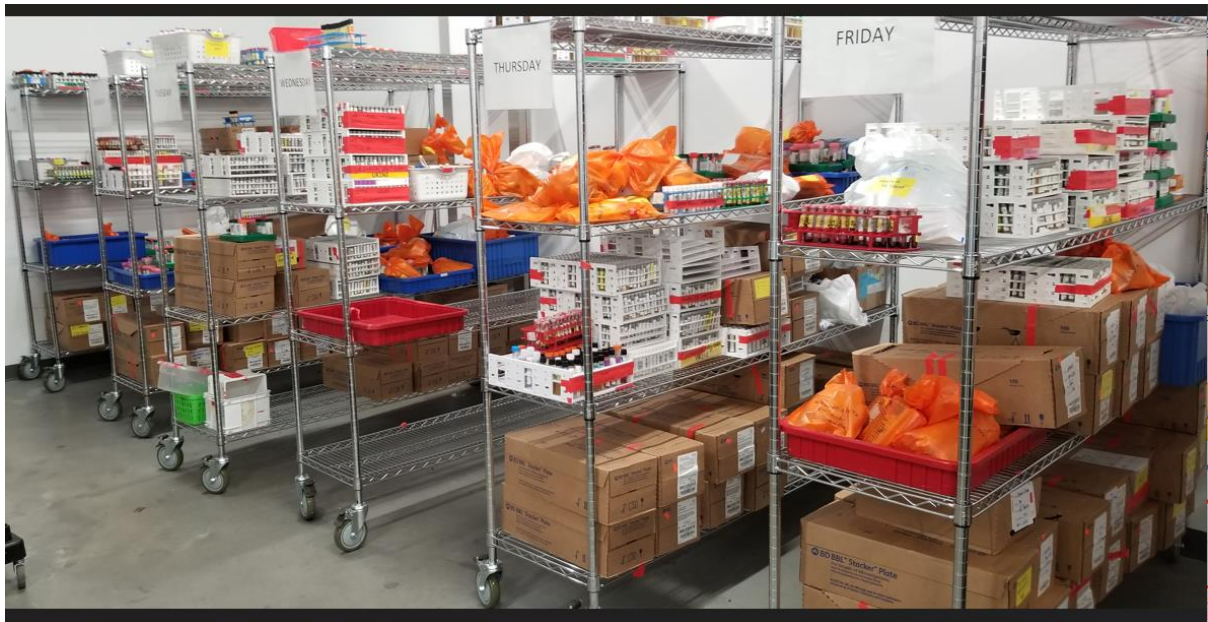


Questions and replies from LabCoP's Feb 2023 Waste Mgt ECHO Session: Rethinking Laboratory Waste Management



Clinical lab specimens awaiting disposal.

February 2, 2023

Contact information for additional questions:

Ed Krisiunas, MLS(ASCP), MPH

President

WNWN International

Waste Not, Want Not!

PO Box 1164

Burlington, Connecticut

06013

1-860-675-1217 (O)

1-860-839-3993 (M)

SKYPE – Boutiquewaste

Email: Primary ekrisiunas@gmail.com

Secondary krisiunas@uchc.edu

Chair - ISWA Working Group on Healthcare Waste (WGHCW) 2022 to 2026)

