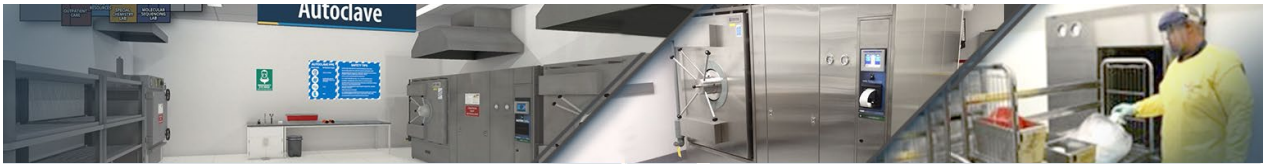
Autoclave: Loading, Operating, and Unloading Scenario Gameplay



Overview/Background

In this scenario, the user will demonstrate the proper steps to safely load, operate, and unload an autoclave. The user is tasked with decontaminating biohazardous waste. The autoclave scenario is performed in the Autoclave room.

Objectives

Demonstrate how to load, operate, and unload an autoclave.

Gameplay Flow

1. Scenario Intro
2. Check the logbook for prior run errors and log your run
3. Check the emergency switch
4. Check the jacket gauge
5. Check the chamber gauge
6. Check the door seal
7. Check the tub
8. Check the drain
9. Add the autoclave tape
10. Add the steam strips
11. Load the autoclave
12. Set the cycle
13. Check the cycle
14. Unload the autoclave
15. Place results into a waste can

Scenario Intro

Introduction: The primary method for decontaminating laboratory waste is in an autoclave. An autoclave is a self-locking, sealed chamber for sterilizing or decontaminating materials using steam under pressure. Any material potentially contaminated with biological agents must be decontaminated before disposal. Personnel should recognize autoclave hazards such as burns, splashes, and explosions to minimize risk. In this training scenario, you will learn the proper procedure for safely loading, operating, and unloading an autoclave to decontaminate biohazardous waste. This scenario uses a jacketed autoclave with a gravity sterilization cycle. Always follow your laboratory's SOP and risk assessment.

Task: In this scenario, you will decontaminate biohazardous waste by demonstrating the proper steps to safely load, operate, and unload an autoclave.

Personal Protective Equipment (PPE): laboratory coat, safety glasses, and nitrile gloves.

Loading and Operating

Step 1: Check the log for the last operation and any malfunction notes. If there are no concerns or issues, enter this run into the logbook.

Note: You should follow your organization's SOP for concerns or issues.

Autoclave Make/Model:	ACME Scientific Autoclave #2100		
Location:	OneLab Building 34	**Facility Name:**	Clinical Lab
Responsible Person:	Wiley Laboratorian	**Emergency Phone:**	(404) 123-4567

Cycle	Date	Time Start, Time End		Contents (e.g. Biological Waste) & Quantity	Pressure (psi)	Max Temp (°F)	Quality Control Checks		Tape Result (P/F)	Operator Initials	Comments
					Record at 20 mins into run		Steam Integrator (#Pass/#Fail)	Biological Indicator? (Y/N)			
1	05/21/2023	08:00	09:05	2 bags, biological waste; 1 sharps container	15psi	121°F	5P/0F	N	P	WL	n/a
2	05/21/2023	16:05	17:00	1 bag biological waste, 1 sharps container, 2 autoclave pans (pipettes)	15psi	121°F	3P/2F	N	P	WL	Run failure – 2 integrators failed
3	05-21-2023	17:30	18:30	Same as above	15psi	121°F	3P/2F	N	P	WL	Repeat of run #3. All integrators passed.
4	05/22/2023	08:00	09:05	5 bags, biological waste	15psi	122°F	5P/0F	Y	P	WL	Biological indicater sent to micro
5	05/24/2023	13:14	14:14	3 bags, biological waste	15psi	122°F	4P/0F	N	P	WL	n/a
6	05/25/2023	10:24	n/a	n/a	n/a	n/a	n/a	n/a	n/a	WL	BI results from 5/22/20223 passed
7	05/30/2023	15:00	16:00	3 bags, biological waste	15psi	122°F	3P/1F	N	P	WL	n/a

Record at Start of run, 20mins into run, after run completion

Step 2: The emergency shutoff switch is a safety mechanism used to turn off the autoclave in emergencies and when it cannot be shut down normally. Verify that the emergency shutoff switch is in the “on” position.

