Medical Waste Regulation
Overview and introduction

- Medical Waste Regulation
  - Legal basis regarding waste management
  - Development of proper hospital waste management

- Film „Waste management in hospitals“

- Biohazard, Sharps and management
  - Types of hospital waste
  - Hazardous hospital waste
  - Sharp waste
Problem Outline

- Task of medical institutions is the protection of the population's health

- Rapid development of medicine and higher medical standards
  - More one-way products
  - A large number of laboratory analyses
  - Results in increase of hospital waste amounts

- Different waste fractions range from simple waste paper through hazardous chemicals to infectious and hazardous materials
Historical Development - Problems

- Reduction of areas because of city cultures
- Lack of hygiene
- Lacking knowledge of microbiological processes (epidemics)

Quellen:
- Boku Abfallwirtschaftsinsitut – VO Abfallwirtschaft, 2010
- Pädagogik.net - http://www.paedagogik.net/wochenthemen/infektionskrankheiten/pest.html
- Brezl: http://www.brezl.at/rund-um-das-brezl-gw%C3%B6lb/die-ringstra%C3%9Fe/
Historic Development – „Waste Disposal“ in the past in Vienna

- 14. November 1560:
  "das Hausmist und andre Unsauberkait in Putten, Scheibtruhnen oder auf Kärren und Wagen strakhs aus der Statt" zu bringen sei…

- 1656 city offers to collect waste

- 1839 obligatory to collect and dispose waste properly

- 1904 104 horse collection carts

- 1918 – 1923 system to collect waste via container was implemented

Quelle: https://www.wien.gv.at/umwelt/ma48/entsorgung/muellabfuhr/geschichte.html
Historic Development – „Waste Disposal“ in the past in Vienna

Former times: waste dumping sites

Today: modern waste incineration plants
Decision: how is medical waste classified, collected and disposed?

Developing countries: India, Asia,…

Industrial countries: waste separation, collection, disposal
Legal basis in Europe

Legal regulations – hierarchy
- European law on waste
  - European waste catalogue
  - Chapter 18 (hospital waste)

- National laws

- Special guidelines for hospital waste management
  - Austria: Standardization Guideline for Medical Field
  - Germany: LAGA guideline
  - Documents of ministry of health or environment
Legal basis in Austria

- Austrian Law on Waste (National Law)
  - Basic regulations concerning Waste Management
  - Waste Separation
  - Handling of Hazardous Waste
  - Official Data Sheets for Hazardous Waste
  - Waste Manager – Waste designee

- Federal State Laws

- Various regulations

- Austrian Standardization Guideline for Medical Field
  - Exact regulations regarding waste collection and disposal
  - 25 years experience
  - Made from a board consisting of experts from waste management in hospitals, disposal engineers, hygiene-experts, medical doctors, users
Waste management in Austria

Key numbers for waste management in Austria

- appr. 8,000,000 inhabitants
- appr. 300 hospitals
- appr. 70,000 beds

Total amount of waste in Austrian hospitals:
- appr. 90,000 t/a
- appr. 3,5 kg waste/bed/day
Waste management in Austria

Waste types and amount in Austrian hospitals
(in Tons/year)

- Hazardous Waste: 5200 tons/year
- Residual waste: 40200 tons/year
- Recyclable waste: 44200 tons/year
Waste treatment and disposal in Austria

- Incineration
  - Hazardous waste, residual hospital waste, waste with risk of injury, body parts (coffin, then buried by incarnation in a crematorium), chemical waste

- Landfill
  - only inert waste (pretreated waste, e.g. after incineration or treatment in a mechanical biological treatment plant)

- Mechanical-biological treatment plants
  - Residual waste, no hospital waste

- Chemical-physical treatment
  - Chemical waste
Hospital waste is produced in every country the same way:

- Bloody waste is infectious
- Scalpels and needles have a risk of injury
- Chemicals could be toxic and hazardous
- Cardboard, glass, paper, etc. are recyclable

But how we separate and classify the waste is different in every country depending on different factors

- Treatment possibilities in the countries
  - Landfill site
  - Incineration
  - Recycling plants
- Legal basics – legal regulations (detailed regulations regarding hospital waste exist/no)
The most discussed waste fraction with the most differences in classification in the different countries is the „infectious“ waste:

- medical waste contaminated with hazardous germs
- medical waste contaminated with blood and body fluids,
- body fluids
- microbiological waste..

Why most discussed? – different views

1. Hygienic point of view
Every waste contaminated with blood/urine/body fluids is infectious and poses possibly a risk for other humans in the hospital – hazardous?

2. Disposal point of view
Only waste that poses a risk for humans inside and also outside of hospitals is defined as hazardous waste – certain hazardous germs (e.g. rabies, tuberculosis, anthrax)
Different understanding of „infectious waste“/hazardous hospital waste

What is a risk for humans inside AND outside of hospitals is different in different countries because of the following disposal procedure

- landfill site, incineration, inhouse pretreatment, transport possibilities

Therefore there are also different regulations for the classification, collection and disposal of medical waste in the different countries.

How is the classification in Austria?

„Infectious“ waste is only a problem inside the hospital, in the following incineration plants we have no problems with normal infectious hospital waste.

