Acute Hospital Carbapenemase Producing *Enterobacteriales* (CPE) Outbreak Control Checklist, Version 1.0

March 2018

CPE Expert Group

POLICY DOCUMENT

These guidelines are aimed at all Health professionals involved in the prevention and control of CPE in the acute hospital sector. It is proposed that they will be reviewed on an annual basis.

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Glossary of Terms

AMAU = Acute Medical Assessment Unit

CPE = Carbapenemase-Producing Enterobacteriales*

ED = Emergency Department

HTM = Health technical memoranda

HLDS = High-level decontamination systems

IPC = Infection prevention and control

IPCT = Infection prevention and control team

NCPERL = National CPE Reference Laboratory

OCT = Outbreak control team

PPE = Personal protective equipment

*Note. Until recently the order Enterobacteriales was considered to include a single family the *Enterobacteriaceae (*so that all Enterobacteriales were also *Enterobacteriaceae).* Recent studies have led to the conclusion that the members of the order Enterobacteriales should be divided into multiple families. This means that the term *Enterobacteriaceae* now encompasses only some of the species of bacteria it formerly encompassed. The term Enterobacteriales is now the term that corresponds most closely to the former meaning of *Enterobacteriaceae (*Adeolu *et Al.*, 2016).

Introduction

This checklist is aimed to support the control of a CPE outbreak in an acute hospital setting.

This checklist is not intended to be exhaustive. The hospital's local outbreak control team (OCT) and infection prevention and control team (IPCT) may decide that some measures recommended are not applicable or relevant or that additional control measures are required, depending on the particular circumstance.

Please also refer to the latest version of *'Guidance relating to CPE Interventions for Control of Transmission of CPE in the Acute Hospital Sector'.*

The measures within the checklist that require implementation will depend on the local context, extent of the outbreak, local resources, isolation capacity etc. Those tasked with the measures will also be determined locally, except where clearly specified.

Next review of this guideline

This guideline will be reviewed in 12 months (March, 2019) or sooner if significant new evidence emerges.

Notification

- Ensure that upon identification, the outbreak has been promptly communicated through the hospital's internal management and risk management structures and that all relevant staff and affected patients are informed.
- Contemporaneously, the outbreak must be formally notified to the Department of Public Health, in keeping with the Infectious Diseases Regulations.
- Inform one of the HPSC Consultant Microbiologists (Dr Karen Burns: karen.burns1@hse.ie or Dr Robert Cunney: robert.cunney@hse.ie & 01-8765300).
- Inform the HCAI & AMR National Clinical Lead (Professor Martin Cormican: hcainational.lead@hse.ie).

Surveillance

- Convene a multi-disciplinary outbreak control team (OCT), which should be chaired by the most senior manager Chief Executive Officer (CEO) or General Manager (GM) and include active participation by the Clinical Director, representative clinicians and Director of Nursing. A representative of the local Department of Public Health should be invited to attend the OCT and receive copies of OCT meeting minutes.
- The frequency of OCT meetings should reflect the epidemiology, the number of wards or services affected and the impact of the outbreak on activity. Daily OCT meetings if required.
- Latest surveillance & microbiology laboratory updates should be available at OCT meetings.
- The OCT agenda should include the review of the latest available epidemiological curve of new suspected and confirmed cases and the wards with which the new cases are linked. The latest prevalence and location of suspected and confirmed cases by affected ward should also be recorded. In a larger outbreak, the potentially large number of patient movements and contacts may necessitate regular and separate reviews of outbreak epidemiology conducted by the IPCT outside of the OCT meeting, with the findings presented at the OCT meeting.
- Timely and latest available surveillance data should be shared with staff working on affected wards, so that they can see how they are doing (for example, a weekly run chart of new ward-acquired cases, weekly point prevalence of known CPE patients cared for on the ward, and compliance with ward's CPE screening policy).
- Depending on local microbiology laboratory capacity, on-site confirmation of the carbapenemase type should be performed. Both rapid molecular and lateral flow (immunochromatographic) systems are available and should be considered. If local confirmation is not possible, suspect isolates should be referred immediately to the National CPE Reference Laboratory (NCPERL) for confirmation. If confirmation is dependent on NCPERL, there may be a delay before official confirmation of a suspected case.
- A request to the Department of Public Health to support an epidemiological study could be considered by the OCT in the setting of a larger or complex outbreak.

