HCAIs:Theories, Enigmas and Practical Approaches

Tackling healthcare associated infections outside of hospital – Learning Workshop 2

Tuesday 2nd December 2008

Breakout Session

The Forest Pines Hotel, Broughton, Brigg, DN20 0AQ

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Tackling Healthcare Associated Infections Outside of Hospitals
Learning Workshop 1
Breakout session
HCAIs: Theories, Enigmas and Practical Approaches to Good Practice

Dr Bharat Patel, Consultant Medical Microbiologist, Regional Microbiology Network, London, Health Protection Agency

This interactive session will provide an understanding of the management of residents at risk of MRSA, *Clostridium difficile* and other infections. Using clinical scenarios, the session will cover the concepts of colonisation and infection. Guidance will be provided on when it is appropriate to take specimens for screening and for the diagnosis of infections. The session will also include an example of a MRSA eradication regime and provide guidance on when it is appropriate to use such regimes. Basic information on the use of antimicrobial treatment regimes will be provided for carers and prescribers. Join us and participate in this informative session.

Interaction between community & hospital

Hospital

Patients

Community

Relatives

Staff

Vehicles of transmission

Community

Where is the difference?

Community case - two thirds have had prior contact with hospitals

Already, policy of accepting the elderly in nursing homes and residential homes

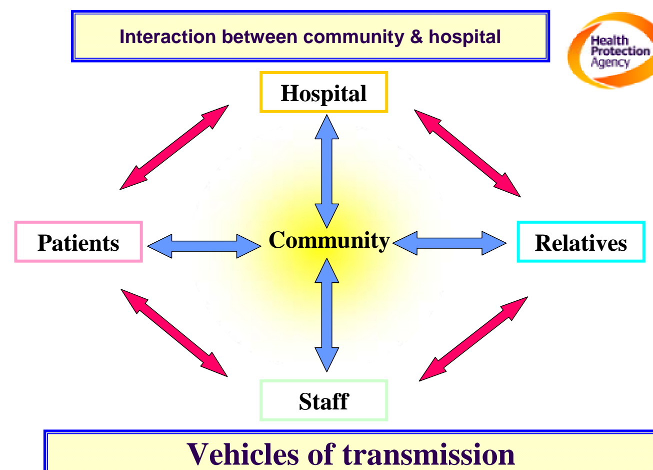
Evidence of colonisation in those around case

Skin contamination of cases

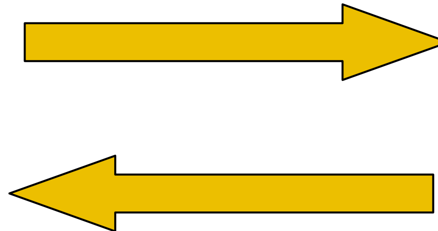
Difficulties of cleanliness around the elderly