IBC and IACUC Community Member UConn Health

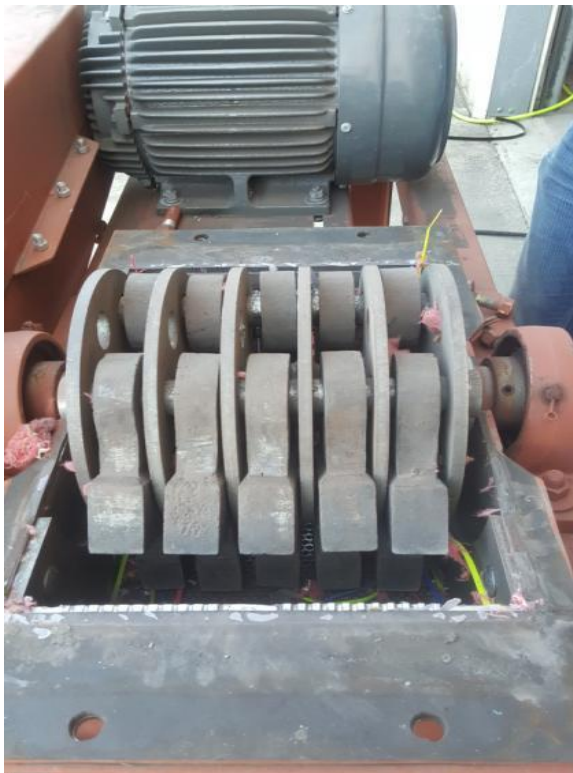
15:29:28 From Mengistu Kebede to Everyone:

What Shredder mean?

Hello Mengistu – A shredder is a mechanical device comprised of two shafts with cutting blades to destroy material. Shredders come in a variety of sizes from ones as small as paper shredder to ones that will destroy tires / metal...as well as healthcare waste. The photos below are of 1) Shredder ; 2) Impact mill; and 3) A granulator. Each can achieve the same results.



1) Shredder



2) Impact mill



3) Granulator



Comparison of a granulator and ham

The shredded / destroyed waste may not be totally destroyed or it could be small pieces. It all depends on the quality of the design as well as the regulatory requirements / expectations of the user.

15:37:19 From Jemia Gordon to Everyone:

Waiting of such training in Cameroon

Bonjour Jemia – please communicate this to ASLM!

15:37:20 From Eve Gadzikwa, SADCAS to Everyone:

Hi Edward, thanks for very interesting insights on management of GTC waste. Given the scale of this issue, it seems suppliers of GTC producing products also have a responsibility to research on less toxic alternatives to reduce the burden on users of their products. In addition, supplier need to also provide waste management solutions to share the burden.

Hello Eve...Your comment falls into the Extended Producer Responsibility (EPR) category. EPR is an environmental protection strategy to reach an environmental objective of a decreased total environmental impact of a product, by making the manufacturer of the product responsible for the entire life cycle of the product and especially for the take-back, recycling and final disposal. I agree creating a process that generates less waste as well as a waste stream that is less toxic should be a goal. The challenge is bringing all “producers” to the table to share equally in their contribution to addressing how to best manage the diverse laboratory waste stream (from what is need to collect a specimen to what is needed to process it).

15:37:44 From Maneo Mothobi to Everyone:

How can we access the GTC Precipitation protocol/procedure?

Hello Maneo....I believe you are based in Lesotho. We will be able share the next version of the guidance document and the protocol in late Q1 2023 or early Q2 2023.

15:39:48 From Essien Idorenyin to Everyone:

How can we in Nigeria get to be part of this innovative insight?

Hello Essien – I would suggest reaching out to Orji Bassey (CDC hqj6@cdc.gov) and McPaul Okye (CDC Nigeria) who we have been collaborating with on VL/EID waste management.

15:40:07 From Ezinne Obii-okpala to Everyone:

Hi Edward, How do you discard toxic fluids like formalin and xylene.

Hello Ezinne – Glad you are asking that question as pathology labs (histology /cytology) have alcohols, xylenes, formalin/formaldehyde and stains.

There are solvent recovery/recycling devices that allow you to recover some of these chemicals to be reused. The upside is less waste to dispose as well as less chemicals to procure which should result in reduced overall costs.


There are a few companies in Africa providing such equipment:

<http://mwdsales.com/>

<https://www.smmafrica.com/>

There are also neutralizers that can be added to spent formalin which allows it then to be discarded to drain.

15:41:00 From MOSILINYANE DIAHO to Everyone:

Reacted to "Hi Edward, How do yo..." with 

Hello Mosilinyane....We have previously presented solvent recovery to MOH in Lesotho. I suggest you also connect with Andreas Fusi to discuss this further .

fusiand@gmail.com

15:43:22 From Aloysius Bingi T to Everyone:

The problem that countries especially in Africa are facing is due to lack of Waste management policies enforced and monitored by governments and WHO. How is CDC and other Funders intervening?