What is hazardous hospital waste in Austria?

- Germs and diseases that pose a risk inside hospitals and outside hospitals
- black death, anthrax, rabies, tuberculosis, dengue fever etc.
Decision: how is medical waste classified, collected and disposed?

**Gefährliche Erreger gemäß ONORM**

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<th>Infection</th>
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Gemeldete Erkrankungen 2016

What is hazardous hospital waste in Austria?

- Germs and diseases that pose a risk inside hospitals and outside hospitals
- black death, anthrax, rabies, tuberculosis, dengue fever etc.
Film
Biohazard, sharps and management
Waste types in Austrian Hospitals

- Hazardous hospital waste (waste with certain virus, e.g. black death, anthrax, rabies, tuberculosis, dengue fever etc.) waste catalogue number 97101, EWC 18 01 03
- Death bodies, body parts and organs waste catalogue number 97103, EWC 18 01 02
- Waste with risk of injury (e.g. needles, scalpels etc.) waste catalogue number 97105, EWC 18 01 01
- Residual hospital waste (e.g. bandages contaminated with blood, IV tubing etc.) waste catalogue number 97104
- Drug residues
- Liquid waste – emptying possible/not
- Chemical waste
- Recyclable waste (paper, glass, plastic, metal)
Hazardous medical waste – non hazardous residual waste

Non hazardous medical residual waste - classification according ÖNORM S2104:

Waste, that may pose a risk inside the hospital, but not outside the hospital, e.g. bandages, tubes etc., even when contaminated with blood
Hazardous medical waste - classification according ÖNORM S2104:

Waste, that poses a risk inside and outside the hospital, waste contaminated with certain infectious virus: rabies, black death, cholera, lepra, etc.

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Gemeldete Erkrankungen 2016
Waste from microbiological and virological laboratories

- E.g. petri dishes, vials, laboratory disposables etc.
- Dependent on the kind of microbiological or virological work (types of germs or viruses – risk level 3 or 4):
  - Collection and disposal as hazardous medical waste
  - Pre-treated at the point of origin (in house treatment)

- Low cost alternative to disposal as hazardous medical waste is disinfection with damp heat (microwave) at the point of waste production
- After thermal treatment:
  - Disposal as regular residual hospital waste with waste catalogue number 97104 or EWC 18 01 04
  - Contribution to reduction of hazardous hospital waste
Waste with risk of injury

- Sharp and pointed objects: e.g. needles, scalpels, etc.
- Collection in puncture-proof disposable units directly after use
- Disposal of the puncture-proof disposable units together with the residual hospital waste is possible (incineration)
  - Waste catalogue number 97105
  - EWC 18 01 01

- Individual solutions for various requirements:
  - Trocars, biopsy needles, endoscopes, awkwardly sized disposable instruments
  - Failing adequate containers collection as hazardous waste
  - Implementation of adequate puncture proof plastic 50-litre disposable containers
    - Disposal as non-hazardous waste
    - Reduction of costs/ of hazardous hospital waste
    - more safety when disposing the sharp objects
Body parts and organs

- Body parts and organs are not regulated by the Austrian Law on Waste or other waste regulations
- Regulated by national Burial Regulations
- EWC 18 01 02
- Collection in Hospitals
  - Collection by department of pathology
  - Disposed of via collection in a coffin
  - Incineration in a crematory

- Small body parts (e.g. tissue, retinas etc.)
  - Collection together with residual waste
  - If not contaminated with infectious viruses
Bodily fluids collected in systems that can be re-opened

- urine bags
- plasma separation bags
- cell-saver-bags

- Can be emptied in the sink,
- empty bags can be disposed via residual waste
- waste catalogue number 97104
Liquid waste

Limits of emptying collection systems for bodily fluids

- Cytostatics in urine (production of aerosols, inhaling cancerogenic substances)

- Liquid limits: bronchial liquids, stomach liquids, etc. – sticky and smelly

- Technical and hygienic limits:
  - When there is no adequate sink or opening and emptying is not possible without risk

- Legal limits: Whole blood
  - Risk of congestion due to coagulation
  - Must not be disposed via sewage system
Bodily fluids collected in systems that cannot be re-opened:

- Drain systems
- Expired blood bags

- Are collected in rectangular black bins and
- disposed as non hazardous residual waste
- waste catalogue number 97104
Cytotoxic Waste

- Production
  - During cancer therapy in central cytostatic pharmacies
  - In in- and out-patient treatment wards during patient cancer therapy

- Classified as hazardous waste
  - Austrian waste catalogue number 53510
  - European waste catalogue number 18 01 08

- Collection in separate one way bins

- Disposal in incineration plants for hazardous waste
Chemical waste – Liquid chemical residues

- Production in hospitals in diagnostics, care and research
  - E.g. organic solvents, acids, bases, disinfectants etc.

- No disposal into the sewage system for:
  - Unused disinfectant concentrates
  - Solvents and cleaning agents
  - Disinfecting and cleaning solutions (>2%)
  - Concentrates or residues of chemicals used in laboratories
  - Aldehyde solutions
  - Untreated photo chemicals
Further Information

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