

COVID-19 planning & design recommendations for  
**OUTPATIENT CARE ENVIRONMENTS**





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# introduction

As our community plans for and adjusts to the current COVID-19 crisis, we have a rare opportunity to review current challenges and apply innovative thinking to design solutions that will help eachother cope with future threats to our healthcare providers. Medical experts agree that once a new and harmful virus is isolated, it could take up to 24 months before effective therapies are available. A pandemic-causing disease is something that we may likely see again in the future. **The time to strategize future forward solutions for our healthcare systems to best address these challenges is now.**

Just as the tragic events of 9/11 transformed the design and operations surrounding airport security, we too must look for ways to re-imagine how we design healthcare spaces that continue to foster safety, promote health and wellbeing, and improve patient outcomes. We envision a new paradigm where the CDC or USPHS institutes a national color-coded threat advisory scale like that of the Department of Homeland Security in 2002.

**“During a public health crisis, telemedicine is optimal. You’re minimizing disease spread, eliminating unnecessary hospital visits, and freeing up resources to best serve those who are in critical need.”**

- Dr. Rahul Sharma, Emergency Physician-in-Chief, NewYork-Presbyterian/Weill Cornell Medical Center, Chair of the Department of Emergency Medicine at Weill Cornell Medicine

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# menu

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PLANNING CONSIDERATIONS

INTERIOR DESIGN

TECHNOLOGY

INFRASTRUCTURE

CONSTRUCTION

MaineHealth Watson Health Center  
Damariscotta, ME



planning , design & implementation



# planning considerations

We aspire to be avid practitioners of Evidence-Based Design, however there is little design research or evidence from past viral epidemics, in particular, past pandemics. Designers are now conducting a new cascade of research and information gathering to determine and interpret what impact this global outbreak will have on healthcare design. Much of what we do is driven by a series of directives and objectives with the goal of improving healthy outcomes. Our initial recommendations for addressing ambulatory care spaces includes a new of approach to planning scenarios, FF&E and material selection, advanced technologies, infrastructure design, and even construction methodologies.

## WAITING AREAS

Once within the waiting room, the ability to have the waiting area segmented into smaller pods of seating will allow patients to be seated at greater distance to each other, and possibly separated by physical barriers such as screens. Where possible, if multiple practice types are sharing the same floor, waiting would be broken up between practices to reduce the amount of patients in any one waiting space. This will prevent cross contamination between different patient sectors who may be coming for well visits and others who may be seeing a general practitioner for a sick visit.

## PATIENT THROUGHPUT

From the waiting area, the path of patients through the space could be in a single direction flow. This will prevent patients from backtracking and coming in contact with another patient in the corridor space, reducing the chances of cross contamination amongst patients. Additionally, a checkout station, separate from the main reception area, would be located at the end of the patient path so that the patient can complete all checkout and future scheduling before exiting back into the building core to use the elevator or stairs to leave the building. This will prevent patients from coming into contact with new patients who may have entered the waiting area subsequent to them having been admitted to the exam rooms.

## CLINICAL LABORATORY

In practices where a lab space is provided, which may be used as a phlebotomy/urinalysis, it is important to be cognizant of the path of these bodily fluids. A toilet could be provided directly adjacent to the lab, in the direction of patient flow wherever possible, so that a patient may utilize the adjacent toilet and be able to hand off the specimen through a pass-through directly between the toilet and lab. This will prevent the handling of bodily fluids within the corridors and any additional surfaces that the patient or staff would come into contact while transporting the specimen back to the lab.

## SUPPLY FLOW

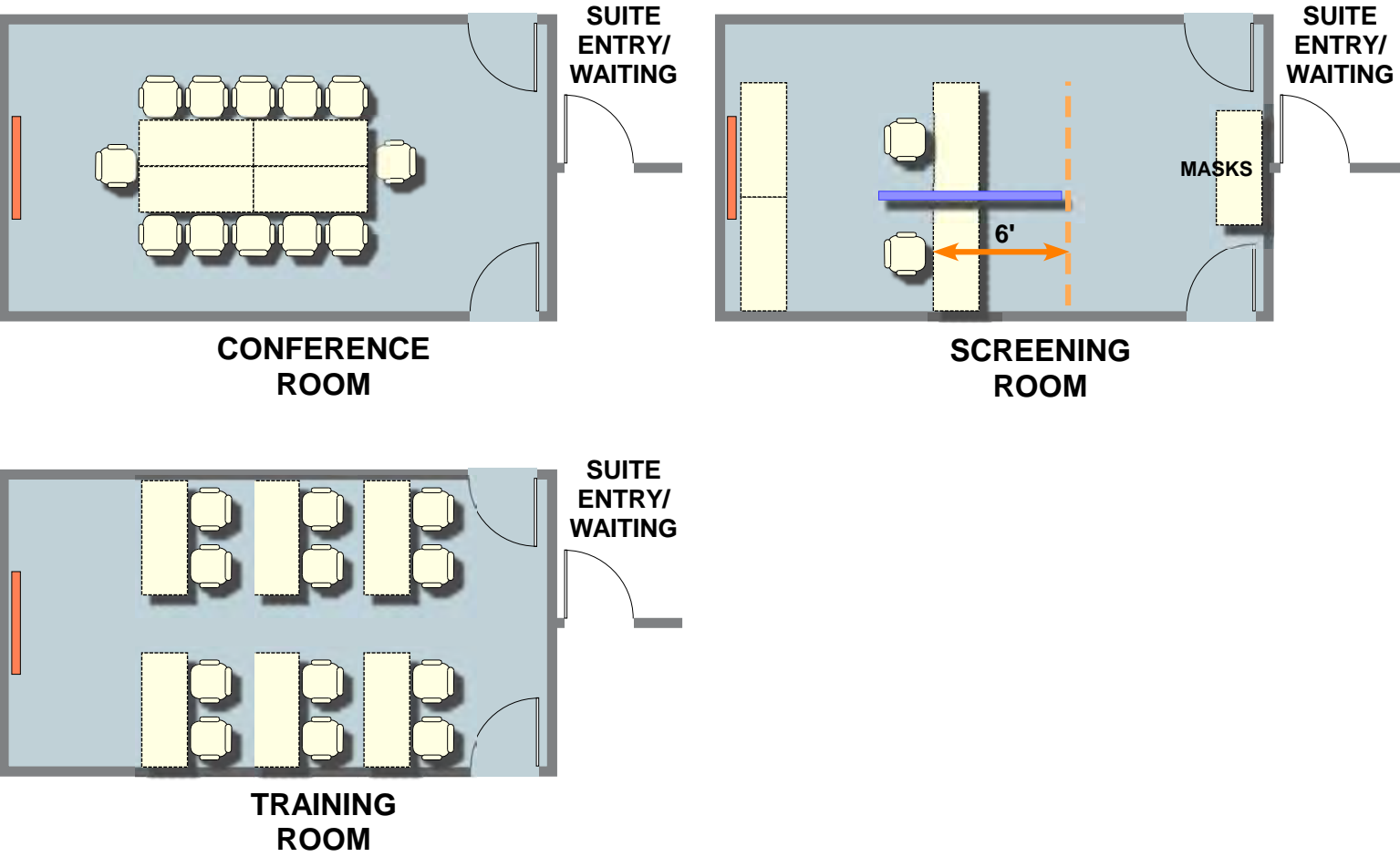
In addition to the flow of patients, the flow of soiled linens is considered and should be in the same direction as patients which will prevent contamination from back tracking towards uncontaminated areas. Soiled rooms should be located towards the end of the circulation path and near the exit door for safer transfer out of the building.

