



**Utrecht University**

## Communicate to Separate

*An Exploratory Study on the Current Waste Management Process of the Faculty of Veterinary Medicine's Department of Clinical Sciences of Companion Animals' Surgical Department and its Possibilities to Recycle Plastic*

### Abstract

This study explores the current waste management process of the Department of Clinical Sciences of Companion Animals' (DCSCA) surgical department, in to fulfil the need for information and clarity regarding this process and to investigate how other comparable organisations have implemented sustainable changes into their waste management process. To provide this much-needed information an exploratory qualitative study with descriptive methods has been conducted over a period of three months. The results provide insights into the current waste management process at the DCSCA's surgical department, and pinpoint how the corresponding guidelines adhere to the Dutch law. Possibilities regarding plastic recycling were investigated. From the results, it can be concluded that the current waste management process of the DCSCA's surgical department's waste is in correspondence to the Dutch law and policies regarding the separation of waste, but that there is a strong need for reassessment concerning the current communication and supervision of these guidelines. Furthermore, the results confirm plastic recycling possibilities for the DCSCA's surgical department. The researcher is confident that this research poses a strong first step in the implementation of sustainable changes in the waste management process of the DCSCA's surgical department.

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## Table of Contents

1.	Introduction .....	4
2.	Research Context .....	6
2.1	External analysis.....	6
2.2	Internal Analysis .....	9
2.3	Reason for Research and Research Goals .....	10
3.	Literature review.....	12
3.1	Waste.....	12
3.2	Types of Waste .....	13
3.3	Waste management .....	15
4.	Research Focus .....	18
4.1	Waste Separation .....	18
4.2	Recycling in Healthcare Facilities .....	18
5.	Methodology .....	20
6.	Results .....	23
6.1	Guidelines .....	23
6.2	Waste Management Process .....	26
6.3	Recycling .....	27
7.	Discussion .....	30
7.1	Guidelines, Communication and Supervision .....	30
7.2	Waste management .....	31
7.3	Recycling .....	32
7.4	Limitations.....	34
7.5	Suggestions for further research.....	35
8.	Conclusion .....	36
9.	Appendices .....	37
9.1	Appendix 1 – Thematic Analysis Themes and Sub-Themes .....	37
10.	List of References .....	42

## 1. Introduction

Utrecht University, situated in the Netherlands, was founded in 1636 (Times Higher Education, 2020) and has since produced twelve Nobel prize winners. In today's society Utrecht University (UU) is recognized for its innovative approach to research while maintaining a high standard of quality (Times Higher Education, 2020). Utrecht University's Faculty of Veterinary Medicine (FVM) was founded in 1821 due to a lack of veterinary knowledge when The Netherlands was hit by three consecutive outbreaks of the rinderpest (Utrecht University, 2015a). Back then, the main focus of veterinary medicine was livestock (Universiteit Utrecht, 2015). In the late 1950's veterinary medicine extended with a new field, medicine of companion animals, due to an increase in the number of pets as a result of economic growth (Koolmees, 2002).

Today, UU's FVM is ranked fourth by the 2020 QS World University Rankings for Veterinary Science (QS, 2020) and fifteenth by the 2019 Shanghai Ranking's Global Ranking of Academic Subjects (Shanghai Ranking, 2019). Furthermore, the FVM is accredited by European, Canadian and American organisations, respectively, ensuring its students the opportunity to work internationally (Utrecht University, 2015a). Within the FVM there are three master degree divisions: Equine Sciences, Farm Animal Health and Clinical Science of Companion Animals (Utrecht University, 2019).

The Department of Clinical Sciences of Companion Animals (DCSCA) consists of several divisions, including a surgical division, that is similar to a small human hospital with comparable facilities. As in any hospital, wound contamination is sought to be minimized in this surgery department, since this is one of the most devastating and challenging complications of surgery (Fossum, 2018). Infections may occur during surgery or during the time spent in hospital in general. To minimize the risk of any type of wound contamination, the use of sterile medical instruments is essential (Baines, 1996). In order to achieve and maintain this sterility, medical instruments are packaged in different types of materials. These packaging materials enable sterilization of the instrument, and once sterilized maintains the instruments sterility (Fossum, 2018). Frequently used packaging materials include instrument cassettes, plastic or paper peel pouches, sterilisation wraps and sterile containers (Fossum, 2018).

Adhering to the previously described sterilization norm, the medical instruments used at the DCSCA's surgical department are packaged in a similar fashion. The surgical kits are wrapped on-site in medical paper before sterilization, while individual instruments are often packed in paper-plastic pouches. Instruments sterilized by the manufacturer, such as syringes and needles, are often packed in a layer of medical soft film, which is a type of plastic, and a layer of medical paper (VP Medical Packaging, 2020). Treatment of patients at the surgical department requires the use of a number of sterile medical

instruments and materials, generating a significant amount of plastic and paper waste, which, after a full day of patient care results in a substantial amount of waste to dispose of. Disposing of this large amount of plastic and paper waste on a daily basis, has sparked the interest of the employees of the DCSCA's surgical department, and the desire to explore the possibilities of recycling this waste, thereby reducing the environmental footprint of treatment conducted at the DCSCA's surgical department.

This research has been conducted for UU's DCSCA's surgery division.

## 2. Research Context

This chapter holds the theoretical framework of the conducted research. By investigating the current global situation (external analysis) and the current situation at both UU and the DCSCA (internal analysis) regarding sustainable waste management insights will be provided. These insights will contribute to the formulating of the research question, the research focus, and eventually the results with the corresponding discussion and conclusion.

### 2.1 External analysis

The effects of global warming and environmental pollution are felt around the world (Fountain, 2020). There is a global rise in awareness regarding environmental issues, alarming double the amount of people it did five years ago (World Wildlife Fund, 2020). Thousands of people from all different backgrounds are now demanding climate actions and a new generation of climate icons such as Greta Thunberg are gaining popularity (Alter et al., 2019; World Wildlife Fund, 2020).

One major source of global pollution is the use and inadequate disposal of plastics. Currently, 40% of the plastics used in Europe is used for packaging and in The Netherlands, the amount of plastic has increased twentyfold over the last 15 years, and is expected to double again within the next 20 years (Ministerie van Infrastructuur en Waterstaat, 2016). In 2013 the global production of plastic consisted of 299 million tons, of which 20% was manufactured in Europe.

The increase in the usage of plastic is the result of its diverse material qualities, such as its relative strength and light weight. However, the downside of plastic is that its production relies heavily on the use of fossil fuels, that plastic is often not recycled and thus valuable raw materials are lost, and that plastic is often found polluting lands and seas after usage (van Veldhoven-van der Meer, 2019). Plastic rarely breaks down, or does so slowly (Ministerie van Infrastructuur en Waterstaat, 2016). When in water, plastic slowly breaks down into smaller particles until micro and nano particles are left (Ministerie van Infrastructuur en Waterstaat, 2016). These so-called microplastics, which are prone to bind toxic substances, are harmful to ecosystems and find their way back into the food chain through birds and fish (Ministerie van Infrastructuur en Waterstaat, 2016).

The rise in awareness of waste pollution has led into a search for solutions. One way to reduce the negative environmental impact is to change waste management and increase recycling possibilities (EEA, 2011). Recycling benefits the environment in various ways (EEA, 2011). For instance, recycling waste prevents it from collecting in designated landfills, thereby preventing toxic discharge (EEA, 2011). Additionally, it diminishes the environmental impact by reducing the need to extract and refine virgin materials, since recycling materials assists in meeting production material demands. Extracting,

refining, and processing new raw materials generate a considerable amount of water and air pollution, which can be avoided through recycling (EEA, 2011; Jersey, 2020).

The Netherlands has taken the recycling of various materials into account in its policy making. Since 2016, the Dutch government is continuously implementing new waste- and production regulations in order to achieve a ‘Circular Economy’ by 2050 (Ministry of Infrastructure and Water Management, 2016). This means that from 2050 onwards, raw materials will be used and reused efficiently, without environmentally harmful emission. If the use of new raw materials has proven absolutely necessary, the extracting, refining and processing should be done so in a sustainable way. Furthermore, products and materials should be designed in such a manner that they can be reused without loss of value and avoiding environmentally harmful emissions (Ministerie van Infrastructuur en Waterstaat, 2016).

One of the priorities of the ‘Circular Economy’ will be to diminish the current usage of plastics. One of the latest developments of the Dutch government in addressing the plastic problem is the so-called ‘Plastic Pact’. The ‘Plastic Pact’ is an initiative of the Secretary of State of Infrastructure and Water Management Mrs. S. van Veldhoven – van der Meer and 75 additional parties (van Veldhoven - van der Meer, 2019). The aim of the Plastic Pact is to simplify and close the plastic chain by producing as many reusable and solely recyclable plastic products and packaging as possible, whilst not using more (different types of) plastic than necessary, by increasing the amount of plastic recycled, and to reuse recycled and biobased plastics for new products and packages (Plastic Pact NL, 2019).

An example of recycling that has already been applied in large quantities is the recycling of paper in all its sorts. In The Netherlands, three million tons of paper and cardboard are produced every year, of which two point two tons is used for packaging (Holwerda et al., 2019). In 2018, 86% of the produced paper and cardboard has been manufactured out of recycled paper (van Houtum and Koopman, 2018). Compared to the plastic chain, the current paper chain is more circular, since the retrieved amount of paper and cardboard, excluding packages, already lies at 86%, and the amount of retrieved paper packages even lies at 88 percent (Afvalfonds Verpakkingen, 2018; van Houtum and Koopman, 2018).

The healthcare sector is also gaining consciousness on its negative environmental impact. Different projects to try and diminish this environmental impact have been launched in a short period of time, one of them being a ‘Green Deal’ for the healthcare sector initiated by the ‘Environment Platform Healthcare’ (Milieu Platform Zorgsector, 2020). The aim of this Green Deal is to improve the quality, accessibility, and availability of healthcare, while diminishing its footprint and thus the long term impact the health sector has on people, the planet, and overall prosperity (Milieu Platform Zorgsector, 2020).

In 2018, the latest Green Deal, Green Deal 226, was launched (Green Deal 226, 2018). The four pillars for the parties involved to enhance sustainability are:

1. To decrease the healthcare sectors' CO2 emission,
2. To promote working circular, in order to reduce waste generation,
3. To reduce the amount of drug residues in surface waters,
4. To create a living environment inside and outside of care facilities that improves the health of all citizens

(Green Deal 226, 2018).

With the healthcare sector looking into sustainability, its waste management companies are implementing sustainable changes too. SUEZ, a self-proclaimed expert in water and waste management (SUEZ, 2020), launched the first ever medical waste container made out of recycled Dutch consumer plastic (de Thouars, 2018). The container is made out of polypropene from SUEZ's own waste sorting facility in Rotterdam and meets all the safety and quality requirements needed for a container that will transport potentially infectious materials (de Thouars, 2018). Research has shown that, compared to a traditional hospital waste container, the environmental impact of this container is 57% less and when comparing the CO2 emission, the recycled container has 51.4% lower CO2 emission (de Thouars, 2018).

To summarize, global warming can no longer be denied and awareness regarding human involvement has reached people of all levels and backgrounds. This global awareness has raised the alarm and set motion into action. The Dutch government, healthcare sector and waste management companies have put their plans into action, laying their focus on recycling and decreasing the CO2 footprint, with plastic management being one of the main focusses.

## 2.2 Internal Analysis

The global and national awareness concerning sustainability has spread to UU. Utrecht University sets high standards for sustainability, placing it at the centre of the execution of its tasks and business operations (Universiteit Utrecht, 2016). The university feels that through the use of its unique combination of expertise in social and natural science, it is in an excellent position to contribute to the transition into a more sustainable society (Universiteit Utrecht, 2016). In addition to aiming to be an inspirational example through its business operations, UU is aspiring to contribute to sustainability through its education and research, aiming to have all its students, regardless of their study background, to be educated on sustainability (Universiteit Utrecht, 2016). The methods with which UU aspires to implement sustainable change can therefore be summarized into three pillars: business operations, research, and education (Universiteit Utrecht, 2019a). The sustainability goal of UU is to be fully CO<sub>2</sub> neutral by 2030, and to have a 33% reduction in CO<sub>2</sub> emission by 2020 when compared to 2014 (Universiteit Utrecht, 2019b). Recent numbers have shown, however, that there is no difference in CO<sub>2</sub> emission between 2017 and 2018 (Universiteit Utrecht, 2019b).

For UU to be able to reach these CO<sub>2</sub> emission reduction and sustainability goals, waste is an important aspect (Vastgoed & Campus and Facilitair Service Centrum, 2019). A report released in 2017 showed an increase in waste, where the total amount of waste in 2015 accounted for 2,312,195 kilograms, in 2017 it was good for 2,565,511 kilograms (Universiteit Utrecht, 2017). More positively, however, recycling increased by 3% over this time period (Universiteit Utrecht, 2017). Nevertheless, the increase in waste stresses the importance of the need for better waste management. Therefore, UU is striving to reduce its production and to optimize its treatment of waste (Vastgoed & Campus and Facilitair Service Centrum, 2019).

