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# Introduction to Implementing Environmental Cleaning Auditing

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## Learning Objective

This introduction to implementing environmental cleaning audits will provide health care settings with considerations and strategies to:

- implement environmental cleaning auditing programs in their settings
- select which environmental cleaning audits to implement
- collect, evaluate, and disseminate the results of environmental cleaning audits

## Background

This document is intended to provide an overview of the implementation of an environmental cleaning audit process to support infection prevention and control (IPAC) best practices, environmental cleaning best practices, and improvement initiatives. In addition to this document, Public Health Ontario has specific audit guides and tools available to support the implementation of Environmental Cleaning Auditing.

## Environmental Cleaning

Cleaning is the removal of foreign material (e.g., dust, soil, organic material such as blood, secretions, excretions and microorganisms) from a surface or object. Cleaning physically removes rather than kills microorganisms. It is accomplished with water, detergents and mechanical action. The key to cleaning is the use of friction to remove foreign material. Thorough cleaning is necessary for any equipment/device prior to disinfection as organic material may inactivate a disinfectant. This may be accomplished through a two-step process involving the use of a cleaner followed by a disinfectant, or through a one-step process using a combined cleaner/disinfectant product.[1]

Disinfection is a process used on surfaces to kill microorganisms. Disinfection will kill most disease-causing microorganisms but may not kill all bacterial spores.[1]

In health care settings, areas not involved in client/patient/resident care are required to meet the standard of “hotel clean”. Hotel clean requires the removal of dirt and dust, waste disposal, and the cleaning of windows and surfaces.[2]

Areas that are involved in client/patient/resident care are required to meet the standard of “health care clean.” Health care clean aims to reduce or eliminate microbial contamination in the environment.

It consists of the “hotel clean” standard with the addition of disinfection, increased frequency of cleaning, auditing, and other infection control measures.

**Components of Health Care Clean**

> **HOTEL CLEAN**
> +
> High-touch surfaces in client/patient/resident care areas are cleaned and disinfected with a health care disinfectant.
> +
> Noncritical medical equipment is cleaned and disinfected between clients/patients/residents.
> +
> **Cleaning Practices are periodically monitored and audited with feedback and education**

# Types of Environmental Cleaning Audits

Audits are an evaluation tool or an indicator which are a part of a quality control program, specifically referred to as “process surveillance”. Process surveillance means to collect and analyze information on whether procedures are being followed. Infection prevention and control programs and environmental services departments use environmental cleaning audits as part of their quality control program to monitor cleanliness and to ensure that they are meeting the health care clean standard. Other types of audits that are part of IPAC programs include, but are not limited to, hand hygiene audits and personal protective equipment audits.

Feedback is an important part of the audit process and refers to providing information based on direct observation that can help improve practices. Audits and feedback may be most effective when performed regularly by supervisors and peers, and include clear targets and an action plan.

Environmental services departments must conduct environmental cleaning audits to ensure that they are meeting the “health care clean” standard, cleaning procedures are being followed, and adequate resources are dedicated for environmental cleaning, and cleaning is being performed consistently.[1]

Additionally, an auditing program can increase the efficacy of cleaning [1], assist supervisors in providing constructive feedback for environmental services workers (EVS workers), and document the performance of the environmental services department.

Environmental cleaning audits can be broken down into observational and post cleaning testing methods.

# Observational Methods

**Table 1: Summary of Observational Methods**

| Method | Description | Element Evaluated | Advantages | Disadvantages |
|---|---|---|---|---|
| Visual Assessment | Trained observers (e.g., environmental service supervisor) assess the cleanliness of an area following cleaning | Visual cleanliness | • Easy to implement[3]<br>• Allows for feedback to individual environmental services staff | • Does not assure that "health care clean" has been achieved<br>• Results do not correlate with levels of microbial contamination[3]<br>• Results are subjective and may vary across different observers[3] |
| Performance Observation | Trained observers observe environmental service staff while they clean | If the setting's procedures for cleaning are performed correctly | • Easy to implement[3]<br>• Allows feedback to environmental service staff | • Time consuming<br>• Labour intensive[4]<br>• Performance while observed may not be the same as performance when not observed |
| Satisfaction Surveys | Patients/ residents/ clients complete surveys and provide feedback on the settings' cleanliness | Customer satisfaction | • Can reach a lot of people<br>• Confidential self-reports will reveal where training and resources should be directed | • Results may not correlate with levels of microbial contamination[5]<br>• Response rate is often low<br>• Responses may be influenced by factors unrelated to actual cleanliness if dissatisfaction with other aspects of the patient experience is present |

## Visual Assessment

Visual assessments involve trained observers who visually inspect areas using a standardized approach and checklist. They ensure that the physical environment is clean and that the "hotel clean" standard is being met. Immediate constructive feedback can be provided to staff and any noted deficiencies can be corrected. Results can be reported as a proportion of items that appear clean. Results can also be combined into an aggregate score that is reported to stakeholders.

