East of England Neonatal Policy for Infection Control & Screening

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Used by: Medical Staff, Neonatal Nurses, Pharmacists, Microbiologists & Infection prevention & control teams.

Key Words: Infection, Neonatal, screening, standards, prevention, precautions

Date of Ratification: 20th June 2018

Registrations No: EOENBG-04

Approved by:

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Ratified by clinical oversight group:

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Audit Standards:

1. 100% of all infants should have routine infection screening
   - Surface swabs should be taken as part of all full admissions to the neonatal unit or Re-admission from other units.
   - Thereafter, infants should be screened weekly to detect the presence of Methicillin-resistant Staphylococcus Aureus (MRSA) and other resistant organisms.

2. Standard Infection control precautions should be used before every episode of direct patient care in 100% of cases as per prevention standards
   - Hands should be washed and decontaminated with alcohol hand rub
   - Non sterile gloves will be worn where there is a risk of contamination of blood, bodily fluids, micro-organisms or chemicals.
   - Sterile gloves and gowns will be worn during invasive procedures involving neonates but excluding peripheral cannulation
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<td>Appendix 4</td>
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Assurance Statement

The Purpose of this protocol is to outline the regional approach to implementing the use of routine infection screening for micro-organisms in neonates following admission and weekly monitoring thereafter. While outlining basic precautions and prevention standards for infection control used routinely on all neonatal units within the East of England Perinatal Networks.

1.0 PROTOCOL DEVELOPMENT

A number of infection outbreaks in neonatal units across the East of England in 2009 led to changes in practices in the way infections were being managed and controlled.

Following these outbreaks parental feedback showed that variations in infection control practices in different units were confusing for parents and had been disruptive and restrictive for families.

This led to the decision to standardise the approach to infection control in four key areas. Managers were asked to highlight what the priorities for standardisation should be.

Two key areas identified for standardisation

- Screening all infants for micro-organisms on admission and re-admission and then during their stay on the neonatal unit
- The use of non-sterile or sterile gloves and aprons where necessary for all staff and parents caring for infants in neonatal units.

This protocol has been developed in agreement with regional microbiologists, infection prevention and control nurses, neonatal nurses and a pharmacist, using evidence where it exists and otherwise based on consensus of the infection working group.
2.0 INTRODUCTION

Neonatal infections can be acquired in utero, trans-placentally or during delivery through the birth canal; spontaneous preterm delivery alone represents a risk factor for infection. Postpartum acquired infections usual come from external sources such as health providers, invasive procedures and the presence of central lines, especially in the very preterm infants which are key factors in late onset sepsis; these are a major cause of morbidity and mortality also resulting in prolonged hospitalisation. All newborn infants are at risk of contracting infections; with preterm infants at increased risk the lower the gestational age, as they are more susceptible to infections due to their immature immune systems and exposure to the hospital environment. The close proximity of infants in many Neonatal Units facilitates transfer of organisms from infant to infant.

Group B streptococcus remains the leading cause of early onset infection. Late onset infection is predominated by coagulase negative staphylococci and gram-negative micro-organisms with increasingly resistant and unusual profiles. There are also an increasing numbers of multi drug resistant organisms being identified within the neonatal population.

Neonatal infections can be caused by a number of organisms.

- Early onset sepsis (<72 hours post-delivery) are usually **Group B Streptococcus, Listeria or E-Coli**.

- Late onset sepsis (occurring at more than 48-72 hours of age after birth) is usually caused by the hospital environment and interventions. The range of organisms causing late onset sepsis includes gram positive and gram negative bacteria with increasingly resistant and unusual profiles (Staphylococci, Enterobacter and Pseudomonas) as well as fungal infections.

- The incidence of MRSA bacteraemia and colonisation in neonatal units is relatively low. Regular screening programmes are carried out in neonatal units as identified in the scoping exercise. This surveillance is likely to lead to timely action on isolation cases thus preventing the spread of MRSA.

