

## Board of Directors (Public)

### Item 3.4

**Subject:** Strategy for the Prevention and Control Management of Carbapenamase – Producing Enterobacteriaceae (CPE) and Other Multi-drug Resistant Organisms (MDRO)

**Date of meeting:** 24<sup>th</sup> November 2015

**Prepared by:** Dr Raph Perry/Medical Director

**Presented by:** Dr Raph Perry/Medical Director

## Board Report

| BAF Ref | Impact on BAF Risk Rating? |
|---------|----------------------------|
| 2       | None                       |

### 1. Executive Summary

- CPE and MDRO pose a significant risk to patients and the business continuity of the trust
- The Infection Prevention and Control Committee oversee the surveillance and management of individuals and outbreaks.
- There has been significant investment in supporting IP & C.
- The surveillance software is being upgraded.
- An antimicrobial stewardship programme has been initiated
- There is a need for increased staffing in terms of consultant time, infection prevention nurse time and admin support
- Appropriate isolation facilities are being addressed
- Deep cleaning processes are being trialled.
- The cost pressures are outlined in the appendices

### 2. Background

This paper will present the Trusts strategy to the management of Carbapenamase Producing Enterobacteriaceae including Carbapenem Resistant Enterobacteriaceae and other multi drug resistant organisms. It will outline present practice and a strategy for control and management of these organisms over the next three to five years.

Enterobacteriaceae are a group of bacteria that usually live harmlessly in the gut of humans and animals. However, these organisms are also some of the most common causes of opportunistic urinary tract infections, intra-abdominal and bloodstream infections. They include species such as *Escherichia coli*, *Klebsiella* spp. and *Enterobacter* spp.

As a result of increasing resistance to various groups of  $\beta$ -lactams due to ESBLs and AmpC enzymes, there is increasing reliance on carbapenems for the treatment of infections caused by *Enterobacteriaceae* and other Gram-negative bacilli, such as *Pseudomonas aeruginosa* and *Acinetobacter* spp.

Carbapenems include meropenem, ertapenem, imipenem and doripenem. Over the last decade, there has been an alarming rise in the reports of carbapenem resistant *Enterobacteriaceae*. There are two major forms of carbapenem resistance in *Enterobacteriaceae*:

- The production of a broad spectrum  $\beta$ -lactamase enzyme (carbapenemase) that cleaves the carbapenem antimicrobial rendering it irreparably damaged and ineffective.
- The combination of broad spectrum  $\beta$ -lactamase (ESBL/AmpC) production with decreased permeability of the bacterial cell wall for the antimicrobial due to porin loss.

The term CRE encompasses *Enterobacteriaceae* with both resistance mechanisms, although emphasis has been put on the laboratory detection and infection control measures recommended for carbapenemase producers, as these enzymes are located on plasmids, like ESBL/plasmidic AmpCs, and therefore have an enormous potential for dissemination.

The majority of CRE are also resistant to other commonly used groups of antimicrobials such as fluoroquinolones and aminoglycosides. Consequently, clinicians are increasingly depending on less commonly antimicrobials such as colistin and tigecycline in the treatment of infections caused by CRE.

In the UK, over the last five years there has been a marked increase in the incidence of infection and colonisation by multi-drug resistant carbapenemase-producing organisms. A number of clusters and outbreaks have been reported in England, some of which have been contained. This provides evidence that, when the appropriate control measures are implemented, these clusters and outbreaks can be managed effectively. They are made by a small but growing number of *Enterobacteriaceae* strains. There are different types of Carbapenemase- Producing *Enterobacteriaceae* (CPE), of which KPC, OXA-48, NDM and VIM enzymes are currently the most common.

This strategy has been developed from the model in the Acute trust toolkit for the early detection, management and control of CPE (Public Health England 2013) has been adapted locally to enable the, screening, detection and infection prevention and control management of such organisms Liverpool Heart and Chest NHS Foundation Trust..

It is important to appreciate that the NHS Toolkit was put in place to manage an acute rise in CPE Infections. The Trust needs to have in place a strategy that minimises the impact and harm posed by MDROs that goes beyond the current concerns. This will ensure the Trust is well placed to manage the challenges of being a tertiary centre and as such at high risk of receiving patients colonised with these organisms from other hospitals.

