1. **INTRODUCTION**

This document reports the outcomes of a patient satisfaction survey undertaken as per Recommendation 1 of Neurology Telemedicine Feasibility Study which stated:

“Due to the small number of participants, for proper evaluation, the telemedicine clinic should be repeated and evaluated until 50 patients have completed questionnaires. “

The South West Wales Cancer Telemedicine Service agreed to manage the patient satisfaction survey for the Neurology Telemedicine Service on behalf Hywel Dda NHS Trust and Abertawe Bro Morgannwg University NHS Trust Neurology Telemedicine Service.

2. **BACKGROUND**

The Neurology service for South West Wales covers a large geographical area, over 52% of the land mass of Wales with a combination of inner city, urban and dispersed rural populations. Road infrastructure is poor and there is limited public transport; this means increased travel times for actual distances and great difficulties for patients to attend remote clinics if they do not (or cannot) drive. The tertiary specialist health services are therefore remote from the more rural areas.

Neurology clinics have been held every three months at Bronglais Hospital, Aberystwyth requiring a Consultant Neurologist to travel from Swansea (156 miles return journey, about 4 hours by car). The restrictions of the amended consultant contract mean that travel time must be included within a job plan for a service that was too infrequent to meet local demand.

An innovative approach to addressing these challenges for delivering healthcare in rural areas of West Wales was required. In an effort to improve services to patients, a study was undertaken to assess the feasibility of increasing the frequency of clinics by introducing telemedicine clinics (patient video consultations) thus also removing travel time.
3. **METHOD**

3.1 **New Service Model/Clinic Format**

Preparation work undertaken as part of the feasibility assessment prior to the first videoconference clinic included:

- Appraisal of existing neurology clinics to establish activity within the consultation. Of the patients seen (34), only 5 (15%) had physical examinations during consultation.
- Questionnaires and information pack sent to patients on waiting list (58) offering telemedicine consultations. Of the 36 replies received 89% accepted telemedicine. 11% refused telemedicine - 5% opting to travel, 6% declining any appointment preferring to be managed by own general practitioner.
- Agreement of new service model (Figure 1).

The first clinic was undertaken in February 2008. The Consultant Neurologist identified potential participants on the waiting list. They were sent information packs with appointment letters outlining change in clinic format. Patients were given the opportunity to attend in person at Carmarthen if they wished. Both new and follow up patients were considered. The patients selected were those in whom the consultation was predicted to rely very heavily upon clinical history rather than clinical signs to formulate a management plan. This leads to a predominance of follow up patients selected for this service.

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**Figure 1 – New Neurology Telemedicine model of service**
Written informed consent was obtained and all patients were asked to complete a satisfaction questionnaire at the end of the consultation. The Neurologist was based at the centre in Morriston Hospital, Swansea and a Consultant Physician and nurse with the patient at the remote site. Each patient was discussed by both clinicians prior to consultation and outcomes discussed post consultation (Figure 2).

3.2 Patient Satisfaction Questionnaire

After attending their video consultation, patients were invited to complete a patient satisfaction questionnaire. This audit of patient satisfaction continued until 50 patients had completed questionnaires. This total was achieved in April 2009.

3.3 Technology

Final equipment configuration:

- Bronglais Hospital (Outpatients Department) – Polycom VSX7000 with two 32” LCD screens
- Morriston Hospital (Rehabilitation Engineering Unit) – Polycom VSX7000 with data sharing and two 32” LCD Screens

At Morriston Hospital, the first clinic was undertaken using a Polycom PVX web camera, but this was subsequently replaced by using facilities at the Rehabilitation Engineering Unit, Medical Physics and Clinical Engineering, Morriston Hospital. Having regular access to appropriate videoconferencing equipment as provided by the Rehabilitation Engineering Unit has proved to be a vital component to the success of this project’s implementation.

The initial videoconferencing equipment used at Bronglais was a Polycom iPower 9000 unit located in the Minor Injuries Unit. However, as the process to relocate the equipment from Minor Injuries Unit to the Outpatients Department (via a lift) was cumbersome and equipment was over four years old, after a few clinics it was substituted with a Polycom VSX7000 unit which is mounted on a small cart, making it more manoeuvrable and taking up less space in the outpatients clinic room.
No investment was required for videoconferencing equipment as existing facilities were used at both sites.

**Technical outcome**

Good video was established and maintained throughout all the clinics.

Audio quality was sub optimal in the first clinic with poor video and audio synchronization. However, this was attributed to web technology at Swansea site and, subsequently swapped for improved videoconference equipment.

Audio feedback was also experienced during the first clinic causing ‘echo-effect’ when the patient was speaking. However, patients did not express any concern or reported experiencing difficulty in understanding or participating in conversation.

All issues with audio have been resolved by replacing the web technology with Polycom VSX7000 videoconference unit (see Technical Configuration above).

Staff have no issues with operating the videoconference equipment.

When comments were received about patients not being comfortable with seeing their own image, it was possible to switch off the monitor with the patient’s image as the videoconference equipment had two monitors.

