

# Hemi-pelvectomy amputation

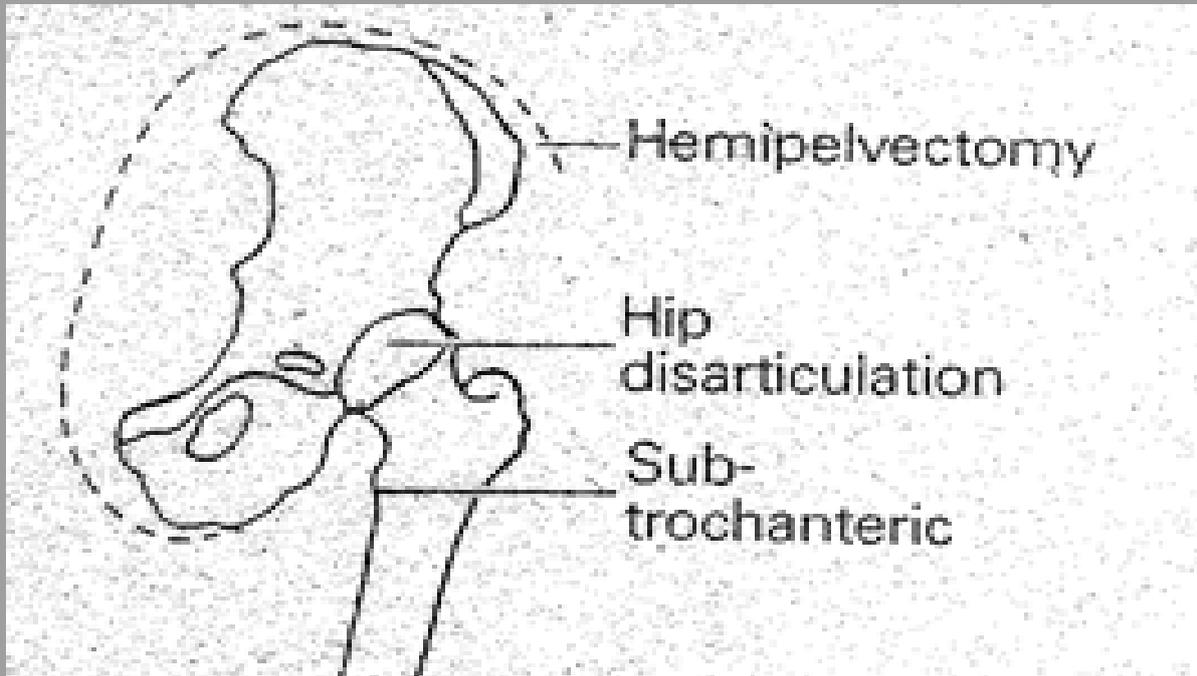


Figure 1. Amputation levels around the Pelvis

Amputations around the Pelvis have always posed a significant challenge for the Rehabilitation team and indeed the patient. Over the years the descriptions of these levels have changed, historically the Hindquarter amputation described the removal of the entire lower limb and half of the Pelvis. Today the terms Hemipelvectomy (HP), Transpelvic (TP) and Hip disarticulation (HD) are more commonly used. The HP amputation is the modern term that describes amputation of the entire hemi-pelvis and limb as did Hindquarter previously. Figure 1. shows the accepted descriptions.

## Causes

The HP amputation is almost exclusively a result of radical resection of aggressive bone

and tissue tumours of the Pelvis, hip, and upper thigh. Traumatic amputation leading to prosthetic management at this level is rare due to the nature of the insult to the body, however not unheard of.

Advanced cancer therapies have decreased patient morbidity and mortality significantly (Kufe et al., 2003). However some tumours still require radical surgical removal as the only hope for cure or remission. Chondrosarcoma and fibrosarcoma are two of the main tumour types for which HP is most appropriate (Kufe et al., 2003).

Significant physical loss, a high mortality rate and the amount of metabolic energy required to use the prosthesis can often mean prosthetic management will be overlooked (Lawless, 1997). Early identification of the patient's functional needs,

medical requirements and home environment must be achieved to formulate a prosthetic treatment plan.

## Prosthetic Management

The Prosthetic management of HD and HP amputee are visually very similar and can use the same hip, Knee and foot components. In practice however the design principals of the HP & HD sockets are significantly different. HP amputee poses the greater challenge of loss of the pelvis and therefore the ability to achieve axial skeletal loading. The mechanism by which this loading is then achieved is by applying an upwardly directed load on the abdominal wall and often the rib margin to increase intra-abdominal pressure, and prevent vertical movement within the socket. Also the added benefit of replacing some of the function of



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the lost abdominal wall means the lumbar spine can be effectively supported. This socket design can be considered more like a combination of spinal and hernia management than the more traditionally designed HD socket.

Once weight is accepted through the abdominal tissue the prosthetist can concentrate on recreating the lost height of the resected hemi-pelvis and ultimately provide an opportunity for standing and walking. However it may be more important and hence successful to restore the lost sitting function of the pelvis than aim for immediate and physically exhausting ambulation. Norwoozi (1983) stated that at comfortable walking speeds, HP prosthetic walking required 125% more energy than able-bodied controls; whereas; crutch walking required only 45% more energy. This may explain why prosthetic walking is so poorly tolerated and or persisted with among HP patients.

There are few studies that focus specifically on a sitting type socket, one such study by Moretto et al, 1992, successfully developed a sitting socket/postural support for a HP amputee suffering Spina bifida, this allowed the subject to return to a normal working day requiring 8 hours of sitting comfort. Recent experience with this level amputation and focuses goals of sitting comfort at St Vincent's health has also achieved similar positive outcomes. While ambulation with a HP prostheses

is extremely difficult and often rejected. The socket design principles of an upwardly directed force on the abdominal viscera offers the rehab team a tool for achieving sitting stability.

If you are a trans-pelvic, Hemipelvectomy or Hemicorporectomy amputee that has difficulty sitting upright you may be appropriate for prosthetic management. You can contact your closest prosthetic service provider for an assessment. They may be able offer you alternatives to an orthopaedic cushion.

Stuart Crampton

#### References

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- Nowroozi Arch Phys Med Rehabil. 1983 Jul;64(7):300-3
- Kufe, D W. et al Cancer Medicine. 6th ed.; section 21, 2003.
- Lawless MW, case reports and literature review. J Trauma 1997

Some useful support and information references are:

[www.hphdhelp.org](http://www.hphdhelp.org)

[www.amputee-coalition.org](http://www.amputee-coalition.org)

The Cancer Council  
[www.cancer.org.au](http://www.cancer.org.au)  
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