The Trust has an excellent track record in controlling and managing multi-resistant organisms. This strategy builds on the basis principles of infection control and will need to be accompanied by a refresh of existing policies by the infection control team. It will cover:

- 2.1. Surveillance and screening
- 2.2 Hospital Hygiene
- 2.3. Isolation Facilities
- 2.4 Antimicrobial stewardship
- 2.5 Workforce
- 2.6. IT support
- 2.7 Education and Training.

## **2.1 Surveillance:**

Screening for MDROs and other infections such as MRSA is a key control measure. The current advice is to screen all patients who have come from known high risk areas.

However with evidence of CPE outbreaks in most surrounding hospitals, our current policy is has evolved to screen any patient who has been transferred from other hospitals. The pace of change is rapid and the guidance now suggests all our patients who have been hospitalised in the previous twelve months should be screened.

Screening for MDROs has a number of problems. A rectal swab is necessary for the enterobacter organisms and can be an issue for patients and some staff.

With the roll out of screening for MDROs, MRSA, MSSA, there will be a need for EPR order sets to ensure this is can be tracked after a clinic visit for elective patients. The system should also allow flagging of patients who are known carriers and any patients who have been in contact with a MDRO outbreak. This should be part of the patients record if tracked through external surveillance.

Patients are held at other hospitals for a period of time prior to transfer. These patients should be screened at the base hospital prior to transfer. This is not often performed and needs to be reinforced with adherence to the guidelines. Agreement on screening criteria with surrounding hospitals varies and occasionally the clinical condition of the patient may not permit delays. Thus screening at base hospitals is unreliable and the Trust must rely on local screening or pre-emptive isolation if there has been known contact or an outbreak. Acute admissions will not have had the opportunity to be screened and will be screened/isolated at LHCH in line with guidance.

#### Rapid testing for CPE.

The results of swabs processed in standard fashion by a laboratory can take up to 48 hours to become available. Thus emergency transfers cannot be screened prior to arrival and need to be isolated in single rooms prior to the result being known.

Whilst this is a cost effective approach for elective admissions, it is not suitable for urgent or emergency patients. Rapid testing using genetic markers can provide a result in less than two hours and is now available commercially. The cost of routine screening is around £10 per swab. Rapid testing at present is around £80 per test. Although the cost per test is currently high, it is likely to reduce as the technology evolves. As it would obviate the need for unnecessary isolation of transfer patients it may prove to be cost effective in the longer term. Around forty per cent of admissions are transfers though many of these are in patients for greater than forty eight hours at the referring trust and should have been screened locally if indicated.

There are a number of tests available commercially and the Trust will develop criteria for urgent testing and discuss with Liverpool Core Laboratories to incorporate this facility in the screening policy.

## **2.2 Hospital Hygiene**

It is clear that MDROs are spread by physical contact rather than the airborne route. Colonisation and infection is therefore due to patient contact with either a contaminated environment or individual.

#### Environmental cleaning

Environmental contamination plays an important role in the transmission of hospital acquired pathogens. Effective cleaning and disinfection is vital to prevent the spread of infection from environmental surfaces.

Many studies have shown that manual cleaning alone does not always deliver effective reduction in microbial counts for all surfaces and equipment within a patient room.

Technologies that do not rely solely on manual cleaning can be used to ensure that all surfaces are decontaminated and these have been implemented in many Trusts. They are generally used in outbreak control and/or as part of the deep/terminal cleaning process following the discharge of a patient who has been nursed in isolation. There are two methods of whole room disinfection in use, hydrogen peroxide and, less commonly in UK hospitals, Ultraviolet C.

#### Hydrogen Peroxide

This uses an automated machine to distribute aerosolised or vapourised hydrogen peroxide in a room. This settles on all surfaces and destroys micro-organisms. There is a large amount of clinical data demonstrating the efficacy. However the room has to be sealed off while the machine is in use and then left for a period to clear the vapour. This means the turnaround time for a room to be back in use can be 3-4 hours.

However a new product has come onto the market recently which cuts the turnaround time to 1- 1 ½ hours. The machine has a capital cost of £30,000 and an additional cost of £20-25 per room.

