

## The care of the limb deficient child in Australia

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### Abstract

The incidence of limb deficiency is given as is the prevalence of prosthetic use in Australia. The organisation of clinics and the Free Limb Scheme is described and its effects discussed.

### Epidemiology

There are no precise figures on the number of children in Australia with congenital or acquired limb deficiencies. The incidence of perinatal limb reduction defects has been shown to be 50 per 100,000 births and is broadly similar in each State (University of Sydney, 1986). It should be noted that this figure includes perinatal deaths. Many are finger deficiencies and syndactyly and are not reviewed in a limb deficiency clinic. The prevalence of prosthetic use in Australian limb deficient children is 14.88/100,000 (Jones, 1988). At the Royal Alexandra Hospital for Children in Sydney 25-30 new patients with congenital limb deficiency are seen each year. Approximately 30 per cent of these children will require prosthetic treatment. The ratio of congenital to acquired limb deficiency among prosthetic users is 3.7:1. The vast majority are still congenital, particularly the wearers of Syme's and PTB prostheses are congenital limb deficient children who have undergone surgical conversion. The causes of limb deficiency in New South Wales children who are prosthetic users are shown in Figure 1. There is a preponderance of males with a sex ratio of 1.8 males to 1 female.

### Limb deficiency clinics

Limb deficiency clinics are run in the major children's hospitals in the capital cities of each State. These clinics are run by a paediatrician/dysmorphologist in Sydney, an orthopaedic surgeon in Melbourne and a rehabilitation physician in Brisbane. In the other cities, children are seen in the major amputee clinics, though at a separate time from the adult patients. The Royal Alexandra Hospital for Children Clinic in Sydney is a multi-disciplinary clinic with attending staff members, including a paediatrician/dysmorphologist, an orthopaedic surgeon, a rehabilitation physician, an occupational therapist, a physiotherapist, a prosthetist and a social worker.

The Brisbane clinic contains a rehabilitation physician, a physiotherapist, occupational therapist, but no paediatrician or orthopaedic surgeon. They are available for consultation. Infants and children are referred to the clinics by paediatricians and general practitioners and orthopaedic surgeons.

Standard international guidelines are used for early prosthetic fitting of both upper and

CAUSES OF LIMB DEFICIENCY - SEX DISTRIBUTION  
N.S.W. CHILDREN (1981-85)

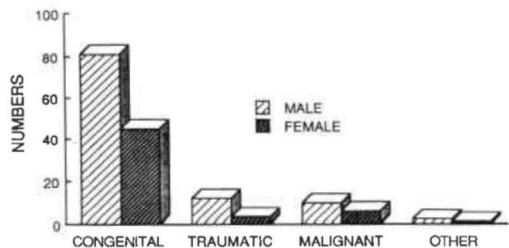


Fig. 1. Causes of limb deficiency in New South Wales.

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lower limb prostheses. Upper limb prostheses are provided when the child commences bimanual activities. Lower limb prostheses are provided when the child commences to stand. Attendance at the clinic is determined by the needs of the child and the family.

### Surgery and the limb deficient child

In Sydney and in Melbourne, the paediatric surgeon is an integral part of the limb deficiency clinic. His/her attendance at each clinic means that planning of surgical conversion occurs at the appropriate time after full consultation with parents and child. Tibial deficiency is treated by knee disarticulation at 3–5 years of age. Syme's amputation for fibular deficiency is performed at 3–5 years of age. A child with proximal focal femoral deficiency is not treated with rotationplasty, (the Van Nes procedure) but is fitted with an appropriate prosthesis incorporating the foot with a knee joint for the short, older child who may have a Syme's amputation for associated fibular deficiency.

### Social integration of limb deficient children

Limb deficient children are integrated into the school and sporting life of ordinary childhood. Hospitalisation, when it occurs, is kept as brief as possible. Children attend normal schools and are encouraged to play in normal social and sporting clubs. There is also an active amputee sporting association for children. It was noted in an analysis of below-elbow prosthetic usage in the Free Limb Scheme that adolescents in Australia, as in other countries, frequently discard their prostheses even if they have been good prosthetic users.

### Financial considerations

Attendance at limb deficiency clinics and medical/paramedical treatments are covered by universal health insurance. These clinics are subsidised by each State Government. There is in Australia a "Free Limb Scheme" which provides free prostheses to Australian residents who require them, within certain constraints. Components such as energy storing feet and hydraulic knees are not covered by the Free Limb Scheme and must be paid for by the patient. Myoelectric hands are not provided by the Scheme. The Variety Club of Australia, a charity, provides a limb bank of myoelectric

hands at the Sydney clinic and shares the prosthetic costs with the Free Limb Scheme for Australian residents. Myoelectric prostheses are provided for children over the age of four, who are good prosthetic users, with a committed family, normal development, and within a reasonable geographic distance from the clinic. Body powered prostheses are not supplied if a myoelectric unit is fitted. Prostheses, in general, are renewed as often as is required depending on wear and tear and the growth of the child.

### Paediatric prosthetic use

An analysis of the prosthetic usage of children under the Free Limb Scheme (1981–1985) showed that 69% of the child prosthetic users used lower limb prostheses (Jones, 1989). The prosthetic usage of these children is shown in Table 1. Upper limb users form 31% of the paediatric prosthetic population, and of these 73% are below-elbow prosthetic users.

### Geographic constraints on prosthetic use

Whilst prosthetic cost is not a problem because of the Free Limb Scheme, geographic isolation of some children in decentralised States, such as Queensland, means that fewer upper limb prostheses are prescribed than those for the lower limb. In very hot areas, sweating and overheating are a problem in prosthetic usage. Children in remote areas, thousands of kilometres from a prosthetic clinic, will learn to manage without an upper limb prosthesis,

Table 1. Lower limb prosthetic use — Australian children aged 0–14 (1981–1985)\*

Lower Limb	Children	Prostheses	Prostheses/ Child
Hip disarticulation	5	11	2.2
Above-knee:			
(suction)	28	65	2.3
(non-suction)	54	152	2.8
Knee disarticulation	9	18	2
Below-knee:			
(PTB)	103	348	3.4
(thigh lacing)	13	39	3
Ankle disarticulation			
(Syme's)	68	205	3
Level not classified	96	341	3.6
TOTAL	376	1,179	

\* Table 1 is published with the consent of the *Australian Paediatric Journal*.

whereas the value of a lower limb prosthesis is so obvious to parents that they will ensure that the child attends clinics and that the necessary prosthesis is provided.

**Summary**

The care of limb deficient children is well organised in Australia at minimal cost to the parents. Prostheses are supplied when required and surgical intervention is arranged when appropriate.

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