Visual assessments are a required component of a health care setting's quality control program. [1,6] The frequency of auditing can be adjusted based on the risk level of the area.[7] Visual assessment audits can

be performed using the Environmental Cleaning  Visual Assessment Tool. Further guidance on performing visual assessment audits is contained in At A Glance: Implementing Visual Assessment Audits for Environmental Cleaning in Five Steps.

## Performance Observation

Performance observations, sometimes referred to as observational coaching audits [6], use trained observers, often environmental service supervisors, who observe environmental service workers performing cleaning tasks. A checklist is used to determine if staff are following best practice and adhering to policies and procedures. The results of the audit are shared with the staff member. They can reassure staff that they are following proper procedures and identify opportunities for improvement.

Performance observations are a required component of a health care quality control program. [1,6] They are labour intensive and must be conducted at least once a year for every health care worker involved in cleaning and disinfection.[6] Additional audits can be conducted during outbreaks and when other audits indicate possible  gaps in best practice. Performance observations can be performed using Environmental Cleaning Performance Observation Tool. Further guidance on performance observation audits is contained within At A Glance: Implementing Performance Observation Audits for Environmental Cleaning in Five Steps.

## Satisfaction Survey

Satisfaction surveys assess the patient's/resident's/family's satisfaction with the cleanliness of a setting. They are often included as part of a larger setting satisfaction survey and involve questions related to a setting's cleanliness. Results can be combined into aggregate results and shared with staff and stakeholders.

Surveys are a required component of a health care quality control program.[6] Further guidance on conducting surveys is not contained within this guide.

# Post Cleaning Testing of Surfaces

**Table 2: Summary of Post Cleaning Testing Methods**

| Method | Description | Element Evaluated | Advantages | Disadvantages |
|---|---|---|---|---|
| Environmental Marking | Surfaces are marked with an invisible tracing agent that can only be seen by a revealing agent.<br><br>After cleaning, an observer can determine if the tracing agent was removed. | Mechanical action | • Allows direct assessment of cleaning thoroughness<br>• Associated with rapid improvement when constructive feedback is provided<br>• Easy to implement<br>• Results easily understood[8] | • Does not directly measure microbial contamination<br>• Does not measure overall quality or intensity of cleaning<br>• Does not assess adequacy of cleaning of unmarked surfaces<br>• Surface texture may affect removal of the tracing agent |
| Adenosine triphosphate (ATP) bioluminescence | Surfaces are tested after cleaning to determine the quantitative level of ATP present. | Organic matter | • Provides quantitative result<br>• Easy to implement[3]<br>• Provides quick and direct feedback[3] | • Not a direct measure of microbial contamination[3]<br>• Some cleaning products and materials may interfere with the test (e.g., microfiber,[9] bleach,[10-12] hydrogen peroxide,[10,13] quaternary ammonium compounds[10], etc.)<br>• Does not assess adequacy of cleaning of unmarked surfaces<br>• Results not comparable across systems due to lack of standardization |
| Environmental Culture | Cultures are be taken from surfaces after cleaning to determine if bacteria are present | Live bacteria | • The only direct measure of contamination of viable microorganisms[3] | • Expensive[3]<br>• Slow turnaround time[3]<br>• Not standardized[3]<br>• Does not assess bacterial contamination beyond the areas tested[3] |

## Environmental Marking

Environmental marking is performed by marking objects using an invisible tracing agent, such as a fluorescent gel or powder, in a consistent manner prior to the EVS workers cleaning the room. Once the room has been cleaned, observers use a revealing agent, such as a black light, to determine which of the marked objects have been cleaned. Immediate constructive feedback, including positive feedback, can be provided to staff and any noted opportunities for improvement can be discussed. Results can be reported as a proportion of items that are cleaned. Results can also be combined into an aggregate score that is reported to stakeholders. Importantly, it is often identified that many high-touch surfaces within the patient/resident environment are missed during cleaning when environmental marking programs are first implemented. Clarification of the cleaning responsibilities for specific surfaces or items that are frequently missed can lead to prompt improvements that may not occur without environmental marking, and may reduce infection rates.

Environmental marking is one of the two recommended options for the post-cleaning test component of a health care setting's quality control program.[1] The frequency of auditing is not prescribed, and can be adjusted based on the risk level of the area (e.g., audits should happen more frequently in higher risk areas, such as where is there a high likelihood for contamination, exposure, or a more susceptible population). Environmental marking audits can be performed using the Environmental Cleaning Environmental Marking Tool. Further guidance on environmental marking audits is contained within At A Glance: Implementing Environmental Marking Audits for Environmental Cleaning in Five Steps.

## Adenosine Triphosphate (ATP) Bioluminescence

Adenosine triphosphate (ATP) is a substance that is present in all living cells and some organic materials including food and body fluid.[1] The presence of ATP on a surface indicates that organic material remains on the surface—thus while the absence of ATP suggests that there is little microbial contamination of a surface, the presence of ATP could represent either microbial contamination, (with both alive and dead microorganisms), or other organic material. Once the room has been cleaned, trained observers swab surfaces and use a machine to provide a measure of the amount of ATP bioluminescence, which is an indirect measurement of the amount of organic/food residue on a surface that may be contaminated with microorganisms, or support the growth of microorganisms. Pass/fail determinations are made based on the manufacturer's instructions for use. Immediate constructive feedback, including positive feedback, can be provided to staff and any opportunities for improvement can be discussed. Results can be reported as a proportion of items that are cleaned. Results can also be combined into an aggregate score that is reported to stakeholders including, but not limited to, staff, leadership, and patients/residents.

ATP bioluminescence testing is one of the two recommended options for meeting the post-cleaning test component of a health care setting's auditing program.[1] The frequency of auditing can be adjusted based on the risk level of the area. ATP bioluminescence can be performed using Environmental Cleaning Environmental Marking Tool as a template. Further guidance on ATP bioluminescence audits is not contained within this guide but the guidance on environmental marking can reasonably be adapted to ATP bioluminescence.

## Environmental Culturing

Environmental culturing involves swabbing or using contact agar plates to directly measure levels of microbial contamination. [12] The results can be useful for investigating transmission events or outbreaks.[15,7]

Environmental cultures should not be routinely performed due to their high cost, slow turnaround time, and the lack of an accepted standard on how they should be performed or interpreted.[1] Guidance on performing environmental culture audits is not contained within this guide.

## Other Audits

While not covered within this guide, quality control programs for environmental services also contain several other types of audits.[6] These include:

- an audit system to ensure that mobile shared equipment (IV poles, mobile computers, wheelchairs, etc.) are cleaned and disinfected between patients.
- an audit system to ensure that personal electronic communication devices are cleaned and disinfected between patients.
- an organizational audit that evaluates the organizational, human, material, and financial resources that are allocated to environmental services.
- an incident management reporting system to document reports of unclean areas that are identified outside of routine audits.

# Using Multiple Environmental Cleaning Audits

Since every audit has limitations, using multiple audits ensures that different aspects of environmental cleaning are being assessed. The Provincial Infectious Diseases Advisory Committee (PIDAC) recommends that health care settings use at least one measure that directly assesses cleaning (e.g., environmental marking, ATP bioluminescence), in addition to observational assessments (e.g., performance observation, visual assessment). [1] The Canadian Standards Association (CSA) requires that health care settings perform visual assessments along with one of the following audits: environmental marking, ATP bioluminescence, microbial culture, or survey. They also require that health care settings assess the patient's/resident's/family's satisfaction with cleanliness in accordance with the health care setting's policies and procedures, as well as performing observational coaching audits. [6]

## When to conduct Environmental Cleaning Audits

Audits can be performed by a diverse group of trained staff including:

- Managers, Supervisors, leaders or charge staff
- IPAC professionals
- Informal leaders or champions
- Peers

Audits should be conducted on a regular basis as established by the organization based on its needs. Different audits should be conducted at different frequencies. Audits should be spread out over time so as to evaluate different staff and shifts. Areas with a higher cleaning frequency, as determined using a risk stratification matrix, can be audited more often. Appendix 21 of PIDAC: Best Practices for Environmental Cleaning for Prevention and Control of Infections in all Health Care Settings, 3rd Edition can be used to determine risk. [1,7]

Additional audits should be conducted after training or a change in process, when there are concerns about the quality of the environmental cleaning, or when there is concern regarding the transmission of

a disease that has an environmental cleaning component such as *Clostridioides Difficile (C. difficile)*, vancomycin-resistant enterococci (VRE), or norovirus. It is important to incorporate environmental cleaning audits into the larger environmental services and IPAC programs and to adjust their frequency as required.

# Implementing Audits into the Environmental Cleaning and IPAC Programs

The following is a suggested approach to implementation using a five step process.


Steps 1 through 5 should be completed for each auditing program that is implemented within a setting. There are separate guides and tools available that go through each of the five steps for visual audits, performance observations, and environmental marking audits.

The five steps should be considered when planning how to incorporate audits into a setting's environmental services and IPAC programs. Before a health care setting implements individual audits, it is important to first plan how you will use auditing within your setting.

The remainder of this document speaks to Step 1 – Plan, and is relevant for each type of audit that may be implemented. Steps 2 – 5 are covered in more detail in each of the At a Glance Implementation Documents.

# Step 1 - Plan

## Establish a working group

Establish a working group to coordinate the process and designate a lead. In addition to members of environmental services, health care settings may wish to also include representatives from the following groups on the working group (the availability of roles in this list may be influenced by the size of your organization; the importance of an interdisciplinary environmental audit planning group applies for smaller organizations as well, and inclusion of available roles is important to enabling the success of any audit program)[6]:

- Management
- IPAC
- Microbiology
- Risk management
- Occupational health and safety
- Quality assurance

- Administration
- Perioperative services
- Patient, resident, and family representatives
- Others as necessary and representative of your setting

## Determine the setting's readiness to implement an Auditing Program

When assessing readiness to implement audits, facilities need to ensure that they have support from management and other relevant stakeholders. This can include, but is not limited to, environmental services management and workers, and other members of the organization's working group. Facilities should also ensure that they have sufficient time to properly conduct the audits, and that adequate resources are available. Ensuring this support before beginning the planning process is essential to setting the program up for success. If the organization isn't fully ready and participating, the program will be less successful at ensuring quality improvements.

## Determine which audits to implement

Audits should be implemented one at a time. Determine which procedures to audit. If a health care setting does not already have an auditing program in place, environmental marking audits may be a good starting point. If you have an auditing program in place you can use this guide to determine if there are way to improve your existing program.

## Develop policies and/or procedures

In order to implement audits in a consistent fashion, health care settings should develop/routinely review policies and procedures before they begin auditing, and ensure that policies and procedures are well understood by staff.

## Obtain staff buy-in

Ensure that auditing is a collaborative process. Discuss the audits and communicate the rationale for the auditing program to all staff. Ensure staff are aware that the audits are non-punitive and conducted to support continuous quality improvement. The intent of audits is to assist staff members in providing a safe environment for everyone.

## Train auditors

Auditors need to be trained in all aspects of the auditing process, including, but not limited to, how to use the health care setting's audit forms, how to judge the various elements on the form in a standardized manner so that results can be compared between auditors and over time, and interviewing staff to answer questions that are not directly observable. e.g., is the cleaning cart locked and properly stored when not in use?

Auditors should be experts in applying the organization's policies and procedures. They require training in the chain of transmission as well as the best practices for environmental cleaning, hand hygiene, routine practices and additional precautions. They should be familiar with the manufacturer's instructions for use for the products that are in the health care setting. They should be familiar with what types of surfaces different disinfectants can be used on, the contact time for various products, and when a special disinfectant is required.

Auditors should provide on-the spot feedback in a constructive and non-punitive way. The following are some tips for auditors to provide constructive feedback:

- Introduce yourself and explain the purpose of the audit (e.g., to ensure that all areas of the health care setting are clean).
- Ask the person being observed if you can provide them with feedback.
- Describe what you observed, including practices that were well done.
- Encourage the use of discussion and problem solving to identify opportunities to address obstacles.
- Ask the staff member to correct any issues identified if they have responsibility for that item.
- Thank them for the opportunity to give them feedback.

Feedback can also be delivered in writing or verbally at a later time. The feedback may include details about the circumstance (e.g., time of day, task) so individuals can explore how a missed opportunity could have occurred. Feedback can be hard to receive, especially if it is not delivered well. Discuss with the team how the feedback process is going to identify its benefits and opportunities to improve the process.

## Establish a baseline level of cleaning

Health care settings may wish to conduct some audits at an increased frequency for the first several months while you determine your setting's baseline. When an auditing program is first implemented, results may not be what you were expecting. This is normal. One of the purposes of an audit is to promote consistency and standardization with cleaning practices. Now that it is being measured, settings can begin to make improvements.

## Determine how results will be analyzed and shared

Each supported audit type has specific guidance on how to collect and analyze data. The results of audits can be included in reports that are shared with your staff, the IPAC Committee, management, patient/resident council, and other stakeholders.

## Identify opportunities for improvement and plan corrective actions

Consider strategies that can be used to improve cleaning. Audits may identify barriers that your environmental services program is facing. The At A Glance documents that accompany this resource contain recommendations on how to create an action plan to address these barriers.

## Re-evaluate the Auditing Program

Plan to regularly re-evaluate the effectiveness of the chosen strategies and determine if the auditing program needs to be modified. Once the program is established, health care settings may need to adjust the frequency of audits, change the forms they are using, or add additional audits to the program.

## Implement specific audits

After a health care setting has planned how audits will be incorporated as part of the overall environmental cleaning and IPAC programs, they can begin to implement specific audits. Click on the following links for guidance on implementing three different types of audits:

- At A Glance: Implementing Visual Assessment Audits in Five Steps
- At A Glance: Implementing Performance Observation Audits in Five Steps
- At A Glance: Implementing Environmental Marking Audits in Five Steps

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