Screening and patient placement

- Patients who are confirmed or suspected CPE carriers and patients who are CPE contacts should be accommodated according to the latest version of *'Guidance relating to CPE Interventions for control of transmission of CPE in the Acute Hospital Sector'*.
- Where possible, there should be dedicated equipment for use on affected patients, and specifically not for sharing between patients. If this is not possible, a robust system to ensure adequate decontamination between patients is required and must include a system for documenting that the required decontamination has taken place. Audit that this is happening.
- Review current local CPE screening policy, in conjunction with the latest version of the *'HSE policy on requirements for screening of patients for CPE in the acute hospital sector'*. Review and audit compliance with local CPE screening policy and identify any gaps with regard to national policy.
- Identify and promptly screen inpatient CPE contacts of confirmed CPE cases, in accordance with the latest version of the *'HSE policy on requirements for screening of patients for CPE in the acute hospital sector'*. Audit that inpatient CPE contacts are screened.
- Where CPE contacts have been discharged home, a paper or electronic alert should be created to identify them as needing screening in the event they represent to the hospital. Audit that this is happening.
- When CPE contacts have completed the recommended screening protocol and have been deemed negative for CPE, the paper or electronic alert may be discontinued. Audit that this is happening.
- Ensure the microbiology laboratory has the required daily resources needed to deliver both the routine CPE screening programme, as recommended in the latest version of the *'HSE policy on requirements for screening of patients for CPE in the acute hospital sector',* and to support the additional recommended screening requirements for outbreak investigation and control, which includes availability of testing at weekends. If not already in place, ensure that the capacity for local confirmation of the carbapenemase type is introduced, to support prompt identification and confirmation of new cases.

Patient movement

- Ask mobile patients on affected wards to refrain from leaving the ward wherever possible, i.e. not to leave for mass, prayer services, visiting hospital restaurant. If patients leave the ward for any reason, advise and facilitate the patient to perform hand hygiene before leaving the ward.

- Transfer of patients with CPE between wards should be avoided, unless based on clinical need (for example, escalation or de-escalation of care) or to facilitate isolation or cohorting. Transfer requires advance and clearly documented communication with the receiving ward nurse manager.

- Transfer of patients between departments (for example, to operating theatre, or radiology) requires advance and clearly documented communication with the nurse manager of the receiving department, who in turn must ensure adequate precautions and an up-to-date local policy are followed to minimise the risk of transmission. There should not be undue delays in patient access to investigations or interventions attributable to their CPE status.

- Transfer of patients between services (for example, between acute hospitals, from acute hospital to primary care or from acute hospital to residential care) requires advance and clearly documented communication with the receiving service, who in turn must ensure adequate precautions and an up-to-date local policy are followed to minimise the risk of transmission. There should not be undue delays in patient transfer and patients or residents should not be denied care in any facility because of their CPE status. Please also refer to latest version of the '*HSE policy on inter-facility transfer of patients colonised or infected with antimicrobial resistant organisms (AMRO), including CPE*'.

