

## FOREQUARTER AMPUTEE AND MIRROR THERAPY;

### A case report on adapting the mirror box design

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#### INTRODUCTION

Mirror therapy has become a valuable treatment for persons with phantom pain. This presentation describes a case study exploring the possibilities of mirror therapy in patients with a forequarter amputation.

#### AIM

To realize mirror therapy for persons with a forequarter amputee with severe phantom pain.

#### BACKGROUND

In September 2008, Mrs. M. underwent a forequarter amputation on her right body side, secondary to the recurrence of a mamma carcinoma. In October 2009, she visited our rehabilitation department with complaints of phantom limb pain. Based on this, we decided to start a trial to explore mirror therapy in this patient.

#### PROCESS

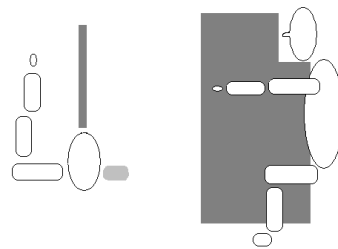
The standard mirror did not successfully create the illusion of the amputated limb being present using the reflection of the unamputated side. Table size mirror was too small to fit the whole arm and shoulder. A large "dressing" mirror was able to solve this problem for the whole arm. However, the reflection of the shoulder and arm was disturbed by mirroring due to the high amputation level in this patient, leading to the visibility of a part of the amputated upper limb during the mirror therapy. For a good illusion of the amputated limb, the unamputated limb needed to be completely blinded for the patient during the mirror therapy. Therefore, a new mirror design had to be realized.

#### Criteria for function and design:

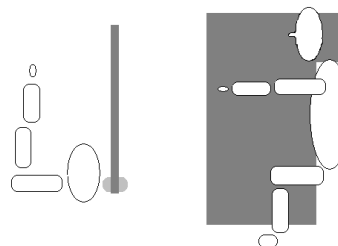
- Reflection of the unamputated arm and shoulder
- Blinding the unamputated arm and shoulder
- Usable for right and left side amputees
- Adjustable for tall and small people
- Stored easily
- Movable and transportable easily
- To carry along and forward easily by one handed person

We used the following materials: lightweight aluminum for the frame, Perspex mirror sheet and Perspex white sheet for the mirror box. The advantages of Perspex are that it is light weight and easily shaped in the desired design.

We tried two designs:



Design 1



Design 2

*Design 1:* the amputated shoulder site was still visible, or the patient was unable to resist the urge to move his head to the amputated side.

*Design 2:* the amputated shoulder site is visual and physical blocked with the design

Two sheets of Mirror Perspex were glued together and assembled with the aluminum frame into the mirror box. A small sheet of white Perspex was used to blind the unamputated arm.

Design 2 fitted the criteria, so this was further developed. The final design is easily adjustable from left to right sided and vice versa, this will takes about 5 minutes.

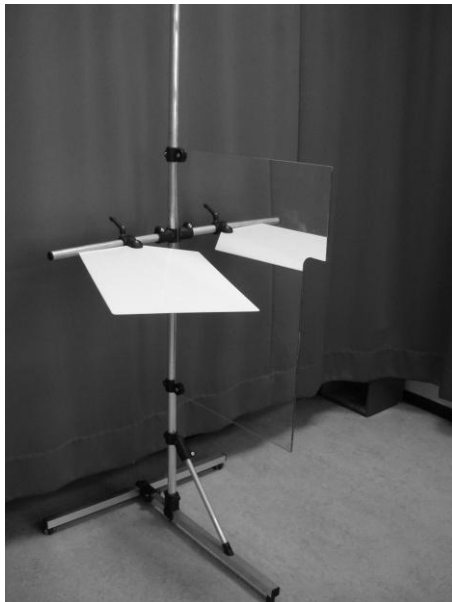


Figure 1: Final design left side view



Figure 2: Final design right side view

Now the mirror was ready to introduce to Mrs. M. She experienced, looking into the mirror, two normal upper limbs as is the case in other mirror therapy practices in patients with a more distal amputation. The mirror was de-assembled, carried by car to her home where she started her mirror box therapy. While in this patient the mirror therapy did not lead to a significant pain reduction, the design of the mirror was successful.

## CONCLUSION

The new design succeeded in mirroring the amputee side, giving the patient the illusion of experiencing two normal upper limbs. With the present design, it is possible to perform mirror therapy in this group of forequarter amputee patients.