Environmental Health & Safety

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Water Quality Management

For several months now, many school buildings have been closed to help slow the spread of COVID19. The resulting drop in building water use increases the risk for the formation of biofilm, which supports the growth of microbial organisms including Legionella in building plumbing and associated equipment like cooling towers, pools, decorative fountains, hot tubs and other equipment. To prevent Legionella growth, these systems must be actively managed and maintained. While Legionella is a primary risk, other opportunistic pathogens (Mycobacterium avium) and metal corrosion concerns (lead scale release) are increased by closure or reduced use situations.

Guidance for Drinking Water Fixtures

Drinking Water Fixtures are defined as:

- Sink Faucets with Potable Water Source
- Drinking Fountains
- Bottle Water Refill Stations
- Ice Machines

Access to drinking water provides more benefit than risk by preventing dehydration, heat-related illnesses, and physical distress during activities and at times of extreme heat. CDC Guidance indicates that the COVID19 transmission risk from direct-contact with a solid surface, such as a drinking fountain button, is low. Shutting off drinking fountains for prolonged periods of time can increase the risk of other bacterial growth, such as Legionella. In addition, shutting off drinking fountains conflicts with International Plumbing Code 2015 Section 403.5. Therefore, drinking fountains and other fixtures used for drinking (potable) water can remain operational in facilities that are open and occupied during the COVID19 pandemic.

Buildings that have low occupancy should consider restricting the use of drinking water fixtures to avoid the potential buildup of bacterial contaminants. Any drinking water fixture that is restricted or turned off or is located in a building that was unoccupied for more than 2 weeks, should be re-activated in according to appropriate biofilm prevention and control practices (see also, the summary table on the following page).

Reactivation

Below are the key aspects of reactivating drink water fixtures that have been restricted or shut off during the pandemic due to building closure or lack of use.

DRINKING WATER FIXTURE	COVID19 RESTRICTION	NO USE or TURNED-OFF		DAILY /WEEKLY
		>2 weeks	< 2 weeks	
Sink Faucet connected to Potable (Domestic) Water System	No restrictions	Flush potable water lines by turning on hot water at sink faucet and let the water run continuously for at least 10 minutes.	No flushing needed. Resume normal operations.	
EVS/Janitorial Sink Faucet	No restrictions	No need to be flushed.	No need to be flushed.	
Drinking Water Fountain	No restrictions	Flush for 2 minutes before bringing back online.		Flush weekly for 2 minutes
Water Bottle Filling Dispenser				
Ice Machines	Use disposable cup or ice scoop.	Perform preventative maintenance, cleaning and disinfection based on manufacturer instructions.		Wash fixture and scoop handles with soap at the end of the business day or work shift.
Refrigerator & Ice Cube Maker	Use paper towel to cover handles or hand hygiene (wash / sanitizer) after contact.	Remove and replace charcoal filter (if applicable).		Scoop should be stored outside of the bin where ice is collected.
Coffee Pot	No restrictions Use paper towel to cover handles or hand hygiene (wash / sanitizer) after contact.	Potable water supplied or used in the fixture is heated to high temperatures that inactivate any microorganisms.		Wash pot with dish soap, rinsed, and left to air dry at the end of the business day or work shift.

Plumbing System Reactivation Biofilm Growth Prevention & Control

School closures and reduced occupancy affect all environmental systems operating inside buildings including 1) potable and non-potable water systems, 2) cooling towers and 3) heating, ventilation and air conditioning (HVAC) that regulate interior relative humidity and control mold. These systems are actively managed and maintained by the campus facilities department to protect the health of building users. In addition to managing systems during shutdown periods, facilities will implement the following start up protocols to ensure public health protection of their faculty, staff, and students.

