



AGRICULTURE, CONSERVATION, ENVIRONMENT AND LAND AFFAIRS

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DACEL

Study Tour Report

Health Care Waste Study Tour April 2002

April 2002



Job 1459103

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1. Introduction and Study Tour Programme

The Study Tour was carried out as part of the Project “Sustainable health Care Waste Management in Gauteng” that is being managed by DACEL and supported by Danced.

The Study Tour was motivated by the need to increase the awareness of international health care waste management to a large group of key project stakeholders thereby establishing a common ground for the assessment of the HCW Management problems in Gauteng and development of possible solutions and scenarios for improved HCW management in the Province.

The Study Tour Programme consisted of

Study Tour Programme			
	Day	Venue	Purpose
1	Friday 5 April 2002	09h00 - 11h00 Introduction to Study Tour 11h30 - 12h30 Tour of Leratong Hospital 12h45 - 13h45 Tour of Itireleng Clinic 14h15 - 15h15 Tour of Wilgeheuwel Private Hospital 15h45 - 16h30 Tour of Sanumed Incinerators Roodeport 16h30 - 17h00 Travel back to Diamond Corner	Establish status quo and basis for comparison
2	Saturday 6 April	17h00 Check-in at JNB Airport 20h00 Departure MS 840 to Cairo	
3	Sunday 7 April	04h00 Arrival Cairo. 9h30 Visit to Cairo University Hospital 13h00 End of visit. Return to Marriott for Lunch	Study Pilot Project implemented at CUH. Project Sustainability, developing countries’ approach.
4	Monday 8 April	9h00 Check in MS 755 to Copenhagen 11h00 Departure flight MS 755 18h05 Arrival Copenhagen	
5	Tuesday 9 April	9h00-11h00 Amagerforbrænding, Hanne Ågaard, Kraftværksvej 31, 3295 0351 11h00-12h00 R98 (CPH waste utility), Marianne Moegreen, Kraftværksvej 25, 3266 1898 13h15-17h00 Visit to Slagelse Hospital	See large MSW incineration plant with side hearth for HCRW. Municipal HCRW Solutions Visit Regional Danish Hospital and municipal systems
8	Wednesday 10 April	9h00-11h00 Rigshospitalet (Royal Danish Uni. Hosp) 11h30-14h00 Lunch & Study Tour Group Meeting RAMBØLL 15h00-16h00 SWS Incinerator Nr. Alslev (Jon Rasmussen)	Visit largest hospital in DK Exchange of observations and discussion of suitability of observed systems and solutions to Gauteng. Visit commercial HCRW incinerator
9	Thursday 11 April	10h00-12h00 Danish Health Agency (Sundhedsstyrelsen), Ole Mygin, Islands Brygge 67, 7222 7742 14h30 Depart SK1541 to Manchester	Danish HCW Management

	Day	Venue	Purpose
		15h20 Arrive Manchester	
10	Friday 12 April	9h00-14h00 Eurocare, HCRW treatment and collection co.	Visit regionalised off-site modern non-burn treatment plant Discuss local and regional government approach, responsibilities, planning and enforcement of HCRW
11	Saturday 13 April	All day free	
12	Sunday 14 April	12h35 Depart BD597 to London 15h00 Depart MS778 to Cairo 20h45 Arrival Cairo	Travel day only
13	Monday 15 April	10h00-11h30 Visit to Ministry of Health Afternoon free	Discuss overall planning, training, enforcement and information systems in Egypt for HCW
14	Tuesday 16 April	01h45 Depart MS 841 to JHB 11h00 Arrival Johannesburg	Travel day only

The Study Tour Participants were:

	Participants	Organisation
1	Mr. Albert Marumo	Gauteng Dept of Health (DoH), Environmental Health
2	Ms. Beatrice Mahonga	Gauteng Dept of Health, Facilities Planning
3	Mr. Benny Maphaka	Gauteng Dept of Health, East Rand Region
4	Mr. Dave Harris	Pikitup, Johannesburg Waste Utility
5	Ms. Dinah Mareletse	Infection Control Nurse, Itireleng Clinic (Pilot Project)
6	Ms. Debra Mothopeng	Gauteng Dept of Health, WITS Region
7	Ms. Lorna Bassed	Gauteng Dept of Health, Human Resource Development
8	Mr. Michiel Eksteen	Gauteng Dept. Public Transport Roads & Works
9	Ms. Mabel Mphela	Infection Control Nurse Leratong Hospital (Pilot Project)
10	Ms. Qaphile Ntsele	National Dept of Health
11	Mr. Sydney Nkosi	Gauteng Dept. of Agriculture, Conservation, Environment and Land Affairs (DACEL)
12	Ms. Tolmay Hopkins	Dept. of Water Affairs and Forestry (DWAF)
13	Ms. Vukani E Khoza	Gauteng Dept. of Health, Occupational Health
14	Mr. Torben Kristiansen	Chief Technical Advisor, RAMBØLL, Tour Co-ordinator.

2. Notes From Meetings During the Study Tour

Three times during the Study Tour the programme allowed for the Study Tour Participants to meet and discuss preliminary findings and observations. The CTA's notes from those three meetings are presented below.

2.1 Meeting 1, Ascot Hotel, Copenhagen

- Management of SA health care facilities must understand the working conditions and problems at ground level and get involved in the solving of problems, incl. HCW management problems
- There is a great need for dedicated Codes of Practice for HCW Management at the individual health care facilities in SA similar to the ones seen during the study tour
- The group was surprised that the HCW management system in Denmark apparently works well with little formal training and formal monitoring. It appears as if the principles of sorting and good practices are accepted and followed widely by all staff. However, there is formal introductions to new staff supported by on-the-job training by other staff, infection control nurses etc.
- It was suggested that a formalised training system should be introduced in Gauteng, including training of trainers systems. It was suggested that the Danish training should be formalised more also.
- There appears to be a passionate commitment to work by the health care staff at hospitals visited in Denmark
- There appears to be a well functioning standard HCW management system at all hospitals visited.
- Training in SA and DK should be continuous
- The storage for chemical waste at Rigshospitalet was by many perceived to be problematic due to the mixing of chemicals according to the Chemicals' Management Manual and the poor ventilation and fire protection equipment there.
- It was agreed that it should be defined what kind of "management commitment" is needed in SA and how it should be materialised incl. delegation of powers, level of involvement of management etc.
- Some felt that the Danish HCWM system could be applied in SA with some adaptations only.
- Some felt that integration of stakeholders is important as to require HCRW service providers to carry out training of hospital staff. There appears to be more onus on the service providers in SA, whereas in Denmark the health care facilities are responsible for the training of their own staff and the internal procedures.
- There is a need for a formalised waste handling system and guideline in SA
- DoH must develop strict technical specifications for HCW management equipment and systems
- There should be integration of all disciplines in the making the Guidelines / Guidance Manual
- SA Service Providers should visit hospitals and clinics to understand better the problems and constraints that the waste handling equipment poses.
- Johannesburg Metro will soon be issuing new By-laws for HCWM. These should be coordinated with the Province at the earliest convenience to avoid the creation of problems and allow for an integrated regional approach to HCRWM.

- There should be formal training of master trainers to carry out the in-service training
- The cardboard boxes used in SA have no handles like the ones used at Slagelse Hospital.
- The quality of the cardboard and especially the plastic bags used in Denmark is much higher and more rigid towards leakage and breakage than the ones used in Gauteng. It appears that the quality of the cardboard boxes has decreased during the past years in Gauteng.
- The Danish system of tying the thick high quality plastic bags with a wire using a drill is very efficient and safe.
- The wheelie bins used in Denmark for HCRW are easy to use, clean and move and appear to be working very well while minimising the manual handling. In Gauteng there is much manual handling and reloading of the cardboard boxes.
- In Denmark needles are separated from the syringes practically everywhere, whereas in SA they are disposed in sharps' containers as one unit. In the past there was also separation in SA. Going back to the separation practise would not be impossible, and would save money. However, it would not be desirable due to the high risk of hepatitis and HIV/AIDS in SA.
- The HCRWM should be based on a risk assessment as hepatitis and HIV/AIDS has a very high prevalence in SA.

2.2 Meeting 2, RAMBØLL, Copenhagen

- The use of visual and colour coding in DK is simple and clear
- Sharps are separated from syringes in Denmark.
- An effective colour coding system is critically essential
- Management of pharmaceutical/chemical separately is critically essential and good in DK
- The availability of storage space (intermediate waste storage rooms) in the wards and the procedures for containerising and collecting HCRW is working well. In SA it will not be easy to establish such intermediate waste storage rooms
- The level of personnel awareness appears very high and linked to a general high level of environmental awareness in the Danish population and something being practised in the homes also.
- The management of health care facilities appear to be very supportive compared to Gauteng
- It is clear that there must be one dedicated person at a hospital responsible for sound waste management, otherwise there will be no one following up and ensuring that good procedures are in place. In SA there is normally no such dedicated person.
- It is interesting that waste management companies in Denmark largely are municipally owned non-profit organisations.
- The availability of space for waste handling is fine at the visited hospitals in Denmark but a problem in Gauteng.
- There seems to be an integration of the environmental awareness, acceptance and behaviour in the Danish homes and at the workplace
- The containers used in Denmark are stronger, more rigid and more leak resistant than the containers used in Gauteng.
- The hospital staff in Denmark appear very committed and passionate about their work and even the waste handlers appear to take pride in their work

2.3 Meeting 3, Hotel Renaissance, Manchester

- There is a need for stringent emission and environmental performance standards. The SA standards are very lenient compared to Denmark and the UK and even the incinerator standards seen at the Cairo University Hospital. The group did not feel that the Incinerator visited in Gauteng is near acceptable, compared to the plants seen in Egypt, Denmark and UK.
- For non-burn treatment technologies segregation is more important to be effective and correct than for incineration. Incineration is able to treat basically all HCRW whereas non-burn technologies require that some waste, especially pathological waste and pharmaceutical waste is treated by incineration separately.
- The plastic bags used in the UK appear thin and flimsy compared to the ones seen in Denmark and Cairo.
- In Denmark there appears to be a too relaxed attitude to sorting and handling of HCRW as much waste is placed in the general waste stream. This is because also the general waste stream is handled with minimum manual handling and incinerated and there is no scavenging or informal reclamation in Denmark. This would not work in SA nor be acceptable.
- In Denmark there is a long established culture of segregating waste and recycling, whereas at the Cairo University Hospital they are only learning. In SA there is a need for re-planning of the entire HCRW management
- Non-burn technologies should be tested and investigated in SA but there is a concern regarding the reliability and monitoring of the microbial inactivation achieved and unease towards relying on self-monitoring. Hence, it is concerns of the pathogens are actually destroyed.
- The heat disinfection unit (HDU) is a relevant option for SA, but procedures must be brought in place to deal with the 5% of the waste stream that needs incineration.
- The Danish system for aiding drug addicts by supplying clean tools (needle, syringe, water, etc.) and providing safe needle containers in the drug addicts' environment is very interesting and should be investigated for application in SA.
- Working together is very important. There appears to be a better cooperation in DK and UK than in SA between relevant authorities. In SA there appears to be very little cooperation and this could be one of the reasons for limited progress in the management of HCRW in SA.
- The wheelie bins are working well and efficiently in both Cairo, Denmark and the UK.
- The quality of plastic bags used in DK is much better than the bags used in UK.
- In SA it should not be allowed to have incinerators without scrubbers for flue gas cleaning, but it should be implemented in a phased manner. There should be compliant plants before non-compliant plants can be closed.
- In SA there should be a move away from manual handling of individual HCRW containers. The systems seen abroad should form the basis for testing new systems at the Pilot Project Institutions in Gauteng to inform the coming provincial tenders.
- Scavenging of waste at landfills in SA is problematic. removal of reclaimers is impossible, and a court case against Pikitup will show if it is legal to remove scavengers by force.
- Training and awareness should include all staff at health care institutions, also cleaners and general workers. but also procurement staff.

- It is important to define competencies and responsibilities for HCRWM, but this is not done effectively in SA today. There are many actors, limited cooperation and lack of clarity as to who has the responsibility.
- In SA it will be difficult to establish the needed intermediate waste storage rooms in existing hospitals, and difficult to include the requirement in the design of new hospitals.
- The ongoing devolution/decentralisation in SA will hopefully address some of the problems of HCRWM today.

3. Minutes of Post Study Tour Meeting



Reference: SD 02-04-23 Minutes of the study tour

Telephone: (011) 355-1673

Enquiries: Stompie Darmas

MINUTES OF MEETING

Job 1459103

Subject Study Tour Report back meeting

Date and location 19 April 2002
Out of Africa Guesthouse, 25A Allen Road, Bedfordview

Meeting No. Study Tour 001

Taken by Stompie Darmas

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Copy to Further distribution
• Other interested parties. To be included in final Study Tour Report

Next meeting Presentations at PSC meeting on 17 May 2002, 14h00

Agenda

- **13h00 Light Lunch**
- **13h30 Introduction of Afternoon's programme**
- **13h45 Overall Evaluation of Study Tour (incl. visits in Gauteng)**
 - Relevance of visits
 - Quality of output from visits
 - Proposals for further follow-up
- **14h00 Experience from Egypt:**
 - Sustainability of the system at Cairo University Hospital
 - Socio-economic and institutional context (Cairo Uni. Hospital & Min. of Health)
 - Good and bad about the systems seen/discussed
 - Relevance, similarities and possible transfer of systems to Gauteng
- **14h20 Experience from Denmark:**
 - Sustainability of the systems in Denmark (R98, Amagerforbrænding/SWS/internal handling systems at hospitals)
 - Socio-economic and institutional context
 - Good and bad about the systems seen/discussed
 - Relevance, similarities and possible transfer of systems to Gauteng
- **14h40 Experience from Manchester/Eurocare**
 - Sustainability of the systems in Denmark (Eurocare and use of equipment in hospitals)
 - Socio-economic and institutional context
 - Good and bad about the systems seen/discussed
 - Relevance, similarities and possible transfer of systems to Gauteng
- **15h00 Afternoon Tea & Snack**
- **15h15 Recommendation and conclusions:**
 - Institutional and financial context
 - Use of equipment
 - *Sharps' containers, separation, bags, bins, etc.*
 - *Nurse trolleys and internal transportation*
 - *Storage facilities*
 - *External transport*
 - *Treatment*
 - Training and Awareness (formal, on-the-job, posters, acceptance, etc.)
 - Budget controls and distribution of supplies
 - Regulations, guidelines

Agenda

- Separation of needles from syringes
- Recycling of glass, paper, plastic, cardboard etc.
- Waste minimisation/reuse
- Role of public and private companies/institutions
- Group recommendation regarding:
 - *Relevance of wheelie bins*
 - *Relevance of nurse trolleys*
 - *Relevance of guidelines/Codes of Practice*
 - *Relevance of separation of needles from sharps*
 - *Other issues?*
- **15h50 Preparation of the Final Study Tour Report & Presentation to the PSC
17 May 14h00**
- **16h00 Closing of Programme**

Minutes

- **13h30 Introduction of Afternoon's programme**

The Chief Executive Advisor, welcomed everyone present and made a brief introduction of the meeting and a formal round of introductions were made for people who were not part of the study tour.

In general, it was agreed that the focus of the afternoon's discussion should be the key issues only and that much has been recorded in the individual notes prepared by the study tour participants.

- **13h45 Overall Evaluation of Study Tour (incl. visits in Gauteng)**

The Group in general agreed that the Study Tour Programme, including the visits to Gauteng health care facilities and treatment plants prior to departure, were very relevant and interesting.

