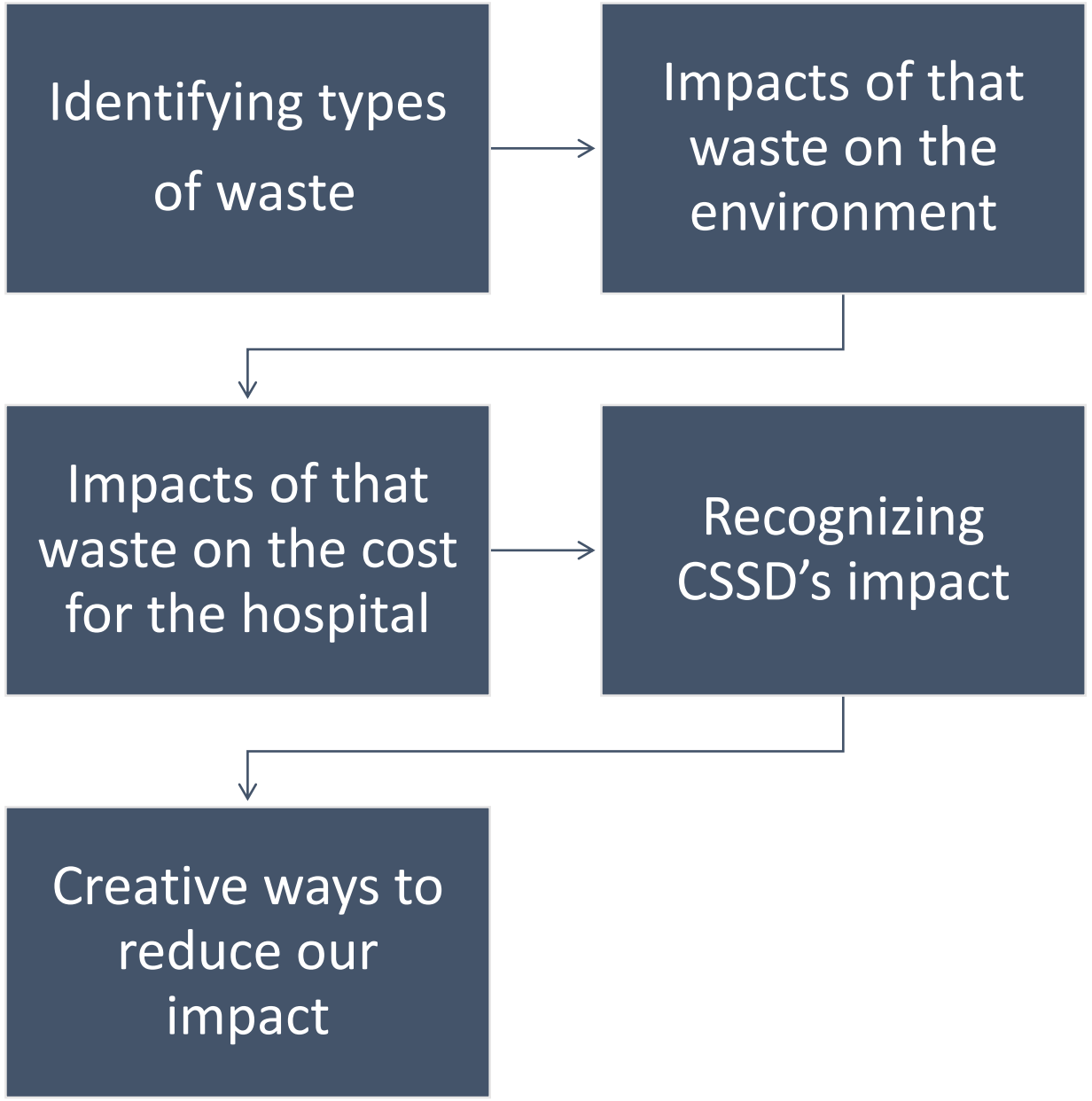
A lean approach to waste management in CSSD

By Derek Hendzel

Learning objectives:



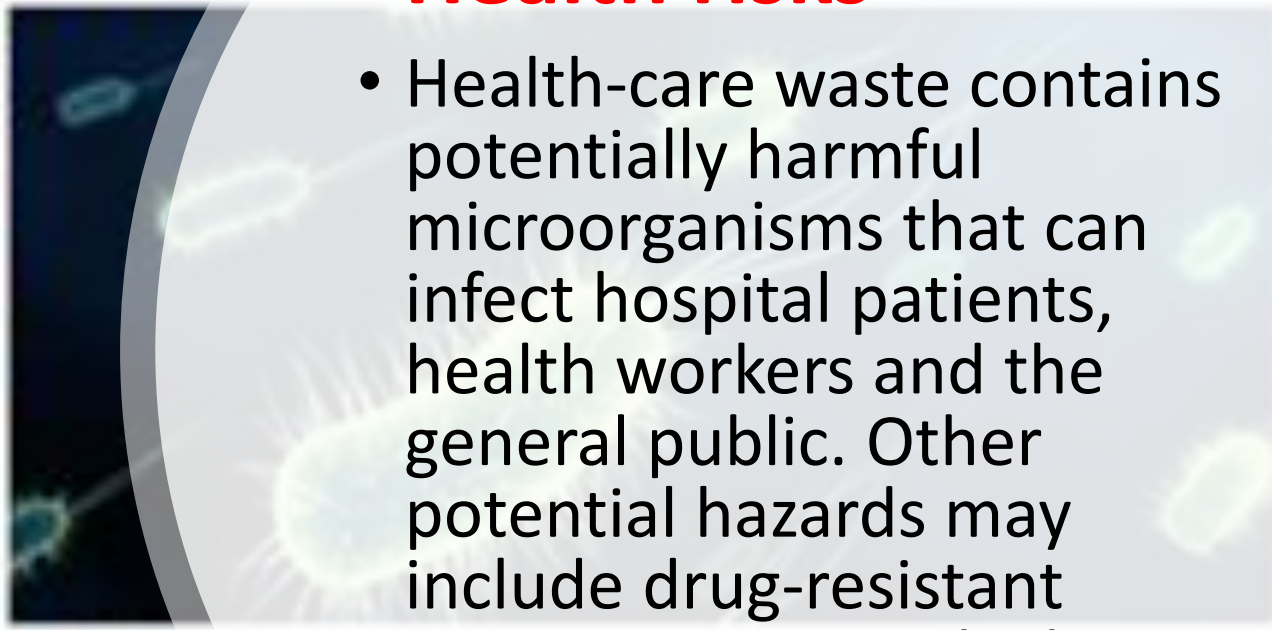
Waste and by-products cover a diverse range of materials, as the following list illustrates:

- **Infectious waste:** waste contaminated with blood and other bodily fluids. In most hospital that would be mainly generated by the Operating Rooms, cultures and stocks of infectious agents from laboratory work, or waste from patients with infections (e.g. swabs, bandages and disposable medical devices)
- **Pathological waste:** human tissues, organs or fluids, body parts and contaminated animal carcasses;
- **Sharps waste:** syringes, needles, disposable scalpels and blades, etc.;
- **Non-hazardous or general waste:** waste that does not pose any particular biological, chemical, radioactive or physical hazard.

- **Chemical waste:** for example solvents and reagents used for laboratory preparations, disinfectants, sterilants and heavy metals contained in medical devices (e.g. mercury in broken thermometers) and batteries;
- **Pharmaceutical waste:** expired, unused and contaminated drugs and vaccines
- **Cyctotoxic waste:** waste containing substances with genotoxic properties (i.e. highly hazardous substances that are mutagenic or carcinogenic), such as cytotoxic drugs used in cancer treatment.
- **Radioactive waste:** such as products contaminated by radiation including radioactive diagnostic material or radiotherapeutic materials.

- High-income countries generate on average up to 0.5 kg of hazardous waste per hospital bed per day; while low-income countries generate on average 0.2 kg.
- However, health-care waste is often not separated into hazardous or non-hazardous wastes in low-income countries making the real quantity of hazardous waste much higher.

MICROORGANISMS



- **Health risks**
- Health-care waste contains potentially harmful microorganisms that can infect hospital patients, health workers and the general public. Other potential hazards may include drug-resistant microorganisms which spread from health facilities into the environment.

There are many adverse health factors associated with MEDICAL WASTE

- Most obvious is sharps-inflicted injuries.
- Toxic exposure to pharmaceutical products, in particular, antibiotics and cytotoxic drugs released into the surrounding environment, and to substances such as mercury or dioxins, during the handling or incineration of health care wastes.
- The burning of the medical waste is a major contributor to air pollution.
- Improper incineration of the waste can result in burn and harm to staff in the facility.
- Radiation burns.
- Chemical burns arising during the process of disinfection, sterilization or waste treatment activities.

