can include oral chemotherapy in others. Nursing has a strong accreditation process for prescribing which could be standardised across London Cancer and would improve patient experience.

London Cancer needs to guide the future development of chemotherapy nursing practice, education and competency in order to introduce new treatments and improve patient safety and experience. Nursing expertise and leadership within chemotherapy services is essential.
Figure 4. Average numbers of Chemotherapy and Non Chemotherapy activity at the trusts of London Cancer per day

NB: Complexity of treatment or patient has not been factored into these results.

Figure 5. The Patient to Nurse ratio at the London Cancer trusts, including chemotherapy and non-chemotherapy patient per day.

* The graph used the average number of nurses on duty per day and the average numbers of patients per day.
<table>
<thead>
<tr>
<th>Trust</th>
<th>Numbers of patients (recorded on SACT database)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCLH</td>
<td>2311</td>
</tr>
<tr>
<td>Barts Health</td>
<td>1827</td>
</tr>
<tr>
<td>RFH</td>
<td>823</td>
</tr>
<tr>
<td>BHRUT</td>
<td>783</td>
</tr>
<tr>
<td>NMUH</td>
<td>543</td>
</tr>
<tr>
<td>PAH</td>
<td>533</td>
</tr>
<tr>
<td>BCF</td>
<td>223</td>
</tr>
<tr>
<td>Whittington</td>
<td>132</td>
</tr>
</tbody>
</table>

*Table 6. Information taken from SACT database for trusts that submitted data. NB. Data may be inaccurate for oral chemotherapy.*

The information in table 6 has been retrieved from the SACT database. Currently this data is not accurate as most trusts are not accurately recording data using electronic prescribing. The data does however demonstrate that UCLH have a large patient population receiving chemotherapy that is not captured in this audit. These patients are a combination of ambulatory care patients, Early phase trial patients and in-patients.
### 3.3.2 Organisation of the multiprofessional team.

<table>
<thead>
<tr>
<th>Trust</th>
<th>BHRUT</th>
<th>Barnet and Chase Farm *</th>
<th>Barts Health</th>
<th>GOS</th>
<th>NMUH</th>
<th>Princess Alexandra</th>
<th>Royal Free*</th>
<th>Whittington</th>
<th>UCLH</th>
<th>HUH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daycare Doctor involved in seeing unwell patients</td>
<td>✓</td>
<td>✓</td>
<td>Barts Newham WX</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>Adult TYA</td>
<td>N/A</td>
</tr>
<tr>
<td>Daycare doctor involved in seeing scheduled patients</td>
<td>✓</td>
<td>x</td>
<td>Only on haem onc ward</td>
<td>✓</td>
<td>x</td>
<td>x</td>
<td>✓</td>
<td>Haematology only</td>
<td>x</td>
<td>✓</td>
</tr>
<tr>
<td>Daycare doctor involved in prescribing for missed prescriptions</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>✓</td>
<td>x</td>
<td>x</td>
<td>✓</td>
<td>N/A</td>
</tr>
<tr>
<td>Nurse prescribers that are practicing</td>
<td>✓</td>
<td>x</td>
<td>Supportive care only</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Nurse toxicity assessments</td>
<td>✓</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Pharmacist Prescribers</td>
<td>x</td>
<td>x</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Pharmacists provide supportive care information written information?</td>
<td>x</td>
<td>✓</td>
<td>Yes for oral chemotherapy</td>
<td>✓</td>
<td>x</td>
<td>x</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
</tr>
</tbody>
</table>

*Finchley Memorial Hospital Infusion Suite is a joint venture by the Royal Free and Barnet and Chase Farm. There is no on-site pharmacist or doctor at this site.*
Observations
Organisation of the multi-professional team has been variably adapted to manage the bottlenecks in the service and according to local resources e.g. BHRUT and UCLH use the nurse toxicity assessments to improve clinic waiting times. Nurse and Pharmacist prescribers of oral chemotherapy help improve the waiting time in clinics, due to a shortfall in medical prescribers. Pharmacist prescribers are not utilised by all trusts as there is still be a need for a separate pharmacist to verify the prescription. Trusts may see this as a risk as the verification may be completed by a more junior pharmacist. Some of these clinics have been limited by the space available in the clinic areas. Barnet and Chase Farm reported that they had 2 chemotherapy nurse vacancies that they were unable to recruit to. This meant they could not utilise all the space available to them.