#### Ultraviolet C

At certain wavelengths ultraviolet light will break the molecular bonds of DNA of micro-organisms thereby destroying them. UV- C has a wavelength within the germicidal range.

UV-C as a method of decontamination is not as common in UK hospitals as vaporised hydrogen peroxide. However it has a number of advantages in that it does not use any chemical products and also it is much quicker to complete i.e. 20-30 minutes. However there is not as much supporting clinical data and there are potential problems with efficacy due to reflection and refraction of light and shadowing. The capital costs have been high at around £90,000 however the technology is evolving rapidly.

The IP & C committee have been in negotiation with a new company, Hygiene Technology, and trialled a new UV-C system in October. The costs of this system would be at most £50,000 and significantly less if we formed an academic partnership. There are no disposable cost and no additional costs other than a service contract. The technology was easy to use and it has the advantage of a rapid turn round time for the room being decontaminated. The results of microbiological testing of this trial will be available in November 2015.

To date the Trust has relied on an excellent in-house cleaning team to manually disinfect rooms and equipment. However, this in itself is unlikely to be sufficient going forward and these two technologies need to be further evaluated and the most effective and cost effective solution considered at the earliest opportunity.

#### Hand Hygiene.

Spread of infections by contact with health care workers is well recognised, and good hand hygiene is a cornerstone of infection control. The Infection control team reviews hand hygiene audits at each meeting and there have been no outbreaks on ward areas attributed to poor technique.

Hand hygiene in critical care areas is more of a problem. Nursing staff often look after more than one patient and in the pressured environment it is easy for good hygiene to break down. Indeed there is evidence for this in a recent outbreak of VRE colonisation.

The Trust needs to consider the introduction of different glove and apron colours for adjacent patients, particularly in POCCU. Only two colours would be required –pink and blue. A nurse looking after two patients would then have a clear aide memoire for glove

changing depending on the colour allocated. It will also ensure medical staff change gloves if there is patient contact during a ward round.

The Trust has recently seen a rise in blood stream infections in the critical care areas. Aseptic non-touch training needs to be reviewed and reinforced. Audits of central venous line insertion and care have shown deficiencies and a task and finish group has been established to review this. These are basic infection control measures that can often be overlooked in a critical care area that has high occupancy.

### **2.3 Isolation Facilities on Wards**

Patients require isolation for two reasons. Firstly, patients with unknown CPE status transferred from other hospitals may pose a risk if nursed in proximity to others. Currently it takes at least 48 hours for the CPE status to be diagnosed from a swab and during this period they may be the source of an outbreak. Thus, until the status is defined, they need to be nursed in a single room.

This problem can be managed to some extent by the use of near patient testing and, as above, it may be cost effective for the Trust to invest in this facility to improve patient flow.

Secondly, there is no cure for CPE, and patients who are infected or known carriers require isolation throughout their entire hospital journey. There is likely to be an increasing number of these patients in the future as a consequence of outbreaks in surrounding hospitals.

An additional consideration is the use of isolation for managing outbreaks. The Trust has dealt with MRSA outbreaks in the past and has needed to cohort infected patients together in a single ward. This is not currently recommended for CPE, though it has been used in other hospitals recently. One hospital lost 180 bed days from a single outbreak, which demonstrates the potential impact of failure to control CPE on business continuity.

Enterobacteria are carried in faeces and isolation rooms therefore require ensuite facilities. The infection control team have recently reviewed the single room facilities in the Trust. There are only six side rooms in Medicine with ensuites (4 Amanda and 2 on Birch.) though there may be potential to utilise beds on Cherry Ward. Surgery has 49, with 13 of these on Maple suite though Maple suite can be used for medicine patients also. Currently the rooms are fully utilised, accommodating the requirements of mixed sex legislation, infection control, cystic fibrosis and private patients. They are also used as part of the routine bed stock, which is always under pressure.

The Trust needs to manage the use of isolation rooms flexibly. This may be constrained by the use of wards for specific specialties. It will be important to be able to nurse cardiac patients on Cedar and thoracic patients on Oak ward. This has significant implications for nurse training and medical ward rounds.