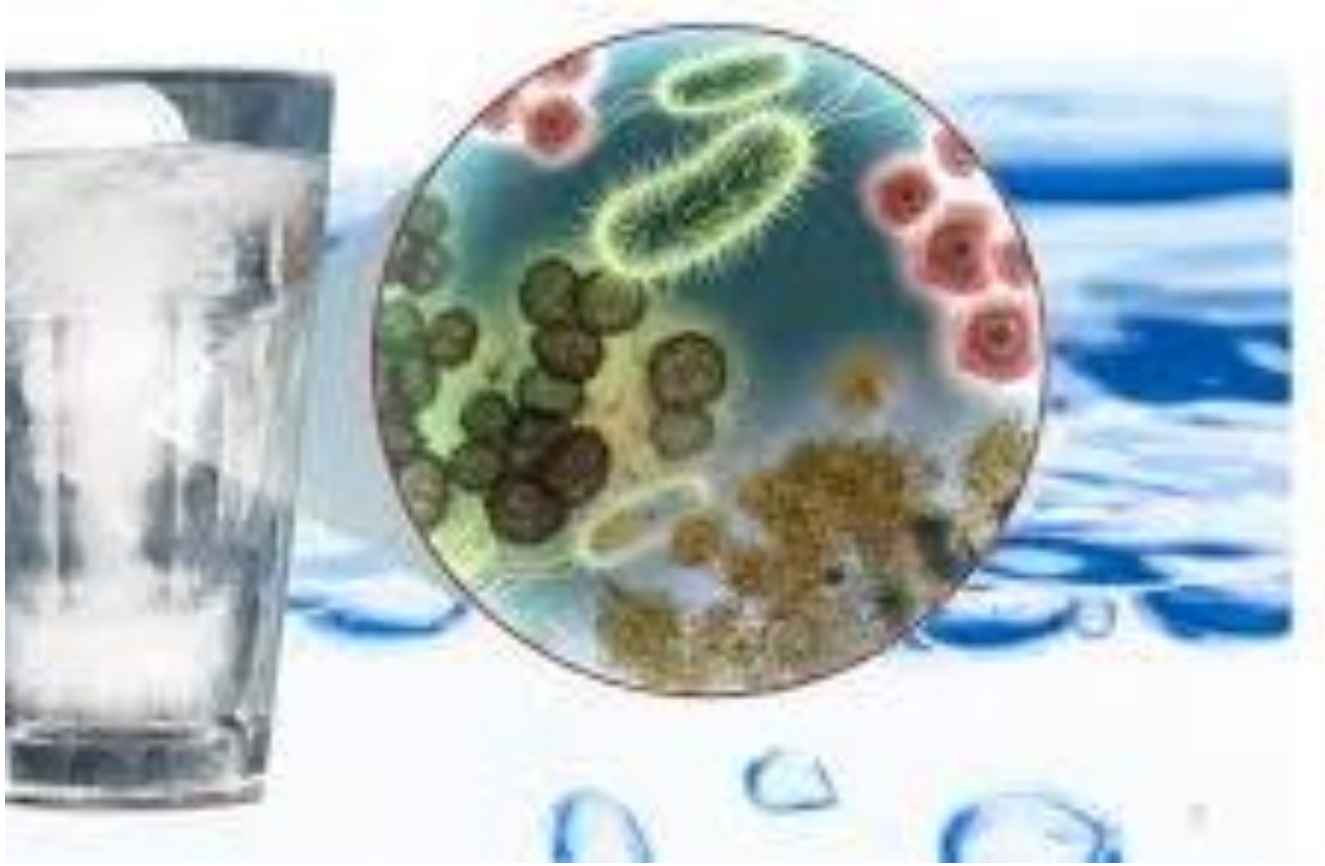
Sharps-related injuries

- Worldwide, an estimated 16 billion injections are administered every year. Not all needles and syringes are disposed of safely, creating a risk of injury and infection and opportunities for reuse.

- Additional hazards occur from scavenging at waste disposal sites and during the handling and manual sorting of hazardous waste from health-care facilities.
- These practices are common in many regions of the world, especially in low- and middle-income countries.
- The waste handlers are at immediate risk of needle-stick injuries and exposure to toxic or infectious materials.

The environmental Impact of medical waste can be enormous.

- The environment is being harmed due to the treatment and disposal of healthcare waste. There are health risks related to the release of pathogens and toxic pollutants at these dump sites.



