



## Conclusion

Gunshot injuries are a heavy workload for state hospitals treating trauma. Several studies have also recognised that such injuries are more expensive to treat than blunt implement and stab wounds. A national costing initiative, utilising a standardised costing system, is urgently required to efficiently determine the real costs of trauma to South Africa's already under-resourced health system.

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## Health care waste management at an academic hospital: Knowledge and practices of doctors and nurses

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**To the Editor:** Health care waste (HCW) is hazardous because of its composition and ability to transmit infectious diseases including HIV/AIDS and hepatitis B and C.<sup>1</sup> HCW management comprises seven key stages: segregation, collection, storage, handling, transportation, treatment and disposal. It is important that hospitals segregate HCW into designated categories, with storage in appropriate containers.<sup>2</sup> Since the knowledge, attitude and practices of health professionals play a significant role in successful management of HCW,<sup>3</sup> we studied these factors in doctors and nurses at Johannesburg Hospital, a large academic hospital.

## Methods

We conducted a descriptive cross-sectional study using a self-administered questionnaire. A random stratified sample

of doctors and nurses ( $N=150$ ) was selected from the list of 2 200 health professionals employed at the hospital. Of 150 questionnaires issued, 128 (95 (74%) nurses and 33 (26%) doctors) were completed. The project was approved by the Wits Committee for Research on Human Subjects (Medical). A potential limitation was self-reporting; the results therefore may not necessarily be a true reflection of the participants' practice.

## Results

**Knowledge about existence of policies.** Documents regulating HCW management used at the hospital were identified: the WHO Manual on Safe Management of Waste from Health Care Activities, the National Environment Conservation Act (1989), the Gauteng Health Care Waste Management Policy, the Gauteng Health Care Waste Management Regulations, the Gauteng Department of Health Code of Practice for Health Care Waste Management, and Johannesburg Hospital Policy on Waste Management. Most of the health professionals in our sample knew about the local hospital policy, with nurses having significantly greater knowledge than doctors ( $p<0.01$ ).

**Acquiring knowledge about policies.** Participants acquired knowledge about these policies through their own initiative (45, 36%), seminars or courses (40, 32%) and other means (39,

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31%). Senior hospital personnel were more likely than juniors ( $p < 0.001$ ) to have knowledge of these policies, which was not influenced by their length of service in the health sector.

#### Access to health care waste management documents.

These documents were accessible to most nurses (86, 91%) but few doctors (5, 15%) ( $p < 0.001$ ). Respondents mentioned a variety of places for storage of documents. There was a significant association between knowledge and access to documents ( $p < 0.001$ ). Ease of access is therefore important in generating knowledge among health professionals about HCW management. Those with access to the documents reported good HCW practices.

#### Handling, segregation, storage and disposal of HCW.

Most respondents (115, 90%) treated health care risk waste differently from health care general waste; 124 (97%) reported readily available bins for different types of HCW; 123 (96%) knew the various types of bins and used them appropriately; and 122 (95%) always used gloves when handling HCW.

**Awareness about diseases transmitted through health care waste.** Most participants (106, 82%) agreed that contact with infectious waste could lead to infectious diseases such as HIV/AIDS, hepatitis B (113, 88%) and hepatitis C (97, 76%). However, some were unsure about the risk of transmission of HIV/AIDS (6.5%), hepatitis B (6.5%) and hepatitis C (18.1%), while 16 (13%) disagreed about the risk of transmission of HIV/AIDS, hepatitis B (9.7%) and hepatitis C (13.1%) through unsafe contacts with infectious waste.

**Perceptions about HCW and transmission of nosocomial infections.** Most (126, 98.5%) agreed that improper management of HCW could lead to transmission of infections among hospital workers and patients; however, 2 (1.5%) did not agree.

**Variation in health care waste generation.** A significant statistical difference was found in different wards about perceptions of HCW collection ( $p < 0.01$ ). Nurses were more likely than doctors to know this information. Most reported

that their ward had never gone without HCW bins including sharps containers.

## Discussion

Although some instances of good knowledge (e.g. of nosocomial infections, HIV/AIDS, hepatitis B and C) and practices (e.g. use of gloves and segregation of waste) were reported, there was generally a lack of knowledge, particularly among doctors, about key documents regulating HCW, which is consistent with other studies.<sup>4</sup> The hospital authority should make these policies more easily accessible and visible, and strive to bring training in HCW management to their doctors. Based on these findings, we suggested steps for effective management of HCW (Fig. 1). Continuous monitoring and evaluation is necessary to ensure that policies and procedures are followed. Although only a small proportion of respondents reported non-segregation of waste (13.1%), it is of concern. Even a small proportion of badly managed waste can potentially be dangerous. Poor compliance with HCW management by a small percentage of staff probably explains the difficulty in managing HCW at Johannesburg Hospital, which is similar to findings in other studies.<sup>5,6</sup> The WHO acknowledges this as a problem, and observes that the human element is as important as technology in waste management.

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