The Group stated that they as individuals benefited very much from the intensive study tour and that much of what has been experienced can make a difference in their daily work

It was agreed that the Study Tour Group should remain as a forum that can assist and guide the Gauteng Project and, for example, be integrated into some of the existing and expected new Working Groups etc, for the project components.

Minutes

It was a general comment that much of what was seen abroad is highly relevant for the further planning of HCW Management systems in South Africa and Gauteng, but certain systems cannot be transferred on critically, as there are particular socio-economic and traditional conditions in South Africa.

- **14h00 Experience from Egypt:**

Comments by participants – Cairo University Hospital

- *This hospital started a new HCW management system in 1999 from nothing, but because management is assisting in co-ordinating and driving the project, their HCWM is much improved. There is a specific system in place and the hospital has defined responsibilities, whereas in South Africa responsibilities are not well defined.*
- *Although it is not clear how sustainable the CUH system is, the most important issue is that there are structures in place and there is compliance and evaluation by the HCWM unit*
- *Top management within the hospital is highly committed and dedicated to the health care risk waste management. Which is very important. Management support is often experienced as a problem in South Africa.*
- *There is good inter-relationship and Health Care worker support*

Incineration

- *The incinerator used at CUH is very good and of a much higher standard than any incinerators currently used in Gauteng. The incinerators are located within the hospital premises.
They are operated by the hospital personnel, no Dept. of Public Works*
- *There is a cold room for storage of infectious waste that is not immediately treated. No exposure to excessive heat and long hours wait for treatment of waste.*
- *There is an internal and central storage*

Nursing Trolleys

- *The nursing trolley concept is similar to the one used at the Wilgeheuwel private hospital.*
- *Medical waste is placed in red bags, which can reduce costs compared to the cardboard boxes being bought in South Africa*

Waste Transporting trolleys & Wheelie bins

- *The trolley system used in Egypt is good, but not suitable for South Africa, unless a locking system is used*

Domestic Waste

- *Next to every patient's bed, there is a rubbish bin for domestic waste, which assists in keeping the ward clean. This is seldom the case in provincial hospital and clinics in SA.*

Minutes

- *Good quality bags are used compared to the bags used in South Africa, which reduces leakages to a minimum. A wire is used to seal full bags and bags are marked with the number of the ward.*

Training and Awareness

- *There is a high illiteracy rate in South Africa similar to the one in Egypt.*
- *Suggestions were made that outreach to the illiterate should be done by picture information, The CUH posters based on pictures only was considered to be efficient and relevant for Gauteng also.*
- *A simple and efficient colour coding is used (red and black)*

Sharps Containers

- *Sharps containers do not fill-up quickly as syringes are thrown into a red bag (separation of needles from the syringes)*
- *The method used for separation of needle from syringe could help SA in reducing the number of containers used, but due to HIV/AIDS it would be a high risk because of needle stick injuries. In general the Group does not feel comfortable about introducing separation of sharps despite the possibility of savings. However, some in the group felt that it could be introduced if supported with significant training efforts.*

Problems identified by the study tour team

- *The hospital has 5 000 beds with only one chief nurse in charge of 3 000 nurses. It seems difficult to manage such a large hospital.*
- *In South Africa there are more general workers and less health care professionals.*

- **14h20 Experience from Denmark:**

- Comments by participants – (R98, Amagerforbrænding/ SWS

- *Municipalities are involved in the treatment of HCRW and has the responsibility of allocating suitable treatment facilities for any type of waste generated in their areas.*
- *The manual handling of HCRW is minimised by the use of wheelie bins and other trolleys*
- *Budget allocated, but not very clear how control is implemented with the supplier or user*
- *There appears to be no problems of supplies in terms of time, amounts or quality and there is an impressive level of commitment and awareness by all workers. There seems to be little need for control of assets*
- *DK systems are excellent and well documented, but people could easily abuse the system due to limited formal control*
- *Colour coding system is good*

It was recommended that Denmark was a benchmarking experience for

Minutes

the study tour participants.

There are certain ways like re-use and recycling systems that would not be easy to implement in South Africa

The Copenhagen system for assisting drug addict in having access to clean tools and provide safe disposal of used tools would be good for South Africa

The Danish system for handling of body parts would not be good for South Africa as there are traditional customs that would lead to theft or abuse of body parts.

The HCW information system in Denmark is very good.

Recycling

- *There is a recycling norm. Everything that can be recycled appears to be recycled. This would be very good for South Africa*
- *There is a long established culture of separating and recycling waste in Denmark, where waste is segregated in the homes also. Hence, it is not difficult to establish advanced sorting systems in the hospitals. SA should also have various containers for recycling.*
- *SA people should be trained on segregating waste from home. There is a need for establishing a waste sorting and recycling culture in SA also.*
- *There is a system in place for pharmaceutical waste*

Incineration - Amagerforbraending

- *The incinerator used at Copenhagen is very large 30 tons of waste incinerated per hour, where only a very small part of the waste is HCRW.*
- *Incinerator operated by municipalities – Very good, no comparison to South African system*
- *There is no manual handling of waste*
- *There is production of electricity and district heating from the waste*
- *HCRW is segregated by generators and air tight lids are used to avoid spillages and leaks*
- *Waste is recorded, categorised and weighted*

HCW Management at Slagelse Hospital

- *It is the responsibility of the Infection Control nurse to ensure that waste is separated properly*

Domestic HCW-Slagelse Hospital

- *Transparent plastic bags are used*
- *Thick plastic lined paper bags are used to avoid leakage in high risk areas. The quality of bags exceeds the bags used in SA by far.*

Training and Awareness

- *There is continuous education and training in segregation of waste, mostly on the job, but also in introduction of new staff*
- *Management is committed to training programmes*

Minutes

Sharps Containers

- *There is a programme for drug-users, which could be useful for South Africa*

Problems identified by the study tour team

- *External storage at Slagelse Hospital is poorly sited and poorly constructed, Wooden storeroom not supervised or locked.*
- *In South Africa –at SANUMED waste is stored for too long and they cannot handle the amount of waste received per day.*
- *There is no cold storage for keeping untreated waste*
- *If boxes are heavy, in SA they are usually wrapped with a sheet and pulled to the storage place, whereas in Denmark there is a flat trolley available to pull and push waste to the storage*
- *Boxes used at SA hospitals do not have handles, as they do in Denmark. The SA boxes can be modified by adding handles for carrying from ward to wheelie bins in order to avoid physical handling of waste.*

- **14h40 Experience from Manchester/Eurocare**

Comments by participants – Manchester-Eurocare

- *Waste for incineration is kept in tagged containers. Waste without tags goes into the heat dis-infection system (HDS)*
- *Use of wheelie bins makes it easy to transport waste from wards to storing and collection points. Wheelie bins must be lockable with a snap-lock according to UK regulations*
- *This company provides containers, transport and it also dispose waste*
- *It is interesting that when using alternative (non-burn technologies) there is still a need for incineration plants to treat approximately 5% of the waste. Hence, the HDS cannot handle all HCRW generated and for example pathological waste and pharmaceutical waste must be treated by incineration in the UK.*

- **15h15 Recommendation and conclusions:**

- *Special training modules needed for different technologies*
- *Provide an alternative treatment plant if possible to avoid problems experienced by (remote) clinics*
- *Identify own problems and return for retraining*
- *Re-use of wheelie bins requires Bin washing system, which is an added cost*
- *Cold storage for HCRW would only be effective if segregation is properly done to reduce the quantities in SA*
- *Is it effective in the guidelines to have a cold store at our local incinerators?*
- *Are the self-monitoring sample findings on the spores etc. from non-burn treatment plants trustworthy– How can this be verified?*

Minutes

- *Posters using pictures similar to the ones at the CUH should be considered for SA*
- *If advanced incinerators complying to EU standards with flue gas cleaning can work in Egypt, why should it not be possible to do this in SA also?*
- *It is not recommended, in general, to move towards separation of sharps from syringes in SA due to high prevalence of HIV and hepatitis etc.*
- *Internal handling of waste should be made less manual, for example, by introducing trolleys, wheelie bins or similar*
- *It is recommended that the pilot projects test the possible use of new waste handling equipment, such as wheelie bins and trolleys where appropriate*
- *Establishment of waste management committees could be a way to ensure that changes can be made with the management's support*
- *If there is no central locking system at the storing room, locks should be put on the wheelie bins or a fenced lockable area could be erected at the pilot as a separate storage. (Management to be consulted)*
- *Induction training manuals to be introduced for use in the Health Care facilities or introduced as an in-service training. The roles and responsibilities should be clearly outlined*
- *Tagging/ labelling waste for verification*
- *Pilots should be innovative to assist in making recommendations*
- *There is a need for improvement on the nurse trolley in SA. The trolley will assist the nurses in doing a single round – the users should test The Cairo hospital trolleys for recommendation. – Adjustments or alterations could be made to the current trolley.*
- *The Trolley used at Wilgeheuwel hospital can be recommended for use in ICU wards.*
- *Outsourcing should be given to people who have awareness.*
- *South Africans should be encouraged to divide facilities into business units*

4. Notes Taken By Study Tour Participants

4.1 Albert Marumo

ALBERT MARUMO
Gauteng Dept. of Health

Study Tour Notes
05/04/02 –15/04/02

Sustainable Health Care Waste Management in Gauteng “Study Tour observations and recommendations”

Date : 05 April 2002

Venue : Itireleng Clinic, Wilgeheuwel Hospital, Sanumed, Leratong Hospital

Scale : Relevance of visit : Was the visit interesting
5 4

Itireleng Clinic - Relevance of visit: Was the visit interesting
5 4

General Observations and notes

- Consists of local authority and provincial health services
- Functional integration not existing
- Two service providers used e.g Buhle and Pik-it-up

Wilgeheuwel hospital - Relevance of visit : Was the visit interesting
5 5

- Several waste collected by Megaphase recycling
- Medical waste collected by Sanumed
- Usage of clear plastic bags for health care waste

Sanumed - Relevance of visit : Was the visit interesting
5 3

- They serve 8 health care facilities
- They are overworked and overloaded
- Incomplete incineration
- Health care waste stored for too long under hot conditions
- Wrong handling of health care waste by SANUMED drivers

Observations regarding relevance to Gauteng conditions

Itireleng and Leratong visits are relevant in the sense that conditions found/existing in the above-mentioned facilities do reflect conditions existing in all public health facilities within the Gauteng Province.

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Date : 07 April 2002

Venue : Cairo University Hospital

Scale : Relevance of visit : Was the visit interesting  
5 5

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### General Observations and notes

- Hospital has 5 000 beds
- Nurses commented and drive the project Health care waste
- Top management assists in driving the process
- The existence of modern incineration which is functioning well
- Incineration to be converted into generating revenue

- The incinerator is operated and serviced by hospital personnel
- Cold storage provided for in case the incinerator is not working
- Monopoly for needle prick injury

#### **PROBLEMS**

- Staff changing minds with regard to health care waste
- Financial sustainability of the project implementation
- Training large groups of nurses at a time (3 000)

#### **Observations regarding relevance to Gauteng conditions**

- They have internal storage & control storage (blockable)
- They have colour coding
- The way health care waste is sealed is interesting
- Red plastic waste is used for health care waste and black for domestic waste
- Gauteng health facilities have no commitment as compared to what we observed in Cairo
- Efficient on site incinerator – in Gauteng we do not have this
- They have business plan and action plan on health care waste
- Incineration capacity of Cairo hospital is far bigger than Sanumed incinerator in terms of tons of waste incinerated per day

#### **Suggested further discussions/investigations**

- One chief nurse in charge of 3 000 nurses. This is rather too much for her.
- Air monitoring should be done on regular basis.

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Date : 09 April 2002

Venue : Amagerforbraending; R98; Slagelse Hospital; Kavo Municipal HCRW

Scale : Relevance of visit : Was the visit interesting

5

5

Amagerforbraending -

General Observations and notes

- Green electricity produced from the plant
- 30 tons of waste is incinerated per day
- It serves half of Copenhagen
- 400 vehicles per day brings waste at this plant
- ± 150 boxes of health care waste are incinerated per day

R98

- R98 has a needle programme for drug users. They provide clean sterile needles and boxes
- R 98 has proper and efficient transport system
- Health care waste is registered and record keeping of health care risk waste is good
- They have a call-in service for found needles and syringes

Slagelse Hospital

- The sorting system is good
- Colour coding is good

- Central storage is available but poorly sited not ideal for health care waste
- It is not under lock and key
- Waste management is part of training for nurses
- Diabetic patients under go training on how to dispose of needles and syringes in a proper manner
- All waste containers are on mobile stands

Observations regarding relevance to Gauteng conditions

- In South Africa we need to look into having a needle programme for drug users
- Record keeping of health care waste should be started

Suggested further discussions/investigations

- Disposing of non infectious waste together with health care waste continuously (mixing of HCW with general waste)

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Date : 10 April 2002

Venue : Rigs Hospitalet; Ramboll, SWS

|                                   |   |                                  |
|-----------------------------------|---|----------------------------------|
| Scale : <u>Relevance of visit</u> | : | <u>Was the visit interesting</u> |
| 5                                 |   | 5                                |

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**Rigshospitalet****General Observations and notes**

- The sorting system is perfect
- They are good at improvising to save money (re-using containers)
- Colour coding is good and is in every department
- They have developed a guide hints for management of health care waste within the hospital
- Sharp containers are transparent
- Internal storage is clean and has conditioning system
- Collection is efficient
- There are 300-400 pricks per year
- They do have clinical storage and recycling station

**Ramboll**

- Meeting held observations of the day discussed

**SWS**

- The incinerator was not operational
- Lot of waste piled and already starting to decompose e.g. health care waste
- General hygiene not satisfactory

**Observations regarding relevance to Gauteng conditions**

- Containers which are re-used should be properly labelled and used for syringes & needles (Sharp containers)
- Sharps containers should be transparent

- Proper records on the number of needle pricks should be kept
- The recycling procedures should be encouraged within our health facilities.

**Suggested further discussions/investigations**

- Harmful chemicals stored next to card boxes
- No fire hydrant provided in the chemical store
- Mixing of chemicals not acceptable within the hospital premises.
- Air monitoring should be done on regular basis.

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Date : 11 April 2002

Venue : Danish Health Agency

Scale : Relevance of visit : Was the visit interesting
 5 4

General Observations and notes

The prime function of the Danish Health Agency is to ensure that systems within the hospitals run smoothly

- The Danish Health Agency also deals with drug abuse, alcohol abuse, tobacco abuse, fat and emotions
- We were also informed that there are 30 registered infection control nurses
- Each municipality has a home based nurse
- The Environmental protection agency is responsible for health care waste including all other wastes

Observations regarding relevance to Gauteng conditions

- The relevance of what we were told is that all stakeholders dealing with health care waste work together smoothly
- All (Waste Management) kinds of wastes should be under the control of DACEL
- Local Authorities should be given sufficient/all powers to deal with waste.