The disposal of untreated health care wastes in landfills can lead to the contamination of drinking, surface, and ground waters if those landfills are not properly constructed.

- The treatment of health care wastes with chemical disinfectants can result in the release of chemical substances into the environment if those substances are not handled, stored and disposed in an environmentally sound manner.

Assessing the scale of the problem in the GCC.

Recent reports suggest that around 150 tons of medical waste is created by GCC countries every day, with Saudi Arabia alone creating 80 tons.

Traditional approaches to medical waste disposal in the Middle East overwhelmingly rely on landfill and small-scale incineration.

The landfills are over flowing and pose a treat to people seeking out items to resell.

15-25% of the total amount of medical waste created in the Middle East is considered hazardous or infectious.

Investment in better & safer disposal facilities

- The building of new incineration facilities are taking time, so much of the Middle East is trying to cut back on relying on landfill for waste disposal.
- However, in the long term, investment is likely to flow towards more advanced and sustainable disposal methods, such as steam sterilization (or autoclaving) which is the most cost effective of the current options.
- The good thing is that autoclaving and can be used to safely process up to 90% of all medical waste.

- As Middle Eastern nations look to tackle their respective medical waste generation challenges, greater cooperation and investment in similarly advanced facilities look increasingly likely.

- Besides interest in autoclaving and other leading sustainable methods, even more advanced medical waste disposal technologies may be making their way to the Middle East in the near future.

- **Plasma gasification** is an emerging solution with excellent prospects for use in medical waste disposal. Last year there were a number of deals signed for the development of plasma gasification as an option for the concerning amount of medical waste being generated in the Middle East.

Medical Waste

PLASMA GASIFICATION

- https://www.youtube.com/watch?v=2qdIM5vdVF0&feature=youtu.be

Measurement of the problem aids in its successful solution

- Tracking the waste itself is also a major part of the long-term disposal solution. It's been shown to be a priority in the UAE in the development of its new national waste database.
- Now in operation, the database is capable of analyzing waste generation nationwide. This is particularly important for monitoring exactly how much hazardous medical waste is produced, how it is treated and how current efforts measure up against national targets and global waste indicators.

- With a more comprehensive data oversight of the nation’s medical waste generation and treatment capabilities, this will help determine the necessary scale and timeline of constructing new disposal facilities.

- Furthermore, this may set the standard for the rest of the region in terms of devising long-term solutions to the problem.

Waste management: reasons for failure

Lack of awareness about the health hazards related to health-care waste.

Inadequate training in proper waste management.

Absence of waste management and disposal systems.

Insufficient financial and human resources plus the low priority given to the topic are the most common problems connected with health-care waste.

Many countries either do not have appropriate regulations, or do not enforce them.

World Health Organization

- Key facts:
- Of the total amount of waste generated by health-care activities, about 85% is general, non-hazardous waste.
- The remaining 15% is considered hazardous material that may be infectious, toxic or radioactive.

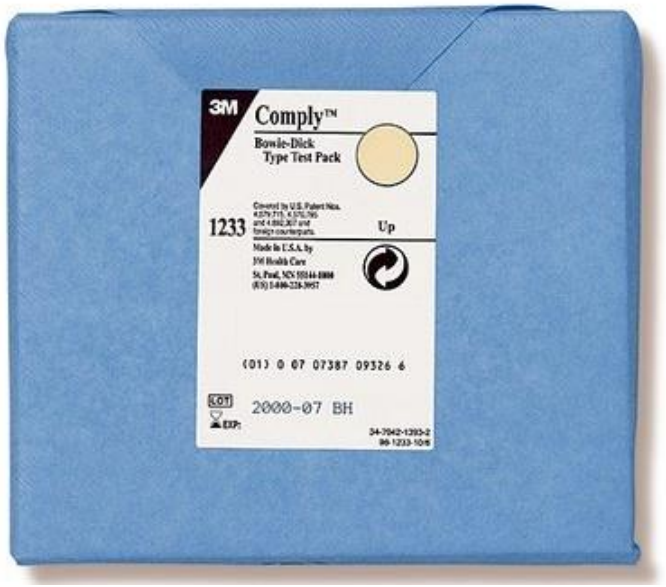
What can CSSD do to help address this issue?

- **A large percentage of CSSD waste falls into the 85% that is general, non-hazardous waste.**

- When it comes to CSSD Waste….
- Does it really matter?
- How much would you really save?
- How can the actions of a CSSD staff really make any impact?

What non-infectious waste items does an average CSSD deal with daily?