Good point Aloysius – We have seen in many countries the development of documents – guidelines / policies / regulations. There is no lack of this information. It may vary among the countries. Some better than others. WHO / CDC / ASLM are really in the position to assist in

identifying these gaps / share knowledge on good/better/best practices to stakeholders. There needs to be ownership / commitment on the part of governments to enforce what they have drafted and created and on the part of the producers of waste to be compliant. Consideration must be given to unfunded mandates. We agree creating a requirement without the supporting funds to implement and monitor will lead to poor outcomes (a theme I can confirm I have seen for more than 20 years with periodic glimmers of success).

15:43:27 From Jérémie Muwonga (DRC) to Everyone:

I have a colleague who is working on laboratory/hospital waste management. How shall she do to get in touch with Mr Edouard?

Thank you Jeremie..I understand you are from the DRC.

My e-mails are:

**Email: Primary ekrisiunas@gmail.com
Secondary krisiunas@uchc.edu**

15:47:27 From Karabyo Balinandi to Everyone:

Beyond GTC, is liquid waste from exotic or GMO material e.g., GMO insects and other animals which we are getting into our soils, sometimes with copious amounts of bleach, etc., via the drainage system. Any innovative ideas on how to manage this kind of waste?

Asante Karabyo..I suspect I did not meet you in Uganda...tick expert! Memories of hospital staff bringing me a tick to my lab 1986- to 1989 – Deer tick? Concerns of Lyme Disease.

Fascinating question...bleach is recommended but neutralized by organic material. Can you reply with a more details? Are you referring to GMOs in the lab or being used/released/planted in the environment?

15:48:46 From Abraham Alabi to Everyone:

Laboratory waste management in a standard way is expensive and could be very challenging. How much of commercialization is available for laboratory waste management as compared, for example, to home waste management. That is, commercial entity managing the waste for a set of laboratories in a city for instance.

Hello Abraham...I believe you are based in Nigeria...Abuja...you must know Orji.

If I understand your comment/question, there are a number of commercial plants in some countries/cities collecting healthcare waste relieving the burden of treating waste onsite. Keep in mind a fee may be charged for such services. You also need to inspect such facilities to ensure they are managing waste per properly. This is an idea that has been implemented in a number of locations around the world and in some cases the plants are located at landfills so that treated waste is immediately buried unless something else is being considered for the waste.

15:50:23 From Mikhael DE SOUZA to Everyone:

How do we get rid of the concrete slabs after they are used? Do they still contain contaminants?

Hello Mikhael - Encapsulation of chemical wastes has been suggested by a number of entities over the past 3 decades. These items, depending on how they are mixed (small versus large containers) could be buried as is or wrapped in plastic. Photo below is an example of chemo waste encapsulated in 200-liter drums to be buried. This issues with these drums are their weight. We have not specifically analyzed the cement / GTC mixture relative to leaching / containment of contaminants. Issues of leaching related to the length of curing of concrete / concentration of GTC / exposure to water/moisture. Interestingly thiocyanate is an additive to cement in cold temperatures as an accelerator (to increase strength). Some studies have looked at sodium thiocyanate leaching from concrete.



15:50:47 From Collins Otieno to Everyone:

Sustainability of using incinerators is a challenge. Is placement model like for Lab equipment a feasible way to go??

Thank you very much.

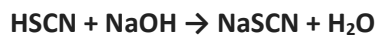
Great question Dr. Collins – We should engage vendors of treatment technologies regarding ways to better manage procurement of equipment that would include maintenance. It might be through leasing / rental / pay per use. The issue of sustainability applies to all equipment. We should spend more time vetting technologies being introduced into countries so that in country service and maintenance along with spare parts are available.

15:52:30 From Alan Woodard to Everyone:

I know cost is an issue, but have you considered alkaline hydrolysis for neutralizing GTC?