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Date : 12 April 2002

Venue : Wrexman Eurocare

Scale : Relevance of visit : Was the visit interesting  
                                                           5                                                          5

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**General Observations and notes**

- Non-burn technologies is being used
- Waste (health care waste) is disinfected before being transported to the landfill
- Wheelie bins are used – these bins are provided by Eurocare to hospitals
- Spore tests conducted on regular basis; so far spore tests conducted
- 95% of HCW are shredded and disinfected
- 5% incinerated
- Segregation is done at the hospital by hospital staff

- Were informed that segregation is not always proper

**Observations regarding relevance to Gauteng conditions**

- Non-burn technology has its advantages and limitations e.g. it does not function properly if limbs are accidentally mixed with waste intended for disinfect ion
- This technology may be relevant in Gauteng provided strict control measures are followed to expose that all waste intended for dis-infection is efficiently disinfected

**Suggested further discussions/investigations**

The efficiency and effectiveness of killing spores to be investigated.

~~~~~00000~~~~~

Date : 15 April 2002

Venue : Ministry of Health – Egypt

| | | |
|-----------------------------------|---|----------------------------------|
| Scale : <u>Relevance of visit</u> | : | <u>Was the visit interesting</u> |
| 5 | | 5 |

General Observations and notes

The Director of Environmental Health in the Ministry of Health informed us that :-

- Every district at least one incinerator which serves surrounding clinics and hospitals plus GP’s
- Landfills are owned/controlled by private companies
- General waste is dumped in a controlled site
- Comprehensive regulations/Act on hazardous health care waste is available
- All health care facilities dealing with health care waste are licensed. This licence lasts for a period of five years
- A pilot project at the university hospital proved to be a success

Observations regarding relevance to Gauteng conditions

The structure of health in Egypt is relevant to the Gauteng situation in as far as health service delivery is concerned. However I do not think provision incinerators reach district is a viable proposition. This will increase the level of pollution. AT the moment incinerators at our health facilities has been stopped

Suggested further discussions/investigations

To investigate as to whether EHOS, safety reps and infection work together there is role clarification of the above categories.

4.2 Beatrice Mahonga and Lorna Bassed

BEATRICE MAHONGA &
LORNA BASSED

Gauteng Dept. of Health

Study Tour Notes
05/04/02 –15/04/02

**Name : Beatrice Mahonga
& Lorna Based**

**Sustainable Health Care Waste Management in Gauteng
“Study Tour observations and recommendations”**

Date : 05 April 2002

Venue : Itireleng Clinic, Wilgeheuwel Hospital, Sanumed, Leratong Hospital

Scale : Relevance of visit : Was the visit interesting
5 4

Itireleng Clinic - Relevance of visit : Was the visit interesting
5 4

General Observations and notes

- *See attached notes*

Wilgeheuwel hospital - Relevance of visit : Was the visit interesting
5 5

- *See attached notes*

Sanumed - Relevance of visit : Was the visit interesting
5 3

- Sanumed appears to be inappropriate for Gauteng structures. It is much too small for the volume of waste and uses inappropriate technology (*See attached notes*)

Observations regarding relevance to Gauteng conditions

Sanumed must be investigated, thus it comply with legislative framework. Does the SA legislature framework comply with international standards?

This technology however, needs support from incineration technology for medical/human tissue waste.

Suggested further discussions/investigations

This technology needs to be investigated further before it can be used in Gauteng. e.g. is residue safe to fill nine dumps? Is it sustainable, affordable. Is the 5% waste that needs incineration to be incinerated on site, in hospitals or at regionalised plants or what.

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### **ITIRELENG-DOBSON CLINIC**

|  | <b>TYPES</b>                                                                                 | <b>SEGREGATION AT POINT OF GENERATION</b>                                                                                                                                                                                                                                                | <b>PROBLEMS CHALLENGES</b>                                                                                                                                                                                                                                                                                                     | <b>OTHER NOTES</b> | <b>SUGGESTED IMPROVEMENTS</b>                                                                                                                                                                                                                                                                      |
|--|----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | MEDICAL Sharps (i.e. needles & Syringes)                                                     | <ul style="list-style-type: none"> <li>Segregated into Sharps Container</li> </ul>                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>Sometimes put into red bags (see below) problems sometimes compliant</li> </ul>                                                                                                                                                                                                         |                    | <ul style="list-style-type: none"> <li>Major training and awareness creation to comply</li> <li>Clear policy guidelines posted at strategic points</li> </ul>                                                                                                                                      |
|  | BIOLOGICAL <ul style="list-style-type: none"> <li>Amputated limbs &amp; placentas</li> </ul> | <ul style="list-style-type: none"> <li>Segregated into a dedicated bucket</li> </ul>                                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>Size of bucket queried in relation to the number of deliveries</li> <li>Storage in –appropriate</li> <li>Cool room not available</li> </ul>                                                                                                                                             |                    |                                                                                                                                                                                                                                                                                                    |
|  | OTHER <ul style="list-style-type: none"> <li>Dressings</li> </ul>                            | <ul style="list-style-type: none"> <li>Segregated into red bags later into boxes</li> </ul>                                                                                                                                                                                              | <ul style="list-style-type: none"> <li>Again non-compliance</li> <li>Sometimes two service providers for province &amp; local authority with different methods and containers</li> <li>Management support lacking to some extend</li> <li>Boxes have no handles</li> </ul>                                                     |                    |                                                                                                                                                                                                                                                                                                    |
|  | GENERAL WASTE                                                                                | <ul style="list-style-type: none"> <li>Segregation into transparent plastic bags, these later put into black garbage</li> <li>All waste collected from temporary storage areas by 2 providers at different times i.e. PIK-IT-UP and BUHLE</li> <li>and transported to SANUMED</li> </ul> | <ul style="list-style-type: none"> <li>Sometimes non compliance</li> <li>Sharps sometimes in these bags</li> <li>No culture of separating bottles, tins, papers etc. for recycling in this province, thus this makes waste bulky &amp; expensive, even though some attempt is made to involve the community in this</li> </ul> |                    | <ul style="list-style-type: none"> <li>Awareness creation and training of staff &amp; service users necessary</li> <li>Clear systems &amp; strategies for recycling to be implemented</li> <li>Clear policy guidelines to be developed and posted at strategic points e.g. posters etc.</li> </ul> |

### **LERATONG HOSPITAL**

|    | <b>TYPES</b>                                                                                   | <b>SEGREGATION AT POINT OF GENERATION</b>                                                                  | <b>PROBLEMS CHALLENGES</b>                                                                                  | <b>OTHER NOTES</b>                                                     | <b>SUGGESTED IMPROVEMENTS</b>                                                                                                                       |
|----|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | MEDICAL <ul style="list-style-type: none"> <li>Sharps (i.e. needles &amp; Syringes)</li> </ul> | <ul style="list-style-type: none"> <li>Sharps needs and syringes in dedicated sharps containers</li> </ul> | <ul style="list-style-type: none"> <li>Degree of non-compliance</li> <li>Storage not appropriate</li> </ul> | Generally the hospital have made a good effort to implement the system | <ul style="list-style-type: none"> <li>Norms &amp; standards to be developed</li> <li>Policy guidelines to be posted at strategic points</li> </ul> |

|    |                                                                                                       |                                                                |                                                                                                         |  |                                                                                                                                                                                                            |
|----|-------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                                                                                                       |                                                                |                                                                                                         |  | <ul style="list-style-type: none"> <li>• Training &amp; awareness creation necessary</li> <li>• Co-ordination of activities with HO&amp;S Environmental Health training facilities planner etc.</li> </ul> |
| 2. | <b>BIOLOGICAL</b> <ul style="list-style-type: none"> <li>• Amputated limbs &amp; placentas</li> </ul> | Biological waste in dedicated buckets                          | <ul style="list-style-type: none"> <li>• Size of bucket for biological waste queried</li> </ul>         |  |                                                                                                                                                                                                            |
| 3. | <b>OTHER</b> <ul style="list-style-type: none"> <li>• Dressings</li> </ul>                            | Waste collected by Buhle (Service provider) on a regular basis | <ul style="list-style-type: none"> <li>• Black bags sometimes interfere with quality control</li> </ul> |  |                                                                                                                                                                                                            |
| 4  | <b>GENERAL WASTE</b>                                                                                  | Collected in transparent bags later put in black bags          |                                                                                                         |  |                                                                                                                                                                                                            |

### **WILGEHEUWIL PRIVATE HOSPITAL**

| <b>TYPES</b>                                                                                            | <b>SEGREGATION AT POINT OF GENERATION</b>                                                                                          | <b>PROBLEMS CHALLENGES</b>                                                                                                             | <b>OTHER NOTES</b>                                                                                                                                             | <b>SUGGESTED IMPROVEMENTS</b>                                                                                                                                    |
|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>MEDICAL</b> <ul style="list-style-type: none"> <li>• Sharps (i.e. needles &amp; Syringes)</li> </ul> | <ul style="list-style-type: none"> <li>• These are collected after sorting by SANUMED Segregated into sharps containers</li> </ul> | <ul style="list-style-type: none"> <li>• Multiple service providers but the institution appears comfortable with the set-up</li> </ul> | Generally the hospital is clean and appears to comply with principles of infection control and posters & clear policy guidelines displayed at strategic points | Improving compliance through training and awareness creation Temporary storage not appropriate this must be re-looked at in terms of dedicated room to be found. |
| <b>BIOLOGICAL</b> <ul style="list-style-type: none"> <li>• Amputated limbs &amp; placentas</li> </ul>   | Segregated into 10/l plastic buckets                                                                                               | Some degree of non-compliance noted e.g. needles in domestic waste                                                                     | The hospital developed product specifications (containers) for the suppliers and very stringent in this                                                        |                                                                                                                                                                  |
| Larger sharps e.g. trocar                                                                               | Separate larger sharps containers for trocar                                                                                       | Temporary storage not appropriate. This is outside, no protection from element of pests & rain                                         |                                                                                                                                                                |                                                                                                                                                                  |
| 3. <b>OTHER</b> <ul style="list-style-type: none"> <li>• Dressings</li> </ul>                           | She – bins serviced weekly by Steiner                                                                                              |                                                                                                                                        |                                                                                                                                                                |                                                                                                                                                                  |
| 4. <b>GENERAL WASTE</b>                                                                                 |                                                                                                                                    |                                                                                                                                        |                                                                                                                                                                |                                                                                                                                                                  |
| 5. <b>RECYCLING</b> <ul style="list-style-type: none"> <li>• Paper</li> </ul>                           |                                                                                                                                    |                                                                                                                                        |                                                                                                                                                                |                                                                                                                                                                  |

|  |                                                                                              |                                                 |  |  |  |
|--|----------------------------------------------------------------------------------------------|-------------------------------------------------|--|--|--|
|  | <ul style="list-style-type: none"> <li>• Glass</li> <li>• Tins</li> <li>• Plastic</li> </ul> | Sorted into different black bins for collection |  |  |  |
|--|----------------------------------------------------------------------------------------------|-------------------------------------------------|--|--|--|

**SANUMED INCINERATION PLANT**

| TYPES                     | SEGREGATION AT POINT OF GENERATION                                                          | PROBLEMS CHALLENGES                                                                                                                                                                                                                                                                                                  | OTHER NOTES                                                                                                                                                                                                                                                                                                                                                                                                                                                  | SUGGESTED IMPROVEMENTS                                                                                                                                                                                                                                   |
|---------------------------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Handling of medical waste | Provides a service to various organisations including waste collection companies e.g. Buhle | <ul style="list-style-type: none"> <li>• Facility very small for the volume of waste</li> <li>• Inappropriate storage</li> <li>• Outdated incinerators</li> <li>• Waste not completely burned</li> <li>• (How safe is this?)</li> <li>• Terrible smell &amp; risk to workers due to inappropriate storage</li> </ul> | <ul style="list-style-type: none"> <li>• The site is questionable, near residential areas &amp; traffic routes</li> <li>• Hours of operation to be reviewed.</li> <li>• Maintenance of incinerators very questionable</li> <li>• Effectiveness of the technology appears to be non-compliant with legislative framework</li> <li>• “Does the SA Regulatory framework comply with international standards?”</li> <li>• Unsatisfactory housekeeping</li> </ul> | <ul style="list-style-type: none"> <li>• To handle waste in proportion to the organization’s capacity</li> <li>• Improve technology</li> <li>• To have new stringent policy on incineration in Gauteng to comply with international standards</li> </ul> |