Biofilm Prevention & Control

Facilities department should prepare within 2-3 weeks lead time to start up the water plumbing system to ensure there is ample time for testing and possible disinfection if needed. The department is expected to collaborate with the district H&S team to ensure employee's safety from both chemical and biological exposure while disinfecting and flushing the building plumping, conduct appropriate training and use PPE (refer to School Water Plumbing Re-opening Following Extended Closures Guidance DOH 331-667 on worker safety for Legionella control and prevention on the OSHA website). To starting up school water plumbing systems after closures and sustained low use periods:

1. Flush the entire water system plumbing to replace all water. Use an USEPA-approved chlorine testing device – for reporting for drinking and wastewater analyses – to measure residual chlorine, flush until measured levels are equal to or slightly less than the supplying utility's chlorine residuals. Some flushing considerations are listed below.
2. Create a list of all plumbing fixtures that will need to be flushed including ice machines, dish washers, locker and health room showers, emergency eye washes and showers, therapy pools, and point of use (POU) treatment devices to ensure that no fixture is overlooked.
3. Verify that testing for back flow assemblies is up to date prior to flushing.
4. Some school facilities receive their water from their water supplier through large diameter water mains frequently associated with needed fire flows. These large diameter water mains must be flushed before building plumbing is flushed. Refer to the flushing guidance referenced above for special concerns for large diameter pipe flushing.
5. Make sure fixture drains are functioning and can handle expected flows without overflowing.
6. Remove all aerator screens before flushing. Clean or replace aerator screens to get rid of scale deposits that may contain harmful metals (lead) or microbial biofilms. Disinfect, heat sterilize, or replace shower heads - especially if immune compromised individuals have access to the showers.
7. Remove all point of use filters before flushing and install new filters when flushing is complete.
8. During flushing operate all valves in the fully open position so that any particulate matter can be flushed through. Pay close attention to float-operated or other restrictive valves which need to be manually opened to clear particulates and prevent fouling of the valves.
9. Pay attention to water bottle filling stations and remember to replace any filters after flushing.

10. Some complex water use devices such as ice machines and dish washers may need additional cleaning and sanitizing steps once building flushing is complete. Follow the manufacturer's or local health jurisdiction's instructions for sanitizing following a water outage or contamination event.
11. Adjust valves back to normal operating positions to ensure that the system is rebalanced.
12. Return hot water systems to normal operating temperatures.
13. Document all start up actions in the **daily maintenance log**.

Verify Startup Effectiveness

The best means of ensuring good water quality throughout your school is to ensure fresh water is maintained throughout the school plumbing. To ensure that water in the school has been turned over you should monitor the free chlorine and temperature at critical fixtures and compare the values at these locations to the values of the incoming water as described above. (Critical fixtures are water fixtures that reflect the most difficult locations for maintaining adequate chlorine residuals and temperatures, or that serve vulnerable students).

Coliform sampling to verify school plumbing start up effectiveness is not recommended because this organism is not similar to plumbing pathogens. The only way to evaluate your startup procedures relative to Legionella is to test for Legionella using an approved culture method or one cited by the National Academies of Science for testing of Legionella in water. **This test measure is not appropriate for surveillance level sampling at all or randomly chosen flush points**. Instead, the applicability of Legionella testing should be declared an environmental assessment to identify areas with increased risk of Legionella growth and spread – based on key factors for Legionella growth (i.e., sediment and biofilm, temperature, water age, and disinfectant residual). This evaluation should incorporate the environmental engineering expertise from H&S or a licensed environmental consulting agency and executed with full formulation of a Water Management Program including full development of Safety Operating Procedures on the action plan – such as, shock chlorination – for if Legionella is detected.

Indoor Air Quality

Each campus facilities department has undertaken a full system review to upgrade indoor air filtration, increase ventilation, and limit recirculation to the greatest extent feasible – based on system design and operation limits. The following is a checklist used to evaluate the systems based on ASHRAE recommendations for mitigating COVID19 transmission risk and the baseline ASHRAE Standard 62.1.

It is important to note – as a building occupant – that building filtration and ventilation rate is not synonymous with heating and air conditioning. Please do not confuse the subjective evaluation of room comfort with engineered filtration efficiency and air quality. In fact, by minimizing indoor air recirculation (to bring in more fresh outside air) temperature control will be less efficient and much more energy consumptive.

The following is a set of checklists for key inspection points that facilities has used to evaluate and upgrade the indoor air filtration systems. Each campus has sought to identify areas where several of the below listed measures are not practical or feasible. For these areas, H&S recommends the location-specific consideration for implementing point of use (POU) air cleaning systems.