Thanks Dr. Woodard – Rick Morgan (WNWN resident Chemist) reply is below:

I think the hydrolysis would have an effect on the Guanidine but not the thiocyanate. Especially at high pH. At neutral pH there is a minor reaction that doesn't change much:



But it doesn't do anything to the thiocyanate molecule.

15:52:33 From Tambo Ernest to Everyone:

Traditional lab Waste management vs emerging waste? Could there any significant difference or new approach?

Hello Ernest – Another great question. Advancement in instrumentation is what in my 40 years of experience has been the greatest chain in Clinical Laboratory Medicine. I must admit that on one hand I am excited to see the advancements as it means faster results back to clinicians and patients to address healthcare concerns, whether it be chronic or infectious disease conditions. Medical Laboratory Scientists (MLS – the new designation from the American Society of Clinical Pathology) have been mechanical technicians – having the skills to maintain platforms in addition to interpreting large volumes of data. Even in microbiological one sees the same although nothing is closer to the enemy than a culture plate or Kirby Bauer plate

This has change the landscape of waste from laboratory where volumes have increased and the composition has become quite diverse. There are more/newer technologies on the market that could process such waste onsite as well as destroying so it would not pose a physical hazard as well as be reused. So, to your point, similar to new platforms to perform tests across the spectrum of laboratory medicine, there are some new as well as improved versions of older technologies (autoclaves) that need to be consider. And let us not forget out biological effluent decontamination.



15:52:39 From Agnes Njeri Murimi to Everyone:

Hi all

How do we manage glasses as waste

Hello Njeri - If you are referring to glass slides, there are some simple ways to crush these albeit it will take some practice (one needs to use a heavy weight/hammer/ sledge to crush small batches of these slides to small pieces). Are these stained slides? Are you disposing of other glassware? Please contact me so I and my team can assist further.

15:53:15 From Dr Raksha K to Everyone:

Greetings from India, Dr Raksha from Bangalore here, my question is whether the recent ISO 15189 2022 standards addressing the management of lab waste?

Hello Dr. Raksha: Great to receive your question. I have worked in Chennai and Lucknow on health care waste management with UN GEF. The new ISO standard refers to other standards for waste management. The following standards apply although the content on waste management is not too detailed. In addition to ISO 15189, there is also ISO 15190 / 22367 / 35001.

15:53:28 From Agnes Njeri Murimi to Everyone:

How do we manage glasses as waste...Agnes from Kitui Kenya

Asante Agnes – as above - If you are referring to glass slides, there are some simple ways to crush these albeit it will take some practice (one needs to use a heavy weight/hammer/ sledge to crush small batches of these slides to small pieces). Are these stained slides? Are you disposing of other glassware? Please contact me so I and my team can assist further.

15:54:21 From Orji Bassey to Everyone:

Thanks so very much Ed for that inciteful presentation. Wow. Please how can we get some guidance documents and policies that will help us develop custom Biosecurity and Biosafety policies and Guidelines looking at Nigeria specific situations. can you also share an assessment tool to help us have a concrete baseline information on Biosecurity situation in Nigeria.

Hello Orji...Always great to communicate with you. Africa CDC has been hosting Biosafety / Biosecurity programs. I suggest reaching out to them via ASLM

<https://africacdc.org/programme/laboratory-systems-and-networks/biosafety-and-biosecurity/>

15:56:37 From Gizachew Girma to Everyone:

The current problem is where to take the liquid waste for treatment

Thank you for the comment Gizachew. The Guidance document will provide options for the management of the liquid. EPHI in Addis has received training on the disposal options. It may be of value to contact Eyob Abera Mesfin (MPH, PhD) - Email: eyob2001@gmail.com

15:56:48 From Eve Gadzikwa, SADCAS to Everyone:

Regulation is obviously being overtaken by events /technology developments. Greater awareness is therefore required to enable practitioners to identify appropriate solutions / options for different situations? Is there such a ASLM Waste Management manual /handbook that can be used by different institutions (urban & rural)?