With the increasing prevalence of MDROs, it is possible that the Trust will experience an outbreak in the near future. Currently, we would find it difficult to accommodate these patients in side rooms or cohorting, with the consequent impact on business continuity.

In view of the above, the Trust needs to consider the additional ward isolation rooms when wards are developed as part of the capital programme.

#### **Isolation Facilities in Critical Care**

Isolation Facilities in Critical Care may be inadequate if the Trust decided to fully implement the recommendations for the management and control of CPE, as it is recommended that

all patients who had been in hospital within the last 12 months would need to be isolated until they have been screened and the screens are negative.

Current practice is that patients transferred in from other Trusts as emergencies to Critical care are admitted to a side room, although even this precaution can prove problematic at times because of capacity.

Options have been explored in relation to enhancing side room capacity in critical care. Reconfiguring POCCU to create more side rooms would have significant costs and unacceptable disruption to patient flow and critical care capacity. Therefore other alternatives have been explored.

#### **2.3.1 Screens used in POCCU**

Screens can be used to partition of all or parts of POCCU. Although they would not be floor to ceiling height as this would cause problem with monitoring of patients therefore they would not function as a fully operational side room and could not be used for patients with airborne infections.

KwickScreens are flexible screens that can be used as temporary or permanent partitions for patient isolation. They can be portable or fixed to a wall. They are made of materials that are wipe clean, bacteria-impermeable and easy to maintain. The availability of mobile screens would cost approximately £30,000 –rising to £38,000 for fixed structures.

#### **2.3.2 Installation of pre-built side room or “pod”.**

These are complete side rooms that can be custom made to fit into an existing area and can be installed on a temporary or permanent basis. They can be hired by the month or purchased outright.

Currently, POCCU is not a suitable environment for the care of CPE positive patients. Both of the above options need full evaluation. It is likely that the implementation of screens or pods on POCCU, combined with additional measures such as glove/gown identification as described, should manage the containment of MDRO infections on POCCU.

### **2.4 Antimicrobial Stewardship**

Antimicrobial resistance (AMR) has risen significantly over the last forty years giving rise to MDROs. The inappropriate use of antibiotics is a key driver to AMR. From 2010 to 2013 antibiotic prescribing in England increased by 6% with a 4% rise in primary care and a 12% rise in hospital inpatient prescribing. The consequences include the increase in MDROs and decreased treatment options when antibiotics are vital. Antimicrobial stewardship is the key to combating AMR and is an important element of the UK five year AMR strategy.

Antimicrobial stewardship embodies an organisational, system wide approach to promoting judicious use of antimicrobials. This includes optimising therapy for individual patients, preventing the overuse and misuse of antibiotics and hence minimising the development of resistance.

The trust has set up an Antimicrobial Stewardship group which meets quarterly and feeds into the main IP & C committee. This includes specialist pharmacy support. The group will be using the Start Smart and Focus toolkit which provides an outline of evidence based antimicrobial stewardship practice in secondary care.

NICE has issued guidance NG15 on antimicrobial stewardship and the IP & C committee are undertaking a gap analysis at present.

## **2.5 Workforce considerations**

The current infection control team has wide-ranging responsibilities but limited resource. There are 1.8 WTE Infection Control nurses, and a 0.5 WTE consultant microbiologist. The microbiologist has clinical responsibilities that limit the time available for infection control. The team is led by the DIPC who also has the other responsibilities of Medical Director. There is 0.3 WTE band 3 clerical support three mornings a week.

The increase in MDRO cases, surveillance, audit and statutory requirements continue to put pressure on the IP & C team. The DIPC is undertaking a review of roles and responsibilities including a review of the microbiology consultant job plan. Critical care guidance now recommends a microbiology consultant presence five days per week. Discussions are on-going with the RLUH pathology department over the disposition of the present and future consultant support. In order to satisfy regulations the trust would need to invest three to five additional consultant PAs.