There will be accidents

Hygiene must be enhanced



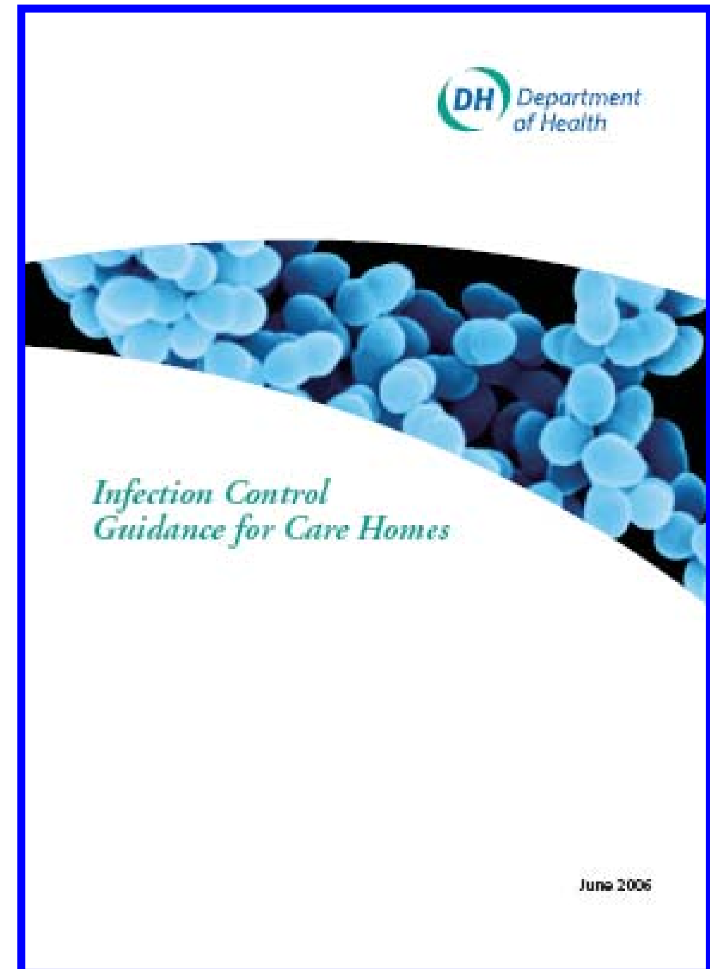
Hospital and nursing home interaction

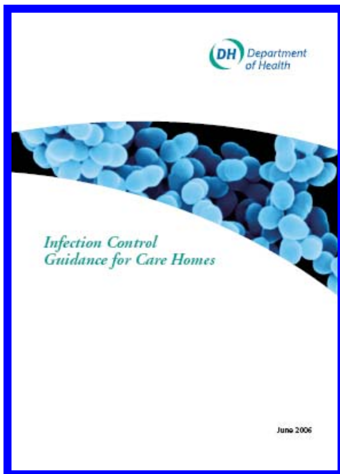


- *Clostridium difficile*
- Norovirus
- (MRSA)
- Other alert organisms

Infection Control Guidance for Care Homes June 2006

- Organisation and management
- How are infections spread?
- Practical procedures
- Guidelines on the management of infections
- Appendix:
  - Infectious disease/incident surveillance form
  - Notifiable diseases
  - Sharps injury flow chart
  - List of diseases
  - Exclusion from work
  - Colour coding of cleaning equipment
  - Working group on the prevention and control of infection in care homes





Monitoring and reporting of infectious diseases

Care homes should meet the requirements laid down in the Care Standards Act 2000.

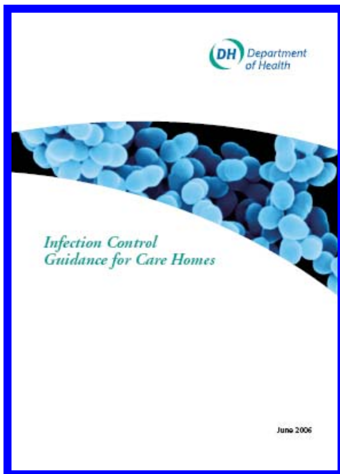
In addition, Regulation 37 of the Care Homes Regulations 2001 states that:

"The registered person shall give notice to the Commission without delay of the occurrence of the outbreak of any infectious disease which in the opinion of any registered medical practitioner attending persons in the care home is sufficiently serious to be so notified."

All staff in a home should be aware of their role in infection control.

They should also be aware of the local arrangements for accessing advice on the prevention and control of infection.

In addition, the person in charge of each home should identify a senior nurse or other responsible person who will take a particular interest in infection control and who will act as the control of infection liaison person. It is recommended that this person should undertake specific training in infection control to enable them to recognise problems as they occur and seek specialist advice from the CICN/HPN or CCDC. Advice on local availability of training can be sought from the CCDC or CICN/HPN.



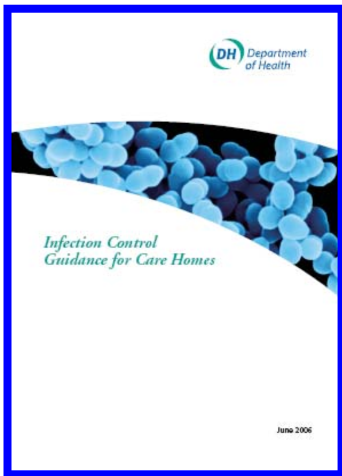
Isolation of residents with an infection

A number of infectious diseases can spread readily to other residents and cause outbreaks.

The commonest outbreaks are caused by viral respiratory infections and gastroenteritis.

The causative organisms can be spread by airborne droplets or alternatively by contaminated food and water. Isolation of infected residents is essential to prevent further cases.

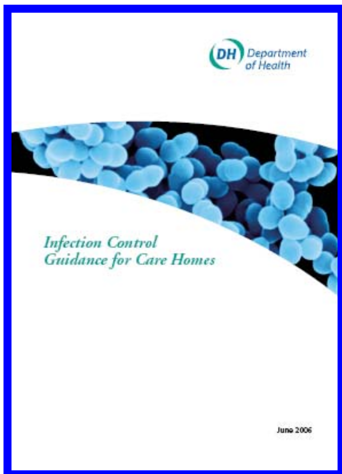
Single rooms should be available for this purpose and managers of homes will need to consider how best to achieve this. Single rooms must contain hand hygiene facilities and a wall-mounted antibacterial hand-cleaning gel dispenser. Ideally, these rooms should have full en suite facilities including a toilet. Residents with infectious diarrhoea must have sole use of a toilet, which must be thoroughly cleaned between each use (see page 16). Advice should be sought by the person in charge of the home from the local CICN or HPU.



Method of spread or mode of transmission

All micro-organisms need a mode of transmission. This varies with different types of organisms.

Hands play a big part in spreading infection. Micro-organisms may be present in body excretions and secretions. If hands come into contact with these the micro-organisms may be carried from one person to another unless the hands are properly decontaminated. Some micro-organisms may be spread in the air. The viruses that are responsible for colds and influenza are found in saliva and sputum. Coughing or sneezing near another person may pass on these viruses in the droplets or aerosol produced. In some circumstances, micro-organisms are able to spread from one part of the body to another, or from an outside source to the body.