Factors such as overcrowding, limited space, inadequate cleaning of equipment and staffing shortages within neonatal units contribute in the ease of spread of micro-organisms. All those involved in the care and management of infants should be aware of their individual responsibility for maintaining a clean, safe environment.

3. SCREENING
The Purpose of Screening Infants is:
- To detect the presence of potentially harmful micro-organisms which may give rise to a serious infection
- To detect the presence of MRSA and other resistant organisms
- Early identification of an outbreak of infection
- A positive result of colonisation on infants without clinical signs of infection does not always warrant antibiotic treatment

Taking and Processing Swabs:
- Appropriate sterile swabs should be used according to Trust policy.
- Ideally the necessary swabs should take place as soon as possible following delivery and prior to commencement of antimicrobial therapy.
- Specimens should be labelled with the infant’s name, date of birth, hospital number and the specimen site.
- Specimens should be transported and processed as soon as possible once taken. If delays are likely, specimens should be refrigerated.
- Units with known resistant organisms may wish to screen for additional micro-organisms on admission

3.1. SCREENING ON ADMISSION

The suggested screening detailed below is considered to be the gold standard to ensure detection and surveillance of infection/colonisation within the neonatal population across the East of England. Some units may feel they do not need to screen for some organisms based on local knowledge of their community. It may be acceptable not to screen all admissions however admissions from other trusts should follow the screening policy.

From the Delivery Unit

Routine swabs should be taken on admission from:
- Ear, Nose and Perineal swabs for MRSA (as per local policy)
- Rectal for Extended-Spectrum beta-Lactamase (ESBL/pseudomonas)
- Swabs/Specimens should be taken from any focal site of inflammation e.g. septic spots, urine etc.

Units with known resistant organisms may wish to screen for additional micro-organisms on admission. Pseudomonas has been the focus of a number of high profile outbreaks both within the region but also nationally and has been responsible
for a number of deaths within the neonatal community. It is for this reason that it is suggested that screening/surveillance of colonisation within this population is useful to support prescribing of the appropriate antibiotics and early identification of outbreaks.

**From Another Neonatal Unit**

On arrival from another neonatal unit swabs should be taken from:

- Ear, Nose and Perineal swabs for MRSA (as per local policy)
- Rectal swab for ESBL / pseudomonas

CPE (Carbapenemase producing Enterbacteriaceae) screening when infant or mother have been an inpatient in London /Manchester or any of the affected locations. See attached map. Screening should consist of alternate day screening for 3 swabs; the infants should be presumed and managed as positive until 3 negative results are obtained

- Any broken skin or open wounds for multi resistant gram negative organisms

**From the Community – where applicable**

- Ear, nose and perineal swabs for MRSA. (as per local policy)
- Rectal swab for ESBL / pseudomonas
- Review symptoms of infant and perform Microscopy, Culture and Sensitivity (MC&S) accordingly.

### 3.2. WEEKLY SCREENING

Very little evidence on the role of regular screening programmes is available. Although no current research to support this, it is suggested that screening provides a level of information to support appropriate use of antibiotics and identification of outbreaks at an early point.

- Ear, nose and perineal swabs for MRSA (as per local policy) and swabs taken from any broken skin or open wound for multi resistant gram organisms.
- Weekly surveillance for pseudomonas/ ESBL

### 3.3. SCREENING DURING AN OUTBREAK

- During an outbreak, screening for MC&S and the organism(s) involved in the outbreak should be carried out in accordance with the instructions from infection control outbreak team. Team should comprise infection control
nurse, consultant microbiologist and other parties such as PHE, NHSI, and CCG’s. Each trusts infection control policy should be adhered to.

3.4. SCREENING RESULTS

- Screening results from the referring unit should be accepted and used as part of the management of the infant by the receiving unit. Infants should not be refused admission pending repeat screening.
- Inter-hospital transfer should take place once clinically indicated UNLESS positive screening results have clearly indicated an infection control/isolation need which cannot be met at the receiving hospital; otherwise transfer should not be delayed due to unavailability of isolation facilities
- Some infants may not be colonised at the referring unit prior to transfer, however may be found to be positive following transfer

3.5. LOCAL RESISTANCE

- It is recognised that individual units may have specific, recurrent, resistant organisms. Screening for resistant organisms specific to each unit and looking for patterns of infections is essential. Sensitivities should be reviewed with local microbiology teams to plan for future management of outbreaks.