Date : 07 April 2002  
Venue : Cairo University Hospital  
Scale : Relevance of visit: Was the visit interesting  
5 5

**General Observations and notes**

- See attached notes

**Observations regarding relevance to Gauteng conditions**

With the larger hospitals like Baragwanath, JHB etc, it might be appropriate to have on site incineration. The smaller facilities could form a consortium and outsource to provider.

**Suggested further discussions/investigations**

The feasibility of installing modern, high technology incinerators on site for the larger hospitals should be investigated. These should comply with international specifications.

Date : 15 April 2002  
Venue : Ministry of Health – Egypt  
Scale : Relevance of visit : Was the visit interesting  
5 5

**General Observations and notes**

*See attached notes.*

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Date : 09 April 2002
Venue : Amagerforbraending; R98; Slagelse Hospital; Kavo Municipal HCRW
Scale : Relevance of visit: Was the visit interesting
5 5

Amagerforbraending -

General Observations and notes

See attached notes

DENMARK - AMARGRFORBRANDING : DATE – 9-04-02

| TYPES OF WASTE | SEGREGATION AT POINT OF GENERATION | OBSERVATIONS | OTHER NOTES | SUGGESTED IMPROVEMENTS |
|---|--|--|--|---|
| <p>Mainly general waste and to a lesser extent also medical waste</p> | <ul style="list-style-type: none"> • Waste collected by another company (R98) • Waste not stored for longer than four (4) days • Medical waste is not sorted but mixed thoroughly | <ul style="list-style-type: none"> • Dust at delivery point • Water use to reduce the amount of dust • Plant produces 80 000 tons of ash per year • Dust has to be tested for pollutants before it can be finally disposed of • The klinker is piled up in “mountains” at the site. Green-peace activists would like to proof that klinker is rendered harmless before it can be disposed of at the land refill sites | <p>The plant meets EU requirements</p> <ul style="list-style-type: none"> • Extremely efficient and effective • The waste is burnt to the 98% efficacy mark • Plant generates heat and electricity from the waste incineration process • This recovers ± 50% of the money required to run the plant. | <p>More efficient ways of dealing with dust must be found</p> <p>Protective clothing/ policy must be adhered to by all e.g. wearing of masks etc.</p> |
| <ul style="list-style-type: none"> • A high technology incineration plant owned by two municipalities. • A non-profit organisation • Highly automated & computerised | <ul style="list-style-type: none"> • Medical waste is separated from general waste and it is incinerated separately at very high temperatures to comply with EU standards | <p>The plant must find ways of dealing with the klinker i.e. to scientifically determine the safety of the klinker.</p> | <ul style="list-style-type: none"> • The plant is extremely well run and there is evidence of well co-ordinate effort; e.g. working in collaboration with all the relevant stake holders e.g. Government, Environmental Agencies, local municipality etc to achieve an efficient waste disposal management system. | |

R98

- A waste collection company - collection of HCRW from hospitals. It is a non-profit organisation
- Supply drug addicts (i.e. diabetics) with clear needles & syringes and collect used sharps and needles from drug addicts.
- These are placed and collected at strategic points throughout the area. This is effective as evidenced by that in 2000, 3 tons of boxes were collected from drug users.
- Collects waste from several organisations and transports them to Amagerforbraendig plant and other treatment plants. Diabetics return their used sharps back to the hospital pharmacies.
- Company concentrates mainly on safe collection, transport and delivery of HCW, from facilities to waste treatment plant.

Slagelse Hospital

- Recycling forms an important part of HCRWM program
- Culture of HCWM prevalent in both hospitals and well developed & functional
- To management support
- Dedicated staff
- EU guidelines in place
- Clear policy guidelines in place
- Continuous education & training
- Quality of containers within legislative guidelines
- Norm & standards determined by legislation & copies available for all

Observations regarding relevance to Gauteng conditions

The above are desperately lacking and needed in Gauteng as a matter of urgency to have a sustainable HCWM, especially the need to co-ordinate the activities of the relevant departments dealing with HCWM

Top management to release resources to support HCWM policies, strategies and related issues. (Top management i.e. MEC, HOD relevant directorates)

Clear specs of requirements for HCWM required.

Suggested further discussions/investigations

In addition to the above there is a need for staff education and training in order to achieve a culture of proper waste management.

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### **CAIRO – UNIVERSITY HOSPITAL – DATE OF VISIT 07-04-02**

| <b>TYPES OF WASTE</b>                                                                               | <b>SEGREGATION AT GENERATION POINT</b>      | <b>PROBLEMS CHALLENGES</b>                                                                                                                                                                     | <b>OTHER NOTES</b>                                                                                                                                                                                                         | <b>SUGGESTED IMPROVEMENTS</b>                                                                     |
|-----------------------------------------------------------------------------------------------------|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Sharps (i.e. needles &amp; Syringes)</li> </ul>              | Use sharps containers                       | <ul style="list-style-type: none"> <li>Some degree of non-compliance</li> </ul>                                                                                                                | <ul style="list-style-type: none"> <li>Top management support the project budget</li> <li>The project is driven by a Doctor who is Head of Department</li> </ul>                                                           | <ul style="list-style-type: none"> <li>Improve the general cleanliness of the hospital</li> </ul> |
| <b>BIOLOGICAL</b> <ul style="list-style-type: none"> <li>Amputated limbs &amp; placentas</li> </ul> | Dedicated colour coded container            | <ul style="list-style-type: none"> <li>Large hospital with 5 000 beds</li> <li>The sheer volume and changing the entrenched mindset of 30 000 workers presented a major challenge</li> </ul>   | <ul style="list-style-type: none"> <li>A high technology modern incinerator in place</li> <li>This is on-site and able to handle large volumes of waste effectively and in keeping with international standards</li> </ul> |                                                                                                   |
| <b>OTHER</b> <ul style="list-style-type: none"> <li>Dressings</li> </ul>                            | Dedicated colour coded bags, then collected | <ul style="list-style-type: none"> <li>Creation of temporary storage points was a challenge <math>\pm</math> 400 storage sites (temporary) were created with top management support</li> </ul> | <ul style="list-style-type: none"> <li>This also provides a service to surrounding hospitals – revenue generation</li> <li>System seems to be working</li> <li>Trainers were trained to train others</li> </ul>            | Incineration a cost-centre ( <i>A business unit on its own</i> )                                  |
| <b>GENERAL WASTE</b>                                                                                | Black bags                                  |                                                                                                                                                                                                |                                                                                                                                                                                                                            |                                                                                                   |

Date : 10 April 2002

Venue : Rigs Hospitalet; Slagelse Regional Hospital

Scale : Relevance of visit : Was the visit interesting  
5 5

### **Rigshospitalet**

#### **General Observations and notes**

See attached notes

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RIGSHOSPITALET (ROYAL DANISH UNVERSITY HOSPITAL : DATE – 10-04-02

| TYPES OF WASTE | SEGREGATION AT GENERATION POINT | OBSERVATIONS | OTHER NOTES | SUGGESTED IMPROVEMENTS |
|---|--|---|---|------------------------|
| Waste categorised into :

4. Medical/clinical Sharps | Designated sharps containers – transparent to be able to see contents filling & not to overfill
Interferes with closing may prick when forcing to close | Very efficient & effective system. The recycling reduces the cost of hospital waste management tremendously | The system is functioning well
300-400 needle pricks per year reduced because all staff report such accidents | |
| 2. Human Tissue and anatomical waste | Designated container bag | A dedicated team oversees the waste management
Clear guidelines/procedure manual available | | |
| 3. Domestic Waste

3.1 Glass
3.2 Paper/Cartoon
3.3 Plastic
3.4 General Waste
<i>The culture of recycling reduces the waste tremendously</i> | Black bag – first in transparent bag collected 3x a day
Designated container
Designated container
Designated container

Black bag | <ul style="list-style-type: none"> • Clear posters placed at strategic points to assist and remind employees • Internal transportation from wards to temporary storage on wheelie bins • Boxes have no handles | The culture of recycling reduces the cost of waste management & South Africans may draw lessons from this | |
| 4. Chemical/Medicine | Used medicine glassed
Empty 1 ½ full glasses
Container sent to pharmacy
Then to a recycling company from pharmacy
Medical waste does not go to clinical waste
Chemical waste (Biological) use of specific colour coded bottle | <ul style="list-style-type: none"> • Very well developed and functioning system <p>Hospital has 149 safety officers, 22 safety management officers for 7 000 staff members</p> | Additional precautionary measure are taken for bloody waste e.g. a large thick lined paper bag is used for medical waste that has a potential for leakage | |

SLAGELSE REGIONAL HOSPITAL – Date: 10-04-02

| TYPES OF WASTE | SEGREGATION AT GENERATION POINT | OBSERVATIONS | OTHER COMMENTS | SUGGESTED IMPROVEMENTS |
|--|---|---|--|------------------------|
| <p>This is a 450 bedded bounty hospital – Waste segregated into</p> <p>6. Medical/High risk
Medical waste
Sharps</p> | <p>Designated sharps containers</p> <p>Designated containers</p> | <p>† Well functioning system</p> <p>† Sharps not acceptable</p> | <p><i>See attached combined notes of Rigshospital & Slagelse</i></p> | |
| <p>5. Human Tissue and anatomical waste</p> <p>6. Chemical</p> | <p>Designated container bag</p> | <p>† Temporary storage of human tissue</p> | | |
| <p>7. Domestic Waste</p> <p>3.1 Glass</p> <p>3.2 Paper/Cartoon</p> <p>3.3 Plastic</p> <p>3.4 General Waste</p> <p><i>The culture of recycling reduces the waste tremendously</i></p> | <p>Designated container</p> <p>Designated container</p> <p>Designated container</p> <p>Designated container</p> | <p>† A culture of recycling reduces the cost of hospital waste management</p> | | |

Date : 11 April 2002
Venue : Danish Health Agency
Scale : Relevance of visit : Was the visit interesting
5 4

General Observations and notes

Have learnt a lot about how the Danish Health system operates. The Danish environment protection agency has the overall responsibility of HCWM. The Government sets the broad framework on HCWM, but the countries and local councils have the autonomy. The local councils are responsible for the implementation of policy and countries are responsible for monitoring to ensure the government policies by laws are complied with.

Observations regarding relevance to Gauteng conditions

The systems are not comparable, except that local government may be given the responsibility of ensuring that the regulatory framework is complied with. Provinces may be responsible for monitoring to ensure that norms and standards are met. Not sure if local councils have the capacity to deal with this function.

Who is responsible for what in Gauteng.

Suggested investigations/discussions

To investigate the relationship between the various departments – Environmental affairs, water, health, conservation & land. The note of province and local governments.

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Date : 12 April 2002  
Venue : Wrexham Eurocare  
Scale : Relevance of visit : Was the visit interesting  
5 5

**General Observations and notes**

This is a private company. It utilises a non-burn (HDS) system and an incineration technology. The HDS is cost efficient. It is much cheaper and kinder to the environment than the incineration method. A problem with this system requires further management (land filling) of the residue. Completely disinfects waste considered to be the best Environmental options available.

**Observations regarding relevance to Gauteng conditions**

This is relevant to the Gauteng situation. The residue from the HDS may be used to fill the mines. Company provides continuous education and training to hospital staff on segregation of waste

### **4.3 Benny Maphaka**

BENNY MAPHAKA  
Gauteng Dept. of Health

## **Study Tour Notes 05/04/02 –15/04/02**

**Sustainable Health Care Waste Management in Gauteng  
“Study Tour observations and recommendations”**

Date : 05 April 2002

Venue : Itireleng Clinic, Wilgeheuwel Hospital, Sanumed, Leratong Hospital

Scale : Relevance of visit : Was the visit interesting  
5 4

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**Itireleng Clinic** - Relevance of visit : Was the visit interesting  
5 4

**General Observations and notes**

- No dedicated storage area.
- Two service providers used e.g Buhle and Pik-it-up

Wilgeheuwel hospital - Relevance of visit : Was the visit interesting  
5 5

- Improved health care waste system in terms of equipment and transportation and colour coded bins/plastic
- Storage for both medical and general waste is inadequate

Sanumed - Relevance of visit: Was the visit interesting  
5 3

- Waste stored under room of hot temperature conditions for long periods
- Staff not properly trained
- Staff works shifts of 12 hours
- Ash not completely incinerated
- Smell is a problem
- Non-compliance with current legislation

**Leratong Hospital**

Health care waste service provided by Buhle waste

A fair system is in place regarding handling of waste, storage and disposal and transportation

**Observations regarding relevance to Gauteng conditions**

Will compare with other sites abroad

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Date : 07 April 2002

Venue : Cairo University Hospital

Scale : Relevance of visit : Was the visit interesting
5 5

General Observations and notes

- Hospital comprises of 5 000 beds
- Management indicated challenge as continuous training for staff
- Top management driving health care waste project
- Incineration to be run as a liability in generating revenue
- Management commitment is very high
- Operation of incinerator by hospital staff and engineers
- Cold storage provided for in case the incinerator is not working
- Ventilated storage area

Observations regarding relevance to Gauteng conditions

- Dedicated internal storage areas (2 x 3) attached to wards and central storage area
- Colour coding at strategic points
- Efficient on site incinerator
- Action plan – based on business plan for health care waste
- Tonnage capacity for Cairo ± 20 and ± 2 tons per day

Suggested further discussions/investigations

- Investigate for HIV as well
- Continuous monitoring of emissions from incinerator and record keeping
- Staff training
- Transformed system in place with regard to the management, handling, storage & disposal of “risk waste management”

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Date : 09 April 2002

Venue : Amagerforbraending; R98; Slagelse Hospital; Kavo Municipal HCRW

Scale : Relevance of visit : Was the visit interesting

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## Amagerforbraending -

### General Observations and notes

- Capacity – 30 tons per hour (general waste)
- Cost general waste is risk waste 500 – 1 500
- 80 000 tons of chinkas – disposal in process, discussions around

### R98

- Utility for Copenhagen
- Innovative projects in place (e.g.) needle program
- Record keeping in place

### Slagelse Hospital

- Central storage for risk waste not ideal
- Colour coding is good

**Observations regarding relevance to Gauteng conditions**

- Community based programs at R98 in place –Sanumed nil
- Record keeping excellent
- Management owned incinerators

**Suggested further discussions/investigations**

- Consciously disposing infectious waste with non-infectious waste simply because it has to be incinerated  
All staff irrespective of level, knows exactly what they are doing, why are they there etc.

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Date : 10 April 2002

Venue : Rigs Hospitalet; Ramboll, SWS

Scale : Relevance of visit : Was the visit interesting
5 5

Rigshospitalet

General Observations and notes

- Colour coding & manual for risk management
- Range of containers relevant to needs, small sharp container on trolley unique to hospital
- Storage are spacious and well ventilated
- Efficient collection and transportation
- Well managed recycling station
- They do have clinical storage and recycling station

Ramboll

- Documentation on risk waste stats for the Royal Danish Hospital and recap on general observation of tour.

SWS

- Although this plant was shut down one can assume the standards are not so high

Observations regarding relevance to Gauteng conditions

- Recycling program a must
- Safety (eg) mixing of chemicals at hospital
- Special waste being incinerated at this plant (eg chemicals)

Suggested further discussions/investigations

- SMS to jerk up plant to EU standards or to compare favourably with other local set-ups
- The Copenhagen hospital co-operation act (HS)

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Date : 11 April 2002  
Venue : Danish Health Agency  
Scale : Relevance of visit : Was the visit interesting  
5 5

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#### **General Observations and notes**

- Clearing roles between departments/agencies (e.g.) Health and Environment
- Documents produced in collaboration with other stakeholders – due to specific specialities in other departments/agencies
- Clear-cut functions, between agency, countries & local authorities.

#### **Observations regarding relevance to Gauteng conditions**

- D.A.H Monitor individuals, not counties
- Inputs into policies, guidelines with Department of Environment (Agency)  
Broader based discussion on health issues was encouraged.

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Date : 12 April 2002
Venue : Wrexman Eurocare
Scale : Relevance of visit : Was the visit interesting
5 3

General Observations and notes

- Introduced to an ultimatum technology i.e. non-burn/heat dis-infection system
- System attached to incineration – 5% of health risk waste incinerated
- Self regulatory process in terms of sampling although third partner used for sampling analysis
- The unavailability of UK hospitals & authorities to share information