Method of spread or mode of transmission

Modes of transmission include:

- aerosol
- droplet
- faecal–oral
- direct contact (person to person)
- indirect contact (food, water, fomites (inanimate objects), the environment)
- blood and body fluid
- insects and parasites.

Colonisation and Infection

- What is colonisation?
- When does colonisation become infection?

When to swab and when to screen?

When to swab and when to screen?

- 75yr old man
- Resident for 5 yrs
- Severe osteoarthritis of Lt hip
- Severe COPD
- Previous admitted 2004 & 2007
- Elective admission in a fortnight for Lt total hip replacement

- What do you do?

When to swab and when to screen?

- 75yr old man
- Resident for 5 yrs
- Severe osteoarthritis of Lt hip
- Severe COPD
- Previous admitted 2004 & 2007
- Elective admission in a fortnight for Lt total hip replacement

- Do you need to send swabs?
- If so which sites?

When to swab and when to screen?

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- Do you need to send swabs?
- If so which sites?
- What do you do with the results?

When to swab and when to screen?

- 75yr old man
- Resident for 5 yrs
- Severe osteoarthritis of Lt hip
- Severe COPD
- Previous admitted 2004 & 2007
- Elective admission in a fortnight for Lt total hip replacement
- Forgot to mention leg ulcer

- Do you need to send swabs?
- If so which sites?
- What do you do with the results?
- Leg ulcer had *Pseudomonas* sp.
- Previous MRSA from Lt leg ulcer

MRSA screening

Saving Lives: a delivery programme to reduce Healthcare Associated Infection, including MRSA

Screening for Meticillin-resistant *Staphylococcus aureus* (MRSA) colonisation:

A strategy for NHS trusts: a summary of best practice

Objective

All trusts should review their screening and decolonisation policies and assess what would be the best and most practical approach for immediate implementation.

Aim

This strategy presents recommendations which, if implemented, will reduce the risk of infection from MRSA through screening patients identified as 'at risk' from MRSA colonisation. All trusts should review their screening and decolonisation policies and implement a decolonisation regimen to reduce the risk of infection for these individuals and the spread of MRSA to other vulnerable patients.

Context

The transmission of MRSA and the risk of MRSA infection (including MRSA bacteraemia) can only be addressed effectively if measures are taken to identify MRSA carriers as potential sources and treating them to reduce the risk of transmission. This requires screening of patient populations for MRSA carriage **either before or on admission** to identify carriers and implement a decolonisation regimen.

There has been little consistent or definitive advice to the NHS on which patients to screen, how to screen them and when. There is also a high degree of variability in practice in NHS trusts and there is no single recommendation with a strong and incontrovertible evidence base that can be recommended uniformly for all NHS trusts. Some trusts have developed screening policies and protocols. It is also clear that reduction in MRSA infections and achievement of local MRSA bacteraemia targets will only be achieved with an increase in the level of screening and decolonisation in many trusts.

The normal habitat of *Staphylococcus aureus*, including MRSA, is human skin, particularly in the anterior nares (nose), axilla (armpit) and perineum (groin). Clinical infection with MRSA (including MRSA bacteraemia) occurs either from the patient's own resident MRSA (if he or she is an asymptomatic carrier) or by cross-infection from another person, who could be an asymptomatic carrier or have a clinical infection. Patients with a clinical infection caused by MRSA should, where feasible, be cared for in single-room isolation to minimise the risk of transmission.

Which patient groups should be screened?

This strategy presents scenarios and recommendations. These are given as options for screening of specific patient groups and are drawn from approaches found to be practicable and effective across various current NHS clinical settings.

- The essential site to sample is the anterior nares (nose).
- This is the most common carriage site for MRSA and most patients positive at other sites have positive results from nose samples (but a small proportion do not).
- The secondary sites are the axilla (armpit) and perineum (groin). Any skin lesion should also be sampled.

http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_063188

Eradication regimes
Treatment regimes

Decolonisation

Decolonisation

As soon as a patient is identified as an MRSA carrier, a decolonisation regimen should be started. This comprises the use of an antibacterial shampoo and body wash daily, and the application of an antibacterial nasal cream three times a day for five days. This should be done irrespective of whether facilities are available to isolate the patient.

The purpose of decolonisation is to reduce the risk of:

• the patient developing an MRSA infection with their own MRSA during medical or surgical treatment;,

and

• transmission of MRSA to another patient.

The decolonisation regimen is only 50–60% effective for long-term clearance, but as soon as the procedure is implemented the presence and shedding of MRSA are reduced significantly and the risk of the patient infecting themselves or transmitting MRSA to another patient is much reduced.

Decolonisation

Guidelines for the control and prevention of meticillin-resistant Staphylococcus aureus (MRSA) in healthcare facilities

Health Protection Agency

Skin decolonization

Skin decolonization using 4% chlorhexidine body-wash/shampoo, 7.5% povidone iodine or 2% triclosan is useful in eradicating or suppressing skin colonization for short times, particularly pre-operatively to reduce the risk of surgical site infections (Category 1a).