Ensure HVAC setting are maximizing ventilation

- Make sure your ventilation systems are serviced and meeting code requirements. They should provide acceptable indoor air quality, as defined by ASHRAE Standard 62.1 (2019), for the current occupancy level for each space.
- Set HVAC systems to bring in as much outdoor air as your system will safely allow. Reduce or eliminate HVAC air recirculation, when practical.
- Increase the HVAC system's total airflow supply to occupied spaces when you can. More air flow encourages air mixing and ensures any recirculated air passes through the filter more frequently.
- Disable demand-controlled ventilation (DCV) controls that reduce air supply based on occupancy or temperature. This way the air supply will remain constant throughout the day.
- For simple HVAC systems controlled by a thermostat, setting the fan control switch from "Auto" to "On" will ensure the HVAC system provides continuous air filtration and distribution.
- Run the HVAC system at maximum outside airflow for 2 hours before and after the building is occupied to refresh air before arrival and remove remaining particles at the end of the day.

Increase ventilation rates

Improving building-wide filtration is one way to increase ventilation.

- Improve the level of air filtration as much as possible without significantly reducing airflow. The colleges have targeted a goal of MERV13 filtration level.
- Make sure the filters are sized, installed, and replaced according to manufacturer's instructions.
- Improve central air filtration:
  - Increase air filtration to as high as possible without significantly reducing design airflow.
  - Inspect filter housing and racks to ensure appropriate filter fit and check for ways to minimize filter bypass.
  - Check filters to ensure they are within their service life and appropriately installed.
- Ensure restroom exhaust fans are functional and operating at full capacity when the building is occupied.
- Inspect and maintain local exhaust ventilation in areas such as kitchens, cooking areas, etc. Operate these systems any time these spaces are occupied. Consider operating these systems, even when the specific space is not occupied, to increase overall ventilation within the occupied building.
- Generate clean-to-less-clean air movement by re-evaluating the positioning of supply and exhaust air diffusers and/or dampers (especially in higher risk areas).

Point of Use (POU) Cleaning Systems

Opening windows and using portable air cleaners are alternative ways to increase ventilation and should be incorporated in areas that the above-listed measures are not feasible. In many cases, building HVAC system design assumes closed door/window operation – thus optimized under "closed" conditions. What this means is that the system works better in "closed" conditions. It means that the following measures should be implemented – only – in areas that facilities (and the H&S team) has reviewed and identified as a space that would benefit by a portable air cleaner that uses high-efficiency particulate air (HEPA) filters to enhance air cleaning, especially in higher-risk areas.

- Open windows & doors, where possible. Use fans to increase the effectiveness of open windows. To safely achieve this, fan placement is important and will vary based on room configuration. Avoid placing fans in a way that could potentially cause contaminated air to flow directly from one person over another. One helpful strategy is to use a window fan, placed safely and securely in a window, to exhaust room air to the outdoors. This will help draw fresh air into room via other open windows and doors without generating strong room air currents.
- Decrease occupancy in areas where outdoor ventilation cannot be increased.
- Consider using ultraviolet germicidal irradiation (UVGI, or bipolar ionization) as a supplemental treatment to inactivate the virus that causes COVID19, especially if options for increasing ventilation and filtration are limited. Consult a qualified professional to help design and install any UVGI system.

Routine Cleaning & Disinfection

Chemical Disinfectants

Each campus has selected disinfectant product(s) that are verified by the Environmental Protection Agency (EPA) with claims against the novel coronavirus and emerging viral pathogens. These products (at working concentrations) do not classify as hazardous chemicals and concentration control is maintained by an RTD (ready to dispense) dilution control device. They may be disseminated to instructors and area managers for supplemental disinfection (as needed to control the spread of infection for COVID19) of high-touch surfaces within their workspaces, provided that the employees have completed proper training on the SOP for Classroom Disinfection; where proper disinfection procedures and safety measures are discussed. No employee should be allowing access to these products by students or people of the general public – without direct supervision and instruction on the appropriate procedures.

As for work with all chemical products, workers must follow the manufacturer's instructions (e.g., concentration, application method and contact time, PPE) and the department's Safety Operating Procedures (SOP) designed for the task. All chemical products must be labeled, appropriately – by the

individual dispensing the product to spray bottle or other container – according to OSHA's hazard communication standards (OSHA 29CFR 1910.1200 /WAC 296-901).

To dispense chemicals from the concentrated product, is considered work with hazardous chemicals, even if the working (diluted) concentration is not considered hazardous. Therefore, no employee is permitted to operate the RTD system or conduct dilution activities without designated authority (through their employment position - e.g. custodial personnel) and proper hazard communication training (HazCom).