## STAFF WORKFLOW

Location and flow of staff is also considered in regarding to the potential for cross contamination with patients. Where possible, separated staff areas with separate corridors could be provided to allow staff to move about without having to utilize patient-centric corridors.

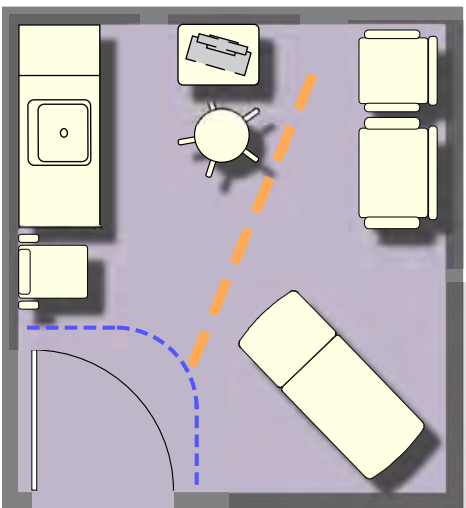
## CONFERENCE & MULTI-FUNCTION ROOMS

When planning outpatient care sites within our new normal, it is important to plan for future flexibility. Locating a conference room adjacent to the front entry / waiting area allows for a number of solutions. This location allows for access from outside the clinical space and enables a second point of entry that can be isolated from the public areas. The conference room can allow guest access without bringing them through the suite or past any patients. The same is true for any educational training sessions. When there is a heightened level of concern, the room can be converted to provide a screening area. This area can ensure any patient entering will be tested and cleared. Staff could also use this room as an ante room for donning and doffing during high risk times.

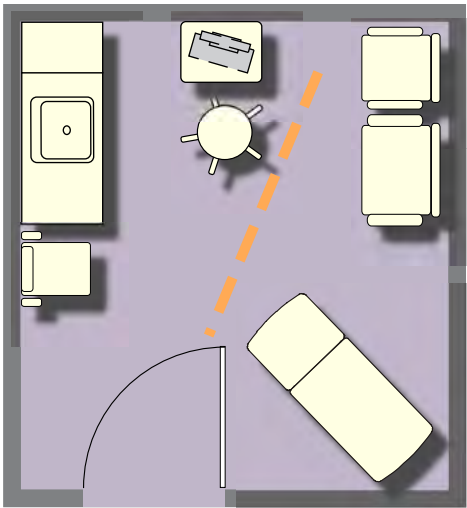


# planning considerations

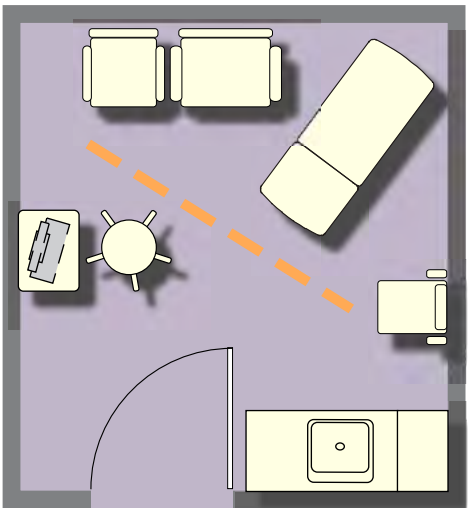
## exam room layouts



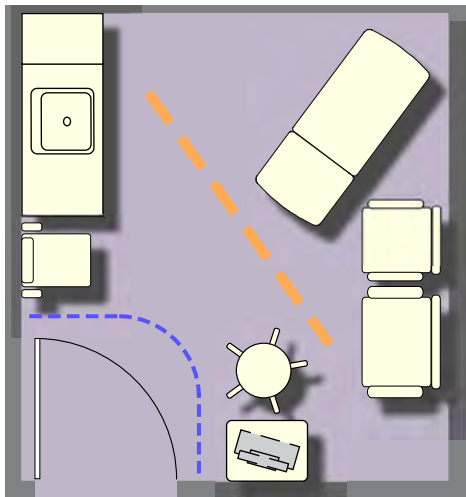
EX-1 Exam table in privacy location with a staff and patient/visitor side zone. Curtain required.