Patients should bathe daily for five days with the chosen antiseptic detergent. The skin should be moistened and the antiseptic detergent should be applied thoroughly to all areas before rinsing in the bath or shower. Special attention should be paid to known carriage sites such as the axilla, groin and perineal area. The antiseptic should also be used for all other washing procedures and for bed bathing. Hair should be washed with an antiseptic detergent (Category 1a).

Nasal decolonization

Patients receiving prophylaxis for an operative procedure and in an outbreak situation under the advice of the infection control team should undergo nasal decolonization. This should be achieved by applying mupirocin 2% in a paraffin base to the inner surface of each nostril (anterior nares) three times daily for five days. The patient should be able to taste mupirocin at the back of the throat after application (Category 1b).

Mupirocin should not be used for prolonged periods or used repeatedly (i.e. for more than two courses for five days) as resistance may be encouraged (Category 1a).

Nasal decolonization using topical nasal mupirocin should be used with other forms of intervention such as skin decolonization with 4% chlorhexidine gluconate aqueous solution (Category 2).

http://www.his.org.uk/_db/_documents/MRSA_Guidelines_PDF.pdf

PATIENT NAME ADDRESS	GP NAME/ADDRESS
D.O.B. Hospital no. Consultant	Occupation Parity

HISTORY

Length of history: months/years

Duration of current ulcer months/years

Pain:

- ulcer 0 1 2 3
- calf 0 1 2 3
- joint 0 1 2 3

Current treatment:

No ☐ Yes ☐

Specify:

Bandages 1 2

Dressings/application 1 2 3 4

SOCIAL CIRCUMSTANCES

lives: alone ☐ with spouse/family ☐

sleeps: in bed ☐ in chair ☐

washes: bath ☐ shower ☐

Support: practice nurse ☐

district nurse ☐

home help ☐

health visitor ☐

social worker ☐

MOBILITY

out & about ☐

fully mobile at home ☐

stick/zimmer ☐

chairbound ☐

OTHER DISEASES

diabetes ☐

rheumatoid arthritis ☐

osteoarthritis ☐

claudication ☐

ischaemic heart disease ☐

cerebrovascular ☐

previous DVT ☐

previous fracture:

previous surgery:

other:

DRUGS

1
2
3
4
5
6

DRUG/CONTACT ALLERGY:

1
2
3
4

http://www.sign.ac.uk/pdf/sign26.pdf

When to swab and when to screen?

- 75yr old man
- Resident for 3 yrs
- Urinary frequency
- Hesitancy
- Nocturia

- What do you do?

When to swab and when to screen?

- 75yr old man
- Resident for 3 yrs
- Urinary frequency
- Hesitancy
- Nocturia
-
- Hasn't passed urine for 24hrs

- What do you do?

When to swab and when to screen?

- 75yr old man
- Resident for 3 yrs
- Urinary frequency
- Hesitancy
- Nocturia
-
- Hasn't passed urine for 24hrs
- Admitted to hospital
- Returned after four weeks with a urinary catheter

- What do you do?

When to swab and when to screen?

- 75yr old man
- Resident for 3 yrs
- Urinary frequency
- Hesitancy
- Nocturia
-
- Hasn't passed urine for 24hrs
- Admitted to hospital
- Returned after four weeks with a urinary catheter
- Has a date for prostate surgery in 2 months

- What do you do?

Health Protection Agency

Best practice guides

EPIC guidelines for urinary catheter management[5]

The ICNA audit tool section on managing urethral catheters[6]

NHS Quality Improvement Scotland urinary catheterisation and catheter care guidelines[7]

5. Pratt RJ, Pellowe CM, Wilson JA, Loveday HP et al. epic2: National evidence-based guidelines for preventing healthcare-associated infections in NHS hospitals in England. Journal of Hospital Infection 2007, 65:S1–S64. Available at www.epic.tvu.ac.uk/PDF%20Files/epic2/epic2-final.pdf (accessed 28 February 2007)
6. Infection Control Nurses Association. Audit tools for monitoring infection control standards. London: Infection Control Nurses Association. 2004. Available at www.icna.co.uk/public/downloads/documents/audit_tools_acute.pdf (accessed 28 February 2007)
7. NHS Quality Improvement Scotland. Urinary catheterisation and catheter care. Best practice statement – June 2004. Edinburgh: NHS Quality Improvement Scotland. 2004. Available at www.nhshealthquality.org/nhsqis/files/Urinary_Cath_COMPLETE.pdf (accessed 28 February 2007)

Urinary catheters

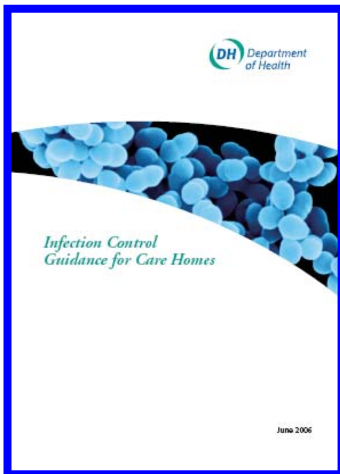
Format of Statement

The statement is divided into 10 sections covering:

1: Decision to Catheterise
2: Infection Control
3: Intermittent Catheterisation
4: Indwelling Urethral Catheterisation
5: Supra-Pubic Catheterisation
6: Urine Sampling
7: Choice of Catheter and Drainage System
8: Catheter Care
9: Catheter Maintenance Solutions
10: Decision to Remove the Catheter.

http://www.nhshealthquality.org/nhsqis/files/Urinary_Cath_COMPLETE.pdf

What carers and prescribers should know?

