Requirements for Screening of Patients for Carbapenemase-Producing *Enterobacteriales* (CPE)[1] in the Acute Hospital Sector

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.

[1] Over the years, the terms CPE and CRE have both been used in Ireland. CRE is the term used in the regulations related to notification of infectious disease. Often people use CPE and CRE to mean more or less the same thing. Much of the time, it probably does not matter very much if we refer to either CPE or CRE, but they are not exactly the same thing. The difference is explained in a frequently asked questions (FAQs) document at www.hse.ie/hcai. Recent changes in microbial nomenclature have altered the meaning of the term "*Enterobacteriaceae*" and mean that the term "Enterobacteriales" now corresponds more closely to the former meaning of "*Enterobacteriaceae*".

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Glossary of Terms

AMAU = Acute Medical Assessment Unit

CPE = Carbapenemase-Producing Enterobacteriales*

ED = Emergency Department

IPC= Infection Prevention and Control

***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

The following is an updated policy to identify patients who must be screened for CPE in acute hospitals.

Hospital groups and hospitals must resource all relevant areas on the ward, in the laboratory and the infection prevention and control (IPC) service to achieve this level of screening for CPE.

In some circumstances, additional screening beyond that recommended here may be required.

For additional information related to healthcare associated infection and antimicrobial resistance, or to confirm that you are using the most current version of this guidance, please go to www.hse.ie/hcai

Next review of this guideline

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

Who must be screened?

The following patients **must** be screened for CPE in acute hospitals.

a. All contacts of a patient with CPE. Where such contacts have been discharged prior to their identification as a contact, their record should be marked to ensure screening on next admission.[2] [3]
b. All admissions to critical care areas (Intensive Care Units, High Dependency Units, Neonatal Intensive Care Units[4]), on admission and weekly thereafter.
c. All admissions to haematology and transplant wards on admission and weekly thereafter.
d. All patients who have received cancer chemotherapy in the previous 12 months on admission.
e. All patients who were transferred from any other hospital in Ireland or elsewhere.
f. All patients who have been inpatients in any hospital in Ireland or elsewhere any time in the previous twelve months. Any hospital includes previous admissions to the hospital to which they are now being admitted. [2] [4]
g. Renal dialysis patients at first dialysis in a unit, periodically during dialysis treatment (at intervals of not less than six months), and on return from dialysis elsewhere.
h. All patients who normally reside in a long term care facility.

This level of screening should be implemented in all hospitals from **1st March 2018**.

[2] A key challenge for implementation is the ability to identify these patients readily. Information regarding inpatient stay in any other hospital in the previous 12 months and residence in a long-term care facility should be recorded routinely by the admissions office and should, whenever possible, be easy to obtain from the patient administration system.

[3] Screening of contacts who have left the acute hospital is generally not necessary until/unless they are subsequently readmitted to an acute hospital. However, if a patient who is a contact is discharged to a long-term care facility which can facilitate collection of samples for screening this may be helpful. Likewise, where a contact patient has left hospital but requests completion of the screening process and is prepared to submit the samples necessary, this should be facilitated.

[4] In some circumstances, it may be appropriate to screen patients who have previously been hospitalised more than one year ago. One year is an arbitrary cut-off, and it is acknowledged that some hospitals had significant issues with CPE as far back as 2011.

Note. The National Emergency Medicine Programme states, "*All patients will undergo Infection Prevention and Control Assessment at Triage*". This assessment should include assessment of risks for CPE colonisation or contact. Screening should be performed if necessary as promptly as reasonably practical.

Patients for whom the requirement for screening is not recognised at the time of admission should be screened as soon as possible after it is recognised that there is a requirement for screening. Hospitals should put in place a process to confirm that those patients who require screening are screened.

Who is a contact?

For the purposes of this policy, a patient **contact** is a person who

1. Has shared a multi-bed area and/or shared toilet facilities with a person identified as colonised or infected with CPE. This includes time spent in the Emergency Department (ED) and Acute Medical Assessment Units (AMAUs).
2. Has been cared for in an inpatient area (including ED and AMAU) by nursing staff who were simultaneously caring for one or more patients colonised with CPE in the absence of Contact Precautions. This might arise in relation to a patient who was not known to be colonised with CPE at the time in question.

Each acute hospital should develop a process to ensure, in so far as possible, the flagging of records of all contact patients so that they are readily identifiable for screening and contact precautions if and when they come back into hospital. This flag may be electronic or manual but should be capable of being removed when they have reached the target of four consecutive samples reported as "CPE not detected", as outlined below.