An aim of London Cancer trusts is to improve the recruitment to trials. This may require chemotherapy nursing and pharmacy staff to be GCP trained.

Best Practice
The multi professional team required to deliver SACT needs competency based training and a standard operating procedure that comprises the chemotherapy pathway, tumour protocols, and algorithms. It is then possible to have a highly efficient service with an agreed division of tasks and responsibilities for delivery of care. Who delivers what task can be varied according to local resources and new models of care in the future should develop the roles of the chemotherapy nurse and pharmacist to improve the service to patients.

The teams visited were in agreement that there is repetition in training across the ICS both for pharmacists and chemotherapy nursing. An audit is currently being carried out by London Cancer of the different accreditation processes in order to harmonise chemotherapy nurse training. These accreditations for both nursing and pharmacists should be developed with the London Cancer Alliance.

GCP training for staff is important when handling trials. UCH has demonstrated that it is possible to adapt the long course to a shortened more relevant course for pharmacy staff. This approach should be adopted for chemotherapy nursing.
3.4 Pharmacist Verification and Aseptic Dispensing

There are two components to the chemotherapy pharmacy service. The clinical pharmacy services role includes chemotherapy prescription verification i.e. ensuring that the prescription details are complete, clear and unambiguous and clinically appropriate for the patient at the time. The aseptic compounding role includes responsibility for dose preparation and ensuring that the final product is prepared exactly as prescribed. At some trusts within London Cancer one pharmacist will hold both roles and in some trusts there will be two individuals involved in the process.

3.4.1 Verification

Pharmacist verification of SACT must have occurred prior to administration of chemotherapy. The verification stage is completed after prescribing and when blood results have returned. There are standards published detailing the checks a pharmacist must make when verifying a prescription from The British Oncology Pharmacists Association. Traditionally, verification would prompt the aseptic unit to manufacture a dose. In recent years this has changed as capacity has increased with the introduction of pre-made fixed doses/bands (dose banding).

Observations

There is great variation in the role of the chemotherapy pharmacist across London Cancer. The Royal free and UCLH trusts have moved some of their pharmacists out of the chemotherapy unit and into clinics and day-care appropriately trained pharmacists can then resolve any problems with prescriptions at the point of prescribing. It can also allow the pharmacist to take up some of the roles of the chemotherapy nurses and give verbal and written documentation to the patients requiring supportive care medication and reduce oral chemotherapy waiting times. The pharmacists can also view toxicity assessments and make recommendations on management of chemotherapy side effects.

Best Practice

Pharmacists deliver an essential safety and quality check on the prescription of chemotherapy in the pharmacy. UCLH and The Royal Free have demonstrated that pharmacists can come out of the pharmacy and add value in the clinic contributing to patient notes, information regarding supportive care medicines and toxicity assessments. Adverse event rates and patient satisfaction with the service should be continually monitored to assess performance of the multi-professional team.
3.4.2 Aseptic Units

3.4.2.1 Dose banding

Aseptic units may dispense all intravenous chemotherapy or may choose to contract out to other providers and a trust can adopt dose-banding for the commonly used drugs. Dose banding is used widely in the UK as a means of rationalising chemotherapy preparation within aseptic units resulting from rising demand. The key concept is the rounding of doses to be administered to within 5% of the calculated dose. The acceptance of this concept relates to acknowledged inaccuracies both of the formulae used to determine body surface area (BSA) and the absence of a direct relationship between BSA based dosing and the pharmacokinetics/pharmacodynamics of the majority of SACT. Dose banding all chemotherapy has the advantage of reducing wastage. A chemotherapy dose made or bought in as a fixed banded dose has a higher potential for re-use compared to one that is non-banded and so has the ability to reduce wasted chemotherapy doses. Pre-made fixed doses from an external supplier still need to be relabelled in clean conditions.

