

Practice Forum

Improving patient care and reducing the hospital acquired infection rate in ageing facilities

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Abstract:

Despite structural and financial constraints, the infection control team at Barberton District Hospital implemented a series of infection control measures that successfully reduced the nosocomial infection rate from 8% in 2005 to 3.6% in 2006, and resulted in fewer cases of post-operative sepsis.

Introduction

Barberton District Hospital (BDH) is a 227-bed hospital situated in the Ehlanzeni district of Mpumalanga province, South Africa. The hospital facilities are old (opened in 1884) and a lack of funding has resulted in inadequate maintenance and upgrading of the building.

The infection control (IC) unit was initiated in 1999 and is coordinated by a professional nurse (currently studying for a diploma in infection control at Stellenbosch University). The IC team has initiated a number of measures to address the high rate of hospital acquired infections experienced at BDH.

Challenges

Physical structure

The physical structure in most sections of BDH is not conducive to the rendering of quality patient care:

- There are no proper isolation cubicles for the isolation of patients with, for example, infections caused by highly resistant bacteria.
- Ceiling fans are still used in the wards.
- Some wards are 'nightingale' style, for example, typically 23 beds to a ward with one hand basin.
- Some departments use cooling/heating air condi-

tioners, keeping windows and doors closed (especially in outpatient and casualty departments).

- Natural ventilation on the wards is not utilized effectively to ensure reduction of hospital acquired infections, such as tuberculosis. Windows are kept closed most of the time.
- Theatre ventilation is poor and staff demonstrate a lack of knowledge about the type of ventilation that should be used in theatres.

Budgetary constraints

Budgetary constraints hamper the implementation of effective infection control principles:

- It is difficult to ensure adherence to proper cleaning procedures without proper equipment.
- The plastic bags required to ensure proper segregation of waste and adherence to the waste disposal policy are not always available
- One trolley is used for the transportation of clean and dirty (potentially infectious) linen to and from the laundry and for the transportation of waste to the hospital-dumping site.
- Adequate cleaning materials, such as liquid soap and disposable towels, are not always available.

High nosocomial infection rate

- The hospital acquired infection rate was above 8%.
- There was a lack of knowledge about the ecology of hospital infections and their modes of spread.
- Soap dispensers, disposable paper towels and guidance on the six steps of hand washing were not freely available.
- The hospital lacked a coordinated infection control programme.

Methods and results—Actions

Physical structure

- The IC team improved bed spacing from 0.5m apart to greater than 2m apart in the general wards, and to 3m apart in the high care unit.
- Cleaners are encouraged to clean ceiling fans weekly and ward personnel are requested to switch the fans off during certain procedures, e.g., during wound care, bed making and doctors' rounds.
- Chlorhexidine 70% alcohol hand rub dispensers (with proper spray tops) were introduced. Training was given to explain the importance of proper use of chlorhexidine spray between patients and between procedures. The importance of hand washing was also emphasized. It was stressed that the use of chlorhexidine spray should not replace hand washing.
- Training was given to explain the importance of opening windows and doors to improve ventilation. A red flag system has been initiated to identify shortcomings and make speedy intervention.
- Engineers identified that theatre ventilation problems were caused by blocked filters and doors that did not close properly. It was also discovered that the doors were kept open most of the time, even during operation procedures, which reduced the effectiveness of the ventilation system. A checklist was formulated to assist the theatre IC link nurse to monitor and identify shortcomings in theatre ventilation and training was given to the theatre team.

Budgetary constraints

- Separate cleaning mops for use in different areas were identified with paint (blue for general wards, yellow for isolation, white for kitchen, red for sluice and toilets). Colour coded charts to guide workers were laminated and displayed in all departments.
- The IC team introduced colour-coded bags to ensure proper waste segregation and training was given to ensure adherence to the policy. The waste disposal quality assurance project was monitored in all departments by link IC personnel using a checklist formulated by the team.
- Although one trolley is still used for the transportation of linen and waste, workers have been trained on the importance of cleaning (with soap

and water), disinfecting (with biocide D) and drying the trolley between procedures.

- Where liquid soap and disposable towels are not available for cleaning, workers are encouraged to remove dust with wet mops and cloths.