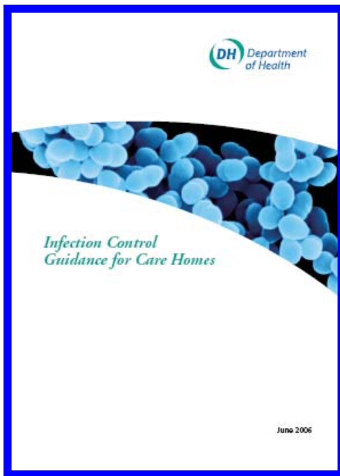


Antimicrobial medicines management

In 2003, the Royal Pharmaceutical Society of Great Britain (RPSGB) published *Guidance on the administration and control of medicines in care homes and children's services*.

The RPSGB guidance outlines the current legislation that applies to all medicines in care homes irrespective of how they were obtained. Details are given of the statutory requirements for the provision of written policies and procedures, and the recording of all medicines.

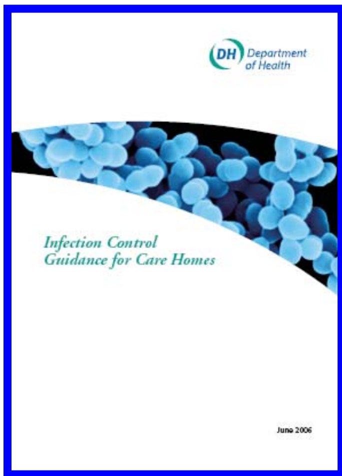
In addition to the requirements laid out in the RPSGB guidance, the following recommendations are considered good practice for the use of antimicrobials.



Antimicrobial medicines management

The Medicines Act 1968 stipulates that medicines must only be administered to the person for whom they have been prescribed, labelled and supplied. Antimicrobials should only be used following the prescriber's advice, and medicines prescribed for one service user should not be given to another. **Antimicrobials are specific as to the type of organism they work for.** They should not be used for a purpose that is different from that for which they were prescribed.

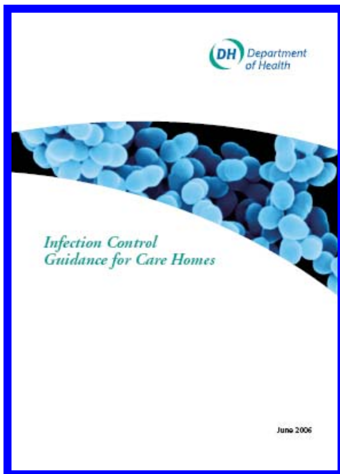
Unwarranted use of antimicrobials can partially mask symptoms and delay the exact diagnosis and recovery. Unless directed by the prescriber, antimicrobials should not be administered before the service user has symptoms (prophylactic treatment) because that increases the risk of resistance developing.



Antimicrobial medicines management

Although many antibiotics initially prescribed are 'broad-spectrum' (capable of killing a wide range of bacterial types), each antibiotic has limited effectiveness against certain types of bacteria.

If an infection does not resolve, the antibiotic being taken may not be compatible with the bacteria causing the infection. The prescriber should be contacted.



Antimicrobial medicines management

If antimicrobials are prescribed, the full course should be administered even if the symptoms improve. Not finishing the treatment contributes to the development of resistant bacteria. Care workers should therefore ensure that the duration of the course of treatment is specified by the prescriber and that the patient actually receives it. With some antimicrobial dosage forms, for example tablets, this usually applies to the entire prescription bottle. However, with liquid antimicrobials, very often the full course of therapy does not equal all the medication in the bottle. Clarification may need to be sought from the prescriber.

Diarrhoea

- 80yr old lady
- Resident for 4 yrs
- Develops sudden onset diarrhoea
- What do you do?

Diarrhoea

- 80yr old lady
- Resident for 4 yrs
- Develops sudden onset diarrhoea
- Has a temperature of 38C
- What do you do?

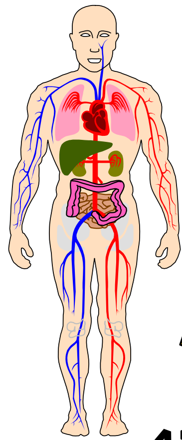
Diarrhoea

- 80yr old lady
- Resident for 4 yrs
- Develops sudden onset diarrhoea (?vomiting)
- Has a temperature of 38C
- Has been in hospital recently

- What do you do?