Thanks again Eve for the comment. There are a number of resources on this but we feel there is a gap how the information is distributed as well as how is it conveyed and understood. We are working with ASLM on providing such guidance.

15:56:51 From Tura Galgalo to Everyone:

It will be nice to engage stakeholders like environment management authorities for advocacy purposes.

Hello Tura – Asante...We agree with your comment to engage with stakeholders. Challenge to environmental authorities for advocacy purposes is over coming risk tolerance – that is approaching environmental issues using improvisation – making due with what you have. It is clear practices will be dictated by local circumstances. We need to move away from grading waste management on a curve. We would not accept test results from a process that has not been validated. We should not for environmental issues.

16:00:03 From Orji Bassey to Everyone:

Nigeria adopted the Saw-Dust waste mitigation method, but some stakeholders wanted us to go further to explain how we will dispose the resultant Ash from the high temperature incineration. They're also worried about the pollution control from Incineration process. The reason we have one of our major incinerator equipped with Pollution Control Unit. How do you reconcile with the worries arising from stakeholders especially when they're looking at other dangerous gases or chemicals associated with incineration fumes. Any best practices to share?

Thank you for the nice presentation.

Thank you for sharing the status of treatment in your locale Orji. You must first begin by ensuring the equipment is operating properly and also conducting emission testing as well as analysis of the ash. These types of test are expensive. They are however, the best way to support the operation of the system you are using is effective. We know testing labs to evaluate air emissions are available in Nigeria. I know of a US Engineer who has worked extensively in Nigeria conducting air emission testing. The issue is cost.

16:03:29 From Kingston Omo-Emmanuel to Everyone:

The private sector waste management company we engaged in Nigeria has a scrubber that prevents the release of pollution from incineration

Thanks Kingston for the feedback – Scrubbers can be very simple – water sprayed on smoke coming from the secondary chamber to create a black or gray water. More sophisticated systems have what are called wet or dry scrubbers using sodium hydroxide to neutralize the acid gases. You know you have issues with air emissions if there are small holes in the room of the incinerator room (if it has a room). There are also filters to capture dust which need to be replaced or cleaned using a mechanical process. You should request the operator to provide air emission data showing compliance with applicable regulations.

The photo is of a roof over an incinerator that has probably been emitting acid gases due to a lack of air pollution control and corroding the roofing metal to create small holes for the sunlight to come through.



16:03:52 From Nurhayati Kawi to Everyone (Jakarta):

Our country regulated and forbidden using incinerator in health facilities, how do we handle that? Currently we use third party for waste management.

Hello Nurhayati – It would best to understand the lab environment you are working in – What lab(s) specifically – HIV – TB – Malaria – other labs? What platforms are being used in the lab(s)? How does the third party manage your waste? We have found photo documentation is a wonderful tool to learn and share with others the information gathered and then to determine / prioritize what needs to be addressed. We look forward to hearing from you.

16:04:09 From BRENDA OTIENO to Everyone:

Anything about handling ethanol bottles ?

Asante Brenda - I am assuming empty ethanol glass bottles? Please confirm via email. Or are they plastic? Glass can be crushed. The plastic bottles may be washed and reused but one needs to understand what they will be used for. There may be interest in the recycling of the plastic but

again, these must be washed of residue. The ethanol will evaporate if bottles are left open in a chemical fume or a BSC if it is vented to the outside.

16:05:36 From Omotayo Awofolu to Everyone:

Incineration is still being used in healthcare waste disposal in Namibia. Any environmental cost-effective suggestions?

Hello Prof. Awofolu – I am familiar with the incinerators at Katatura having been to Namibia many times as well as the City of Windhoek treatment plant with an incinerator as well as an autoclave with shredding and treated waste going to Kupferburg. Have you visited the CoW plant? Contact Eliphas Kahorere

Eliphas.Kahorere@windhoekcc.org.na

The plant addresses waste that can be processed in a non burn technology as well as waste that is best destroyed via incineration.

Thank you all for listening in on February 2nd and for the questions provided. We look forward to continued collaboration with all the ASLM member countries on laboratory waste management.