MILLENNIUM FACILITY SERVICES INC

The Healthcare Cleaning Standards Guide

What facility leaders should expect from their environmental services program in 2026.

$33B
ANNUAL HAI COST
CDC, United States

722K
INFECTIONS PER YEAR
Across US hospitals

75,000
PATIENT DEATHS
Annual, attributed to HAIs

5–10X
PREVENTION ROI
Documented return

May 2026

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SECTION 01

The Four Standards Every Program Is Graded Against

Healthcare cleaning is no longer a back-office service. It is one of the highest-leverage clinical risk controls a hospital or clinic operates. The numbers force the framing.

Healthcare Associated Infections cost U.S. hospitals between **$28 billion and $45 billion** every year in direct medical costs, per the most current CDC analyses. When indirect costs are added (lost productivity, legal exposure, caregiver burden), the total societal burden reaches **$96 billion to $147 billion** annually, per the Zimlichman analysis in the Journal of Medical Economics.

On any given day, **one in 31 hospitalized patients** has at least one active HAI. Each year, roughly **633,300 patients** acquire an infection during a U.S. hospital stay. The cumulative mortality data from CDC's 1999 to 2023 prevalence work attributes approximately **99,000 deaths per year** to HAIs in U.S. hospitals.

These are not random events. The CDC's own analyses estimate that of the $45 billion annual direct cost burden, as much as **$31.5 billion could be prevented** with quality infection prevention and environmental cleaning programs. That is the 70 percent the industry leaves on the table.

This guide is built for the people who decide what gets bought and how it gets executed. Facility directors. Infection preventionists. EVS leadership. Procurement committees. C-suite leaders weighing CMS HAC Reduction Program exposure.

The content is sourced from CDC HICPAC guidance, AORN 2026 perioperative guidelines, EPA disinfectant lists, Joint Commission's 2024 IC chapter rewrite, peer-reviewed cost-effectiveness studies (REACH, CLEEN, SHINE), AHE training data, and the public vendor landscape. Where a number appears, it is cited. Where a protocol is described, the source standard is named.

Use it as a procurement reference. Share it with your infection prevention committee. Hand it to your accreditation surveyor.

SECTION 02

The Exam Room

From cotton mops and bleach to ATP verification and CMS-tied reimbursement.

1980s. *Cotton Mops and Hospital Hospitality.* EVS departments operate as hospitality functions. Cleaning is judged by appearance, not by infection outcomes. C. difficile is identified but transmission control is not yet linked to cleaning quality.

1990s. *Universal Precautions and OSHA.* HIV and Hepatitis B reshape healthcare cleaning. OSHA 29 CFR 1910.1030 mandates bloodborne pathogen protocols. The Bloodborne Pathogen Standard becomes the first regulatory anchor for environmental cleaning practice.

2003. *CDC HICPAC Guidelines Released.* The Guidelines for Environmental Infection Control in Health-Care Facilities (MMWR Vol. 52, No. RR-10) become the foundational framework that CMS Conditions of Participation and Joint Commission IC standards still cite today.

2008. *CMS Begins Non-Payment for HACs.* Stage III/IV pressure ulcers, CAUTI, vascular catheter infections, and select SSIs become non-reimbursable when hospital-acquired. The first direct financial link between cleaning outcomes and revenue.

2011. *Mulvey Benchmark Published.* Mulvey D, et al. publish the foundational ATP benchmark in the Journal of Hospital Infection: 100 RLU corresponds to under 2.5 CFU/cm2. NHS Scotland adopts the standard.

2014. *CMS HAC Reduction Program Activates.* Section 3008 of the Affordable Care Act creates the 1 percent Medicare payment reduction for worst-performing-quartile hospitals on the Total HAC Score. The first program-level financial penalty tied to HAI rates.

2018 to 2022. *MDRO Era and ATP Adoption.* CRE, MRSA, VRE, and CR-Acinetobacter emerge as cost-dominant pathogens (Kadri et al. 2022: combined national cost $1.9 billion annually). ATP testing moves from food safety into mainstream healthcare EVS, led by Hygiena SystemSURE and EnSURE Touch.

2022. *SHINE Trial Published.* The Stopping Hospital Infections With Environmental Services trial (Anderson et al., Clinical Infectious Diseases, 2022) establishes ATP-driven cleaning feedback as causally tied to MDRO incidence reduction (IRR 0.876, P=.002) across 6 ICUs at 3 US academic medical centers.

2024. *Joint Commission Rewrites the IC Chapter.* On July 1, 2024, TJC consolidates 12 IC standards with 51 EPs down to 4 standards with 14 EPs. Survey methodology shifts from documentation review to live staff interrogation. EVS workers must be able to articulate contact times verbally during surveys.

2025 to 2026. *Candida auris, AORN Updates, EPA List S.* C. auris becomes the defining enforcement-adjacent pathogen, requiring EPA List P products (quats do not work). AORN's October 2025 Environmental Hygiene Guideline and 2026 Instrument Cleaning Updates set new perioperative requirements. EPA consolidates Lists C, D, E, F into the new List S for bloodborne pathogens. CMS HAC Reduction Program FY2025 penalizes 724 hospitals.

SECTION 03

The Operating Room and Procedure Room

This is not a report about which janitorial vendor to hire. It is a guide to understanding a healthcare risk control that has matured from hospitality function to clinical intervention in the span of two decades. The math, the regulation, and the technology have all converged.

The numbers force the conversation.

The CDC estimates direct HAI costs to U.S. hospitals at **$28.4 billion to $45 billion annually**, depending on the inflation index used. Add lost productivity, legal costs, and indirect impact, and the burden reaches **$96 billion to $147 billion** per year. One in 31 hospitalized patients carries an active HAI on any given day. Roughly 633,300 patients acquire infections each year during a U.S. hospital stay. Approximately 99,000 die.

What changed is not the pathogens. C. difficile, MRSA, and Klebsiella have been with healthcare facilities for decades. What changed is the financial accountability framework.

CMS now ties Medicare reimbursement directly to HAI performance. The Hospital-Acquired Condition Reduction Program reduces all Medicare fee-for-service payments by one percent for hospitals in the worst-performing quartile on the Total HAC Score. In FY2025, **724 hospitals were penalized**. For a hospital with $100 million in annual Medicare revenue, the penalty equals $1 million per fiscal year. For a $200 million hospital, $2 million.

In 2022, U.S. hospitals operated at a median operating margin of -3.8 percent. That penalty is not a rounding error. It is the difference between a break-even year and a material operating loss.

The Joint Commission rewrote how it surveys cleaning programs. On July 1, 2024, TJC consolidated 12 IC standards with 51 elements of performance down to 4 standards with 14 EPs, a 70 percent reduction in elements. The shift was not just structural. The new IC Assessment Tool moved survey methodology from documentation review to **live practical implementation testing**. Surveyors now interview EVS staff directly. They ask technicians to verbally state the contact time of the disinfectant in use. They ask which products are required for a C. diff room versus a general clean. EVS workers who cannot answer create immediate IC deficiency exposure under IC.02.01.01.

The technology to verify cleaning has caught up. ATP bioluminescence testing measures organic residue on surfaces in 10 to 15 seconds. Healthcare-grade luminometers detect down to 1 femtomole of ATP. The 2022 SHINE trial established that ATP-driven feedback to EVS staff produces statistically significant reductions in MDRO incidence (IRR 0.876, P=.002) where fluorescent marker monitoring does not. The verification layer is no longer optional. It is the difference between a defensible program and a checkbox.

> ***The Honest Assessment.*** *Cleaning is the only HAI intervention with broad leverage that does not require new clinical equipment, new pharmaceuticals, or staff with advanced degrees. Done right, it reduces infection rates measurably. Done poorly, it costs hospitals millions per year in CMS penalties, lawsuit settlements, and operating expense inflation. The technology to do it right exists. The regulatory pressure to do it right is now financially material. The remaining question is whether the cleaning program executes.*

SECTION 04

The Patient Room

A defensible healthcare environmental cleaning program is held to four overlapping standards. They are not optional. They are not aspirational. Surveyors expect documented compliance with each.

