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Canadian Centre for Mine Action Technologies
Le Centre canadien des technologies de déminage

Midterm Report

Niagara Foot Pilot Study in Thailand

Appendices

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APPENDIX 1

Documentation for Aranyaprathet Hospital Follow Up Study of Niagara Foot

PART 1

Preparation of Materials for Aranyaprathet Hospital

Summary

1. Fourteen A4 envelopes will be prepared with the subject names on them according to the attached list.
2. Inside each envelope will be two copies of each of two forms.
 - a. Form 1 is the *Comments from the Prosthetist*.
 - i. This is printed on A4 paper.
 - ii. This is to be numbered with the patient numbers from above that correspond to the patient name on the envelope. Note that the patient name should not appear on the forms, just the number.
 - b. Form 2 is the *Feedback for the Niagara Foot*.
 - i. This is printed on the back of a post card.
 - ii. The front of the post card is addressed as follows:
Niagara Foot Project
c/o Department of Mechanical Engineering
Queen's University
Kingston, Ontario,
Canada
K7L 3N6
 - iii. The appropriate postage stamp should be affixed to the front of the post card.
 - iv. The space marked subject I.D. on the form should be numbered with the patient's number from the above list that corresponds to the patient's name on the envelope.
3. The set of envelopes should be delivered to Pin at the Director's office in the Aranyaprathet hospital.

PART 2

Process in Aranyaprathet

Preparation

The prosthetist should have:

1. A supply of envelopes that has the patient's name on it. Inside this envelope are the required forms for the two patient visits. Note that the patient's name is not to appear on the forms, just the patient's subject number. It is also important that we do not get the patient's forms mixed up.
2. The reference photograph for the prosthetist's report (Figure 1)
3. The template of the Niagara foot (Figure 2)
4. A digital camera with disk

Process

1. Contact patients
 - a. Prosthetist contacts patients to arrange appointment.
2. Patient visit
 - a. Upon arrival, the prosthetist should examine the foot and complete the "Comments from the Prosthetist" form.
 - b. Take digital photograph of foot using template (Figure 1) provided.
 - c. Take any other digital photographs as necessary.
 - d. Patient should complete the "Feedback from the patient" card with assistance from the prosthetist if necessary.
 - e. Patient should receive expense money.
 - f. Both forms and any photographs should be returned to the Director's Office at the hospital and given to Pin.
3. Pin should transcribe the prosthetists report to email format. (See attached Example)
 - a. This is what the form looks like
 - b. This is what the email looks like
4. Attach photographs to email.
5. Send email and photograph attachments to npo@me.queensu.ca
6. Send postcards to Queen's University (stamped and preaddressed) via post.

Example

a. This is what the form looks like...

Niagara Foot Pilot Study:
Comments from the Prosthetist

We are trying to assess trends in the Niagara Foot usage as part of the pilot study that is underway. When the patient returns to you, we ask that you inspect the Niagara Foot and cover to help us in understanding the wear patterns. Please fill out the following and return it to us by email, through the director's office.

Subject Number: 18

Foot Serial Number: TD 9001 0158

Is the foot worn in a shoe? Yes/No YES

- Please remove the Niagara Foot from its attachment and inspect it. Refer to **Figure 1** for corresponding numbers for location of problems.

Problem	Yes/ No	Where? (1, 4, 10 etc.)									
1. Is the foot broken?	No										
2. Is the foot cracked?	No										
3. Are there places of wear on the foot?	Yes	5	6								
4. Are there rips or any wear on the cover?	No										

Comments:
Foot comes loose sometimes when working for a long time

- Place the Niagara Foot on the profile of **Figure 2**. Please align the foot with the arrows shown. Digitally photograph the foot on the profile.
- Please have the patient fill out the patient comment card and leave it with you. When you have all patient comment cards complete, please mail them to us through the director's office.

Thank You

b. This is what the email should look like...

Subject Number: 18
 Foot Serial Number: TD 9001 0158
 The foot is worn in a shoe

Q1-No
 Q2-No
 Q3-Yes 5, 6
 Q4-No

Comments: Foot comes loose sometimes when working for a long time.

Form 1

(With Figures 1 and 2)

Form 1 Comments from the Prosthetist

We are trying to assess trends in the Niagara Foot usage as part of the pilot study that is underway. When the patient returns to you, we ask that you inspect the Niagara Foot and cover to help us in understanding the wear patterns. Please fill out the following and return it to us by email, through the director's office.

Subject Number: _____

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- Please remove the Niagara Foot from its attachment and inspect it. Refer to **Figure 1** for corresponding numbers for location of problems.

