



Checklist for Restarting Laboratories on College and University Campuses

Introduction:

The COVID-19 pandemic has impacted college and university campuses across our nation and around the world. Within a short period of time, many laboratories were shutdown as students, faculty, and staff were required to leave their campuses to shelter-in-place at home. As administrations begin to consider how best to restart operations, there are many things that must be considered in bringing laboratories back into operation safely and protect all involved.

The Campus Safety Health and Environmental Management Association recognized the need for a comprehensive restart checklist, focused on laboratories in the higher education environment. Such a checklist would assist Environmental Health and Safety professionals as they in turn help their college and university departments restart work in laboratories. As our members began contributing to the CSHEMA body of knowledge in our community forum, our Board of Trustees appointed a task force to bring all of these great resources together to create this much needed checklist.

The attached checklist is meant to assist higher education safety specialists as well as laboratory Principal Investigators (PIs) and other researchers in preparing to safely open and resume activity in laboratory spaces. Add, delete, and customize this checklist as needed to create a document that will best serve to ensure your institution's spaces are prepared for research once again. Be aware that each institution may have various parties who handle different aspects of this checklist. Likewise, there may be some items specific to your institution, state, or local directives that warrant additions. This checklist could easily be converted to a matrix that assigns particular tasks to specific individuals, offices, or work units.

The institution should use their language.

Task Force Members:

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Laboratory COVID-19 protocols

This section focuses on practices and supplies required to limit the spread of the COVID-19 Virus

1) Review your institution's and State's COVID-19 protocols

- Link your "Guiding Principles" here
- Develop a training/communication to cover basic COVID-19 awareness, hygiene, and communal safety expectations
- When possible, develop training and communications that can temporarily replace required in-person laboratory safety training

2) Procure Transmission-Prevention Equipment/Supplies

- Ensure lab occupants have cloth or single-use face coverings (if required)
 - Know where pick-up & drop-off points are located if masks are being provided by your institution
 - If masks are brought from home, confirm all users are aware of [CDC guidelines for fit and use](#)
- Acquire face shields (if applicable) and establish policies for use
- Ensure adequate disinfectant supplies are available
 - Pre-order as supplies may not be readily available. Supplies required may include disinfectants, spray bottles, paper towels, or wipes
- Develop clear guidance for when glove use is allowed outside of the laboratory (e.g. hallways, common areas, shared facilities)
- Post signs/labels as needed (i.e. hand-hygiene, disinfection, and distancing reminders; COVID-19 occupancy limits; disinfectant bottle labels)
- Check that waste bins for disposable wipes/paper towels are available near all points of use
- Ensure hand washing supplies including soap, paper towels, and skin moisturizer are available, or provide hand sanitizer for where sinks are not available
- Consider equipment protection covers, plastic wrap, or aluminum foil on common touch surfaces for ease of cleaning shared equipment
- Create floor markings as needed or required to promote physical distancing and direction of foot traffic (entry and exit flow if space allows).
- Procure masks required by a procedure's hazard analysis (surgical, N95, half or full-face respirators)
- If applicable, develop a plan for central or departmental procurement and distribution of any of the above-mentioned items

3) Develop Transmission-Prevention Protocols

- If required by your institution, post COVID-19 occupancy limits
- Establish physical distancing protocols and arrangement of work stations
 - Consider spacing of office/desk space

- Consider physical distancing in the lab that takes into account need to move between benches, equipment, and labs (including growth chambers, greenhouses, animal rooms, etc)
- If unable to physically separate workstations, consider physical dividers
- Review the use of cloth face coverings, filtering facepieces (i.e. N95's), and respirators (include proper donning, doffing, storage, cleaning, and disposal)
- Establish cleaning guidelines and schedules for laboratories
 - Also see the CDC's [Cleaning and Disinfection Guidance¹](#)
 - Establish decontamination protocols for shared equipment
 - Establish decontamination protocols for personal work stations
 - Establish a document for tracking when decontaminations have been completed
- Review your shared Personal Protection Equipment (PPE) policies
 - Minimize sharing of PPE as much as possible, designating items to individuals as much as reasonable.
 - Consider what PPE can easily be disinfected between users, like safety glasses, splash goggles, welding visors, and face shields
 - Consider what PPE is or may be incompatible with disinfectants, for example laser safety eyewear
 - For reusable gloves, like cryogen-handling or autoclave gloves, plan for proper hand hygiene including washing hands before and after (*Do not use disposable gloves in conjunction with these types of gloves*)
 - Consider changes to lab coat laundering procedures or services that may be needed, especially for shared coats
- Establish working procedures
 - Consider shifts (ex: teams, no overlap, 4 days on, 10 days off)
 - Create log sheets for contact tracing, if required
 - Create procedure for receiving shipments
 - Establish reservations system for shared equipment
 - Establish collaborator access protocols
 - Determine which tasks can and must be done remotely
 - Experimental planning, data analysis, writing, etc.
 - Laboratory meetings
 - Devise a method for tracking the status of active vs. inactive laboratories and essential personnel
 - Determine what the reporting mechanism will be, or review and communicate procedure, for reporting complaints, concerns, and observations of non-compliance