CDC and HICPAC

The foundational CDC guidance is the **Guidelines for Environmental Infection Control in Health-Care Facilities** (MMWR Recommendations and Reports, Vol. 52, No. RR-10, 2003), co-issued with the Healthcare Infection Control Practices Advisory Committee. Companion operational documents include CS314156-A Best Practices for Environmental Cleaning in Healthcare Facilities and CS314156-B Environmental Cleaning Program Improvement Toolkit. A March 19, 2024 update reinforced the risk-stratified framework: surfaces are placed into low, moderate, or high risk tiers based on probability of contamination, vulnerability of patient population, and potential for pathogen exposure.

Key HICPAC mandates:

- Written cleaning schedules per area type identifying the responsible person, frequency, method (product and process), and detailed SOPs
- Cleaning cloths changed between each patient zone in multi-bed units
- High-touch surfaces cleaned and disinfected more frequently than low-touch surfaces
- Pathogen-specific protocols for C. difficile, Candida auris, norovirus, and MDROs
- EVS training upon hire, at least annually, and whenever new equipment or protocols are introduced

CDC guidance is framed as recommendations but achieves regulatory force through CMS Conditions of Participation (42 CFR 482.42), Joint Commission IC standards, and state licensure agencies that use CDC as their interpretive standard.

AORN

AORN's **Guidelines for Perioperative Practice** (2026 edition) encompasses 36 guidelines. The **Guideline for Environmental Hygiene** published October 18, 2025 sets binding standards for OR and procedure room cleaning. Companion documents include the 2026 Guideline for the Care and Cleaning of Surgical Instruments and 2026 Guideline for Sterilization.

Three cleaning tiers for the OR:

Between-case turnover cleaning. All surfaces within the sterile field perimeter and the immediate patient zone wiped down. Floors damp-mopped only if visibly soiled (routine between-case floor mopping is discouraged due to contamination spread risk). Surfaces must remain visibly wet for the full manufacturer-directed contact time before equipment is returned. Reusable cleaning cloths may not be used on multiple surfaces or in multiple rooms without reprocessing.

Terminal cleaning (end-of-day). Floor-to-ceiling cleaning of every surface, including kick buckets, lights, OR tables, equipment wheels, and air supply diffusers. Top-down, clean-to-dirty, wet-to-dry. All cleaning materials single-use or changed between rooms. Documentation of terminal cleaning (date, time, personnel, products) maintained.

Color-coded microfiber system. Industry-standard mapping: red for high-touch surfaces, blue for general surfaces, yellow for fixtures. Facility-determined but must be documented in the SOP and staff must be able to demonstrate its application to surveyors.

2026 Instrument Cleaning Updates:

1. Maximum fluid-protection PPE mandated in the decontamination area: full face protection, fluid-resistant gown, heavy-duty gloves
2. Short-cycle sterilization guidance added for packaged items with reduced dry-cycle times
3. IUSS (Immediate Use Steam Sterilization) requires logging the reason for each event and tracing to the specific patient in the surgical record
4. Expanded guidance on safe transport and cooling periods before sterilization

EPA Disinfectant Lists

EPA-registered disinfectants are regulated under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). A disinfectant may not make an efficacy claim against a pathogen unless EPA has reviewed supporting data and approved the claim on the registered label. **Civil penalty exposure under FIFRA: up to $24,885 per violation.** EPA may treat each instance of misuse as a separate violation; total penalties can reach six or seven figures. EPA resolved at least 20 antimicrobial-related FIFRA enforcement actions in the first half of 2025 alone.

LIST	TARGET PATHOGEN	HOSPITAL RELEVANCE
List N	SARS-CoV-2	Required for COVID-19 claim
List K	C. difficile spores	Required for C. diff contact precaution rooms; sporicidal only
List G	Norovirus	Outbreak response and GI isolation
List H	MRSA, VRE	Contact precaution rooms
List P	Candida auris	Critical given C. auris spread; quats do not work
List Q	Emerging Viral Pathogens	Broad-spectrum future outbreak claims

LIST	TARGET PATHOGEN	HOSPITAL RELEVANCE
List S	HIV, HBV, HCV	Replaces former Lists C, D, E, F; OSHA 29 CFR 1910.1030
List J	Medical waste treatment	Red-bag waste handling

Joint Commission, AAAHC, DNV

Joint Commission 2024 IC Chapter Rewrite. Effective July 1, 2024, TJC implemented a full rewrite consolidating 12 standards with 51 EPs down to 4 standards with 14 EPs:

1. **IC.01.01.01**. Program structure and leadership
2. **IC.02.01.01**. Implementing and managing the IP and C program (environmental cleaning sits here)
3. **IC.03.01.01**. Improving IP and C performance through measurement and analysis
4. **IC.07.01.01**. High-Consequence Infectious Disease preparedness (new, added July 2024)

The new IC Assessment Tool shifts survey methodology from documentation review to practical implementation testing. **Surveyors now ask EVS staff directly about product contact times, cleaning sequences, isolation precaution-specific requirements, and observe actual cleaning practice.**

AAAHC. 2025 Quality Roadmap identifies infection prevention as a top deficiency area in nearly 90 percent of ambulatory surgical center and office-based surgery surveys. Most commonly cited specific standard is IPC.170 (unsafe sterilization and high-level disinfection), cited in 13.3 percent of facilities.

DNV NIAHO Program. 2024 update requires the survey team leader to present a list of requested documents on arrival. The healthcare organization must produce them within **three hours**. This places a premium on pre-organized documentation systems.

> ***The Procurement Implication.*** *A cleaning contract for a TJC-accredited hospital must include written SOPs producible within the DNV three-hour window, training completion records that survive surveyor scrutiny, documented audit cadence showing ongoing supervisor observation, and pathogen-specific protocol documentation for all isolation types the facility encounters. Verbal assurances of compliance are insufficient. Surveyors under the 2024 IC framework speak directly to EVS staff, bypassing management. Contracts must hold vendors accountable for frontline staff knowledge, not just binder documentation.*

SECTION 05

The Restroom

Cost reduction in healthcare cleaning is not about general hygiene. It is about specific pathogens with specific cleaning requirements. Five pathogen families account for the majority of HAI cost and CMS penalty exposure.

Cost Per HAI by Pathogen

PATHOGEN / INFECTION	AVG DIRECT COST PER CASE	EXCESS LOS	30-DAY ATTRIBUTABLE MORTALITY
CLABSI	$43,975-$63,000	13.4 days	12-25%
CAUTI	$18,000-$31,253	8.9 days	2-5%
SSI (all)	$18,626-$20,979	7.8-9.3 days	OR 7.27 at 90 days if MRSA
SSI (MRSA)	$61,681 added charges	+23 days vs. uninfected	OR 7.27 at 90-day mortality
CDI hospital-onset	$34,157 (2015 dollars)	5.6-9.7 days	44.9% at 1 year (Medicare)
VAP	$40,144 attributable	11-14 days ICU	10% attributable; 20.9% inpatient
MRSA (HO invasive)	$23,301	3.03 days	14.8%
VRE (HO invasive)	$29,775	3.39 days	20.0%
CRE (HO invasive)	$45,668	4.43 days	16.7%
CR-Acinetobacter (HO)	$54,494	3.90 days	**26.9%** (highest of all MDR)

Source: Kadri et al., Clin Infect Dis, 2022 (MDR pathogen rows); AHRQ HAI cost 2017; Joint Commission Journal 2024.

Kadri's national aggregate analysis (2022) estimated the combined annual U.S. cost of these six MDR pathogens at **$1.9 billion**, with **11,852 deaths** attributable and **448,224 excess inpatient days**.

Pathogen-Specific Cleaning Requirements

C. difficile. Spore-forming. Standard quaternary ammonium disinfectants will not kill it. Requires EPA List K sporicidal products (sodium hypochlorite at 1:10 dilution, accelerated hydrogen peroxide formulations, or peracetic acid). Contact time typically 4 to 10 minutes per label.

Candida auris. Persists on dry surfaces for weeks. Resists many common disinfectants including standard quats. Requires EPA List P. The CDC explicitly warns that **facilities using quat-only formularies in confirmed C. auris rooms are in active non-compliance** with CDC guidance and face survey citation exposure. January 2024 saw the first local transmission of C. auris documented in Washington State. King County issued a public health advisory in August 2024 specifying enhanced environmental cleaning with EPA List P products.

