

# Practice guidelines for videoconference-based telepsychiatry in South Africa

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## Introduction

Telepsychiatry, the practice of psychiatry over distance using information and communication technologies is, after teleradiology, the most practiced form of telemedicine in the world. As with any new technology, clinical service, or intervention in medicine, it is prudent to have guidelines for the safe and efficacious use of the technology in clinical practice. Guidelines facilitate best practice and provide both clinicians and patients with a set of standards and procedures that serve to protect their interests. Protection is particularly important when dealing with vulnerable groups.

As with any new field in medicine, pioneers learn from their experiences, both positive and negative, which in turn direct the development of guidelines. Clinical, technical and operational guidelines should ideally be developed by clinicians working in the field in conjunction with their professional associations and not by regulators or legislators who may not have an understanding of the nuances and special needs of the discipline. Guidelines produced in this manner assist regulators and legislators in overseeing safe and sound practice.

The need for telepsychiatry in the developing world is great. It provides access to scarce specialist skills and reduces unnecessary travel. In the absence of guidelines for the good and ethical practice of telemedicine in South Africa, it was deemed necessary to develop guidelines for the practice of telepsychiatry in the hope of facilitating its implementation and uptake locally.

As there is limited experience in telepsychiatry in South Africa, it was decided to draw upon international guidelines. The American Psychiatry Association produced guidelines for the practice of telepsychiatry in 1998<sup>1</sup> as have other associations. The American Telemedicine Association has

recently revised its guidelines<sup>2</sup> based on an evidence based review.<sup>3</sup> It was decided to adapt these guidelines where necessary to meet the needs and infrastructural challenges of South Africa. The American Telemedicine Association (ATA) was approached, through its International Special Interest Group, to explore the possibility of adapting the ATA guidelines to South African needs and to supply the ATA with the guidelines as a resource for other developing countries to either adopt or modify as required.

The guidelines and standard operating procedures were developed over a period of four years following a modified guideline development process:<sup>4</sup>

**Making initial decisions:** Establishment of an expert review committee and defining the scope; Reviewing available evidence: Assessment and review of international guidelines<sup>2,5-7</sup>, on technical and clinical appropriateness, policy and ethical issues;

**Guideline development:** Standard operating procedures (SOPs) were developed by the Department of Telehealth; Guideline Document was developed based on a review and adaptation of the 'Guidelines for Telepsychiatry' of the ATA;

**Consultation:** Consultation by the expert review committee with psychiatrists in the public sector in KwaZulu-Natal in 2008 and 2009; Presentation of the guidelines to the College of Medicine of South Africa in 2010; Circulation to Heads of Academic Departments of Psychiatry of the eight medical schools; Submission to the South African Society of Psychiatrists (SASOP) in 2010;

**Endorsement:** the guidelines were endorsed by the South African College of Psychiatrists in June 2011 and are being considered for endorsement by the South African Telemedicine Association;

**Implementation:** the guidelines are being implemented in fledgling telepsychiatry services in South Africa.

This serves as a model for the development of guidelines for other aspects of telemedicine in South Africa i.e.

**Practice Guidelines for Videoconference - Based Telepsychiatry in South Africa.**

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**Mission**

The following guidelines are designed to aid in the development and practice of coherent, effective, cost effective, safe and sustainable telepsychiatry practices in South Africa. Establishing guidelines for telepsychiatry improves clinical outcomes, ameliorates the maldistribution of specialty care and promotes informed and reasonable Mental Health Care User (MHCU) expectations.

**Scope**

These guidelines are designed to serve as both a consensus operational best practice reference base on clinical empirical experience and an educational tool to aid practitioners in providing appropriate telehealth care for MHCUs. The term telehealth generally indicates an inclusion of all health care and health professionals, ranging from dermatology to mental health, to doctors, allied health workers, educators, and nurses. The use of telehealth also refers to the broader scope of e-health and distance education. Telepsychiatry therefore, is the practice of mental health by the specialties at a distance. The practice of medicine is an integration of both the science and art of preventing, diagnosing, and treating diseases. It should be recognized that adherence to these guidelines will not guarantee accurate diagnoses or successful outcomes. The purpose of these guidelines is to assist practitioners in pursuing a sound course of action to provide effective and safe medical care that is founded on current information, available resources, and MHCU needs. The guidelines are not meant to be unbending requirements of practice and they are not designed to, nor should they be used, to establish a legal standard of care.

The primary care or mental health practitioner is responsible for the decision about the appropriateness of a specific procedure or course of action, considering all presenting circumstances as indicated under the Mental Health Act no 17 2002 (the Act), the National Health Act 2003 and the Bill of Rights. An approach that differs from the guidelines does not necessarily imply that the approach varied from the standard of care. If circumstances warrant, a practitioner may responsibly pursue a course of action different from these guidelines when, in the reasonable judgment of the practitioner, such action is indicated by the condition of the MHCU, restrictions or limits on available resources, or advances in information or technology subsequent to publication of the guidelines. Nonetheless, a practitioner who uses an approach that is significantly different from these guidelines is advised to document in the MHCU record information to explain the approach pursued.

These guidelines do not include the provision of services over the World Wide Web which will be developed at a later time.

**How to use these guidelines**

The guideline contains requirements, recommendations, or actions that are identified by text containing the keywords "shall," "should," or "may." "Shall" indicates that it is required whenever feasible and practical under local conditions. "Should" indicates an optimal recommended action that is particularly suitable, without mentioning or

excluding others. "May" indicates additional points that could be considered to further optimize the telepsychiatry care process.

**Applications for the Practice of Telepsychiatry****Clinical Applications**

Currently, the point of delivery for telepsychiatry services is as varied as the type of services that are being provided. Sites may include hospitals, emergency rooms, community mental health centers, clinics, physician offices, nursing homes, assisted living facilities, prisons, schools, and MHCU homes. With careful planning, telepsychiatry services can significantly impact the quality, timeliness, and availability of services in almost any mental health service.<sup>8-20</sup>

**• Scope of Services**

Clinical applications of telemedicine encompass diagnostic, therapeutic, and forensic modalities across the lifespan. Common applications may include pre-hospitalization assessment, in-hospital care, assessment post-hospital follow-up care, scheduled and urgent outpatient visits, medication management, psychotherapy, consultation and psychological testing.

**• Clinical Interviews**

Telepsychiatry interviews may be conducted between physicians in consultation, between a physician and another health care provider (mental health care practitioner), or between mental health practitioners and a mental health care user (MHCU). Other persons, such as another health care provider or family member, may also be present in an interview. The Telepsychiatry interview may be an adjunct to periodic face-to-face (F2F) contact or may be the only contact; and should be supported by additional communications technologies such as faxed or emailed consultation information or transmission of an electronic medical record.