Screening is only effective if the results are known in a timely fashion and acted upon. The Trust now screens for MRSA, C.Difficile, Staph aureus and MDROs. The increasing volume of screening results is difficult to manage within the small current infection control team. There is thus a requirement for additional clerical support for the infection control nurses who manage any patients who screen positive for MDROs. This will ensure that positive patients are not missed and do not become the source of an outbreak. There is estimated to be a need for further specialist nurse support of 0.5 WTE and additional 0.2 WTE clerical support. The latter is to ensure that surveillance results are identified and dealt with in a timely manner.

## **2.6 IT Support.**

The Infection Control Team need to be able to trace contacts of infected or colonised patients; this is critical to the management of outbreaks of CPE or any organism. Since 2008 the trust has utilised the ICNet surveillance software platform shared with Royal Liverpool and Aintree Hospitals through Liverpool Core Laboratory. The surveillance ensures all infection results are flagged, and allows contact tracing across the main hospitals in our Region. There has been no on-going cost to this support after the initial purchase in 2008.

This software is to be upgraded to a new version in November 2015, with the current version becoming obsolete thereafter. There is an implementation cost then an annual licencing fee for the duration of the agreement – at present five years. The IP & C team have carried out an option appraisal of surveillance methods/software; see Appendix 1.

In addition to the surveillance software two additional software packages are recommended by IP & C. The first of these is ICNet Pharmacy which links patients prescribing and is vital to support the antimicrobial stewardship programme. The second is ICNet surgical/theatres interface. This allows extensive surgical surveillance allowing better tracking of wound infection and treatment. It also allows mandatory reporting direct to PHE.

After discussions at the Exec group continued use of the upgraded ICNet software has been agreed with attendant costs. The costs of continued surveillance can be mitigated by the cost to business continuity of a missed result causing a local outbreak.

The trusts EPR allows analysis and performance management of the treatment of patients with infection. Recent audits of the sepsis bundle have shown a need for improvement in documentation and data entry to be compliant with the trusts aims and aspirations. There

needs to be a greater engagement of the clinical staff with the relevant sections of EPR. The recent increase in resource should allow further refinement of the PER processes and training of staff groups to maximise the effectiveness of treatment bundles and order sets.

## **2.7 Education and Training.**

Medical staff currently receive information on infection control at induction to the Trust and as part of mandatory training. The information needs updating in view of the additional risks presented by MDROs and to reinforce the facilities of EPR. An updated guide on antibiotic prescribing will be developed and circulated by the antimicrobial stewardship group.

Non-medical staff will continue with the new PACT as a learning tool for updated infection control issues.

A structure of infection control link nurses already exists and they are the key guardians of infection control at ward areas. Releasing them from direct patient care is difficult on occasion but their role needs to be reinforced and emphasised. Basic principles of hygiene are key to preventing spread of newer organisms and staff should be encouraged to challenge poor practice (e.g. poor hand hygiene technique) and if necessary report through the incident reporting process.

Education and training processes and materials will need to be reviewed to ensure they are fit for purpose going forwards.

Continued modifications of the EPR systems will be communicated widely to staff and specific training given as appropriate.

## **3. Summary**

There is a clear increase in the incidence of CPE and MDROs throughout the healthcare community. The impact of MDROs on a tertiary cardiothoracic hospital could be significant and an outbreak must be considered as a significant risk. The risks, most importantly, are to patient safety both individual patients and those unable to be treated for the risk of spreading infection. There could be a serious risk to the business continuity of the Trust.

The control of these organisms requires persistent focus on the standard areas of Infection control. The trust has put in place updated surveillance, and antimicrobial stewardship group, considered isolation strategies and is looking at investment in appropriate personnel to ensure present standards are met and in the future improved.

It is of note that the Trust has had an excellent record in this respect for many years. However given the proliferation of MDROs present facilities are unlikely to be sufficient to meet the challenges of the next three to five years..

## **4. Recommendations**

This paper highlights key areas for the Trust to consider and adopt to ensure that the Trust keeps patients safe and is able to continue to provide the highest quality of care in the coming years.

The quality committee is asked to note the report and consider the developments outlined and attendant costs which are outlined in appendix 1 and 2.



