

East of England Neonatal Policy for Infection Control & Screening

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For use in: East of England Neonatal Units. Guidance specific to implementing infection control standards in the care of neonatal patients.

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

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

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Approved by:

Clinical director	Sajeev Job
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Audit Standards:

1. 100% of all infants should have routine infection screening
 - Screening swabs should be taken as part of all full admissions to the neonatal unit or re-admission from another 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/or decontaminated with alcohol hand rub as appropriate
 - Nonsterile gloves will be worn where there is a risk of contamination with blood, bodily fluids, micro-organisms or chemicals. Any enhanced measures as defined by the Infection control team should be adhered to
 - Sterile gloves and gowns will be worn during invasive procedures involving neonates but excluding peripheral cannulation

Document Reader Information

Policy	
Document Purpose	Policy
EOE Reference Number	
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Publication Date	
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Timing	
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Assurance Statement

The Purpose of this guideline 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 Operational delivery Network.

Protocol development

Good infection prevention control (IPC), including cleanliness and prudent antimicrobial stewardship (AMS), is essential to ensure that people who use health and social care services receive safe and effective care. Effective prevention of infection must be part of everyday practice and be applied consistently by everyone. It is also a component of good antimicrobial stewardship as preventing infections helps to reduce the need for antimicrobials – Health and Social Care Act 2008/ updated Dec 22

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. Over recent years infection control outbreaks have been a challenge with multi drug resistant organisms (MDRO) being seen across the region, with outbreaks of MRSA (Methicillin resistant *Staphylococcus aureus*, *Enterobacter*, *Serratia* and *Pseudomonas*. Outbreaks in Neonatal units have serious implications for the health of the neonatal population and also on patient flow across the region.

Review of infection control procedures during some of these outbreaks identified that despite there being a standardised guideline adherence to this was variable. This difference in practice is often a cause of concern for families as they move from unit to unit.

As part of the guidance standardisation was seen as a key focus.

Two key areas were 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 caring for infants in neonatal units.

This guideline 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.

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 usually come from external sources such as health and care providers, the environment both in the direct care area and outside of it, invasive procedures, equipment 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. Whilst all newborn infants are at risk of contracting infections; preterm infants are at particular increased risk with the risk of increasing the lower the gestational age. These infants are more susceptible to infections due to their immature immune systems and exposure to the hospital environment. The close proximity of infant's cots/ incubators in many Neonatal Units facilitates transfer of organisms from infant to infant.

Neonatal infections can be caused by a number of organisms.

- Early onset sepsis (<72 hours post-delivery) is 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 and isolation of cases thus preventing the spread of MRSA.
- Newly emerging organism *Staphylococcus Capitis* and Carbapenemase-producing Enterobacterales (CPE)

Factors such as overcrowding, limited space, inadequate cleaning of equipment, inadequate environmental cleaning, environmental factors and staffing shortages within neonatal units contribute to 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.

Screening

The Purpose of Screening Infants are:

- 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
- Surveillance which can provide early identification of an outbreak of infection
- A positive screening result or 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
- All units should have a clear process for review of screening swab results and ensure entry of each patients results into care records

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. All infants should be screened on admission to provide a baseline for future surveillance.

From the Delivery Unit

The following swabs should be taken on admission:

Organism	Site
MRSA	Nose and perineal swab
ESBL/ Pseudomonas	Rectal swab/ stool
M,C&s	Focal sites of inflammation – septic spots

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 appropriate antibiotic usage and early identification of outbreaks

From Another Neonatal Unit

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

Organism	Site
MRSA	Nose and perineal swab
ESBL (extended spectrum beta- lactamase)/ Pseudomonas	Rectal swab/ stool
CPE- Carbapenemase producing enterbacteriaceae	Rectal swab/ stool
Microscopy, culture and sensitivity (M,C&S)	Focal sites of inflammation – septic spots

From the Community – where applicable

Organism	Site
MRSA	Nose and perineal swab
ESBL (extended spectrum beta- lactamase)/ Pseudomonas	Rectal swab/ stool
Microscopy, culture and sensitivity (M,C&S)	Focal sites of inflammation – septic spots

Routine screening

Although there is very little evidence available on the role of routine screening, the role of early detection and identification of an outbreak is clear. Detection of increased numbers of multi drug resistant organisms (MDRO) can then support further investigation to rule out or confirm an outbreak. Screening may also support with appropriate antibiotic prescribing. Routine screening requires good oversight for each patient and as a unit cohort to support identification of trends and to alert teams to evolving patterns of infection results.