**• Emergency Evaluations**

Internationally, many programs successfully provide emergency evaluations by telemedicine with minimal support staff and standards in place at the MHCU site. Emergency evaluations for psychiatric hospitalization can be conducted via telemedicine, and usually will require additional personnel to provide physical control of the environment and possibly the MHCU, for safety. Situations such as a MHCU who is suicidal, homicidal, or suffering from dementia or acute psychosis may require additional personnel in the room in addition to family members. In general, adequate support staff or responsible family members shall be present at the remote site in order to safely care for the MHCU. If other alternatives are immediately available to meet the MHCU's needs without transfer, services are preferred to be provided on-site and in-person. In the event that support staff and family members are not present, the telepsychiatry provider must make a determination whether immediate intervention is deemed necessary for MHCU safety.<sup>7,21-23</sup> Special attention shall be paid to the enhanced need for privacy and confidentiality and every attempt to preserve the MHCU's right to privacy shall be employed.

### • **Multidisciplinary Team Management (MDT)**

In large distributed systems where MDT management is needed, videoconferencing allows collaboration between all the involved clinical participants regardless of distance. Clinical treatment plans can be developed with input from experts who would not otherwise be available.<sup>8,18,24-25</sup>

### • **Clinical Supervision**

Supervision of trainees (e.g. Registrars, Community Service Officers or interns) at a distant site can facilitate both training and MHCU care. Supervision may be done either in real-time with the supervisor present via videoconferencing, or, when appropriate, by the use of store and forward technology.<sup>26</sup> Supervising practitioners shall comply with professional requirements for in-person supervision of Registrars, interns and other staff providing mental health care.

### **Non-Clinical Applications of Videoconferencing**

#### • **Distance Learning**

Videoconferencing technologies for education encompass a broad range of applications. These include, but are not limited to, point-to-point applications, such as physician-to-physician, physician-to-MHCU, or multipoint sessions such as a classroom setting where a teacher is at one site and the "pupils" are at other multiple remote sites. Distance learning modalities can be used for off-site mentoring to teach new techniques or multi-site transmission of "grand round" conferences and continuing medical education (CME) events. These can be streamed via the internet or transmitted via a number of ways including point-to-point circuits and the public Internet (if transmitting protected health information or other sensitive information via the public internet, AES encryption or a virtual private network (VPN) may be used to secure the transmission).<sup>27</sup> Distance education modalities can be used for clinical care of MHCU, e.g. teaching regarding medications, therapies, or compliance with treatment plans.

#### • **Research**

Telemedicine has been applied as an effective and reliable means of gathering research data from clinical populations. Telepsychiatry enables multi-site and remote acquisition of information via in-person interviews or direct observation, as well as providing a simple means of archiving MHCU-practitioner interactions in video format for later scoring and evaluation. All requirements for human-subjects' research shall be applied to the use of telepsychiatry for research purposes, especially when research involves the use of video or audio taping of the telemedicine conversations. Attention shall be paid to issues of confidentiality and informed consent, ensuring that MHCU's who are involved in research trials via telemedicine understand that the consent is for the purposes of research and not for receiving care via telepsychiatry. Efforts shall be made to ensure that MHCU's receiving telepsychiatry services are aware that telemedicine conversations will be recorded only with their consent.<sup>7</sup>

### • **Administration**

Interactive two-way audio-visual communication between facilities, which could include distant hospitals, clinics, schools, prisons and justice centers is an effective means of providing administrative services and support and helps organizations to achieve cost savings in large or geographically dispersed systems. Any discussion of protected health information shall be secured through use of a one on one, point-to-point circuit, an ISDN connection, or AES encryption or virtual private network (VPN) shall be used for transmissions via the public internet.

### **Guidelines for the Practice of Telepsychiatry Standard Operating Procedures (SOPs)**

Any organization or provider considering the use of telecommunications equipment for the purpose of providing mental health or substance abuse care to a remote site should have in place prior to initiating such a service a set of SOPs that shall include (but are not limited to) the general, educational, clinical, ethical, technical, and administrative specifications. Local SOPs shall also describe roles, responsibilities, communication, and procedures around emergency issues.<sup>23</sup>

The following are the general principles for Standard Operating Procedures for the practice of telepsychiatry.

- Telepsychiatry providing institutions and providers shall ensure that appropriate staff is available to meet MHCU and provider needs before, during, and after telepsychiatry encounters of all types.
- Telepsychiatry providing institutions and practitioners shall be aware of the enhanced requirements for privacy and confidentiality that is afforded to a MHCU receiving mental health care.
- Telepsychiatry providing institutions and practitioners shall determine processes for documentation, storage, and retrieval of telepsychiatry records. Specific descriptions shall be in place that address that can have access to the records.
- A MHCU receiving mental health and substance abuse services is afforded a higher degree of rights as well as institutional responsibilities. Telepsychiatry organizations shall be aware of these additional responsibilities and ensure that they are achieved.
- Telepsychiatry providing institutions and practitioners should have in place policies and procedures that address all aspects of administrative, clinical, and technical components regarding the provision of telepsychiatry and shall keep the policies and procedures updated on an annual basis or more often as needed.
- Telepsychiatry providing institutions shall ensure that the telepsychiatry service is part of the organization's quality improvement program.
- Telepsychiatry providing institutions and practitioners shall comply with the specific consents to treat and for medication administration that apply under the Act. No special consents are needed to use telepsychiatry to serve a MHCU.
- Telepsychiatry professionals shall be aware of who has regulatory authority and any and all requirements (including those for liability insurance) that apply when practicing telehealth in another jurisdiction.

- SOPs should be in place for the local management of Telepsychiatry Services at local and consultant sites (Table I)

**Table I: Sample General Telepsychiatry SOP**

<p><b>Local Site</b></p> <ul style="list-style-type: none"> <li>• A locally based treating health professional should be present with the mental health service user during the consultation.</li> <li>• All service providers or health workers at the local site, participating in Telepsychiatry should:                     <ul style="list-style-type: none"> <li>- Have read the Telepsychiatry guidelines</li> <li>- Be familiar with the use of Telepsychiatry equipment</li> <li>- Have clinical documentation available at the consultant site to enable the psychiatrist to familiarize him or herself with the case prior to the consultation using a standard referral sheet</li> <li>- Follow the procedure guidelines for each required consultation</li> <li>- Document the session</li> <li>- Complete a Telepsychiatry Record Keeping Form</li> </ul> </li> <li>• All support personnel at the local site should sign a once-off confidentiality agreement.</li> <li>• If required, a translator must be made available for the consultation.</li> <li>• Other persons, such as the family of the service user or a translator, may also be present during the consultation.</li> </ul>
<p><b>Consultant Site</b></p> <p>All consultants at the consultant site, participating in Telepsychiatry should:</p> <ul style="list-style-type: none"> <li>• Have read the Telepsychiatry guidelines</li> <li>• Be familiar with the use of Telepsychiatry equipment</li> <li>• Ensure that the mental health service user receives a full explanation of the process and has completed the consent form, if competent</li> <li>• Follow the procedure guidelines for each required consultation</li> <li>• Document the session</li> <li>• Complete a Telepsychiatry Record Keeping Form</li> </ul>

**Educational SOP Specifications**

A significant component of mental health outreach services is clinical teaching. Clinical teaching should be an integral part of a Telepsychiatry outreach service. This can be provided through Telepsychiatry videoconferencing (Table II).