4. **PATIENT SATISFACTION QUESTIONNAIRE SUMMARY**

**Detailed analysis of questionnaire is available in Attachment 1**

9 clinics held between February 2008 and April 2009. During this period 60 patients attended clinic and were given questionnaires. 50 (83%) questionnaires were completed.

Of the 50 patients who completed questionnaires, 29 (58%) were follow up, 11 (22%) were new patients - 10 (20%) were unknown as the referral section was left unanswered on the questionnaire.

17 (38%) patients were male, 28 (62%) were female - 5 were left unanswered.

All patients could see the doctor clearly, 49 (98%) were satisfied they could hear the doctor clearly and 48 (96%) felt the doctor was easy to talk to using the videolink.

48 (98%) patients were satisfied with their consultation, with 1 (2%) unsure and 1 (2%) left unanswered. However all patients were happy to use again. None of the patients were put off by the technology and all preferred to use videoconsultation close to home rather than travel to Carmarthen for face to face consultation.

None of the patients have taken the option of travelling to Carmarthen for face to face consultation.
5. **CONCLUSION**

Data from this survey suggests using telemedicine for carefully selected patients in Neurology clinics is feasible.

The benefits include:

- **Increased clinic frequency from once every three months to once every six weeks.** This has improved the patient access to consultant neurologists.
- **Removal of travelling time for the neurologist meaning better use of scarce clinical time.** Additionally, the removal of travelling time means reduced carbon emissions through travelling 156 miles from Swansea to Aberystwyth; this equates to 67Kg of CO$_2$ for each clinic held. This will be offset to some extent by the power usage of the process but is still likely to reflect a carbon saving.
- **Improved educational opportunities for staff at remote site.** The relative isolation of remote district general hospitals poses challenges to maintenance of appropriate continuing professional development. These clinics provide an opportunity for a local physician to discuss the neurological diagnosis and management of patients that will require local assistance from time to time (e.g., epilepsy). Additionally, the communications established through the telemedicine clinics has raised the potential for the regional neuroscience meetings to be linked to the remote site for both consultant and trainee education.

Our experience suggests that for appropriately selected patients a telemedicine consultation is both clinically satisfactory and meets the needs and expectations of patients.

As a result of this successful trial the new model (Figure 2) was implemented in April 2008.

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Results of Neurology Telemedicine Patient Satisfaction Questionnaire

**Question 1 – Could you see the doctor clearly?**

Yes – 50 (100%)
No – 0 (0%)
Don’t know - 0 (0%)

**Comments:**
- “Glare on eyes, would have been better sat further back from screen”
- “Nice to have local physician in the room as well”
- “Very pleased”
- “Very clear”

**Question 2 – Could you hear the doctor clearly?**

Yes – 49 (98%)
No – 1 (2%)
Don’t know – 0 (0%)

**Comments:**
- “Most times/ok/sometimes sounds a bit tinny”
- “Had some connection problem with the technology at first”
- “Some breaking up”
- “Had problem understanding the conversation (generally) but not because of the equipment”
- “Links much improved with sound quality in second clinic appointment”

**Question 3 – Did you feel the doctor was easy to talk to using the videolink?**

Yes – 48 (96%)
No – 0 (0%)
Don’t know – 2 (4%)

**Comments:**
- “Felt a bit uncomfortable with screen, used to face to face”
- “Very good idea”
- “Thought it was very effective”
- “On the whole, yes”
- “Not totally comfortable seeing myself”
- “Great, pleased with this kind of consultation”
- “Didn’t look at the screen to much due to going a bit funny last time”

**Question 4 – Are you satisfied or unsatisfied with your video consultation?**

Satisfied – 48 (98%)
Unsatisfied – 0 (0%)
Don’t know – 1 (2%)
1 left blank

**Comments:**
- “Very”
Question 5 - Would you be happy to use telemedicine for your consultation again?

Yes - 50 (100%)
No - 0 (0%)
Don't know - 0 (0%)

Comments: “Yes, thought it was very effective”
“Very pleased, third or fourth time to use it now”
“Very happy to support and encourage use of technology”
“Very impressed. Enjoyed it”

Question 6 - Were you put off by the technology?

Yes - 0 (0%)
No - 50 (100%)
Don’t know - 0 (0%)

Comments: “Difficult to continuously concentrate on issues”
“Patient appreciates technology, but didn’t like seeing herself on screen”

Question 7 - Which would you prefer?

Using videoconference close to home? - 50 (100%)
Travel to Carmarthen for face to face? - 0 (0%)
Don’t know - 0 (0%)

Comments: “Very happy”
“No particular issues today, but if I had I would prefer face to face consultation”
“All in all a brilliant idea and well worth developing”
“Very good idea”
“Would like this similar arrangement for follow up consultations with Cardiff Neurologist”
“I think this is an excellent initiative to help patients get a diagnosis and treatment”

Question 8 - Gender - Male - 17 (38%), Female 28 (62%) - 5 left blank

Question 9 - Age

Under 30 - 7 (16%)
30-45 - 6 (13%)
45-60 - 21 (47%)
60-70 - 4 (9%)
Over 70 - 7 (16%)