4.0 THE LOCAL ENVIRONMENT

- The local environment should be considered to be an area around the cot or incubator, extending from the floor to ceiling. This includes surfaces, shelves and ledges which may hold items used for the infant and which could become contaminated.
- The environment should allow for easy access to hygiene and personal protective equipment.
- Hands should be washed on entering NICU and the Clinical rooms.
- Hand wash basins should be used for hand washing only. Used water, dextrose solutions, TPN and other liquid waste products should be disposed of in the sluice or dirty water areas.
- Limit outdoor clothing, bags, personal effects, or mobile phones going into the clinical area, if not required for medical emergencies.
- All medical equipment used as part of the care of the Neonate should be cleaned daily in line with local trust decontamination policies and signed to evidence this has occurred. Shared equipment should be cleaned before and after use and there should be a log of this cleaning process. This applies to items such as the Ultrasound machine.

- Any disposable equipment, in accordance with local trust policy, should be changed daily/weekly or when contaminated with body fluids and decontaminating is deemed insufficient. Unless the equipment is single use, then discard after use.

- Minimise clutter around the bed spaces and restrict the number of cuddly toys to 2. These should be washable at 60°C. Parents should be asked to take home and wash weekly.

- Visitor number should be monitored closely and local guidance adhered to, any deviation to this is at the discretion of the senior nurse in charge on an individual basis.

- Decisions to move infants to different ward areas must be based on clinical/ capacity needs to minimise any potential to spread infection.

### 5.0 HAND HYGIENE

**The purpose of hand hygiene:**

- Most health care acquired infections can be avoided through good hand hygiene practice

- Cleaning hands in the right way at the right time is the most essential part of infection control.

- WHO 5 moments of hand hygiene

### 5.1 GENERAL PRINCIPLES FOR HAND HYGIENE

- Bare below the elbows. Wrist and hand jewellery should be removed before entering clinical areas, if wearing a ring this should be plain band only.

- Covering cuts and abrasions with a waterproof dressing

- Fingernails kept short and clean. No nail polish when undertaking clinical work

- False nails are not to be worn when undertaking clinical work
- Hand sanitiser is effective and convenient unless hands are visibly soiled or when dealing with suspected or confirmed infective diarrhoea as hand sanitizer is not effective against these (C.difficile, Norovirus) however hand washing should take place after several applications of hand sanitizer.

- Visibly soiled hands should be decontaminated using liquid soap and warm water

- Hands should be decontaminated before every episode of direct patient care and following any activity which could have resulted in contamination, as per 5 moments of hand hygiene (WHO)

### 5.2. Hand Sanitizer

- Convenient and fast acting, overcoming obstacles to hand washing such as lack of time or access to sinks as well as being less of an skin irritant

- Hand sanitizer is effective in reducing many micro-organisms and colonisations but not all, so therefore should not be used as the only measure to prevent cross-contamination.

- Product should cover all hand surface and rubbed together well until dry

- Hands should be washed between multiply use of alcohol-based hand rub as it can lose efficacy after several consecutive applications

- If hands are visibly soiled or contaminated, hand washing should take place.

- Hand sanitizer should not be used to decontaminate gloves

### 5.3 ISOLATION PRECAUTIONS

Isolation and 1:1 nursing of any infant who is found to be colonised/infected with a MDRO (multi drug resistant organisms) should be considered the gold standard. However in practical terms this is often not possible due to workload and the acuity of the infant. In such circumstances a risk assessment must be undertaken by the neonatal team in conjunction with the local infection prevention team. Decisions
about where and how to isolate will be dependent on the facilities available, type of infection, staffing and any other infection control concerns at the time.