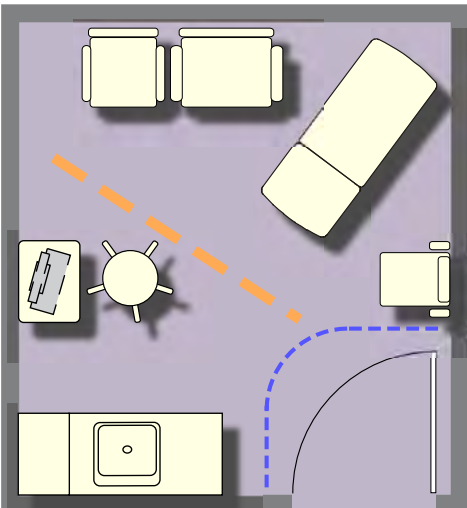
EX-2 Exam table in privacy location with a staff and patient/visitor side zone. The door is also located for privacy, no curtain needed. More difficult access to room.



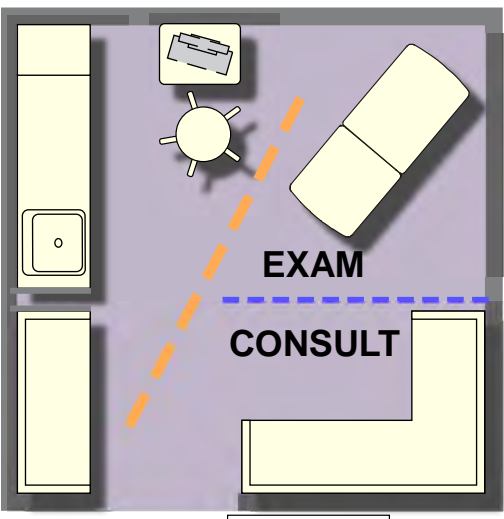
EX-3 Room is designed for staff safety. Staff and patient space are zoned with patient/visitor in the back of the room. Allows for staff to come in and out with minimal patient contact. The door is also located for privacy, no curtain needed. More difficult access to room.



EX-4 Room is designed for staff safety. Staff and patient space are zoned with patient/visitor on one side of room. Allows for staff to come in and out with minimal patient contact. Curtain required.



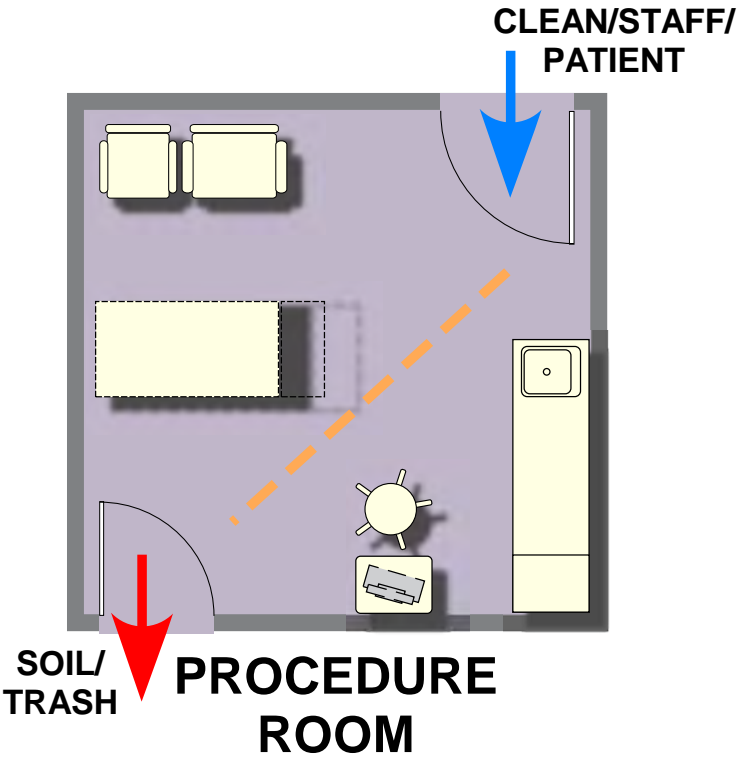
EX-5 Room is designed for staff safety. Staff and patient space are zoned with patient/visitor in the back of the room. Allows for staff to come in and out with minimal patient contact. Curtain required.



EX/CONS-6 The room is designed to minimize patient movement. Staff and patient space are zoned with patient/visitor to one side. Allows for staff to come in and out with minimal patient contact. Curtain required for exams.

## procedure room layouts

The procedure room is zoned for Staff work and patient/visitor space. We recommend staff to enter and exit these spaces with minimal patient contact. Curtains will be required and a single source flow of soil materials needs to be designated





# interior design considerations

Ambulatory spaces need to be designed to support an environment of wellness and safety for visitors and staff. These spaces must heighten visitor awareness and confidence in the brand and the people who will serve them. The brand should provide an environment that is appealing to all of the senses and continuously prompts wellness. The aim is to create a place that reduces stressors and reinstates a sense of ease.

Addressing what design will remain and exploring what needs to change; there may be a slight shift where the perception of safety may now need to outweigh the balance of comfort. Many approaches trigger a sense of calm through positive distractions through the aesthetics of an environment.

Several trends to explore when addressing interiors, include:

- Infection control measures will influence finishes and materials
- Our personal space parameter will expand, particularly in waiting areas
- Technology will lead efforts to gather, process, and analyze information
- Science and data will assimilate with the design process
- Finish selection reach beyond aesthetics
- Provide more germ fighting surfaces vs. non-germ supporting surfaces
- Significant increase in the touchless technology implementation
- Design for increased flexibility and adaptability
- Consider increased storage needs
- Further paperless processes
- Increased pre-visit information gathering and sharing
- Improve design which affects the care givers wellbeing

Our recommended solutions will continuously be tested to determine the best new paradigm of designing for ambulatory environments.





