



MINISTÈRE DE LA SANTÉ  
ET DES SPORTS

# Health-Care Waste (HCW) Management Program in France

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- Regulatory framework
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- Monitoring

# Regulatory framework

## European regulation

- Principle : the producer of any waste is responsible for its elimination
- Definition : elimination consists of all stages from the production to the final treatment i.e segregation, packaging, transportation, treatment, ...

➔ Overall waste management law in **France**

# French Regulatory framework

- Overall Waste Law (Environment Code)

1975

- Public Health Code

- definition of Health-care waste

- responsibility of the producer

- many management's rules for infectious waste

1997

# History of HCW management in France

- HCW were treated with other types of waste (incineration, landfill, ...)
  - + Onsite incineration on hospital ground
  - Evolution of environmental standards
  - Increase of non re-usable equipment (increase of generated waste)
  - Emergence of “new” infectious agents (HIV, prion)
  - Setting of Hospitals accreditation programs
- ⇒ 1997: new regulation on HCW

# History of HCW regulation in France

- 1978 : sanitary departmental regulations
- 1986 : decision (by law) to replace departmental regulation with national regulation for public health issues
- 90's :
  - National survey (assessment of quantities generated + disposal systems)
  - European discussions → some definitions
- creation of a working group (key partners) in France
  - ⇒ 1997: new regulation on HCW

# Definition of Health-care waste (1997)

- Waste generated by activities of diagnostic, following and preventive, curative and palliative treatment in the fields of human and veterinarian medicines.

*Art.R1335-1 of Public Health Code*

# Typology of health-care waste

- HCW similar to domestic waste
- Infectious HCW (IHCW)
  - containing pathogenic micro-organisms
  - sharps, blood, non recognizable body parts
- Other hazardous waste (chemical, radioactive)
- recognizable body parts

# Risks associated to IHCW

- Infectious risk
  - Mechanical risk (by injuries) : sharps
- ↔ a portal of entry for infectious agents present in waste
- Emotional risk: recognizable body parts, medical equipment (sharps and syringes)



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# Risks related and people exposed to IHCW

- Health-care workers : doctors, nurses...
- Patients (and visitors/family)
- Waste workers  
(handling and waste disposal facilities)

# Who is responsible ?

- Health-care establishment, education establishment, research establishment, industrial establishment,
- Moral person for whom a professional practices,
- Physical person who generates waste (health professional, diabetic).

*Article R.1335-2 of Public Health Code*

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# Five Texts in France, concerning infectious waste (IHCW)

- Decret n°97 -1048 6 nov. 1997 = articles R.1335-1 to R.1335-14 of Public Health Code
- Arrete 7 sept. 1999 about storage
- Arrete 7 sept. 1999 about control of elimination
- Arrete 24 nov.2003 about packaging
- *To-come Arrete about neutralization*  
+ arretes (2002) about incineration

# Key partners

- At national level : 3 ministries involved
  - Health (pilot):
    - 2 departments
      - health department (DGS)
      - hospitalization and cares organization department (DHOS)
  - Ecology
  - Workers Safety
  - + Agencies (Environment)
  - + other ministries = Transportation, Internal affairs
  - + other stakeholders (waste disposal companies...)

# Internal organization

- A committee against nosocomial infections (CLIN) exists in each health-care establishment
- Hygiene team managed by hygienist nurse

# Stages of elimination

- Segregation
- Packaging and labelling
- Storage
- Transportation
- Treatment
  - incineration
  - neutralization