N.B; management of colonised and infected infants may change from day to day due to the unit activity and review of other infection risks. Risk assessments with the infection control team should take place prior to moving patients, and information given to parents regarding these decisions.

6.0 PROTECTIVE EQUIPMENT

The purpose of wearing glove, aprons and other personal protective equipment is to:

- protect the care giver from contamination from blood, micro-organisms and chemicals

- Prevent transmission of micro-organisms from the care givers to the patient and vice versa and therefore reduce the cross-transfer of micro-organisms between patients.

- Staff should use aprons and gloves with all patient contact – the decision to do this will be a local decision. Apron and gloves should be worn for all procedures where contact with any body fluid is possible (universal precautions)

6.1 GENERAL PRINCIPLES OF GLOVE USE

- Thorough hand hygiene should be undertaken prior to using gloves; this is the most important infection control measure.

- Gloves should be worn as a single use item

- An assessment of the risks of transmission of micro-organisms to the infant or the care giver should be made prior to undertaking any procedure. This assessment will affect the decision as to whether sterile on non-sterile gloves are to be worn

- Sterile gloves must be used for invasive procedures and when in contact with sterile sites, non-intact skin or mucous membranes, including a review of and when changing wound dressings. In most situations gloves need not be worn when intubating, however a risk assessment should be made prior to undertaking the procedure.
- Non sterile gloves are suitable for any procedure which carries a risk of exposure to blood, body fluids, secretions or excretions. This may include blood sampling, cleaning of contaminated equipment, handling of clinical waste and sharps handling.

- Gloves must be changed between patients, between different care activities for the same patient and before touching surrounding equipment. Gloves should be donned immediately before the care procedure i.e. before touching surrounding area or equipment. Hand Sanitizer should not be used to decontaminate gloves.

- Gloves should be put on immediately prior to undertaking any direct clinical care and removed following completion of the task. Gloves should be disposed in clinical waste for incineration.

- Following gloves disposal, hands should then be washed using liquid soap and water. Glove use does not replace hand washing hand washing is necessary even when gloves have been worn. This should take place as soon as gloves have been removed and prior to touching any surface or patient.

- Gloves should be used to protect those involved in procedures and cleaning where repeated exposure to chemicals leaves them at risk of skin irritation and breakdown. Local Health and Safety policies should be followed in these circumstances.

6.2. GENERAL PRINCIPLES FOR APRON USE:

- Aprons are single use only for the infant being cared for at the time. The apron must be changed when moving from one patient to another.

- Aprons must be worn for all direct clinical care and when handling or coming into close contact with the infants equipment. This may lead to contaminations of clothing with micro-organisms.

- Gloves and aprons do not need to be used to cancel cot side alarms or to view infants from within their cots/incubators but hands should be contaminated if any area in the “local environment” has been touched.

- Aprons should be disposed of as clinical waste.

6.3 PARENTS AND FAMILY MEMEBERS

Gloves:
- Parents and family members must always be taught to wash their hands prior to and after touching their baby.
- Parents and family members are not required to wear gloves when handling their own baby unless they have a skin infection or broken skin which could come into contact with the baby during care giving, kangaroo care (skin to skin) or general handling.

**Aprons:**
- Parents and family members are not required to wear aprons unless they choose to.

### 7.0 TRANSFERS BETWEEN UNITS

Transferring units must inform the transport team of any known or suspected infection risk at the time of referral. This includes whether results are pending or known. For planned transfers units must confirm that the information has been communicated to receiving units.

The ANTS team will follow their guidance on deep cleaning between infants when there is suspected or confirmed infection. Infection control concerns may change the order in which the transport team are able to undertake transfers.

### INFECTION CONTROL OUTBREAKS

Infection control outbreaks will be declared on discussion with an outbreak team, this will be managed locally. Communication of any outbreak is important to ensure containment and early identification within other units of the network.