Network recommended routine screening		
Organism	Site	Frequency
MRSA	Nose and perineal swab	Weekly

ESBL (extended spectrum beta-lactamase)/ Pseudomonas	Rectal swab/ stool	Weekly
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Screening during an outbreak

- During an outbreak, screening for the organism(s) involved in the outbreak should be carried out in accordance with the instructions from the infection control outbreak team. The team should comprise Infection Control Nurse, Consultant Microbiologist and other parties such as UKHSA, ODN and ICB teams. Each Trusts infection control policy should be adhered to.
- The ODN and PaNDR (Paediatric and Neonatal decision support and retrieval team) should be informed to ensure any impact on capacity is assessed and appropriate precautions are taken during any neonatal transport.

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 identified as colonised at the referring unit prior to transfer, however may be found to be positive following transfer

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, and these may influence antibiotic prescribing choice.

Environmental

- The local environment should be considered in the following ways

- The 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 non-direct environment, rooms where devices are cleaned, domestic cleaning equipment storage areas, staff areas, changing rooms, storage rooms and parents rooms
- Wider Trust environmental impacts: water safety, programmes of work and upgrades. Neonatal teams should ensure representation at Trust Water safety groups
- Trust estate teams should report into neonatal units any changes in water counts of micro-organisms identified in their water testing
- The environment should allow for easy access to hygiene and personal protective equipment
- Hands should be washed with soap and water on entering NICU and the Clinical rooms
- Hand wash basins should be used for hand washing only. Used water, glucose solutions, TPN and other liquid waste products should be disposed of in the sluice or dirty water areas.
- Limit outdoor clothing, bags and personal effects 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. Equipment used for over 7 days should be changed i.e. incubators (gov.uk 2022)
- Respiratory devices that require single use circuits should not be set up many hours prior to use, as the life integrity of the single use item may be unintentionally extended beyond the recommendation for the device.
- 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, Retcams, ROP screening devices, transport incubators, auroscopes.
- Any single patient use 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.
- Daily record of all equipment asset numbers should be kept within the infants notes

Hand Hygiene

The purpose of hand hygiene:

- **Wash hands with soap and water/alcohol gel as appropriate**
- 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
- Regular hand hygiene audits should be undertaken to ensure compliance

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/ gel nails when undertaking clinical work
- False nails or gel 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 sanitiser is not effective against these (C.difficile , Norovirus). however, hand washing should take place after several applications of hand sanitiser.
- 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)

Hand sanitiser

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

- Hand sanitiser 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 where there is a risk of C.difficile or Norovirus.
- Product should cover all hand surface and rubbed together well until dry
- Hands should be washed between multiple 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.
- Gloves should never be decontaminated and should be disposed of immediately after use.

Isolation precautions

Isolation and 1:1 nursing of any infant who is found to be colonised/ infected with a MDRO should be considered the gold standard. However, in practical terms this is often not possible due to staffing capacity 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 and control 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, along with overall capacity and safety for all babies in the NNU

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 regularly and prior to moving patients, and information given to parents regarding these decisions.

Protective equipment

The purpose of wearing gloves, 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.
- Apron and gloves must be worn for all procedures where exposure to blood and /or other body fluid, non -intact skin or mucous membranes is anticipated or likely. *The advice to wear gloves for all patient contact will be dependent on local decision'.*

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 or 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 sterile gloves need not be worn when intubating, however a risk assessment should be made prior to undertaking the procedure.
- Non-sterile gloves must be worn for every interaction with a patient who is suspected or confirmed to have a transmissible infection or colonised or infected with a resistant organism such as MRSA, CPE, etc.
- 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 Sanitiser 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.

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 infant's equipment, which could 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 decontaminated if any area in the “local environment” has been touched.
- Aprons should be disposed of as clinical waste

Parents and family members

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.

Transfer 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 PaNDR 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 / PaNDR
- ICBs via LMNS
- Movement of any infants should follow communication to the transport team and the receiving unit about the implication of the outbreak