Considerations for Reduced Laboratory Staffing Levels

This section focuses on how to plan for reduced staffing, that not all staff may be available or allowed on campus. Consider who will be needed for essential lab activities and what types of lab activities may need to be delayed based on reduced staffing

1) Establish policies related to reduced staffing

- Post/update contact information for key people such as lab managers, equipment stewards, and lab subject matter experts
- Review your working alone in the laboratory policies
- Review assigned lab duties and consider reassignment, coordination, or cross-training if individuals won't be in the lab to perform duties
- Determine if supervision or coordination of certain workers or for certain tasks is required
 - Determine what high-hazard work may not be performed at this time by inexperienced researchers
 - Determine what high-hazard work must not be performed alone Determine which projects or tasks may require hands-on training/supervision that cannot be performed while physical distancing measures are in effect
- Consider ability of personnel asked to come in who may not want to or who have special circumstances and are not able to
- Plan work to account for inability to return at-will, and review procedures for managing unattended processes
- Develop procedures for securing work during off-shift (if longer duration than usual)
- Review or develop a lab visitor policy, this might include intra-campus, inter-campus, or external visitors
- Consider conducting lab safety self-assessments with available EH&S resources, if EH&S or peer inspections will not be possible

External Stakeholders and Service Providers

This section covers vendors and campus entities that may be separate from safety specialists. These external stakeholders and service providers may have different updates to their policies and schedules. Check to see if these will impact the ability to safely reopen labs.

1) Review shared facilities/core facilities and projects approved by regulatory committees

- Review any shared facilities/core facilities restrictions
- Review any restrictions on Human Subject Research, Animal Subject Research
 - Determine if any updates need to be made to protocols approved by your institution's review boards or safety committees Institutional Animal Care and Use Committee (IACUC)
 - Institutional Review Board (IRB) (other human subject research)
 - Institutional Isotopes/Radiation Committee
 - Institutional Biosafety Committee (IBC)
 - Other Institutional review groups or committees
- Communicate with vivarium manager(s) prior to restarting animal research
- Confirm your outside service contractors have established COVID-19 protocols and that they meet your institution's requirements
- Check for any changes in procedures for distribution and return of dosimeters, and check if dosimeter return dates have been changed

2) Resupply laboratories

- Check research supply levels and availability; engage your procurement department as they may have the best access to supply chains
- Consider alternate cleaning supplies as standard items may not be available.
 - 2.5% Bleach
 - 70% Isopropyl or Ethyl Alcohol
 - Soap and water solution

3) Confirm institutional and external service contractors have resumed service and anticipate potential delays due to simultaneous start-up (e.g. custodial services, waste pickup/disposal, equipment certification and inspection, maintenance, and IT-support)

Pre-Occupancy Review of Lab and Lab Building Spaces

This section focuses on handling spaces that may have had prolonged vacancies. These include building level concerns along with items for individual labs. Many items may require careful attention and consideration to ensure that buildings and labs are safe for occupancy and use.