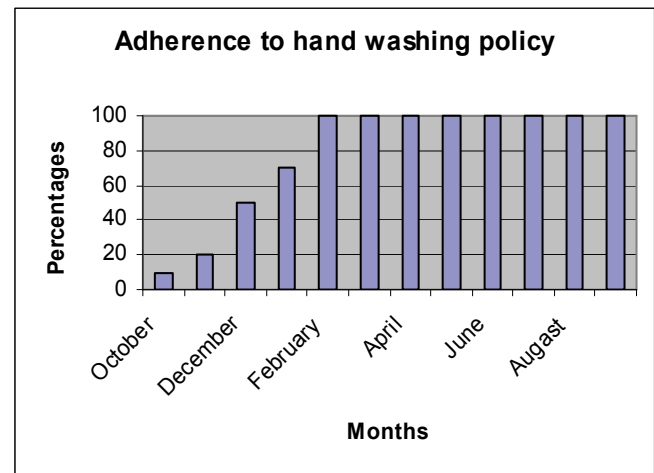


Figure 1: Adherence to hand washing policy

High nosocomial infection rate

- The IC team identified epidemiologically important infection sites and focused efforts on preventing and reducing the incidence of nosocomial infections in these areas.
- A quality assurance project on hand washing was initiated. The link IC personnel in each department applied for disposable paper towel holders and disposable paper towels. Wall mounted soap dispensers were bought for public areas only, due to financial constraints. Wards are using liquid soap with proper spray tops (supplied by pharmacy), with no topping up or washing of the spray tops on the wards. Pamphlets on hand washing, from the National Department of Health, were photocopied, laminated and displayed at every hand basin. Training is given regularly and adherence to the hand washing policy is monitored on a monthly basis using a checklist formulated by the IC team.
- Copies of all laboratory culture specimen results are collected by the IC coordinator. Surveillance forms have been formulated by the IC team to identify nosocomial infections so that contaminants can be excluded. Training about nosocomial infections is given in each department on a continuous basis.
- A coordinated IC programme, involving all departments, has been in place since 2005. An IC committee has been established and a checklist was formulated to aid committee members to monitor progress and identify gaps. Graphs showing common nosocomial infections and infection rates in each unit are discussed at committee meetings. A three-day orientation programme was held for committee members and IC link personnel,

who were then responsible for training in their various units. Continuous monthly training is given through the human resource in-service programme.

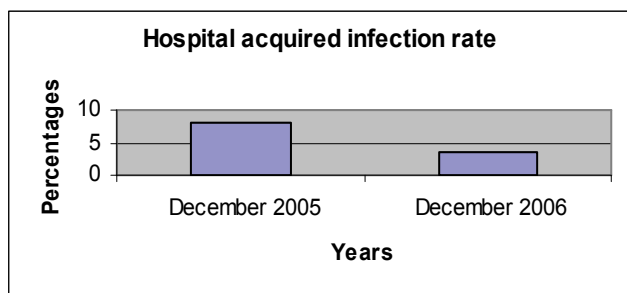


Figure 2: Hospital acquired infection rate

Results

Hand washing and the use of chlorhexidine hand rub has improved since the quality assurance project commenced in October 2005 (Figure 1).

The hospital acquired infection rate has been reduced from 8% in 2005 to 3.6% in 2006 (Figure 2).

The theatre ventilation system has improved and the postoperative sepsis rate has dropped. However, the doors cannot be repaired and particle counts cannot be performed due to financial constraints. Hospital personnel are now well informed about the importance of natural ventilation.

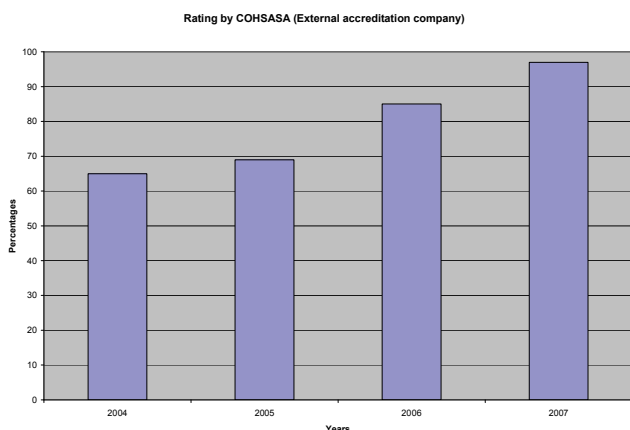


Figure 3: COHSASA rating for the IC team at Barberton District Hospital

Conclusion

Despite structural and budgetary constraints, the IC team has improvised to ensure quality patient care and a reduction in the hospital-acquired infection rate to below 4%.

The IC team has become a resource for other hospitals in the vicinity, offering consultation during outbreaks (such as *Klebsiella pneumoniae* in neonates) and equipping hospitals to prevent further outbreaks. The BDH IC team has formulated a tool for such outbreaks that can be used in any hospital in the Mpumalanga Province. The team has also been offering IC orientation programmes for nurses throughout the Mpumalanga Province since 2004.

Since 2004, the BDH IC team has received several infection control awards in the Mpumalanga province and has improved their accreditation rating annually, from 65% in September 2004 to 85% in September 2006 (Figure 3). (Subsequently the COHSASA rating has improved again to 97% in 2007.)



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