Observations regarding relevance to Gauteng conditions

- Doubts about capacity of local landfill sites to handle treated residues from non-burn technology
- The non-burn technology must be weighed against current practices in the local industry of waste

Suggested further discussions/investigations

The NHS to pursue a more rigid reliable sampling process to complement the self-regulatory process.

The non-burn must prove to be safe and cost effective alternate to be of benefit to all.

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Date : 15 April 2002

Venue : Ministry of Health – Egypt

Scale : Relevance of visit : Was the visit interesting  
5 5

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**General Observations and notes**

- Environmental health lab for ministry of health
- Responsible for licensing of public/private health care facilities in Egypt
- Certificate issued every five years
- Clinical hazardous waste licensed separately by health ministry
- Incinerators placed at district hospital (e.g.) Tower hospital

**Observations regarding relevance to Gauteng conditions**

Incinerators placed in public institutions

Landfill sites available in desert, but transport could be cost-effective

Ministry of health responsible for licensing and collaboration with Agriculture for list of hazardous substances

**Suggested further discussions/investigations**

To develop systems in SA for developed and under developed areas – with a special focus on an awareness campaign

Process requires continuous improvement

DAVE HARRIS  
Pikitup

**Study Tour Notes**  
**05/04/02 –15/04/02**

**Sustainable Health Care Waste Management in Gauteng  
“Study Tour observations and recommendations”**

Date : 05 April 2002  
Venue : Itireleng Clinic, Wilgeheuwel Hospital, Sanumed, Leratong Hospital  
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Leratong Hospital- Relevance of visit : Was the visit interesting  
6 4

**General Observations and notes**

- Medical Waste system – large card board system
- 25l plastic – sharps – Buhle waste collection by trolley
- large boxes
- service everyday
- no protective clothing – record keeping not good

Itireleng Clinic - Relevance of visit: Was the visit interesting  
5 4

**General Observations and notes**

- Buhle and pikitup systems – same as above problem with bin liners

Wilgeheuwel hospital - Relevance of visit : Was the visit interesting  
5 5

- Medical waste removed by sanumed – each area marked
- Medical – tablets in boxes
- Problems of storage

Sanumed - Relevance of visit : Was the visit interesting  
7 3

**Suggested investigations/discussions**

Sealing of red bags – protective clothing record keeping  
Check quality standards for boxes – card boxes and sharps containers  
Disposal of tablets in medical waste

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Date : 07 April 2002
Venue : Cairo University Hospital
Scale : Relevance of visit : Was the visit interesting
5 5

General Observations and notes

- 5 000 beds
- Red and black systems
- Storage rooms – one for each ward
- Poster system available
- Business unit. Sustain waste system
- Incinerator accepts all waste
- Cost – 10million rand – life span 11-12 years
- Problem – maintenance – still dependant in on contractors
- Major cost – bag filters

Observations regarding relevance to Gauteng conditions

- Bin system – NB Vs card board boxes
- Collecting system

Suggested further discussions/investigations

- Colour coding system
- Good for training to have a poster system
- Business cont. as above explained.

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Date : 09 April 2002  
Venue : Amagerforbraending; R98; Slagelse Hospital; Kavo Municipal HCRW  
Scale : Relevance of visit : Was the visit interesting  
5 5

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**Amagerforbraending -**

**General Observations and notes**

- Incineration only
- 0/5 million – people waste problems
- 400 000 tons per year – 80 000 tons clinker ash
- 150 containers everyday
- very clean – medical waste system
- bin liner system used in medical waste bin

R98

- Different systems
- From different users to dead animals
- Needle programme in place for drug users

### Slagelse Hospital

- 430 beds
- Very good system – very simple – cost small box 16kl

### Observations regarding relevance to Gauteng conditions

- No comparison – incinerator system
- Some systems will not work in SA as used at the Slagelse Hospital

### Suggested further discussions/investigations

- Collection of dead animals at the present moment is disposed on landfills “problem” should be incinerated
- Needle programme can be put in place

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Date : 10 April 2002

Venue : Danish Health Agency

Scale : Relevance of visit : Was the visit interesting
4 3

General Observations and notes

- All problems investigated and results given to hospitals
- A system is in place if anything goes wrong
- 3x members in environmental health look at medical waste in hospitals
- medical waste stats a – all systems under ministry of health
- local councils plan the waste law made in conjunction with ministry of health
- Classification of certain waste e.g. sanitary towels
- NB: medical waste is local council’s responsibility – very similar system
- Very similar system, however various departments do not work together
- This caused large problems

Suggested further discussions/investigation

Must work as a team

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Date : 12 April 2002

Venue : Wrexman Eurocare

Scale : Relevance of visit : Was the visit interesting  
5 3

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### General Observations and notes

- Cost for incineration – 200 pounds
- Cost for non-burn technology 100 pounds
- Bin system used for HCW – 770l
- HDS system – largest in UK
- Treats 95% of waste – HCW – 5% to be treated - residue to landfill

- Bins clearly marked, red, blue, black
- Training very important
- System in use very simple
- The bin collection vehicle very simple and works

**Observations regarding relevance to Gauteng conditions**

- Bin lifting system and vehicle could be used in South Africa

**Suggested further discussions/investigations**

To investigate bin system – lifting device

To look at the non-burn technology in more detail

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Date : 15 April 2002

Venue : Rigshospitalet; Ramboll; SWS Incineration

Scale : Relevance of visit : Was the visit interesting

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General Observations and notes

Poster presentation very good

Refuse disposal – includes paper – cartoon, glass to be recycled

Clinical waste - yellow

This will be incinerated

Medical waste – red

Paper recycling system in place and glass

Needle box transparent

Process glass – remove cups

Re-use disposal service 4 x per day

Staff – hospital 7 000

Observations regarding relevance to Gauteng conditions

Poster presentation – and a colour coding system

Suggested further discussions/investigations

Poster presentation is very necessary

A simple colour coding system

4.5 Debra Mothopeng

DEBRA MOTHOPENG
Dept. of Health – Central Region

Study Tour Notes
05/04/02 –15/04/02

**Sustainable Health Care Waste Management in Gauteng
“Study Tour observations and recommendations”**

Date : 05 April 2002

Venue : Leratong, Itireleng Clinic, Wilgeheuwel Hospital, Sanumed

Scale : Relevance of visit : Was the visit interesting
5 5

Leratong Hospital - Relevance of visit : Was the visit interesting
5 5

General Observations and notes

- Problem of waste segregation

Itireleng Clinic - Relevance of visit : Was the visit interesting
5 5

- Problem of waste segregation

Wilgeheuwel Hospital - Relevance of visit : Was the visit interesting
10 5

- The hospital is well organised. Health Care waste Mx maintained.
- Risk Mx sustained and improves workforce
- Compliance is encouraged though not 100%
- Transportation of medical waste was camouflaged

Sanumed

- Prolonged exposure to heat? Compliance to heat regulation
- Pre-disposed to musculo-skeletal problems. Overloaded with backlog in hospitals and clinics
- Non-separation of clean and contaminated containers.
- Use of wheelie bins not safe

Observations regarding relevance to Gauteng conditions

Sanumed is overloaded and over worked, which proves inadequate availability of incinerators in Gauteng

Storage insufficient at the treatment plant facilities

Common problem of delayed collection by the service providers due to broken vehicles etc

Suggested investigations/discussions

Determination of burning waste as mentioned during presentation

Systems of improving collection of waste at facilities.

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Date : 07 April 2002  
Venue : Cairo University Hospital  
Scale : Relevance of visit : Was the visit interesting  
5 5

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**General Observations and notes**

- Mx commitment to the plan
- No window dressing, evident method implemented
- Compliance to regulations, no exposure to excessive heat and long hours
- Risk assessment
- Evaluation tool for compliance by the HCWM unit
- Partnership in production (Finance)
- Provision of PPE
- Informed Mx of proceedings in CUH
- Good inter-relationship and HC worker support

**Observations regarding relevance to Gauteng conditions**

- Non-compliance to regulation
- Exposure to heat stress
- Over worked in risky areas
- None offensive odours in Rx plants
- Compliance to OSHACT-PPE and colour coding
- Ventilators said to be outward extractors and utilised in summer
- Master training for trainer-trainee was urgent

**Suggested further discussions/investigations**

Motivation and incentives for health workers to comply  
Very impressed by the HWCWRMU relationship with procurement of finance to supply resources to sustain the project  
Outreach of the illiterate by picture information.

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Date : 09 April 2002
Venue : Amagerforbraending; R98; Slag else Hospital; Kavo Municipal HCRW
Scale : Relevance of visit : Was the visit interesting
5 5

Amagerforbraending -

General Observations and notes

- Not very informative on HCRWM

R98

- MX all HCWR generated in Health institutions, separated and managed accordingly i.e. type disposed appropriately
- Set standards in conjunction with health care waste consultant set standards affected all generators even general private practitioners

More interesting all health care waste is considered irrespective of how inconsiderate e.g. Amalgam from dentists.

Slag else Hospital

- Concept not satisfactory of mixing waste taking in consideration of end disposal
- Storage area not adequate – possible for SP. Does not comply with storage of hazardous material. Safety threatened +++++

Observations regarding relevance to Gauteng conditions

- R98 – Concern to Gauteng – Disposal Mx of Amalgam in rising water and on the floor. Idea implemented very important
- No set standards
- Service providers concentrate on HCW generated from patients only
- No interdepartmental relation of HCW Mx to alleviate disposal by the service provider All waste Mx in one place
- Storage sites are available but not protected at R 98
- Disposal containers similar though varying in size

Suggested further discussions/investigations

Procurement well sustained – what might be the problem in Gauteng Mx motivation, Commitment to be investigated.

Budget allocated but not very clear on how control is implemented with the supplier and user.

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Date : 10 April 2002

Venue : Rigs Hospitalet; Ramboll, SWS

Scale : Relevance of visit : Was the visit interesting

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### Rigshospitalet

#### General Observations and notes

- Compliance to set regulations
- Commitment and pride in work
- Generation of income from waste
- Interdepartmental collaboration
- No evidence of dissatisfaction
- Organisation of waste segregation

### Ramboll

- Organisational structure available departmental especially with accountability.

### SWS

- Mis management of the equipment which might have led to failure to operate
- Environment not very conducive
- Hand out very informative

### Observations regarding relevance to Gauteng conditions

- Compliance to H/S primary level. Safety officers and district and hospitals = Infection control
- Organisational structure similar, although in Gauteng based in secondary and tertiary hospitals
- Budget allocation
- Non-comparative but similar organisation available – not included in the study.

### Suggested further discussions/investigations

Further follow-up into HCWM in Gauteng to identify standards and compliance.  
Containers are airtight and no complain as compared to Gauteng.

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Date : 11 April 2002

Venue : Danish Health Agency

Scale : Relevance of visit : Was the visit interesting

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General Observations and notes

Central body monitoring, controlling medical professional persons

- assisting with designation and control of medical waste

Observations regarding relevance to Gauteng conditions

No relevance – all professions monitored and accountable to their respective authority body.

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Date : 12 April 2002

Venue : Wrexman Eurocare

Scale : Relevance of visit : Was the visit interesting

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### General Observations and notes

- Use of wheelie bins
- Waste not properly segregated – alleged medical waste
- Identification of wheelie bins with tags – type of waste
- Minimal handling of waste
- Non-segregation of needle and syringe
- Proper tying of plastics and securing waste in the bins reduced spillage
- Biological, radio-active matter not incinerated

### Observations regarding relevance to Gauteng conditions

- Same containers though lids not similar
- Use of single plastic –? same microns
- Identification of source hospital

- Fluids/tissues with blood in containers

**Suggested further discussions/investigations**

Proper monitoring of spores to be verified by 2<sup>nd</sup> opinion.

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Date : 15 April 2002

Venue : Ministry of Health – Egypt

Scale : Relevance of visit : Was the visit interesting

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General Observations and notes

- Waste Mx well co-ordinated by environmental health department.
- Waste legislated for hospitals and clinics
- Supervisory teams to monitor
- Risk assessment to reduce pollution within the legislative framework for incinerators within hospitals
- Combined method of waste Rx – General waste not combined with Heat Risk waste in the landfill
- Fever hospitals incinerate separately
- Owners of producers of waste to collect and dispose
- Private sector incorporate into hospital waste Mx
- Contractors provide all equipment for waste Mx bags containers etc. on exchange basis.
- Government issues contracts for recycling.

Observations regarding relevance to Gauteng conditions

Fragmented legislation, non compliance and supervisory

Tenders given to contractors for paper waste but finds not fully utilised

Suggested further discussions/investigations

Tool used to identify need for incineration in a specific area.

DINAH MARELETSE
Dept. of Health – Itireleng Clinic Dobsonville

Study Tour Notes
05/04/02 –15/04/02

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A brief meeting was held at the Diamond Corner building – Informing the team what to expect during the study tour.

Leratong Hospital - Relevance of visit : Was the visit interesting

5

4

General Observations and notes

- Demonstration of containers – well done. Did not give details of how far the pilot study was. Part of generated waste to central point & good.

Itireleng Clinic - Relevance of visit: Was the visit interesting

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- General problems indicated and options made to suit problems

Wilgeheuwel Private Hospital - Relevance of visit : Was the visit interesting

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- The Health Care Waste system is excellently dealt with. The facility is well organised and deserve to be appraised. Although central storage is not protected from rain, storms & windy conditions.

Sanumed - Relevance of visit : Was the visit interesting

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- Area well managed although there is a lot of smell, which shows that the atmosphere is full of floating chemicals there is a need to improve their protective clothing against the smells and the heat and as they have said they have high needle prick injury- more training is needed for the staff

Observations regarding relevance to Gauteng conditions

The study tour was an eye opener and will serve as a guide to the participation of the study tour abroad. Posters used in most facilities for lay-employees

- Incinerators:- Rx plants with only three incinerators for the whole of Gauteng are insufficient as they will be out of order in future. They are not sustainable to carry such big load of work. No cold storage, handling waste by drivers not correct.

- Gauteng HCWM needs to be developed in facilities in such a way that every health worker carries the system efficiently. At the moment it needs improvement and also needs to be upgraded to compete with other countries.

Suggested investigations & discussions

- Needs in-service education for the staff – this can be arranged with education & training centres
- Needs to evaluate the whole system, by visiting facilities to see if correct measures are taken
- To abide by standards/guidelines

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Date : 07 April 2002

Venue : Cairo University Hospital

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| Scale : <u>Relevance of visit</u> | : | <u>Was the visit interesting</u> |
| 5                                 |   | 5                                |

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#### **General Observations and notes**

- Hospital too big to implement a pilot study – 1 nurse in charge of the whole hospital with 3 thousand nurses & 3 thousand beds
- Problems encountered still to change the behaviour of the employees and too difficult to train nurses because of the big numbers
- Top management commitment high
- The incinerator operated by the hospital personnel
- Cold storage for infectious waste
- Has internal storage and central storage
- Colour coding present
- Cairo has business plan and action plan which works

#### **Observations regarding relevance to Gauteng conditions**

- Lack of space in Gauteng facilities for internal storage
- No commitment from top management
- Efficient on site incinerator in Cairo and in Gauteng incinerator not well developed
- Incinerators capacity 2 tons per day at Sanumed and 20 tons for Cairo. Which services only hospital waste

#### **Suggested further discussions/investigations**

- One chief nurse in charge of 3 000 nurses.
- There is no policy for needle prick injury – considering HIV/AIDS
- Continuous monitoring and follow-up. Training of staff needs to be considered
- Very interesting to see how they have improved in waste management within a very short period

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Date : 09 April 2002

Venue : Amagerforbraending; R98; Slagelse Hospital; Kavo Municipal HCRW

Scale : Relevance of visit : Was the visit interesting
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Amagerforbraending -

General Observations and notes

- Very busy/huge incinerator I have ever seen
- Generation of electricity
- 30 tons of waste incinerated per hour
- operated by the municipalities

R98

- Needle programme which provides sterile needles
- Supplies drug users with syringes
- Emptying of syringes boxes in public areas e.g. diabetic needles

Slagelse Hospital

- Colour coding is good
- Sorting system is good
- Internal storage available
- External storage poorly sited and poorly constructed, not under lock