Problem	Yes/ No	Where? (1, 4, 10 etc.)									
1. Is the foot broken?											
2. Is the foot cracked?											
3. Are there places of wear on the foot?											
4. Are there rips or any wear on the cover?											
Comments:											

- Place the Niagara Foot on the profile of **Figure 2**. Please align the foot with the arrows shown. Digitally photograph the foot on the profile.
- Please have the patient fill out the patient comment card and leave it with you. When you have all patient comment cards complete, please mail them to us through the director's office.

Thank You

Figure 1.

Numbers for location of problems.

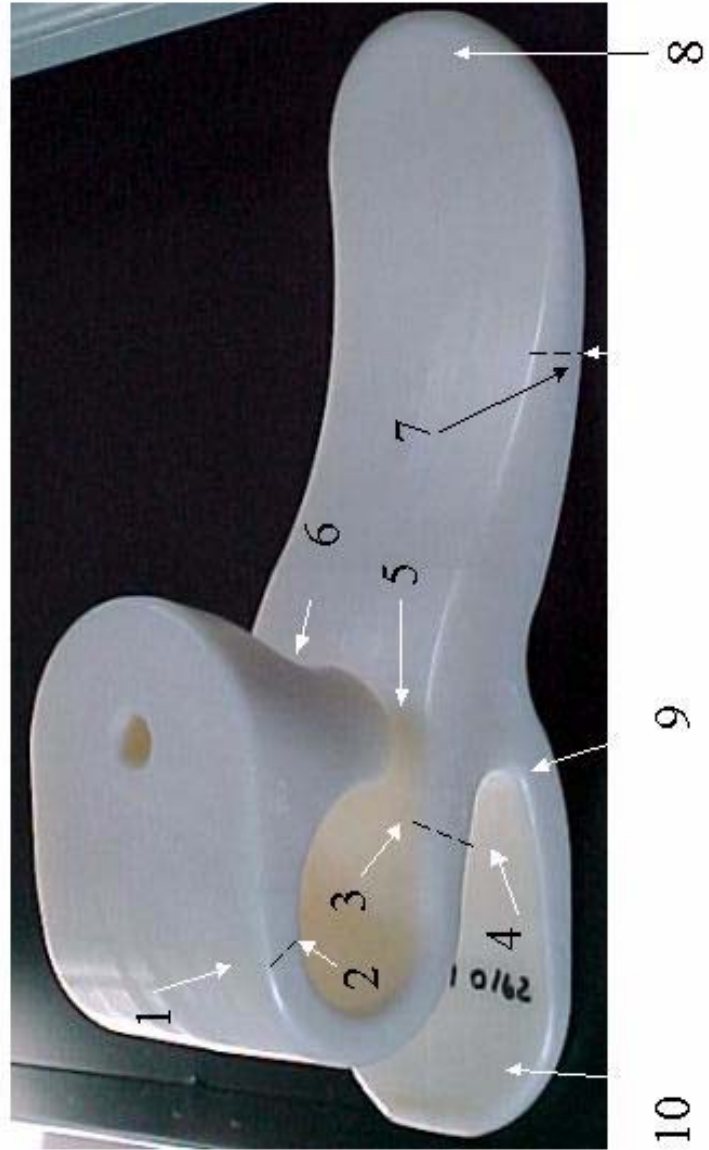
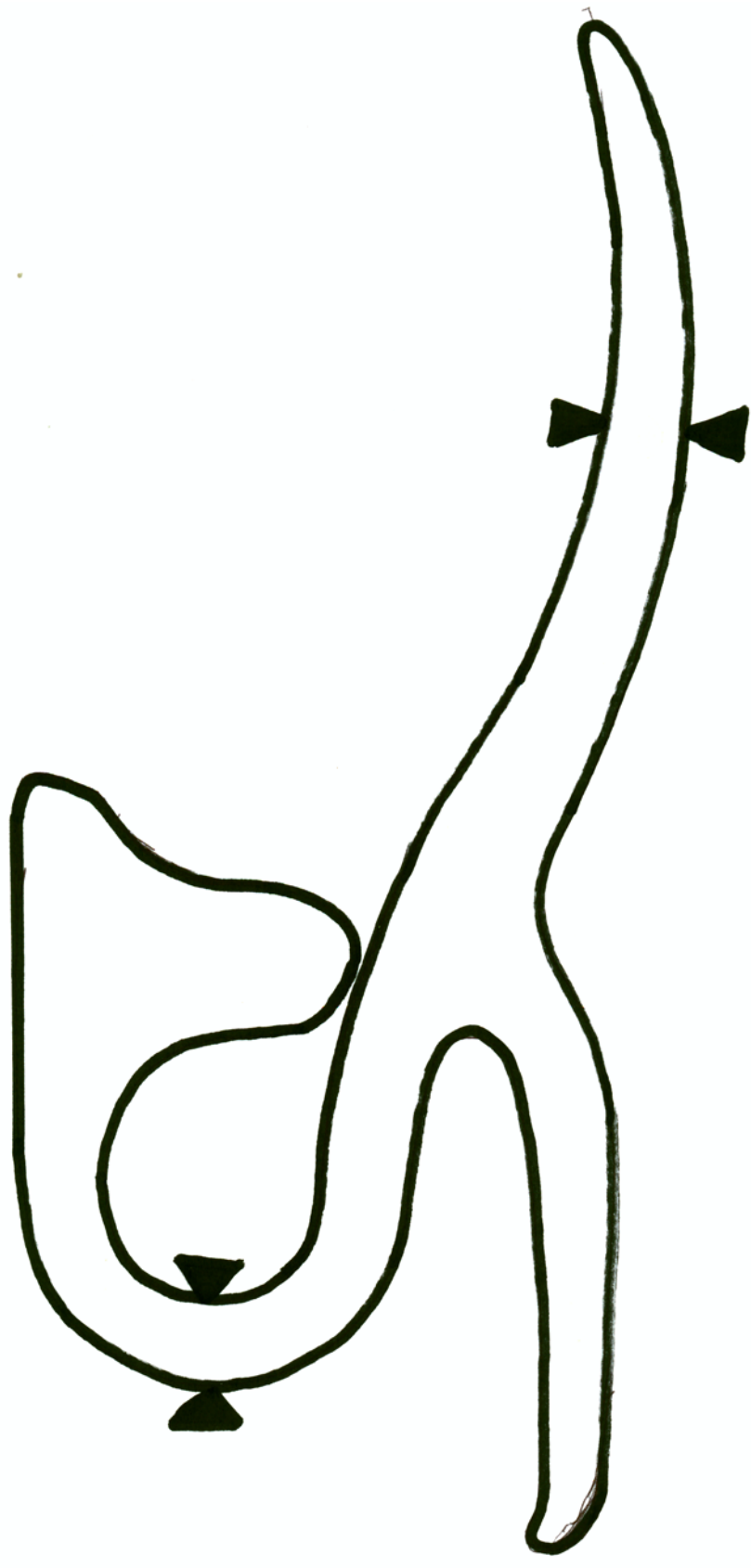