Pathogenesis

Health Protection Agency

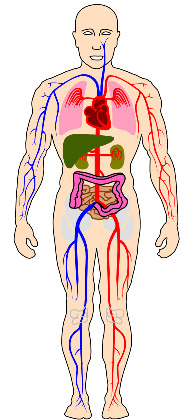


Exposure to spores

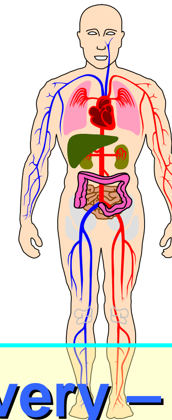
Antimicrobial treatment

- change in pattern of disease
- Severe disease
- Increase mortality and morbidity

Asymptomatic



- Role of receptors
- Role of immunity
- Role of Host factors
- Role of antibiotics (Q & 3GC)



CDAD

Colonisation resistance

10^{12} organisms per gram of faeces

Patient safety – Quality in healthcare delivery – Zero tolerance

Epidemiology and incidence of *Clostridium difficile*-associated diarrhoea diagnosed upon admission to a university hospital

Patients with *Clostridium difficile*-associated diarrhoea (CDAD) may initially develop symptoms in the community and be subsequently diagnosed at hospital admission. The objective of this study was to report the incidence of CDAD at a tertiary care hospital, and to determine the epidemiology of cases diagnosed within 48 h of hospital admission, compared with cases of nosocomial CDAD diagnosed 48 h or more after hospitalization. The average incidence was 4.0 cases/10 000 patient-days for CDAD on admission and 7.0 cases/10 000 patient-days for nosocomial CDAD. A significant difference was observed in CDAD rates on admission compared with nosocomial CDAD rates ($P = 0.017$), but no differences were observed over time for either rate.

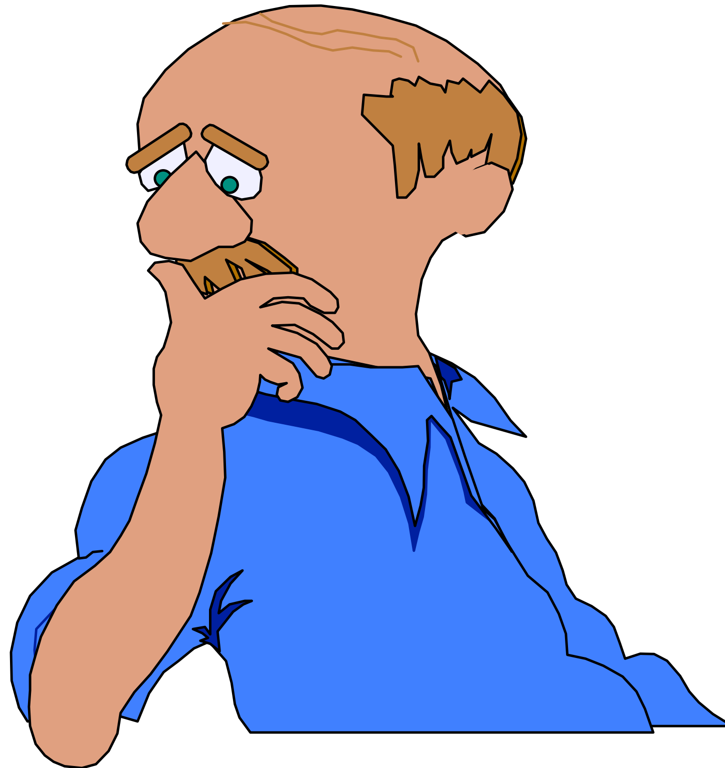
Overall, 44% of cases had CDAD on admission and 56% of cases had nosocomial CDAD. Fifty-six (62%) patients with CDAD on admission had been admitted to the same hospital and 24 (27%) had been admitted to another hospital within the previous 90 days.

Only eight (9%) patients had not been exposed to any healthcare services in the 90 days preceding hospital admission. A standardized case definition of healthcare-associated CDAD should include previous hospitalizations.

Admitting physicians should consider *C. difficile* in the differential diagnosis of patients admitted with diarrhoea, with or without a history of admission to healthcare facilities.