3.4.2.2 Licensed Aseptic Units

Licensed aseptic units are able to manufacture chemotherapy and give doses their maximum possible expiry. This in turn means that chemotherapy can be made in advance (if clinically appropriate) and there is a high potential for re-use if it is not required resulting in a reduction in wastage. The un-licensed units can only give a maximum expiry of seven days and therefore the potential for reuse is reduced.

Aseptic units, which do not have a licence, are only able to dispense chemotherapy against a patient prescription. They are not allowed to produce large batches of fixed chemotherapy doses for utilisation as dose banding.

Some larger units dispense chemotherapy for other sites within the same trust. Examples of licensed units are BHRUT who manufacture chemotherapy for Baxter, Royal Free who dispense for Healthcare at Home and Barts Health who deliver to Newham and Whipps Cross hospitals. For trials, to be distributed across NHS trusts a licensed unit must apply to the MHRA for an IMP (Investigational Medicinal Product) license for the products they wish to supply. The product would also need to go through various quality assurance processes before it can be sent to the patient. The stringent regulatory processes and requirements by the MHRA has been a barrier to supplying trial chemotherapy to other trusts or organisations.
Observations
The reasons observed for a poor uptake of dose banding across London Cancer are:

- Lack of storage space for the pre-made doses,
- Short expiry times for the drugs which increase the likelihood of dose expiring before it can be dispensed,
- The difficulty in implementation of dose banding on the Chemocare® program (not an issue with Aria®) or the lack of e-prescribing.

The complexity of the preparation method taken to prepare a chemotherapy dose will impact on the time taken to make it. Repetitive strain injury is common for a chemotherapy pharmacy preparation technician and the maximum number of dose units that can be made by any one technician has been shown to be 30 units per 3 hour session.

Best Practice
Chemotherapy pharmacy units that are licensed to MHRA standards and that process high volumes of drugs have the greatest potential for innovative service and cost savings through extended expiry times and dose banding.

MHRA licensing is necessary in order to continue the trend of rationalising the smaller less economic units into larger ones and further work is needed to devise the optimum chemotherapy pharmacy model that combines efficiency in dispensing and transport with the flexibility to respond to last minute changes in patient requirements. This should include investigating how the larger units can become MHRA accredited to deliver IMPs to support wider access of patients to clinical trials in the peripheral units.

The greatest and most immediate cost saving would be achieved by prioritising the banding of high cost drugs on e-prescribing systems to minimise wastage. Banding all doses also has the advantage of increasing pharmacy capacity, and being more readily available for patients on a same day pathway. The purchasing of banded products should be evaluated by individual units according to their waiting times and their ability to supply a suitable expiry to minimise wastage. For example, at The Whittington hospital they are able to dispense chemotherapy within an hour and therefore the value of purchasing a dose banded product would be limited.
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Table 8. Characteristics of a Chemotherapy Unit in London Cancer
3.5 Procurement and Cost saving initiatives of Trusts

3.5.1 Vial Sharing

Observations
Trusts vial share when possible and record as a Quality, Efficiency and Productivity saving. Apart from Barts Health all trusts vial share on a campaign basis. This means that the doses are scheduled to be made in the same isolator session and patients scheduled to attend within the expiry time of the prepared drug.