**Table II: Sample Educational Telepsychiatry SOP**

<p><b>Case based teaching</b></p> <ul style="list-style-type: none"> <li>• During the consultation, the consultant should use the opportunity to mentor and provide supervision to the local health worker regarding the specific management and treatment of the case presented.</li> </ul>
<p><b>Scheduled Clinical Teaching to local District Health Staff</b></p> <ul style="list-style-type: none"> <li>• If feasible, some sessions should be dedicated to the teaching of specific topics as identified by the local district hospital staff.</li> <li>• All staff should be invited, including local staff from the OPD clinics, who are involved in the care of mental health care users.</li> </ul>
<p><b>Scheduled Clinical Teaching and Case Discussion with PHC clinic staff</b></p> <ul style="list-style-type: none"> <li>• If feasible, some specific sessions should be dedicated to topics and cases raised by local PHC staff. PHC staff should have the opportunity to travel to the local site to attend a teaching session with the consultant psychiatrists. These sessions could be case based, with PHC staff presenting local mental health cases.</li> </ul>

**Clinical Specifications**

- The telemedicine operation and its health professionals shall ensure that the standard of care delivered via telemedicine is comparable to any other type of care that can be delivered to the MHCU, considering the specific context, location and timing, and relative availability of in-person care.
- Health professionals shall be responsible for maintaining professional discipline and clinical practice guidelines in the delivery of care in the telemedicine setting, recognizing that certain modifications may need to be made to accommodate specific circumstances.
- Sample SOPs for Consultation Liaison Telepsychiatry Services to Designated Hospitals (Table III) and Consultation Liaison Telepsychiatry Services to Mental Health Clinics (Table IV) are provided. Copies of standard referral, telepsychiatry forms, standard information sheets and consent forms are available from the Department of Psychiatry, University of KwaZulu-Natal, South Africa.

**General Telepsychiatry Practice Issues**

**Exam Inclusion Criteria/Scope**

The inclusion of cases for a telepsychiatry consult is at the discretion of the referring and consulting clinicians. There are no absolute contraindications to a MHCU being assessed using telepsychiatry.<sup>28</sup>

**Consult Request Data**

Information shall be available to the consulting practitioner for referral to provide supportive data to the practitioner in preparation for evaluating the MHCU, and for on-going MHCU management. Procedures should be in place between organizations and practitioners for sharing clinical mental health information timeously.

**Cultural Competency**

The clinician practicing telepsychiatry should be aware of cultural differences in the population he or she is serving at a distance.<sup>28-29</sup>

**Psychological Testing**

Psychological testing may be provided via telemedicine but may need to be modified for use via video. Organizations administrating cognitive testing via videoconferencing shall be aware of the properties of the individual test instrument, how it may be impacted by videoconferencing, and potential needed modifications. Computer-based testing may be provided at the MHCU location and results securely transmitted to the telepsychiatry practitioner for scoring and interpretation. On-site testers are appropriate to be used for cognitive testing and telepsychiatry organizations shall have in place arrangements for the use of ancillary staff to administer cognitive testing and the sharing of results with the telepsychiatry provider.<sup>8,30-36</sup>

**Specific Telepsychiatry Videoconferencing Issues**

The following guidelines are recommended to ensure the safety of the MHCU and also ensure accurate diagnosis, appropriate intervention, and supportive ongoing care.

**Table III: Sample Consultation Liaison SOPS For Designated Hospitals**

<i>Responsible Clinician:</i>	<i>Local hospital Health Practitioners</i>
<b>Definition of Service:</b>	<ul style="list-style-type: none"> <li>• Consultation Liaison Services to local health practitioners in Hospitals for admitted MHCUs under 72 hour observation, assessment or management; OR forensic assessment for the purposes of confirming diagnosis and advising on management and disposal of the MHCU.</li> </ul>
<b>Booking</b>	<ul style="list-style-type: none"> <li>• MHCU assessed for suitability for Telepsychiatry</li> <li>• Need for translator assessed</li> <li>• Bookings should be made at least one day in advance, if not an emergency consultation</li> <li>• Relevant documentation should be obtained using a standard referral sheet at least 1 hour prior to consultation</li> </ul>
Depending on the outcome of the assessment of suitability, the MHCU will either be present during the consultation or not.	
<b>MHCU Present during Consultation Prior to Session</b>	<ul style="list-style-type: none"> <li>• Staff include: Clinician, Translator and MHCU</li> <li>• Full explanation provided to MHCU of purpose of consultation, procedure and technical aspects of process e.g. camera placements and microphone</li> <li>• Informed consent signed by MHCU / family / guardian, depending on competency</li> <li>• All staff and persons present to be informed of all people participating in consultation by name, position, responsibility</li> </ul>
<b>Consultation</b>	<ul style="list-style-type: none"> <li>• Patient is introduced to all participants in consultation</li> <li>• Case is presented by Health Practitioner to Consultant</li> <li>• Interview is conducted</li> <li>• If needed, interview and answers are translated</li> <li>• Discussion with MHCU and Health Practitioner</li> <li>• Confirmation of treatment and management suggestions</li> </ul>
<b>Post Session</b>	<ul style="list-style-type: none"> <li>• Documentation of key decisions on MHCU's file (local site) and record of clinical consultation (Consultant site)</li> <li>• Completion of a Telepsychiatry Record Keeping Form (Consultant site).</li> </ul>
<b>MHCU not Present during Consultation Consultation</b>	<ul style="list-style-type: none"> <li>• Health Practitioner presents case to Consultant</li> <li>• Documentation of key decisions on MHCU's file (local site) and record of clinical consultation (Consultant site)</li> <li>• Completion of Telepsychiatry Health Record Keeping Form (Consultant site)</li> </ul>

**Identification of participants**

All persons in the examination room at both sites shall be identified to all participants prior to the consultation.

Disclosing persons who are attending the consultation shall be done by panning each end of the consultation with the video camera or at a minimum, announcing the presence of individuals present and asking the MHCU's permission for additional persons to be in the room.

Verbal permission from the MHCU is not required if safety concerns mandate the presence of another individual or if the MHCU is being legally detained, but should be encouraged by the practitioner.

**Clinical History/Results**

Telepsychiatry providing institutions and practitioners should have agreements in place that outline the procedure for securely sharing such clinical history and results. Laboratory or procedure results should be reviewed by the telepsychiatry consultant timeously.

Telepsychiatry consultants need to have access to relevant clinical data as if the MHCU were being seen in person.

**Reports**

As with any consultation, there shall be a traceable record of the teleconsultation at both the referring and consulting sites. The practitioner at a minimum shall have documentation including pertinent and required aspects of the clinical encounter, and the MHCU site shall have documentation that a telepsychiatry consultation occurred with the MHCU. The consultant's opinion and any services that were ordered or performed shall also be documented in the MHCU's medical record. Recommended language for the consultant includes "Based on the video images and history provided, my impression is as follows...."

Verbal communication with referring practitioners or other pertinent entities may be given and written records of the interaction shall be kept according to legal and regulatory requirements at least at both sites (referring and/or consulting). Reports may be faxed, mailed or electronically sent after the interaction has ended and should be done using secure methods. A consultant report shall include at a minimum the diagnosis and/or differential diagnoses, a summary of the findings, and recommended management.