Step 3: Autoclaves are rarely turned off except for long periods of nonuse. Ensure the power switch is in the “On” position.

Step 4: Check the jacket pressure gauge. The jacket pressure gauge displays the pressure inside the jacket.

Note: Check your autoclave manufacturer's user guide and laboratory's SOP for your autoclave's desired jacket pressure gauge reading.

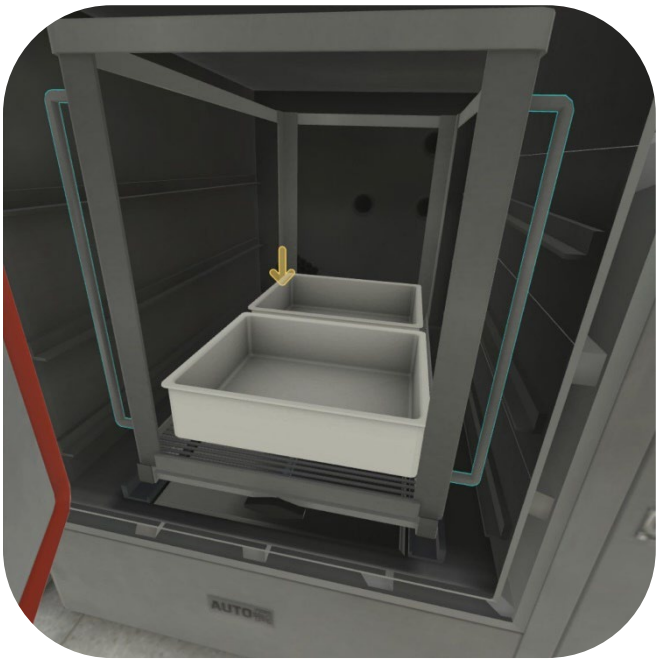
Step 5: Check the chamber pressure gauge. The gauge displays the pressure inside the chamber, which should be a minimum of 15 pounds per square inch (PSI) during operation. Ensure the chamber pressure gauge reads zero prior to opening the autoclave.

Step 6: The autoclave door assembly seals the chamber from the outside atmosphere and prevents steam from escaping. Open the door.

Step 7: Door gaskets and seals should not be ripped or torn or have gouges. Inspect the door gasket to ensure no nicks, gouges, or tears.

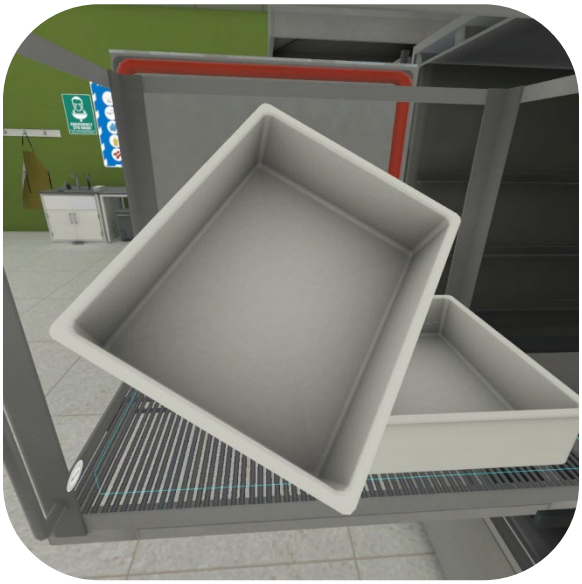
Note: A damaged door gasket can allow steam and pressure to escape.

Step 8: Pull the cart out, and you will see autoclavable pans on the cart.