Figure 2

Template of the Niagara Foot



Form 2

Feedback for Niagara Foot

Subject ID:



10 9 8 7 6 5 4 3 2 1

1. Comfort of the prosthetic

Rating scale for item 1: 10 9 8 7 6 5 4 3 2 1

2. Ease of use

Rating scale for item 2: 10 9 8 7 6 5 4 3 2 1

3. Ease of adaptation

Rating scale for item 3: 10 9 8 7 6 5 4 3 2 1

4. Stability when standing

Rating scale for item 4: 10 9 8 7 6 5 4 3 2 1

5. Stability when walking

Rating scale for item 5: 10 9 8 7 6 5 4 3 2 1

6. Minimizes muscular effort

Rating scale for item 6: 10 9 8 7 6 5 4 3 2 1

7. Heel strike feels good

Rating scale for item 7: 10 9 8 7 6 5 4 3 2 1

8. Toe off feels good

Rating scale for item 8: 10 9 8 7 6 5 4 3 2 1

9. Opposite leg feels good

Rating scale for item 9: 10 9 8 7 6 5 4 3 2 1

10. Limb/Socket contact is good

Rating scale for item 10: 10 9 8 7 6 5 4 3 2 1

11. Do you feel that you could use this foot to walk on for the entire day? Yes No

Comments:

Thank-you!

APPENDIX 2

Field Tests for the Evaluation of the NPO Foot

Fields Tests for the Evaluation of the NPO Foot

The following tests were reported by Olney et al. in 1979 to establish objective measures of gait performance in clinically important areas of 1) fundamental skill; 2) characteristics of free walking; 3) effort of walking; and 4) walking endurance. It has been modified slightly to include measures to record the Physiological Cost Index (PCI) reported by Rose et al. 1991.