- Diabetic patients undergoes training and they are taught how to dispose of the needles and syringes
- All waste containers are on mobile stands

Observations regarding relevance to Gauteng conditions

- Disposal of non-infectious waste mixer with chemical waste done consciously
- Gauteng private owned incinerators - of which in Slagelse hospital it is controlled by the municipality
- Record keeping of health care waste in Slagelse is good - of which in Gauteng it is not clear

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Date : 10 April 2002

Venue : Rigs Hospitalet; Ramboll, SWS

Scale : Relevance of visit : Was the visit interesting  
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### **Rigshospitalet**

#### **General Observations and notes**

- Colour coding well done
- Develop a guide for management of waste



- Sharps containers transparent – adequate to put in each nurse trolley
- Internal storage well and has adequate space
- Collection of waste efficient
- Central points well developed
- Internal transport well organised
- Recycling station fully functional

**Ramboll**

- Meeting held to discuss observation of the day and statistics given

**SWS**

- Incinerator not working – waste starting to decompose
- General hygiene not satisfactory
- Incinerator not in good condition yellow (risk) sticker for needles
- No colour coding
- Reusable containers obtained from the hospital –
- Proper record of needle stick injury

**Observations regarding relevance to Gauteng conditions**

- Emphasis of recycling of material should be established
- Mixing of chemicals not acceptable within hospital premises

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Date : 11 April 2002

Venue : Danish Health Agency

Scale : Relevance of visit : Was the visit interesting

5 4

General Observations and notes

No records were shown to the study tour group as evidence of compliance

- No hierarchical structure from slides were shown as prove or to give the group some true indication or picture of the members of the committee board Responsibilities of the board well indicated
- The system of control very good and does not exist in South Africa
- Too perfect for me as there are no problems encountered in the whole system of waste management and system needs to be reviewed

Observations regarding relevance to Gauteng conditions

- No such system exists in South Africa
- Management from Denmark committed and implement whilst in Gauteng conditions and guidelines are only “found and filed” and inefficient follow-up is done.

Suggested investigations and discussions

- Needs to be part of Gauteng guidelines and needs to be added in the new draft.

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Date : 12 April 2002

Venue : Wrexham Euro care

Scale : Relevance of visit : Was the visit interesting  
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### **General Observations and notes**

Non-Burn Technology

- Effective because – less air pollution
- Monitoring system good and done on frequent basis
- Emission control
- Waste shredded and not a danger to the public
- Spores checked regularly
- Segregation of waste good
- No storage – waste stored in trucks and had to be handled when transported to wheelie bins during emergency when plant is not working

### **Observations regarding relevance to Gauteng conditions**

- Gauteng not having such a Rx plant and needs to have one especially in treating general waste
- Gauteng needs to review the whole system and adopt the European style of waste management. Still a long way to go but with time if management, stakeholders and those from functional level have active participation, it will gradually work.

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GENERAL COMMENTS FOR THE WHOLE STUDY TOUR

LOCAL – 05 APRIL 2002-04-23

MAIN OBJECTIVE

1. To acquire more knowledge and insight to become well vest with HCRWM in South Africa. Prior to the tour abroad
2. For comparison reason i.e. South Africa versus other countries
3. To correlate South African Waste Management with other countries and come out with 01 better improved system
4. To develop interpersonal relationship with other stakeholders and to work together as a team.
5. To observe HCRWM from cradle to grave. This will help both health workers and service providers to see where they are lacking and be able to rectify mistakes in order to implement a system, which works for everyone.

ABROAD – 06 APRIL 2002 – 15 APRIL 2002

MAIN OBJECTIVES

1. To assess different options used by other countries related to HCRWM
 - *This would help us South Africans to choose the most suitable methods, which can either be utilised or modified to suit HCWM in South Africa*
2. To look into HCWM problems and find easier methods of solving them
3. To create health care waste management awareness to all South Africans
 - *This will assist us to see measures taken by other counties how they dispose of their waste*
4. For comparison reasons so as to see where South Africa is lacking for improvement purposes
5. To look into different equipment used in other countries and observe methods used for a safer, complete treatment of HCRW without contamination of both the environment and personnel being at risk.
6. To upgrade and uplift the standard of health care risk management in South Africa
7. For exposure of study tour group to a new environment for motivational purposes – so as to carry out the HCRWM to pilot study with vigour and energy.
8. To observe and assess personnel from another perspective – To observe how they manage HCRW in bringing about prevention of cross infection and medico – legal hazards e.g. needle prick injury.
9. To acquire more knowledge and insight and a better understanding in future
10. To further plan and implement the pilot study so that it becomes a success.
11. To look into other methods which can reduce or keep the HCWM budget constant e.g. less wastage on personnel & material resources.
12. To create a sustainable system as far as HCRM is concerned which will change the present culture and bring about good waste disposal habits in all South Africans
13. To empower all South Africans so as to develop and improve methods used presently in SA.
14. To benefit all the stakeholders to a better, healthier HCW system which can be utilised in the coming future
15. To improve and upgrade guidelines already formulated according to the European union standards

MAIN KEYS FOR SUCCESS OF HCWM ABROAD

1. Develop “*culture of compliance*” in management of their waste
2. There is commitment from top to bottom
 - *management commitment*
 - *community commitment*
 - *health worker commitment*
3. Work oriented – everybody knows her scope of practice

1. Self monitoring – not being followed or forced to do work
2. Respect and have positive attitudes towards one another
3. There is collaboration of stakeholders – abides by European union guidelines
4. Uniformity of HCWM throughout most countries
5. They have got an organised systemic process i.e. cradle to grave
6. Very high standard – maintenance of equipment good and not abused e.g. wheelie bins & containers used are of good quality (plastic is also thick)
7. Staff awareness – colour coding clear and easy to understand by everybody
8. Adequate space in the facilities – For the path and storage of HCW
9. There is no mis-management of funds
10. Precautionary measures taken – From generated site until where waste is treated, there is no man handling – HCW taken from generated site by wheelie bins into trucks made for that purpose
11. Recycling of material done efficiently by everyone i.e. community & health facilities
12. Way-forward in South Africa
 - a. Formation of a forum
 - b. Functions of the forum
 - i. bring all the stakeholders together
 - ii. participate (active in the pilot study – for full implementation of the process)
 - iii. co-ordinate with national, provincial and local levels
 - iv. produce integrated draft plan
 - v. look into staff establishment – Motivate staff if necessary
 - vi. Work together with the task team chosen for both pilot study facilities
 - vii. Look into sustainable containerisation to be used
 - viii. Look into motivational incentives which can assist the staff to be motivated
 - ix. Work with management from the two pilot study facilities.

OTHER POINTS TO CONSIDER IN SOUTH AFRICA

1. HIGH HIV STATISTIC IN SOUTH AFRICA

Consider separation of needles from syringes

2. SHORTAGE OF STAFF

Most nurses have gone abroad to work because of de-motivation from the government, therefore no manpower for the management of waste.

3. **OVER POPULATION OF PATIENTS OR OVERCROWDING OF HAZARDS**

Because of poverty – diseases take its toll and hospitals and clinics are full and therefore no time for waste management

4. **DIFFERENT CULTURAL GROUPS**

Although there are ethics in nursing, nurses/staff differ from culture to culture, and this may bring about ignorance in waste management also considering patients from different backgrounds too

5. **BURNT-OUT SYNDROME**

Most workers have burnout syndrome because of overwork and inadequate salary

6. **RESISTANCE TO CHANGE**

The implementation may take time before people accept the new process – ***patience and tolerance is the mother of success.***

4.7 Mabel Mpela

MABEL MPELA
Gauteng Dept. of Health – Leratong Hospital

Study Tour Notes **05/04/02 –15/04/02**

**Sustainable Health Care Waste Management in Gauteng
“Study Tour observations and recommendations”**

Date : 05 April 2002

Venue : Itireleng Clinic, Wilgeheuwel Hospital, Sanumed, Leratong Hospital

Scale : Relevance of visit : Was the visit interesting
5 4

Itireleng Clinic - Relevance of visit : Was the visit interesting
5 3

General Observations and notes

- The presentation made was on the pilot study not on what is being done. Only when we moved from room to room were we able to see what they are using and how they do it.

Wilgeheuwel hospital - Relevance of visit : Was the visit interesting
5 5

- This hospital is using relevant methods to their situation as a new hospital.

Sanumed - Relevance of visit : Was the visit interesting
5 3

- This facility is old and not so efficient
- The burning was not effectively done and a lot of ash has to be disposed of

Leratong hospital

- Presentation and guiding through the hospital done by myself. Aim was to establish the status quo so as to be able to compare with other facilities on tour.

Observations regarding relevance to Gauteng conditions

The visit to the four areas was of importance as it created a basis of comparison for the study tour. We have to know what happens in our facilities in order for us to see the different ways of handling waste.

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Date : 07 April 2002

Venue : Cairo University Hospital

Scale : Relevance of visit : Was the visit interesting  
5 5

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**General Observations and notes**

- This hospital is an old hospital and has a high number of patients, but they can afford to have a rubbish bin for domestic waste next to each patient which makes bedside care easy

- The nursing trolley concept is similar to the one in Wilgeheuwel though they still use open bottle method for storage of cheattle forceps. In our hospitals these were removed long ago. We currently use spray bottles and dressings are pre-packed individually
- The waste management is good. The type of bag trolley used in the ward facilitates easy closure and removal to the bar fence trolley. The sharps container does not fill up quickly as syringes are put into a red bag.

**Observations regarding relevance to Gauteng conditions**

- Method used for separation of needle from syringe could help us in reducing the number of containers used.
- Use of red bag on the nursing trolley putting in all medical waste could also reduce expenses made on buying boxes; provided they would not be left to overflow.
- The incinerator could be relevant for use and may be piloted in one hospital so as to save for the province or one service provider to cater for a number of hospitals.

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Date : 09 April 2002

Venue : Amagerforbraending; R98; Slagelse Hospital; Kavo Municipal HCRW

Scale : Relevance of visit : Was the visit interesting
 5 5

Amagerforbraending -

General Observations and notes

- This incineration plant is modern and efficient. It is properly situated and is not a health hazard

R98

- This collection unit is committed to proper handling of waste. Packaging facilitates a proper disposal and the co-operation from facilities enhances that.

Slagelse Hospital

- The hospital is modern and has complying staff
- proper waste management is spontaneous for the local people. They are used to the way they do things
- They are not concerned about things that came from the patient e.g. dressings, segregation is not an important issue
- Storage for the medical waste is far from the people and cannot be accessed by children and other staff, but is near a road

Observations regarding relevance to Gauteng conditions

- In South Africa we need to look into having a needle programme for drug users
- Record keeping of health care waste should be started

Suggested further discussions/investigations

- Amagerforbraending plant would help reduce the amount of scavengers in Gauteng as the public is not accessible to the waste. The methods used are advanced and they would facilitate a healthy waste management
- R-98 packaging which would be enhanced by segregation could help reduce the amount of HCRW burnt in our incinerators.
- In Gauteng, it is important to segregate waste as there are many utensils-appliances, and equipment used on patients that are disposed of.
- Slagelse hospital – their storage of medical waste could not work in Gauteng because of heat and the place is small, poorly ventilated for Gauteng standards

The waste generated in the hospital is not as much as ours as we have a high turnover of patients in our hospitals.

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Date : 10 April 2002  
 Venue : Rigs Hospitalet; Ramboll, SWS  
 Scale : Relevance of visit : Was the visit interesting  
 5 4

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**Rigshospitalet**

**General Observations and notes**

- In this university hospital waste management is done in a passionate way by all. The availability of resources could be contributing to this. There is co-operation amongst the staff

**Ramboll**

- Meeting held observations of the day discussed

**SWS**

- In spite of not being functional during our visit seems efficient in handling hazardous waste

**Observations regarding relevance to Gauteng conditions**

- With availability of human, financial and material resources, this system could work in Gauteng support from different levels of management are also important for success.
- Their export of flue gas to other countries could be used as a generation of funds for the Gauteng province including the boiler ash, foundry sand and other kinds of inorganic waste

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Date : 11 April 2002
 Venue : Danish Health Agency
 Scale : Relevance of visit : Was the visit interesting
 5 5

General Observations and notes

The agency has controlling powers over health issues to ensure that efficient service is delivered. Compared to Gauteng Province it does not have different bodies that deliver but has them under one umbrella. That facilitates easy and smooth running of services and does not confuse people. People know where to go when they have to complain. The principle of *Batho-pele* which considers clients first seems to be ruling here. Co-ordination is done centrally

Observations regarding relevance to Gauteng conditions

- Having a health agency would probably be good because in Gauteng Province, we have fragmented services. Central control would help reduce the number of services that have to be co-ordinated at different levels.

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Date : 12 April 2002

Venue : Wrexman Eurocare

Scale : Relevance of visit : Was the visit interesting  
5 5

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**General Observations and notes**

- This company provides containers, transports and disposes waste
- The heat dis-infection system processes the waste in a unique way
- The shredding of waste seems quite healthy and inexpensive as at the end it is taken to a landfill site. There are no harmful emissions in the HDS, and the residue can be recycled or reused.
- Waste for incineration is put in tagged containers. This facilitates easy identification of waste e.g. the anatomical, pharmaceutical and radioactive waste. Colour coding of tags makes things simple. Non-tagged waste goes into the HDS

**Observations regarding relevance to Gauteng conditions**

- The HDS requires low operating and maintenance costs
- There are no toxic gaseous products which are emitted by our incinerators in Gauteng
- The wheeled bins could help ease the transportation of waste and the tagging would help in identification of the different types to be incinerated. The use of bar-coding system would also be an efficient way in counting and knowing where the bins originated from.
- Controlled landfill sites would be necessary for Gauteng to avoid scavengers.

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Date : 15 April 2002

Venue : Ministry of Health – Egypt

Scale : Relevance of visit : Was the visit interesting
5 5

General Observations and notes

This body monitors environmental health in all the health services offered in this country. Health care risk waste management being one of the important health services is co-ordinated, controlled and monitored. They send teams to do inspections to facilities.

- The other services under the umbrella of health ministry were indicated and related to the body
- Incinerators for HCRW are available though cannot be put up in all hospitals because of dense population
- HDS is implemented and landfill sites with strict security are used
- Private company has contract with government to provide services in Alexandria

Observations regarding relevance to Gauteng conditions

Gauteng could look into the HDS which could help reduce waste taken to landfill site as it would be shredded and would be of no harm to citizens by emission of hazardous gas and controlled landfill sites could be used.

MICHIEL EKSTEEN
Dept public Transport, Roads & Works

Study Tour Notes
05/04/02 –15/04/02

**Sustainable Health Care Waste Management in Gauteng
“Study Tour observations and recommendations”**

Date : 05 April 2002
Venue : Leratong, Itireleng Clinic, Wilgeheuwel Hospital, Sanumed
Scale : Relevance of visit : Was the visit interesting
5 5

Leratong Hospital - Relevance of visit : Was the visit interesting
5 5

General Observations and notes

- General procedures for taking care of Health Waste are in place, but all areas needs to be upgraded. An area that needs urgent attention is: Storage, transportation, containers and segregation.

Itireleng Clinic - Relevance of visit : Was the visit interesting
5 5

- Waste handling on a small scale but areas that needs attention is the same as in Leratong Hospital

Wilgeheuwel Hospital - Relevance of visit : Was the visit interesting
5 5

- HCRW is handled in a responsible way, although packaging (*containers*) and segregation needs attention (*Sharps were found in clear bags*)

Sanumed

- Plant is reasonably well organised, but all HCRW is handled manually and HCRW is received in boxes which can and do leak.

Observations regarding relevance to Gauteng conditions

The Sanumed chimney stacks is bent, which refractory over the full length

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Date : 07 April 2002  
Venue : Cairo University Hospital  
Scale : Relevance of visit : Was the visit interesting  
5 5

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**General Observations and notes**

- A special project was implemented to take care of HCRW
- A system for HCRW is operational for about 2 years
- Training and awareness programs are going on

- Special containers for different types of HCRW is used as well as bag holder for trolleys
- Special transporting trolleys for HCRW is used, manufacture for this purpose.