# Segregation

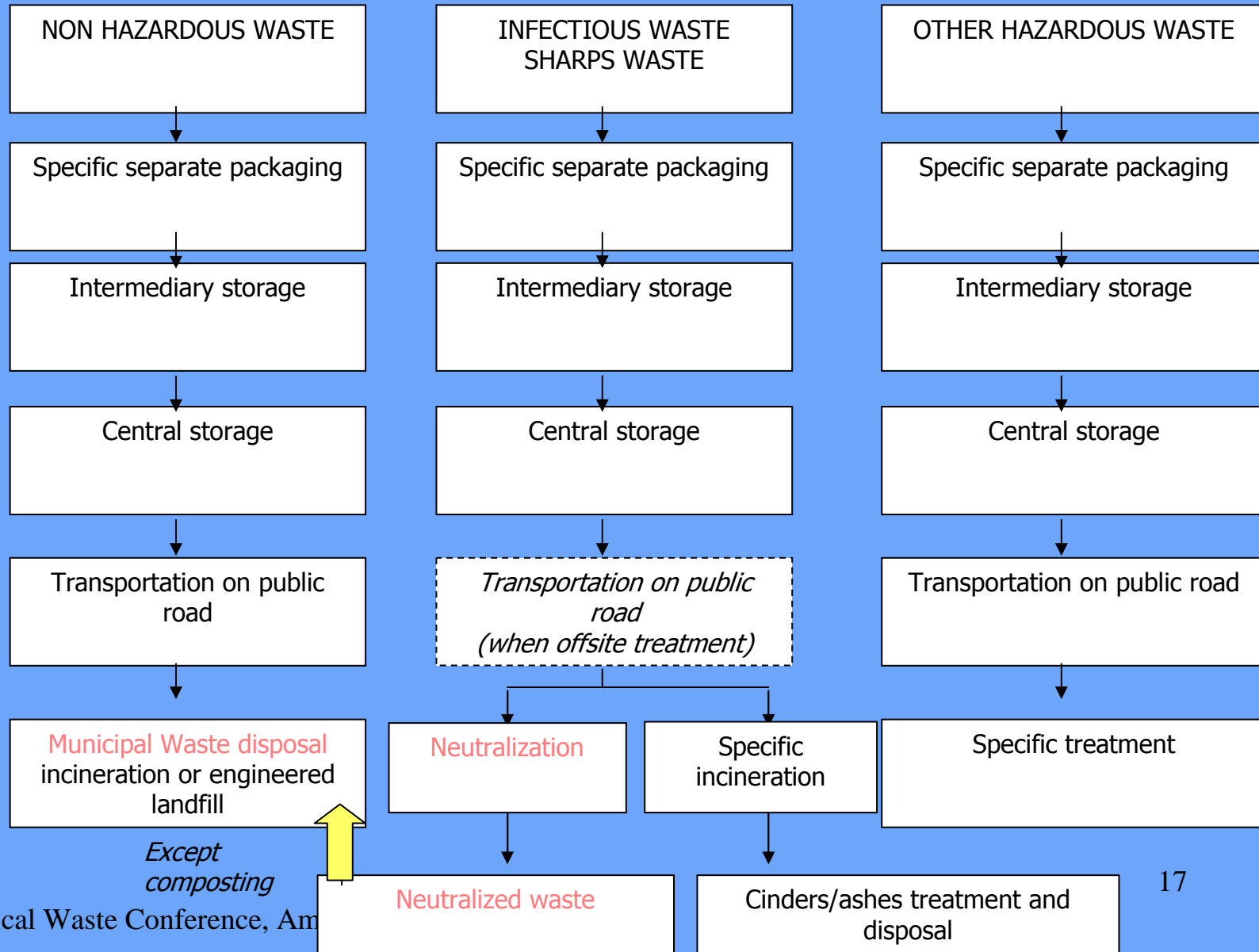
Aim = protect people, respect hygiene rules,  
separate the different types of waste and  
control related costs

When = immediately after generation of waste

- HCW similar to domestic waste
- Infectious HCW
  - containing pathogenic micro-organisms
  - sharps, blood, non recognizable body parts
- Other hazardous waste (chemical, radioactive)
- recognizable body parts

*Article R.1335-5 of Public Health Code*

# Elimination chains



# IHCW Packaging

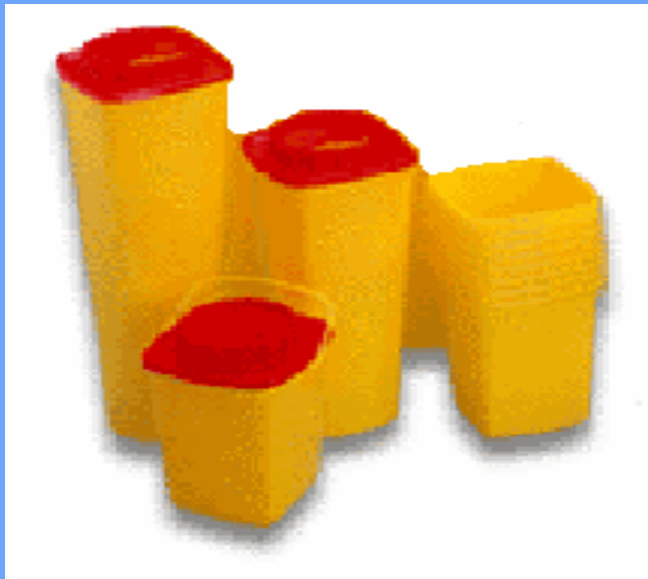
- Single use packaging
- Yellow packaging
- Labelling
- Four types of packaging in wards:
  - Sharps containers (normalised NF X30-500)
  - Plastic bags (normalised NF X30-501)
  - Plastic containers (to come normalisation)
  - Plastic or cardboard boxes (with a plastic bag inside)

*Article R.1335-6 of Public Health Code*

*Arrete 24 nov.2003 about packaging*

# IHCW Packaging

Choice of packaging is crucial:  
it guarantees persons safety



Guidelines (Safe practices) by Ministry of Health

# IHCW Storage

- Temporary in wards and centralised before evacuation
- Time limits (depending on the quantities produced)
- Characteristics of the storage premises



*Article R.1335-7 of Public Health Code*

# Time limits for IHCW storage

- Depending on the quantities produced

Production	> 100 kg/week	> 5 kg/month	< 5 kg/month
Storage	72 hours (*)	7 days (*)	3 months (**)

- (\*): from production to final treatment
- (\*\*): from production to evacuation

*Arrete 7 sept. 1999 about storage*

# IHCW Storage premises

- Exclusively used for dirty products (packaged waste, washing, etc)
- Identified
- Ventilated
- Easy-to-wash grounds and walls
- Protected water tap, easy waste water drain (except in wards premises)



*Arrete 7 sept. 1999 about storage*



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# Transportation : European regulation “the ADR”

(Europe **A**greement concerning the international carriage of **D**angerous goods by **R**oad)

- Infectious HCW are also considered as hazardous in this regulation
- Authorised packaging and vehicle
- If the packaging is not in accordance with the ADR, wastes must be over-packed with a packaging in accordance with the ADR.
- Bags and many sharps containers are not allowed for transportation and are put in big bags.