Equipment:

- minimum 15 meter measuring tape
- masking tape
- a stop watch
- 4 meter parallel bars - Height ?
- a measured distance of 15 meters
- five stairs with a rise between 13 and 17.5 cm
- A heart rate monitor would simplify recordings

Description of Test Items:

#	Test	Description
1a	Resting Pulse	The test is not administered within an hour of eating, drinking coffee or smoking. If medication could have affected heart rate, the medication name is noted under "Comments" on the recording sheet. The subject rests quietly for 10 minutes before a 20-second pulse count is taken.
1b	Effort of Walking	Heart rate is recorded at rest and after two minutes and six minutes of walking. Subjects are instructed to walk as fast as possible safely for 6 minutes. The distance walked in meters and the heart rate at the 2 and 6 minute marks is recorded.
2	Total Distance	The patient walks until he begins to feel tired or uncomfortable, or until 15 minutes has elapsed. The total distance is recorded.
3	Bilateral Stance	The subject stands upright in the parallel bars bearing weight on both limbs for as long as he can or until 30 seconds has elapsed. No hand support is used.
4	Uninvolved Limb Stance	Weight is borne on the uninvolved limb while lifting the opposite leg for as long as possible or until 10 seconds has elapsed. If necessary, the subject is permitted to steady himself lightly with one or both hands on the bar, although no weight-bearing through the hands is permitted.

5	Involved Limb Stance	Weight is borne on the involved limb lifting the opposite leg for as long as possible or until 10 seconds has elapsed. The subject is allowed to steady himself, as for item 3.
6	Dynamic Weight Transfer	Following a demonstration, the subject performs ten steps in place as rapidly as possible. The subject stands in the parallel bars and holds onto them. The first few steps are used as a warm-up and a count of zero at foot down begins the timing. The time for 10 full steps of the same foot is recorded.
7	Speeded Ambulation in Parallel Bars	The subject walks through the parallel bars, as quickly as possible using hand support. Timing starts as soon as the subject passes the uprights of the parallel bars and ends when he reaches the four-metre mark. A second trial is taken as the subject walks in the opposite direction.
8	Speeded Ambulation with Walking Aids	The subject walks as quickly as possible with his usual walking aids for four meters outside the parallel bars. The time for two trails is recorded.
9	Stair Ascent	The subject is directed to ascend five stairs at his normal speed. He uses handrails or assistive devices, and the type of aid is recorded. The stair rise must be between 13 cm and 17.5 cm high. Timing begins as soon as the subject lifts his foot in preparation for a step and ends the instant the second foot contacts the fifth stair. The time for two trials is recorded.
10	Free Cadence Walking	A straight away lap distance of 15 metres is selected and marked. The subject is asked to walk at the speed that best suited him with his usual aids. The stop watch is started when the subject's right heel contacts the starting line. The number of strides the subject takes during one lap, to the nearest quarter stride, (1 stride = from heel contact of one foot to next heel contact of same foot) is recorded.

References:

- Olney SJ, Elkin ND, Lowe PJ and Symington DC. (1979) An ambulation profile for clinical gait evaluation. *Physiotherapy Canada*, 31(2):85-90.
- Rose J, Gamble JR, Lee J, Lee R, Haskell WL. (1991) The energy expenditure index: A method to quantitate and compare walking energy expenditure for children and adolescents. *Journal of Pediatric Orthopaedics* 11:571-8.

NPO Field Trial Data Sheet

Subject Code: _____

Visit Date (dd/mm/yy): _____

Visit Number: 1 2

Subject status:

General Health 1- poor 2 - fair 3- good 4- very good 5- excellent

Right Foot _____

Left Foot _____

Weight (kgs): _____

Height (cm): _____

Age (yrs): _____

Sex: M F

Foot tested: R L

Prosthetic Foot: NPO other specify: _____

Accommodation - days adjusting to current prosthetic: _____

Test Measurements:

1a-Resting Heart Rate (beat/20 s): _____

1b-Effort of Walking

2 minutes (beat/20 s) HR: _____ Distance: _____

6 minutes (beat/20 s) HR: _____ Distance: _____

2-Total Distance (m): _____ 15 min or less

3-Bilateral Stance (s): _____ 30 s max

4-Uninvolved Limb Stance (s): _____ 10 s max

5-Involved Limb Stance (s): _____ 10 s max

6-Dynamic Weight Transfer (s): _____ 10 steps

7-Speeded Ambulation in Parallel Bars (s): _____/_____ 2 trials

8-Speeded Ambulation with Walking Aids (s): _____/_____ 2 trials

9-Stair Ascent (s): _____/_____ 2 trials - 5 stairs

10-Free Cadence Walking (15 m) Time: _____ # Strides: _____

Comments on testing:

Medication: _____

Aids used: Speeded walking (#8): _____ Stair ascent (#9): _____

