AMERICAN TELEMEDICINE ASSOCIATION

A CONCISE GUIDE FOR TELEMEDICINE PRACTITIONERS: HUMAN FACTORS QUICK GUIDE EYE CONTACT

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A Concise Guide for Telemedicine Practitioners: Human Factors Quick Guide

Eye Contact

An American Telemedicine Association Human Factors SIG publication in collaboration with the Home Telehealth and Remote Monitoring SIG

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This guide is a quick reference to the importance of eye contact--and the lack of it--in providing healthcare services. Some pointers relate specifically to the provision of remote services, but all are applicable to most healthcare encounters. For more information and details we refer you to the references at the end of the guide.

Why Is Eye Contact Important?

- One of the most important aspects of human (provider-patient) interaction[1,2]
- One of many non-verbal cues that take time to process remotely
- Fundamental to the REDE (Relationship, Establishment, Development, Engagement) model of patient provider interaction for optimizing provider-patient relationships[3]
- Important to clinical encounters and used as part of medical skill set checklists[3]
- Impacts patient's sense of dignity[4,5]
- Helps establish rapport; trust[6] (keeps participants focused on each other; encourages interaction; facilitates memory; influences likeability & attractiveness; affects perceived emotion; creates sense of inclusion when present & sense of isolation when not[7])
- Allows for the use of non-verbal cues in communication[8]

Eye Contact Etiquette

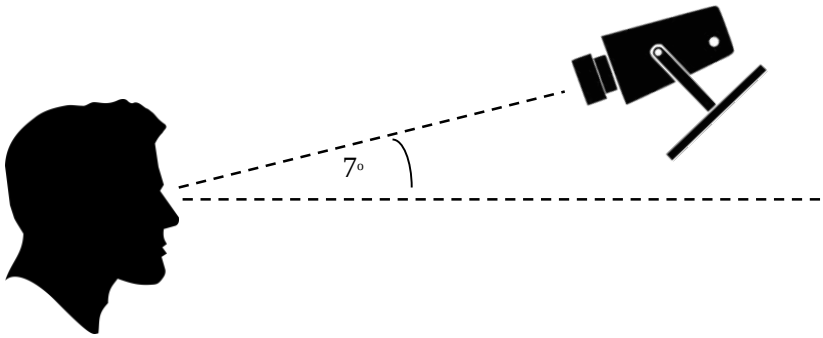
- "Rules" of direct versus indirect eye contact can differ by culture[9,10].
- It is important to be aware of possible cultural heuristics:
    - Arabs, Latin Americans & Southern Europeans make more eye contact during conversation than Asians & Northern Europeans
    - Japanese may consider eye contact rude & people are taught to look at a person's Adam's apple instead of the eyes; eye contact with superiors is avoided
    - Women generally make more eye contact than men
- Eye contact changes with age
    - Increases from age 4-9
    - Decreases from 10-12
    - Increases again into adulthood.
- Certain mental health medical, and vision conditions impact the ability or willingness of some patients to make and/or maintain eye contact[11,12,13]

Tips for Telemedicine Camera Positions & Viewing Screens[14,15]

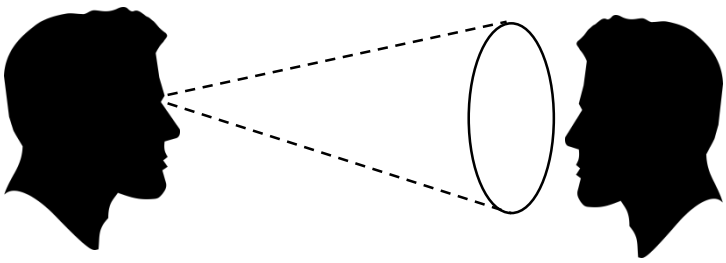
- Locate camera above the face for accurate estimation of gaze[6,16]
    - Preferably 7 degrees (of viewing angle) or less above from transmitter's position (refer to Figure below).
- Initial viewing distance (introductions) should be close enough for "passport" view (head & top of shoulders)
- Avoid placing camera too close to yourself

    - Close placement can make the viewer feel as though their “personal space” is invaded from a distance
- Afterwards can move the viewing distance out for better view of the body & non-verbal cues
    - Recommend 1080p (or 720p) monitor with aspect ratio 16:9, start out with the following viewing distances (may differ for 3-D screens)[17]:
    - Desktops, tablets, and phones—common sense
    - 42” monitor: 1.5m / 4’11”
    - 52” monitor: 2.0m / 6’6”
    - 65” monitor: 2.5m / 8’2”
- Avoid the parallax problem or the inclination to look at face on screen rather than into camera
    - Replicate real eye-contact patterns by looking into the camera frequently[6]
    - If the viewing distance is correct, you will see the patient on the monitor and the camera simultaneously
- Higher resolution cameras & monitors are preferred
    - Produce sharper images making it easier to see & follow eye gaze
    - Sharper images are less tiring to look at if you are providing remote services for long periods.
- Use camera zoom features to adjust your apparent distance (your image size) from the camera as necessary
    - For proper sizing in the viewing frame without changing suitable physical distance and good camera angle (See diagrams below)
        - This applies to the patent as well if there is either remote zoom or the patient can adjust their camera.
- Some legacy or low-end systems may have image quality issues
    - Verify the image quality prior to clinical use

Camera Position



Cone of Gaze



Clinician Positions[6,18,19,20]

- Maintain direct gaze - people are very sensitive to small shifts in gaze
    - At greater distances from the camera, gaze can shift more often and at a wider angle while still maintaining proper perception of contact
    - Proper distances for viewing angles and apparent closeness can be controlled through the use of zoom features, i.e., moving physically back from the camera and zooming to appear close
- Perception of gaze is influenced by head orientation
- Ensure image of other person is as close to camera as possible at least initially
    - Consider clinical information that may be gained/lost from proximity to camera
- Sit back from display until eye contact achieved
- Keep yourself centered in the camera's field of view at near & far distances

Additional Pointers

- Verify HIPAA compliance of any communications system
- Be aware of blinking
    - Speaking increases blinking rate (0.7 to 2 times/sec) while listening reduces it (0.5 to 1.5 times/sec)[21]
- Maintain focus but don't stare - shift occasionally from eyes to forehead etc.[16]
- Locate light source to illuminate your face:
    - 1 main source located as close as possible behind the camera
        - Use diffuse lighting to avoid shining in users' eyes and reducing eye contact
    - Multiple lights from different angles reduces shadow effects and glare
- Try to understand gaze indicators as misunderstanding may lead to improper interpretation of interactions[8]
- Check/test your image initially to ensure good quality/placement and image quality but don't continue to look at yourself during encounters
    - Ideally, good quality control includes a view of yourself from someone else's device
    - We tend to assume we are seen as we see the incoming transmission
- There are limits to technology
    - Question the appropriateness of the remote encounter if the clinical information obtained is not consistent with your judgement of what is required to make clinical assessment[22,23,24]

Using Tools/Devices to "Simulate" Eye Contact

- Hardware and software options are under development to simulate eye contact[25]
- Users should evaluate "novel" options for realism

Glossary of Terms:

- Gaze – A look directed at a person or object; eye contact is gaze directed at another's eyes; mutual eye contact occurs when 2 people make eye contact simultaneously[6]
- "Cone of gaze" - Defines the sweep of gaze in which the person looked upon perceives you to be looking at them[6,26]

- Visual Angle – The angle formed at the retina by the meeting of lines drawn from the periphery of the viewed object[27]
- Viewing distance – The distance between the individual and the camera as perceived by lens of the camera

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