One way to achieve this, is to have the waste collected separately by 2020 (Vastgoed & Campus and Facilitair Service Centrum, 2019). To ensure separation of waste from the very beginning, this being the moment when something is thrown away, UU is installing waste-collection systems that grant all visitors the possibility to separate their waste (Utrecht University, 2015b). These waste-collection systems differentiate between general waste, organic waste, and paper waste in all its sorts.

Even though UU is doing a tremendous effort to implement recycling, the current situation at the FVM DCSCA's surgical department does not yet allow the separation of waste other than between residual company waste and medical waste, nor are there any guidelines to further separate their waste. There are, however, employees that have expressed the need to start recycling the large amounts of plastics and paper generated at the surgery department. The employees of the surgical department's sterility division have taken matters into their own hands and have asked for separate paper and plastic waste-

collection systems to start the separation of these types of waste. However, many employees are uncertain about how to implement such a recycling process at a surgical department, since there might be different guidelines compared to everyday recycling. This leaves them wondering if there are possibilities to recycle at a surgical department at all.

To summarise, UU is taking tremendous steps towards sustainability and recycling, that match the worldwide trends. However, not all individual departments have caught up with the trend yet. The FVM's DCSCA's surgery department has some employees taking initiative to incorporate recycling, however, uncertainty regarding recycling is holding them back from persevering recycling.

### 2.3 Reason for Research and Research Goals

When comparing the global and national trends and the progress made regarding sustainability and recycling to the current situation at the DCSCA's surgical department, there is an undoubtful gap. Employees of the DCSCA's surgical department are confronted with this discrepancy in what is known and shown to be possible, versus the current situation at work. It should be no surprise that this discrepancy has left them wondering what opportunities are available to them to contribute to a more sustainable world through the waste management of the DCSCA's surgical department's waste.

This wondering about opportunities has led, as mentioned previously, to the employees expressing their need to start recycling of the plastic and paper waste generated at the DCSCA's surgical department, but that uncertainties regarding proper recycling guidelines and the overall recycling possibilities are holding them back. Therefore, there is a clear reason to research how recycling of plastic and paper can be implemented at the DCSCA's surgical department. Nonetheless, before this research can be conducted and change can be implemented, it is of great importance to first gain full awareness of the current process of the DCSCA's waste management. This is a logical order of business, often followed without even realizing. Subsequently, there is clear reason to research the current waste management process, as the first step towards changing it.

Furthermore, as depicted from the external analysis, the recycling of paper is a well-established process in The Netherlands, currently reaching recycling numbers over 80%. This suggest that the paper recycling process is close to its optimal and that clear guidelines regarding the process are established, making it easy for the DCSCA's surgical department to follow these general guidelines. However, the recycling process of plastics is barely developed, and only recently has the national government started to acknowledge its important role within sustainability. This means, that for plastic recycling, there is still a lot to discover. Therefore, in order to expand the knowledge regarding the recycling possibilities for the DCSCA's surgical department further than the already established paper recycling process, the recycling of surgical plastic will be the scope of this research.

From the internal analysis it can be derived that the employees of the DCSCA's surgical department are uncertain regarding the recycling options for their surgical department's waste. A good way to explore these recycling possibilities, is to investigate similar organisational bodies that have already implemented recycling into their surgical departments' waste management processes. Therefore, additional to the DCSCA's current waste management process, there is a clear reason to research similar organisational bodies' waste management processes to see the recycling possibilities available to the DCSCA's surgical department.

The aim of the study will be to research and determine the current waste management process of the DCSCA's surgical department's waste and how other comparable organisational bodies have implemented plastic recycling into their surgical departments' waste management processes. The outcome of this study will provide information and clarity regarding the current waste management process of the DCSCA's surgical department, and brings examples from other surgical departments' plastic recycling processes, in order for the DCSCA's surgical department to further assess its possibilities for the sustainable improvements of its waste management.

Therefore, the following research question has been formulated:

*"What is the current waste management process of the DCSCA's surgical department's waste,  
and are there possibilities to recycle its plastics?"*

### 3. Literature review

In order to map, study and determine the current waste management process of the DCSCA's surgical department, it is important to understand what exactly constitutes "waste", what types of waste exist and how they are defined, and what regulations exist around their disposal.

As mentioned, the goal of the research and the researcher is to determine the current waste management process of the DCSCA's surgical department. Before executing the research, it was key to deepen the researcher's knowledge and explore existing literature regarding certain topics concerning waste management. Therefore, existing literature on certain concepts in the research question and the external and internal analyses has been explored, to develop the research focus.

#### 3.1 Waste

There are multiple definitions for waste. When considering the Cambridge English Dictionary, waste is defined as "*unwanted matter or material of any type, especially what is left after use*" (Cambridge English Dictionary, 2020). The European Parliament and Council (EPC) define waste in a different manner, defining it as "*any substance or object which the holder discards or intends or is required to discard*" (European Union, 2008). Some parties find the current definition of the EPC unsatisfactory and believe it does not stimulate towards sustainable waste management (Pongrácz and Pohjola, 2004). According to Pongrácz and Pohjola's research (2004), the current definition does not encourage reuse, recycling or recovery measures nor does it embody the essence of waste prevention(Pongrácz and Pohjola, 2004). Furthermore, they believe that defining waste as "*a substance or object which the holder discards*" (European Union, 2008), does not encourage to minimize the generating of waste, and thus avoiding having an object or substance to discard in the first place, since they consider this to be the most appropriate waste reduction approach.

Even though parties argue that the current definition of the EPC is insufficient in the stimulation of sustainability and recycling in all its sorts, the researcher finds that EPC's definition is broad and can be interpreted in multiple ways. The '*holder discards or intends or is required to discard*' (European Union, 2008) does not state that the discarding cannot be done in a sustainable way as suggested by Pongrácz and Pohjola (2004), it only states that it will no longer be with the current holder. This, together with the fact that UU is an institution situated in the Netherlands, an important member of the European Union, has been the reason for the researcher to adopt the EPC's definition of waste for this research.

### 3.2 Types of Waste

The list of types of waste can be endless, depending on how the waste is categorized. The European Union differentiates waste into 20 major categories, each divided further into sub-categories (European Union, 2014). To have a clear distinction between types of waste, and to be able to make international comparisons, the European member states requested a list that gives clear and unambiguous characteristics to the different types of waste (Openbare Vlaamse Afvalstoffenmaatschappij, 2019). Hence the European waste list, the EURAL, was constructed and taken in use from the third of May 2000 onwards (European Union, 2000). All 800 different types of waste on this list have been given a six digit code; their euralcodes (European Union, 2000). The list contains both hazardous and non-hazardous types of waste. The types of waste that have been deemed hazardous by experts are marked with an asterisk (\*) behind their euralcodes (European Union, 2000). It is possible for each member state to make national or regional expansions. The EURAL will be updated when new numbers and research demonstrate it to be necessary (Openbare Vlaamse Afvalstoffenmaatschappij, 2019).

As discussed previously, however, the DCSCA's surgical department currently only differentiates between two types of waste: general non-regulated waste and infectious medical waste. Therefore, all other types of waste will be excluded from the scope of this research.

#### 3.2.1 Medical waste

The World Health Organisation (WHO) defines medical waste as waste that "*includes all the waste generated by health-care establishments, research facilities, and laboratories. In addition, it includes the waste originating from "minor" or "scattered" sources—such as that produced in the course of health care undertaken in the home (dialysis, insulin injections, etc.)*" (World Health Organisation, 2020). Since this covers a diverse list of materials the WHO has categorized them into the following categories: sharps, infectious waste, radioactive waste, pathological waste, pharmaceutical waste, chemical waste, genotoxic waste, and general non-regulated medical waste, respectively (World Health Organisation, 2020). The waste in the latter term is also known as non-hazardous waste, or non-specific hospital waste – this type of waste does not pose any danger and should be disposed of through the municipal disposal mechanisms (MedPro Disposal, 2018; World Health Organisation, 2020). This type of waste will be addressed further on.

The National Waste Plan (LAP3) (LAP 3, Sectorplan 19, 2019) provides more detailed information on the classification of medical waste in one of its sector plans with the use of euralcodes. The euralcodes for veterinary medical waste are 180202\*, 180203, 180205, 180206 and 180207, respectively. Table 1

shows the specifications per euralcode. The euralcode 180202 has been marked with an asterisk, meaning it is categorized as hazardous waste and needs to be treated as such.

180202*	Potentially infectious waste <ol style="list-style-type: none"> <li>1. Sharp object/ needles regardless of their origin or the type of contamination</li> <li>2. Non dried up blood and all the non-dried excrement, regardless of the origin or contamination</li> <li>3. All the waste that is potentially contaminated with microorganisms and that is generated during the conscious reproduction of microorganisms in laboratories, regardless of the origin or contamination.</li> <li>4. All the waste that has been in direct contact with (laboratory) animals that are infected with infectious disease that is listed on the category A ADR list without the ad-on cultures only;</li> <li>5. Waste of (experiment) animals with an infectious disease that does not meet the criteria described in points 1 to 4 but where based on a professional judgement it is determined that the waste generates a risk in the waste removal chain</li> </ol>
180203	All the waste that is formed during diagnosis, treatment and prevention of disease of animals that cannot be classified within a euralcode in chapter 180202, such as waste that has been decontaminated conform the regulations
180205	Chemicals that contain or are made out of hazardous substances
180206	Chemicals that are not included in 180205
180207	Cytotoxic and cytostatic medicaments
180208	Medicaments that are not included in 180207

Table 1 Veterinary waste and their Euralcode (LAP 3, Sectorplan 19, 2019)

### 3.2.2 General non-regulated medical waste

According to the WHO, the amount of the waste produced by healthcare providers that does not impose a health risk, lies between 75 and 90% of the total waste produced by health-care-related activities (World Health Organisation, 2020). To determine whether or not the generated waste imposes a health risk the categories described in Table 1 can be used. All the waste that does not fit the description of the categories 180202 or 180205 to 180207 can be classified as general non-regulated medical waste, also known as nonspecific medical waste ; euralcode 180203.

### 3.3 Waste management

Managing waste consists of collecting , transporting, processing, recycling and/or disposing and monitoring of waste materials, the supervision of these operations and the after-care of disposal sites (Demirbas, 2011; European Union, 2006). It is important to manage waste in the correct manner, since poor waste management can have an enormous impact on the local and global environment, health and economy (Kaza et al., 2018).

Medical waste should always be managed in a well-determined process from the point of its generation up until its final disposal. The WHO (2017) stresses that medical waste management (MWM) is a management issue and therefore depends on the employees, and their commitment to the cause (World Health Organisation, 2017). To ensure this desired commitment, it is important to teach current and future employees the reasoning behind rules and guidelines, as well as the potential risks malmanagement imposes . Furthermore, the WHO advises to have good supervision regarding the waste management and implementation and execution of the rules and guidelines (World Health Organisation, 2017).

In The Netherlands, waste management, including MWM, is regulated by law and policies. These policies are described in the National Waste Management Plan (NWMP), of which currently the third version is in use, and organisational bodies are expected to respect and abide to these policies in their waste management (“National Waste Management Plan,” 2020).

One of the policies states that in order to create pure and easy-to-process waste streams it is important to manage and treat different categories of waste individually. To achieve these individual waste streams throughout the entire waste management process it is of great importance to separate waste at its source of generation (Ministerie van Infrastructuur en Waterstaat, 2020a). In chapter B3 appendix 5, the NWMP provides a list of waste categories that are ought to be kept separated (Ministerie van Infrastructuur en Waterstaat, 2020b). Furthermore, the law states that once separated, the different categories of waste have to be kept separated up to the final waste treatment, forcing waste management companies to transport different categories of waste separately in most cases (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2019, 2018). Medical waste categories classified with euralcodes 180202\*, 180205, 180207 and 180203 (Ministerie van Infrastructuur en Waterstaat, 2020b) are mentioned on this list. Therefore, these types of waste are ought to be kept separated, obligating the healthcare facilities generating them to differentiate between the different types of waste.

Once separated, the different categories of waste can be managed differently. Waste classified with euralcode 180203, defined as nonspecific medical waste, is not considered to pose a potential infectious risk during transportation or treatment. This, and the fact that it has a similar composition to general (household) waste, allows this type of waste to be classified and treated as residual company waste. This means that it can be transported to- and treated at- regular waste incineration installations as long as the waste is being incinerated (LAP 3, Sectorplan 19, 2019; LAP3, Sectorplan02, 2019).

