Telemedicine's Leader

Guideline

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INTRODUCTION

While the selection of videoconferencing equipment is usually the primary concern for those new to telemedicine, providing an environment that makes communication over a distance seem like an in-person communication plays a significant role in the success of a clinical event. The appropriate location and configuration of space used for telemedicine events can help all participants reduce the barrier posed by the physical distance between them.

Some organizations may choose to locate a fixed space(s) dedicated for telemedicine, while others may have telemedicine sharing space with other programs in a multipurpose room. Still others may choose to implement telemedicine at the point-of-care, depending on the nature of the clinical service or program.

Where renovations to existing infrastructure to accommodate telemedicine are not possible, some adjustments will likely be required to accommodate telemedicine equipment and to provide for privacy considerations for clinical sessions.

The type of telemedicine equipment required may influence decisions around space, as will factors like existing infrastructure, budget, and personal preference. Member space for telemedicine should be assessed by an individual with telemedicine experience. Your OTN Regional Manager can provide assistance with suitable equipment solution selection, optimal equipment positioning, and recommendations for physical space adjustments to accommodate equipment and/or maximize the videoconferencing experience.

The focus of this guideline is for space used for clinical events, and the types of educational or administrative sessions that typically occur in boardrooms or meeting rooms. This guideline does not address space preparation for outfitting large auditoriums for multi-media type educational sessions. If you are considering a large education space, please speak to your Regional Manager.

GUIDELINE

Location

A location that is convenient for users will encourage their participation and support for telemedicine. For sites engaging in clinical telemedicine, easy access for patients and close proximity to washrooms, change room facilities (to accommodate clients who may have to change into examination gowns), patient reception areas and outpatient registration counters as well as emergency resuscitation equipment are important considerations, as is wheel-chair accessibility. The space should have a call bell system for staff or patients to access assistance quickly.

Appropriate signage, indicating the location of the telemedicine clinical space for patients, volunteers or even emergency responders, should be considered.

Noise

Too much background noise will result in poor quality sound during your videoconference. The microphones on videoconference systems are sensitive to noise, which can be picked up at the far site. Therefore space is

ideally located in a quiet location away from internal and external noise and sources of vibration, including fans, air conditioners or plumbing. In-room ventilation systems should be quiet. Ideally, overhead paging systems should be excluded from the space. If possible, select a room that is soundproof or can be soundproofed to prevent unauthorized individuals from hearing the consultation for clinical telemedicine. Alternatively, consider a location removed from high traffic areas to reduce the possibility of a breach of client confidentiality.

Size

The size of the space must be large enough to comfortably accommodate the number of users you expect while also housing your telemedicine system, peripheral devices and furniture. Some space will likely be multi-purpose and used for patient consultations, team conferences and larger groups attending educational events or administrative meetings.

The area should have a ceiling no higher than 10 feet (9 feet is recommended). Participants should sit at least 5 to 6 feet from the main camera and monitor so that the remote viewers have a suitable image.

Rooms used to accommodate clinical telemedicine should have doors wide enough to admit a stretcher or wheelchair and consideration for enough floor space to allow clients to walk a distance.

If the space is to be used for other than clinical purposes, then storage of the telemedicine equipment in the space requires careful consideration.

Windows

If a room has windows, ensure that there are window coverings to ensure privacy and good light control (outdoor light can interfere with your video image.) Depending on the amount of outdoor light a room receives, window coverings may need to be of black-out quality. When people sit in front of windows, they may only appear as shadows to viewers at the far site. Windows can also be a source of distraction for far site viewers if they can see outside activity through a window during a videoconference.

Key Considerations for Space Preparation

Mandatory space requirements include power connection, OTN Network connectivity, and signage. All other elements are guidelines based upon previous experience and industry recommendations.

Power Connection - Mandatory

Each telemedicine workstation requires grounded standard 120V 60Hz AC electrical outlets. The telemedicine system should be positioned based upon lighting and room layout constraints, with outlets installed in an easily accessible location no more than four feet from the telemedicine system.

Signage - Mandatory

As noted in the OTN Membership Agreement, the Member may be asked to post signage specific to the provision of telemedicine and ensure that it is visible to each patient who participates in a telemedicine event.

It is good practice and important videoconference etiquette for all sites to be identified during a telemedicine event. OTN provides signage for each site that can be used on a tabletop or wall. These signs should be positioned so that remote audiences can easily see them during each event. Tabletop signs are best seen when they are on the table in front of the participants. Wall signs are best seen in view of the main camera when they are behind the participants.

Additional suggestions for signage include one on the outside of the door to identify the telemedicine space and a “Telemedicine session in progress” sign to hang on your door during an event.

Acoustics and Sound Considerations

Telemedicine microphones should be placed in front of the individuals speaking in the videoconference but at least four feet from the unit to prevent audio feedback.

Sound bounces around a room with hard floors and untextured walls or ceilings bounce, creating a very poor audio environment. While sound-absorbing wall coverings are ideal, an inexpensive and effective solution for reducing noise is to install regular wall insulation above the ceiling tiles.

Clock

Telemedicine events should begin and end on time. A clock mounted on the wall near the telemedicine system allows users to keep track of the time.

Furniture

Furniture that may be needed in a telemedicine studio include a table, chairs, stretcher or examination bed, a small general purpose table to hold a fax machine and telephone and a coat rack.