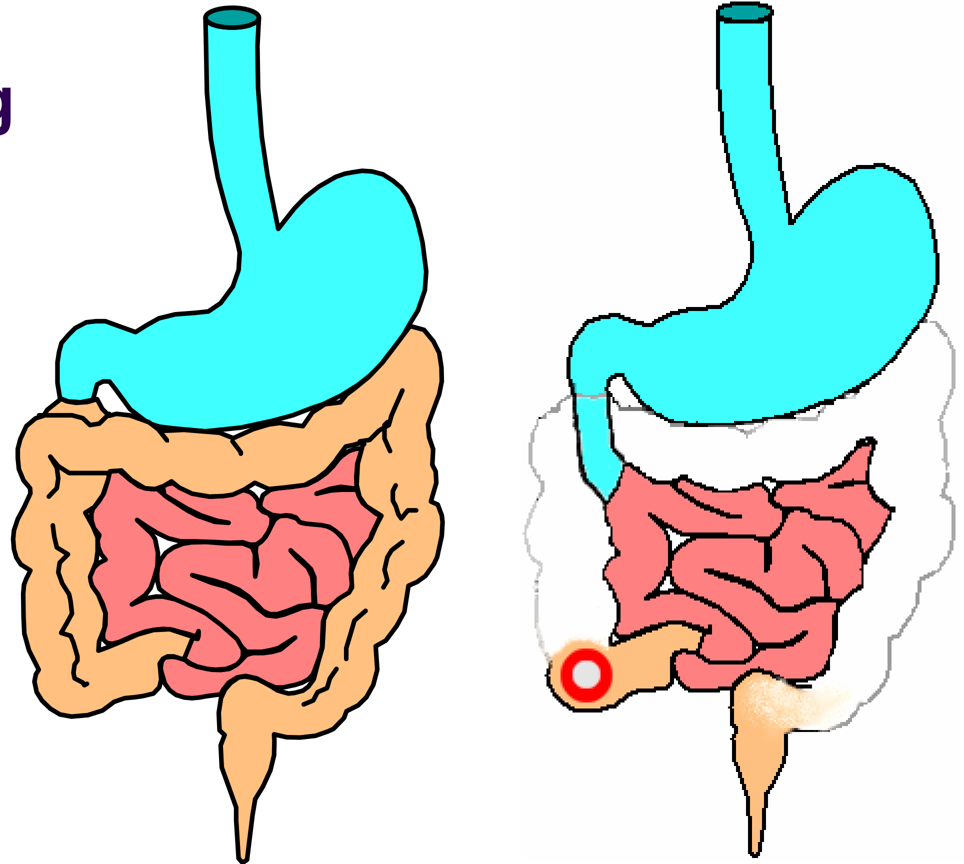
M F Price JHI 65 (1) January 2007 p 42-46

Imagine



Summary
Local, National, International problem

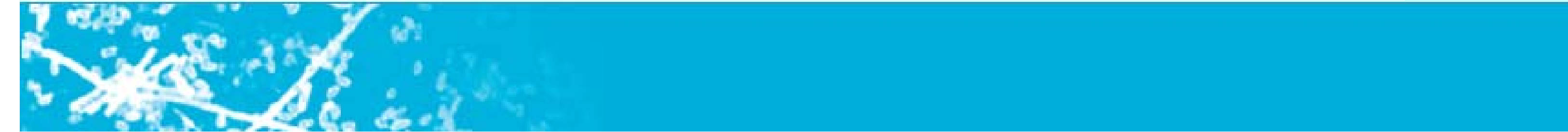
- Increase in numbers
- Elderly as well as young
- Severe disease
- Increased mortality
- Increase relapse



Saving Lives: reducing infection, delivering clean and safe care

High Impact Intervention No 7

Care bundle to reduce the risk from *Clostridium difficile*



- Isolation of infected patients
- Enhanced environmental cleaning
- Prudent antibiotic prescribing
- Hand hygiene
- Personal protective equipment

All five measures 100% of the time

- Surveillance
- Compliance
  - Whats happening
  - Root cause analysis

Those most at risk of CDAD are older patients and those who have had a recent (within the last four weeks) course of antibiotics[7]. Five main factors have been identified as being necessary to reduce the incidence of CDAD[2, 8] which if rigorously applied using a 'care bundle' approach would contribute to a reduction.

- Prudent antibiotic prescribing[9]
- Hand hygiene[10, 11, 12, 13, 14, 15, 16, 17]
- Enhanced environmental cleaning[14, 15, 16, 17, 18, 19]
- Isolation of infected patients[18, 19, 20]
- Personal protective equipment[19, 20]

Patient safety – Quality in healthcare delivery – Zero tolerance

Diarrhoea in nursing homes

- Non – infective causes
- Laxatives
- Constipation –over flow
- Feed – milk intolerance

- Infective causes
- Norovirus
- *Clostridium difficile*
- Rotavirus

- Early detection
- Isolation
- En suite room
- Adequate cleaning
- Submission of specimen
- Adequate log book of incidents

Ex hospital patient

- **Discharge letter**
- **Local intelligence**
- **Infection control measures**
  - Hand hygiene
  - Cleaning standards
  - Regular meetings
  -
- **Asymptomatic**
  - then develops diarrhoea
- **Relapse**
-
- **Recent antibiotics**
  - trigger for Cd infection
- **Recent Hospitalisation**
  - primed patient