As mentioned earlier, waste with euralcode 180202\* is earmarked as potentially hazardous and therefore requires different management compared to non-hazardous waste. There are several treatment options regarding this category of waste. The first option is to decontaminate the waste in order to kill off its potentially hazardous character (LAP 3, Sectorplan 19, 2019). Once decontaminated, and thus no longer potentially hazardous, waste with euralcode 180202 (note the absence of asterisk) may now be treated similar to waste with the euralcode 180203. However, even after decontamination, the policy which states different categories of waste should be kept apart is still in force, making it illegal to physically mix the 180202 classified waste with the 180203. They are however allowed to be assembled and taken away at the same time, as long as the different waste categories can be differentiated (LAP 3, Sectorplan 19, 2019).

The decontamination of potentially hazardous waste is not obligated. If a healthcare facility decides not to decontaminate its potentially hazardous waste, then this waste has to be transported to a waste incineration installation with a licence to treat potential hazardous waste (LAP 3, Sectorplan 19, 2019). In The Netherlands there is only one of those licenced waste incineration installations, ZAVIN in Dordrecht (LAP 3, Sectorplan 19, 2019). The only acceptable treatment for potentially hazardous waste is incineration, under the strict condition that the incineration process destroys all potentially hazardous materials (LAP 3, Sectorplan 19, 2019).

Waste is unavoidable and its management should be done in such a way that its environmental impact is minimised (Dijkema et al., 2000). More advanced waste management systems, often situated in wealthier regions, have the possibility to aim for the minimization of their environmental impact as well as optimizing the preservation of resources (Kaza et al., 2018). There is a sustainability hierarchy when it comes to these more sustainable management options. Highest in the hierarchy is prioritizing on minimizing waste or the generation of waste in general, followed by the reuse and recycling of materials. The process of recovering energy from waste treatment processes such as incineration, only comes after composting in the hierarchy, since incineration causes air pollution and all (valuable)

materials are lost. Absolute last in the hierarchy is the disposing of waste at landfills (Dijkema et al., 2000; Kaza et al., 2018)

Within the current medical waste management it is interesting to find out whether there are ways to improve its sustainability as well. When obeying the hierarchy mentioned above, the first priority should be to try and diminish the amount of waste generated (Kaza et al., 2018). This, however, is a difficult task for healthcare facilities concerning their medical waste, since medical treatments requires a lot of different medical instruments and materials. The only way to diminish waste generation, would be to reconsider which instruments are essential during treatment, and to avoid using non-necessary equipment. This is simply not an option, since this may lead to bad decisions and carelessness when it comes to medical instrument (re)use, potentially putting both patient and caregiver at risk. A better way in which medical waste of healthcare facilities can be reduced, is through careful management of their pharmacies, and so avoiding the expiring of medicines (Kaza et al., 2018). Furthermore, recycling may be an option. Items- or objects that have the feasibility for reuse or recycling are mostly objects that do not come into direct patient contact, thereby avoiding the risk of contamination.

## 4. Research Focus

Prior research, as discussed in the literature review, has highlighted that, in order to get individual, easy-to-process, waste streams, it is important to separate waste. The national government has established laws and policies, forcing organisational bodies such as the DCSCA to separate their waste. The three main themes described below are built into the study in order to have a focus throughout the research. These themes are derived from the literature review as crucial for a waste management process, combined with being constructed to gain information needed to answer the research question.

### 4.1 Waste Separation

As mentioned earlier in this document, medical waste that is categorized with euralcodes 180202 and 180203 is listed by the NWMP as waste that should be separated at the source as well as kept separated throughout the entire waste management process. To ensure this waste separation, the WHO stresses that it is required to have employees that are committed to this cause, something that may be facilitated through the use of clear guidelines. Furthermore, the WHO mentions the importance of supervision. Therefore, questions are raised whether the DCSCA's surgical department has guidelines that ensure the separation of the waste at its source, whether these guidelines are understandable for- and well communicated to the employees, and whether there is supervision regarding commitment to these guidelines.

#### Waste management

While the responsibility for waste management can be placed at a local, national, and even international level, merely the direct stakeholders are considered in the scope of this research . To fully understand the DCSCA's surgical department's current waste management process it is key to identify all stakeholders involved as well as pinpointing which respective role they fulfil. Therefore, the researcher has investigated which stakeholders, in addition to the DCSCA, are directly involved in the management of the DCSCA's surgical department's medical waste and how these stakeholders manage this waste.

### 4.2 Recycling in Healthcare Facilities

In all waste management process, it should be ensured that the environmental footprint is as small as possible (Dijkema et al., 2000). As previously noted, the best way to minimize one's environmental waste impact is to diminish the waste generated. However, unfortunately this is not the best choice for health care facilities, as has already been pointed out. When taking into consideration the sustainability hierarchy, the next best option would be to recycle the generated waste and, since the DCSCA generates a lot of plastic, recycling this plastic could be an option. This option has been

considered by the DCSCA's surgical department, but has not been put into action yet, since, besides the fact that there is general unclarity about their current waste management process, it is also not clear what possibilities of recycling plastic in healthcare facilities generally are. The best way to gain information on this topic is by observing and gaining information from the initiatives of other, similar organisations. Therefore, the researcher has sought these possibilities by investigating if other Dutch healthcare facilities have implemented recycling in their surgical departments, and if so, how they have managed to do so successfully.

## 5. Methodology

This qualitative research has been conducted in the spring of 2020 for the DCSCA's surgical department. The aim of the research was to pinpoint what the current waste management process at the DCSCA's surgical department entails and to clarify the aspects included in this process. Therefore, the researcher has decided to approach the research question by using an exploratory study with descriptive methods. According to Saunders et al. (2009) exploratory studies are "*a valuable means of finding out 'what is happening'; to seek new insights; to ask questions and to assess phenomena in a new light*"(Saunders et al., 2009, p.139), and they can be beneficial in situations that need the clarification of a matter. Exploratory studies and descriptive methods go hand in hand due to the possible objective of descriptive methods to "*portray an accurate profile of an event*" (Saunders et al., 2009, p.140). Therefore, the researcher is confident that combining the two provides the opportunity to accurately describe the findings of this exploratory study (Saunders et al., 2009).

### 5.1.1 Data Collection

The data was collected through a multi-method qualitative approach in a population of waste experts, whose institutions are stakeholders in the researched waste management process. The determination of the population samples was executed using snowball sampling in combination with convenience sampling. Snowball sampling is a "*non-probability sampling procedure in which subsequent respondents are obtained from information provided by initial respondents*" (Saunders et al., 2009, p.601). In this research the snowball sampling started at the DCSCA where through primary data gained, the next stakeholder in line in the waste management process was identified, and it went on from there. Convenience sampling is defined as "*non-probability sampling procedure in which cases are selected haphazardly on the basis that they are easiest to obtain.*"(Saunders et al., 2009, p.589) and applied in this research as the experts that have been sampled based on their expertise, as well as on their availability and willingness to assist in the research.

Waste experts from different stakeholders within the waste management process have been consulted. The first stakeholder within the current waste management process is the DCSCA's surgical department since the waste is generated there. The DCSCA's employees are busy people leading to few experts in this field to be available to assist in the research. When the researcher contacted the first employee, snowballing and convenient sampling led to a face-to-face interview with a different-, this research's first expert, Mr. Hans van Baar. (van Baar, 2020), is a valuable expert since he has been with the DCSCA for at least three years as a front office employee of the facility service centre, and therefore has extensive knowledge on waste guidelines and management at the DCSCA's surgical department. Halfway through the interview with Mr. van Baar, when overhearing the conversation a

second expert joined the discussion out of interest. This second expert is an employee of the DCSCA's surgical department and is therefore knowledgeable on the waste management execution directly on the work floor (Anonymous Employee, 2020). This expert indicated a desire to remain anonymous. This face-to-face, two-expert interview was recorded using a mobile phone voice recorder after which it was transcribed for data analysis purposes.

A second face-to-face interview was conducted at the DCSCA, this time with the Occupational Health and Safety & Environment Expert of the FVM, Ms. M. Schmitz (MS) (Schmitz, 2020). Her knowledge regarding the waste guidelines and the waste management is superior to any other employee, since she has created the current guidelines. The same recording and transcribing techniques as previously mentioned were used for this interview.

With the primary data collected at the DCSCA, the researcher was able to establish that Renewi is the waste management company that manages the DCSCA surgical department's waste. Therefore, the researcher reached out to Renewi's DCSCA account manager. The account manager, who prefers to remain anonymous, was interviewed through a telephone interview, during which the data was recorded through handwritten notes by the researcher. Additionally, the researcher attempted to further elaborate on the topic by submitting questions through an e-mail interview as described in Cassell and Symon 2004 (Cassell and Symon, 2004). However, the email interview was ineffective from the start, due to the lack of response from the expert. After this loss of contact by the end of March, and after multiple unsuccessful attempts to re-establish the contact, the researcher was left with no choice but to utilize the information collected so far.

The snowballing sampling led to the third and final stakeholder, the waste incineration installation licenced to incinerate potentially hazardous waste: ZAVIN Dordrecht. Unfortunately, the researcher was not provided with a contact person for ZAVIN. Therefore, ZAVIN was contacted through calling their general phone number. The employee spoken to reacted negatively on the request for answers due to the extreme increase in waste the company was experiencing because of the Corona Virus Disease 2019 (COVID-19). The employee kindly requested to put the questions into the standard contact form on their website and promised that they would respond when there was time to do so. Unfortunately, so far no response has been received, despite multiple attempts in filling the contact form on their website.

The waste recycling expert, that the researcher was planning to contact, at the Utrechts Medisch Centrum (UMC), the UU's medical training hospital, that was recommended to the researcher to be interviewed, could not participate in the research since COVID-19 imposed priorities elsewhere. Therefore, the researcher considered different possibilities. Additional research and contacting of

hospitals known to have implemented recycling in their surgical departments, resulted in a positive response from OLVG, a hospital situated in Amsterdam. The expert Ms. E. Parma (Parma, 2020) has been the current environmental coordinator of the two separate locations of OLVG for nearly two decades. Ms. Parma is extremely driven and her knowledge regarding the general medical waste separation guidelines and the required waste management is extraordinary. Her network directed the researcher towards a newly recommended expert, conveniently based at the already earlier contacted UMC. This new expert representing the UMC was Mr. E. van Stralen, team leader internal logistics and waste management. Just like Ms. Parma (EP), Mr. van Stralen (EvS) has tremendous knowledge regarding waste, its guidelines and its management. Both experts have been interviewed through telephone, during which data was collected again through voice recording and transcribed for analysis.

As described, data was collected using multi-interview methods, which was complemented with the study of relevant written documentation. The first two interviews conducted were face-to-face unstructured interviews. However, as the research progressed, due to the COVID-19 pandemic (as explained in the limitations further on) face-to-face interviews were no longer an option. Therefore, for the remaining experts, the researcher collected data through unstructured, one-to-one, telephone and internet-mediated (electronic) interviews (Saunders et al., 2009).

Besides data collection through interviews, data was also collected from documents and the information available on websites of the relevant stakeholders. All experts that have been interviewed have given consent to the information being used in this research. Furthermore, all experts named by name have given additional consent for this matter.

### 5.1.2 Data analysis

After the initial collection of all data, analysis was subsequently performed. The recorded interviews were transcribed prior to their analysis. Once all data was collected, thematic analysis was performed as described in Nowell et al. (2017). To prevent bias while analysing the data, the researcher decided to conduct thematic analysis, ensuring all data was holistically considered. To ensure all data was considered rather than merely the data that answered these questions, emphasis was put on not to focus on the research question, nor the research focus during data analysis. This resulted in a more in-depth analysis of the collected data, causing the researcher to have more elaborate results, and providing more value to the DCSCA's surgical department.

With the use of this thematic analysis, main themes and their subthemes were derived from the data as shown in Appendix 1, with the main themes are guidelines, process and recycling. The results are elaborated further below.

## 6. Results

The analysed data has led to some interesting results. As illustrated in Appendix 1, three main themes, with each their sub-themes, can be derived from the data. The first main theme is guidelines, consisting of the sub-themes stakeholder guidelines, guideline communication, supervision/ responsibility, and clarity, respectively. The next main theme is process, with the stakeholders waste management process and corresponding actions as sub-themes. Lastly there is recycling, with sub-themes process and guidelines, communication, willingness, and timeframe, respectively. The results have been elaborated on further below.

### 6.1 Guidelines

The first theme, guidelines, is about the guidelines that are established by the stakeholders to make a differentiation between the different types of waste. These guidelines are essential as, without them, there would be no clarity on how to generally separate waste.