# IHCWaste disposal

2 ways :

- incineration
- neutralization (before final disposal as domestic waste, composting is forbidden)

*Compacting IHCW (to reduce volume) is forbidden*

*Article R.1335-8 of Public Health Code*

# IHCW Incineration

- In specific incinerators or by co-incineration
  - onsite incinerator on hospital grounds (no more in France),
  - 30 incinerators dedicated to hazardous HCW or domestic wastes (co-incineration)

# IHCW Incineration with domestic waste

- Temperature  $> 850^{\circ}\text{C}$
- 10 % maximum of HCW
- 3 % of unburned in cinders
- Direct introduction of HCW in the incinerator without any handling



# IHCW Pre-treatment by disinfecting

- Aim
  - to transform infectious HCW into “domestic waste”
- Mean
  - physical (autoclave, microwave) or chemical disinfection
  - modification of the appearance (related to mechanical and emotional risks) : mostly by shredding (before disinfection mostly)



# Agreement for neutralization machines

- Agreement by the Ministries of Public Health and of Environment, after submission to the 'Conseil Supérieur d'Hygiène Publique de France' (CSHPF)
- Long administrative and technical procedure

20 agreed machines

44 units in France

# Monitoring

- Traceability Documents :
  - Convention between the producer (responsible) and the contractor.
  - Waste follow-up forms “travelling” with the IHCW from its generation to its disposal.
- Regulation enforced by local Health services  
*Penalties (up to 2 years prison)  
and/or fines (up to 75 000 euros)*

R.1335-3 and R.1335-4 Public Health Code

# Regional Master Plans for HCW management

- Text 18 nov. 1996
- Four aims:
  - to prevent and minimize waste production
  - to list the treatment installations
  - to evaluate the quantity of HCW in the coming 10 years
  - to plan for the creation of new disposal facilities if necessary

# IHCW Treatment in France

- Assessment : 170 000 tons / year infectious HCW generated

- 155 000 tons by 4 500 health care units
- 12 000 tons by 250 000 health professionals
- 3000 tons by 1,5 M<sup>ons</sup> patients at home

- **85 % incinerated**

**Cost** : 240 to 260 euros/ton in domestic incinerators  
+ 150 to 350 euros for transport

- **15 % disinfected**

**Cost** : 350 to 500 euros /ton (up to final disposal )

# Conclusion

## The +

- Regulatory framework, normalization and guidelines
- Biggest producers (hospitals) have HCW management systems
- Enough disposal facilities related to HCW generated in France

# Conclusion

## The -

- Questions about neutralization  
*disinfection's quality, workers safety, social acceptability*

- Waste generated by health professionals  
(medical offices and home care)

= not properly/safely managed

and waste generated by patients at home...

# REGULATIONS IN PROGRESS

- Concerning infectious HCW produced by patients at home :
  - to secure the collect by distributing normalized sharp containers to the patients ;
  - to state the principle of enlarged responsibility of producers ;
  - to adapt the rules about storage and collection

# REGULATIONS IN PROGRESS

- Concerning units of pre-treatment :
  - introducing a certification process of pre-treatment equipments
  - introducing rules for carrying out pre-treatment units
- adaptation to progress (new normalization and new processes)
- links with the evolution of waste regulation in the Environment Code

# Human Anatomic Pieces élimination

- Rules defined by the Public Health Code
  - packaging (normalized)
  - storage (8 days at 0 to 5°C, freezed or collected immediately)
  - transport (ADR)
  - treatment (crematorium)
- monitoring by traceability documents
  - convention ; follow-up forms ; register

# Other hazardous waste

- Submitted to Environment Code
- + Public Health Code for some waste
  - mercury
  - radioactive substances
  - antineoplastic drugs
  - other drugs

# Other hazardous waste

- Mercury waste
  - thermometers forbidden since the 01/03/1999
  - elimination of dental amalgam
    - arrêté du 30/03/1998
- radioactive waste
  - short live waste (decrease management)
  - long live waste (elimination by ANDRA)
  - sealed sources (elimination by the supplier)

# Drug waste

- Antineoplastic drug waste
  - concentrated (incineration as hazardous waste)
  - dirty waste (incinération as infectious HCW)
- other drugs waste
  - hospital and liberals (elimination by the supplier)
  - patient at home (cyclamed)