TITLE

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If You Did This Today You Probably Got Poo On Your Hands Do You Know How to Get it Off !

The Tongue Twister & The Pantomine

- I am not the pheasant plucker
- Oh yes you are !

A Patient Story -1

- 2016 60 year old man diagnosed with stage 4 lymphoma
- Extensive disease – abdominal adenopathy and generalized body swelling
- Treated with chemotherapy – very good response

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A Patient Story -2

- Mid 2017
  - Disturbance of vision and concentration
  - CT brain: mass surrounded by oedema
  - MRI - R frontal lesion
  - Biopsy - Lymphoma
  - More treatment

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A Patient Story -3

- Scans show lymphoma is shrinking
- Planed for stem cell transplant and autologous stem cell transplant
- Summary : 60 year old man with complex disease requiring intensive treatment that will put him at continuing risk of infection but with reasonable prospect of good outcome

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Microbiology Complications

- June – 2017 Rectal screen – CPE not detected
- August 2017 Rectal swab screens
  - VRE not detected
  - CPE screen looks positive
  - *K. pneumoniae* Meropenem MIC of 24mg/l

    – mic > 8 is considered resistant

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Why Is It Resistant

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Molecular Identification                Auth
CPE Panel
  KPC Carbapenemase gene NOT detected
  VIM Carbapenemase gene NOT detected
  IMP Carbapenemase gene NOT detected
  NDM Carbapenemase gene Detected
  OXA-48-Like Carbapenemase gene NOT detected
CTX-M Panel
  CTX-M Group 1 genes Detected
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Why Is It Resistant

- It produces and enzyme that hydrolyses carbapenems
- Carbapenemase producing *Enterobacteriaceae* (CPE)
- So meropenem is out but what else have we ?

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What Do We Have ?

Co-amoxyclav R	Meropenem R
Amoxicillin R	Cefpodoxime 10 R
Ciprofloxacin R	Amikacin R
Tazobactam/Piperacillin R	Cefoxitin 30 R
Gentamicin R	Cefpodoxime10/Clavulanic acid1 R
Cefotaxime R	Ertapenem R

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What Do We Have ?

E-Test Auth

Tigecycline M.I.C.: 0.5 ug/ml

Interpretation : Susceptible

Colistin M.I.C. <=1.0 ug/ml

Interpretation : Susceptible

MIC is determined by Broth Dilution Method.

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What To Do Now ?

- Source Isolation- reduce risk to others
- De-colonisation is **not possible (he has this for life)**
- If he develops blood stream infection with this organism 30 day mortality is at least 50%
- We might be able to use
  - colistin, tigecycline and a third agent ??? what
- Aztreonam will not work
- The new combinations (cefotolozone-tazobactam and ceftazidime-avibactam) don' t work

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Where Did He Get It ?

- Hard to tell ?
- In Ireland most CPE are probably hospital acquired
- He was in multiple hospitals

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Main Points From The Case

- CPE = Carbapemease Producing Enterobacteriaceae
- They come in a few different colours (OXA, KPC and NDM)
- Most of them are phenomenally resistant
- Mostly they stay in the gut if you are healthy
- They stay there for a very long time
- There is no way to get rid of them that we know off
- If they get into blood stream of your vulnerable patients half of them will be dead in 30 days (crude mortality)

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My Key Messages -AMR & Stewardship

- 1. Antimicrobial Resistance (AMR) is hurting patients and costing money
- 2. AMR is getting worse –in the world, in Ireland and in the HSE
- 3. CPE (Carbapenemase Producing Enterobacteriaceae) is the biggest problem we have to deal with right now
- 4. Using less antibiotics is hard but it can be done
- 5. Using less antibiotics **is not** about denying patients antibiotics they need
- 6. Giving patients antibiotics they don't need is bad for them and bad for everyone

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My Key Messages –Prevention and Control of HCAI

- 1. Healthcare associated infection is a commonplace adverse event (too common)
- 2. Some but not all of it is preventable
- 3. Some but not all is related to new organisms acquired in hospital (so it is not just about control of cross infection)

The HCAI/AMR Response Team (Established May 2017) Who We Are

Division: Health & Wellbeing. Stephanie O'Keefe and Kevin Kelleher

Martin Cormican Consultant Microbiologist (National Lead HCAI/AMR)
Anne Sheahan, Public Health Consultant
Mary McKenna IPC ADON
Nuala O'Connor GP (Community Antimicrobial Stewardship)
Donna McNena (Admin Support not yet started)
Maria Molloy (Medical Scientist – Surveillance not yet started)
Audrey Lambourn (Communications- not yet started)
Antimicrobial Pharmacist (to be recruited)
Project Manager (to be recruited)

The HCAI/AMR Response Team (Established May 2017) What Are We Doing

- Raising awareness and advocating for change (hospital and community)

Providing leadership guidance and support

We won't do the infection control and antimicrobial stewardship but we hope you will

My Key Messages –HCAC

(If you have not seen the abbreviation HCAC before that is because I made it up at my kitchen table on Wednesday night)

- 1. Patients colonised with AMR bacteria have the same right to access care, to dignity and to privacy as everyone else
- 2. Healthcare associated colonization with AMR is pretty routine in many parts of our health care system
- 3. Most of it related to patients swallowing other patients faeces (MRSA is an exception related to skin flakes)
- 4. Most of it is related to contact (hands, equipment and surfaces)
- 5. Just because we are used does not mean it is OK especially when it is CPE and there is little left to treat it with

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We Need You to Advocate

- Picking up CPE cannot be allowed to become the routine price patients pay for accessing care in the HSE
- If you want to be kept up to date send an email to hcainational.lead@hse.ie with "add me to the mailing list" in the subject line

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Antibiotic/Antimicrobial Resistance Is A Big Deal

Antibiotic /Antimicrobial Resistance (AMR)

The Growing List of Acronyms: MRSA/ESBL/VRE

21 September 2016 New York

Secretary-General's remarks to High-Level Meeting on Antimicrobial Resistance [as delivered]

I am pleased to join you to address this important topic.