**Table IV: Sample Consultation Liaison SOPs for Mental Health Clinics****Responsible Clinician:**

- Local health workers and Multidisciplinary Team

**Definition of Service:**

Support Services to Health Workers (Medical Officers, Psychiatric Nurses or PHC Nurses) in District Hospitals responsible for mental health service users seen in the psychiatric or mental health outpatient clinic:

- Interviewing new MHCUs
- Selected follow ups
- Second Opinion

**Booking**

- MHCU assessed for suitability for Telepsychiatry
- Need for translator assessed
- Bookings should be made at least 2-4 weeks in advance, if possible
- Relevant documentation should be obtained using a Standard Referral Sheet at least 1 day prior to consultation

**Prior to Session**

- Full explanation provided to MHCU of purpose of consultation, procedure and technical aspects of process e.g. camera placements and microphone, presence of technician
- Informed consent signed by MHCU/ family / guardian, depending on competence
- All staff and persons present to be informed of all people participating in consultation by name, position, responsibility

**New Mental Health Service Users (MHCU)**

- MHCU is introduced to all participants in consultation meeting
- MHCU is interviewed by Consultant
- Discussion with patient and local health worker
- Confirmation of treatment and management suggestions

**Follow up of selected mental health service users**

- MHCU is introduced to all participants in consultation
- MHCU case and issues for review are presented to Consultant by health worker
- Discussion with MHCU and local case worker
- Confirmation of treatment and management suggestions

**Post Session**

- Documentation of key decisions on MHCU's file (local site) and record of clinical consultation (consultant site)
- Completion of Telepsychiatry Audit Form (Consultant site)

telepsychiatrist directly prescribes. In this last scenario, clear procedures shall be established and communicated to all parties regarding the method for obtaining initial prescriptions and refills and reporting adverse effects. Pharmacotherapy shall comply with the practice parameters for MHCU care.<sup>6,39</sup> In an emergency situation, as per (Act 90 of 1997) Medicines and Related Substances Control Act 101 of 1965 after amendment by the Medicines and Related Substances Control Amendment Act, Schedule 5 medications may be prescribed verbally for 48 hours but needs to be followed up with a prescription within 72 hours. This can be a faxed copy.

**Psychiatric Emergencies**

Emergencies are to be managed in accordance with the Mental Health Care Act and Clinical Protocols. Emergency Telehealth guidelines for psychiatric emergencies are still to be developed based on a previous set of published clinical guidelines on emergency telepsychiatry.<sup>23</sup>

**Special Groups****Children and Adolescents (C&A)**

Children generally respond very positively to videoconferencing consultations.<sup>6</sup> Videoconference procedures for the evaluation and treatment of children and adolescents shall follow the same guidelines presented for adults with modifications to consider the developmental status, such as motor functioning, speech and language capabilities. Families shall be informed when a Videoconference consultation is scheduled for their child, in order to prepare their child for the consultation.

The room at the originating site (local site) should be large enough to include the child or adolescent and a parent, one to two other individuals and to allow the camera to scan an area large enough to adequately observe children's motor skills as they move about the room, play, and separate from their parents.<sup>6</sup> A table and relevant toys should be available for the child, but the table should not interfere with communication or viewing of the child or adolescent's motor skills.

**Elderly Populations**

Sensory deficits, especially visual and auditory, can impair the ability to interact over a videoconference connection and mental health care practitioner should be aware of this and appropriately address where this possible.<sup>6</sup> The geriatric MHCU often has multiple medical problems, many of which affect cognitive/behavioral state, require appropriate laboratory, radiologic, and other diagnostic procedures. The inclusion of family members should be undertaken as clinically appropriate and with the permission of the MHCU. Interviewing techniques shall be appropriate for a MHCU who may be cognitively impaired, or find it difficult to adapt to the technology.

**Substance Use issues**

Clinicians shall assess substance issues, be familiar with local resources for substance use assessment and treatment, and be prepared to play a more active role in substance use treatment.<sup>21,28</sup>

**Psychotherapy**

Standard practice guidelines for therapy shall direct psychotherapy services within the telemedicine setting. Evidence-based practice and empirically supported treatments shall be followed and adapted by the health practitioner as appropriate for videoconferencing.

**Medication Management**

Expert pharmacotherapy is the most frequently requested telepsychiatry service.<sup>37-38</sup> Internationally, various methods have been employed to provide this service, including: a) the telepsychiatrist consults to the referring primary care or managing physician (PCP) who prescribes the medications; b) the telepsychiatrist works with a mid-level professional at the MHCU site who writes the prescriptions; and c) the

**Specific cultural and language issues**

Specific consideration should be given to cultural sensitivities and language issues and the involvement of translators as appropriate.

**Forensic issues**

Because detained persons are a vulnerable population, providers should be confident that incarcerated MHCUs are referred for videoconference evaluation appropriately, rather than to avoid cost.

**Ethical Considerations**

Although telemedicine is not a practice in and of itself, practicing at a distance creates a unique relationship with the MHCU that requires attention and adherence to professional ethical principles. In the absence of specific current telemedicine ethical guidelines, all Telehealth consultations shall be governed by the national professional ethical guidelines for mental health care service provision, including:

- Awareness of medical and other professional discipline codes of ethics when using telemedicine
- Informing the MHCUs of their rights and responsibilities when receiving care at a distance (through telemedicine) including the right to refuse to use telemedicine, in compliance with the right to refuse treatments in the Act.
- Support staff: Non-clinical personnel present shall sign a confidentiality agreement.

**Technical Specifications**

The specifications below provide a general overview of technical specifications for equipment. It is important that every institution start with at least the minimum requirements to have a Videoconference session as a wide array of equipment and standards-based software is available that can greatly enhance the capabilities and usefulness of the videoconferencing system. Telepsychiatry users, where available, practical and affordable, should be able to:

- Display static pictures, diagrams, or objects.
- View and share a computer desktop or applications.
- Play videos or CDs so people at other locations can see and hear them.
- Record meetings when clinically appropriate and with MHCU permission.
- Share information on a common white board or via computer files.

Other desirable features of a videoconferencing system include:

- Ease of use with minimum operator training.
- Availability of remote camera control so that a clinician can pan, tilt, and zoom (PTZ) the camera on the MHCU end for close-up views (Table V):
  - Easy-to-understand visual cues to give user feedback on features selected.
  - On screen messages to notify the user of such conditions as loss of far end video, incomplete or dropped connections, mute / unmute etc.
  - Option to view the picture sent as well as the picture received simultaneously (known as 'picture-in-picture' or PIP).

**Table V: Suggestions to improve a consultation by videoconference**

**Local site**

- Camera is set up initially to view every-one in room at local site
- Camera allows the consultant to view the patient in full as well as zoom in on face close up
- When interviewing, consultant should zoom in on person being interviewed
- Encourage person interviewed to look into camera and not on monitor
- Ensure microphone is directed at the person speaking
- Wait for the person at the other site to stop speaking before responding

**Consultant site**

- Camera is set up, initially zoomed in on the consultant psychiatrist's face to enable the people at the local site to see the consultant close up
- Consultant to wear a solid color (not white) to prevent a vibrating or distorted image
- Don't shuffle papers, as microphone will pick up all noises.
- Wait for the person at the other site to stop speaking before switching microphone on to respond

**Monitoring**

- A Telepsychiatry Record Keeping form shall be completed after every tele-consultation.