When does a contact cease to be a contact?

For the purposes of this document, a person is no longer a “contact”

- After they have had **four consecutive screening samples** reported as “CPE not detected”/”CPE negative” but with an interval of at least one week between samples

and

- There is a minimum of **four weeks** between the most recent contact and the final sample reported as “CPE not detected”/”CPE negative”

IMPORTANT

The CPE colonised/infected person should be regarded as a potential source of infection from the beginning of the hospital admission during which CPE was detected **or** from the most recent date on which there was evidence that they were not colonised (that is to say the date of their most recent screening sample reported as CPE negative/not detected (whichever is the more recent).

What do we mean by screening?

Screening refers to

- The collection of a rectal swab or sample of faeces.
- The swab/sample should be submitted **within 24 hours** of the patient presenting to the hospital.
- Collection of rectal swabs, rather than waiting for stool samples, lends itself to prompt sample collection and is generally preferred.
- If rectal swab sampling is not acceptable to a patient, stool samples are acceptable.

NOTE: In some circumstances, samples from additional sites for testing for CPE may also be appropriate based on clinical assessment.

In the acute hospital setting **Standard Precautions** and **Contact Precautions** should apply to any contact of a patient colonised with CPE. Standard and Contact Precautions should be applied until **a minimum of four consecutive samples** taken at intervals of not less than one week have been tested by an appropriate method and reported as, “CPE not detected” or “CPE negative”. The final sample from a contact should be taken **at least four weeks** after the most recent contact. It is accepted that a small number of patients may become detectable as CPE positive more than four weeks after contact with a CPE positive patient but it is felt necessary at this time to apply a pragmatic time limit to the process.

There is no evidence that the collection of rectal swabs represents a significant risk to patients who are neutropaenic, and CPE may be a particular risk for these vulnerable patients. Several recent publications report routine screening by rectal swab collection in hematology cohorts including bone marrow transplant recipients (Demiraslan *et al*., 2017, Inverarity *et al*., 2014, Viale *et al*. 2015). These patients should be included in screening programs.

Is retesting required if the patient is confirmed positive for CPE?

Retesting of patients confirmed positive for CPE is generally **not necessary** at present.[5]

This is because an agreed process for declaring that a patient colonised with CPE is clear of CPE has not yet been defined. If an agreed process for declaring that a patient who was confirmed positive for CPE and has subsequently been cleared of CPE is in the future defined, testing to confirm clearance may become of value in that context.

Laboratory screening

Laboratory screening for CPE should at a minimum mean plating of rectal swabs/faeces on one of the accepted CPE chromogenic agars. Access to rapid methods for direct testing of selected samples and/or for rapid confirmation of suspect CPE from agar plates should be available. Where screening is based on an initial molecular method those samples that test positive should be cultured to attempt to isolate the organism. It is accepted that in some instances it will not be possible to confirm a molecular result by culture. If the molecular test used is a CE (European Conformity) marked product or a well validated in-house method, this result is generally sufficient to designate the patient as CPE colonised though consideration should be given to culturing subsequent samples to obtain culture confirmation whenever possible.

Where capacity to perform screening does not exist in each individual hospital laboratory, hospital groups may consider providing the testing from one centralised

[5] Rescreening of known CPE positive patients on readmission is not essential for infection prevention and control purposes if the patient is managed as CPE positive but it may be of value to assess if they have acquired additional CPE variants. It may also have a value in providing assurance regarding the capacity of the screening system in place to detect CPE. However, it is important to ensure that patients are not considered cleared of CPE because of a single "CPE not detected"/ "CPE negative" rectal swab/faecal sample result.

laboratory or from a limited number of laboratories if this is a more effective use of resources. Laboratories should have arrangements for processing samples daily or sending samples for processing daily including over weekends.

The first isolate of any bacterial species or CPE genetic type from a patient should be sent to the National Reference Laboratory Service. It is acknowledged no isolate is available for sending in the event that CPE is detected by molecular methods but not confirmed by culture.

References

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2. Demiraslan, H., Cevahir, F., Berk, E., Metan, G., Cetin, M. and Alp, E., 2017. Is surveillance for colonization of carbapenem-resistant gram-negative bacteria important in adult bone marrow transplantation units? *American Journal of Infection Control*, 45, pp.735-739.

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