Step 9: An autoclavable pan is a secondary containment for spillover. Inspect each pan for cracks, punctures, or liquids.

Note: If the autoclavable pan is cracked, punctured, or damaged, it must be discarded and replaced in accordance with your laboratory's SOP.

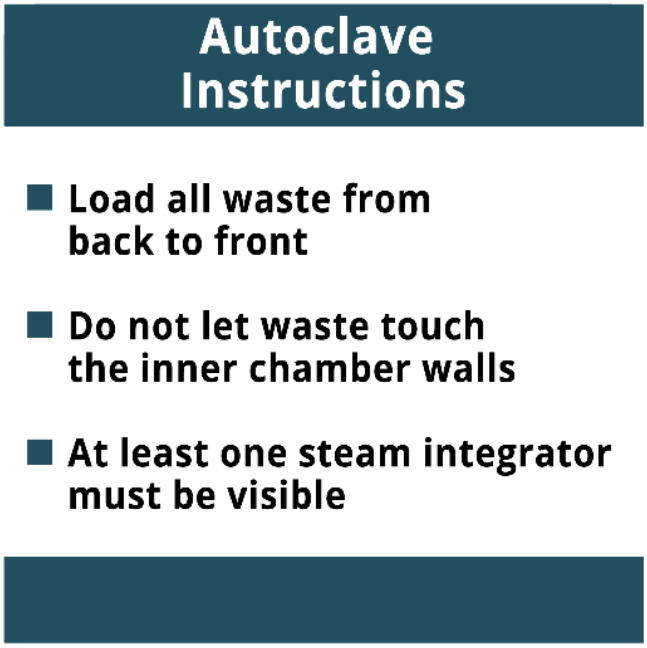


Step 10: You will see the drain screen on the autoclave floor. The drain screen prevents debris from entering the drain line. Verify the drain screen is clear of debris.

Caution: A clogged or blocked drain can lead to improper air removal and incorrect drying times, which may prevent the steam from reaching the correct pressure and temperature. If the drain is clogged or blocked, notify your supervisor and follow your laboratory's SOP.

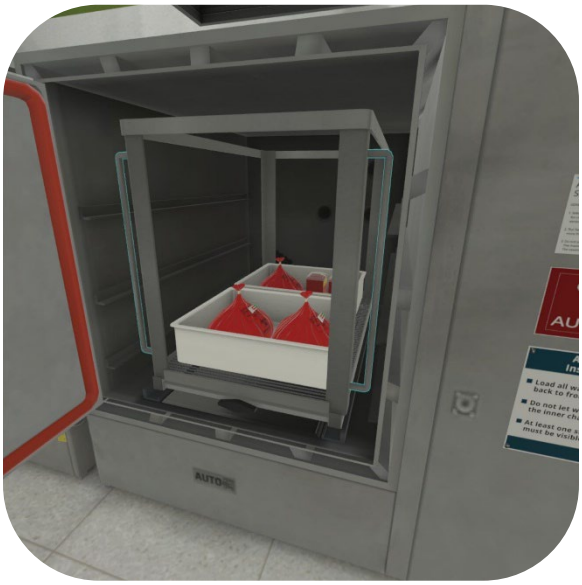
Step 11: Move to the waste rack and attach autoclave tape over the lids of the sharps containers and on biohazard bags.

Step 12: Move the waste from the rack to the autoclave pan on the loading cart. Items should be placed from back to front and should not touch the inner walls of the chamber.



Step 13: Apply the steam sterilization integrator strips. Steam exposure time and temperature chemical indicators must be included in every autoclave run. Attach three steam integrators to the waste in the indicated areas. One to two steam integrators should be clearly visible from the door opening.

Step 14: Carefully push the loaded cart into the autoclave steam chamber and close the door.



Step 15: Run the autoclave for 60 minutes. The temperature should be 121 degrees Celsius, and the chamber pressure should be 15 pounds per square inch or 30 inches of mercury. Set the autoclave cycle to gravity sterilization, verify the temperature and pressure, and press start. At 20 minutes, check to make sure the autoclave is operating correctly.