#### 6.1.1 Stakeholders' guidelines

The stakeholders' guidelines are established by the direct stakeholders of the DCSCA's surgical department's waste management process. The most important aspect of the guidelines is to make a clear differentiation in waste categories. According to MS (2020) and Anonymous (2020) the guidelines are based on the Dutch national law and -policies. Renewi describes residual company waste, which contains the nonspecific medical waste, as "*waste that is generated through operating a business that is not suited for recycling and can be incinerated*" (Renewi, 2018), medical waste not included. According to van Baar, at the DCSCA's surgical department residual company waste has "*a broad definition, it's in fact everything that can go into the press container, being everything that's not medical waste or what goes to destruction*" (van Baar, 2020). Universiteit Utrecht agrees that residual company waste should not contain any dangerous waste or medical waste and adds that the residual company waste should go into dedicated the trash bags obtained from the cleaning company (Arbo&Millieu Coordinator, 2019).

According to Renewi, medical waste is waste categorized with euralcode 180202\* and translates this into "*laboratory animals and parts of laboratory animals that are infected with microbes stated in group A and B of the law concerning prevention and detection of infectious disease; testing animal that have been treated with medication; sharp materials such as injection needles; broken instruments etc., cytostatica, large quantities of blood, plasma and other fluid waste*" (Renewi, 2020). Utrecht University further elaborates that medical waste is waste that is generated with the treatment of or research with animals, including infected bandages (Facility Service Centre et al., 2017), and that all potentially infectious materials should be treated as medical waste (Arbo&Millieu Coordinator, 2019).

Additionally, Occupational Health and Safety & Environment stresses the importance of ethics concerning this type of waste, stating that disposables smeared with blood should be considered and treated as medical waste.

The stakeholder guidelines state that medical waste is collected in certified yellow containers, which are air tight, clean and dry on the outside, and should not outweigh the maximum weight capacity, nor be top heavy, and should be marked with a sticker that is obligated by law to mark its potential hazardous content (Anonymous, 2020; Arbo&Millieu Coordinator, 2019; Facilitair Service Centrum, 2017; Renewi, 2020; Schmitz, 2020). Even though needles and sharp objects are medical waste, they should not be thrown into the normal yellow containers, since there are no sharp objects allowed to stick out of the yellow containers (Arbo&Millieu Coordinator, 2019). Therefore the needles are "*collected in special needle containers, which are collected and eliminated through the medical waste containers*" (Arbo&Millieu Coordinator, 2019). Furthermore, according to the guidelines of Renewi, in case of an abundance of fluids in the container, there should be absorbing materials to prevent it from splashing (Facilitair Service Centrum, 2017; Renewi, 2020).

### 6.1.2 Guideline Communication

Guideline communication has shown to be an important topic. According to van Baar (2020), the relevant guidelines are not documented at DCSCA's surgical department and he expresses the absence of waste guideline charts explaining waste separation. The lack of documentation of guidelines at the surgical department is being contradicted by Schmitz, who states to have provided a shortened version of the waste guidelines so that employees do not have to plough through pages of guidelines, hoping to make the guidelines more accessible (Schmitz, 2020). However, the individuals that the guidelines have been sent to are stated to management function (Schmitz, 2020).

Mr. van Baar and Ms. Schmitz agree on the fact that there has been some form of guideline communication, and both suggest that the information has been communicated through emails (Schmitz, 2020; van Baar, 2020). HB states that this has been in the past and on an occasional notice "*We have had some emails regarding guidelines*" (van Baar, 2020), while MS states that "*I am surprised that I am continuously doing this*" (Schmitz, 2020), referring to her continuously communicating the guidelines to others. The anonymous employee of the DCSCA, however, firmly states "*We never hear from her*" when MS is mentioned in the interview (Anonymous Employee, 2020). This anonymous employee proceeds by stating that "*I dare to tell you that there are guidelines, but that these guidelines are not being communicated*" (Anonymous, 2020).

### 6.1.3 Guideline Supervision and Responsibility

Analysing the obtained data showed that the supervision and responsibility of the guidelines is a reoccurring theme. When asked who ensures that the waste guidelines are being followed the data shows that the responsibility is being passed down. Renewi expects the waste generator, in this case the DCSCA's surgical department, to be aware of the guidelines and to follow them, but admits that it is difficult to oversee the actual following of guidelines (Anonymous, 2020). When Ms. Schmitz was asked, who currently makes sure that the guidelines are being followed, Ms. Schmitz states "*I am not responsible, I work in the occupational health and safety & environment department, and I am not responsible for the fact if someone on the floor is following the guidelines or not... that should be up to the team leaders or the supervisors*" (Schmitz, 2020). Additionally, Ms. Schmitz suggests that the cleaning company should have a signalling function in case they notice that the guidelines are not being followed when collecting the produced waste (Schmitz, 2020). Furthermore, the employees of the DCSCA surgical department believe that there are no guidelines to follow; everybody is doing what he/she thinks is best, and Mr van Baar thinks everyone is taking their own responsibility regarding the matter (Anonymous Employee, 2020; van Baar, 2020).

Clear supervision appears in the data as external supervisors checking the waste containers for the mandatory hazardous waste stickers (Anonymous, 2020). Furthermore, there is supervision by the governmental body Humane Environment and Transport Inspectorate, that checks from time to time if guidelines are being followed regarding storage and transport of waste (Anonymous, 2020).

### 6.1.4 Guideline Clarity

The final sub-theme within guidelines is the guideline clarity. The employees of the DCSCA's surgical department state that the current guidelines are non-committal, and a lot of questions are raised regarding to which category certain waste items belong to; some even describe the current following of guidelines as '*a mess*' (Anonymous Employee, 2020; van Baar, 2020). "*And if there will be clarity then please, because everybody is in need of clarity... the employees are the ones that have to execute the guidelines, so please ensure clarity for the workforce*"(Anonymous Employee, 2020). In juxtaposition, when asked about the clarity of the guidelines Ms. Schmitz stated that they are very clear and can be found on the university's intranet (Schmitz, 2020). However, the employee at Renewi was also struggling to clarify the exact guidelines and had to ask her colleagues whom she defines as being more knowledgeable regarding this (Anonymous, 2020). Ms. Parma from OLVG believed the guidelines in the Sectorplan 19 from the NWMP multi interpretable and therefore make it difficult to separate waste into its correct categories (Parma, 2020). Therefore, she gave her own interpretation to certain guidelines, such as the droplet pollution (Parma, 2020).

## 6.2 Waste Management Process

The next main theme within the acquired data is the waste management process itself, depicting how the stakeholders handle the process and what actions are related to this.

Utrecht University is a big waste generator and can therefore order the waste containers needed from the waste management companies (Schmitz, 2020). The yellow containers are ordered through a TOP-desk notification to the Facility Service Centre (FSC) (Arbo&Millieu Coordinator, 2019). According to Ms Schmitz the costs generated for the waste management are being covered by the facility service centre(Schmitz, 2020), however, it appears that this is not common knowledge since the anonymous employee states that the question "*Do you know how expensive that is?*" (Anonymous, 2020) is often raised when it comes to waste separation.

The storage of the yellow containers should not be done in the hallway or outside the buildings, and, once closed, the containers are not allowed to be stored for more than two weeks (Facilitair Service Centrum, 2017). If the waste is susceptible to deterioration, it should be stored in a freezer for as long as possible and dead laboratory animals should be frozen too (Facilitair Service Centrum, 2017, 2017).

*"The smaller yellow containers for the needles and sharp objects are being emptied into bigger yellow containers"* (Anonymous Employee, 2020), however, Mr. van Baar states that normally there is a bigger storage container where the smaller containers have to be stored into (van Baar, 2020).

The garbage bags containing the residual company waste from the entire DCSCA's surgical department are collected at the end of the day by the cleaning company Asito, put onto stretchers and brought to garbage containers that are standing just outside the sterilisation section of the DCSCA' surgical department (Schmitz, 2020; van Baar, 2020). When these containers are full, they emptied into the DCSCA's press container which is located outside the building. The waste management company Renewi collects this container every once in a while (van Baar, 2020).

When the guidelines as described above are not being followed, it can lead to tainted waste categories and Renewi can decide not to accept to process the waste. This means that the waste is left at the location where it was generated. This might happen, for example, when there are needles in the residual company waste (Arbo&Millieu Coordinator, 2019; Schmitz, 2020; van Baar, 2020). Renewi further states that after having collected the waste from the waste generator, in this case the DCSCA, and having sorted the waste, it is still possible that a batch of waste is disapproved (Anonymous, 2020). When this happens, Renewi sends pictures of the incorrect waste to the waste generator, charges more money, and issues an official warning. If it were to happen again, Renewi refused to collect the press container (Anonymous, 2020).

Renewi brings the medical waste to the waste incineration institute ZAVIN in Dordrecht, where it is incinerated under supervision and regulated conditions (Anonymous, 2020). While both types of waste are incinerated, the anonymous interviewee states that the reason why residual company waste and medical waste are transported and incinerated separately is mostly due to the way the waste is managed, as medical waste is managed more carefully (Anonymous, 2020). Furthermore, there are different diploma's for drivers that work with different categories of waste and the incineration of the medical waste is executed more carefully, container for container, to prevent infection of bystanders and the environment (Anonymous, 2020).

### 6.3 Recycling

The final theme is recycling and the data within this theme is mostly gathered from the hospitals that have implemented recycling.

#### 6.3.1 Timeframe and Willingness to Recycle

Recycling within surgical departments is relatively new. For OLVG the recycling of plastics from their surgery department has started in 2017 and for the UMC in 2018 (Parma, 2020; van Stralen, 2020). The plastic recycling initiative in OLVG came from the employees and the surgical department themselves (Parma, 2020). Since the implementation of the recycling people have been very willing to recycle, as Ms. Parma says "*People became very driven*" (Parma, 2020). Even with the majority of employees being positive, Parma states there are always people who believe it to be nonsense and tainting the waste categories (Parma, 2020). However, OLVG experienced the most resistance from their waste management company, as it did not want to cooperate if the plastic waste was not pre-sorted into the different types of plastic, something Ms. Parma deemed an impossible task to ask her workforce (Parma, 2020).

The UMC's employees' willingness to recycle is similar to that of OLVG, as it was also the surgical department that came with the initiative to start to recycle their package plastics (van Stralen, 2020). According to Mr. van Stralen the willingness to recycle differs per division but the surgical department is "*very enthusiastic*" (van Stralen, 2020). It is clear that the UMC's surgical department has the back up from the UMC as Mr. van Stralen states "*We as a hospital are trying to make our waste more recyclable, that is definitely an ambition, an ambition that relates to the fact that we are a hospital, we make people better, therefore we should not pollute the environment*" (van Stralen, 2020). Furthermore, the UMC believed that if they, as large generators, do not try to change and innovate the current waste management, no-one will (van Stralen, 2020). In contradiction to OLVG, the UMC did not experience a lot of resistance from the waste management company (van Stralen, 2020). The

UMC advises the DCSCA's surgical department to consider recycling their plastics too (van Stralen, 2020).

At the DCSCA, if a department is interested in separating their waste, they will come ask for materials to ensure this waste separation themselves (van Baar, 2020). Mr. van Baar states increasingly that questions are regarding waste separation and recycling, and that people are interested but simply do not know how to do it (van Baar, 2020). According to Mr. van Baar the question if employees can start plastic recycling has come from the extraordinary amount of disposables (van Baar, 2020). However, Anonymous (Anonymous Employee, 2020) expresses her doubts whether or not one should wish to have waste separation in the DCSCA's surgical department since there might be a risk of contagious disease.

### 6.3.2 Progress and Guidelines

Currently, there is only one plastic waste container at the DCSCA's surgical department and it is not located within the surgery rooms themselves (Anonymous Employee, 2020; van Baar, 2020). Both OLVG and the UMC have plastic waste containers next to the surgery rooms, where all the plastic from the plastic packages is thrown into, and no differentiation between plastic types are being made (Parma, 2020; van Stralen, 2020). The plastic waste from OLVG's surgical department is brought to Kras Recycling by Renewi where it is turned into pellets that can be used as fuel in the brown coal power plants in countries such as Sweden (Parma, 2020). The plastic waste of UMC is collected by SUEZ and brought to Attero, where, after a sorting process, plastic granulates are made that can be used as raw materials in the plastic industry (van Stralen, 2020). The UMC only recycles the plastic that has been in clean areas of their surgical department; plastic coming from less clean areas is treated as residual company waste (van Stralen, 2020).

### 6.3.3 Communication

At OLVG, the waste separation guidelines have simply been put on an A4 word document and distributed to the contacts of the relevant divisions by Ms. Parma; allowances to change the guidelines according to need have been granted (Parma, 2020). The printed waste guidelines are physically hung close to the waste separation containers to help the employees with the separation process (Parma, 2020). When questions regarding waste separation are asked she prefers to go and have a look herself, rather than answering from behind her desk (Parma, 2020). Furthermore when needed Ms. Parma gives "*clinical lessons... where I give information on why we separate our waste, what laws and policies are involved and what the costs are, since different categories have different costs.*" (Parma, 2020). The new employees get the information regarding the waste separation from a new employee app, Ms. Parma adds that using this app is unfortunately not obligated. Ms. Parma states that check-ups are

performed once in a while, and that when something is found not to be as it should be she provides feedback to the relevant team leaders (Parma, 2020). Mr. van Stralen states that he never checks, but that the waste management company Attero, evaluates waste samples, and in case of abnormalities feedback is provided (van Stralen, 2020). The UMC employees can find the waste separation guidelines on Intranet (van Stralen, 2020).