Staff education on hand hygiene, precautions, and PPE

- All staff should have training records of induction and periodic training on standard and transmission based precautions.
- In the setting of an outbreak, refresher training may be indicated, which should be provided by the infection prevention and control nurses (IPCNs) or certified trainers at ward level.
- Additional audits of staff compliance with standard (in particular, hand hygiene technique and opportunities taken) and transmission based precautions should be undertaken on all wards, with documentation of audit schedule and results available.
- Wards affected by an outbreak should be supported to provide real-time feedback on non-compliance with hand hygiene and other elements of standard precautions and transmission based precautions to staff and others involved in direct or indirect patient contact.
- Ensure there are sufficient stocks of personal protective equipment (PPE) to meet additional demands, along with increased frequency of waste disposal.
- Provide additional IPCN resources to deliver staff CPE education and audit of standard and transmission based precautions.
- Audit hand hygiene facilities: Hand hygiene sinks should be used for hand hygiene only and not for disposal of fluids. Ensure all hand hygiene sinks meet health technical memoranda (HTM) requirements and start replacing those that don't.
- Audit toilet facilities.
- Audit sluices, bed pan washers (temperature controls, service records, test soils etc.), bed pans and commodes.
- Consider, in consultation with management, posting the environmental audit score and hand hygiene audit score of every ward on the entrance door to the ward.

Communication about the outbreak with staff

- Ensure that staff members have been formally notified by the CEO, Director of Nursing, Lead Clinical Director that there is an outbreak ongoing. The line manager of every staff member, including contract staff must communicate what is required. Communication should be by e-mail, by letter attached to pay slips, by text message: whatever mechanism is needed to ensure all staff are aware. The frequency is best determined locally and will depend on the extent of the outbreak, amongst other things.
- Town hall meeting series chaired by senior managers for all staff should provide key facts on the outbreak organism and ensure that they can answer most patient queries. <u>Attendance must be recorded.</u>
- The ward managers, nurses, medical staff, allied health professionals, healthcare assistants, porters, clerical, cleaning, maintenance and catering staff working on affected wards need to take ownership of the outbreak control measures and must acknowledge their critical role in the successful control of the outbreak, in partnership with the OCT.
- A designated shared IT folder or intranet location accessible by all hospital staff should be created as an easy-to-find repository of all documents associated with CPE and the outbreak response.
- The Occupational Health Department should be available to address potential staff fears or to address queries in conjunction with the OCT.
- Ensure all signage complies with the agreed measures for CPE cases, CPE contacts and patients with other transmissible organisms. It should also be up-to-date, clear and placed where it is visible to staff entering an isolation room or cohort area, so they know what precautions are required.
- Update signage at entrance to wards affected by the outbreak, so that it is evident there is an outbreak on the ward.
- Ensure swipe card access is activated on doors linking wards, with signage telling staff and visitors not to take shortcuts between affected and unaffected wards.

Communication with patients, visitors and the public

- Ensure that patients who are found to be carrying CPE are promptly informed by the clinical team and provided with a patient information leaflet or frequently-asked question (FAQ) document or card. There should be documentation that the patient has been told of their status available in the clinical notes.
- Patients could be provided with a durable wallet/purse-sized card indicating that they have had a positive test for CPE and advised to use the card to alert healthcare providers to their CPE status when they present for future care.
- Ensure there is an adequate stock of relevant patient information leaflets on all wards and in areas where public and patient information is provided.
- Ensure that patients receive information on the importance of social hand hygiene (after using the toilet, bedpan or commode and before eating) and additional hand hygiene opportunities, as deemed appropriate to their clinical situation. Ensure that patients who are not mobile are provided with the opportunity to perform hand hygiene as needed.
- Ensure that visitors receive information on the importance of hand hygiene and have access to alcohol-based hand rub dispensers. Consider the provision of portable alcohol-based hand rub dispensers or hand-sanitising wipes to patients, families and visitors on affected clinical areas, to support good hand hygiene practice.
- Prepare a one page letter to be given to every patient by the nursing staff on their ward telling the patient that there is an outbreak ongoing and the actions the hospital is taking to keep them safe, and prevent them acquiring infection. Closure of an outbreak ward to new admissions is generally indicated and the OCT will provide further guidance.
  If, in exceptional circumstances, patients are newly-admitted to a ward experiencing an outbreak, they should be informed of this prior to arrival to the ward and also be provided with the letter.
- A media statement should be ready if needed and the hospital needs to be pro-active and prompt in ensuring open and transparent communication with patients, families and the community they serve. Depending on the extent of the outbreak, the media statement may need to include a request for people stay away from the hospital unless absolutely necessary.