- Audio at 7 kHz full duplex with echo cancellation (capable of eliminating room return audio echo), with easy-to-use mute function and volume adjustment.
- Standard computer and peripheral ports for transmission of data.
- Ability to operate at a bandwidth of 384 Kbps or higher.
- Capacity for software upgrades as improvements become available.

**Physical Location/Room Requirements**

Videoconferencing takes place via digital telephone lines (ISDN) or over TCP/IP (utilizing a local area network (LAN), wide area network (WAN), or broadband Internet connection. Conferencing can be established between just two locations (called point-to-point) or among a number of sites simultaneously (called multi-point).

**Sound**

**Microphones:** High quality microphones and speakers ensure effective aural communication and should be used in telepsychiatry consultations to ensure accurate interpretation of the MHCU's and TMHP spoken communication. High-quality audio is essential to the success of telepsychiatry services, capturing the nuances of conversation that are often vital in making appropriate diagnoses. Microphone type and placement are extremely important, as are the acoustical properties of the room used. Most flat "conference-style" microphones are adequate to pick up sounds around a table or in a room, as long as the microphones are placed on a hard, flat surface at desk or table-top level. Many will also work well if placed on a flat wall at about head level for a seated person. If no flat surface is available, or if the MHCU is active or agitated, an omni-directional microphone can be hung from the

center of the ceiling. "Quiet" rooms (those with carpeting, soft furniture, acoustical treatments, or other sound absorbing characteristics) allow for better intelligibility of transmitted speech.<sup>40-42</sup>

#### **Transmission Speed and Bandwidth**

Internationally, most telepsychiatry programs use systems that transmit data at a minimum of 384 Kbps. Transmission speed shall be the minimum necessary to allow the smooth and natural communication pace necessary for clinical encounters. Research into the quality of data transmission has shown that viewers perceive a marked difference in quality between 128 and 384 Kbps, but report less noticeable difference between 384 and 768 Kbps, although the proportionate cost increase is often much larger at the higher transmission speed. The use of lower bandwidths is necessary in some locations due to lack of, or expense of, broadband access and the need to provide services to disparate and/or remote populations.

#### **Image Storage, Retrieval and Transmission**

**Security:** For telepsychiatry services provided, all legal requirements shall be followed at all times to protect MHCU privacy. Measures to safeguard data against intentional and unintentional corruption shall be in place during both storage and transmission.

**Privacy:** Network and software security protocols to protect confidentiality shall be provided as well as appropriate user accessibility and authentication protocols. Privacy requirements in other countries shall be followed for telepsychiatry services provided in those countries. Telepsychiatry services being provided across political boundaries shall be in conformance with privacy requirements in both locations. This is governed by the Promotion of Access to Information Act 2000, the Bill of Rights Section 14 and the Mental Health Care Act, No 17 of 2002. However, doctor-patient relationship has NO absolute privilege, and disclosure of patient data may be authorized by a court of law or in an emergency situation (Mental Health Act No, 17 2002 13 (1) (2) and (3)). Section 51 of the Promotion of Access to Information Act No 2 of 2000 (PAIA) requires that information be made available to the public according to the procedure for requesting information in the Act, for the purpose of exercising or protecting rights. As per the National Health Act all users have a right of access to their medical records. The user should have explicit assurance regarding appropriate confidentiality of the Telepsychiatry session; if anyone other than the interviewing consultants or health care worker is to be present, the consent of the user should be obtained for this arrangement.

**Confidentiality:** Network and software security protocols to protect confidentiality shall be provided as well as appropriate user accessibility and authentication protocols

**Encryption:** Consistent with South African legislation and practice, video sessions shall be secured to the greatest practical extent.

**Resolution:** The resolution of the display monitor should match as closely as possible the resolution of the acquired image being displayed, or the originally acquired image

resolution should be accessible using zoom and pan functions.

**Interoperability:** Equipment shall be based on standards which allow successful conferencing regardless of platform or manufacturer. The ITU standards that shall be used comprise the H (video), G (audio) and T (data) series.

**Videoconferencing with Personal Computers:** The same guidelines on bandwidth apply. The monitor should be at least 15" with a display at least 800 x 640 resolutions.

**TCP/IP:** There are continuing innovations in software protocols designed to assure consistently high quality signals (called "quality of service" or QOS) for videoconferencing systems using IP networks. The use of these protocols (which are usually implemented in the videoconferencing system itself) can significantly improve the quality of transmission over an IP network.

#### **Integrated Services Digital Network (ISDN):**

Videoconferencing over ISDN is governed by the H.320 ITU standard, which includes a number of associated standards to control video, audio, and data flow. ISDN connections usually use a multiplexer (MUX) to aggregate 2-6 individual phone lines into a single high-bandwidth connection. As each line transmits at 64 kbps, a minimum of 6 lines should be used to ensure transmission at least at 384 kbps.

#### **Physical Location/Room Requirements**

During a telepsychiatry session, both locations shall be considered a MHCU examination room regardless of a room's intended use.

#### **Room Set-up**

Both sites shall be appropriately designed with audio and visual privacy and, additionally, the originating site shall have the ability to accommodate posture and movement visualization by the MHCP.<sup>43</sup> The ability to view written or drawn material should also be available. Rooms shall be designated private for the duration of the telepsychiatry session and no unauthorized access shall be permitted. The organization shall take every precaution to ensure the privacy of the consultation and the confidentiality of the MHCU. All persons in the examination room at both sites shall be identified to all participants prior to the consultation and the MHCU's permission shall be obtained for any visitors or clinicians to be present during the session.

#### **Room Lighting**

The room in which videoconferencing is used shall be well lit (150 ft candles at the MHCU site is recommended), preferably using light sources as close to day light as possible (i.e., fluorescent day-light or full spectrum bulbs rather than incandescent). The room shall be comfortably lit for the MHCU and lit well enough for the provider to see the MHCU without shadows falling on the MHCU's face or other areas where clinical data is being displayed (such as lower extremities, hands, etc.). The lighting of the provider's space shall meet the same requirements in that the MHCU must be able to see the face of the provider with no shadowing.

**Backdrop**

Backdrops behind the MHCU and provider should be clean and plain in color and without distractions such as office papers, book shelves, etc. Blue is an optimum color for backdrops as blue neither reflects nor absorbs light, is a calming color, and helps to accentuate the area of interest.

**Ergonomic Considerations**

The comfort of the mental health professional undertaking the consultations should be considered to prevent fatigue and computer vision syndrome problems common with prolonged/increased computer interactions.<sup>44</sup>

**Gaze Angle**

Gaze angle is the angle between the near participant's camera and where the near participant looks at the onscreen far participant (eye contact). The vertical location of the far participant on the screen will affect gaze angle. Gaze angles of approximately 5 to 7 degrees are imperceptible to most persons. Gaze angle should be as small as practical.