# technology

## ENHANCED TECHNOLOGY STRATEGIES

Incorporate the following enhancements and upgrades as integral part of the space design:

- *Eliminate paper with Electronic Medical Records*
  - » Patient uses their own cell phone to provide information to the practice. No more filling out paperwork when coming to the practice.
- *Audiovisual Technology*
  - » Telepresence systems to support patient outreach/“video visits”; TeleMedicine in both live and as informational resources (self-evaluation related content, etc.).
  - » Video intercom systems: ease of use, contactless operation, welcoming, clarity, cleanable/antimicrobial surfaces
- *Security & Access Control*
  - » Thermal temperature screening cameras
  - » Touchless access control such as iris readers
  - » “Wave operators” to allow touchless door opening
  - » Access control integration with door operators
  - » Access control integration with elevator control
  - » Voice recognition for system controls and operation

## TECHNOLOGY & COMMUNICATIONS

- WiFi on stands, rapid deployment of high capacity WiFi for temporary testing and care facilities (tents, pop up hospitals, etc.)
- Cellular 5G deployment: “Cellular-in-a-can” solution to extend 5G coverage throughout new and temporary care, testing, and related areas
- Charging benches/hubs: fast charging station for mobile devices, configured for wipe-down and related safety activities

## TELEMEDICINE

TeleMedicine is already playing a crucial role for medical providers with the current COVID-19 pandemic by helping to eliminate unnecessary hospital visits, minimizing the spread of infection, and freeing up resources for those in critical need. For outpatient clinics, TeleMedicine design recommendations should be evaluated and coordinated in order to aid in implementing and integrating these services into current and future facilities to accommodate both patient, family, and physician comfort and privacy.

The 2018 FGI Guidelines (Inpatient & Outpatient) offers a proactive approach with many recommendations such as space requirements, acoustics, lighting, interior surfaces, site identification, equipment, and AV technologies that can be applied based on individual needs. For TeleMedicine, it will be essential to know what services will be provided in order to achieve a functional design based on patient population and type of outpatient clinic.

Areas will need to be created for TeleMedicine which maintain the requirements of HIPAA laws and pre-screen patients prior to an office visit, or identify those that need to be segregated when they come in. This could be used as a pre-screen for patients who have appointments already. There are limitations to this technology that should be recognized such as lighting and proper tools, that may be required on the patient side to help diagnose conditions.





# infrastructure

## INDOOR AIR QUALITY STRATEGIES

Implement systems to improve overall indoor air quality within the suite to improve the health and well-being of the patients and the care givers.

- *Enhanced Filtration Strategies* - Substitute air purification systems in lieu of standard filter media at the new air handling unit. Air purification systems reduce overall particle counts and kill airborne pathogens with a space creating a cleaner environment
  - » Consider use of 100% outside air, once filtered through the HVAC systems for specific areas of the suite (i.e. Waiting Areas, Lobbies, etc.)
  - » Upgrade HVAC systems to include final filter section utilizing Air Purification System resulting in a cleaner environment
  - » Consider the provision of a strategy to connect a portable emergency generator to the electrical systems to provide power supply during a prolonged power outage
  - » Consider the provision of a strategy to connect to a portable oxygen supply to the medical gas systems - if applicable to the space needs
- *UV Light Strategy* - Install UV light technology either at the main AHU or locally within identified spaces.
  - » Main AHU location - Install a UV light down-stream of the cooling coil within the new AHU to reduce, if not eliminate airborne pathogens
  - » Localized Unit at strategic locations - Install wall mounted UV lights in high patient population areas such as Waiting Rooms, Lobbies, etc. Implement a strategy whereby the light is energized to disinfect the space during unoccupied times
- *Higher Air Change Rates* - For years, higher air change rates have been evaluated and thought to result in cleaner environments. For example, Operating Rooms are required to be maintained at 20 air change per hour while Exam Rooms are required to be maintained at 6 air changes per hour.
  - » Increase size of new AHU to achieve additional air change rates throughout the space - this would impact the size of the AHU and the size of the distribution ductwork, VAV boxes and diffusers down stream
- *Consider a supply high and return / exhaust low strategy in high traffic areas (eg. Waiting Areas, Lobbies, Exam Rooms, etc.)* - Utilizing this approach to achieve a better circulation of air through the space - similar to OR design and/or Infectious Isolation Room design
- *Provide local fan powered HEPA filtered units to recirculate and filter air* - These units can be installed above the ceiling and be integrated into the ceiling system
- *Provide Plasma Air Coils down stream of VAV boxes to provide cleaner environment* - These units can be installed to the existing ductwork system down stream of the VAV boxes to kill potential airborne pathogens and viruses resulting in a healthier environment
- *Provide local Plasma Air Cleaners in strategic locations (i.e. Waiting Rooms, Lobbies, etc.)* - These localized floor mounted units will kill potential existing airborne pathogens and viruses - having these local units may provide a level of comfort to the patients
- *Substitute Temperature Sensors / Control* - convert adjustable temperature sensors to sensors only to eliminate the potential adjustments thus eliminating the touching of the device