## Appendix 1

# Committee Paper

|                         |   |
|-------------------------|---|
| <b>Subject:</b>         | <b>Infection Prevention and Control Surveillance System</b> |
| <b>Date of meeting:</b> | <b>14<sup>th</sup> October 2015</b>                         |
| <b>Prepared by:</b>     | <b>Nicola Best</b>  |
| <b>Presented by:</b>    | <b>Dr Raph Perry</b>  |

### 1. Introduction

This paper outlines the Trust options for the continuation of their electronic Infection Prevention and Control surveillance, case management and reporting system. The Infection Prevention and Control Team have explored available options and have presented these below for discussion and approval to proceed.

### 2. Background

Surveillance and reporting of specific micro-organisms is prerequisite of a robust infection prevention and control programme and is a requirement identified in the Health and Social Care Act 2008. Generally there has been a move nationally to use electronic systems to provide automatic imports and alerts, collate both patient and audit data and generate reports.

Liverpool Heart and Chest NHS Foundation Trust have been using a software system ICNET (version 6) for the surveillance and monitoring of Healthcare associated infections (HCAI) for a number of years. This was introduced in conjunction with Royal Liverpool and Broadgreen University Hospitals NHS Trust's (RLBUHT).  
RLBUHT and Aintree University Hospitals NHS Foundation Trust are now moving to the newest version of ICNet Software as part of a tender managed by Liverpool Clinical Laboratories (LCL).

When RLBUHT upgrade from Version 6 to ICNet NG later in the year, (current project timescales are December 2015) Liverpool Heart and Chest will lose access to their infection control surveillance system.

LCL have offered to include LHCH ICNet NG provision as part of the Service Level Agreement for the Laboratory Services they currently provide the Trust.

### 3. Issues

There are 3 options available to the Trust as detailed in Appendix 1 below. If no action is taken the electronic surveillance system will cease in December 2015. The infection prevention nurses will revert to a system whereby

RLBUHT laboratory sends lists twice a day to the infection prevention nurses of any “alert organisms” and then paper based records will be generated. Functions currently available will no longer be able to be used. This move does not reflect what is happening regionally and nationally, with many Trusts opting to upgrade their surveillance systems.

The other 2 options are to integrate a surveillance and reporting system from Allscripts or to use the upgraded ICNET NG system with RLBUHT and Aintree University Hospital. There are significant costs associated with both these options, as detailed in Appendix 1.

Within ICNET NG there is the option to have the infection prevention and control module and then add also a surgical site module and/or pharmacy/antibiotic prescribing module at the same time or at a later date. Projected costs for the additional modules are also included in the appendix.

### **Recommendation**

The Infection prevention and control team recommend that the Executives consider their preferred option (Option 3) which is to upgrade the current system and install ICNET NG.

#### 4. Appendix 1 -Options Appraisal

|                  | Option                          | Service Impact  | Benefits  | Timeframe   | Cost  |
|------------------|---------------------------------|---|---|---|---|
| <b>Option 1:</b> | Do nothing                      | <ul style="list-style-type: none"> <li>Electronic referrals and alerts from laboratory system not available</li> <li>Electronic case management history not available</li> <li>Software for collating and reporting functions on alert organisms not available</li> <li>No efficient contact patient tracing system</li> <li>Less efficient audit processes</li> <li>IPCT will revert to a paper based system therefore more administration time required from IP nurses</li> </ul> | Less expensive than other options.  | Electronic system access will cease when RLBUHT upgrade (December 2015) | No cost initially but more administration personnel/hours will be required.                           |
| <b>Option 2:</b> | Implement new Allscripts Module | <ul style="list-style-type: none"> <li>There will be no continuity of service</li> <li>A paper system will be required in the interim period. Functions will not be available in the interim period as above</li> </ul>   | <ul style="list-style-type: none"> <li>One platform for all Trust data</li> <li>Functionality predicted to be equivalent or exceed what is available currently (although does not have all the benefits of the ICNET NG upgraded system)</li> </ul> | Approximately 1 year to implement                                       | No detailed information on development costs but estimate of £100,000 for additional required modules |