Nursing homes – Infection Control standards

- **En suite facilities**
- **Adequate hand hygiene facilities**
  - Sinks, soap, drying facilities – appropriate placement
  - Disposal bins – placement
  - Alcohol gel (not *Clostridium difficile*)
- **Cleaning standards**
  - daily cleaning regime
  - weekly cleaning
  - deep cleaning
  - de-clutterring and de-dusting
  - Bathroom cleaning checklist
- **Food hygiene standards**
- **Visitor policy**
  - Children
  - Adult
- **Change in culture**
- **Change in behaviour**
- **Education**
- **Training**
- **Monitoring**
- **Audit**
- **Audit against standard**
- **Walk about**
- **Governance structure**
- **Reporting lines**
- **Accountability and Responsibility**

Nursing home – patient care

- ❑ **Rapid isolation to prevent spread**
- ❑ **Full infection control measures**
  - ❑ **Staffing arrangements**
  - ❑ **Hand hygiene**
  - ❑ **Daily cleaning arrangements**
  - ❑ **Responsible person**
  - ❑ **Daily patient review – do not neglect (out of site out of mind)**
  - ❑ **Terminal clean**
  - ❑ **Nursing and social care**

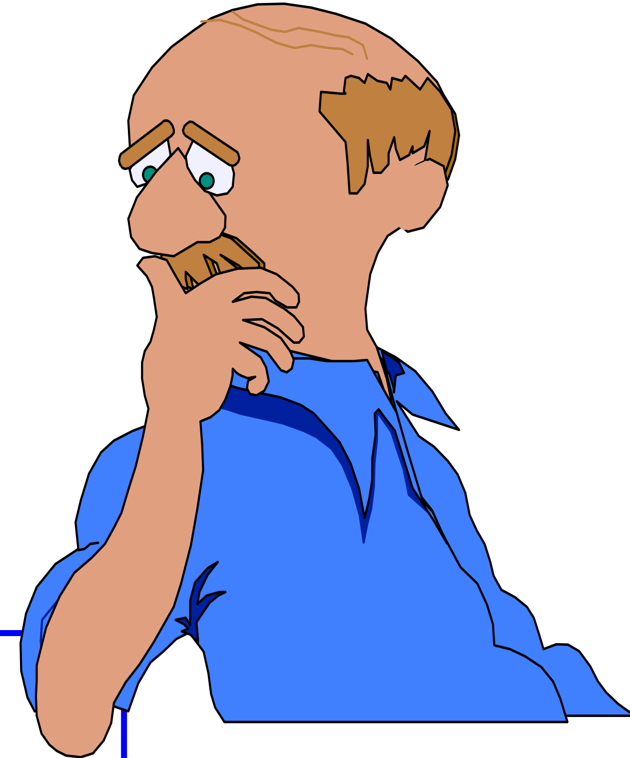
- ❑ Protocol driven
  - ❑ **Patient care pathway**
  - ❑ **Nursing care pathway**
    - ❑ **Stool charts – frequency and consistency**
    - ❑ **Fluid balance**
    - ❑ **Blood pressure, heart rate and temp monitoring**

Nursing home – Isolation facilities

- Isolation facility
  - Rule base, procedures and processes
  - Infection control rules can be maintained
  - Environmental cleaning easier
  - Toilet facilities – bedpan and commodes
  - Control who comes in and who goes out
  - Maintain hand hygiene, gowns, etc
  - Maintain discipline

What makes it happen?

- Levers
- Drivers
- Motivation
- Incentives
- Improving
- Making it happen



- Delivering safe care
- Delivering reliable care
- Delivering consistent care
- Delivering the best care

Key points

- Organisational culture
- Leadership
- Frontline staff
- When organisations get it right
- Education, Knowledge and training

Strategies – Attention to detail

- Every little measure counts
- No single measure is effective
- All five measures 100% of the time
- Is it really happening at the coal face?
- How do we know?
- What are the monitoring systems?
- How do we know its working?

Cautions

- Take account of outbreaks
- Take account of norovirus

How can we improve?

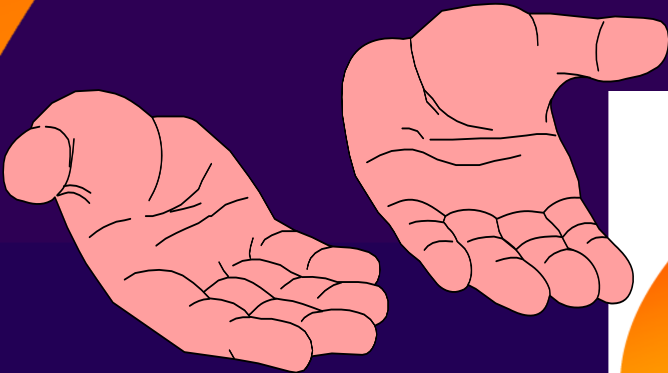
- Measure it
- Audit it
- Monitor compliance
- Learn from our mistakes
- Learn from others mistakes
- Access all the skills of the work force

Who makes it happen?

- Are you encouraged by what you have seen?
- Are you inspired?
- Go back to your Care home
- Take a lead
- Become a leader
- Make a difference
- Enhance patient safety and save lives

Thank you for listening

Patient Safety **Community Safety**



PLEASE WASH YOUR HANDS

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