Communication of a patient's CPE status

- Use an electronic IPC flag system if available.
- Implement a formal healthcare record alert for all suspected and confirmed CPE cases. A pro-forma alert sticker can be used for a 'suspected CPE case' and then updated once the final result is available as either a 'confirmed CPE case' or a 'CPE not confirmed' alert sticker. Regarding the healthcare record alert:
  - Consider applying to the front cover of the healthcare record, a fluorescent sticker indicating an infection prevention & control alert
  - The inside of the front cover should have a written description of the alert, the date of the positive result and the date of the alert
  - In the event of a new healthcare record being created or the existing healthcare record being split, it is recommended the medical records department places a new sticker on the new healthcare record with the information from the previous version
  - The pro-forma alert sticker can be filed chronologically in the patient's healthcare record on the date the alert was created
- If all confirmed CPE cases have not had a formal healthcare record alert created, retrospective placement of alerts needs to take place.
- A system of prompt prospective healthcare record alerts of new confirmed CPE cases needs to be put in place. Audit the alert system once it has commenced.
- Audit healthcare records of patients confirmed CPE positive for evidence of documentation that the patient has been told of their status. To facilitate the process, the pro-forma alert sticker could include space for the clinical team to sign/confirm that the patient has been told about their status.
  Audit discharge letters to general practitioners (GPs) for evidence that the GP has been told about their patient's CPE status.
- Develop a pro-forma letter to be systematically sent to the admitting consultant and GP of every patient once confirmed as carrying CPE. This serves as a safety net if the patient has since been discharged, or it is not certain that the GP was told, or if an electronic discharge letter or copy of discharge letter does not exist for review. Provide the hospital's CPE patient information leaflet with the letter.
- A local secure electronic database of all confirmed CPE cases would be helpful, including confirmation that an alert was placed on the healthcare record, an electronic IPC alert flag active, and confirmation of patient and GP communication status.
- Where a newly-detected CPE case is identified in an acute hospital or long-term care facility and the patient is linked to another Irish hospital or long-term care facility, this must be promptly communicated back to the IPCT or Nurse Manager on the ward where the patient or resident was accommodated, or to the Director of Nursing of the long-term care facility. If the patient came from another facility and was identified as carrying CPE after arrival (inform the referring facility) **OR** if the patient had left a facility by the time they were identified as carrying CPE and were transferred to another hospital or long-term care facility (inform the receiving facility).

Environmental hygiene

- Ensure that hygiene services (cleaning) staff are represented on the OCT and are included in any ward-based briefings and educational interventions.
- Environmental disinfection should be carried out at least twice daily, with increased disinfection likely to be required for frequently-touched areas and for toilets. Audit that this is happening. Consider the use of test soils prior to cleaning and ultraviolet (UV) light after cleaning or adenosine triphosphate (ATP) to evaluate efficacy of cleaning.
- Equipment disinfection. Audit that this is happening. Consider use of test soils prior to cleaning and UV light after cleaning or ATP to evaluate efficacy of cleaning.
- Audit that the technique of cleaning is correct and that the sequence of cleaning is correct particularly for sink cleaning, so taps don't get contaminated from drains.
- Consider use of environmental microbiological sampling to verify efficacy of cleaning, based on OCT advice.
- The use of novel high-level decontamination systems (HLDS) may be considered on patient transfer, based on OCT advice, although the current evidence for their efficacy in this setting is limited.
- HLDS may be considered for the decontamination of sluices and toilets, based on OCT advice, although the current evidence for their efficacy in this setting is limited.
- Ensure multi-disciplinary hygiene audit teams are conducting audits on all areas on an ongoing basis and that improvement action plans are in place and followed-up, where indicated by audit findings. Consider increasing the frequency of such audits for affected ward areas.
- Check the integrity of surfaces of all floors, walls and fixtures to ensure that there is no exposed plaster, bare wood or corrosion of surfaces or fittings that precludes effective cleaning.
- Audit the integrity of chair coverings and furniture under surfaces.
- Audit the integrity of mattresses and pillows: remove coverings to evaluate insides, especially if seams are not sealed.
- Audit toilets to ensure they can be properly cleaned and that the fittings and fixtures are of cleanable quality.
- Ensure that all drains in showers, baths and other facilities allow free downward flow of water and that there is no back flow or pooling of water.
- Audit sluices, bed pan washers (temperature controls, service records, test soils etc.), bed pans and commodes.
- Ensure all ventilation service records and monitoring records within affected areas are up-to-date and signed-off by technical services department staff.