**Administrative SOPs**

Organizations shall aim to comply with the telepsychiatry SOPs for setting up services (Table VI), the technical readiness of the telehealth equipment and the clinical environment.

- Organizations providing telehealth services should have processes in place to ensure the safety and effectiveness of equipment through on-going support and maintenance.
- Organizations providing telehealth services should have policies and procedures in place to ensure the physical security of telehealth equipment and the electronic security of data.<sup>44</sup>
- Organizations should have appropriate redundant systems and appropriate recovery procedures in place that ensure availability of the network for critical connectivity.
- Organizations should ensure compliance with all relevant safety laws, regulations, and codes for technology and technical safety.
- Organizations should have infection control policies and procedures in place for the use of telehealth equipment and MHCU peripherals.

**Policy Related Steps to Optimize Telepsychiatry Practices**

It is critical to develop policies and procedures to ensure consistent implementation of telepsychiatry program functions. In developing a policy, these issues shall be addressed:

- Release of information and informed consent
- Identifying all required MHCU information for a referral/consultation
- A reliable process for communicating findings after consultations
- Ensuring privacy and confidentiality
- Intake procedures and screening

**Table VI: Sample Technical SOPs for setting up a Local Telepsychiatry Service**

**Organizing the local Telepsychiatry Program**

- Hospitals or facilities with videoconference venues that want to set up a Telepsychiatry Service should be linked to a Consultant Psychiatrist who is responsible for: Consultation Liaison services to District Hospitals for consultations and for inpatient liaisons for MHCU, ongoing support for rural mental health care inpatient and outpatient services and clinical Education

**Supporting the Telepsychiatry Program**

- The Telepsychiatry Program should be supported by a local Telemedicine Site Coordinator at the local Hospital
- The Site Coordinator shall be responsible for ensuring that the scheduling is done, the venue is booked, equipment is functioning, all relevant staff are notified, that the session runs smoothly and that all records and logs are maintained

**Scheduling and Support**

- A scheduling system should be set up between the local and the consulting sites and supported by the Hospital Site Coordinator
- Scheduling activities include clinical consultations, clinical teaching sessions and training sessions
- Every session should be booked with type of session, dates, times, number of consultations and virtual consultant psychiatrist on duty for each session to be clearly identified in advance

**Venue**

- Telepsychiatry clinical venues should conform to the standard requirement for Telepsychiatry venues
- For Telepsychiatry consultations the room should be set up as close as possible to resemble a face-to-face consultation
- Consultant sites should also include all reference material, which could be used by the consultant (Mims, DSM) etc.

**Bandwidth**

- Evidence suggests that a minimum of 128 kbps reserved-bandwidth connection provides sound and image quality suitable for mental health consultations, but that 384 kbps is the preferred bandwidth
- If the bandwidth is not adequate, consultation should be restricted to consultations without the MHCU or for follow up consultations

**Equipment**

Equipment should include at least:

- A high resolution monitor with a minimum of an 36" screen
- An omni-directional microphone
- A camera which can capture the entire room, have tilt, zoom and pan movement, an automatic iris adjustment and remote control
- The monitor and camera should be facing the patient. It seems to work best with the camera mounted on top or on the side of the monitor, which allows "eye contact" with minimal effort

- Staff roles and responsibilities
- Transmission of MHCU data
- Use of electronic medical records if available
- Appointment scheduling
- Transmission of prescriptions, laboratory orders and progress notes
- Evaluation and measurement of MHCU outcomes
- Quality improvement & Safety
- Licensing, liability and malpractice insurance
- Continuous training
- Record keeping & monthly logs

Table VII: Digital Standards	
Standard	Description of Standard
ITU-T	The International Telecommunications Union has established a series of standards (H.300) for VTC. It includes such sections as the H.320 series for circuit-switched, n x 64 (i.e., ITU-T); the H.323series: packet-switched/network, Internet Protocol; and the H.324: Plain Old Telephone Service (POTS).
Session Initiation Protocol (SIP):	The Internet Engineering Task Force RFC 3261 also applies to VTC. SIP is a text-based protocol for initiating interactive communication sessions between users, including voice, video, chat, and virtual reality
Common Compression methods	Some of the most common compression methods used for still images includes the following. The method used depends on the achievable compression ratio and the number and types of artifacts created during compression. Lossless compression allows for the reconstruction of the exact original data prior to compression without any loss of information. Lossy compression refers to methods that lose data once the image has been compressed and uncompressed. The level of compression and method used affect the amount of data loss and whether or not it is visually perceptible. The type and level of compression may vary depending on the type of exam. Different compression algorithms will achieve different compression ratios with varying degrees of artifacts. The choice of compression method and level should be reviewed periodically for each image and exam type, to insure that artifacts are not perceptible. It should be noted that lossy compression can affect the colors in an image.
JPEG (2000)	JPEG 2000 uses wavelet technology that allows an image to be retained without any distortion or loss. File extensions for JPEG 2000 are either .jp2 or .j2c (traditional JPEG is either .jpg or .jpeg).
TIF	Tagged Image File Format used for formatting and compressing images. It can be lossy or lossless. The file extension TIF is tiff or tif.
WAV	A method of compression using wavelets transforms (mathematical functions that divide data based on frequency components). There are a variety of file extensions depending on the wavelet method used. It can be lossy or lossless.
HL7	Health Level Seven is one of several American National Standards Institute (ANSI) Standards Developing Organizations (SDOs) operating in the healthcare arena. Health Level Seven's domain is clinical and administrative data.

### Existing Digital Imaging Standards<sup>2</sup>

This is not meant to be a comprehensive list of all existing standards, but rather provides a description of the standards most relevant to the practice of telepsychiatry (Table VII).

### Telemedicine/Telehealth Glossary<sup>2</sup>

The following is a list of terms and definitions that are commonly used in telemedicine and telehealth (Table VIII). The list was assembled for the purpose of encouraging consistency in employing these terms in American Telemedicine Association related documents and resource materials. The list is not all-inclusive and may be augmented by specialty areas as deemed appropriate.

### Acknowledgement

These guidelines are based on the Practice Guidelines for Videoconferencing-Based Telemental Health of the American Telemedicine Association which have been adapted to meet local circumstances. They have been endorsed by the South African College of Psychiatrists. The guide lines were developed by Jennifer Chipps , Suvira Ramlall and Maurice Mars.