1) Establish or review new building-level procedures

- Elevator procedures, including occupancy limits
- Direction of travel (stairwells, doors, hallways)
- Occupancy limits for common areas
- Cleaning and disinfection of common areas
- Emergency egress and equipment (fire extinguishers, emergency irrigation, etc.) not blocked
- Create or review lab-safety self-assessment resources if EH&S inspections or peer inspections will not be possible

2) Survey the laboratory for unsafe conditions

- Consider possible hazards you may encounter before entering the laboratory and review procedures for reporting and responding to those issues
- Stop outside the door and check for unusual odors indicative of a chemical release or spill before entering
- Listen for local alarms indicating safety issues
- Upon opening the door, scan the lab for any immediate concerns before walking through the doorway
- Survey for and manage leaks, spills, or releases according to protocols, for example:
 - Liquids on the floor or indication of leaks on walls or ceiling tiles
 - Chemical & Biological material, and waste storage areas
 - Sinks
 - Floors near refrigerators/freezers
- Check for equipment that may have been affected by power disruptions
- Carefully open all cabinets, drawers, refrigerators/freezers, and other storage areas to survey for shifted, leaking, or compromised containers
- Cleanup and put away chemicals, supplies equipment, glassware, and other items left out during the shutdown
- Manage any expired, outdated, peroxide-forming, self-reactive, or other reagents with a limited lifespan according to institution's safety guidance
- Review the container integrity and storage conditions of any air-sensitive, water-sensitive, and pyrophoric chemicals
- Review the storage conditions of any temperature sensitive chemicals and materials
- Check walk-in cold rooms and air conditioning units for visible mold
- Secure, correctly label, and/or request a pickup of any Hazardous Wastes
- Manage any medical or biological wastes
- Complete any outstanding inspection or audit open corrective actions

- Confirm inventory of controlled substances and proper documentation
- Check expiration dates on drugs and other agents to be administered to animals and discard expired
- Report missing, or theft of, controlled substances or radioactive materials according to your institution's procedures
- Reduce clutter to make cleaning and decontamination of surfaces easier

3) Check fire, life safety, plumbing, and HVAC operations

- Confirm fire extinguishers have not been removed or discharged
- Confirm chemical fume hoods are operating as expected
- Confirm biological safety cabinets are working as expected
- Run hot and cold water at each sink for 5 minutes to flush water lines.
- Run the eyewash (collect water as needed) until clear; record date on the log sheet, if applicable
- Fill floor drains and unused sink traps with water

4) Check laboratory supply levels

- Confirm adequate waste-collection supplies are available for near-term research needs
- Confirm adequate personal protective equipment is available for near-term research needs
- Replace missing or expired items in first aid kit(s)
- Replace missing or expired items in chemical spill control kits
- Replace items that may have been donated during calls for personal protective equipment collection

5) Review key contact information

- Update door postings with current laboratory contact information
- Post or share information on how to report a COVID-19 related safety concern
- Post or share information on how to report a (potential) COVID-19 case, including employee, occupational, or student health
- Post changes to facility, safety, or department personnel contacts

Resumption of Lab Activities

As your institution begins research activities, ensure personnel, equipment, and materials are prepared.

1) Review laboratory safety protocols prior to lab occupancy

- Update your laboratory safety manual to incorporate new COVID-19 related working protocols
- Review required trainings to ensure lab members up to date
- Ensure all lab researchers have reviewed any new protocols
- Review/update your hazard analysis/Job Safety Analysis/Job Hazard Analysis
- If the lab requires a Chemical Hygiene Plan, review/update your Standard Operating Procedures

2) Safely Restart Systems

- Review equipment manuals for safe start-up procedures
- Review equipment state and safely release or mitigate any stored energy sources
- Follow up on any missed equipment maintenance or calibrations
- Plan to restart equipment when the process can be monitored for enough time to confirm safe continuous operation
- Review start-up procedures for any compressed gas cylinders, gas generation stations, and/or gas distribution systems. Leak check connections
- Remove and replace fuels/lubricants as needed in combustion engines
- Review the integrity and safe operations of glove boxes
- Follow the manufacturer's instructions to power up electrical equipment
- Energize electrical equipment slowly and one at a time to avoid overloading electrical circuits
- Verify that interlocks and other safety related controls still operate
- Verify cryogen supply; do not fill large units alone
- Verify heat sources do not have damaged cords before reconnecting to power (i.e., hot plates, furnaces, heat blocks, sterilizers, and water baths)
- Verify radioactive material survey equipment are operating normally

3) Plan for the possibility of future shutdowns

- Review and update previous shutdown plans

Footnote

Also see the CDC's Cleaning and Disinfection Guidance¹ <https://www.cdc.gov/coronavirus/2019-ncov/community/disinfecting-building-facility.html>

Supporting Documents:

Institutions, discussions, and entities that influenced the creation of this list:

Michigan Technological University

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Members of CSHEMA

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