Antimicrobial resistance poses a fundamental, long-term threat to human health, sustainable food production and development.

It is not that it may happen in the future.

It is a very present reality – in all parts of the world, in developing and developed countries; in rural and urban areas; in hospitals; on farms and in communities.

We are losing our ability to protect both people and animals from life-threatening infections.

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Status of AMR in Ireland

Doing Better on AMR (National Action Plan Required by WHO Developed by DOH)

1. Use Less Antibiotics (everywhere)

2. Get Better at Stopping the Resistant Bacteria From Spreading

An Introduction to CPE

CPE – faecal oral spread

If someone got CPE they swallowed traces of someone else's faeces

That should happen a lot less often in health care delivery than it does

CPE: What it is
First the E = Enterobacteriaceae

E: = normal gut bugs

E: a group of bacteria that belong normally in the gut (normal colonisation)

But: Can get into urine (cystitis/pyelonephritis), gall bladder (cholecystitis) and blood (blood stream infection/septicaemia)

E (=Gut Bugs) are Harder to Kill

1986 – pretty to easy to kill them when they cause trouble (co-amoxiclav with ceftriaxone as big gun)

1996 – getting harder to kill them **(ESBL)**
(ceftriaxone not so sure meropenem as big gun)

2017 – sometimes nearly impossible to kill them **(CPE)**
(meropenem not sure – what is next big gun)

Now the C in CPE: What it is

C = Carbapenemase – an enzyme that destroys carbapenem antibiotics

Carbapenems (a family of antibiotics) meropenem is best know example

So CPE: What is it ?

C = Carbapenemase
P = Producing
E = gut bugs

(Term **CRE** widely used means more or less the same thing most of the time)

CPEs Come In Different Colours

(this is not an endorsement of smarties, Nestlé, or any other food high in refined sugar (although I do like smarties I like giant chocolate buttons even more but they are all the same colour so they were not suitable to illustrate this point)

OXA 48

KPC

NDM-1

CPE: The Scale of What We Know About

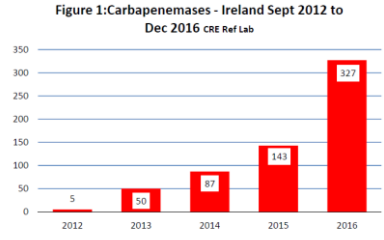

Fig 1: Carbapenamase Genes Jan - June 2017

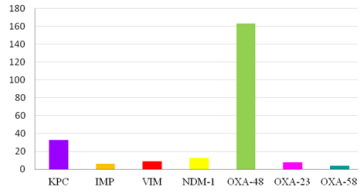

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Fig 2: Distribution of Carbapenemase Genes by Species Jan - June 2017

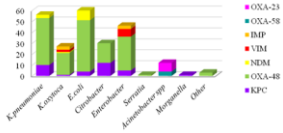

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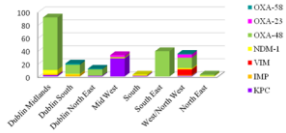
Fig 3: Geographic Distribution of Carbapenamase Genes Jan - June 2017



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CPE: A Different Kind of Pandemic

JM on ward 1 has *Escherichia coli* CPE (**OXA 48**) January 15

MC on ward 3 has *Klebsiella pneumoniae* CPE (**OXA 48**) February 1

PD on ward 4 has *Citrobacater freundii* CPE (OXA 48 February 17)

And none of the three has an infection

CPE: A Different Kind of Pandemic What is the Connection ?

JM on ward 1 has *Escherichia coli* CPE (**OXA 48**) January 15

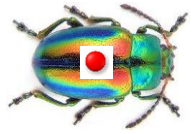
MC on ward 3 has *Klebsiella pneumoniae* CPE (**OXA 48**) February 1

PD on ward 4 has *Citrobacater freundii* CPE (**OXA 48** February 17)

A piece of DNA (plasmid /transposon) moving so fast between bacteria that the name of the bacteria does not matter

CPE: Three Different Kinds of Bugs All Carrying the Same Red Smartie





CPE: A Different Kind of Pandemic
How Did It Get from JM to PD ?
Silent Transmission

JM on ward 1 has *Escherichia coli* CPE (OXA 48) January 15

E. coli – doctor hand – patient X – nurse – bed pan – patient Y - moved to ward 4 on February 6 – newspaper – PD in the next bed – DNA hops into *Citrobacter freundii* living in gut of PD

PD on ward 4 has *Citrobacater freundii* CPE (OXA 48 February 17)

CPE: A Different Kind of Pandemic
Why Does It Matter If No One is Sick ?

PD on ward 4 has *Citrobacater freundii* CPE (OXA 48 February 17)

March 14 PD has a bone marrow transplant

March 19 fever, rigors, rising heart rate, falling blood pressure

Take blood cultures, start antibiotics but which ones ?

If CPE is in his blood mortality is about 50%

Summary

Antimicrobial /Antibiotic Resistance Massive Problem

CPE is a creeping pandemic that is easy to overlook

You can't see it spread if you are not looking (and many hospitals are not looking hard enough)

It is already shortening lives and costing misery and big money

We are paying and we will pay more – the choice

Pay now to try to control it

Pay in perpetuity for our failure

We Need You to Advocate

- Picking up CPE cannot be allowed to become the routine price patients pay for accessing care in the HSE
- If you want to be kept up to date send an email to hcainational.lead@hse.ie with “add me to the mailing list” in the subject line