## 7. Discussion

The aim of this study was to determine the current waste process management for the DCSCA's surgical department's waste. Using an exploratory approach with descriptive methods, the intent of the research was to bring clarity into the current waste management process. Furthermore, interviewing hospitals that have implemented plastic recycling at their surgical departments has given the chance to explore potential future possibilities. The most interesting findings are discussed below, as well as the study's limitations, and the suggestions for future research.

### 7.1 Guidelines, Communication and Supervision

Considering the research focus, it can be deducted from the results that there are in fact guidelines that ensure the separation of the different categories of waste at the DCSCA's surgical department. Besides the DCSCA's guidelines, Renewi further ensures the waste separation at the DCSCA through its waste acceptance conditions. By using these guidelines, the DCSCA's surgical department and Renewi are adhering to the Dutch laws and policies indicated by the Ministry of Interior and Kingdom Relations, and respecting the list provided by the NWMP (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2019, 2018; Ministerie van Infrastructuur en Waterstaat, 2020b). Furthermore, through creating these individual waste streams, the DCSCA's surgical department and Renewi are contributing to pure and easy-to-process waste streams, as deemed so important by the NWMP.

The results have established the existence of official guidelines for the separation of waste. However, from the results, it can be concluded that there is a clear discrepancy in the clarity of these guidelines when comparing the UU employee creating the guidelines, versus the workforce executing them. The workforce is experiencing a lack of clarity regarding the guidelines, leaving them with a lot of uncertainty. While the workforce struggles to properly execute the guidelines due to uncertainties, the guideline creator perceives them as clear and easy to follow. The crux of this discrepancy most probably lies within the communication of the guidelines. When consulting the results they provide evidence for this assumption. The guideline creator believes communication is done well, and is putting in extra efforts to make them more accessible. However, the workforce expresses a lack in guideline communication, and through the mentioning of the guideline charts imply their preference in communication of the guidelines. This communication inadequacy causes the uncertainty the workforce is experiencing regarding the guidelines. As indicated by the WHO (2017), this uncertainty leads to less commitment to properly separate the waste, causing poor management of the waste. Kaza et al. (2018) clearly state that poor health management has an enormous impact on the local and global environment. This confirms that it is important to find where the communication stagnates. From the data it can be extracted that the guidelines are communicated to individuals with

management functions. If it is then assumed that these individuals further communicate the guidelines to the workforce, it could very well be that the guideline communication stagnates there. Another interesting find in the results is that the Renewi Anonymous (2020) interviewee had trouble answering detailed questions regarding the waste separating guidelines. This indicates that waste separation guidelines in general are difficult to comprehend, further emphasizing the importance of clear communication.

While the WHO (2017) advises good employee supervision regarding rules and guidelines, the current analysis reveals that at UU and the DCSCA's surgical department, it is unknown who is responsible for the supervision of the execution of the guidelines. No one has stepped up to take on this responsibility to supervise the guideline execution, which has led to the workforce to take individual responsibility, executing the guidelines to their own abilities. If this leads to improper separation of waste, it has major consequences. Not only does improper waste separation pose a potential threat to the environment (Kaza et al., 2018), waste separation is also obligated by law, making incorrect separation a violation of the law ("National Waste Management Plan," 2020). Furthermore, the results demonstrate that Renewi expects its clients to be aware of the guidelines and holds them responsible. This means that if a waste stream is tainted, Renewi holds the right to refuse to transport the batch of waste, leaving it at the holder.

## 7.2 Waste management

The results also imply that the direct stakeholders of the DCSCA's waste management process are the DCSCA's surgical department, Asito, Renewi and ZAVIN. The DCSCA is the generator of the waste and ensures that the waste is separated into medical and nonspecific medical waste. The medical waste is treated as potentially infectious waste and therefore collected in special yellow containers. These containers have to apply to strict guidelines regarding their exterior cleanliness, maximum weight, maximum storage time once closed, and should be labelled by stickers to highlight their potentially hazardous content. To avoid the risk of sharps and needles sticking out of the containers, these materials should be collected into specially dedicated needle containers which are a smaller version of the special yellow containers mentioned earlier (Arbo&Millieu Coordinator, 2019). However, data show that the employees of the DCSCA's surgical department empty these needle containers into the bigger yellow container. The literature does not state if the use of a needle container is obligated, but does state that it is good packaging for needles, leaving the use of these needle containers free for interpretation (LAP 3, Sectorplan 19, 2019). However, since the guidelines from the Occupational Health and Safety & Environment state that the needles should be stored into the needle containers, these guidelines should be respected and followed by the employees. The yellow containers are

collected by Renewi and brought to ZAVIN in Dordrecht where they are burned under strict conditions. This corresponds with the literature where it is stated that the only incineration licensed to incinerate this type of waste is ZAVIN (LAP 3, Sectorplan 19, 2019), ensuring safe treatment of the DCSCA's medical waste.

From the results can be derived that the nonspecific medical waste is treated as residual company waste, which adheres to the literature (LAP 3, Sectorplan 19, 2019; LAP3, Sectorplan02, 2019). The residual company waste is collected at the DCSCA's surgical department in designated trash bags. At the end of the day, the cleaning company Asito comes to collect these trash bags and with the use of the operation room stretchers transport them to the grey containers just outside of the surgery department. When the grey containers are full, they are taken to the press container outside, on DCSCA's grounds. This container is emptied by Renewi, and further manages as residual company waste, which as stated in the literature review can be further treated as long as there is a minimum of this waste being incinerated (LAP3, Sectorplan02, 2019).

### 7.3 Recycling

The results from the interviews with OLVG and the UMC can be taken as an opportunity to compare waste management processes and learn from institutions that have already implemented recycling at their respective surgical departments. A very interesting finding from the data that was not taken into account for the scope of the research, is that willingness regarding recycling is an important theme. For all three healthcare facilities, it has been their surgical departments' employees that have initiated the plastic recycling, which is in line with the current trends on plastic and its recycling found in the external analysis. From the results, it is clear that the employees of the UMC and OLVG seemed willing to recycle, whereas the employees of the DCSCA seemed hesitant. This is a very interesting result, as one of the reasons for research of this study was derived from the need of employees of the DCSCA's surgical department to start recycling. Furthermore, the researcher can confirm through personal knowledge, that there are indeed employees at the DCSCA's surgical department that feel the need for recycling. This contradiction can be the result of the fact that the researcher spoke to different experts prior to the study, compared to the experts that have contributed to the data used in this study.

Furthermore, the obtained data demonstrate that the communication methods at OLVG appear to differ significantly compared to UU and the UU and the DCSCA's surgical department. Where at the DCSCA's surgical department there is a, as previously acknowledged, clear inadequacy in guideline communication, the guideline communication at OLVG is managed in a better way. Where the

workforce at the DCSCA's surgical department would like to have communication charts, OLVG already has these charts in use. They are situated next to their waste containers to aid the employees in the waste separation process. Furthermore, the data indicates that Ms. Parma has taken on the responsibility regarding the supervision of these guidelines, something UU and the DCSCA's surgical department have yet to establish. The results demonstrate Ms Parma to be open to questions regarding the guidelines and feels responsible for the clarity of the guidelines. In case of uncertainty Ms. Parma prefers to solve this through personal visits, and conducts additional teaching moments when necessary. This managing of employees corresponds with the management methods deemed important by the WHO (2017), and the reason why recycling at OLVG is a success.

An interesting result within the plastic recycling process is that OLVG and the UMC have designated rooms where all medical instruments and materials needed for surgery are unpacked. This is a clean room that ensures a minimalized chance of contamination of the plastic, and therefore keeping it suitable for recycling. This differs to DCSCA's surgical department where the instruments and materials used in surgery are unpacked in the operating room. However, the plastics generated at the DCSCA's surgical department can be managed in such a way that potential contamination through patient contact is avoided, making them suitable for recycling. The current study can confirm through its findings that there is indeed a possibility to start the recycling of surgical plastics, as results from UMC and OLVG positively establish this. However, UMC stresses the importance of that the implying of recycling should be done in corporation with the waste management company, which in this case would be Renewi.

## 7.4 Limitations

This research was conducted in the spring of 2020, in the midst of the Corona Virus Disease 2019 (COVID-19) pandemic. Early into the study the Dutch government declared a national crisis and a lockdown was implemented. As a result of the lockdown UU closed down and research students were obligated to work from home. This research was, therefore, conducted from home, making the researcher rely heavily on secondary information, and the quickness in- and willingness to reply of the subjects. Plans at the beginning of the research to physically follow the waste throughout its entire management process whilst talking to all parties involved in order to gain valuable first-hand information was no longer a possibility.

Furthermore, the COVID-19 crisis has raised the necessity of healthcare workers to work with protective gear. Items such as masks, gloves and aprons were mandatory, and needed to be changed every few hours. All these items ended up as waste, classed as potentially hazardous due to possible contamination with this new, relatively unknown virus. All this extra medical waste had to be managed with care, but more importantly, with a certain haste to minimize its potential environmental impact, forcing waste management companies such as Renewi to act immediately, and literally covering the only waste incineration installation licenced to treat this category in mountains of waste. The absolute priority of these companies understandably lied with their national responsibilities during this crisis, averting their time and availability away from this research. Therefore, not all data aimed for was collected from these organisations, and questions have been left unanswered. However, the researcher has great understanding for this situation and expresses her respect the waste management institutions.

The experts selected for this research have been accessed through convenience sampling, making all of them willing and available to assist in the research. According to Saunders et al. (Saunders et al., 2009) this willingness to assist may lead to a bias in the sampling. Furthermore, Saunders states that telephone interviews might lead to lack of trust from the interviewee and to a reduction of time granted by the interviewee, making them less likely to answer more in-depth questions (Saunders et al., 2009). Additionally, not being face-to-face during an interview blocks the possibility to note non-verbal communication (Saunders et al., 2009). Furthermore, the limited group of experts can result into bias results, as their opinions are used to represent those of larger populations. These limitations are important to take into consideration. However, the researcher was left with no other choice because of the current situation, and has conducted the data collection in the best way possible during these circumstances.

To avoid interpretation discrepancies regarding the waste guidelines stated in the NWMP (2020), the researcher tried to contact the Ministry of Infrastructure and Water Management, as they are responsible for the guidelines. However, all attempts have been unsuccessful, potentially influencing the interpretation of these guidelines.

In spite of the situation created by this unusual circumstance, the researcher has tried to conduct this research to the best of her abilities. Some data has been collected from documents instead of from experts and has been assembled in the best possible ways.

### 7.5 Suggestions for further research

Future research regarding the current waste management process of the DCSCA's surgical department's waste is indicated. The researcher advises to put future research focus on the employees of the DCSCA's surgical department and their willingness to recycle. In the current research the willingness to recycle was not included in the research scope, but was derived from the data as a remarkable finding. In the beginning of the study the researcher did not deem this theme important to a waste management process, however, the results proved otherwise. The results stating that the employees of the DCSCA's surgical department are doubtful when it comes to implementing recycling, is contradictory to the need to recycle expressed by employees in the introduction. Therefore, future research, most preferably within a bigger population of the workforce is indicated to be able to make a more validated conclusion regarding the matter. Recommended research methods for this future study include, but not limited to, surveys, focus groups or one-on-one interviews.

Furthermore, it deems the researcher important to conduct future research on the stagnation of the communication. The lack of communication not only makes the waste separation process a lot harder for the workforce, and may lead to poor health management, which has an enormous impact on the local and global environment. As demonstrated by OLVG, good communication leads to a well-established waste separation process.

Then, after having explored the possibilities for plastic recycling at surgical departments, the researcher advises a study on how to implement plastic recycling processes into the DCSCA's surgical department's waste management process. As suggested by Mr. van Stralen a cooperation with the waste management company that will further manage the plastic, in this case Renewi, is advised

Lastly, in case of future in depth studies regarding the current waste guidelines provided by the NWMP (2020), the researcher advises to contact the Ministry of Infrastructure and Water Management for more in depth details concerning the guidelines. This to prevent interpretation discrepancies of the guidelines.

## 8. Conclusion

To conclude, the current waste management process of the DCSCA's surgical department's waste is in line with the Dutch law and policies regarding the separation of waste. However, there is a strong need for the reassessment of the communication, the clarity of these current guidelines, and the supervision regarding these guidelines. Proper communication and clarity of guidelines in combination with supervision, aids waste separation of waste, through which the DCSCA's surgical department can avoid violating the law, and positively influence its environmental impact.

Furthermore, this research has clarified that there are indeed possibilities to recycle the DCSCA's surgical department's plastic waste. However, if the DCSCA's surgical department desires to implement the recycling of plastics into their current waste management process, further research is advised.