Minimise clutter

- Confirm that all PPE is easy to access and stored in a manner that minimises contamination of PPE, that it is wall-mounted outside the patient room and contains all of the required PPE safely and minimises clutter.
- Ensure that any unused or unnecessary equipment is removed from wards. Declutter days are recommended.
- Ensure that used equipment awaiting decontamination is stored in a designated area away from clean equipment. Audit that this is happening.
- Dispose of old, damaged equipment.
- Ensure there are sufficient chairs, so that people aren't sitting on patient beds where they are at risk of contaminating their clothing.
- Keep isolation room doors closed, unless patient need dictates otherwise. Document risk assessment regarding doors needing to stay open. If a door cannot be closed, ensure that signage regarding the required Transmission Based Precautions is in place so that it remains clearly visible to staff prior to room entry.

Minimise traffic

- A local decision should be made as to whether visiting should be temporarily limited if necessary to control the outbreak.
- If visiting is to continue, implement restricted visiting, as per local visiting policy. The ward manager should use discretion in application of the visiting policy, taking into account the needs of the patient and the particular clinical circumstances. <u>Audit that this is happening.</u>
- Depending on the extent of the outbreak, the media statement may need to include a request for people stay away from the hospital unless absolutely necessary.
- Outside of scheduled visiting times, activate swipe card access to limit access to wards. <u>Audit that this is happening.</u>
- Temporarily cease non-essential services on outbreak ward (for example, mobile services: hairdresser, mobile shop, mobile library). Patients with CPE who have borrowed books from a hospital library should be allowed to keep the books. The books should not be returned to the library stock.
- If the facility's pastoral care services are required by patients, those delivering those services must have received formal training on Standard and Transmission Based Precautions prior to patient contact.
- Discontinue for a period volunteer services that have direct patient contact or deliver patient care on affected wards. Ensure any volunteers in this category have received formal training on Standard and Transmission Based Precautions prior to the re-introduction of services.
- Visitors and volunteer services who visit patients but do not deliver care or have direct contact should be requested to visit one patient only per visit and not to move between patients during visiting times.
- Restrict nursing, medical and allied health professional student activities on affected wards to supervised work placement, with confirmation that training on Standard and Transmission Based Precautions has been undertaken prior to placement.
- Clinical team ward rounds should end on CPE affected wards, but the individual patient's clinical needs should **not** be compromised when they require review. The number of team members entering the patient zone should be limited to those absolutely necessary and all staff entering the patient zone of an isolation room or cohort area must perform hand hygiene and don recommended PPE prior to entry.