- Two incinerators are used for incineration of HCRW – Hot water is produced for the hospital as part of the incineration process
- Incinerators comply with local emission regulations.

#### **Observations regarding relevance to Gauteng conditions**

- Containers and trolleys will be suitable for Gauteng conditions.
- Incineration plant is suitable for our conditions and ca comply with SA emission standards
- Hot water can be provided to community hospitals
- Alternative methods of treating HCRW can be investigated.

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Date : 09 April 2002

Venue : Amagerforbraending; R98; Slag else Hospital; Kavo Municipal HCRW

Scale : Relevance of visit : Was the visit interesting
5 5

Amagerforbraending -

General Observations and notes

- Excellent example how to treat normal waste – Electricity and hot water is generated to produce an income

R98

- Non-profit organisation to collect general and medical waste. Medical and general waste is delivered to Amagerfonbraending. Medical waste is collected and transported using dedicated vehicles

Slag else Hospital

- Excellent example of how HCRW should be handled, although the storage of HCRW is not acceptable (wooden hut)

Observations regarding relevance to Gauteng conditions

- Amagerforbraending: serious consideration must be given to rationalise incineration in order to provide cost effectiveness.
- R 98 is an excellent example
- Slag lese : This is a very good example and a similar system will be applicable to the Gauteng conditions.
- Personnel are dedicated and HCRW aware.

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Date : 10 April 2002

Venue : Rigs Hospitalet; Ramboll, SWS

Scale : Relevance of visit : Was the visit interesting  
5 4

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### **Rigshospitalet**

#### **General Observations and notes**

- HCRW is properly sorted, containerised and transported.
- Bags and containers are properly identified and labelled to indicate source
- Golden rule : If you handle HCRW, remember someone else must handle it as well, safety!!
- Income is generated out of sorted waste (paper, metal, glass etc)
- Dedicated and trained person to handle hazardous waste (chemical man))

#### **Ramboll**

- Nice and well organised

#### **SWS**

- Special incineration only. Plant to incinerate medical and other hazardous waste.
- Permit restricts the type of waste that can be incinerated
- Capacity 150 tons/day

#### **Observations regarding relevance to Gauteng conditions**

- Containers and transport system at the Royal Danish can be made applicable to Gauteng conditions.
- Training and awareness methods can be available to Gauteng conditions

#### **Suggested further discussions/investigations**

Wheelie bin system – will it be suitable for our condition?

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Date : 11 April 2002

Venue : Danish Health Agency

Scale : Relevance of visit : Was the visit interesting
5 5

General Observations and notes

A central data-base is used to capture and process all relevant waste data.

Handling HCRW is part of the complete Health Care System.

Procedures to handle HCRW is properly documented and distributed.

Controlling offices of health in each country to inspect and follow up complaints

The EPA (Environmental, Protection Agency) is responsible for the policy and guidelines regarding all environmental issues.

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Date : 12 April 2002

Venue : Wrexman Eurocare

Scale : Relevance of visit : Was the visit interesting  
5 5

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#### **General Observations and notes**

- HCRW is treated by means of
  - incineration
  - Heat disinfection system
- HCRW is collected in bags or reusable wheely bins.
- Wheely bins are washed in a special washing machine
- No plastic liners are used for wheely bins
- Life expectancy of reusable containers is 5 years
- Incineration complies with the EU standards
- Double decker system with hoist platform is used to collect wheely bins from hospitals and HCRW generators for transportation to Eurocare
- Heat disinfection system is used to treat 95% of the HCRW
- Contracts to treat HCRW is valid for 3 years.

#### **Observations regarding relevance to Gauteng conditions**

- Types of treatment suitable to Gauteng conditions.

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Date : 15 April 2002

Venue : Ministry of Health – Egypt

Scale : Relevance of visit : Was the visit interesting
5 5

General Observations and notes

- Environmental Health is dealing with HCRW
- Ministry of Health & Population licence and control all HCRW services
- Incinerators are used to treat HCRW
- License for treatment of HCRW is valid for 5 years
- All incinerators must comply to EU standards
- HCRW generators are feasible to collect and transport waste to treatment site
- Incinerators at each hospital is not viable
- Target is to have an incinerator plant in every district
- Incinerators can be used to generate money
- Autoclaving is used in high density areas.

QAPHILE NTSELE
National Dept. of Health

Study Tour Notes
05/04/02 –15/04/02

Sustainable Health Care Waste Management in Gauteng “Study Tour observations and recommendations”

Date : 05 April 2002

Venue : Itireleng Clinic, Wilgeheuwel Hospital, Sanumed, Leratong Hospital

Scale : Relevance of visit : Was the visit interesting

5 5

Leratong Hospital - Relevance of visit : Was the visit interesting

6 5

General Observations and notes

- Sorting of waste – Waste is sorted into 3 groups and collected by Buhle waste regularly

Problems

- Overloading of waste
- Companies providing wrong leads
- In-service training

Suggestions

- Provision of protective clothing to workers
- Records to be kept for boxes stored (full audit)
- Full plastic bags to be taped (sealed)

Itireleng Clinic - Relevance of visit : Was the visit interesting

5 5

- Service providers – Buhle and Pik-it-up
- No dedicated storage for HCW
- Functional integration is not existing

Wilgeheuwel Hospital - Relevance of visit : Was the visit interesting

5 5

- Recycling system in place
- No storage area for HCRW and general waste
- Plastic bags are colour coded
- HCRW collected regularly
- Training programs are in place

Sanumed - Relevance of visit : Was the visit interesting

5 5

Storage conditions not adequate
Handling of waste is not adequate

Incomplete incineration

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Date : 07 April 2002

Venue : Cairo University Hospital

Scale : Relevance of visit : Was the visit interesting

5 5

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### General Observations and notes

- Cairo is a big Hospital with 5 000 beds with 1 chief nurse in charge of 3 000 nurses
- The top management within the hospital is very committed and dedicated to the health care risk waste
- They are also driving and co-ordinating the project
- Problems encountered in the HCRW project are as follows:
  - a. *changing mind-set of staff/personnel*
  - b. *financial sustainability of the project during implementation*
  - c. *training of a large group of nurses and other staff*
- Incineration to be a separate entity generating income
- Incinerators installed appeared to be functioning quite well, but air monitoring and sampling has to be done on occasional basis to ensure that no Nox escapes to the environment
- The incinerator is located within the hospital premises. There is a cold room for storage

### Observations regarding relevance to Gauteng conditions

- Changing attitudes of staff or personnel with regard to HCRW
- Coming up with a financial strategic plan to ensure sustainability of the project
- Developing effective training programs
- Internal and central storage to be organised
- Colour coding on the wall on each storage room
- Business plan and action plan must be drawn by each institution
- More energy should be focused on

### Suggested further discussions/investigations

- Contingency plans in the case of needle pricking must include investigating for HIV/AIDS as well
- Air monitoring and sampling program must be in place
- Location of an incinerator on hospital premises or away from hospital must be investigated
- Training of old nurses and doctors must be continuous.

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Date : 08 April 2002

Venue : Royal Danish University Hospital, Ramboll, SWS

Scale : Relevance of visit : Was the visit interesting

5 5

Royal Danish University Hospital

General Observations and notes

- Colour coding and classification of waste is very good
- A guide was developed for management of waste
- Sharp containers available on each trolley and are transparent
- Internal storage is condition, collection is done regularly
- Recycling station functions very adequate and there is a permanent person responsible for the station
- Re-use of containers is identified by colourful stickers and this cut costs.

Ramboll

- Meeting held – Observations of the day discussed.

SWS

- Incinerator was temporarily not operational
- A lot of waste is piled and starting to decompose
- General hygiene not satisfactory

Observations regarding relevance to Gauteng conditions

- Containers to be re-used and labelled by a colour-ful stickers
- Proper recording and number of needle pricks to be kept
- Recycling station to be installed and encouraged

Suggested further discussions/investigations

- Flammable chemical storage – no fire hydrant
- Mixing of chemicals not acceptable

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Date : 09 April 2002

Venue : Amager forbraending; R 98; Holbaek/Slagelse hospital

Scale : Relevance of visit : Was the visit interesting

5 5

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## Amagerforbraending

### General Observations and notes

- Energy is produced during incineration process
- 30 tons of waste per hour
- operated by municipality
- 80 000 tonnes each year of ash not properly stored

#### **R 98**

- Needle program – provide containers & needles for drug addicts
- Proper efficient transport system
- Record keeping system is good (waste information system)
- Call-in service for sound needles is existing effectively

#### **Slagelse Hospital**

- Sorting system is good – colour coding, thick plastic
- Internal storage for HCRW is not good/adequate
- Not locked and poorly sited
- Waste Mx is part of nurses syllabus
- Diabetic patients are given medication as well as the box for disposal as part of the package
- Containers are on mobile stands.

#### **Observations regarding relevance to Gauteng conditions**

- Incinerators are owned by the Municipality
- No effective community based programs for Mx of HCW
- Record keeping system is very good and up to date and this could be a plus for Gauteng

#### **Suggested further discussions/investigations**

- Disposal of non-infectious waste with risk waste continuously

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Date : 11 April 2002

Venue : Danish Health Agency

Scale : Relevance of visit : Was the visit interesting
 5 5

General Observations and notes

- The Danish Health Agency/National Board of Health is very clear with its role on HCRW management
- The agency was part of the team for the development of guidelines on HCRW
- Since the agency is also involved in the planning of curricula at the schools HCRW modules can easily be part of the curricula
- There is an existing National Insurance Employment Scheme for compensation file incidences including needle prick injury
- The Board ensures that each province has got a home-based care system, and further ensures that the systems are sustainable.

Observations regarding relevance to Gauteng conditions

- The agency is an authoritative or controlling body for the Department of health
- They are using a collaborative approach with other departments or stakeholders which could be very relevant for Gauteng and the whole of South Africa

Further discussions/investigations

Does the agency get involved with community based projects e.g. needle program. "If so, what was the role of their Drug abuse unit with the needle program?"

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Date : 12 April 2002

Venue : Wrexman Eurocare

Scale : Relevance of visit : Was the visit interesting  
5 5

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### General Observations and notes

- The storage period of waste for both incineration and heat disinfection unit is minimised as much as possible
- The barcoding system seems to be working effectively
- The containers for waste are manufactured according to the governments specifications, making it easier for government to monitor the process
- segregation of waste seems to have been the problem
- The idea of using oil in the HDU is good since steam could be corrosive and need a lot of other units fitted in such as boilers etc.

### Observations regarding relevance to Gauteng conditions

- The HDU could be a cost effective technology to be used because of its simplicity and does not require too many people to operate.
- The spore test could be a cost effective method for Gauteng to make sure that microbiologically the destruction of HCRW in the HDU is safe.
- The idea of using one way containers may be expensive for Gauteng – maybe to re-use some containers to some extent may be necessary

### Suggested further discussions/investigations

- A difficult approach on training for segregation is maybe needed for it to have an impact
- Specifications on the physical nature of processed waste prior to disposal to landfill should be looked at.

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Date : 15 April 2002
Venue : Ministry of Health – Egypt
Scale : Relevance of visit : Was the visit interesting
5 5

General Observations and notes

- All issues pertaining waste, HCRW and air quality and pollution are co-ordinated by the Department of Health
- The environmental legislation that was developed in 1994 is coordinating all activities with regards to waste and pollution etc.
- The legislation also makes provision on
 - a. Presence for the system on Mx of HCRW in all health care facilities
 - b. the minister has certain obligations and the ministry of health & population licences all facilities
 - c. specifications on the type of containers to be used
 - d. they are trying to discourage the use of landfills due to the known problems associated with them
 - e. other technologies like autoclaving and steam sterilization are also used but under go testing first

Observations regarding relevance to Gauteng conditions

- There must be a supervision team from National department of health that supervises and monitors the hospitals and clinics and HCRW project
- The Gauteng project should also look into the following strategies
 - a. Environmental auditing
 - b. Health assurance for school children
 - c. Sustainable training programs
 - d. Sustainable funding programs for HCW
 - e. Health education for doctors and nurses

Suggested further discussions/investigations

The legislation is dictating on the type of technology to be used e.g. there must be an incinerator in each hospital.

4.10 Sydney Nkosi

SYDNEY NKOSI
DACEF-Assisting Project Director

Study Tour Notes
05/04/02 –15/04/02

**Sustainable Health Care Waste Management in Gauteng
“Study Tour observations and recommendations”**

Date : 05 April 2002

Venue : Leratong, Itireleng Clinic, Wilgeheuwel Hospital, Sanumed

Scale : Relevance of visit : Was the visit interesting
5 5

Leratong Hospital - Relevance of visit : Was the visit interesting
5 5

General Observations and notes

- Problem of waste segregation

Itireleng Clinic - Relevance of visit : Was the visit interesting
5 5

- Problem of waste segregation

Wilgeheuwel Hospital - Relevance of visit : Was the visit interesting
5 5

- The hospital is well organised. Health Care waste Mx maintained.
- Risk Mx sustained and improves workforce
- Compliance is encouraged though not 100%
- Transportation of medical waste was camouflaged

Sanumed

- Prolonged exposure to heat? Compliance to heat regulation
- Pre-disposed to musculo-skeletal problems. Overloaded with backlog in hospitals and clinics
- Non-separation of clean and contaminated containers.
- Use of wheelie bins not safe

Observations regarding relevance to Gauteng conditions

Sanumed is overloaded and worked which proves inadequate availability of incinerators in Gauteng
Storage insufficient and the treatment plant facilities

Common problem of delayed collection by the service providers due to broken vehicles etc

Suggested investigations/discussions

Determination of burning waste as mentioned during presentation

Systems of improving collection of waste at facilities.

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Date : 07 April 2002

Venue : Cairo University Hospital

Scale : Relevance of visit : Was the visit interesting  
5 5

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**General Observations and notes**

- Mx commitment to the plan
- No window dressing, evident method implemented
- Compliance to regulations, no exposure to excessive neat and long hours
- Risk assessment
- Evaluation tool for compliance by the HCWM
- Partnership in production (Finance)
- Profession of PPE
- Informed Mx of proceedings in CUH
- Good inter-relationship and HC worker support

**Observations regarding relevance to Gauteng conditions**

- Non-compliance to regulation
- Exposure to neat sites
- Over worked in risky areas
- None offensive odours in Rx plants
- Compliance to OSHACT-PPE and colour coding
- Ventilators said to be outward extractors and utilised in summer
- Master training for trained -

**Suggested further discussions/investigations**

Motivation and incentives for health workers to comply  
Very impressed by the HWCWRMV relationship with procurement of finance to supply resources to sustain the project  
Outreach of the illiterate by picture information.

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Date : 09 April 2002
Venue : Amagerforbraending; R98; Slag else Hospital; Kavo Municipal HCRW
Scale : Relevance of visit : Was the visit interesting
5 5

Amagerforbraending -

General Observations and notes

- Not very informative on HCRWM

R98

- Single waste collection company – strictly regulated
- Requirements to meet/to be re-organised as a waste collector
- Customised vehicles for risk waste collection
- Collection vehicle did not have a bio-hazard sign – legal requirements in South Africa
- Monopoly over the HCRW market – South African conditions allows for free market forces with empowerment of PDI's

Slag else Hospital

- Concept not satisfactory of mixing waste taking in consideration of end disposal
- Storage area not adequate – possible for SP. Does it comply with storage of haz maf material. Safety threatened +++++

Observations regarding relevance to Gauteng conditions

- R98 – Classical example for the need to register waste transporters/collectors
- Adapted to Gauteng context for the collection of risk waste from a cluster of private GP's
- Emergency spills should be part of the transporters emergency plants.

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Date : 10 April 2002

Venue : Rigs Hospitalet; Ramboll, SWS

Scale : Relevance of visit : Was the visit interesting

5

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### Rigshospitalet

#### General Observations and notes

- Compliance to set regulations
- Commitment and pride in work
- Generation of income from waste
- Interdepartmental collaboration
- No evidence of dissatisfaction
- Organisation of waste segregation

### Ramboll

- Organisational structure available departmental especially with accountability.

### SWS

- Mis management of the equipment which might have led to failure to operate
- Environment very conducive
- Hand out very informative

### Observations regarding relevance to Gauteng conditions

- Compliance to H/S primary level. Safety officers and district and hospitals = Infection control
- Organisational structure similar, although in Gauteng based in salary and tertiary hospitals
- Budget allocation
- Non-comparative but similar organisation available – not included in the study.