- Packaging and papers left after a Bowie Dick test pack.
- Wrappers from loaner trays that were sterilized but unused.
- Papers from count sheets and monitoring reports.
- Waste from cutting peel pouch.
- Waste from items being sent to CSSD for reprocessing do to expiring or holes in the wrappers.
- Empty Sterrad cassettes.



Any idea of how much waste comes from a Bowie Dick?

- On average a Bowie Dick test pack has around 1.5cm of paper waste per pack.
- **Our hospital uses 3 Bowie Dick test packs a day.**
- We operate 7 days a week so our hospital generates enough paper waste to reach the height of a 4 story building per year.

- There are around 104 Hospitals in UAE.
- If 85% of those 104 are using a Bowie Dick (that has paper waste) that would equal 88 Hospitals.
- **Those 88 hospitals would produce a stack of papers 1,235 meters high yearly.**
- Burj Khalifa is only 830 M.

Switching to an Electronic Bowie Dick would make a huge difference.

SteamSpy is an electronic Bowie-Dick test system permanently installed in the steam sterilizer.

Or

Bowie Dick test packs that use the same paper for 15 cycles

What if you switched from wrappers to containers?

How much could you save?

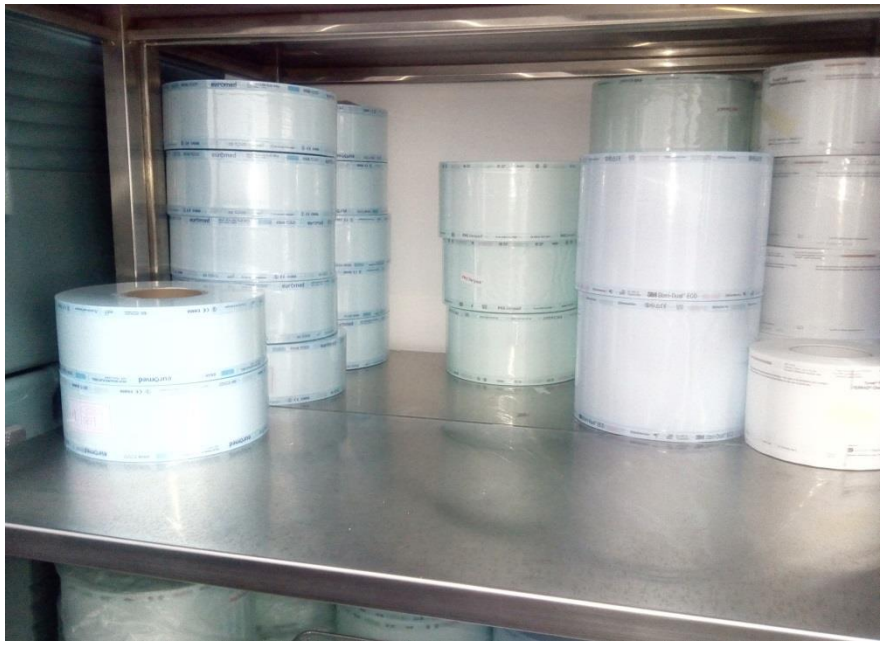
• Sterilization Containers Reduce Waste

- Sterilization containers are the preferred choice for cost savings versus blue wrap, and they help reduce waste too.
- Sterilization containers can achieve up to 80% cost savings over disposable sterilization blue wrap.
- Sterilization containers can help you save the environment by decreasing your waste.
- They can also save your hospital money on the cost of disposing the Medical Waste.
- Blue **wrap** makes up 5 percent of operating room **waste** daily.

By simply switching from a large size tray to a smaller tray we were able to place in a peel pouch.

Try going PAPERLESS!

- Using an instrument tracking system, with an option to save the count sheet digitally verses print a count sheet, would save tons of paper.



Focus on waste from using the wrong size of precut peel pouches.