|                  |  |  |  |  |   |
|------------------|--|--|--|--|---|
| <b>Option 3:</b> | Continuation of ICNet Infection Prevention | <ul style="list-style-type: none"> <li>LHCH becomes part of existing LCL project</li> <li>Minimal team disruption as project already underway</li> </ul> | <ul style="list-style-type: none"> <li>Upgraded system – Functionality will exceed what is currently available</li> <li>Wider surveillance across 3 Trusts; therefore comprehensive patient picture for infection control purposes</li> <li>Continuity of service - Immediate access to ICNet full suite of reports</li> <li>2 days of on-site training or consultancy per year</li> <li>Dedicated account manager for ICNet users</li> <li>Unlimited user licenses</li> </ul> | <p>Access to lab system will continue (new system will migrate approx. December 2015)</p> <p>Access to patient administration information will be phased into existing project. Timescales dependant on patient administration feed.</p> | <p>Y1 - £33,668 (installation)<br/>Y1 - £18,535 (license)<br/>Y2-Y5 - £18,535 per year</p> <p><u>5 Year Total: £126,343</u></p> <p>(See Appendix 2: LCL Proposal submitted as part of Pathology Contract SLA)</p> |
|------------------|--|--|--|--|---|

\*Option 3 pricing is based on ADT information assumed to be taken from Allscripts module which includes bed and bay. N.B. Confirmation is still required to confirm if an Allscripts export is available.

\*\*Option 3 interfaces for PAS and Lab are offered at a reduced cost to reflect the investment already made with ICNet.

| <b>Option 3: Additional Interfaces</b>  | <b>Service Impact</b>   | <b>Benefits</b>   | <b>Timeframe</b>   | <b>Additional Cost</b>                                       |
|---|---|---|--|--|
| <b>ICNet Surgery/theatres interface</b> | <ul style="list-style-type: none"> <li>There is no existing interface to electronic theatres system</li> <li>Current mechanism of SSI surveillance is manual</li> </ul> | <ul style="list-style-type: none"> <li>IPCT can conduct extensive surgical surveillance</li> <li>ICNet can export directly to PHE for mandatory surveillance</li> <li>Expansion of system to surgical team</li> <li>Enhanced outcomes reporting options available for surgery (LOS etc.)</li> </ul> | <p>Dependant on Trust procurement decision for theatres system.</p> <p>Can be included in existing LCL install as a project phase.</p> | <p>£24,000 (Installation)<br/>£0 (annual license uplift)</p> |

|  |  |   |   |   |
|--|--|---|---|---|
| <b>ICNet Pharmacy</b><br><br><b>(if purchased as part of ICNet Infection Prevention)</b> | <ul style="list-style-type: none"> <li>• There is no IPCT existing interface to electronic prescribing system</li> </ul> | <ul style="list-style-type: none"> <li>• Reporting tool which supports Trust in antimicrobial stewardship</li> <li>• Cost reporting to assess Trust pharmacy spend</li> <li>• IPCT have access to prescribing information for fuller picture of patient</li> <li>• Antimicrobial and other clinical teams have wider picture of patient</li> <li>• Ability to be alerted to a multitude of scenarios</li> <li>• Encourages cross departmental team working</li> </ul> | Can be included in existing LCL install as a project phase. | £32,000 (Installation)<br>£7,105.97 (annual license uplift) |
|--|--|---|---|---|

\*All costs included in 'Option 3: Additional interfaces' are indicative at the time of proposal and may be subject to change.

\*\*ICNet Pharmacy module costs license costs have been discounted as they are being purchased with or as a latter phase of the Infection Prevention Module. Further costs can be provided by ICNet if Pharmacy wish to procure alone

## Appendix 2

### Cost pressures; CPE/MDRO strategy

|                                 |  |  |
|---------------------------------|--|--|
| ICNet Surveillance (see Appx 1) | <b>Option 3</b>                          | £33,668 installation<br>£18,535 licence annual |
|                                 | Additional packages                      | £56,000<br>£7,105.97 licence annual            |
| Staffing Costs                  | Consultant PAs 3-5                       | £24,000 - £40,000                              |
|                                 | Band 6/7 0.5 WTE Infection control nurse | £22,000 (est)                                  |
|                                 | Band 3 0.2 WTE clerical support          | £4.000 (est)                                   |
| CPE Testing                     | Rapid testing excess                     | £7000 - £10,000<br>(Estimated 2-3/week)        |
| Critical care Screens           | Needs fuller consideration               |  |