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Appendix 1

Sourced from the World Health Organization website

Your 5 Moments for Hand Hygiene

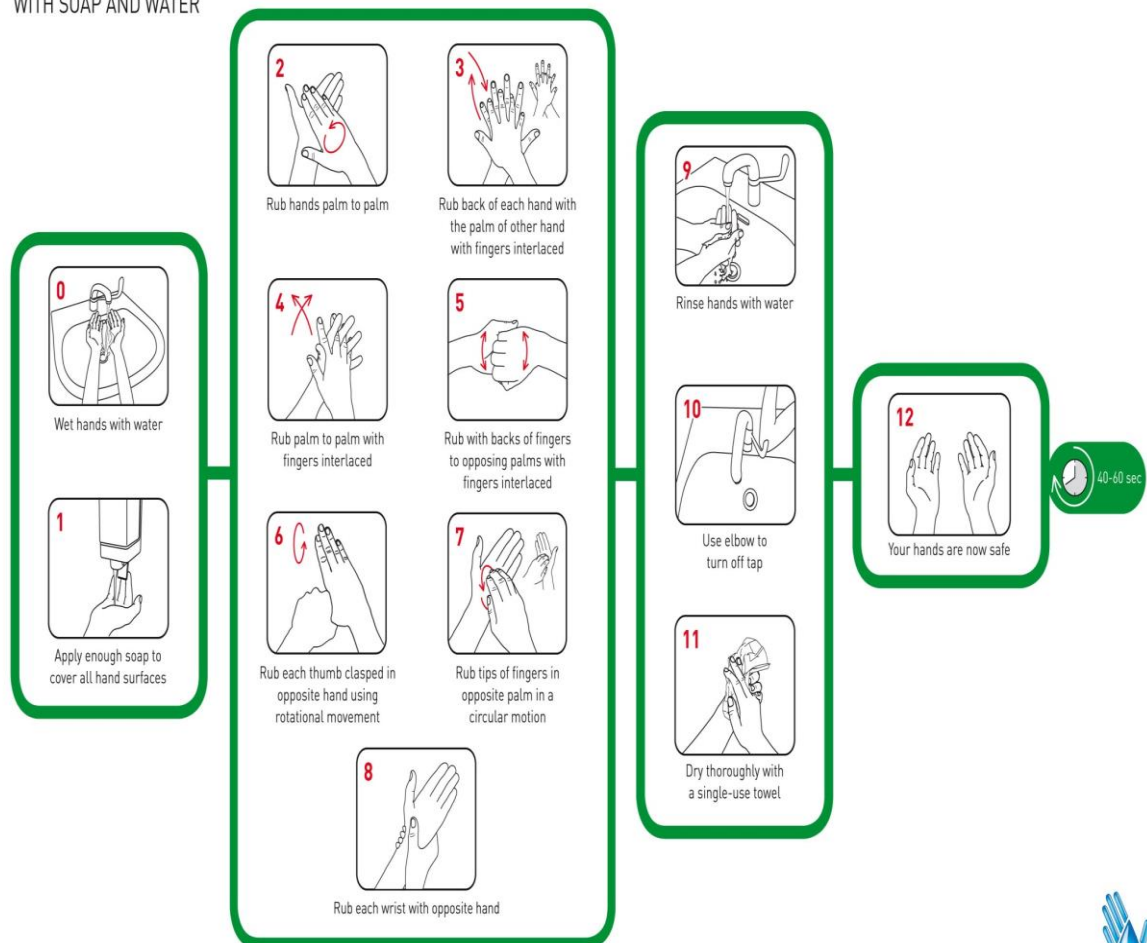


Appendix 2

HAND CLEANING TECHNIQUES

How to handwash?

WITH SOAP AND WATER



www.npsa.nhs.uk/cleanyourhands

Adapted from World Health Organization Guidelines on Hand Hygiene in Health Care
TW1/09

Appendix 3

Sourced from the World Health Organization

PART II. CONSENSUS RECOMMENDATIONS

Figure II.1
How to handrub



Hand sanitizer is used for cleaning non soiled hands.

APPENDIX 4 SCREENING AND ISOLATION

Name of organism	Isolate where possible	Nurse in incubator	Gloves and apron	Enhanced precautions with gown
MRSA	✓	✓	✓	✓- when diagnosis confirmed
ESBL	✓	✓	✓	✓
CPE	✓	✓	✓	✓- when diagnosis confirmed
Pseudomonas	✓	X	✓- if MDRO	X
MDRO	✓	X	✓	X
RSV	✓- must be isolated in an isolation cubicle	✓	✓	✓
Covid 19	Isolate	✓	✓ and mask FFP3 when undertaking AGP	✓

Organism	Type of screen	On admission	Weekly	As per specific regime
MRSA	nose and groin swab - as per trust policy	✓	✓	3 x Negatives required before isolation precautions change – alternate days
ESBL	Perianal swab/ stool specimen	✓	✓	
CPE	Perianal swab/stool specimen	✓	✓	On admission from affected areas x 3 alternate day swabs
Pseudomonas	Perianal swab/ stool specimen	✓	✓	
MDRO	Stool specimen	✓	✓- only when an increase colonisation or clinical samples has been identified.	
Covid 19	Throat swab	✓	✓	Regular screening may need to be altered in line with local policy during the pandemic

Appendix 5

Formal Opt -out Form Guidelines, Policies and Procedures for the East of England Perinatal Networks.

To be completed by the individual / unit /network making the request. Please complete in BLOCK CAPITALS.	
Title:	Surname :
First Name :	Organisation/ Unit :
Telephone Contact Lead:	Email :
Guideline, Policy or Procedure Opt – Out Title :	Rationale for Opt Out :
Signature of Clinical Lead :	Signature Medical Director Trust :
Date:	Date Received by the Network Team :