Best Practice
Trusts would vial share more effectively if patients were appropriately scheduled. Extended expiries would help vial sharing. Doses could be banded, made in one session and if a patient did not need chemotherapy the product could be re-used. For unlicensed units, it may be more cost effective to purchase high cost drugs by grouping together. The vial share gain would be shared and there are many companies investing in extending the expiry times of their products. A trust outside London Cancer has recently moved to purchasing Azacitadine, a high cost drug used for AML resulting in a financial efficiency saving.$^4$

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<th>BHRUT</th>
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Table 9. The Vial Sharing Opportunities at London Cancer Providers

Green: Vial Sharing in use; Amber: There is potential to vial share; Black: No opportunity to vial share

London Cancer Chemotherapy Service Audit
### 3.5.2 VAT reduction and Homecare

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<tr>
<th>Trust</th>
<th>BHRUT</th>
<th>Barnet and Chase Farm (Results for Barnet only)</th>
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<th>GOSH</th>
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*The trust does not benefit financially from home delivery of oral anticancer treatment as the dispensing is undertaken by a private organisation.

All trusts were asked to provide the names of the oral or IV medicines that they supply on homecare. VAT law in UK means that if an NHS hospital dispenses an oral or IV medicine then that trust has to pay VAT on the drug cost which for most new medications can be a very considerable amount. If a private company supplies the oral or IV medication to a patient at home there is no VAT payment applicable. The NHS trust then pays the homecare private company for the delivery charge and the VAT free cost of the medication.

**Observations**

Most Trusts are taking advantage of the current regulations to reduce their VAT liability. Other methods used by trusts to reduce VAT are either to outsource the pharmacy dispensary to private pharmacies e.g. Lloyds or Sainsbury’s, or to give patients a Community Pharmacy prescription (FP10) for local dispensing.

**Satisfaction with Homecare or Home delivery**

As trusts have moved more services to homecare there has been an increase in patient complaints due to a sudden high demand for the service. Regular satisfaction surveys should be undertaken to ensure that the quality of the service is maintained.

**Best Practice**

There are an increasing number of high cost SACT drugs that are administered either by mouth or by subcutaneous injection suitable for home delivery or home administration. All providers should take the opportunity to reduce VAT costs by utilising this or by other means e.g. Lloyds Pharmacy work with the Royal Free hospital enabling them to maximise VAT savings. Other trusts outside London including Warwickshire have reported to make savings of £250,000 per annum on VAT savings⁵. Patient satisfaction must continue to be monitored in homecare as in hospital services⁶.

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London Cancer Chemotherapy Service Audit

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3.5.3 The mechanisms of billing

Chemotherapy payment changed in April 2013 when NHS England was created. This resulted in the implementation of a National Cancer Drug fund list, administrated directly by NHS England. Although specific questions regarding chemotherapy funding were not asked, it was apparent that trusts used different mechanisms to charge NHS England for chemotherapy services delivered. Some trusts had concerns about “double charging” for chemotherapy services as funding arrangements still existed between provider trusts and the old PCT’s. Work is being carried out by NHS England to harmonise all commissioning/billing arrangements so that all providers across England are reimbursed in the same way for each chemotherapy treatment in England.

It was apparent on the visits that there was not a high awareness amongst chemotherapy teams of the billing requirements that NHS England mandate to ensure that the providers get paid at the correct tariff. In relation to the Cancer Drugs Fund, some providers across London Cancer were not billing NHS England correctly.

Billing for chemotherapy services is complex and coders employed to do the job rely heavily of pharmacy services to help in the process. Trusts do not have coding IT systems which are integrated with the chemotherapy e-prescribing systems so coders need to interpret chemotherapy prescriptions on e-prescribing systems and then appropriately choose the correct code to enter. This is done against a national list of chemotherapy regimens which includes over 400 regimens and specific codes. If an incorrect code is entered then the provider trust may receive an incorrect financial tariff.

3.5.4 The London Procurement Partnership
The London Procurement Partnership (LPP) is an organisation paid for by trusts across London to enable London trusts to save money through efficient procurement. Joint projects of the group and London Cancer include the implementation of dose banding and a project to reduce wastage from expired drugs.

Best Practice
The sharing of information about billing practices in the CERG has helped ensure that all providers across London Cancer are aware of what should be done to ensure that tariff payments are received from NHS England and invoices are paid.