Outbreaks are likely to impact a unit's ability to manage patient flow as admission to the unit may be restricted;

Any outbreak should be notified to;
- ODN - Operational delivery network
- EBS - Emergency bed service
- Movement of any infants should follow communication to the transport team and the receiving unit about the implication of the outbreak

### 8.0 Reference List


Lam. 2001 Infection Control in the NICU. Recommended Standards


Health Protection Agency, 2004. Investigation of gastric aspiration and infection screen swabs from neonates. 4(1)

Reading List:


Appendix 1

Sourced from the World Health Organization website
Your 5 Moments for Hand Hygiene

1. Before touching a patient
2. Before clean/aseptic procedure
3. After body fluid exposure
4. After touching a patient
5. After touching patient surroundings
Appendix 2

HAND CLEANING TECHNIQUES

How to handwash?
WITH SOAP AND WATER

1. Apply enough soap to cover all hand surfaces
2. Rub hands palm to palm
3. Rub back of each hand with the palm of other hand with fingers interlaced
4. Rub palm to palm with fingers interlaced
5. Rub with backs of fingers to opposing palms with fingers interlaced
6. Rub each thumb crease in opposite hand using rotational movement
7. Rub tips of fingers in opposite palm in a circular motion
8. Rub each wrist with opposite hand
9. Rinse hands with water
10. Use elbow to turn off tap
11. Dry thoroughly with a single-use towel
12. Your hands are now safe

www.npsa.nhs.uk/cleanyourhands

Adapted from World Health Organization Guidelines on Hand Hygiene in Health Care
TMI039
Appendix 3

Sourced from the World Health Organization

**Figure II.1**
How to handrub

### Hand Hygiene Technique with Alcohol-Based Formulation

- **Duration of the entire procedure:** 20-30 seconds

1. **1a**
   - Apply a palmful of the product in a cupped hand, covering all surfaces;

2. **1b**
   - Rub hands palm to palm;

3. **2**
   - Right palm over left dorsum with interlaced fingers and vice versa;

4. **3**
   - Palm to palm with fingers interlaced;

5. **4**
   - Back of fingers to opposing palms with fingers interlocked;

6. **5**
   - Rotational rubbing of left thumb clasped in right palm and vice versa;

7. **6**
   - Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;

8. **7**
   - Once dry, your hands are safe.
Hand sanitizer is used for cleaning non soiled hands.

### APPENDIX 4 SCREENING AND ISOLATION

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<tr>
<th>Name of organism</th>
<th>Isolate where possible</th>
<th>Nurse in incubator</th>
<th>Gloves and apron</th>
<th>Enhanced precautions with gown</th>
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<tr>
<td>MRSA</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓- when diagnosis confirmed</td>
</tr>
<tr>
<td>ESBL</td>
<td>✓</td>
<td>✓</td>
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<td>CPE</td>
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<td>✓</td>
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<td>✗</td>
<td>✓</td>
<td>✓- if MDRO</td>
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<tr>
<td>MDRO</td>
<td>✓</td>
<td>✗</td>
<td>✓</td>
<td>✗</td>
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<tr>
<td>RSV</td>
<td>✓- must be isolated in an isolation cubicle</td>
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### Screening

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<th>On admission</th>
<th>Weekly</th>
<th>As per specific regime</th>
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<tr>
<td>MRSA</td>
<td>Ear, nose and groin swab - as per trust policy</td>
<td>✓</td>
<td>✓</td>
<td>3 x Negatives required before isolation precautions change – alternate days</td>
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<tr>
<td>ESBL</td>
<td>Perianal swab/stool specimen</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>CPE</td>
<td>Perianal swab/stool specimen</td>
<td>✓</td>
<td>✓</td>
<td>On admission from affected areas x 3 alternate day swabs</td>
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<tr>
<td>Psuedomonas</td>
<td>Perianal swab/stool specimen</td>
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<td>Telephone Contact Lead:</td>
<td>Email :</td>
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<tr>
<td>Guideline, Policy or Procedure Opt – Out Title :</td>
<td>Rationale for Opt Out :</td>
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<tr>
<td>Signature of Clinical Lead :</td>
<td>Signature Medical Director Trust :</td>
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