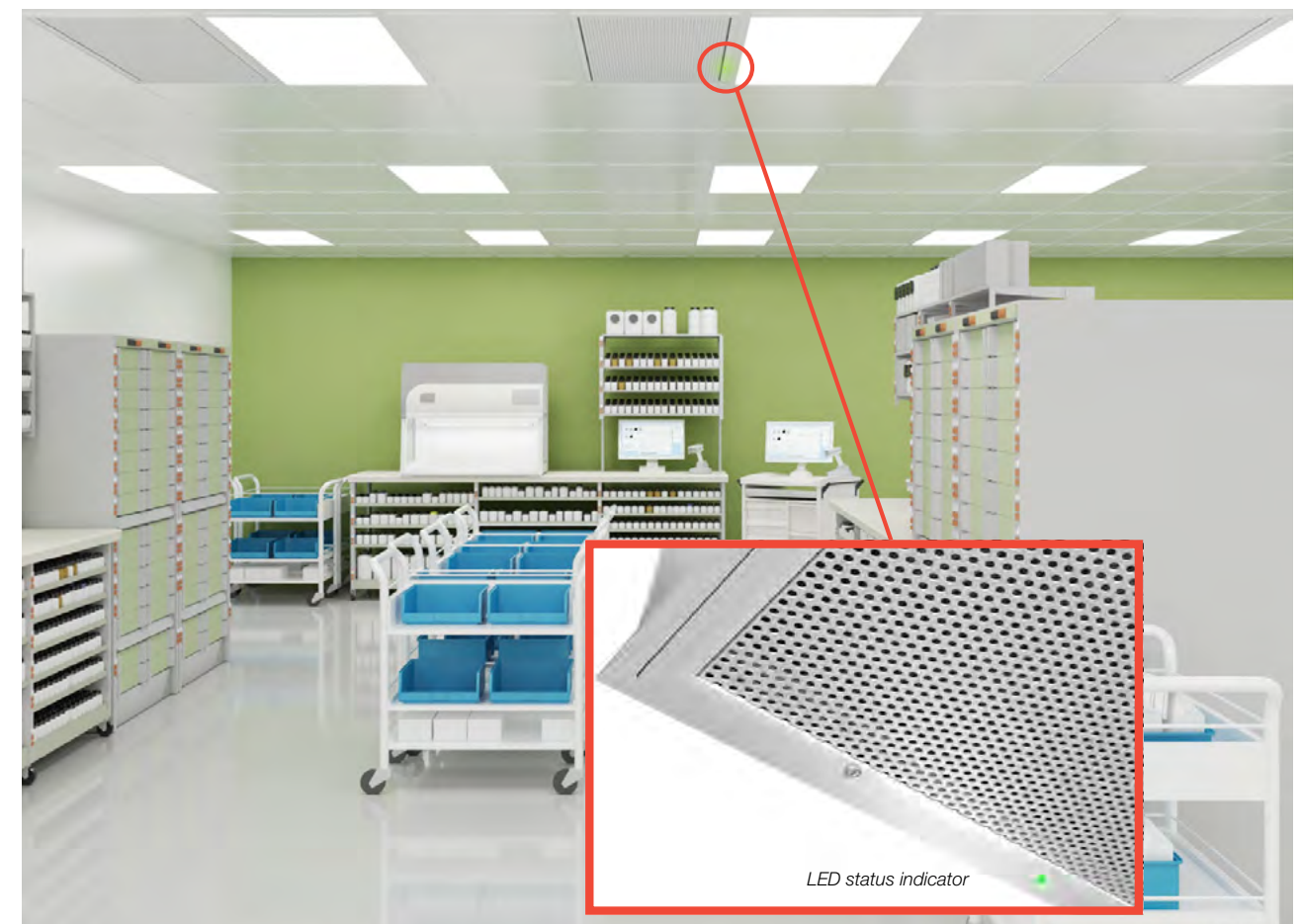
## CASCADING PRESSURIZATION STRATEGIES

Create spaces that are under negative pressurization compared to adjacent spaces to allow “sick” patients to be isolated from “healthy” patients.

- *Increase the size of the new exhaust air fan(s) and associated ductwork system* - the goal is to achieve negative pressure within strategic areas (i.e. Waiting Areas, Lobbies, Exam Rooms, etc.). Extent of negative pressure relationship to be reviewed and finalized.

## TOTAL HANDS-FREE STRATEGIES

- Replace lighting switches with occupancy sensors and/or hands-free control
- Replace door card readers with hand swipe controllers
- Replace standard doors with automatic doors with hand swipe controllers
- Replace hand operated faucets with hands free sensor operated controls at all sinks
- Replace hand operated water dispensers with sensor operated type
- Truck mounted O2 generators or large portable truck mounted O2 tanks can be connected and feed oxygen into the distribution system.





# construction

As we envision accessing the construction site there may be new guidelines from the hospital about site entry points, PPE equipment when walking to the site, elevator use and capacity, and how goods are moved and transported through the hospital. Providing all site personnel with appropriate instruction and equipment is paramount. Various recommendations have been suggested with regards to site access. Here are some suggestions Construction Teams plan to implement:

- Provide PPE equipment within separate ante rooms or small spaces, serving as hygiene pods with all PPE supplies:
  - » Develop a standardized procedure and kiosk for sign in and all PPE equipment that is required.
  - » Inform all subcontractors if there is a limit to the quantity of tradesman allowed on-site at a given time and how this may impact schedule and deliverables.
  - » Change of PPE equipment from external to internal sites or department to department.
  - » Clear, concise manual outlining protocol for an on-site work process to minimize impact on schedule
- Remote diagnostic or perimeter site consultation to access:
  - » Temperature
  - » Blood pressure

## TEAM MEETINGS

Weekly on-site construction meetings may be revised to include critical personal only. Utilizing virtual meetings and on-site cameras, the remainder of the team can participate in the weekly meetings from off site.

## ON-SITE SAFETY

Clean and sterile spaces have become paramount, even on construction sites. Some suggested measures will include:

- Actively monitor air quality and air changes at construction site
- Conduct regular reviews of PICRA, and types of barriers used.
- Active pressurization through local system to monitor negative and positive pressures.
- Utilize materials to mitigate virus / infection.
- Use fogging systems to disinfect the job site.

## MODULAR CONSTRUCTION

In certain instances, modular construction (off-site construction) may be an approach to consider. These modular solutions are non-combustible, set on concrete slab, steel structures, permanent structures. Components are built off-site, under controlled conditions in a manufacturing facility. The structure is then broken apart, shipped to site and field set, followed by mate line connections and completion of site related work. Significant benefits of this approach:

- Decrease construction duration, non-combustible modular, from multiple stories to single rooms yield a 30%-40% savings in onsite construction time.

- Infrastructure can arrive crated and be lifted into place in ceilings, almost a 'plug in'
- Prefabricated construction: all the walls are modular, pre-wired, pre-gassed, which will allow for seamless connection of all the parts.

