High Definition 3D Telemedicine: the next frontier?

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HD3D overview

Quality of Use: more than face to face

HD3D installations

3D Stereoscopy

Retinal disparity
- Glasses
  - Anaglyph red/green
  - Activeshutter system
- No glasses
  - Autostereoscopy

Quality of use

LeRogue et al 2007 Use quality critical success factors for full organizational, clinical and social context of telemedicine
- Technological - useability
- Orchestration – workflow, co-ordination of medical team
- Communication
  - Telepresence – immersion, being there
  - Access to records
  - Professionalism
HD3D in Tele-medicine

- Radiology
- Surgical:
  - 3D endoscopy
  - 3D laparoscopic
- Surgical training
  - Virtual 3D liver
- Wound
  - 3D wound reconstruction

HD3D Telemedicine: the next frontier?

12 Sites in Victoria
State govt funded.
tele dentistry,
tele-psychiatry,
tele-oncology,
tele-wound,
tele-geriatrics

Tele-wound

- Description: Nurses in the home, Nhill, Bundoora, Ballarat transmit images to scarce wound specialists. Store and forward solution. HD3D screen for wound specialist.
- Business case: Low cost. Easily recovered by saving wound specialist travel and hospital admissions
- Use quality:
  - Technological: S&F Low tech, Color calibration, Automated Depth – wound reconstruction
  - Orchestration: Same equipment. Schedule and hold a video conference not so practical
  - Communication: Telepresence, Realism, Records,
  - Professionalisms

Tele-psychiatry

- Description: Psychiatrist at Uni Melb HD3D video conference with patients at Ballarat.
- Business case: Prompt, accurate assessment - keep patients in community
- Use quality:
  - Technological: Synchronous video conference. AARNET. Glasses ok
  - Orchestration: Short consultations between monthly face to face
  - Communication: Telepresence, Realism, Records - no. Professionalism
Tele-psychiatry
- **Description:** Psychiatrist/patients at Ballarat Hospital HD3D video conference with patients/psychs at Horsham.
- **Business case:** Prompt, accurate assessment - earlier hospital discharge.

**Use quality**
- **Technological:** Synchronous video conference. Network latency. Glasses ok
- **Orchestration:** Consultations easy to schedule
- **Communication:** Telepresence, Realism.

Tele-oncology
- **Description:** Private oncologist in Ballarat visits Horsham patients once a week.
- **Business case:** Short consultation day after chemotherapy instead of waiting a week.

**Use quality**
- **Technological:** Glasses not ok. HD3D videos by nurse practitioner uploaded to S&F
- **Orchestration:** Short consultations readily fits into nurse practitioner and oncologist schedule
- **Communication:** Telepresence, Realism. DVD recording of consultation for patient take home

Tele-dentistry
- **Description:** Attendants in aged care perform oral scans for S&F to Uni Melb Dentists for treatment plans
- **Business case:** Treatment plans enable effective triage.

**Use quality**
- **Technological:** S&F with 2D video. 3D camera under development
- **Orchestration:** Largely asynchronous. Tele-dental kit costs. New role for attendants
- **Communication:** Treatment plans without interaction. Ergonomics

Tele-geriatrics
- **Description:** Patient in aged care facility, geriatrician in Bundoora
- **Business case:** Saves geriatrician travel time. Patient seen promptly saves escalation

**Use quality**
- **Technological:** S&F with HD3D video. Vernet/NBN network
- **Orchestration:** S&F preparation. Synchronous consultation
- **Communication:** Telepresence.
Conclusion: Is HD3D the next frontier?

- Enables Automated analysis: Wound depth, automated assessment
- Promises realism: Wow factor.
- User expectation: As HD3D TV/movies become the norm, expectations rise for tele-medicine
- Trial status: Installations designed and IBES test bed tested. Field trials commence 2013
- Short answer: Probably yes, if Use Quality can be secure

Questions