Part of the mandatory SACT dataset which will apply in April 2014 is the reporting of the chemotherapy delivery and procurement codes. Some provider trusts (e.g. Barts Health) have
built these codes into their e-prescribing system so when the SACT reports are run from the e-prescribing system, the delivery and procurement codes are automatically populated from the e-prescribing system. Despite these measures, there are still inaccuracies in reporting. Coders can then also run reports of chemotherapy activity from e-prescribing system and use the pre-populated codes to ensure that they are coding the chemotherapy correctly on the trusts coding IT systems.

In order to take advantage of the work of the LPP Trusts with small volumes of the more expensive drugs should consider partnership agreements with a larger user to minimise cost and wastage.
### 3.6 Clinical Governance

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**Table 11. Clinical governance**

*Green = Evidence seen, Amber – conducted however not frequently, Red – Not collected, White - no return*
**Observations**

All trusts were able to demonstrate that they had suitable governance structures with respect to regular governance meetings, Drugs & Therapeutics meetings and meetings regarding the reporting of incidents and near misses.

GOS and the UCLH participate in joint governance and D&T meetings for paediatrics and young people. This is believed to be of great value as they share patients as they move between the two trusts. The Lead clinician at GOS recognises the need for a further networked governance structure between GOS and the surrounding POSCU’s but it is felt that there are too many currently to organise the system in this way. There was great variation in the manner in which the committees delivered their function and how the individual trusts responded to risk registers. There were examples of trusts unable to address their high risk issues due to financial constraints and a lack of understanding of the impact on patient care. There was no evidence of sharing of lessons learned between trusts in *London Cancer* as required by the peer review standards. There was variable evidence that Trusts were collecting and reporting their thirty day NCEPOD deaths following chemotherapy with good practice most evident at BHRUT.

*London Cancer* Pathway boards are in the process of publishing up to date guidelines regarding chemotherapy treatment protocols. This will allow trusts to determine and record off protocol prescribing more effectively.

**Best Practice**

All tumour pathway boards must publish their guidelines, protocols, and algorithms in order that the treatment and off protocol use can be audited.

The CERG is responsible for ensuring that all the Trusts in London Cancer comply with the peer review standards for clinical governance. All Trusts must supply evidence in the form of their agenda papers but not the content of their governance meetings. All must submit reports of near misses, adverse events, off protocol prescribing, and NCEPOD deaths within thirty days of chemotherapy to the CERG in order that they can be disseminated to the lead clinicians at each trust to share the lessons learned.

Regular local feedback of collected data is essential to improve practice and outcomes. BHRUT have demonstrated success through systematic audit in collating and feeding back thirty-day death data at local governance meetings. The feedback has resulted in an improvement in the consent of patients and their AOS service⁷. Lessons learned learned can then be translated to other tumour groups within Cancer Services.
5. Conclusions

London Cancer consists of ten providers that deliver chemotherapy all of whom have demonstrated areas of excellence. The CERG audit has demonstrated ways to improve patient experience of chemotherapy throughout the London Cancer Integrated Cancer System (ICS) by sharing best practice and reducing variation where possible in the chemotherapy services. The audit can be used to demonstrate to individual trusts how improvements can be made in their service to achieve best practice and cost efficiency. Together with the London Cancer Alliance and NHS England (London) we have begun to develop new commissioner and provider models for modernising chemotherapy services that will be needed to lead organisational change.

The recommendations made in this report are consistent with the NHS England and the London Model of Care for Cancer Services, Commissioning Strategy for Chemotherapy, The Chemotherapy Service Specification and National Cancer Peer Review Standards.
6. References


2. Pedley I et al. The Oncology Homecare Programme. HSJ awards 2013


5. Williams, D. HMRC investigating trusts over drug tax schemes. HSJ. April 2013

6. Patient safety alert on minimising risks of omitted and delayed medicines for patients receiving homecare services. NPSA Alert April 2014