In addition to decreasing the project duration, fewer staff will be required on site which dovetails with the desire to eliminate large group gatherings and mitigate the potential for infection for the workers at the construction site.

## NEW CONSTRUCTION STRATEGIES AND TECHNIQUES

- Temporary WiFi deployment to support virtual site visits
- Thermal cameras for screening people reporting for work
- Jobsite cameras
- Live collaboration workstations to facilitate real-time collaboration and coordination
- HVAC - Develop and monitor through construction an ICRA Strategy that utilizes HEPA filter exhaust units to maintain negative pressure relationships in the construction zone to other areas in the facility - include pressure monitors to assure that negative pressure relationships are maintained - consider connecting this to the BAS
- Detailed ICRA plan showing HEPA filtered exhaust and negative pressure monitors at strategic locations (similar to what is required in Florida per AHCA)
- Periodic construction inspections by AHJ during construction phases
- Electrical - Develop a strategy whereby hands-free control of light fixtures throughout the construction site
- Plumbing - Implement hands free usage of water supply and consider monitoring the drainage out of the construction site





# menu

click title to navigate

ADULT OUTPATIENT CLINIC

PEDIATRIC OUTPATIENT CLINIC

Shady Grove Fertility Clinic & Surgery Center  
Rockville, MD



case studies



# adult outpatient clinic

## patient experience

This outpatient clinic program supports its local community. The institution’s brand of great service with the best clinicians is packaged into a clean and sophisticated design. A few considerations as you enter this clinic include adding smooth surfaces on select walls in the elevator lobby, updating finishes in the elevator cabs and first floor lobby, and including hygiene stations at the beginning and end of the patient flow loop. We envision the hygiene station to be fully designed to coordinate with the existing décor and level of finishes in the waiting room.

### SIGNAGE

Universal signage is recommended at key locations describing the measures the facility is taking to keep everyone safe, similar to health grading standard for restaurants, delis and even LEED. Signage design considerations displaying information which allows patients to feel more comfortable within public spaces and waiting areas will be added. The two seating pods (already separated from the front entry and reception area) could be further spaced apart, employing an additional glass partition between the two.

### WAITING ROOM & VISITOR AREAS

At the waiting room and visitor areas, fewer seats are recommended to create distance or divide the room into micro waiting areas so that in times of higher infectious disease, people are easily spread out. Markings on the carpet every six feet in a contrasting color could be provided to identify social distancing precautions as a reminder to patients and their visitors. Furniture that is flexible, foldable, and/or stacks for storage when needed, could be incorporated to further reduce crowding.

### APPOINTMENT SCHEDULING

Programming appointments and operational changes in scheduling should be provided to reduce waiting room occupancy and wait times. If scheduling cannot fully alleviate crowded waiting rooms, then larger areas for waiting rooms may be designated at the early stages of projects to aid in six foot social distancing measures and allow for spread out seating arrangements.

### EXAM SUITE & CORRIDORS

Upon entering the exam suite corridor areas, automatic operators with wave sensors could be added to aid in touchless entry. Door hardware selections for the individual exam rooms and offices are available in copper, a proven antibacterial. Painted hollow metal door frames vs. wood could be studied further to determine efficacy against germ fighting. Exam room doors could shift to sliding doors mounted on the corridor side, that are ADA compliant and also allow staff to use their elbows or shoulder to push open without touching.

Touchless occupancy lighting sensors and UV lighting could be provided in the exam rooms, where patients spend the majority of their time. Identifying risk zones outside of the exam rooms could also aid in reducing the spread of aerosol laden infections. HINS (High Intensity Narrow Spectrum) light is making strides in the fight against pathogens; these could be incorporated into risk zones such as where there may be heavy breathing, in restroom spaces, and in high touch locations. Consults could be limited to exam rooms themselves, so that potentially infected patients are not contaminating the physician office spaces, infection would be contained in the exam rooms for ease of cleaning materials, furniture, and surfaces. Fabrics on guest chairs, physician stools, and the exam tables could be specified with silver oxides and nanotechnologies which prevent transmission of germs. Fabric selections must withstand the harshness of increased use of disinfecting agents.





# adult outpatient clinic

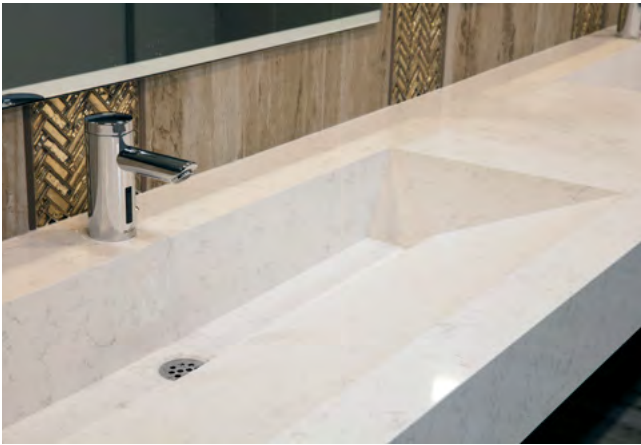
continued

PROCEDURE ROOMS

The program includes a larger procedure room at the front of the exam suite. The finishes in this room are similar to those in the standard exams, to aid in infection control and ease of cleaning. Most of the mobile equipment used for procedures are stored in a closet within the room and would not be transported

TOILET ROOMS

Toilets in this space currently have touchless sensor faucets. Touchless soap dispensers and hand dryers could also be all incorporated into the fixture model or countertop. Vacuum toilets are available that flush inward to mitigate aeration and the spread of germs into the immediate atmosphere. All toilets could be specified at ADA height, so people are less inclined to grab onto things to hoist themselves on and off. Anti-microbial grab bars can be specified. Toilet room design currently provides full height, wipeable, tiling around the entire toilet room instead of just the wet wall or wainscoting. Toilet rooms with floor drains allow housekeeping to wash down the entire room easily.



staff environment

Staff safety and wellness is a key component in our design and in the battle against future pandemics. Exam rooms on this floor are laid out to separate the clinicians from patients and guests, with the offices at the end of the floor. All ultrasound equipment is portable and therefore can be moved around the room to provide an equipment layout that is safe for the patient and their guests during times of heightened concern.