The researcher is confident that this research poses a strong first step in the implementation of sustainable changes in the waste management process of the DCSCA's surgical department.

## 9. Appendices

### 9.1 Appendix 1 – Thematic Analysis Themes and Sub-Themes

#### 9.1.1 Guidelines

Guideline Stakeholders	G. Communication	Supervision/ Responsibility	G. clarity
Restafval is heel ruim begrip dat is eigenlijk alles wat in de persontainer mag , wat dus geen ziekenhuis is en geen destructie. Besmettelijke dingen , zoals laboratorium afval.	komt dat denk ik, van Arbo en milieu maar Marion Schmitz	dan is het aan de gebruiken zelf, omdat te organiseren en in te vullen binnen de afdeling.	Het is vrij, vrijblijvend helaas
Ze hebben een aantal van die gele bakkens, in die houders staan dat is ziekenhuisafval	Dat is dat vastgelegd in de documenten en? Hans van Baar ; niet bij de bij de afdeling	binnen het bedrijf is neemt iedereen denk ik zijn eigen verantwoordelijkheid daarin	Maar we komen er al achter dat het is wel redelijk vrijblijvend he
De gewone prullenbak wat papieren handdoekjes en dat soort dingen in gaan. Ja, dat is gewoon restafval.	We hebben dan wel mailingen van gehad in het verleden, van wat er in kan en wat er niet in kan	Nee zover ik weet tenminste niet dat ik binnen het bedrijf merk van dat er gecontroleerd wordt wat er in de vaten verdwijnt of wat er in het restafval verdwijnt	De één zegt: het mag wel, want het is plastic, het mag wel in de plastic ton en de ander zegt nee, want er zit bloed en pus en weet ik veel wat op, het moet gewoon in de afval bak
Kijk en zo'n parvo hond, dat gaat als ziekenhuisafval de deur uit	Maar dat is niet zo dat er kaarten hangen overal wat erin mag en wat er niet in mag	Daar wordt van geacht dat ze dat weten	Eigenlijk weet het niet, zou mij niet verbazen als het gewoon bij het restafval komt
Ja en de rest. Ja, die komt gewoon in zakken terecht.	Er hangen geen kaarten	Als iemand bloed aan de handschoen heeft en hij goot het in de prullenbak en niemand ziet dat en niemand reageert daarop dan geburt daar verder niets mee	Maar de volgende: nsputten, medicatie die nog in zit die spuit die in de gele bak en spuitje zelf verdwijnt in plastic, is dat de bedoeling?
Er is gewoon niet één beleid	We hebben daar ooit een keer mening over gehad	En iedereen doet naar eigen inzicht.	De één zegt dat het groene papier wel bij het papier mag, eh nee, andersom. Het groene papier niet en het witte papier wel, nou, ik gooï het er helemaal niet in, ik gooï het gewoon in de rest afval.
Ja want er is geen beleid op dat gebied	Dat is een mailing die dan rond gestuurd wordt van wat is ziekenhuisafval en wat is geen ziekenhuisafval	Daar is geen richtlijnen zijn en dat iedereen dat naar eigen inzicht	Deze flessen, (infus flessen) valt dat onder plastic of niet?
Dus die zijn wettelijk zijn Europese en Nederlandse wetgeving	Maar we komen er al achter dat het is wel redelijk vrijblijvend he	Ja, dat is een groot grijs gebied waar je naar eigen inzicht dingen doen.	Het wordt inderdaad rest afval, maar de vraag is: mag dat
maar de bak voldoet aan de UU en richtlijnen van waar een bak aan moet voldoen,	We hebben ooit een mailing gehad van wat gift afval is wat plastic in de oranje bak mag, en wat niet in de oranje bak mag	de medewerkers worden geacht om als ze beginnen te werken dat worden ingewerkt, en dat ze te horen krijgen waar ze een sleutel ophalen waar ze xps krijgen waar ze mogen parkeren, waar ze hun afval laten, hoe ze moeten werken waar ze hun witte jas halen, waar ze hun afvallaten, dat hoort eigenlijk bij bij het hele pakket van inwerken	Maar ja, het ophalen van het ziekenhuisafval, weet je wel dat het kost?
Proefdier kadavers. Anatomisch rest op bloed of bloed producten Wegwerpsteriel zoals naalden spuiten, besmetten verbandmiddelen, kwekt middelen, envoorts. Dat gaat allemaal in het geel	Dat veranderd trouwens ook in de loop van tijd	Nou, ik ben er niet voor om ziekenhuisafval of dat wat op de ok wordt verzameld, aan afval.	Die Bakken die betalen ze per stuk en eh dat is inclusief afvoer en verbranden, geloof ik hè
Dus alles wat gebruikt wordt bij onderzoek aan mens of dier, wordt in die afvalstroom verwerkt..	Hier hangen ook geen papiertjes van wat waar in mag	, Ja, meer ingang heb ik niet. Ik sta er niet bij	De vraag is: wat moet er eigenlijk allemaal in die ziekenhuisafval en wat niet.
Op het moment dat je een bedrijf bent, dan heet het bedrijfs afval. En dan zijn er veel hogere eisen aan	Daar is discussie over	Geen idee worden ze geacht te weten.	Hoort dat wel in de vuilniszak?
Komt van nou, dat renewi, en dat is wetgeving op het moment dat bedrijfsafval heet, of dat het huishoudelijk afval heet	Die discussie is constant, overal eigenlijk	Ik ben ook niet degene die nieuwe medewerkers introduceert. Op, in de klinieken dus degene die verantwoordelijk is voor het inwerken van nieuwe medewerkers	Maar dat is iets dat weten wij ook niet want wij gooien in principe kleintjes ook gewoon hier in
Als je één fout maakt, is het afval afgekeurd en is het ooit weer in eens restafval.	Wat betreft medicijnen ook, ook daar is er weer hele discussie over	Dan is iedereen helemaal in paniek van de ja, de vaten staan vol ja, had maar opeget.	Wat is het verschil tussen de burger en bedrijf?
Zou zomaar kunnen zijn dat dat ze bij renewi zeggen ja, daar kunnen we niks mee en dat het vervolgens in het restafval gooien	Er is gewoon niet één beleid	En als het dan niet land genoeg is, ik weet niet wat je dan moet doen.	Je vergelijk denk ik een beetje met thuis en hoe je daar scheidt en dat doe je dan hier min of meer ook hè
Wet wordt gevuld	(M. Schmitz die is van Arbo en milieu) daar horen wij nooit wat over	Nee, dit is, dit is puur intern.	maar dat heeft ook te maken met de onduidelijkheid
Wettelijke gevarieerd afval, per afvalstroom verschillende V = verwerkingscode, afvalstroom nummers, zonder deze koppeling niet meer rijden.	Ja dat durf ik je te zeggen er richtlijnen zijn, maar dat die niet worden door gecommuniceerd.	De organisatie van mensen moeten zich bewust zijn wat wel afval te maken en waar laat je het vervolgens	nou denk het niet en ik heb ook inderdaad constant discussie hierover ja, dan moet je bij het papier, nou daar heb ik zo wel mijn twijfels over. Ik gooï het er niet in en een ander wel.
Erasmus: normaal mondkapjes en shorten IC locaties bij restafval, niet besmet.	We krijgen af en toe een algemene mailing daarover	Ik ben niet verantwoordelijk, ik ben arbo en milieu coordinator. Ik ben niet verantwoordelijk voor dat iemand op die werkvoer zich houdt aan de regels	Je kan beter vragen is er überhaupt duidelijkheid.
bloed is ziekenhuisafval	Weet je wel wat het kost? Dat is zoveel, dat is zo veel dat je hier hoort.	Dat is de teamleider of de leidinggevende in arbo land is het zo dat iedereen verantwoordelijk is voor zo eigen zaken	Wij hebben gedacht dat de apotheker de medicijnen apart afvoerde, dat blijkt dus niet te zijn.
Vat moet gekeurd zijn	En arbo dat doet er inderdaad, die doet helemaal niks uit zichzelf.	Die moeten het zorgen dat het binnen de organisatie bekend is	Die weet dat er heel veel behoeft aan is aan de duidelijkheid
Euralcode 180202*	Op de afdeling, dan is het niet zo dat er iets van bovenaf komt van jullie moeten nu dit of jullie moeten dat.	wie daar uiteindelijk op gaat handhaven. Ja, dat is degene die toevallig het afval wel of niet meeneemt	dat zou wel inderdaad prettig zijn als je kan zeggen: dit mag, dit mag niet dat er eigenlijk, je moet geen discussies daarover.
Proefdieren en delen van proefdieren voor zover deze zijn besmet met ziektekiemen, genoemd in groep A en B van de Wet bestrijding infectieziekten en opsporing ziekteoorzaken (Staatsblad 1928, 265), of zijn behandeld met geneesmiddelen	daarom heb ik ooit voor de klinieken wat kortere versie gemaakt, zodat je niet metvrij heel stukken moet akkeren om er achter te komen waar je nu spuitjes die afval laat, dus dat zijn twee A4tjes of zo.	Maar ja het achter de OK, of ja in de OK blok daar kom je niet of je bent op uitnodiging of om een hele speciale reden. Dan ga je niet zomaar even naar binnen, dus blijft dat het heel erg uit het zicht.	Wat mag er wat mag er niet in.
Scherpe voorwerpen, zoals: injectienaalden. Afgeknipte capillaren, scalpels, kapotte instrumenten en bloedhuzen	ja, dit is het a4tje voor afval in de klinieken	Zij hebben weinig met het afval te maken. Dat klopt, maar ze hebben wel voor ons een signaalfunctie	en dit , telt dit als papier?
Cytostatica	Het is net weer naar Barbara gestuurt, dus ik hoop dat daar weer toch weer even tussen de oren komt dat het afval procedure is	Dus als de zakken als zij inderdaad nooit open zak zien, dan is het inderdaad terecht, maar anders zouden ze dat kunnen zien.	geen idee ik heb toevallig gisteren gevraagd en toen wist niemand mij het te vertellen
Grottere hoeveelheden bloed, plasma en andere pasteuze en vloeibare afvalstoffen	Ik heb het algelezen halfjaar nu twee keer het document door moeten sturen van wat doen we niet met het afval	Wordt verwacht van de klant dat ze weten wat er onder rest afval valt.	het is natuurlijk ook wel een constatering van de boel is niet op orde want het is te vrijblijvend voor iedereen
Verpakking dient uitwendig droog en schoon te zijn	Degene die de begeleidende doet van de diervoorzorging, die heeft het dus al een paar keer in het overleg blijkbaar.	Controleurs op gevraagd afval plakken	Die zijn heel duidelijk, dat zijn de regels van het reststoffen beheer, die vind je terug op intranet.
Verpakking dient lucht en vloeistofdicht te worden aangeboden	Dus ja, je hoort je van de regels op de hoogte te stellen en naar te handelen en het enige wat ik kan doen is de regels toegankelijk maken voor de mensen	ILT overheid : ziekenhuisafval of de tonnen goed gesloten zijn , goed worden opgeslagen, consequentie en boetes	Iedereen was het weer kwijt wat er nu wel en niet op het in de poli's en op de OK's af gevoerd mocht worden, want iemand riep van bij paard en bij gezelschaps dieren zijn er andere regels.

