Usage of teleoncology

- Teleoncology delivers oncological services at a distance.
  - Remotely supervise chemotherapy administration
  - Remote planning of radiotherapy and telesurgery.
  - Monitor physical and psychological symptoms
  - Supplements experts for remote multidisciplinary meetings
  - Teleradiology and telepathology, telegenetics
  - Genetic counselling
  - Skin and eye examinations can occur by transmitting images
  - Clinical trials
Aims of Teleoncology

• The aims of the use of teleoncology include:
  – reduce rural and remote disparities in cancer outcomes, including with indigenous patients.
  – service of low-income countries which lack specialist expertise.
  – support peer interaction and education of remote practitioners and trainees.
  – provides an avenue for remote patients being able to access a second opinion.
  – Reduce travel for both patients and practitioners and this is the source of much of the cost savings.
Mobile Health

- Enables home health follow up
- Wearable devices can monitor vital signs
- Often linked to Smartphone Apps
Evaluation of a Telemedicine Link Between Darwin and Adelaide to Facilitate Cancer Management

Olver et al Telemedicine 2000, 6:213-8

- Survey 20 health professional and 8 patients
- Isolated clinicians feel better supported
- Filled gaps in Multidisciplinary team (RT)
- Decreased patient and practitioner travel
- Enhanced education and peer review
- Patients satisfied by better range of opinions
Lesson from Teleoncology Trials

- Grass roots need
- Dedicated room to make facilities accessible
- “Champion” at either end
- Should not interfere with usual practice (e.g. pathology) store and forward
- Training on the technology
- Ethics, billing and governance issues were not barriers
Is Teleoncology Effective and Cost Effective?

- Both clinical and cost effectiveness have been shown. 
  Doolittle GC et al J Telemed Telcare 1997;3:63-70
- Calculate in Kansas that the cost of a telemedicine consultation was 10% lower than an outreach clinic.
Cost effectiveness

Area with shortage of workforce, long distances and rough terrain, with 200-300 thousand people

5 Satellite centres from Townsville with regular weekly consultations plus urgent referrals

2 centres can give IV the others oral chemo
Cost Calculation

• Crowe's model was used to calculate cost.  

• Included project establishment, equipment, maintenance, communication, staffing
<table>
<thead>
<tr>
<th>Type of cost</th>
<th>Cost per centre</th>
<th>Cost for all centres for three years</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project establishment</td>
<td>6000</td>
<td>6000 X 6</td>
<td>36,000</td>
</tr>
<tr>
<td>Equipment</td>
<td>23,726</td>
<td>23,726 X 6</td>
<td>142,356</td>
</tr>
<tr>
<td>Maintenance</td>
<td>21,353 per year for all centres</td>
<td>21,353 X 3</td>
<td>64,059</td>
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<tr>
<td>Communication</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Staffing</td>
<td>50,000 per year for all centres</td>
<td>50,000 X 3</td>
<td>150,000</td>
</tr>
<tr>
<td><strong>Total cost over three years</strong></td>
<td></td>
<td></td>
<td><strong>392,415 AUD</strong></td>
</tr>
</tbody>
</table>
# Expenses prevented by Tele Health

<table>
<thead>
<tr>
<th>Description</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return travel cost for patient and one relative to Townsville</td>
<td>$474,600</td>
</tr>
<tr>
<td>- Mt Isa: 380 X 2X 600 $ = 4,600</td>
<td></td>
</tr>
<tr>
<td>- Proserpine: 11 X 2 X 150 $ = 3,300</td>
<td></td>
</tr>
<tr>
<td>- Hughenden: 10 X 2 X 260 $ = 5,200</td>
<td></td>
</tr>
<tr>
<td>- Winton: 5 X 2 X 320 $ = 3,200</td>
<td></td>
</tr>
<tr>
<td>- Doomadgee: 3 X 2 X 1,150 $ = 6,900</td>
<td></td>
</tr>
<tr>
<td>Overnight accommodation for Patient and one relative at Townsville</td>
<td>$40,900</td>
</tr>
<tr>
<td>- 100 $ X 409</td>
<td></td>
</tr>
<tr>
<td>Aero Medical Retrieval of four patients from Mt. Isa</td>
<td>$52,400</td>
</tr>
<tr>
<td>- 13,100 $ X 4</td>
<td></td>
</tr>
<tr>
<td>Specialist travel once a week</td>
<td>$72,000</td>
</tr>
<tr>
<td>- 500 $ X 48 X 3</td>
<td></td>
</tr>
<tr>
<td>Total savings over three years</td>
<td><strong>$639,900 AUD</strong></td>
</tr>
</tbody>
</table>
Cost-Benefit Analysis

Over 3 years saved $227,485

Benefit starts after first year

More centres, greater distance, more consultations more benefit
Is teleoncology as effective as standard oncology care for the treatment of cancer?

- COSA and CCA produced clinical practice guidelines for teleoncology
- Multidisciplinary care by teleoncology models is acceptable to health professionals and patients
- Use of teleoncology for multidisciplinary team care can result in management decisions similar to face to face assessments. (Grade C evidence)
Teleoncology Guidelines

• Teleoncology models of care for medical nursing and allied health
• Covers efficacy for diagnosis, screening and treatment including palliative care
• Covers privacy, legal issues and safety
A smartphone text message-based tool, consisting of behavioural strategies to address the three main reasons for oral chemotherapy non-adherence (forgetfulness, side-effects and poor knowledge of oral chemotherapy) was developed.

The tool includes delivery of oral chemotherapy intake reminders and hyperlinks to documents with information about oral chemotherapy and side-effect management.

Compliance recorded by MEMS (Micro-Electro-Mechanical) dosette boxes.
Teletrials

Australian_Teletrial_Model

COSA is recruiting a treating regional and rural patients to clinical tails by linkages with primary trial centres.
Remote supervision of medical training via videoconference in northern Australia.
Cameron et al BMJ Open 2015, 5:e006444.

- This qualitative study evaluated the Townsville teleoncology supervision model for the training of junior medical officers in rural areas of North Queensland, Australia
- Themes included the practicalities of remote supervision, challenges of recognising non-verbal cues and physical examination
- Must address training in the use of videoconferencing for supervision and admin and nursing support
Addressing International Disparities

- Internet access is now available in many LMC
- Can be linked with experts in HIC
- Human factors rather than resource factors are often obstacles – political or professional power, reluctance to seek 2nd opinions, fear of change
Summary

• Teleoncology has been shown to be cost effective and clinically effective (longer distances and greater patient numbers are key)
• Many other applications embrace education, trial participation and mobile health
• Can help with regional and international disparities