OPERATIONAL EFFICIENCIES

There are many operational efficiencies which could be reviewed to assist in the prevention of transmission of pathogens in the facility. When it comes to staff comfort and safety, new recommendations on cleaning and disinfection protocols should be set so they are distinct. Recommendations should be outlined for new cleaning regiments and protocols so staff and maintenance crews can clearly understand the distinction between, cleaning, sanitizing, and disinfecting. Identifying better routines to manage the storage and disposal of used and potentially infected materials will assist in avoiding contamination. Smaller sharps may mean more frequent disposal of soiled material.

STAFF LOUNGE SPACE

Staff lounges may need to be reconsidered to aid in social distancing of clinicians and their colleagues. Various smaller spaces could be provided to allow them to take their lunch break in lieu of congregating in the staff lounge around one single table. Rethinking how the medical staff hold meetings and gather together could be evaluated to ensure additional spaces are provided for flexibility of rooms within the clinic.

SPECIFIC DESIGN AND PLANNING RECOMMENDATIONS:

- Translucent partition/shield guard at reception
- Deeper desks for more space between staff and patients
- Touchless Entry to clinic and exam rooms
- Waiting area: fewer seats with alcoves, folding chairs that can be stored when infection risk is low, and hip chairs for less touching
- Hand sanitizer stations; Hand washing stations.
- Signage with universal symbols to indicate safety precautions
- Exam Rooms: ADA sliding doors, UV lights or robots for cleaning
- Smaller breakout rooms instead of large, open staff room
- Toilet Rooms: Touchless faucets, soap dispensers, hand dryers, toilets, copper door hardware. ADA height toilets, inward flushing toilets, floor drains and finishes for easier cleaning





adult outpatient clinic





# pediatric outpatient clinic

## patient & staff environment

Pediatrics is a special concern for transmission of infection as younger children exploring their new world are inclined to touch almost everything. Though we must keep in mind that highly infectious cases are often not seen at this specific clinic, we believe that seriously troubling pediatric cases may need to be first vetted via TeleMedicine in order to determine a proper course of action, and whether a visit to this location may occur. Part of the TeleMedicine call could be the introduction of the facility’s protocols for infection control during visits. We recommend a small educational introduction outlining what is expected from the visitors. Additional topics may also include measures already in place to keep all visitors safe, the maintaining a clean environment while visiting, and engaging the visitor as part of the solution for a safer visit.

Addressing pediatric environments there are some exceptions when approaching planning and design solutions. Once visitors have arrived the following suggestions may be implemented to address visits during the COVID pandemic, and possible future pandemics.

### A VISIT TO THE OFFICE

In preparation for a visit, sending educational information and precautions to clients is good practice before their arrival. Programing appointments to reduce potential large gatherings improves social distancing measures. In practices with larger families, people may bring several children with them. Understanding the patients/visitors condition via a TeleMedicine session will allow the practice to manage the visit accordingly with heightened sensitivity, if required. Separating and scheduling visits where ailments are related and providing waiting within a designated zone (i.e. assigning a floor or contained space within a glassed area) decreases exposure to non-infected patients. Clearly displaying newly developed universal symbols or graphics to denote no touch zones, hand washing stations, sanitizing, mask requirements, etc. will help with potential language or communication barriers. Within visitor areas providing fewer seats can create distancing or the room can be divided into smaller waiting pockets to spread people out if dealing with high times of infectious disease.



Identifying high, moderate and low threat levels on design plans can also be employed in a pediatric setting. To help mitigate children’s inclination to touch everything we incorporate pleasant distractions. Dancing lights in a corridor have proven effective, however more distractions can be employed within the space and including designated, easily cleaned, touch elements in the enclosed zone.

A virtual glass game wall identifies a high touch area location that can be easily maintained. Hand washing stations for children, designed in a pediatric friendly manner, encourages hygiene education through playful activity. Wall treatments are essential at the wainscot level for small children and easy to wipe down in contrast to paint. Placing hygiene stations throughout the facility allows the visitors to feel in control of their own health and safety. Providing clear signage to describes the measures the facility is taking to keep everyone safe adds to visitor confidence.

For staff, translucent shields at registration and reception areas should be integrated into the design to avoid a feeling of alienation. Another consideration is higher staff seating to help protect the staff further vs. sitting below visitor eye level. Staff desks may become deeper than usual, to create more distance between visitor and staff.

Any surfaces touched by visitors should be highly resistant to germ growth and resilient to constant, required cleaning, as with Solid Surfaces.

### RECOMMENDED MATERIALS

There are now many materials and finishes that fight, or are resistant to, germs and airborne pathogens. Some materials do not support growth, while others have bacterial killing properties. Anti-microbial materials should become the norm for most finishes where available and projects should specify SSM (Solid Surfacing Materials) where economically viable. Door hardware selections are available in copper or brass, offering other anti-microbial treatments. Studies to determine the germ fighting efficacy of metal doors and frames versus wood or painted doors is recommended.

A Plyboo wall design for pediatric spaces is a consideration, confirming the sanitizing approach for keeping it safe from transmitting disease. Flatter surfaces are less tactile and slightly less tempting to touch by children, however this idea needs further study as there are advantages and disadvantages to both.





# pediatric outpatient clinic

continued

There are fabrics that have silver oxides and nanotechnologies which prevent the transmission of germs. For previously purchased, or installed, seating we can investigate topical treatments currently on the market. The research is ongoing as to which is tougher and more germ resistant.