Please note, it is the supervisor's responsibility to ensure that each employee receives appropriate and applicable training before starting work and that direct reports are fully trained and authorized to use any required equipment, including cleaning products. For more details on employee roles and responsibilities, please see the corresponding section of this program.

General guidance to perform routine cleaning and disinfection[1]

Seattle Colleges follows *CDC Guidance for Cleaning and Disinfecting*[2] to develop, implement, and maintain a plan to perform regular cleanings to reduce the risk of exposure to SARS-CoV-2, the virus that causes COVID19. The following sections discuss our plan to

- Provide non-hazardous chemical disinfectants that are verified effective to kill the virus that causes COVID19, so that employees can wipe down commonly used surfaces (e.g., doorknobs, keyboards, remote controls, desks, other work tools and equipment) before each use. These chemical products have been particularly chosen because they are non-hazardous products that do not require gloves at the working concentrations.
- All users are to be trained and directed to follow the manufacturer's instructions for all cleaning and disinfection products (e.g., concentration, application method, and contact time); as discussed in the SOP for Classroom Disinfection; where proper disinfection procedures and safety measures are discussed.
- Discourage workers from using each other's phones, desks, offices, or other work tools and equipment, when possible.
- Store and use disinfectants in a responsible and appropriate manner according to the label.
- Do not mix bleach or other cleaning and disinfection products together. This can cause fumes that may be very dangerous to breathe in.
- Ensure there is adequate ventilation when using cleaning and disinfection products.

[1] CDC Revision March 8, 2021
[2] CDC Revision April 5, 2021

When to Clean & When to Disinfect: Cleaning with products containing soap or detergent reduces germs on surfaces by removing contaminants and may also weaken or damage some of virus particles, which decreases risk of infection from surfaces.

- When no people with confirmed or suspected COVID19 are known to have been in a space, cleaning once a day is usually enough to sufficiently remove virus that may be on surfaces and help maintain a healthy facility.
- Follow additional, specific guidance to clean and disinfect when someone is sick.

Vacuuming

The risk of spreading COVID19, during vacuuming is unknown. At this time, there are no reported cases of COVID19 associated with vacuuming.

- Consider removing area rugs completely, if possible, to reduce the need for cleaning, disinfection, and vacuuming.

If vacuuming is necessary or required:

- Close off areas visited by the ill persons. Open outside doors and windows and use ventilating fans to increase air circulation in the area. Wait 24 hours or as long as practical before beginning cleaning and disinfection.
- After cleaning and disinfection, the following recommendations may help reduce the risk to workers and other individuals when vacuuming:
- Use a vacuum equipped with a high-efficiency particulate air (HEPA) filter, if available.
- Do not vacuum a room or space that has people in it. Wait until the room or space is empty to vacuum, such as at night, for common spaces, or during the day for private rooms.
- Temporarily turn off in-room, window-mounted, or on-wall recirculation HVAC to avoid contamination of the HVAC units.
- DO NOT deactivate central HVAC systems. These systems tend to provide better filtration capabilities and introduce outdoor air into the areas that they serve.

Campus Hygiene Standards

In the following discussion, the phrase "**clean & disinfect**" means to follow **spray-wipe-spray** method (or wipe-discard-wipe method for electronics & sensitive equipment) as discussed in the *initial COVID-19 H&S training*.

Below is a list evaluated campus areas with hyperlink to directly access the corresponding section:

Restrooms

- No eating or drinking allowed.
- **Standard custodial sanitation activities**: stock supplies (toilet paper, soap, paper towels, seat covers, urinal screens), clean & disinfect (sinks, toilet bowls, urinals, trashcan, stalls, mirrors, and windows), remove trash & debris, replace female hygiene sanitation can liner, dust mop & wet mop floors, clean & empty tray/filter of hand dryer (if present), clean & report graffiti, if toilets don't work: bag the seat, close off the stall, and mark as "out of order" until repaired. Notify supervisor of any maintenance issues (e.g. if sharps container is full or something is non-functional or broken).

Common Spaces & High Traffic Areas (e.g. where lines may form)

- No eating or drinking allowed.
- Disinfectant wipes and hand sanitizer to be available where lines may form and/or equipment is shared (e.g. pens, keyboard, mouse, etc.).
- **Standard custodial sanitation activities**: clean & disinfect elevator buttons, ADA buttons, hand rails, doors & knobs, drinking fountains, table & countertops, dust mop or vacuum, wet mop (as needed), spot clean (as needed), remove trash & debris, straighten furniture, dusting: light fixtures, vents, furniture/shelves (as needed).

Copy/Printer Office Spaces

- Disinfectant wipes and hand sanitizer should be available for occupants to wipe down equipment before & after use (use alcohol based wipes for electronics and sensitive equipment).

Personal Offices, Shared Offices, & Cubicle Spaces

- Disinfectant wipes and hand sanitizer to be available in the copy/printer office space(s); occupants should wipe down their own work space before & after work.
- Occupants are encouraged to eat or drink outside; if not outside, in office; if not in office, go to designated lunch or breakroom space ← no food waste in office trash (pest hazard).
- **Standard custodial sanitation activities:** custodians generally do not enter; trash removal is placed outside the door or deposited in nearest public trash bin, vacuum & spot cleaning (upon request via work order request).

Computer & Electronics Labs

- No eating or drinking allowed.
- Hand sanitizer and (alcohol based) disinfectant wipes to be available in this space ← provided by Facilities (for chemical disinfectant hazard management and control).
- Users wipe down the keyboard, mouse, desk platform, and chair-back/arms before & after each use ← with staff supervision (use alcohol based wipes for electronics and sensitive equipment).
- Do not allow student access to chemical disinfectants without direct supervision by faculty or staff.
- Shared equipment (stapler, printer, copier, etc.) to be wiped down periodically by staff.
- **Standard custodial sanitation activities**: remove trash & debris, dust mop or vacuum, wet mop (as needed), dusting: light fixtures, vents, furniture/shelves (as needed), and straighten furniture.

Libraries

- No eating or drinking allowed.
- Hand sanitizer and (alcohol based) disinfectant wipes to be available in this space ← provided by Facilities (for chemical disinfectant hazard management and control).
- Computer users wipe down the keyboard, mouse, desk platform, and chair-back/arms before & after each use ← with staff supervision (use alcohol based wipes for electronics and sensitive equipment).
- Do not allow student access to chemical disinfectants without direct supervision by faculty or staff.
- Tables, countertops, and chair-back/arms to be wiped down periodically by staff.
- Shared equipment (stapler, printer, copier, etc.) to be wiped down periodically by staff.
- Returned equipment to be wiped-down before being returned to circulation
- **Standard custodial sanitation activities:** clean & disinfect table & countertops, dust mop or vacuum, wet mop (as needed), spot clean (as needed), remove trash & debris, straighten furniture, dusting: light fixtures, vents, furniture/shelves (as needed).

Breakroom spaces

- Before re-opening space and in order to prevent the risk of Legionnaires' disease, facilities will ensure plumbing fixtures are flushed (according to water quality management procedures detailed in the corresponding section of this program).
- Disinfectant wipes to be available in this space ← provided by Facilities (for chemical disinfectant hazard management and control).
- Occupants to wipe down surfaces before & after use (including table & countertops and handles/buttons on refrigerators/microwaves).
- **Standard custodial sanitation activities**: clean & disinfect (table & countertops, sink, chair-back/arms, also handles/buttons on refrigerators/microwaves), dust mop or vacuum, wet mop (as needed), carpet spot clean (as needed), stock soap/towels, remove trash & debris, straighten furniture, dusting: light fixtures, vents, furniture/shelves (as needed).

Designated (public) Lunch spaces

- Before re-opening space and in order to prevent the risk of Legionnaires' disease, facilities will ensure plumbing fixtures are flushed (according to water quality management procedures detailed in the corresponding section of this program).
- Disinfectant wipes and hand sanitizer to be available near vending machines, microwaves, and food prep areas ← provided by Facilities (for chemical disinfectant hazard management and control).
- **Standard custodial sanitation activities**: clean & disinfect (table & countertops, sink, chair-back/arms, also handles/buttons on refrigerators/microwaves, vending machines, drinking fountain, doors & knobs, ADA buttons, hand rails), dust mop or vacuum, wet mop (as needed), spot clean (as needed), stock soap/towels, remove trash & debris, straighten furniture, dusting: light fixtures, vents, furniture/shelves (as needed).

Laboratory & Shops Spaces

- No eating or drinking allowed.
- Shops should have handwashing sinks (if no shop sink, call that to the attention of H&S during return to campus planning process) ← department ensures ample supply of soap/towels.
- Shared equipment to be wiped down by user both before & after each use ← with direct supervision by faculty or staff (use alcohol based wipes for electronics and sensitive equipment).
- No sanitizer or alcohol based product near sparks, flame, intense heat, or highly energized equipment.
- Do not allow student access to chemical products without thorough instruction and direct supervision by faculty or staff.
- Standard hygiene for **chemistry/physics based laboratories**: at the end of class, each student is to clear their work space and clean surfaces with Liquinox (or similar product).
- Standard hygiene for **biology based laboratories**: at the end of class, each student is to clear their work space and clean surfaces with 70%$_v$ alcohol (or similar microbicide).
- Standard hygiene for **shops**: at the end of class, students clear & clean their workspace, and wash surfaces with soap, sweep/mop, and clean spills according to chemical hygiene and standard industry practice(s). Shared equipment and tools should be wiped down between each user.
- **Standard custodial sanitation activities:** custodians generally do not enter; paper based trash removal is placed outside the door or deposited in nearest public trash bin, vacuum & spot cleaning (upon request via work order request).

Kitchen & Culinary Class Spaces

- Before re-opening space and in order to prevent the risk of Legionnaires' disease, facilities will ensure plumbing fixtures are flushed (according to water quality management procedures detailed in the corresponding section of this program). ← see also food service reopening checklist <hyperlink>
- No eating or drinking allowed (unless otherwise planned for and declared in the program-specific health and safety plan for food/wine tasting based on instructional activities).
- Do not use hand sanitizer; Use the available sinks to wash hands with soap and water.
- Shared equipment to be wiped down by user both before & after each use ← with direct supervision by faculty or staff (use alcohol based wipes for electronics and sensitive equipment).
- No sanitizer or alcohol based product near sparks, flame, intense heat, or highly energized equipment.
- Standard hygiene for kitchens: at the end of class/day, students clear & clean their workspace, and wash surfaces with soap & sanitizer, sweep/mop, and clean spills according to food/chemical hygiene and standard industry practice(s).
- Do not allow student access to chemical products without thorough/proper instruction and direct supervision by faculty or staff.
- Wear gloves (food grade or nitrile) when handling any ready to eat food items. Always wash hands after removing gloves. Latex gloves are not recommended.
- Wear gloves and apron when handling dirty dishes or loading dish rack. When removed, the apron should be folded outside-inward and laundered at the end of day. It is safe to launder the apron with other standard laundry items. Always wash hands after removing gloves/apron (and handling laundry).
- Standard custodial sanitation activities: custodians generally do not enter but for trash removal and vacuum or spot cleaning (upon request via work order).

Outdoor Areas

- Spraying cleaning products or disinfectants in outdoor areas – such as on sidewalks, roads, or groundcover – is **not necessary, effective, or recommended**.
- High-touch surfaces made of plastic or metal, such as grab bars, play structures, and railings, should be cleaned regularly.
- Cleaning and disinfection of wooden surfaces (such as wood play structures, benches, tables) or groundcovers (such as mulch and sand) is **not recommended**.

Traditional Classrooms

- No eating or drinking allowed.
- Disinfectant wipes will be made available and we encourage:
    - Students should wipe down their own space (including chair-back/arms) before & after class ← with direct supervision by faculty or staff.
    - Instructor should wipe down their own keyboard, mouse, projector remote, desk platform, and chair-back/arms. Please consider wiping down the door & knob before & after class.
- Hand sanitizer must be available in this space or at reasonable distance (either secure installations or distribute/control provisions through department leadership).
- No student sharing of equipment otherwise user wipes down equipment both before & after use ← with direct supervision by faculty or staff (use alcohol based wipes for electronics and sensitive equipment) .
- Do not allow student access to chemical disinfectants without direct supervision by faculty or staff.
- **Standard custodial sanitation activities**: trash & debris removal, floor surfaces: vacuum and/or dust mop or wet mop (as needed), clean & disinfect tabletops & chair-back/arms, white board "stain-cleaning" (weekly), window washing (quarterly), and straighten furniture.