### References

1. APA Board of Trustees. American Psychiatric Association Resource Document on Telepsychiatry Via Videoconferencing 1998; Available from: <http://www.psychiatry.med.uwo.ca/ecp/>

[info/toronto/telepsych/Appendix%20II.htm](http://www.psychiatry.med.uwo.ca/ecp/info/toronto/telepsych/Appendix%20II.htm)

2. Yellowlees P, Shore J, Roberts L. Practice Guidelines for Videoconferencing-Based Telemental Health. 2009; Available from: [http://www.americantelemed.org/files/public/standards/EvidenceBasedTelementalHealth\\_WithCover.pdf](http://www.americantelemed.org/files/public/standards/EvidenceBasedTelementalHealth_WithCover.pdf).
3. Grady B, Myers KM, Nelson EL, Belz N, Bennett L, Carnahan L, et al. Evidence-based practice for telemental health. *Telemed J E Health* 2011;17(2):131-148.
4. Shekelle GP, Woolf SH, Eccles M, Grimshaw J. Clinical guidelines: Developing guidelines. *BMJ* 1999(318):593.
5. Canadian Telepsychiatry Association. Telepsychiatry: Clinical Guidelines and Procedures for Clinical Activities Available from: [www.psychiatry.med.uwo.ca/ecp/info/toronto/telepsych/telepsychguide.html](http://www.psychiatry.med.uwo.ca/ecp/info/toronto/telepsych/telepsychguide.html)
6. Myer L, Cain S. Practice Parameter for Telepsychiatry with Children and Adolescents. *J Am Acad Child Adolesc Psychiatry* 2008;47(12):1468-1483.
7. Yellowlees P, Marks S, Hilty D, Shore JH. Using e-health to enable culturally appropriate mental healthcare in rural areas. *Telemed J E Health* 2008;14(5):486-492.
8. Montani C, Billaud N, Tyrrell J, Fluchaire I, Malterre C, Lauvergnay N, et al. Psychological impact of a remote psychometric consultation with hospitalized elderly people. *J Telemed Telecare* 1997;3(3):140-145.
9. Brennan JA, Kealy JA, Gerardi LH, Shih R, Allegra J, Sannipoli L, et al. Telemedicine in the emergency department: a randomized

<b>Table VIII: Glossary</b>	
<i>Term</i>	<i>Definition</i>
<b>Asynchronous:</b>	This term is sometimes used to describe store and forward transmission of medical images or information because the transmission typically occurs in one direction in time. This is the opposite of synchronous (see below).
<b>Bandwidth:</b>	A measure of the information-carrying capacity of a communications channel e.g. 128kbps.
<b>CODEC:</b>	Acronym for coder-decoder. This is the videoconferencing device (e.g., Polycom, Tandberg, Sony, Panasonic, etc) that converts analog video and audio signals to digital video and audio code and vice versa. CODECs typically compress the digital code to conserve bandwidth on a telecommunications path.
<b>Compressed video:</b>	Video images that have been processed to reduce the amount of bandwidth needed to capture the necessary information so that the information can be sent over a telephone network. Some compression techniques result in the loss of some information, which may or may not be clinically important.
<b>Consultant Site:</b>	The consultant site is defined as the telehealth site where the provider/specialist is seeing the MHCU at a distance or consulting with a MHCU's provider. Other common names for this term include – hub site, specialty site, provider/physician site and referral site. The site may also be referred to as the distant site.
<b>Digital Camera (still images):</b>	A digital camera is typically used to take still images of a MHCU. This camera produces images that can be downloaded to a PC and sent to a provider/consultant over a network.
<b>Distance Learning:</b>	The incorporation of video and audio technologies, allowing students to "attend" classes and training sessions that are being presented at a remote location. Distance learning systems are usually interactive and are a tool in the delivery of training and education to widely dispersed students, or in instances in which the instructor cannot travel to the student's site.
<b>Document Camera:</b>	A camera that can display written or typed information (e.g., laboratory results), photographs, graphics (e.g., ECG strips) and in some cases x-rays.
<b>Electronic MHCU Record:</b>	An electronic form of individual MHCU information that is designed to provide access to complete and accurate MHCU data, alerts, reminders, clinical decision support systems, links to medical knowledge, and other aids.
<b>Guideline:</b>	A statement of policy or procedures by which to determine a course of action, or give guidance for setting standards.[50]
<b>Health Practitioner:</b>	A health professional involved in the provision of health care services to a MHCU
<b>Integrated Services Digital Network (ISDN):</b>	This is a common dial-up transmission path for videoconferencing. Since ISDN services are used on demand by dialing another ISDN based device, per minute charges accumulate at some contracted rate and then are billed to the site placing the call. This service is analogous to using the dialing features associated with a long distance telephone call. The initiator of the call will pay the bill. One ISDN line permits connections up to 128Kbps.
<b>Internet Protocol:</b>	The Internet Protocol (IP) is the protocol by which data is sent from one computer to another on the Internet. Each computer on the Internet has at least one address that uniquely identifies it from all other computers on the Internet. IP is a connectionless protocol, which means that there is no established connection between the end points that are communicating. The IP address of a videoconferencing system is its phone number.
<b>Mental Health Care Practitioner:</b>	A mental health professional providing mental health care services to a MHCU
<b>MHCU:</b>	A Mental Health Care user
<b>MHCU site:</b>	The MHCU site is where the MHCU and/or the MHCU's physician are located during the telehealth encounter or consult (CMS). Other common names for this term include – spoke site, local site, remote site, and rural site or originating site
<b>MHCU Exam Camera: (video)</b>	This is the camera typically used to examine the general condition of the MHCU. Types of cameras include those that may be embedded with set-top videoconferencing units, handheld video cameras. The camera may be analog or digital depending upon the connection to the videoconferencing unit.
<b>POTS:</b>	Acronym for Plain Old Telephone Service.
<b>Presenter (MHCU Presenter):</b>	Telehealth encounters require the distant provider to perform an examination of a MHCU from many miles away. In order to accomplish that task an individual with a clinical background (e.g. Registered Nurse) trained in the use of the equipment must be available at the originating site to "present" the MHCU, manage the cameras and perform any "hands-on" activities to successfully complete the examination. For example, a neurological diagnostic examination usually requires a nurse capable of testing a MHCU's reflexes and other manipulative activities.
<b>Store and Forward (S&amp;F):</b>	S&F is a type of telehealth encounter or consult that uses still digital images for the purpose of rendering a medical opinion or diagnosis. Common types of S&F services include radiology, pathology, and dermatology and wound care. Store and forward also includes the asynchronous transmission of clinical data, such as blood glucose levels and electrocardiogram (ECG) measurements, from one site (e.g., MHCU's home) to another site (e.g. hospital, clinic)
<b>Synchronous:</b>	This term is sometimes used to describe interactive video connections because the transmission of information in both directions is occurring at exactly the same period.
<b>Telementoring:</b>	The use of audio, video, and other telecommunications and electronic information processing technologies to provide individual guidance or direction. An example of this help may involve a consultant aiding a distant clinician in a new medical procedure
<b>Telepresence</b>	The method of using robotic and other instruments that permit a clinician to perform a procedure at a remote location by manipulating devices and receiving feedback or sensory information that contributes to a sense of being present at the remote site and allows a satisfactory degree of technical achievement. For example, this term could be applied to a surgeon using lasers or dental hand pieces and receiving pressure similar to that created by touching a MHCU so that it seems as though s/he is actually present, permitting a satisfactory degree of dexterity.
<b>Videoconferencing Systems:</b>	Equipment and software that provide real-time, generally two way transmission of digitized video images between multiple locations; uses telecommunications to bring people at physically remote locations together for meetings. Each individual location in a videoconferencing system requires a room equipped to send and receive video.
<b>Videoconferencing</b>	Real-time, generally two way transmission of digitized video images between multiple locations; uses telecommunications to bring people at physically remote locations together for meetings. Each individual location in a videoconferencing system requires a room equipped to send and receive video.

- controlled trial. *J Telemed Telecare* 1999;5(1):18-22.
10. Zaylor C. Clinical outcomes in telepsychiatry. *J Telemed Telecare*. 1999;5 (Suppl 1):59-60.
  11. Mielonen ML, Ohinmaa A, Moring J, Isohanni M. Psychiatric inpatient care planning via telemedicine. *J Telemed Telecare* 2000;6(3):152-157.
  12. Pollard SE, LePage JP. Telepsychiatry in a rural inpatient setting. *Psychiatr Serv* 2001;52(12):1659.
  13. Miller TW, Kraus RF, Kaak O, Sprang R, Burton D. Telemedicine: a child psychiatry case report. *Telemed J E Health* 2002;8(1):139-141.
  14. Kennedy C, Yellowlees P. The effectiveness of telepsychiatry measured using the Health of the Nation Outcome Scale and the Mental Health Inventory. *J Telemed Telecare* 2003;9(1):12-16.
  15. Nelson EL, Barnard M, Cain S. Treating childhood depression over videoconferencing. *Telemed J E Health* 2003;9(1):49-55.
  16. Broder E, Manson E, Boydell K, Teshima J. Use of Telepsychiatry for Child Psychiatric Issues: First 500 Cases. *CPA Bulletin de l'APC [serial on the Internet]*. 2004. Available from: <https://www1.cpa-apc.org/Publications/Archives/Bulletin/2004/june/broder.asp>.
  17. Major J. Telemedicine room design. *J Telemed Telecare* 2005;11(1):10-14.
  18. Sorvaniemi M, Ojanen E, Santamaki O. Telepsychiatry in emergency consultations: a follow-up study of sixty patients. *Telemed J E Health* 2005;11(4):439-441.
  19. Pineau G, Moqadem K, St-Hilaire C, Perreault R, Levac E, Hamel B, et al. Telehealth: clinical guidelines and technological standards for telepsychiatry. Agence d'Evaluation des Technologies et des Modes d'Intervention en Sante (AETMIS). ; 2006 [cited 75. ]; Available from: <http://www.aetmis.gouv.qc.ca/>.
  20. O'Reilly R, Bishop J, Maddox K, Hutchinson L, Fisman M, Takhar J. Is telepsychiatry equivalent to face-to-face psychiatry? Results from a randomized controlled equivalence trial. *Psychiatr Serv* 2007;58(6):836-843.
  21. Brennan JA, Kealy JA, Gerardi LH, Shih R, Allegra J, Sannipoli L, et al. A randomized controlled trial of telemedicine in an emergency department. *J Telemed Telecare* 1998;4 (Suppl 1):18-20.
  22. Yellowlees P, Harry D. What standards should we develop for collection of data about telemedicine encounters to better facilitate research? *J Telemed Telecare* 2006;12(Suppl 2):S72-76.
  23. Shore JH, Hilty DM, Yellowlees P. Emergency management guidelines for telepsychiatry. *Gen Hosp Psychiatry* 2007;29(3):199-206.
  24. McLaren P, Ahlbom J, Riley A, Mohammedali A, Denis M. The North Lewisham telepsychiatry project: beyond the pilot phase. *J Telemed Telecare* 2002;8 (Suppl 2):98-100.
  25. Rosina R, Starling J, Nunn K, Dossetor D, Bridgland K. Telenursing: clinical nurse consultancy for rural paediatric nurses. *J Telemed Telecare* 2002;8 (Suppl 3):S3:48-49.
  26. Simpson S, Knox J, Mitchell D, Ferguson J, Brebner J, Brebner E. A multidisciplinary approach to the treatment of eating disorders via videoconferencing in north-east Scotland. *J Telemed Telecare* 2003;9 (Suppl 1):37-38.
  27. Fahey A, Day NA, Gelber H. Tele-education in child mental health for rural allied health workers. *J Telemed Telecare* 2003;9(2):84-88.
  28. Shore JH, Savin DM, Novins D, Manson SM. Cultural aspects of telepsychiatry. *J Telemed Telecare* 2006;12(3):116-121.
  29. Nieves JE, Stack KM. Hispanics and telepsychiatry. *Psychiatr Serv* 2007;58(6):877-878; author reply 878.
  30. Ball C, Tyrrell J, Long C. Scoring written material from the Mini-Mental State Examination: a comparison of face-to-face, fax and video-linked scoring. *J Telemed Telecare* 1999;5(4):253-256.
  31. Ball C, Puffett A. The assessment of cognitive function in the elderly using videoconferencing. *J Telemed Telecare* 1998;4 (Suppl 1):36-38.
  32. Lee JH, Kim JH, Jhoo JH, Lee KU, Kim KW, D.Y. L. A telemedicine system as a care modality for dementia in Korea. *Alzheimer Dis Assoc Disord* 2000;14(2):94-101.
  33. Jacobsen SE, Sprenger T, Andersson S, Krogstad J-M. Neuropsychological assessment and telemedicine: a preliminary study examining the reliability of neuropsychology services performed via telecommunication. *J Int Neuropsychol Soc* 2003;9(3):472-478.
  34. Hildebrand R, Chow H, Williams C, Nelson M, Wass P. Feasibility of neuropsychological testing of older adults via videoconference: implications for assessing the capacity for independent living. *J Telemed Telecare* 2004;10(3):130-134.
  35. Cullum CM, Weiner MF, Gehrmann HR, Hynan LS. Feasibility of Telecognitive Assessment in Dementia. *Assessment* 2006;13(4):385-390.
  36. Loh P-K, Donaldson M, Flicker L, Maher S, Goldswain P. Development of a telemedicine protocol for the diagnosis of Alzheimer's disease. *J Telemed Telecare* 2007;13(2):90-94.
  37. Cain S, Spaulding RJ, editors. *Telepsychiatry: lessons from two models of care. Clinical Perspectives, presented at the 53rd Annual Meeting of the American Academy of Child and Adolescent Psychiatry*; 2006; San Diego CA.
  38. Myers K, Valentine J, Morganthaler R, Melzer S. Telepsychiatry with incarcerated youth. *J Adol Health* 2006;38(6):643-648.
  39. Mental Health Act Regulations, 474 15/12/2004 N.27117. Pretoria: Government Gazette ROSA; 2004.
  40. Wootton R, Yellowlees P, McLaren P. *Telepsychiatry and e-Mental Health*. Glasgow: Bell and Bain. ; 2003.
  41. Harte L. *Introduction to IP Video: Digitization, Compression and Transmission*. USA Althos Publishing 2007.
  42. Tam T, Cafazzo JA, Seto E, Saleniaks ME, Rossos PG. Perception of eye contact in video teleconsultation. *J Telemed Telecare* 2007;13(1):35-39.
  43. Health and the Information Highway Division. *Telemental Health in Canada: A Status Report*. 2004; Available from: <http://www.hc-sc.gc.ca/hcs-sss/pubs/ehealth-esante/2004-tele-mental/index-eng.php>.
  44. Occupational Safety & Health Administration (OSHA) workstation solutions.; Available from: <http://www.osha.gov/SLTC/etools/computerworkstations/index.html>.