Ultraviolet lighting is becoming a big factor for healthcare facilities. Integrated into the lighting plan, it can kill germs and bacteria as a constant source or as scheduled. Exploring fabrics, we should examine if environmentally friendly polyurethanes and silicones hold up better than vinyl over time as chair covering. Fabric must also be specified that can withstand the harshness of increased use of disinfecting agents, though less harsh disinfectants are being developed. There is an ongoing debate regarding disposable cubicles versus anti-microbial treated cubicles in the battle to arrest germ transmission; these options will be carefully considered and new solutions are being developed. In all the discussion of prevention there is still the consideration of the larger picture which is the environmental impact of all choices.

## TOILET ROOMS

Toilets rooms with floor drains can be washed down in entirety if needed. It would be wise to also consider tiling the entire toilet room instead of just the wet wall and or wainscoting, using larger scale tiles to reduce grout lines on all walls. Employing all hands free and touchless fixtures throughout the toilet room, including proximity faucets, should be implemented. Wash basin designs should relieve aeration, spills, and splashes. The faucet location in relation to the drains is critical to prevent the aerosol of germs. Hand dryers with UV lights and splash mitigation should be specified. Installing safe UV lighting on timers for all day disinfection could be used, or employing HINS (High Intensity Narrow Spectrum) light which is making strides in the fight against pathogens. Waste receptacles for non-touch use should be deployed. There are vacuum toilet systems that flush inward to mitigate aeration and the possible spread of germs into the immediate atmosphere.



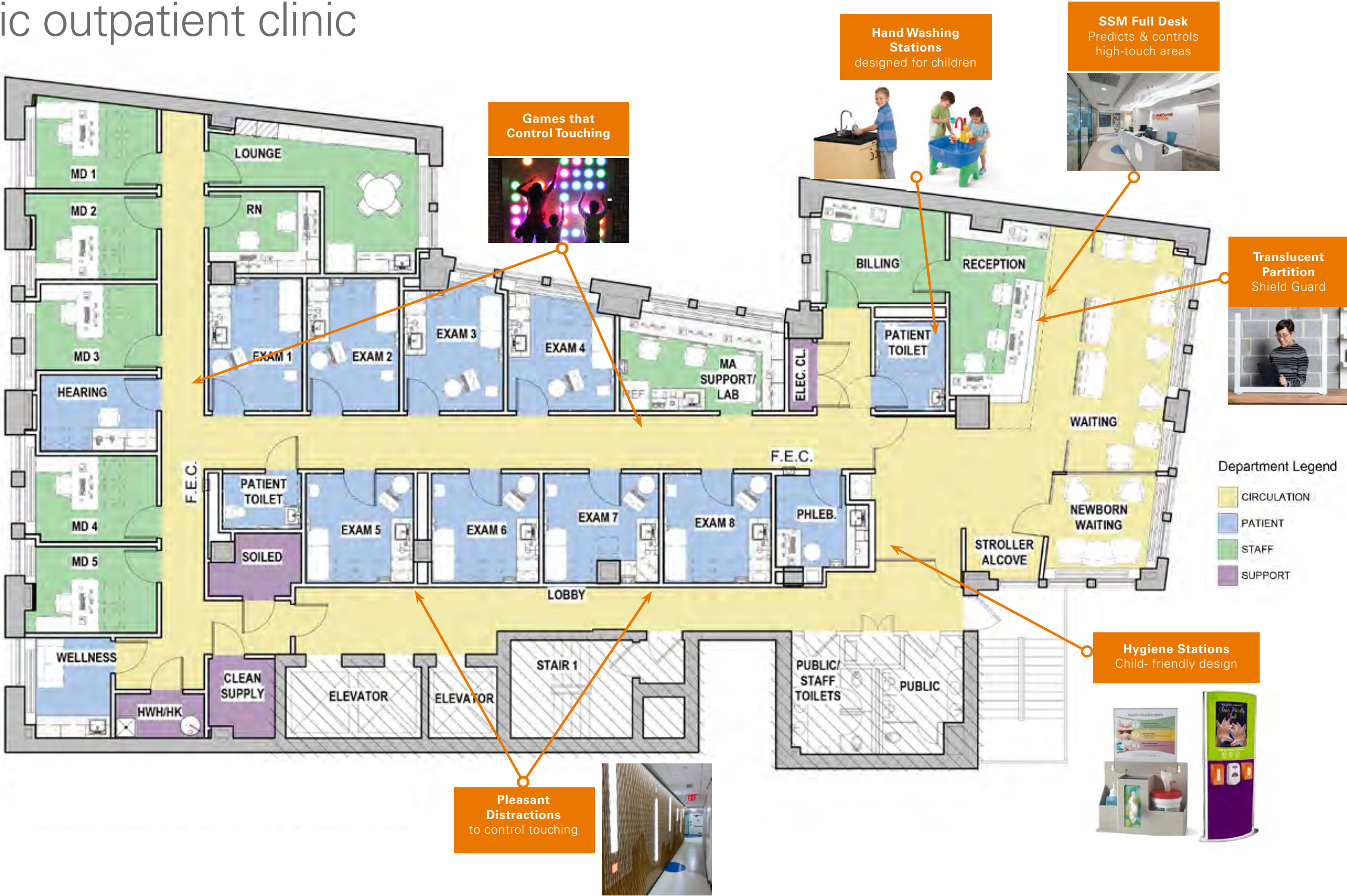
## IMPROVED CLEANING PROCESS

New level of cleanliness will be immediately required. Better routines are required to manage storage and disposal of used and potentially infected materials. Smaller sharps may mean more frequent disposal of soiled material. Cleaning, disinfection, and sterilization protocols will have to be implemented with complete comprehension of their differences. Providing manufacturer manuals for surface cleaning and maintenance will be critical. A designated staff member walking the site, wiping down surfaces, as seen in hospitality and high-end facilities, may be considered. This instills a higher level of confidence in the cleanliness and safety of the facility.





# pediatric outpatient clinic





For more information on COVID-19 planning, design, and implementation considerations, visit the [COVID-19 Resource page](#) on our website.

[e4harchitecture.com/covid-19-resource-page/](https://e4harchitecture.com/covid-19-resource-page/)