In geval vloeistoffen (bloed e.a. lichaamsvloeistoffen) aanwezig zijn dient voldoende absorberend materiaal aanwezig te zijn, conform verpakkinginstrucie P621 van het	Ik heb praat niet met iedereen, en alles dus dat is altijd zijn altijd contactpersonen die dat voor mij regelen dus	<b>zicht houden is moeilijk</b> naalden sharpsafe, En de sputten met medicatie/ vaccinations? Ziekenhuis afval????	Nee er zijn geen andere regels. Er is een andere interpretatie van dezelfde regels jn ergernis, want dan kun je merkt aan mijn stem dat ik heel erg geiriteerd raak van dit onderwerp
Ziekenhuisafval vaten (UN-gekeurd) 25—60 l	Maar ik ben wel verbaasd als ik dit continu doe en ja.		Dit doen we om de paar jaar word dit gevraagd en mijn ervaring is dat op de werkvlloer erg wordt geredeneerd van het is anders zo duur.
Ziekenhuisafval dozen (UN-gekeurd)	maar dit is dit is meer, waar je steeds weer tegen aanloop		
Alle afvalstoffen die vrijkomen bij het voeren van een bedrijf die niet voor recycling geschikt zijn en in een verbrandingsinstallatie verwerkt kunnen worden is restafval	Kijk en alle mensen op de OK en in de Poli ook studenten krijgen ze staan allemaal zijn allemaal boekwerken van allerlei protocollen en één van die protocol is gewoon afval moeten zijn.		Maar het is niet duur wat het kost de werknehmer en de departementen het ok blok geen rooie cent want het wordt centraal genomen
Stoffen die een hinderlijke reuk veroorzaken	Ik heb het ooit naar de OK gestuurd van Ron van wandelen, Peter van Miltenburg, Barbara de loor, nou mensen die er wat meer op dat niveau zitten,		Ja , als ze, als ze er inderdaad al een discussie is als iemand twijfelt wanneer iets patiënt besmet is, dan wil ik het niet in het restafval, want no way dat ik het een bron wil laten zijn van welke ziekte dan ook
Chemicaliën en overige stoffen die schade kunnen opleveren aan de gezondheid van mens, dier of gewas of schade op kunnen leveren <b>om de bodem niet bij rest afval</b>			Dus dan eh nou ja, af en toe loop je wel rond in de kliniek en dus dan zie je he wat daar
Milieu hygiënisch, esthetisch en/of technisch moeilijk te verwerken afvalstoffen zoals specifiek ziekenhuisafval, landbouwfolie, matrassen, autobanden, isolatiematerial (glas-en steenvlo. EPS) e.d niet bij restafval			Advies: besmette middelen altijd bij ziekenhuisafval ??
Gekookte etensresten (swill), vlees en visafval, kadavers, slachtafval en fecalen niet bij restafval			Bloedspetters? In principe ziekenhuis afval
Ziekenhuisafval is afval dat vrijkomt bij medische behandeling van, of onderzoek aan, mens of dier			naalden sharpsafe, En de sputten met medicatie/ vaccinations? Ziekenhuis afval????
Het gaat dan bijvoorbeeld om noorderkaadavers (al dan niet van transplantaat), anatomische resten of bloed (producten). Ook wegwerpartikelen (naalden, sputten, besmette verbandmiddelen, kweekmiddelen, pipetpuntjes e.d.) die gebruikt zijn bij onderzoek aan mens of dier worden in deze afvalstroombin verwerkt			En als der duidelijkheid gaat komen graag want iedereen heeft daar behoeft.
Alle scherpe voorwerpen worden beschouwd als afval met een infectierisico en moeten worden afgeweerd onder Eurlocode 18.01.03* of 18.02.02* via het SZA in de gele vaten			Je merkt wel dat er behoefte is aan duidelijkheid
Het ziekenhuisafval wordt ingezameld in gele vaten met gele deksels			Dat het een zootje is
Dese vaten zijn voorzien van de wettelijk verplichte gevarenlabellers voor dit type afval (klasse 6.2, UN 3291)			De werkvlloer moet het uitvoeren dus zorg dat er duidelijkheid komt bij de werkvlloer.
Bedrijfsafval of restafval wordt verzameld in zakken van het schoonmaakbedrijf en bevat alle afval wat niet valt onder een van de bijzondere categorieën, zoals gevaarlijk afval, specifiek ziekenhuisafval.			
ziekenhuisafval (SZA) wordt verzameld in gele vaten met geel deksel. Ziekenhuisafval is afval dat vrijkomt bij medische behandeling van, of onderzoek aan, mens of dier			
Het afval mag kleine hoeveelheden chemisch laboratoriumafval of minimale restanten van medicijnen of cytostatica bevatten, plastics, injectiesputten (onder naald!)			
Uit het vat mogen geen scherpe voorwerpen steken = naalden worden ingezameld in speciale naaldencontainers. Deze worden vervolgens weer in het SZA-vat verzameld en afgeweerd			
In het kader van veilig omgaan met scherpe voorwerpen waaronder naalden, worden naalden: eenmalig gebruikt, niet gerecycled (veiligheidsspitje niet terugplaatsen), altijd van de sputt afgeworpen via een naaldencontainer en apart afgeweerd. (Scapel)mesjes worden eveneens via een naaldencontainer afgeweerd.			
Een belangrijk criterium voor SZA is dat het voor de mens en/of dier infectieus kan zijn; bijvoorbeeld op een OK een abces bij een dier wordt verwijderd, is dit materiaal mogelijk infectieus voor mens of dier en valt het onder de categorie SZA			
Daarnaast speelt esthetiek ook mee: een geel vat is direct goed afgesloten en houdt veel uit het zicht. Met bloed besmeurde disposables gaan in het SZA en niet bij het plastic of restafval			
De verpakking mag niet topzwart beladen zijn			
Vaten met vloeistof dienen aangevuld te zijn met voldoende absorberend materiaal, zodat de vloeistof niet kan klotsten.			
Vaten moeten hermetisch gesloten zijn (indien goed gesloten zorgt de plakrand in het deksel voor een hermetische afsluiting)			
De buitenkant moet schoon en smetvrij zijn			

## 9.1.2 Process

Waste Mngt Stakeholders	Actions
Ze hebben een aantal van die gele bakken, in die houders staan dat is ziekenhuisafval	En dan zorgen wij dat zij, hoe heet het, de oranje tonnen krijgen
Je zit nu bij de gene die alleen de grote lijnen een beetje weet	Wij doen wel de meldingen in top desk, allemaal direct naar Renewi
Niet naar het ziekenhuisafval, die OK jassen	Wij doen het bij paard anders dan jullie bij gezelschapsdieren
maar dat is iets sinds renewi hier het afval dingen doet. Maar dat gaat ook niet goed dan	Nee restafval de vuilniszakken die worden verzameld in het OK
Ja want dat hebben wij ook wel eens gehad, dat ze het egwoon niet op komen halen	In de recovery exact hetzelfde, wordt niet iedere dag weggehaald
En als je verkeerd scheid dan vervuil je te veel en dan wordt zo'n partij ook afgekeurd, dan zit je daar ook weer mee	Inleidruimtes worden deze kleine sharpsafes, die kleintjes die je daar op het aanrecht ziet, die wordt leeggegooid, die staat daar zonder deksel die wordt leeggegooid in de grote gele bak, en dan gaat die weer terug naar de inleidt ruimte
Van het hele OK blok, iedereen kan hier in	Ja dat wel, maar ze worden niet leeggeschud en die in die gele bakken, niet overal
Nee ze vullen het zelf aan en halen het zelf op maar er hoort hier een grote zwarte bak te staan voor die sharp safe	Daar gaan die kleintjes in ( in het grotere vat) en als wij die ophalen,
de perscontainer die staat daar achter de bospies	Ja die staan daar bij de deur, dat zijn gewoon restafval, zijn gewoon grote containers
Nee, die zijn van de UU, omdat de UU als hele grote afval producent met de afvalverwerker kan afspreken welke type bakken ze gebruiken voor het een of ander	Als ik een kartonnetje heb van een lamp en ik ko hier toevallig langs en goi ik het hier er ook bij in
We krijgen ook wel vrij veel commentaar dat vooral het sputten, enzovoorts. Nou, ja, sputten	savonds staan ze bij onze deur, daar blijft die staan en de vuilniszakken van de OK worden verzameld op een brancard en dan gaan ze via de brancard gaan ze naar ons gebracht worden.
heel af en toe krijgen we ook dat er afval niet geaccepteerd is omdat er een sput in zit die er niet in hoort te zitten of een naald die er niet in hoort te zitten.	Naar de pers container
Renewi neemt het niet mee	Nee dat doen de schoonmaker of wij als wij een volle container zien
en ook als de gele vaten aan de buitenkant vies zijn. Dus als ze met bloed bespat zijn, nemen ze ze niet mee dan krijg je gaat terug naar de afdeling en zorgt dat er weer schoon is voordat je weer kunnen aanbieden	Die jongens, doe komen over de straat heen, die komen hier heen, en de pers containter dei kan je gewoon bedienen hier
Afkeur, alles wat gestort wordt vaak na gesorteerd, mocht het erbij zitten dan wordt het eruit gehaald, moeilijk klant aan te spreken, grote 10m3 containers dan krijg je een afkeur met foto's , meer kosten en waarschuwing. Volgende keer laten ze container staan bij controle vivavaten boetes aanvast zitten	Asito is degene die de OK blokken, schoonmaakt dus de schoonmaakdienst verwerkt verwijderd ook het afval
Het afval mag niet buiten of in de hal worden neergezet.	Daarin is de schoonmaker die echt overal komt.
Vat en al verbrand, zwin in doordrecht, landelijk zkhafval en daar wordt het onder toezicht en voorwaarden verbrand	Potentieel besmet, infectieuze stoffen bevatten wat bij verbranding niet zomaar mag kunnen loskomen. Gaat vooral om de inzameling en de wijze van verwerken, heel voorzichtig mee omgegaan. Begint al bij chaf met de vaten; andere diploma's. Verbranding: Vaatje voor vaatje op de band, uiterst voorzichtig. Infectie milieu en omstanders verhinderen
Na sluiting mogen de vaten niet langer dan twee weken worden opgeslagen, daarom wordt aangeraden de volle, goed afgesloten vaten zo spoedig mogelijk naar de inzamellocaties te brengen	
Afval dat aan bederf onderhevig is moet zo lang mogelijk in een vriezer bewaard worden.	
De inzamelaar of Reststoffenbeheer zijn bevoegd het afval te laten staan als aan een van de bovenstaande voorwaarden niet is voldaan	
Het ziekenhuisafval wordt ingezameld in gele vaten met gele deksels	
In het geval van vloeibaar afval moet men zorgen voor voldoende absorberend materiaal.	
De kosten van afvalverwerking vallen binnen de basiscostenverlening van het FSC (er vindt dus geen doorbelasting plaats aan faculteit/departementen).	
Er zijn gele vaten van 30 of 60 liter. Ze worden besteld middels een TOPdesk melding aan FSC-Reststoffenbeheer	
Het maximale vulgewicht is 25 kg per vat	
Door deefdieren worden in bevrucht toestand aangeboden.	
De inzamelaar of Reststoffenbeheer zijn bevoegd het afval te laten staan als aan een van de bovenstaande voorwaarden niet is voldaan	

### 9.1.3 Recycling

Process + Guidelines	Communication and supervision on Recycling	Recycling Willingness	Recycling Time frame
Maar is dit jullie enige plastic bak? hier hè, en de recovery 1 maar voor de rest niet. Nee	Dus wij hadden al heel snel tegen die inzamelaar gezegd, luister het is of alles bij elkaar, of niks, want die monostromen dat gaat hem niet worden	de afdelingen vragen zelf om scheidingen materialen	Oké, Ja en als ik het goed begrijp, dit was in de periode rond 2016? ja
In het ok gebied sws denk ik niet want dat is al helemaal niet	Ik heb dat, dat is een A4je gewoon heel simpel, in Word gemaakt, en dat stuur ik dan vaak op naar mijn contact persoon bij de betreffende afdeling.	Ja je krijgt wel steeds meer vragen op dat gebied kwam dat mensen willen inzamelen, maar niet weten hoe.	in 2011 kwam er eigenlijk van de werkvoer, kreeg ik steeds meer vraag naar van kunnen we het plastic ook niet gescheiden gaan inzamelen
Want we kunnen wel inzamelen maar het moet natuurlijk vervolgens ook nog door een inzamelaar afgenoem worden, afgeweerd worden	En dan zeg ik altijd van verander het naar wat jij hebt op je afdeling,	Maar moet je het in de OK ook wel willen om daar zoveel soorten, want je zit natuurlijk ook met helemaal micro organismen, een bacterie of virussen en wat dan ook, wat ook lekker overdraagbaar is, wat lekker staat te broeien	Anderhalf jaar schat ik even in
Wat zij wilde het liefst monostromen	en dan koppel ik dat terug aan de leidinggevende van de betreffende afdeling	Niet wenselijk eigenlijk in deze omgeving	
het is godsonmogelijk om vijftien verschillende bakjes naast elkaar te zetten	Nou ja, dan beantwoord ik natuurlijk die vragen vaak ik gewoon even zelf kijken omdat ik dat het prettigste communiceren vind dan van achter mijn bureau	Er zit hier ook een stukje laksheld in	
van die stroom, daar worden uiteindelijk, worden daar zeg maar energie korrels van gemaakt, die dan gebruikt worden in bruinkoolcentrales	en dan bied ik ook altijd aan dat ik een Ja, dat noemen wij dan een klinische les, daar is niks klinisch aan natuurlijk, aan afval scheiden, maar dan een soort gewoon ja informatie, dat doe ik dan doormiddel van een powerpoint, en dan geef ik dus informatie over, van waarom we moeten afval scheiden, welke wet en regelgeving daar aan vast zit, de kosten, want aan elke afvalstroom zitten aparte kosten	Er staat er heel duidelijk een prullenbak zo van alleen plastic. En dan worden dus de koffiebekers ook ingegeoid en de handschoenen worden er ook ingegeoid	
Bruinkool is zeg maar een voorloper van steenkool en als je dat verbrand is de milieu schade nog veel groter dan bij steenkool.	Met nieuwe medewerkers dat is nog wel een dingetje dat dat niet altijd even goed gaat,	dan heeft het scheiden daarom helemaal geen zin	
We hebben dan één inzamelaar, maar die brengt dus dat OK plastic onderdaan naar een andere verwerker. We hebben Renwl, en Renew maakt zelf dan die energie pellets en het OK plastic wordt echt maar een verwerker gebracht die daar weer grondstoffen van maakt.	hebben wel een nieuwe medewerkers app, ziekenhuisbreed dus ook allerlei ziekenhuizen en daar staat wel iets in van over het afval scheiden	die plastic bakken zijn er gekomen doordat personen van de werkvoer dus niet hogerhand, zelf Zo iets hebben van moeten we het niet afval scheiden	
Ja dat is Kras recycling uit Volendam	Dat gaat dan over intranet, dan plaats ik een bericht op intranet,	als mensen zouden zeggen daar gaan wij niet aan beginnen in want daar zien wij het nut niet van in, nou dan wordt er niet aan begonnen.	
Wij hebben voor de plastic stroom en de rest afval stroom hebben we Suez	Wij hebben een intranetsite dus dan alle informatie mbt afval staat erop	ik vraag me af: hoe ver moet je gaan?	
en voor de papier karton hebben wij, veolia	niet zo vaak als ik zou willen, want ik ben, ik ben maar alleen voor twee ziekenhuizen en ik voer wel audits uit en dat is dan echt heel praktisch, dan ga ik met een gripper ga ik gewoon onderdaan afvalbakken langs. Om te kijken wat er in zit of dat ook dat wat, ik trek echt de afvalbakken open	Wij zijn de vragen van plastic afscheiding is ook gekomen omdat ze zo verschrikkelijk veel is disposable spul is	
Naar Atero, in Wijster	daarnaast is er ook wel controle, eigenlijk de omgekeerde controle, dat ik veel vragen krijg van afdelingen van hoe zit dat dan	Maar dit is ook vanuit de werkvoer gekomen, het is niet van hogere hand	
De beslissing, tuurlijk beslis je altijd zelf, maar dit is wel in heel nauw samenwerking met suez gegaan ja.	is er nog een supervisie en een controle die die wordt uitgevoerd, om dus er voor te zorgen dat de richtlijnen echt worden nagestreefd, of zijn jullie echt afhankelijk van de welwillendheid van de medewerkers. Ja, met name het laatste.	Nee, dat is van ons uit gegaan	
Nee dat werkt ook niet dus aan beide kanten moet je in mijn optiek daar gewoon transparant over zijn van wat, hoe doen wij het intern en wat bieden wij ze aan, waar komt dat vandaan. En aan de andere kant waar laten zij het en wat gebeurt er mee	Nee wat er wel bij Attero gebeurt is dat attero neemt van iedere zending die zij ontvangen een monster, en dat kijken ze na dat zoekten uit van wat is het en dat doen ze voor verschillende doeleinden dus voor eigen cijfers, van wat is het, wat krijgen we binnen en hoe is die verhouwing. Maar daar halen ze ook de kwaliteit uit van wat ze krijgen en dat koppelen ze ook wel terug	En eigenlijk in diezelfde periode kreeg ik van de OK uit oost de vraag van: kunnen wij geen plastic gaan inzamelen?	
we streven natuurlijk naar maximale recycling	Oké, maar bij jullie intern is het niet zo dat u om de zoveel tijd denkt goh. Ik ga even een rondje lopen en ik kijk even in de afvalbakken wat er of het wel goed gescheiden wordt? Nee	Maar dan willen we niet dat dat op de grote hoop komt, maar dat er echt, dat het hoogwaardiger plastic is en dat dat meer gerecycled gaat worden, want ons plastic is heel erg schoon.	
Doen we nu ook om ons heen kijken van wat gebeurt daar, met andere ziekenhuizen mensen met leveranciers. En ja, dat geeft ook weer andere inzichten.		en toen was er dus ruimte voor om daar verder in te duiken, wat voor soorten plastic zijn dat dan en wat kan daar dan mee	
dat je dus van je medewerkers verwacht dat ze op zoek gaan naar dat plastic tekenje, wat voor soort plastic het is, en ook veel van die plastic verpakkingen staan het niet.		in 2011 kwam er eigenlijk van de werkvoer, kreeg ik steeds meer vraag naar van kunnen we het plastic ook niet gescheiden gaan inzamelen	
Dan moeten mensen nog weten wat PET is en wat LDP is en PE en PPE en weet ik veel wat, dat gaat niet werken		Dus het was echt een vraag van de medewerker	
dat plastic dat wordt geperst, tot ja dat noemen ze dan pellets. Het zijn eigenlijk een soort grote bixkorrels en die worden dan gebruikt als, inplaats van dan bruinkool, dus dan het milieu effect is vele malen beter dan het milieu effect van de verbranding van bruinkool, maar uiteindelijk wordt het toch verbrand.		Mensen werden bloedje fanatiek en kwamen met de meest creatieve oplossingen om maar zo veel mogelijk plastic in te zamelen	
Wij scheiden heel veel categorieën afval, dat zijn er een stuk of 16/17. Waar heb denk ik niet name om gaat is de grote stromen: dan heb je het over restafval. Heb je het over een specifiek ziekenhuisafval, dus infectieus, en hebben we het over plastic metaal drankkarton, PMD, gift is een grote stroomb, en dan doen we nog papier, karton, gla		andere afdelingen klopte ook al op de deur van wij willen ook mee doen	
Toen zeiden wij dat het goed dan gaan we dat ook faciliteren, dus dan krijgen jullie de bakken en komt het goed, en dat doen ze dus tegenwoordig.		en dat willen wij ook	
En dan wordt het een karretje, wordt gewoon met alles al niks meer zit in plastic wordt echt ook ruimte zelf ingrediënten? Ja inderdaad		meeste mensen zijn heel fanatiek en doen het keurig	
Ja dat is een bedrijf die heeft een soort verterings installatie staan, en die scheiden de plastic in de verschillende deels stromen, daar maken ze balen van en dat gaan vervolgens weer naar de industrie die daar van dat granulaat van maakt van grondstof.		dan zitten er altijd wel weer een aantal tussen die vinden het flauwekul	
Papier wordt bij ons gescheiden ingezameld maar heb je papier, want op wat voor reden dan ook besmeurd is met bloed, dan moet het toch in het specifiek ziekenhuisafval vat.		En dan heb je ja, dan wordt zon stroom, toch vervuild met vaak etensresten, koffie resten Et cetera	

als er bijvoorbeeld medicijn resten in glazen potjes zit mag je dat niet zomaar in de glasbak gooien dan moet dat weg als medicijnrest, inclusief de verpakking		dat de meeste weerstand ondervonden we bij de inzamelaar	
Dat geldt natuurlijk ook voor het plastic, als je een plastic potje hebt waar nog medicijn resten in zitten, of een plastic zakje bijvoorbeeld van een infus waar als er medicijnen worden toegediend en dan wordt zo'n zakje afgekoppeld en dan zit het nog halfvol met opgelost Antibioticum, bijvoorbeeld. Dan mag dat natuurlijk niet bij het plastic, dan moet dat als medicijnrest afgevoerd worden		En die deed daar erg moeilijk over	
dat samen met ja gewoon producten die geen plastic zijn en waarvan mensen dan wel denkt dat, zoals die handschoenen, dat heeft de wat niet kolom opgeleverd.		We hadden een hele zak verzameld van nou dit is het soort plastics die je aan kan treffen	
Op het LAP, het landelijk afval plan. Dan heb je dat Landelijk Afval Plan		Dat heb ik zelf bedacht, ja.	
en ik heb zelf aan het druppelvormige verontreiniging heb ik zelf een hoeveelheid gehangen.		alleen die app wordt dan vervolgens niet verplicht gesteld dat ze die doorwerken, dus het is totaal vrijblijvend wat nieuwe medewerkers met die app doen en of ze die informatie ook tot zich nemen, dus daar zie nog een grote verbeteringsslag	
OMdat een druppelvormige verontreiniging is natuurlijk weer multi-interpretabel, en mensen op de werkvlloer zitten daar niet op te wachten		mensen zien daar nu wel de belangrijkheid van in dat het afval goed gescheiden wordt, en ook, naja inderdaad dat dus ook het plastic gescheiden wordt	
En dat wel of niet geabsorbeerd staat ook in het LAP, of in dat sectorplan		Dus dat soort initiatieven krijg ik steeds meer uit de organisatie van dat mensen dat zonde vinden en daar iets mee willen	
Restafval, PMD, plastic metaal drankkarton, dat is daar natuurlijk voornamelijk plastics		er zijn altijd mensen die vinden het flauwkeul en die hebben zo'n houding van daar ben ik niet voor aangenomen en die doen het dan niet	
Je hebt geen drankkarton op een OK dat is duidelijk maar goed dat is dezelfde stroom en dezelfde bak uiteindelijk		Wij zijn als ziekenhuis bezig om ons afval steeds meer recyclebaar te krijgen, dat is zeker een ambitie, aansluitend op de ambitie van het idee van joh. Je bent een ziekenhuis, maakt mensen beter dan moet je je omgeving niet willen vervullen	
restafval, plastics, glas komt voor, dat is het wel, de rest is medisch. De rest is dan of infectieus of medicijn afval		We hebben gezegd: nou, daar gaat de markt niet uit zichzelf in bewegen als wij, als grote opdoners of aanbieders daar niets aan doen, dus dat proberen wij wel te innoveren en dingen te doen die nieuw zijn en nieuwe marktpartijen nieuwe mogelijkheden op te zoeken	
En wij zijn die scheiding gaan toepassen in die schone ruimtes, waar we uitpakken		Als we kijken naar het ongevaarlijk afval daar hebben we dan in deze over, zeggen we willen gewoon volgen wat er in de markt gebeurt want ja in ongevaarlijk afval zijn wij als ziekenhuis niet heel anders dan ieder ander bedrijf	
Het is eigenlijk een extreem schone ruimte dus de meest schone ruimte van het ziekenhuis		En daar zie je natuurlijk dat de laatste jaren, het name is ingezet op plastic scheiding, en dat daar infrastructuur in het land voor ontwikkeld wordt. Dus hebben we gezegd: nou daar willen we op aansluiten, mensen die gooien op het station hun plastic apart weg is, net als dat we al jarenlang papier en karton apart weggooiden. Wij doen dat thuis. Dat willen wij in het ziekenhuis ook faciliteren	
De vuile kant is gewoon infectieus afval en dat gaat in vaatjes in de verbranding nu nog.		toen kwam bij ons de OK zelf met het initiatief van Ja kunnen wij ook, want wij hebben heel veel schoon plastic in onze uitpak ruimtes en dat kunnen we prima scheiden, dat is helemaal geen punt dat willen wij ook	
Ja dat hebben wij ook wel, maar dan gaat het gewoon als restafval weg. Daar scheiden we niet, dan krijg je inderdaad wel hele grote risico's, dat doen we niet		Die was wel meegegaan. Er zit wel weerstand in de afvalverwerking op afval uit ziekenhuizen,	
We doen wel Infus containers op de verpleegafdeling, een andere afdeling. Die gaan wel bij plastic afval als ze leeg zijn		Hoe ervaren jullie medewerkers het en dan voornamelijk, de medewerkers van het OK blok dat er dus nu kans is om te recyclen? Positief?	
Kleine plasticjes, zoals het verpakking van een naald of een spuitje, weet u wat daarmee gebeurt? Hetzelfde, die worden uitgepakt en dan gaat het die bak in		Wij begonnen met die plastic scheiding in kantoren en openbaar gebieden. En toen kwam het OK personeel toen zelf met daar kunnen wij ook gelijk om aanhaken. Ja beter kan je het niet hebben	
een sput en een naald die zitten in een verpakking met aan de ene kant plastic en de andere kant papier. Dus dat wordt dan gescheiden, zeg maar, maar dus het papier gaat bij papier en het plastic gaat bij plastic		Dat wisselt nog wel eens per afdeling maar die OK is heel enthousiast, bereidheid mee te werken)	
Waren, er nog wetten en besluiten waar jullie rekening mee moesten houden op het moment dat jullie hadden besloten om vanuit dus de OK plastic te gaan scheiden of waren jullie er zodanig van overtuig dat het echt geen kans op infectie had dat dat niet nodig was? Het laatste		En van zo'n OK is het natuurlijk leuk dat het echt een hele medische afdeling is waar het dan toch opgepakt wordt, dus dat is daar dan weer leuk, en op andere afdelingen heb je weer andere leuke dingen, dus ja dat heeft wel energie	
		Kunt u het ons aanraden om dus serieus overwegen om ook ons plastic en dergelijke te recyclen? sowieso.	
		Ja wat ik natuurlijk ook zet van de faculteit diergeneeskunde die heeft natuurlijk ook gewoon kantoor, openbare gebieden en noem maar op en dat is niet anders dan andere bedrijven of een huishouden, en dan kan je op een ok kijken wat is je proces en zo een schone kant beginnen want die zullen jullie ook wel hebben	

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