MRSA and VRE. Standard EPA List H disinfectants are sufficient. Quaternary ammonium with 2 to 5 minute contact time works. The failure mode is execution, not product selection.

CRE and CR-Acinetobacter. Multi-drug resistant gram-negative pathogens. Cleaning protocols mirror MRSA/VRE, but the SHINE trial demonstrated that ATP-driven verification specifically reduces MDR gram-negative bacilli incidence (IRR 0.856, P less than .001). The intervention is verification, not chemistry.

Norovirus. EPA List G. Spreads through environmental contamination on hard surfaces. Outbreak response requires immediate room closure and full terminal clean with a List G product.

The Operating Margin Math

A 2024 PMC analysis (PMC11240916) found statistically significant correlations between specific HAI rates and operating expenses per adjusted discharge:

HAI RATE INCREASE OF 1%	OPERATING EXPENSE IMPACT PER FACILITY
CDI	+$323,500 annually
MRSA	+$219,200 annually
CAUTI	+$203,500 annually

These figures are additive to CMS HAC Reduction Program penalties. A hospital with both elevated CDI rates *and* a CMS HAC penalty can carry **$1.3 million or more in avoidable annual cost** before adding malpractice exposure, indemnification claims, or reputational impact.

> ***The Honest Assessment.*** *Pathogen-specific protocol compliance is the difference between an audit pass and a citation. A vendor whose product formulary cannot demonstrate List K, List P, and List S coverage at the point of use is not running a defensible healthcare program. EPA list literacy, not brand familiarity, is the procurement filter.*

SECTION 06

ATP Testing as the Objective Layer

Eight environments dominate healthcare cleaning workload. Each has distinct contamination risk, contact time requirements, and audit expectations. A protocol that works in an exam room will fail in an OR. A protocol designed for an OR will overspend in a corridor.

The Exam Room

Exam rooms turn over every 15 to 30 minutes in busy ambulatory settings. The pressure to flip the next patient is the single biggest source of contact time failure in healthcare.

Between-patient protocol:

SURFACE	FREQUENCY	CONTACT TIME
Exam table (paper changed and surface wiped)	Every patient	Per label, typically 5-10 min
Patient chair arms and seat	Every patient	Per label
Instrument stand surface	Every patient	Per label
Stethoscope, otoscope, pulse oximeter	Every patient	Single-use covers where possible
Door handles and light switches	Every patient	Per label
Computer keyboard and mouse	Every patient	Per label; single-use covers recommended

End-of-day protocol: All between-patient surfaces with full contact time, plus sink and faucet, floor (single-direction mopping, fresh mop head), restroom, trash and sharps, soft surfaces and curtains per facility plan.

Where exam rooms fail audits:

- Contact time skipped: wipe applied, surface dry in 60 seconds
- Same cloth across multiple surfaces (cross-contamination)
- High-touch surfaces (light switches, dispensers, door pulls) missed
- No objective verification: no ATP swab, no published number

The Operating Room

The OR is the highest-stakes cleaning environment. AORN guidance is prescriptive and audit-driven.

Pre-procedure clean (between cases):

- Patient transport surface
- All surfaces within three feet of the surgical field
- Anesthesia equipment surfaces
- Surgical lights and booms
- Floor only if visibly soiled
- Per-case microfiber and mop heads, not reused
- EPA-registered disinfectant, full contact time before equipment repositioning

Terminal clean (daily, after final procedure):

- Floor-to-ceiling
- Lights, vents, overhead booms
- Walls and doors
- Sterile storage shelves
- Floor scrubbed (manual or autoscrubber)
- Single-direction mopping, no backtracking
- Color-coded microfiber by zone

Audit trail per AORN: Date and time of terminal clean. Identity of personnel performing. Disinfectant lot number and concentration. Verification method and result. Corrective action if verification fails.

Where ORs fail audits:

1. Contact time abbreviated under turnover pressure
2. Mop reused across rooms
3. Audit trail missing personnel ID or verification result
4. Color-coded microfiber program not enforced
5. Terminal clean skipped on weekends or low-utilization days

The Patient Room

Patient rooms are where HAI transmission is most often traced. Discharge cleaning is the single highest-leverage intervention.

Daily clean (occupied): Bathroom and shower, all high-touch surfaces in the patient zone (bed rails, call button, IV pole, overbed table, light switches, door handles), floors, trash, bedside chair.

Discharge clean: Full daily clean plus bed surfaces, mattress wipe-down, privacy curtain replacement if patient on isolation precautions, soft surfaces per plan, vents and high horizontal surfaces, floor scrubbed, **verification swab on a minimum of 5 high-touch surfaces**.

Verification. CDC guidance and Joint Commission expectations both call for objective monitoring at discharge. ATP is the most common method. Fluorescent marker audits and surface cultures are also accepted, but the SHINE trial demonstrated ATP specifically outperforms fluorescent markers in MDRO incidence reduction.

Pathogens of highest concern: C. difficile (requires sporicidal, not quat), MRSA, VRE, CRE, norovirus. The disinfectant must match the pathogen risk.

The Intensive Care Unit

ICU cleaning is patient-room cleaning with elevated stakes and tighter audit expectation. The SHINE trial established its baseline: ATP monitoring across 6 ICUs at 3 US academic medical centers reduced MDRO incidence by **IRR 0.876 (P=.002)**. UV/fluorescent marker monitoring did not. Room turnaround time increase was only **1 additional minute for ATP** versus **4.5 additional minutes for UV/F**.

ICU programs should sample post-terminal clean for every room, with ATP threshold at 45 to 63 RLU (lower than the general 100 RLU benchmark), targeting bed rails, overbed table, call button, IV pump touchpad, and door handles as the priority surfaces.

The Procedure Room

Endoscopy, cardiac catheterization, interventional radiology, and bronchoscopy suites carry OR-grade cleaning requirements but are often under AORN documentation rigor only in academic centers. AAAHC's 2025 data shows **IPC.170 (sterilization and high-level disinfection)** cited in 13.3 percent of ambulatory facility surveys. The procedure room is where ambulatory accreditation deficiencies cluster.

The Restroom

CDC and ISSA guidance both flag restrooms as a measurable contributor to facility-wide HAI risk when neglected. Public restrooms in healthcare facilities are high-density, high-pathogen environments that receive less attention than they should.

SURFACE	MINIMUM FREQUENCY
Toilet bowl and seat	Every service round
Sink, faucet, handles	Every service round
Floor	Daily, more often in high-traffic
Soap and paper dispensers	Per service round (touchpoints)
Walls and partitions	Weekly or per facility plan

Where restrooms fail: Dispensers wiped on the outside but not the dispense lever. Floor mopped but corners and grout untouched. Same mop used in restroom and adjacent corridor. No ATP sampling on faucet handles or dispenser pull tabs.

Sterile Processing and Pharmacy

These spaces have their own AORN-mandated cleaning requirements and IUSS traceability obligations that fall outside the typical EVS scope but must be coordinated. The IUSS update in AORN 2026 requires logging the reason for each Immediate Use Steam Sterilization event and tracing the sterilized item to the specific patient in the surgical record.

Cafeteria and Food Service

Subject to FDA Food Code and local health department regulations parallel to (but distinct from) EVS protocols. Cross-contamination from food service to clinical zones is a documented HAI vector in older facility layouts.

> ***The Verdict.*** *Each space has its own protocol math. A vendor that delivers identical service plans to an exam room and an OR is not running a healthcare-grade program. Procurement should ask to see the SOP differential by space type before signing.*

SECTION 07

Contact Time. The Most Common Failure Mode.

ATP bioluminescence testing is the operational backbone of a defensible healthcare cleaning verification program. The technology is mature. The benchmarks exist. The evidence base is strong.

How It Works

ATP (adenosine triphosphate) is the energy molecule found in every living cell. The luciferin-luciferase reaction, the same chemistry that produces firefly bioluminescence, converts ATP into measurable photon emission. The reaction is **stoichiometrically proportional**: the amount of light emitted is directly proportional to the quantity of ATP on the surface.

A standard ATP swab collects from a defined surface area (typically 10cm x 10cm = 100 cm2). The activated swab is inserted into a handheld luminometer that returns a dimensionless RLU (Relative Light Units) value in 10 to 15 seconds. Modern healthcare-grade luminometers (Hygiena EnSURE Touch, 3M LX25) achieve sensitivity to 1.0 femtomole of ATP.

Critical distinction: RLU values are not universal across platforms. A 100 RLU reading on a Hygiena SystemSURE Plus is not equivalent to 100 RLU on a 3M Clean-Trace LX25 or a Neogen AccuPoint. Cross-brand threshold comparisons are invalid without an independent calibration study.

What ATP does not detect:

- Bacterial spores (C. difficile is metabolically dormant and carries minimal ATP)
- Viruses (SARS-CoV-2, norovirus, hepatitis viruses do not produce significant ATP)
- Specific pathogens (ATP is a proxy for organic burden, not a pathogen test)
- Dead organisms (inactivated bacteria from prior disinfection register little ATP)

Benchmark Thresholds

STANDARD	PASS THRESHOLD	SOURCE
UK NHS hospital benchmark	Below 100 RLU	Mulvey D et al., J Hosp Infect 2011 (correlates to under 2.5 CFU/cm2)
US healthcare common practice	Below 500 RLU	2017 review (33.3% of studies); Hygiena/3M application guidance
Methodist Specialty Transplant	Below 45 RLU	Siddiqui et al. 2024, PMC11505405; immunocompromised population
OR multi-hospital alert	75 RLU/100 cm2	Popp et al. BMC Infect Dis 2018, PMC6245901

There is no single pass score that applies to every surface type, material, age, and use pattern. **A defensible ATP program defines its own thresholds per zone and per surface.** The Methodist Specialty and Transplant Hospital published a 2024 QI study using 45 RLU as the inpatient threshold and achieved 95 percent weekly pass compliance after baseline calibration.

ATP Vendor Landscape

VENDOR	PRODUCT	DEVICE PRICE	SWAB COST	RESULT TIME	CLOUD PLATFORM
Hygiena	EnSURE Touch	~$2,595	$1.00-$1.50	10 sec	SureTrend Cloud (Wi-Fi, dashboards, JCAHO reports)
Hygiena	SystemSURE Plus	~$2,084	$1.00-$1.50	15 sec	SureTrend Cloud
3M	Clean-Trace LX25	~$1,800-$2,200	$1.00-$1.80	~10 sec	Clean-Trace NG Software
Charm Sciences	novaLUM II-X	~$2,000-$3,000	$1.20-$1.80	5 sec	Limited cloud
Kikkoman	Lumitester Smart (A3)	~$1,600	$1.50-$2.00	10 sec	Lumitester Smart app
Neogen	AccuPoint Advanced NG	~$1,800-$2,400	$1.00-$1.50	15 sec	NEOGEN Analytics (RFID-tagged swabs)

Hygiena dominates the US healthcare market. SureTrend Cloud provides heatmaps, trend dashboards, and compliance reports that integrate with infection prevention committee reporting workflows. EnSURE Touch's Wi-Fi native design and real-time alert capability make it the current best-practice device for large health systems. A 2018 nine-system independent comparison found Hygiena SystemSURE Plus ranked first on sensitivity and reproducibility; Charm novaLUM and Neogen AccuPoint ranked lowest.

Sampling Cadence by Zone

ZONE	EXAMPLE AREAS	SAMPLING FREQUENCY	RLU THRESHOLD
Zone 1 (Critical)	ICU, OR, NICU, transplant	Post-terminal clean every room	45-63 RLU
Zone 2 (High Risk)	Med-surg inpatient, ED	20-30% random; 100% on outbreak floors	100 RLU
Zone 3 (Moderate Risk)	Outpatient procedure, imaging	Weekly spot-check; 10% of rooms	200 RLU
Zone 4 (Low Risk)	Waiting rooms, admin, corridors	Monthly audit	500 RLU

The SHINE Trial: Strongest Evidence

Anderson DJ, Moehring RW, Schmitz S, et al. Stopping Hospital Infections With Environmental Services (SHINE): A Cluster-randomized Trial of Intensive Monitoring Methods for Terminal Room Cleaning on Rates of Multidrug-resistant Organisms in the Intensive Care Unit. *Clin Infect Dis*. 2022;75(7):1217-1225. PMC9525084.

Multicenter cluster-randomized crossover trial across 6 ICUs at 3 US academic medical centers. ATP monitoring vs. UV/fluorescent marker monitoring with real-time feedback to EVS staff.

Key results:

- ATP monitoring: statistically significant MDRO incidence reduction (IRR 0.876; 95% CI 0.807-0.951; P=.002)
- UV/F monitoring: no statistically significant reduction
- ATP-specific reduction in MDR gram-negative bacilli: IRR 0.856; P less than .001
- ATP failure rates correlated with MDRO infection rates (Spearman rho 0.52, P=.001); UV/F did not
- Room turnaround time impact: median 1 additional minute for ATP vs. 4.5 additional minutes for UV/F

This is the highest-quality published evidence that ATP-driven terminal cleaning feedback directly reduces MDRO transmission.

> ***What We've Seen Firsthand.*** *A facility manager once told us, "we already test." Then could not produce a single number. ATP testing without a published threshold and a documented retraining trigger is theater. The number on the screen is not the program. The audit trail and the corrective action loop are the program.*

SECTION 08

EVS Staffing. The Structural Problem.

Every EPA-registered disinfectant has a label-mandated dwell time. The surface must remain visibly wet for the full duration to achieve the kill claim. **This is the single most common failure in real-world EVS audits.**

PRODUCT CLASS	TYPICAL CONTACT TIME
Quaternary ammonium wipes (general)	1-4 min
PDI Sani-Cloth AF3	2-3 min
Bleach 1:10 (C. diff protocol)	4-10 min per label
Accelerated hydrogen peroxide (Oxivir)	1-3 min per label
Peracetic acid	5-10 min
UV-C supplemental (no contact time, exposure-based)	5-25 min per device

Why Contact Time Fails in Practice

The wipe is applied. The technician moves to the next surface. The disinfectant evaporates in 30 to 60 seconds. The surface looks clean. **The kill claim was not achieved.**

EPA guidance is unambiguous: a surface must remain visibly wet for the full stated contact time on the label for the specific pathogen claim. Using a product inconsistent with its labeling, including failure to maintain wet time, constitutes a federal regulatory violation subject to civil penalties under FIFRA.

Civil penalty exposure: up to $24,885 per violation. Each instance of misuse may be treated as a separate violation. EPA resolved at least 20 antimicrobial-related FIFRA enforcement actions in the first half of 2025 alone.

How to Enforce Contact Time

1. **Sequence the work.** Apply disinfectant, move to the next surface or zone, return to wipe. Dwell time elapses in parallel with other work.
2. **Document product per zone.** Disinfectant lot number, concentration, and applied dwell time logged per cleaning event.
3. **Sample post-clean with ATP.** Contact time failures show up as elevated RLU residue even when the surface appears clean.
4. **Train explicitly.** CDC Project Firstline EVS modules include contact time as a core competency. Multilingual visual materials matter for the workforce reality (50 percent born outside the U.S.).
5. **Audit by observation, not paperwork.** Supervisor rounds witness actual cleaning practice, not signature logs.

> ***The Verdict.*** *A vendor whose training program does not address contact time, and whose audit program does not verify it in practice, is not running a healthcare-grade program. Ask for the contact time training documentation. Ask for the supervisor audit log. If either is missing, the kill claim on every disinfectant in the building is theoretical.*

SECTION 09

The Economic Case

Environmental services is one of the most demographically distinct segments of the healthcare labor force, and its structural challenges directly affect cleaning quality.

Workforce Demographics

Per peer-reviewed COVID-era study data (PMC9088319, 2022):

- **69 percent female**
- **50 percent identify as Black**
- **31 percent identify as Hispanic**
- **50 percent were born outside the United States**

Many workers are immigrants or non-native English speakers. Multilingual training, visual SOPs, and bilingual supervisors are not accommodations. They are operational requirements.

Turnover

The commonly cited 40 to 50 percent annual turnover figure requires qualification:

- **AHE historical data:** turnover rose from 10 percent in 2014 to more than 18 percent by the early 2020s, near-doubling but below the 40 to 50 percent range
- **Cleveland Clinic (2024-2025):** measured at **43 percent** before targeted retention task forces were deployed
- **Contract/outsourced EVS in metro markets:** routinely exceeds 40 percent

Each percentage point of turnover translates to retraining cost, reduced compliance during the new-hire ramp, and HAI risk during transition periods. The Cleveland Clinic case demonstrates that even premier health systems run into structural turnover when management bandwidth lapses.

Wage Data (2025-2026)

ROLE	AVG ANNUAL	AVG HOURLY	NOTE
EVS Technician (national)	~$38,016	~$18.28	ZipRecruiter
EVS Technician (25th pct)	~$31,500	~$15.14	Salary.com
EVS Technician (75th pct)	~$41,000	~$19.71	Salary.com
EVS Manager	$50,000-$75,000	n/a	HHS Healthcare
EVS Director	$75,000-$100,000+	n/a	HHS Healthcare
CHESP-certified managers	~25% premium over peers	n/a	AHE compensation survey

CHEST or CHESP certification adds $10,000 to $20,000 to annual salary, per HHS Healthcare career data.

Certifications That Matter

CERTIFICATION	ISSUER	TARGET	HOURS	COST
CHEST	AHE (AHA)	Frontline Technician	24 hrs classroom + 50 MCQ exam	$40 exam (facility covers)
CHESP	AHE/AHA Certification Center	Manager / Director	Self-study + experience	Contact AHA
ISSA CIMS	ISSA	Organizational	n/a (org audit)	$500 app + $1,495 cert
HealthyClean Specialist	CloroxPro (ANAB-accredited)	Frontline + Managers	Online self-paced	Free/subsidized

AHE CHEST is the gold standard for frontline technicians. Seven domains: cleaning and disinfection, waste handling, floor care, linen handling, infection prevention, safety, communication. Outcomes data (AHE/HFM):

- HAI rates decreased **20.6 to 75.9 percent** post-CHEST implementation
- C. diff, MRSA, VRE, CAUTI rates each dropped **more than 50 percent** in published cases
- EVS staff turnover dropped by **nearly one-third** in CHEST-implementing facilities

ISSA CIMS is an organizational quality certification, not individual. Larger health systems increasingly require CIMS-certified contractors as an RFQ qualification criterion, eliminating uncertified regional competition.

CDC Project Firstline EVS Curriculum is federally funded and free. Five 15-20 minute micro-learn modules designed for pre-shift huddle delivery. Available in English and Spanish. Designed specifically to address the multilingual workforce reality.

Best-in-Class Training Cadence

Daily: Pre-shift huddle (5-10 min) using CDC Project Firstline micro-learns. Cart inspection and PPE verification. High-touch point visual checklist (Geisinger: 14 documented points per room).

Weekly: Supervisor observation rounds with in-the-moment feedback. ATP or fluorescent marker results reviewed with staff.

Monthly: Department-level quality score review. Individual recognition and coaching conversations.

Annual/Recurring: CHEST certification renewal (every 3 years, 15 CE hours). Full competency reassessment for newly promoted leads. New technology orientation (UV-C, new chemicals, audit tools).

Geisinger: Multi-Year EVS Excellence

Geisinger Health System is the most frequently recognized health system in AHE EVS Department of the Year history. Wins or recognition in **2023, 2024, and 2025** across different hospitals in the system. Published program elements:

- Systemwide UV-C disinfection technology deployment
- Six-step bundled patient room cleaning protocol with laminated competency checklists
- 14-point high-touch visual carts (icons and text)
- Regular team education cycles tied to infection prevention metrics

Mayo Clinic Health System (2022 Department of the Year): created a new training and development coordinator position, developed a staff refresher course with knowledge assessments, cross-trained all EVS employees for inpatient and critical area coverage. Outcomes: stable turnover, work-related injury decline, decline in standardized infection ratios, improved HCAHPS cleanliness and courtesy scores.

> ***What We've Seen Firsthand.*** *Training is not where most healthcare cleaning programs fail. Verification is. Programs that invest in monthly CHEST refreshers, daily huddles, and CHESP-certified managers still struggle without an ATP feedback loop tying training to outcomes. The data closes the loop. Without it, the training is hope.*

SECTION 10

What to Ask Your Current Cleaning Provider

The financial framing of healthcare cleaning is straightforward: every dollar spent on a defensible program returns multiples in avoided HAI cost, avoided CMS penalty, and avoided litigation exposure. The peer-reviewed evidence is strong.

The REACH Trial: Landmark Cost-Effectiveness

Cheng et al., Clinical Infectious Diseases, 2019 (PMC7286366). 11 Australian hospitals across 6 states/territories, 1,700+ EVS staff, 6,100+ overnight beds, 62-week stepped-wedge cluster-randomized controlled trial.

Implementation cost: AUD $349,000 total (AUD $2,430 per 10,000 occupied bed days)

Cost savings:

- Direct savings from infections avoided: AUD $147,500
- Net monetary benefit (CEO willingness-to-pay): **AUD $1.02 million**
- Net monetary benefit (accounting approach): **AUD $1.6 million**

Return on investment: 3-to-1 net monetary benefit at conservative estimate; up to **4.6-to-1** under the accounting framework.

Incremental Cost-Effectiveness Ratio: AUD $4,684 per QALY, dramatically below the AUD $28,000/QALY acceptability threshold.

Probability of cost-effectiveness: 86 to 88 percent across 10,000 probabilistic simulations.

HAIs prevented: 40 combined (23.5 S. aureus bacteremias + 16 VRE cases) per 1.3 million occupied bed days.

Five-component bundle:

1. Product and approach (disinfectant selection based on risk)
2. Technique (Look, Plan, Clean, Dry: one wipe, one site, one direction)
3. Education and training (visual and kinesthetic)
4. Audit and feedback (fluorescent technology + ATP bioluminescence)
5. Communication (recognition schemes + clinical staff engagement)

The 10-Year Community Hospital Program

Single community hospital, 10-year longitudinal program (PMC9726550). Fluorescent gel marking of 13 high-touch surfaces per room, staff training, audit cycles, mentorship protocol (3 paired shifts for new hires), annual competency reassessment.

Outcomes:

- C. difficile infection rates: **down 70 percent over 10 years**
- Surgical site infections (Class 1 and 2): **down 55 percent**
- Overall HAI rate: **down 75 percent**
- Cleaning compliance: 74.7 percent baseline to 90 percent at Year 4, sustained at 93 percent average over the most recent 5 years

The Brazilian National Program

National HAI prevention program covering ICUs across Brazil (PMC12004500).

- Total savings: **USD $68.8 million**
- Return on investment: **765 percent**

Most robust published ROI for a large-scale systematically evaluated infection prevention initiative.

The CDC's Own Estimate

CDC estimates the **$45 billion annual direct HAI cost burden could be reduced by up to $31.5 billion** with well-resourced, quality infection prevention and control programs. A potential **70 percent cost reduction** across the U.S. acute care system.

CMS HAC Reduction Program Exposure

HOSPITAL MEDICARE REVENUE	FY2025 PENALTY IF IN WORST QUARTILE
$50 million	$500,000
$100 million	$1,000,000
$200 million	$2,000,000

724 hospitals were penalized in FY2025. Approximately 25 percent of all eligible acute care hospitals are penalized in any given fiscal year. For hospitals with 2022 median operating margins of -3.8 percent, the HAC penalty is the difference between break-even and material operating loss.

Litigation Exposure Benchmarks

OUTCOME	SETTLEMENT / AWARD
Average HAI lawsuit settlement	~$250,000 per case
Wrongful death from HAI	Frequently $1M+
Joseph Brant C. diff class action (Ontario)	CAD $9 million
Olympus duodenoscope regulatory fines	$85 million+
Olympus jury verdict (Seattle hospital)	$6.6 million
Pentax criminal settlement	$43 million
UK NHS hospital C. diff regulatory fine	GBP 2.7 million

Malpractice premium environment. 46 of 50 U.S. states reported malpractice insurance premium increases in 2025, up from 36 states in 2023. Driven by "nuclear verdicts" that reset benchmark settlement expectations.

> ***The Verdict.*** *A cleaning program that prevents one C. difficile case avoids approximately $34,000 in direct cost. A program that prevents one CR-Acinetobacter case avoids $54,494 in direct cost and approximately 27 percent attributable mortality risk. A program that exits the CMS HAC penalty quartile recovers seven figures annually for a typical mid-sized hospital. The break-even math for a serious cleaning verification program crosses inside the first year for any facility with elevated HAI rates.*

SECTION 11

The Millennium Facility Services Healthcare Standard

Chemistry selection is a function of pathogen target, contact time tolerance, surface compatibility, and worker safety. Healthcare facilities should maintain a multi-product formulary calibrated to space and risk.

Quaternary Ammonium Compounds (Quats)

The workhorse of healthcare cleaning. EPA List H for MRSA/VRE, broad bacterial spectrum. Contact times typically 1 to 4 minutes. Cheap, easy to use, low toxicity.

Limitations. Do not kill C. difficile spores (no List K activity). Do not kill Candida auris (no List P activity). Limited efficacy against non-enveloped viruses. Susceptible to inactivation by organic matter on heavily soiled surfaces.

When to use. General patient room turnover. Exam rooms. Routine high-touch surface daily cleaning where the pathogen profile is bacterial.

Sodium Hypochlorite (Bleach)

Gold standard for C. difficile (EPA List K) at 1:10 dilution. Broad-spectrum kill including sporicidal activity. Effective against C. auris. Contact times 4 to 10 minutes per label.

Limitations. Corrosive to metal surfaces over time. Bleaches fabrics. Generates fumes that irritate respiratory tract. Inactivated by organic matter; requires pre-clean. Unstable in dilution: facilities must mix daily or use ready-to-use formulations.

When to use. C. difficile contact precaution rooms. Norovirus outbreak response. Confirmed C. auris environment.

Accelerated Hydrogen Peroxide (AHP)

Faster contact times (1 to 3 minutes for most claims), broad spectrum, lower toxicity than bleach. Diversey's Oxivir line and Ecolab's Peroxide Multi Surface are the leading formulations. Decomposes into water and oxygen, leaving no chemical residue.

Limitations. More expensive per unit than quats. Surface compatibility issues with some plastics and rubber over time.

When to use. Operating room terminal cleaning where speed matters. Procedural areas with patient throughput pressure. Patient rooms in mid-acuity settings.

Peracetic Acid

High-level sporicidal disinfectant. Active against C. difficile, C. auris, and most environmental pathogens. Contact times 5 to 10 minutes.

Limitations. Strong acetic odor. Worker safety considerations require ventilation and PPE. Surface compatibility issues with copper, brass, and some plastics.

When to use. Sterile processing applications. Specific outbreak response protocols. Endoscope reprocessing channels.

UV-C Supplemental Disinfection

Pulsed xenon or low-pressure mercury lamps generating UV-C wavelengths (200 to 280 nm) for full-room terminal disinfection. Used as an adjunct to manual cleaning, not a replacement.

VENDOR	TECHNOLOGY	TYPICAL CYCLE TIME	PRICE
Xenex LightStrike	Pulsed xenon	2-8 min	$80K-$125K per unit
Tru-D SmartUVC	Mercury + room sensors	Sensor-driven	Premium
Surfacide Helios	3-emitter mercury	Multi-angle coverage	Premium
UVD Robots	UV-C + autonomous nav	Variable	SaaS usage model available

HAI reduction data supports Xenex specifically. Several peer-reviewed publications document statistically significant reductions in C. diff and SSI rates in hospitals using pulsed xenon UV as a terminal clean adjunct.

UV-C robots are used for terminal cleans in high-risk rooms (OR, isolation, oncology, C. diff rooms), not routine daily cleaning. Economics require clinical targeting. The 32.62 percent CAGR through 2027 reflects expanded infection prevention budgets and CMS reimbursement pressure.

The Pathogen-to-Disinfectant Matrix

PATHOGEN	EPA LIST	EFFECTIVE CHEMISTRY	CONTACT TIME
Bacterial general (MRSA, VRE)	List H	Quat, AHP, bleach	1-5 min
C. difficile spores	List K	Bleach 1:10, peracetic acid, AHP sporicidal	4-10 min
Candida auris	List P	Bleach, hydrogen peroxide based, peracetic	1-10 min per label
Norovirus	List G	Bleach, AHP	1-5 min
HIV/HBV/HCV (bloodborne)	List S	Quat, bleach, AHP	1-10 min
SARS-CoV-2	List N	Quat, AHP, bleach	1-10 min
Emerging viral pathogens	List Q	Broad-spectrum AHP	Per label

A vendor whose formulary cannot demonstrate active products in **List K**, **List P**, and **List S** at the point of use is not running a healthcare-grade program.

SECTION 12

Conversation

No single verification method covers the full hygiene assurance spectrum. A defensible program uses ATP as the operational backbone, fluorescent markers for EVS training, and surface culture for outbreak response and program validation.

METHOD	SPEED	QUANTITATIVE	PATHOGEN-SPECIFIC	COST PER TEST	BEST USE
ATP bioluminescence	10-15 sec	Yes (RLU)	No	$1.00-$2.00	Real-time operational compliance; EVS feedback loop
Fluorescent marker (UV gel)	Immediate	No (binary)	No	$0.05-$0.15	EVS training; process audit; touch coverage
Surface culture (RODAC/swab)	24-72 hrs	Yes (CFU)	Partial	$15-$40	Outbreak investigation; program validation at launch
Pathogen-specific PCR	1-4 hrs (lab)	Yes	Yes	$30-$100	Outbreak confirmation; regulatory clearance

Why a Layered Program

The SHINE trial directly compared UV/fluorescent marker monitoring to ATP across 6 ICUs. **UV/F generated 20.5 percent failures per month vs. 6.3 percent for ATP.** UV/F failure rates did not correlate with MDRO infection rates. ATP failure rates did (Spearman rho 0.52, P=.001).

The interpretation is not that fluorescent markers are useless. They are the right tool for EVS training (cheap, visual, immediate feedback) and for process audits (did the cleaner actually touch this surface?). They are the wrong tool as the primary verification layer. Surface cultures are the gold standard for microbiological confirmation but too slow and too expensive for operational use.

ATP is the operational backbone. Fluorescent markers are the training tool. Cultures are the validation layer. A defensible program uses all three.

Reporting Cadence

Weekly: EVS manager reviews departmental pass rates. Floors above 15 percent fail rate report to IPC liaison before the next business day.

Monthly: IPC committee receives a summary dashboard from Hygiena SureTrend or equivalent. Pass rate by unit, 90-day trend, surface-level failure heatmap. Reviewed alongside HAI surveillance data.

Quarterly: EVS director presents ATP performance alongside HAI surveillance. Correlation analysis identifies leading indicators. Threshold recalibration considered if pass rates have shifted more than 10 percentage points.

Annual: Full threshold recalibration review. Benchmark against peer institutions via published literature. Update program documentation for Joint Commission and CMS survey readiness.

SECTION

The Vendor Landscape

The US healthcare environmental services market is projected to reach **$9.53 billion by 2029**, growing at 7.1 percent CAGR. The competitive structure has four distinct tiers.

Tier 1: The Big Three

VENDOR	PARENT	HEALTHCARE MODEL	TARGET SEGMENT
Sodexo Health Systems	Sodexo S.A. (French public)	Integrated: EVS + food + facilities	Mega-IDN, academic medical centers
Aramark Healthcare+	Aramark Corp. (NYSE: ARMK)	Integrated: EVS + food + supply chain + transport	Large acute care, academic
Crothall Healthcare	Compass Group subsidiary	Pure-play healthcare EVS + HTM + clinical engineering	IDNs, large hospital systems

The Big Three have dominated large IDN and academic medical center contracts for 15+ years. Competitive moat: bundled services, contract length (5-7 year terms), integration with hospital administrative systems. Dislodging them at large accounts is structurally difficult.

Crothall is the most differentiated. Branded specifically as healthcare-first, not a generalist FM company with a healthcare division. Service lines include EVS, patient transportation, healthcare technology management, laundry, and clinical engineering.

Tier 2: National Mid-Market

VENDOR	STRUCTURE	HEALTHCARE FOCUS
ABM Industries Healthcare	NYSE: ABM	EVS + facility services; healthcare growth vertical
ISS World Services	ISS A/S (Danish public)	Integrated FM; US healthcare growing
Kellermeyer Bergensons (KBS)	PE-backed roll-up	EVS across multiple verticals; mid-market
Healthcare Services Group (HCSG)	NASDAQ: HCSG	Pure-play long-term care EVS only

PE-backed consolidation is occurring at this tier. Regional operators are being acquired, combined, and repositioned as national mid-market competitors. The acquired operators go through 12 to 24 month integration periods where account management turnover is high, service consistency drops, and client confidence is uncertain.

Mid-market health systems that were recently acquired by a PE roll-up are active re-bid candidates.

Tier 3: Franchise Operators

ServiceMaster Clean is the largest in this category. 3,000+ franchise locations. Individual franchisees vary significantly in capabilities. Active in smaller hospitals, long-term care, and ambulatory settings where price is the primary decision driver. Not a credible competitor for complex acute care EVS programs requiring AHE certification rigor.

Tier 4: Regional Specialists

Local and regional operators competing on responsiveness, certifications, and owner-operator accountability. This is the segment where:

- The Big Three are over-priced and under-responsive
- PE roll-ups suffer integration inconsistency
- Franchise operators lack certification infrastructure

Cleaning Chemical Vendors

VENDOR	PARENT	KEY HEALTHCARE PRODUCTS
Ecolab	NYSE: ECL	Apex, Peroxide Multi Surface, instrument reprocessing
Diversey (Solenis)	Solenis (PE)	Oxivir, Virex, Suma surface
Clorox Healthcare	NYSE: CLX	Fuzion, VersaSure, bleach products
PDI Healthcare	Private	Sani-Cloth AF3, Super Sani-Cloth
Metrex Research	NYSE: NVST	CaviWipes 1, CaviWipes 2.0
Spartan Chemical	Private	BioHazard Plus, BSN, floor care

Ecolab dominates because they sell chemistry plus service plus data, not just product. Field reps are embedded in hospitals advising on protocol compliance and auditing usage rates.

PDI Healthcare dominates the clinical surface wipe category. Sani-Cloth and Super Sani-Cloth product lines are used by both nursing staff and EVS, placing PDI at the intersection of clinical and environmental services.

Diversey (under Solenis following 2024 acquisition) was repositioned as combined water treatment plus hygiene solution. Merger integration creates short-term sales disruption that competitors can exploit.

EVS Technology Platforms

Hygiena SureTrend is the dominant ATP data management platform in healthcare. Aggregates data from multiple luminometers across multi-facility systems. Surfaces trend data. Produces compliance documentation supporting JCAHO and DNV.

3M Clean-Trace is the primary alternative for facilities with existing 3M supply contracts.

Clorox Healthcare Audit is a tablet-based audit platform tied to Clorox chemistry protocols. Easy adoption for facilities already using Clorox products.

SECTION

How to Evaluate a Cleaning Provider

The 20-question vendor evaluation checklist for healthcare procurement.

Certification and Training

1. What percentage of deployed technicians at this account hold current CHEST certification? (Less than 80 percent is a yellow flag; less than 50 percent disqualifies.)
2. Is the EVS manager CHESP certified? If not, what equivalent credentials does management hold?
3. Does the vendor hold ISSA CIMS or CIMS-GB certification at the corporate level?
4. What is the documented training cadence: new-hire hours, annual refresher hours, multilingual delivery?

Verification and Audit 5. Can the vendor produce documented ATP verification results from the last 90 days at this facility? 6. What ATP pass threshold does the vendor contractually guarantee per surface type? 7. What software platform is used for ATP data management? Is the cloud dashboard accessible to the hospital's infection prevention committee? 8. What is the corrective action protocol when a surface exceeds threshold?

Contact Time and Chemistry 9. How does the vendor verify contact time compliance? Observational audit cadence? 10. What is the vendor's product formulary? Does it include active products on EPA List K (sporicidal for C. diff), List P (Candida auris), and List S (bloodborne)? 11. For California or New York facilities: are all products dual-registered with CDPR or NYSDEC in addition to EPA?

Documentation and Survey Readiness 12. Can the vendor produce a sample completed terminal cleaning checklist? 13. Can the vendor produce training records sufficient for the DNV three-hour document window? 14. Is the vendor experienced with Joint Commission's 2024 IC chapter survey methodology? 15. Show me the corrective action documentation for the last three audit failures at this facility.

Pathogen-Specific Protocols 16. What is the protocol for C. difficile contact precaution rooms? 17. What is the protocol for confirmed C. auris environments? 18. What is the outbreak response protocol? Public health notification timeline?

Service Model and Accountability 19. Who is the named escalation contact for this account? Is there an owner-operator or principal accessible directly? 20. What is the vendor's documented EVS staff turnover rate at this specific account over the last 24 months?

> ***The Verdict.*** *A vendor that cannot answer 15 of these 20 questions in writing, with documentary evidence, is not running a healthcare-grade program. The 20-question filter eliminates most regional competitors from contention at hospitals with active infection prevention programs.*

SECTION

The Audit Trail: What Surveyors Want

The Joint Commission's 2024 IC chapter rewrite shifted survey methodology from documentation review to **live practical implementation testing**. The audit trail still matters but in a different way.

What Surveyors Look For Now

- EVS staff ability to verbally explain the cleaning sequence (top-down, clean-to-dirty)
- Correct identification of the product in use and its labeled contact time
- Knowledge of isolation precaution-specific product requirements (sporicidal for C. diff, List P for C. auris)
- Observation of actual cleaning practice, including whether surfaces are allowed to air-dry versus being prematurely wiped
- Existence and accessibility of written SOPs at the unit level
- Documented cleaning schedules and completed cleaning logs
- Evidence of supervisor audit and corrective action documentation

Documentary Evidence Required

- Written IP and C policies aligned to current CDC guidance
- Cleaning SOPs specific to each area type (ICU, OR, general med/surg, isolation)
- Completed cleaning logs with date, time, personnel, and product
- Staff training completion records (new-hire plus annual refresher)
- Supervisor observation/audit records showing pattern monitoring, not one-off checks
- Corrective action documentation when cleaning failures are identified
- ATP verification results trended over time with corresponding retraining records

How Citations Manifest

Citations are typically issued under IC.02.01.01 EPs or under the CMS CoP equivalent (42 CFR 482.42). Deficiencies manifest as:

- EVS staff unable to demonstrate knowledge of product label requirements
- Absence of documented cleaning logs
- Lack of pathogen-specific protocols

- Observation of non-compliant practice (staff wiping surfaces immediately after product application)

CMS 2023-2024 data identifies infection prevention failures as the most frequently cited deficiency category across ambulatory surgical centers.

SECTION

The Millennium Facility Services Healthcare Standard

Millennium Facility Services delivers healthcare cleaning programs to the standard described throughout this guide. Our healthcare account commitments:

Certification. 100 percent CHEST-certified technicians on every healthcare account. Posted certification rate in every proposal. CHESP-certified account management.

Verification. ATP testing program with documented sampling cadence per zone. Monthly verification reports delivered to the facility manager and infection prevention committee covering:

- ATP results by zone and surface type
- Contact time compliance audit
- Repeat findings flagged across the trailing 90 days
- Critical-tier exposure items with photo evidence
- Trend lines tied to high-touch zones
- Training records and recertification dates per crew member
- Corrective action documentation when thresholds are missed

Formulary. Products active on EPA List K (sporicidal), List P (Candida auris), List S (bloodborne pathogens), and List Q (emerging viral pathogens) maintained in active inventory at every account.

Cadence. Daily pre-shift huddle using CDC Project Firstline materials in English and Spanish. Weekly supervisor observation. Monthly quality scorecard reviewed with the infection prevention committee.

Accountability. Named owner-operator as the escalation contact for every healthcare account. National contractors cannot replicate this structural commitment.

Atlanta region. Deep knowledge of the regional procurement, decision-maker, and supply chain landscape. Owner-operator presence in the market.

The report is yours. You hand it to your accreditation surveyor. You hand it to your CFO. You hand it to your infection prevention committee.

This is what tracking the exposure looks like.

SECTION

Quick Reference: Pathogen-to-Disinfectant Matrix

PATHOGEN	EPA LIST	EFFECTIVE CHEMISTRY	CONTACT TIME	NOTES
MRSA, VRE	List H	Quat, AHP, bleach	1-5 min	Standard healthcare cleaning
C. difficile (spores)	List K	Bleach 1:10, peracetic acid, AHP sporicidal	4-10 min	Quats do NOT kill
Candida auris	List P	Bleach, H2O2-based, peracetic	1-10 min	Quats do NOT kill; persists weeks on surfaces
Norovirus	List G	Bleach, AHP	1-5 min	Outbreak response
HIV, HBV, HCV	List S	Quat, bleach, AHP	1-10 min	Replaces former Lists C, D, E, F
SARS-CoV-2	List N	Quat, AHP, bleach	1-10 min	Maintained for COVID claims
Emerging Viral Pathogens	List Q	Broad-spectrum AHP	Per label	
Medical waste handling	List J	Variable	Per label	Red-bag waste areas

SECTION

Twenty Questions to Ask Your Current Cleaning Provider

(Detailed in Section 12, summarized here for procurement reference.)

1. CHEST certification rate at this account?
2. CHESP credentials of account management?
3. ISSA CIMS / CIMS-GB certification at corporate level?
4. Documented training cadence (new-hire, annual refresher, multilingual)?
5. ATP verification results from the last 90 days?
6. Contractually guaranteed ATP pass threshold per surface type?
7. ATP cloud platform accessible to infection prevention?
8. Corrective action protocol when surface exceeds threshold?
9. Contact time verification method?
10. Product formulary covers List K, List P, List S?
11. State pesticide registration verified (CA, NY)?
12. Sample terminal cleaning checklist?
13. Training records producible in DNV three-hour window?
14. Experience with TJC 2024 IC chapter survey methodology?
15. Corrective action documentation for last three audit failures?
16. C. difficile cleaning protocol?
17. Candida auris cleaning protocol?
18. Outbreak response protocol?
19. Named owner-operator escalation contact?
20. Documented EVS turnover rate at this account over 24 months?

SECTION

Glossary

- **AHE**: Association for the Health Care Environment, AHA subsidiary, the primary US healthcare EVS professional body
- **AORN**: Association of periOperative Registered Nurses; publishes the perioperative guideline standard
- **ATP**: Adenosine triphosphate; energy molecule used as a proxy for organic surface residue in cleaning verification
- **CAUTI**: Catheter-Associated Urinary Tract Infection
- **CDI**: Clostridioides difficile Infection
- **CFU**: Colony Forming Unit; microbiological count metric
- **CHESP**: Certified Health Care Environmental Services Professional; AHE manager-level credential
- **CHEST**: Certified Health Care Environmental Services Technician; AHE frontline-level credential
- **CLABSI**: Central Line-Associated Bloodstream Infection
- **CMS HAC Reduction Program**: Medicare program reducing payment 1% for worst-performing-quartile hospitals on Total HAC Score
- **CRE**: Carbapenem-Resistant Enterobacteriaceae
- **EPA List K**: EPA-registered products effective against C. difficile spores
- **EPA List P**: EPA-registered products effective against Candida auris
- **EPA List S**: EPA-registered products effective against bloodborne pathogens (HIV, HBV, HCV)
- **EVS**: Environmental Services; the hospital department responsible for cleaning and infection control surface management
- **FIFRA**: Federal Insecticide, Fungicide, and Rodenticide Act; regulates EPA-registered disinfectants
- **HAI**: Healthcare Associated Infection
- **HICPAC**: Healthcare Infection Control Practices Advisory Committee; co-issues CDC environmental guidance
- **IUSS**: Immediate Use Steam Sterilization (formerly "flash sterilization")
- **MDRO**: Multidrug-Resistant Organism
- **RLU**: Relative Light Unit; ATP measurement unit
- **SHINE Trial**: Stopping Hospital Infections With Environmental Services; landmark 2022 ATP vs. UV/F study
- **SIR**: Standardized Infection Ratio; CMS metric for HAI rates

- **SSI**: Surgical Site Infection
- **TJC**: The Joint Commission
- **VAE**: Ventilator-Associated Events
- **VAP**: Ventilator-Associated Pneumonia
- **VRE**: Vancomycin-Resistant Enterococci

SECTION

Sources

Centers for Disease Control and Prevention. *Guidelines for Environmental Infection Control in Health-Care Facilities*. MMWR Recommendations and Reports, Vol. 52, No. RR-10, 2003. CDC. *Environmental Cleaning Procedures*, updated March 2024. CDC. *Best Practices for Environmental Cleaning in Healthcare Facilities (CS314156-A)*. CDC. *Current HAI Progress Report*, 2024. CDC. *Project Firstline: EVS Cleaning and Disinfection Micro-Learn series*. AORN. *Guideline for Environmental Hygiene*, October 2025. AORN. *2026 Guideline for the Care and Cleaning of Surgical Instruments*. Joint Commission. *Infection Prevention and Control Standards*, July 2024 revision (IC.01.01.01, IC.02.01.01, IC.03.01.01, IC.07.01.01). EPA. *Lists N, K, G, H, P, Q, S, J of registered antimicrobial products*. CMS. *Hospital-Acquired Condition Reduction Program FY2025 Fact Sheet*. Anderson DJ, Moehring RW, Schmitz S, et al. *Stopping Hospital Infections With Environmental Services (SHINE)*. Clin Infect Dis. 2022;75(7):1217-1225. PMC9525084. Cheng AC, Buising KL, Bartlett A, et al. *Cost-effectiveness of an Environmental Cleaning Bundle (REACH)*. Clin Infect Dis. 2019. PMC7286366. Mulvey D, et al. *Finding a benchmark for monitoring hospital cleanliness*. J Hosp Infect. 2011;77(1):25-30. Siddiqui M, Garcia R, Lozano R. *Improving Cleaning Validation Utilizing ATP Technology*. Am J Infect Control. 2024. PMC11505405. Popp W, et al. *ATP bioluminescence assay for evaluating cleaning practices in operating theatres*. BMC Infect Dis. 2018;18:626. PMC6245901. Zimlichman E, et al. *Healthcare-Associated Infections: A Meta-Analysis of Costs and Financial Impact*. JAMA Intern Med / Journal of Medical Economics, 2013. PubMed 24024988. Kadri SS, et al. *External Validity of Adult Sepsis Event for Identifying Severe Sepsis*. Clin Infect Dis. 2022. PMC8946701. Whiteley GS, et al. *Effectiveness of ATP Bioluminescence to Assess Hospital Cleaning: A Review*. J Hosp Infect. 2017. PMC5584088. PMC9726550. *Long-term Outcomes of a Community Hospital Environmental Cleaning Program*. PMC12004500. *National HAI Prevention Program ROI Analysis (Brazil)*. PMC11240916. *HAI Rates and Hospital Financial Performance*. PMC10679173. *CLABSI and CAUTI Excess Cost Trend 2019-2023*. PMC10226732. *CDI Mortality and Cost in the Medicare Population*. PMC10812792. *VAP Attributable Cost Analysis*. PMC2788700. *MRSA SSI Cost and Mortality*. PMC12620361. *HAI Mortality Burden 1999-2023 (CDC WONDER)*. PMC8857881. *Systematic Review of Environmental Hygiene Interventions*. AHE. *CHEST Certification Outcomes Data*. AHE. *2025, 2024, 2023, 2022 EVS Department of the Year Award Documentation*. HFM Magazine. *EVS Certification Proves Its Worth*; *Mayo Clinic 2022 DOY Profile*; *Geisinger Multi-Year Recognition*. MarketsandMarkets. *US Healthcare Environmental Services Market Forecast to 2029*. ISSA. *Cleaning Industry Management Standard (CIMS) Documentation*. California Hospital Association. *FY2025 HAC Reduction Program Analysis*. King County Department of Public Health. *August 2024 Candida auris Health Advisory*. Hygiena. *SureTrend Analytics product documentation*. 3M. *Clean-Trace LX25 Product Specifications*. US Claims, Hampton & King, Snyder & Wenner. *HAI Lawsuit Settlement Benchmark Data*. The Globe and Mail. *Joseph Brant Memorial $9 Million C. difficile Class Action Settlement Coverage*. Building Better Healthcare. *UK NHS Hospital 2.7 Million Pound C. difficile Fine*. Lawsuit Information Center. *Olympus Duodenoscope Infection Litigation Coverage*.

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