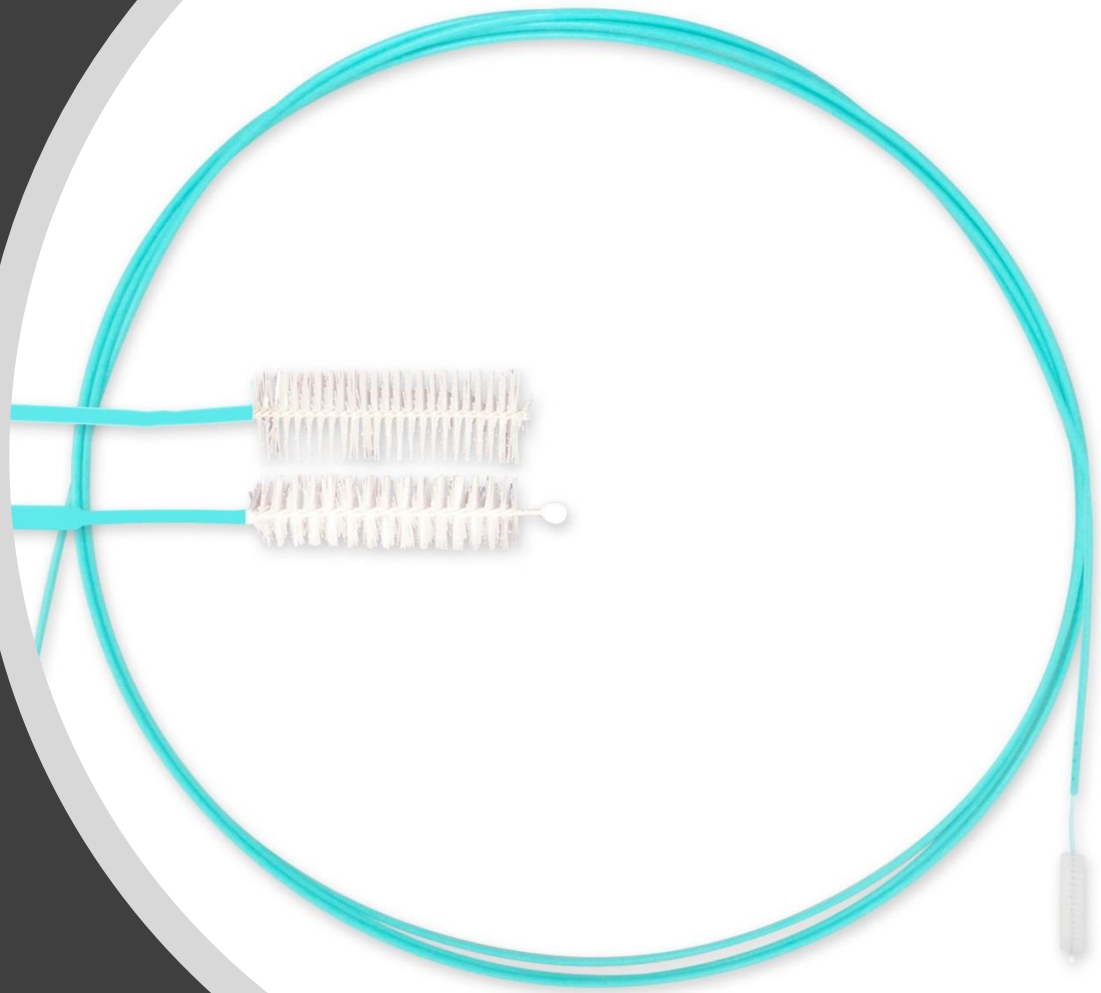
- There are now amazing sealers that measure out the exact size you need and can make over 1000 pouches per hour.
- Having the exact size means you save on cutting the precut pouches, therefore reducing waste.

- You can easily adjust the size of the pouch to accommodate any new instruments.
- The hospital would save on shipping cost and storage space for boxes of ready made peel pouches.
- It’s cheaper to buy reels and have the machine cut the exact size you need.

- The trend has been to go to single use brushes, but that is having an impact on the addition of waste from our decontaminations.

- Consider using REUSABLE brushes. Create a policy to ensure proper cleaning and inspection of the brushes.

- Involve your staff in finding solutions that will not reduce quality of their work, but could help reduce the waste .



- Worker closely with scheduling to ensure that wrappers are not wasted on cases that have a high chance of being cancelled at the last minute.
- Be sure to label items properly to avoid unnecessarily opening items looking for mislabel items.
- Be aware that simple mistakes will add to the hospital’s waste.

In conclusion….

- There are many types of medical waste that we can’t control, but as CSSD professionals can still have an impact.
- Focus on what your CSSD can do to lower your medical waste.
- It can be as simple as bringing you own coffee cup to purchasing an instrument tracking system.

- Thank you!

- *(1)* Pépin J, Abou Chakra CN, Pépin E, Nault V, Valiquette L. Evolution of the global burden of viral infections from unsafe medical injections, 2000-2010.PLoSOne. 2014 Jun 9;9(6):e99677.
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