Antimicrobial stewardship

- Review latest antimicrobial consumption data for the hospital and provide feedback to prescribers. In particular, focus on consumption of classes that are most strongly-associated with selection of CPE, namely:
  - Carbapenems
  - Fluoroquinolones
  - Third generation cephalosporins
  - Anti-pseudomonal penicillins
- All prescribers should be communicated with by the Consultant Microbiologist and Lead Clinical Director on classes of antimicrobials that are restricted and reserved for use only on approval by Clinical Microbiologist or Infectious Diseases (ID) Physician. Refer to the latest version of the '*HSE national policy on restricted antimicrobial agents'*. Audit that this is happening and provide feedback to prescribers.
- Depending on local compliance with the '*HSE national policy on restricted antimicrobial agents'*, there may be a need to remove restricted agents as stock items from affected wards and dispense on named-patient only basis from pharmacy.
- The antimicrobial pharmacist should be on the OCT and report the following findings of stewardship ward rounds to Clinical Directors and OCT:
  - Patients prescribed broad spectrum agents as listed above
  - Patients prescribed restricted agents without documented approval from microbiology/ID
  - Antimicrobial prescriptions non-compliant with empiric local guidelines
  - Evidence of regular antimicrobial prescription review for suitability for de-escalation, IV to oral switch or discontinuation of antimicrobials, as per the 'Start Smart & Then Focus' Antibiotic Care Bundle
  - Patients who are on antimicrobials >7 days
- Pharmacy may need to allocate additional resources for increased frequency of stewardship rounds on affected wards.
- With implementation of '*HSE national policy on restricted antimicrobial agents'* and regular antimicrobial stewardship audit and point prevalence surveys, a decline in the inappropriate consumption of restricted antimicrobials should be evident via local antimicrobial consumption monitoring and stewardship audit reports.
- Patients with CPE who require antimicrobial therapy for suspected CPE infection must be discussed with an infection specialist, as the antimicrobial susceptibility profiles of CPE isolates may vary:
  - Capture data on patients who are being treated for suspected infection due to CPE. This data should be provided by clinical microbiology, infectious diseases and pharmacy for inclusion in the outbreak report and this should be provided to the OCT.
  - Data on patients who are commenced on treatment for suspected CPE infection could be a standing agenda item at OCT meetings.

Resources

- Ensure there is sufficient consultant microbiologist, IPCN, pharmacist, microbiology laboratory scientist, surveillance scientist resources to support the increased demand on the microbiology laboratory and antimicrobial stewardship, IPC and outbreak control. Take into account requirement for 24/7 access to clinical microbiologist advice, potential need for 7/7 on-site IPCN presence during an outbreak and whether or not daily OCT meetings including weekends are necessary, dependent on size and extent of outbreak.

- An outbreak places increased demands on almost every facet of the organisation. Patients with CPE often have complex medical needs, many risk factors and higher care requirements than other patients. The resources needed should not be underestimated and an intense initial response may mitigate a larger, lengthier outbreak. Particular attention should be made for the provision of single rooms, increasing numbers of nursing and healthcare assistants on affected ward(s), increased resources for cleaning, infection prevention and control, surveillance, pharmacy, equipment, IT and clerical support for the outbreak.

- Ensure that staff members are designated to care for either patients with CPE or patients without CPE for the duration of the shift.

Outbreak Closure

- Refer to the latest version of '*HSE policy on assessing evidence of transmission of CPE*' which outlines criteria for determining whether CPE transmission has ceased in a hospital.

- A brief summary of the outbreak should be prepared by the OCT detailing the following: the duration of the outbreak; the number of wards affected; the bed days lost due to closures as a result of the outbreak; the total number of new CPE cases detected; the total number of CPE contacts identified; the total number of patients with CPE requiring treatment for suspected CPE infection; the 30 day inpatient outcome of patients with CPE; the impact of the outbreak on the laboratory; IPCT; the number of OCT meetings; findings and recommended actions from any relevant audits conducted and learning points as identified by the OCT.

- The final outbreak summary report should be forwarded to the local Department of Public Health, to senior management in the hospital and hospital group and to the hospital board (where appropriate), along with formal notification of the local Department of Public Health of closure of the outbreak.

References

1. Adeolu, M., Alnajar, S., Naushad, S. and Gupta, R.S., 2016. Genome-based phylogeny and taxonomy of the 'Enterobacteriales': proposal for Enterobacterales ord. nov. divided into the families Enterobacteriaceae, Erwiniaceae fam. nov., Pectobacteriaceae fam. nov., Yersiniaceae fam. nov., Hafniaceae fam. nov., Morganellaceae fam. nov., and Budviciaceae fam. nov. *International Journal of Systematic and Evolutionary Microbiology*, 66(12), pp.5575-5599.

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