Note: Check your autoclave's manufacturer user guide and laboratory's SOP for your autoclave's settings.

Step 16: After 20 minutes, check the autoclave display to verify the temperature is 121 degrees Celsius, and the chamber pressure is 15 pounds per square inch or 30 inches of mercury.

Note: If the temperature or chamber pressure is incorrect, inform your supervisor and follow your laboratory's SOP.

Step 17: Continue the autoclave cycle for the remaining 40 minutes.

Unloading

Step 18: Verify the cycle completed by reviewing the display panel to determine that the proper temperature and time cycle have been reached.

Note: Check your autoclave's manufacturer user guide and laboratory's SOP for your autoclave's settings.

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Display will indicate the following:

- Status: Complete
- Completed Runtime: 60 minutes
- Completed Temperature: 121°C
- Completed Chamber Pressure: 15 PSI/30 inches of mercury (inHg)

Step 19: Next, verify the chamber pressure gauge is zero.

Note: The chamber pressure gauge must be zero prior to opening the autoclave. If the chamber does not reach zero, notify your supervisor and follow your laboratory's SOP.

Step 20: Don the steam apron and the heat-resistant thermal gloves.

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Step 21: Position yourself so you are clear of the autoclave door and any escaping steam.

Step 22: Slowly and gently open the autoclave door, no more than one inch, allowing steam to escape and decrease temperature. Wait 10 minutes before opening the door completely.

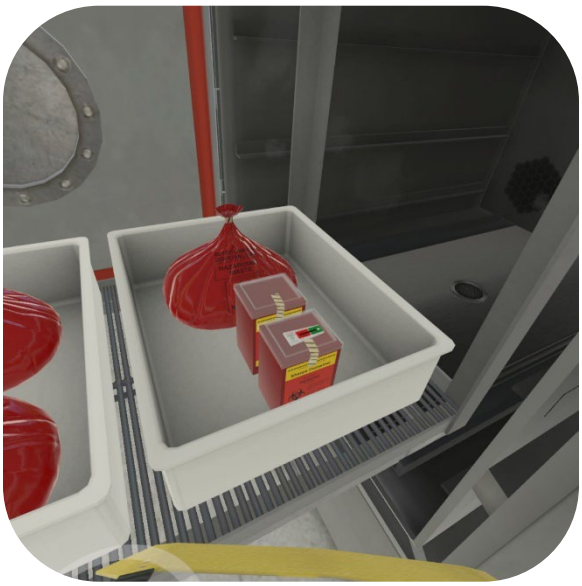
Caution: If the door is open more than one inch or the waiting time is shortened, steam will rapidly escape and may cause a steam burn.

Step 23: After 10 minutes, it's safe to open the door completely.

Step 24: Next, pull out the load cart.

Step 25: Steam integrators have a printed line of chemical integrator ink. If the required exposure time, temperature, and steam are reached, the steam integrator will indicate “Pass.” If the required exposure time, temperature, and steam are unmet, the steam integrator will indicate “Fail.” Check all three steam integrators. Verify that no more than one steam integrator failed.

Note: If more than one steam integrator fails, the load is considered to fail and must be repeated. If no more than one fails, the run is considered successful.



Step 26: Since you have verified that no more than one steam integrator has failed, record this run in the logbook as passed, and there were no issues or malfunctions.

Step 27: Remove waste from the autoclave and place waste in the black biohazardous container.

Note: If you drop the waste, consult your laboratory's SOPs for dealing with spills and leaks.

Step 28: Move to the table, remove heat-resistant thermal gloves, and place them on the table.

Step 29: Remove the steam apron and place it on the hook on the wall.

Complete: Congratulations! You have successfully completed this scenario!

Scenario References and Acknowledgements

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Scenario Design By

Centers for Disease Control and Prevention (CDC)
Office of Laboratory Science and Safety (OLSS)
Center for Laboratory Systems and Response (CLSR)
Division of Laboratory Systems (DLS)
Training and Workforce Development Branch (TWDB)

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