The table and chairs should be of light to medium color to allow light to reflect people's faces. Avoid dark colors that absorb too much light and provide a darker image. Also avoid highly reflective or glossy surfaces that will cause a glare and wash out participants' faces. Use furniture with a matte finish.

For infection prevention and control in clinical space, use furniture that you can wipe clean.

Chairs that roll will make it easier (and quieter) for all participants to position themselves in front of the camera, but these types of moving chairs may not be appropriate to use in space hosting clients for clinical telemedicine.

Room Layout

Typically the telemedicine system is situated in front of the participants. Participants should sit directly in front of the camera so that they don't look like they are looking upwards, downwards or sideways.

If extra monitors are attached to the telemedicine system, they should be positioned close enough so that participants look in the direction of the main camera lens. This produces natural images at the far site. A horseshoe arrangement of seats permits a clear view of each participant, although some panning by the camera will be necessary to optimize results. This layout can work very well for small groups.

Lighting

Proper illumination levels ensures proper skin colour. Regular fluorescent lights can cause a glare or produce a greenish hue, which is misleading during clinical telemedicine sessions. Glare from lights can also make an image look blurry on the videoconference monitor. Lighting sources should bathe subjects from the front and side, but never from behind. Lights should never be visible in the range of the camera as this makes it difficult to control image brightness. Position the light so that it shines in the same direction that the cameras are usually pointing to help eliminate this common error with room lighting.

For clinical telemedicine, many aspects of a physical examination are in fact not color or texture dependent, but require the creative use of shadows to illuminate changes in size, pulsations, or body movement. Consider having a movable light source that offers the flexibility to direct light where fixed lighting is insufficient. Accurate color reproduction is important for many clinical telemedicine applications, and is especially crucial in dermatological exams.

To maximize the appearance of skin tones, standard fluorescent fixtures (usually two by four feet) with colour-corrected fluorescent tubes (minimum Kelvin 4100 recommended) and clear acrylic prismatic diffusers are recommended. Light suspended from the ceiling angled at 45 degrees is the optimal solution to eliminate shadows. Do not use "egg-crate" diffusers as these concentrate the light, creating concentrated spots of light called "hot spots." Parabolic reflectors cause light to be directed straight downward and result in dark faces and shadows.

The following is a recommendation for electronic ballasts and colour corrected florescent tubes from WestBurne Electrical:

- Ballasts: #GT232A12347GEBSSR (1x4 Electronic Ballast Fixtures)
- Fluorescent tubes: #F32T8SPX41 T8 fluorescent bulb (4100 Kelvin colour temperature)

Lamps with 4100 Kelvin color temperature can emit light that is completely different from fluorescent fixtures. Ensure that lights selected have a Color Rendering Index (CRI) of at least 85, preferably 91 or higher.

Paint

Walls should be painted a medium shade of solid grey-blue for optimal videoconferencing. This colour provides the same depth of color as skin and hair, allowing the camera lens to let in just the right amount of light. A solid background makes it easier to concentrate on the image while panning over or zooming in on an image.

Matte or flat finish is recommended to minimize reflection within the room. White walls and bright colors such as red and yellow should be avoided as they 'fool' the camera lens, resulting in images that are either overexposed or shadowed.

If your space is very large - for example if ceilings are over 10 feet high, we recommend you choose a darker shade of blue or blue-grey.

The following four palette recommendations have been used in sites that host patient consultations. In each case, we recommend that the darker colour of the pair be used on the wall behind the screen/monitor and the lighter hue on the other three walls.

- Palette One - Benjamin Moore: Mysterious AF-565 (dark); Amsterdam AF-550 (light)
- Palette Two - Benjamin Moore: Silhouette AF-655 (dark); Cinder AF-705 (light)
- Palette Three - Benjamin Moore: Flint AF-560 (dark); Storm AF-700 (light)
- Palette Four - Benjamin Moore: Montpelier AF-555 (dark); Solitude AF-545 (light)

OR

- Benjamin Moore #HC-152 Whipple Blue (grey/blue)
- Canadian Tire Waterproof 788 (grey/blue)
- General Paints # 8513+D.2 (medium/blue)

Another option is to hang a solid blue curtain for participants to sit in front of. Off-white, suspended acoustical tile ceiling is recommended.

Telephone Fax and Computer

The space should be equipped with a standard phone with long-distance calling capability. This allows users to communicate with the OTN Service Desk should technical problems arise during a telemedicine event. It is much easier to troubleshoot a technical problem when you are sitting in front of your system than having to go back and forth between rooms.

A readily available telephone outside the immediate space is also helpful for staff to respond to pages or make phone calls without interrupting the flow of the telemedicine event.

A fax machine is also useful assist with transmission of additional written patient information that may be required during clinical events, for example laboratory results or diagnostic image reports.

Computers in the room allows for staff to access OTN's Ncompass scheduling software to monitor/change any events as well as accessing patient information via the EMR.

Security

The space should have a call-bell system for staff or patients to access assistance quickly. If your space is used for purposes other than telemedicine, the telemedicine equipment should be locked in secure cabinets. All of the peripherals (slide projector, laptop, stethoscope, etc.) should also be secured in locked cabinets. The door to the space should remain locked when the room is not in use. Key circulation should be well controlled to minimize tampering/damage to the equipment.

END OF GUIDELINE