### Suggested further discussions/investigations

Further follow-up into HCWM in Gauteng to identify standards and compliance.

Containers are airtight and no complain as compared to Gauteng.

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Date : 11 April 2002
Venue : Danish Health Agency
Scale : Relevance of visit : Was the visit interesting
5 4

General Observations and notes

Central body monitoring, controlling medical professional persons

- assisting with designation and control of medical waste

Observations regarding relevance to Gauteng conditions

No relevance – all professions monitored and accountable to their respective authority body.

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Date : 12 April 2002  
Venue : Wrexman Eurocare  
Scale : Relevance of visit : Was the visit interesting  
5 5

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**General Observations and notes**

- Use of wheelie bins
- Waste not properly segregated – alleged medical waste
- Identification of wheelie bins with tags – type of waste
- Manual handling of waste
- Non-segregation of needle and syringe
- Proper tying of plastics
- Biological, radio-active matter not incinerated

**Observations regarding relevance to Gauteng conditions**

- Same containers though lids not similar
- Use of single plastic – same microns
- Identification of source hospital
- Fluids/tissues with blood in containers

**Suggested further discussions/investigations**

Proper monitoring of spores to be verified by 2<sup>nd</sup> opinion.

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Date : 15 April 2002
Venue : Ministry of Health – Egypt
Scale : Relevance of visit : Was the visit interesting
5 5

General Observations and notes

- Waste Mx well co-ordinated by environmental health department.
- Waste legislated for hospitals and clinics
- Supervisory teams to monitor
- Risk assessment to reduce pollution within the legislative framework for incinerators within hospitals
- Combined method of waste Rx – General waste not combined with Heat Risk waste in the landfill
- Fewer hospitals incinerate separate
- Owners or producers of waste to collect and dispose
- Private sector incorporate into hospital waste Mx
- Contractors provide all equipment of waste Mx bigger containers etc. on exchange basis.
- Government issues contracts for recycling.

Observations regarding relevance to Gauteng conditions

Fragmented legislation, non compliance and supervisory

Tenders given to contractors for proper waste but finds most fully utilised

Suggested further discussions/investigations

Tool used to identify need for incineration in a specific area.

TOLMAY HOPKINS
Dept. of Waster Affairs (DWAF)

Study Tour Notes
05/04/02 –15/04/02

**Sustainable Health Care Waste Management in Gauteng
“Study Tour observations and recommendations”**

Date : 05 April 2002

Venue : Itireleng Clinic, Wilgeheuwel Hospital, Sanumed, Leratong Hospital

Scale : Relevance of visit : Was the visit interesting
5 4

Leratong Hospital - Relevance of visit : Was the visit interesting
4

General Observations and notes

- HCGW; Clear/black bags
- HCRW:
 - Red liners in boxes - removed by Buhle waste (daily service)
 - Speci-cans
 - Sharps containers

From wards † corridor † storage room (locked)

Do have training

No tracking system (containers are however marked according to ward)

Itireleng Clinic - Relevance of visit : Was the visit interesting
5 5

- Boxes with liner & speci-cans
- Collection: Mon, Wed, & Fri
- General waste: Clear/black: HCW: red liners; boxes, speci-cans

Wilgeheuwel (Private Hospital) - Relevance of visit: Was the visit interesting
5 5

- Focus on recycling, (refer to hand-out)
- Collection 2x per week, marked according to ward
- Large facility (Collection twice per week; marked according to ward)

SANUMED Relevance of visit : Was the visit interesting
5 5

- Large facility (2 x 350kg/h and 1x300kg/h incinerators)
- Incineration not complete – ash of low quality (disposed at Holfontein HH facility). No scrubbers

Observations regarding relevance to Gauteng conditions

Leratong & Itireleng –

- a) Colour coding currently used compared to proposed
- b) Colour coding link between procurement and management of HCW should be investigated.

Wilgeheuwel has recycling initiatives

SANUMED capacity available in Gauteng and standard of treatment and disposal associated with these

Suggested further discussions/investigations

Satellite clinics and “links” to bigger facilities.

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Date : 07 April 2002

Venue : Cairo University Hospital

|                                   |   |                                  |
|-----------------------------------|---|----------------------------------|
| Scale : <u>Relevance of visit</u> | : | <u>Was the visit interesting</u> |
| 5                                 |   | 5                                |

**General Observations and notes**

- Hospital has 5 000 beds
- Currently using red and black bags
  - † ± 200 intermediate storage rooms
  - † HCRW to 2 incinerators that comply to EU standards (150kg/h units)
- Continuous training and awareness campaigns
  - † master trainers present course
  - † posters in each ward
- Established a waste management unit within the hospital
- Satellite hospitals bring their waste here
- Bottom ash and fly ash are mixed and removed by contractor to sanitary landfill

**Observations regarding relevance to Gauteng conditions**

- Basic system
- Implementation of a system was linked to a change in mind-set/behaviour
- Continuous training essential.

**Suggested further discussions/investigations**

- Establishment of a “waste management unit” in Gauteng hospitals

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Date : 09 April 2002

Venue : Amagerforbraending; R98; Slagelse Hospital; Kavo Municipal HCRW

| | | |
|-----------------------------------|---|----------------------------------|
| Scale : <u>Relevance of visit</u> | : | <u>Was the visit interesting</u> |
| 5 | | 5 |

Amagerforbrænding -

General Observations and notes

- Non-profit, municipality-owned incinerator (400 000 tons/annum)
- Produce electricity & heating
- Waste streams produced
 - bottom ash (80 000 tons/annum- deposited on site)
 - fly ash (16 000 tons/annum) – exported to Norway
 - contaminated water – settle and treated
- HCRW: 150 containers/day & immediately mixed with waste in incinerator via separate lift

R98

- Non-profit concessionaire; 350 000 tons/annum
- Transport waste from hospital, doctor's room, pharmacies etc. to incinerator

Slagelse Hospital

- 430 beds & day patients
- Grey bags for general waste and also contain infectious waste e.g. dressings
- Yellow bags in containers for HCRW
- Temporary storage in sluice room
- Grey bags to compactor to incinerator
- HCRW to storage shed – packed manually into wheelie bins – to incinerator

Observations regarding relevance to Gauteng conditions

- Sorting system should “fit” treatment/disposal facility

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Date : 10 April 2002

Venue : Rigs Hospitalet; Ramboll, SWS

Scale : Relevance of visit : Was the visit interesting

5 5

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## Rigshospitalet

### General Observations and notes

- 12 waste fractions identified in 3 main groups
  - ┌ Clinical waste = yellow (sharps & infectious etc)
  - ├ Medicine waste = Red
  - └ General waste = black
- Recycling!!
- Re-use of containers in certain instances
- Waste move from temporary storage facilities to – central storage facilities
  - ┌ Container yard
  - ├ Locked area for HCRW
  - └ Locked area for chemical waste
- Collected 4 x a day

**Ramboll**

- General overview

**SWS**

Rotary kiln: HCRW and low hazardous waste (as permissible according to permit)

- commercial company
- 15 tons/day
- waste products
  - slag – (to landfill)
  - fly ash – (to Norway)
  - filter cake ( to landfill) as a result of water treatment

**Observations regarding relevance to Gauteng conditions**

- Feasibility of recycling initiatives in Gauteng
- ensure capacity of people responsible for different aspect of management of HCW

**Suggested further discussions/investigations**

- Management of waste generated by ambulances

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Date : 11 April 2002

Venue : Danish Health Agency

| | | |
|-----------------------------------|---|----------------------------------|
| Scale : <u>Relevance of visit</u> | : | <u>Was the visit interesting</u> |
| 5 | | 4 |

General Observations and notes

Responsible for supervising healthcare provided and registration of individuals providing healthcare, receive complaints & investigate prevention programmes (e.g. drug and alcohol abuse).

Small section responsible for environmental health. Do not handle environmental matters. All waste related issues are dealt with by Danish EPA

- Was however involved in developing of HCW guidelines.

Observations regarding relevance to Gauteng conditions

Institutional arrangements have to be critically looked at, as well as the + responsibility & roles of different authorities/parties.

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Date : 12 April 2002

Venue : Wrexman Eurocare

|                                   |   |                                  |
|-----------------------------------|---|----------------------------------|
| Scale : <u>Relevance of visit</u> | : | <u>Was the visit interesting</u> |
| 5                                 |   | 5                                |

**General Observations and notes**

Commercial facility

Incinerator : 5 500 tons/yr; £200/ton (treatment only)

Heat disinfection unit (HDS): 6 000 tons/yr; £100/ton

5 groups of waste not allowed in HDS:

- anatomical
  - cytotoxic
  - radio-active
  - pharceuticals
  - veterinary
- } Should be incinerated

Residues generated are disposed of at landfill; currently considering recycling

Washing plant for wheelie bins (770l)

On-line monitoring for air pollutants

Training on segregation provided by Eurocare ar hospitals

Spore-test: once a week and grab sample of treated waste

**Observations regarding relevance to Gauteng conditions**

- Importance of segregation for non-burn technology + requirement for incineration (of other facility) for waste that cannot be treated by non-burn technology.

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Date : 15 April 2002

Venue : Ministry of Health – Egypt

Scale : Relevance of visit : Was the visit interesting

5

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General Observations and notes

- Responsible for licensing and supervising of health care facilities including waste management systems at these facilities.
- Until 1994: hazardous waste not recognised: promulgated environmental act (framework law to address waste issues).
- At district level, at least one incinerator to serve hospitals and other health care facilities → thus, all waste that is collected is transported to a central facility (This facility may charge a fee that is used for maintenance and operation
- Comprehensive regulations/Act on hazardous health care waste is available
- Main concern: costs associated with appropriate treatment
- Awareness and capacity building is regarded as key issues (continued training)

Observations regarding relevance to Gauteng conditions

→ Institutional arrangements and roles and responsibility of different spheres of government

→Regional approach towards management of HCW

VUKANI KHOZA
Gauteng Dept. of Health

Study Tour Notes
05/04/02 –15/04/02

**Sustainable Health Care Waste Management in Gauteng
“Study Tour observations and recommendations”**

Date : 05 April 2002
Venue : Itireleng Clinic, Wilgeheuwel Hospital, Sanumed, Leratong Hospital
Scale : Relevance of visit : Was the visit interesting
5 4

Leratong Hospital- Relevance of visit : Was the visit interesting
7 4

General Observations and notes

- Infectious control nurse HCRW management program are linked to occupational health and safety
- Use different containers and runs training for staff
- Problem with signage – no sign of management involvement

Itireleng Clinic - Relevance of visit: Was the visit interesting
5 4

General Observations and notes

- Similar to the above though in a very small scale

Wilgeheuwel hospital - Relevance of visit : Was the visit interesting
5 5

- Much more advanced systems in terms of labelling, colour-coding, recycling and management involvement
- Less integration into occupational health and safety programme

Sanumed - Relevance of visit : Was the visit interesting
5 3

- Bad smell at the incineration and lots of waste kept. Very hot on the plant, full of unburned waste

Observations regarding relevance to Gauteng conditions

On all visits systems in place appeared to be relevant to Gauteng conditions.

Suggested investigations/discussions

Upgrading of the incinerators
Storage (temporal storage)
Need to consider regionalising HCWM
Needs management support and integration.

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Date : 07 April 2002

Venue : Cairo University Hospital

Scale : Relevance of visit : Was the visit interesting

5

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#### **General Observations and notes**

- Management support and commitment
- Integrated approach and linked to infection control and occupational health and safety
- Has a special unit that is running with the programme
- Has allocated budget
- Has sustainability plan e.g. revenue generation through servicing other institutions
- Has efficient incineration system

#### **Observations regarding relevance to Gauteng conditions**

- Uses non-burn technologies which could be used also in Gauteng
- Works hand in hand with occupational health/safety and also environmental section
- Plan for revenue general for sustainability
- Segregation and containerisation
- Sealing method simple
- Use of plastic bags only – no cardboard makes

#### **Suggested further discussions/investigations**

- HCW management infection control and occupational health in an institution should be in one section
- Not impressed with the approach to HIV/AIDS. Very neglected saying they do not have problem.

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Date : 09 April 2002

Venue : Amagerforbraending; R98; Slagelse Hospital; Kavo Municipal HCRW

Scale : Relevance of visit : Was the visit interesting

5

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Amagerforbraending -

General Observations and notes

- Efficiency of the plant about 98%
- Recycling of domestic waste
- Plastic containers very hard & durable
- Medical waste go straight to incinerator it was not stored

R98

- Waste segregation into domestic, contagious and sharps
- Concern about risk of infection to personnel

Slagelse Hospital

- Segregation part of community culture
- Less training being given

- Containerisation and storage of domestic and health care risk waste

Observations regarding relevance to Gauteng conditions

- Medical waste not stored. In Gauteng there are backlogs
- No mention or emphasis on staff protection = HIV/Hepatitis
- *NGO none profit organization* – applicability in Gauteng
- Related storage far away close to public road
- *Lack of training* – n/a to Gauteng lot of training needed
- *Staff protection* – not emphasised in the system

Suggested further discussions/investigations

- Regionalisation of treatment plant or incinerator of treatment plant or incinerator. Use of buckets that will never be opened, also use of wire seal
- Less emphasis on staff protection
- Buckets used – cannot be opened when sealed.

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Date : 10 April 2002

Venue : Rigs Hospitalet; Ramboll, SWS

Scale : Relevance of visit : Was the visit interesting

5 5

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**Rigshospitalet**

**General Observations and notes**

- Waste segregation and colour coding
- Hazardous clinical, sharps, pharmaceuticals, recycling
- Signs and procedure manuals available
- Storages – short time frequency of collection
- Chemical hazardous waste
- Collection and transportation
- PPE provision

**Ramboll**

- Documentation on risk waste stats for the Royal Danish Hospital and recap on general observation of tour.

**SWS**

- Profit making company that specialise on different types of waste including medical waste.

**Observations regarding relevance to Gauteng conditions**

- Recycling program a must
- Safety (eg) mixing of chemicals at hospital
- Special waste being incinerated at this plant (eg chemicals)

**Suggested further discussions/investigations**

- Medical waste has dedicated staff tasked with responsibility – Gauteng health needs to consider this
- Medical waste – responsibility of the safety officer. Possibility for Gauteng health
- Use of used fluids containers to contain sharps – saves costs

Integration of medical waste infection control and occupational health and safety needs further discussions in Gauteng.

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Date : 11 April 2002

Venue : Danish Health Agency

Scale : Relevance of visit : Was the visit interesting
5 5

General Observations and notes

- Responsible for accreditation of private practitioners
- Local municipality responsible for waste management in general
- Compensation for occupational diseases and injuries done through insurance system
- Agency responsible for supervision of medical personnel and medical statistics.

Observations regarding relevance to Gauteng conditions

- Well defined responsibility in terms of waste management
- Information management system that Gauteng need to develop
- Division that deals with complaints from the public, complaints, which could include dumping of medical waste.
- In Gauteng this could be referred to statutory bodies i.e. SANC etc.

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Date : 12 April 2002

Venue : Wrexman Eurocare

Scale : Relevance of visit : Was the visit interesting  
5 3

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**General Observations and notes**

- Non-burn technique used for 95% of medical waste – heat disinfect ion system
- 50% waste incinerated
- waste segregation and containerisation and use of different tags from the generation source
- use of real containers buckets
- waste could be traced from the source ward
- waste not sorted for long time and collected daily
- bins washed and disinfected through well established system

**Observations regarding relevance to Gauteng conditions**

- Use of landfill for residue of the HDS ? in Gauteng
- Training for management and all staff on waste management, a requirement for Gauteng.
- Waste management enforced by health and safety laws – Gauteng need to incorporate waste management or integrate it at institutional level - DHS service



**Suggested further discussions/investigations**

Waste could be traced from the generating ward – this illustrates well-established information management that Gauteng need.

Residue of HDS needs further investigation.

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Date : 15 April 2002

Venue : Ministry of Health – Egypt

Scale : Relevance of visit : Was the visit interesting

5

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General Observations and notes

- Environmental health laboratory measures air pollution
- One doctor qualified in environmental health – responsible for management of hazardous waste
- Ministry of health responsible for medical waste. Authority for issuing licence to other departmental hospital
- Has wide system – incineration, recycling and HDS
- Centralised treatment plant
- Revenue generation

Observations regarding relevance to Gauteng conditions

- Authority and competencies delegation clear department of health's responsibility. This needs to be a recommendation in Gauteng.
- Have treatment plant at each districts – Revenue generation and sustainability
- Partnership with private sector relevant to Gauteng
- Issuing of licence to all waste generators

Suggested further discussions/investigations

- Delegations of competencies use of various treatment technology

5. Selected Photographs from the Study Tour

Egypt









Denmark









United Kingdom:











Gauteng:







