

# Environmental Health Initiatives to Control Covid19 in a County Correctional Facility.

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# Bucks County Correctional Facility



# Typical Housing for approximately 700+ prisoners and detainees



**What makes a  
correctional  
facility unique?**

# Communicable Disease Considerations

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Correctional facilities are notoriously independent and unique in how they do business. Security is their business ... not public health.

Correctional facilities historically are “epicenters” for infectious diseases (TB, MRSA, Influenza, Hepatitis B/C and HIV, Norovirus, Pediculosis, Dermatophytosis).

Difficulty in establishing quarantine versus isolation versus release into the community. Most local facilities have crowding issues. Social distancing is difficult. Masking?

Correctional facilities must admit all individuals ... regardless of status. Funding for additional disease detection and prevention programs may not be available.

**Correctional Facilities are always OPEN !**

# Communicable Disease Considerations

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Conditions of confinement: single and multiple celling, dormitories, work-release (internal and external).

Several populations occupy the same spaces: inmates (sentenced and detainees) correctional and civilian support staff, contractors, volunteers, visitors.

Mixed inmate populations (male, female, juvenile) as well as major sub-groups: mental health, administrative segregation, medical and drug/alcohol rehab.

Centralized services: dining, recreation, medical, courts and attorney visits, family visitation, religious programs, education, counseling, library, barber and beauty “shops”.

Logistics of internal and external movement: courts, transportation, intake and release.

# Health and Security Often Intersect

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Health issues can quickly spread and overwhelm the medical care system. Sick inmates transmit illness to staff. Staff gets sick and infect family. Staff levels reduced. Inmate lockdown occurs.

Inmate activities affected (food, recreation, medical access, visitors).

Changes and alterations of usual traffic patterns affect delivery of food, laundry, commissary, warehouse, waste and maintenance.

Increases in mental health issues.

Physical plant influences: Combination toilet-lavatory, electronic water management systems, ligature-resistant shower controls and controlled access to janitorial supplies may affect personal hygiene and sanitation.



# Role of Environmental Health in Corrections

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Inmates have a right to be free from harmful and unhealthy environments.

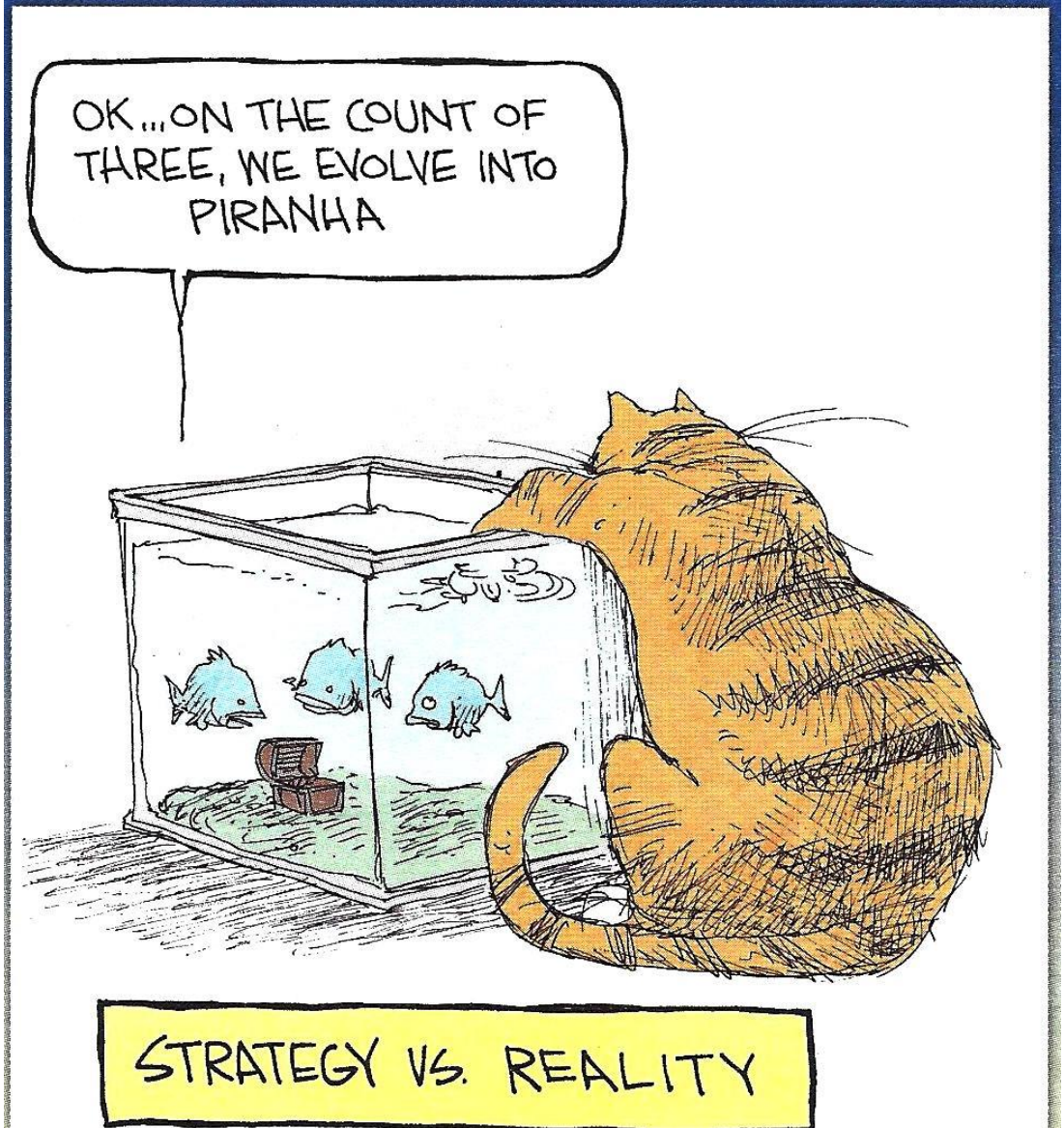
***They are there as punishment, not for punishment.***

Correctional facilities restrict inmates' ability for self-preservation. They control every aspect of "cottage life": food, laundry, sanitation, personal hygiene, recreation, shelter, sleeping and comfort.

Institutional environmental health practice is not regulatory. Sanitarians look at the overall "Conditions of Confinement" and evaluate the risk of real and potential harm. We determine if a facility meets "Constitutional Standards" as recognized by the courts.

Therefore, it is our role to ensure that the environment is neutral to the inmate and does not compromise health, safety or well-being.

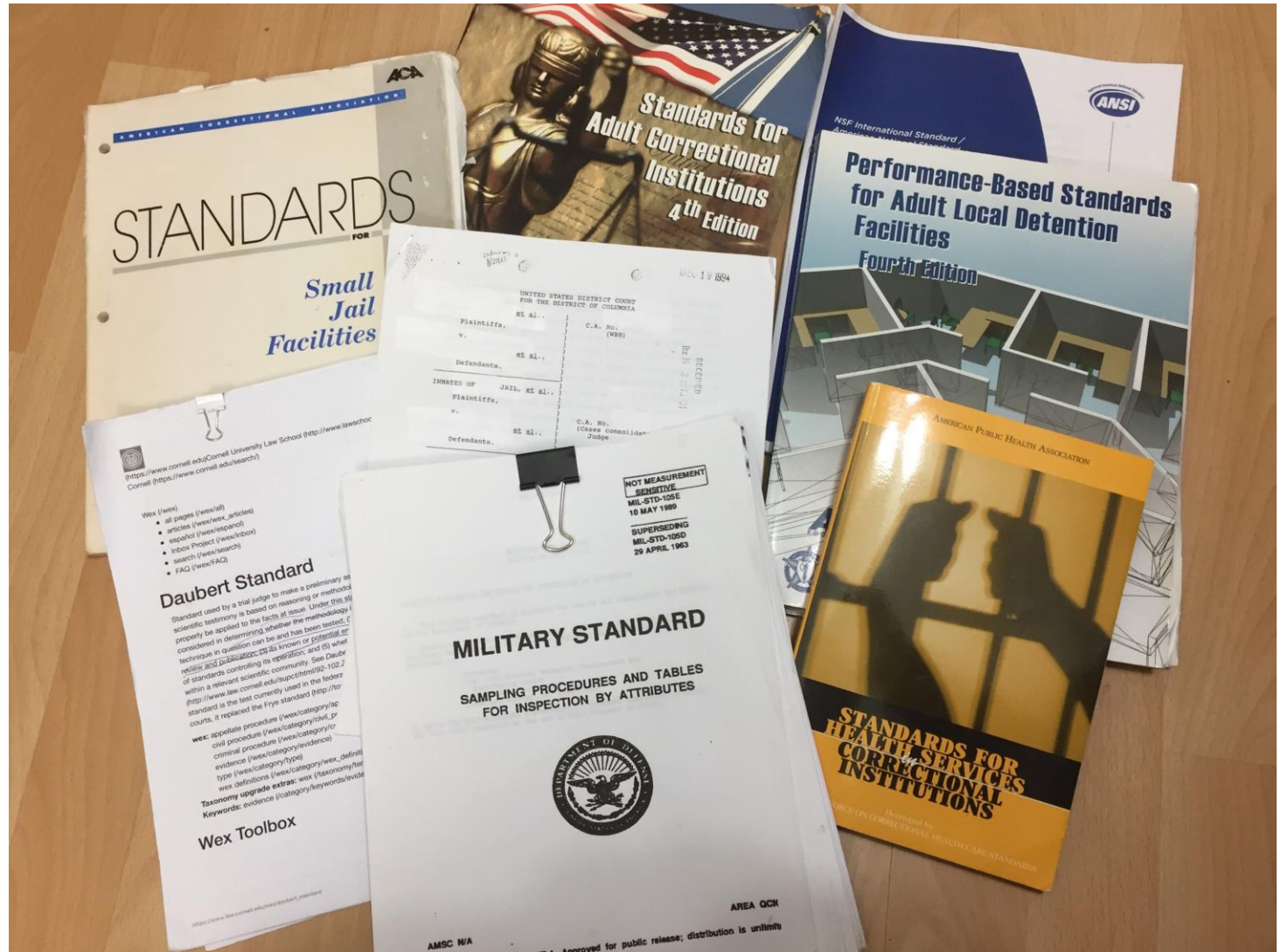
**All environmental health initiatives must be sensitive to SECURITY concerns.**



# **Covid19 Control: Environmental Health Initiatives**

# Guidance Documents

- American Correctional Association (ACA)
- American Public Health Association (APHA)
- U.S. Department of Justice: Federal Bureau of Prisons
- State Codes (Pennsylvania Code Title 37)
- American National Standards Institute (ANSI)
- National Fire Protection Association (NFPA)
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
- U.S. Military sampling standards (MIL-STD-105E)
- Facility's policies and procedures including Post Orders



# Disease Transmission Strategies

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Environmental health initiatives were prioritized in accordance with epidemiological risk assessments.

- 1. Droplet (generally within 2m)**
- 2. Airborne (droplet nuclei, dust rafts)**
- 3. Contact (direct and/or indirect)**
- 4. Common Vehicle**
- ~~5. Vector~~

# Control Strategies

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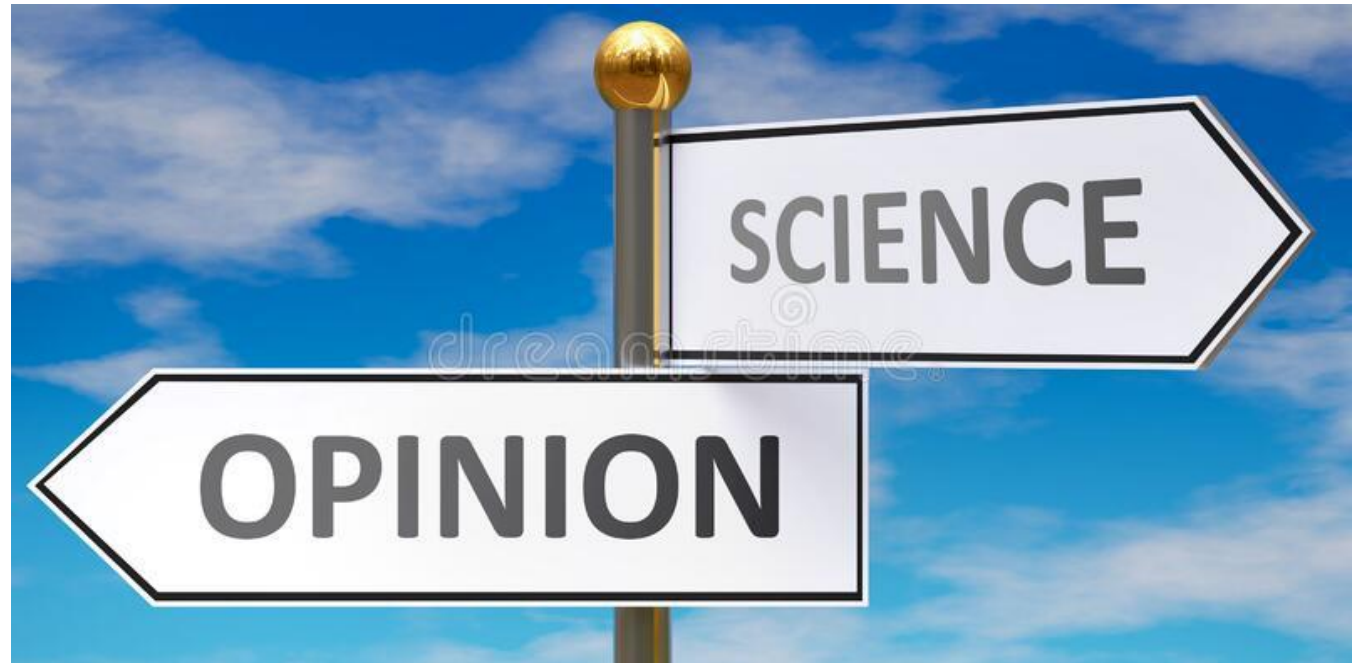
Exposure

**Potential**

versus

Exposure

**Experience**



# Administrative Guidance

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Instituted **Unit Management**. UM is a small self-contained inmate living and staff office area, operating semi-autonomously within the confines of the larger institution; to improve the delivery of correctional services.

Defining “Quarantine” versus “Isolation” and modifying inmate classification to allow implementation.

Drafting new policies and procedures to conform with emerging public and environmental health mandates.

# Administrative Guidance

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Modifying inmate traffic patterns throughout the facility.

Food service was decentralized. Inmate workers were routinely tested and medically cleared.

Modifying medical disease responses, including movement of inmates and medical staff. Strict adherence to PPE protocols.

Adapting to recommended and suggested changes: general sanitation, terminal disinfection, personal hygiene.



# Administrative Guidance

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Introduced video court to limited exposure with Attorneys, parole and probation staff, transport officers and any external sources (aside from staff).

Inmate and staff screening, with attention to inmate workers and to limit non-essential staff and visitors.

Enhancing or modifying services such as commissary, laundry, cable TV, library, education, rehab programs, barber/beauty.

# Space Considerations<sup>(1,2)</sup> and Social Distancing

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Cells: 60 ft<sup>2</sup> per inmate with 35 ft<sup>2</sup> unencumbered space, not including writing table and seat, toilet and bunk.

Dormitories: 60 ft<sup>2</sup> per inmate with 35 ft<sup>2</sup> unencumbered space

- Maintain 6 ft distance between center of bed to center of adjoining bed.
- Stagger sleeping arrangement head to toe.

Day rooms: 35-ft<sup>2</sup> per inmate per maximum occupancy with 25 ft<sup>2</sup> unencumbered space with one seat per inmate.

1. Bailus Walker Jr. and Theodore Gordon. *Health and High-Density Confinement in Jails and Prisons*. Federal Probation: March 1980.
2. Robert J. Glass, Laura M. Glass, Walter E. Beyeler and H. Jason Min. *Targeted Social Distancing Design for Pandemic Influenza*. Emerging Infectious Diseases: Vol.12, No. 11, November 2006.

# Ventilation

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## Mechanical systems\*:

- Use 'As-Built' drawings as guide to ventilation system(s). Conduct visual and cursory evaluation of current operation.
- Check air conditioning filters and condensation collection points for biofilm.
- Conduct detailed screening for 7 cfm/person outside air, or re-circulated/filtered air: 10 cfm existing with 15 cfm fresh air.

## Air changes per hour (ACH):

- General areas: 4
- Cells and dormitories: 6
- Quarantine and Examination rooms: 6, with 2 ACH outside air
- Isolation rooms: 12, with 2 ACH outside air

Smoke ejector fans in isolation and quarantine common areas are activated 5-minutes per shift or 5-minutes per day during epidemic. This allows for total air turnover without compromising temperature.

## Air flow:

All cells and dormitories to maintain 0.01-inches water gauge negative differential to common areas. This prevents outward migration of infectious organisms and toxic compounds (smoke).

\*Cross ventilation: openings 12.5% of floor space

R.W. Powitz & Associates, PC

# Thermal Comfort

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## Temperature

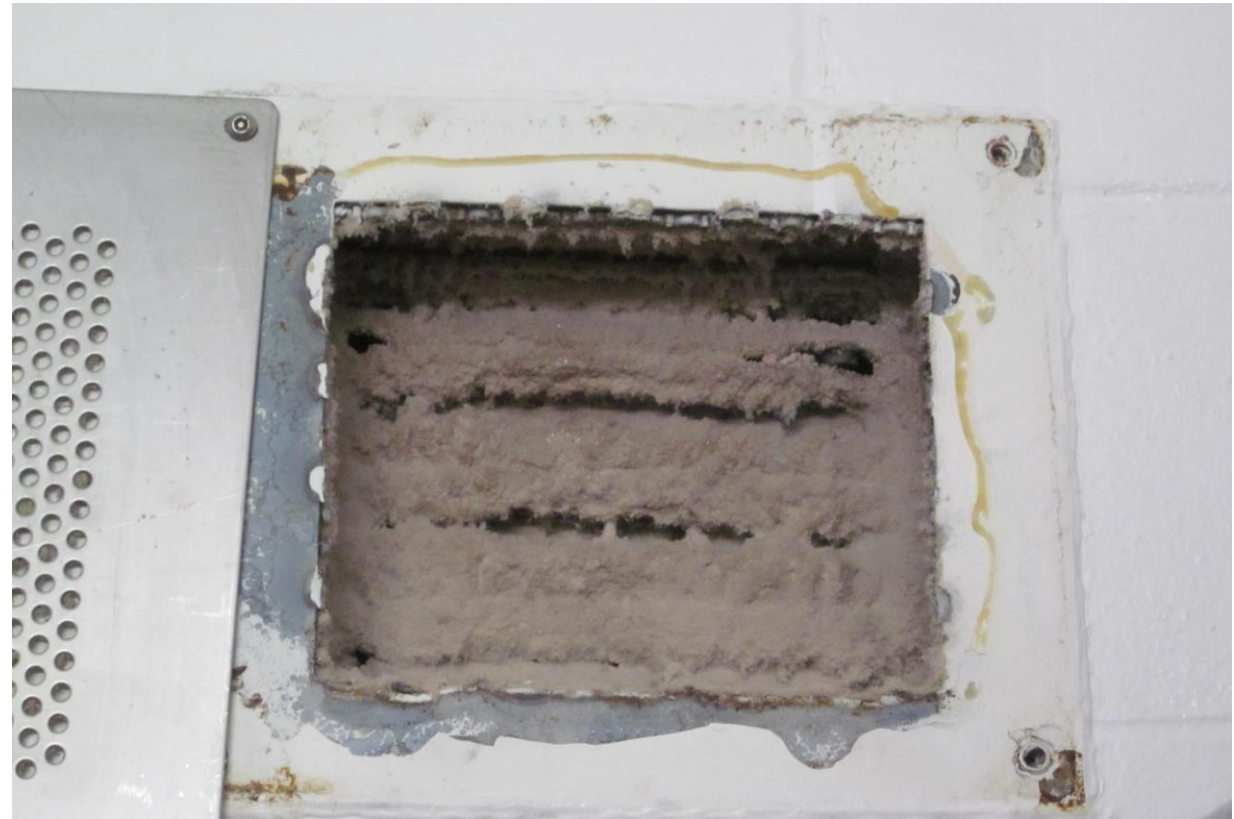
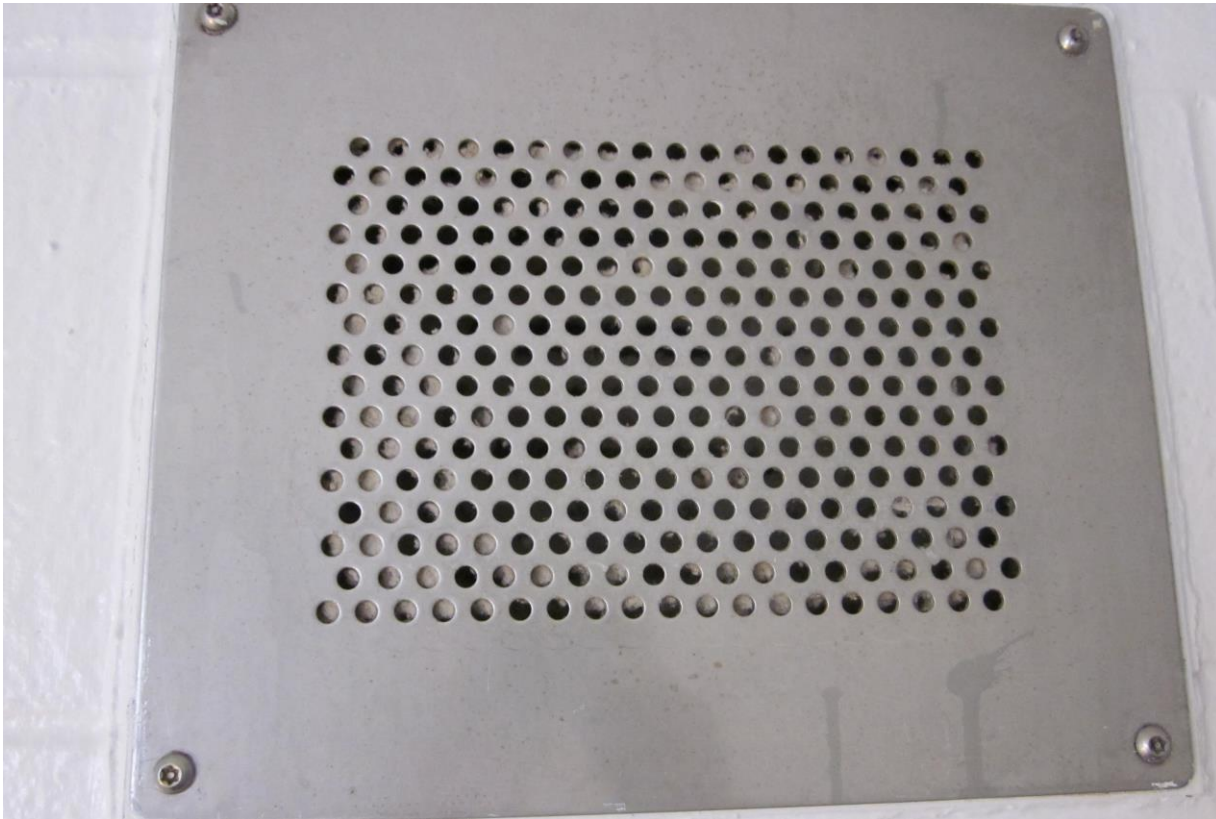
- 69° – 76°F is within comfort range for sedentary confinement.
- Warning at 80°F / 85°F is harmful to heat-sensitive inmates (special attention to those on psychotropic and blood pressure medications).
- Below 68°F, provided additional clothing and blankets.
- Exclude solar radiation. Control radiant heating and cooling.

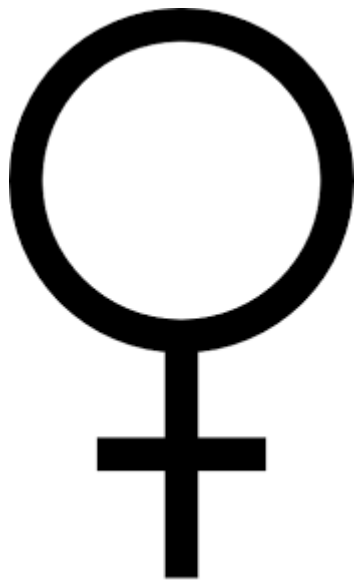
## Relative Humidity

- Below 60% (mold prevention)
- Comfort between 30% and 50%

ASHRAE 55 Thermal Environmental Conditions for Human Occupancy. (2010)

# Ventilation issues





# Personal Hygiene

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Handwashing – virtually impossible with correctional fixtures.

- Modify existing plumbing wherever practical;
- Replace spring-activated fixtures;
- Install portable handwashing stations in areas where modifications are not possible, and,
- Non-alcohol hand sanitizer stations.

Showers – Increase access and terminal cleaning

# Handwashing

Water spigots are designed to deliver 10-second stream

Spring-activated Metering 4 in. Center-set 2-Handle Bathroom Faucet and correctional sink.



Low-voltage solenoid valve activated





# Personal Hygiene

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Showers: minimum 3 times per week. Daily when on disease lock-down.

Laundry – Access 5-days a week. Same day turnkey operation.

Towels – 3 times per week

Barber Shop/Hairdressing Salon – limit for court only.

Ensure comfort kits and access to commissary.

# Maintenance Priorities

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Changing maintenance classifications of work orders based on new demands imposed by epidemic:

“Emergency” is redefined along with priorities for disease response.

Preventive ← Routine Maintenance → Deferred → No Action

Ensuring all vital systems are fully operational.

- Emergency power and fire alert systems
- Communications (security, cable and closed-circuit television)
- Ventilation systems
- Personal hygiene systems
- Support (Service Corridor): Kitchen, Laundry, Warehouse and Receiving, Sanitation and Commissary.

# Medical

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Bring medical to the inmate (limited movement).

Convert a cell on the quarantine, isolation and female blocks to medical examination room.

Bunk bed and toilet were removed. The desk and seat remained.

Handwashing sink, paper towel dispenser, exam table, medical storage cabinet and emergency call alarm button were installed.

# Medical

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Lighting levels were increased from 20 to 40 foot-candles (430 Lux) at exam table height (3').

Ventilation improved and adjusted to provide 7+ air changes per occupant (x2) with total airflow adjusted to 0.01-inch water gauge negative to the common area. This meets isolation standards.

# Sanitation

Common touch – phone, banisters, day room furnishings, etc.

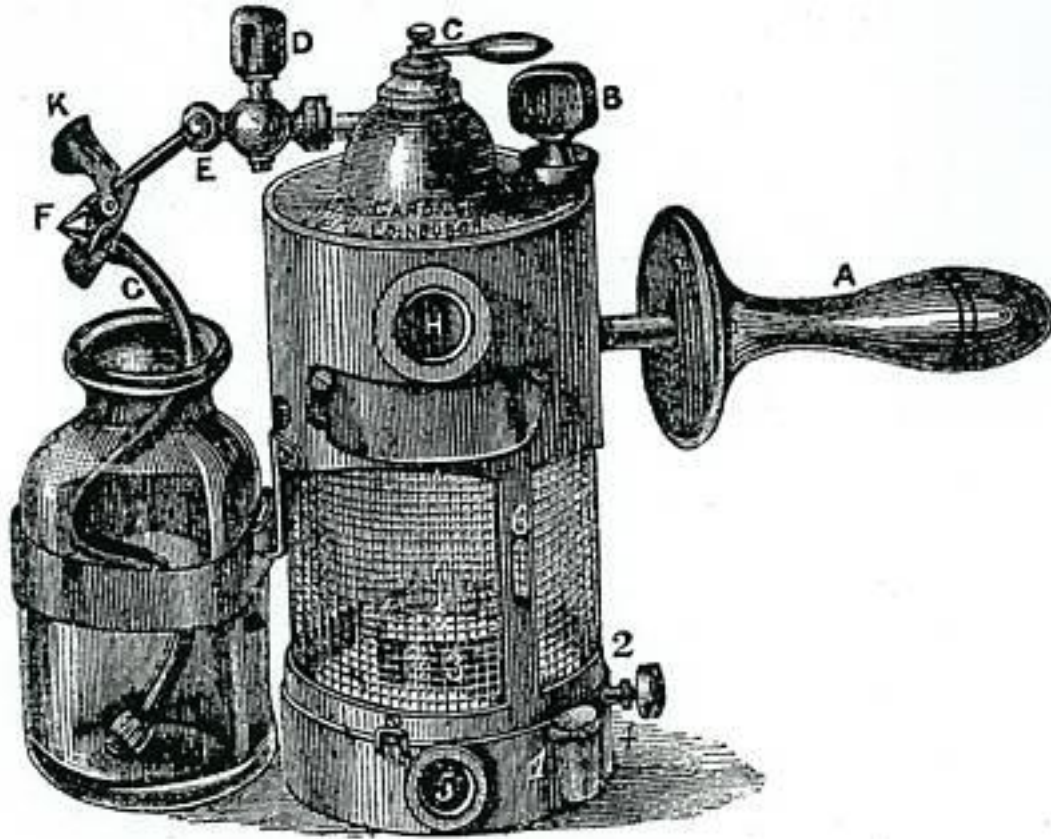
Common use - showers

Intake - holding cells and processing including personal clothing storage

Terminal cleaning and sanitizing cells used for isolation and medical examination

Touchless cleaning – disinfectant titer

# Influences from vendors and press



**Sanitarian's  
Monitoring Tools:  
Field Instruments**

# Approach

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We do not inspect. Our approach is a hybrid between an audit and an evaluation.

We try to be as objective as possible for assessing relative risk and providing guidance for initiating optimal correctional measures. Therefore, if it's measurable, we measure it!

**Everything is discoverable**



*“The bone is not the reward—digging for the bone is the reward.”*



# Instrumentation

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## Goals:

Quantification to determine actual conditions

Qualification to determine adherence to policy

Before and after comparisons – measuring change in conditions.

# Sampling

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## Repeatability – sampling strategy

- Random: MIL-STD-105E
- Stratified: Equal representation of subgroups (relevant stratification)
- *Snowball: A non-random selection to define the environment.*



# Field instruments for general housing

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Tape measure for bed spacing, unencumbered cell, dormitory and dayroom space

Infrared thermometer

Heat stress meter for AT, RH, WBGT

LED flashlight (>900 lumens)

Extension mirror

Camera with date and time stamp

Circuit tester with GFI

Multimeter for lighting, air velocity and thermocouple (K-probe)



# Field instruments for ventilation

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CO<sub>2</sub> Meter

Velometer – air speed

Mini Anemometer for temperature compensated air velocity

Borazin gun – air flow

Smoke Pencil – air flow

Tape measure

Bi-metal thermometer

Infrared thermometer

Heat stress meter (AT, RH, WBGT)



# Field instruments for sanitation

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ATP monitoring system – swabs and luminometer

LED flashlight – adjustable white light

Ultraviolet flashlight – 365 – 400 nm

Alcohol and cotton-tipped swabs

Adjustable mirror

Clear tape and loop

Camera – date and time stamp

Sanitizer monitoring papers



# Field instruments for water

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Hardness test kit

pH test strips – 0 -14

Hose spigot thread chaser  
- ¾-inch

Bi-metal thermometer

TDS meter

Pressure and flow gauges



# Data interpretation

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Answer questions that were posed before any samples were taken.

Draw a central theme out of the data.

Determine if controls are adequate to meet requirements.

Determine if controls are effectively implemented and maintained.

Sort data and findings based on importance (significance) and relevance.

Importance can be judged based on:

- Repeated occurrences (quantitative data)
- One-time occurrences that have high risk (qualitative data)

Ensure results are traceable to requirements.

# Sanitarian's conclusions based on findings

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**Security takes priority. Work with correctional and support staff.**

Consider cost-efficiency and cost-effectiveness.

Sustainability.

Provide suggestions – do not take ownership. Recommend only if there is an imminent danger to health and well being.

Provide several options for each remedial suggestion.

Once implemented, assist in amending policies, procedures and post orders.  
Provide compliance guidance.

Re-evaluate!





**“I’ve still got 37 more slides to go!”**

**THANK YOU**



**ANY  
QUESTIONS**

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