Amputation
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Amputation can range in severity from the loss of a toe or finger to the removal, either traumatically or surgically, of one or more limbs. Amputation occurs often enough to be a common part of the rehabilitation professional's experience, and although it may carry more devastating vocational implications than other types of physical impairment, it can still result in a positive outcome if proper care is provided. The goal of any amputation should be to preserve as much of the extremity as possible in the hope of maintaining good joint function and prosthetic application. For this reason, amputations above a joint result in more severe vocational handicaps than amputations below a joint. Amputations of an upper extremity are considered to have more serious implications for vocational placement and the performance of daily living activities than amputations of a lower extremity. However, each case must be judged on an individual basis, with the level and severity of injury and the patient's ability to resume similar or alternative work taken into consideration. Even relatively minor amputations can have serious psychological consequences for a patient, and for this reason the rehabilitation professional should intervene early during an amputee's recovery. The rehabilitation professional can be of assistance in coordinating a health-care delivery team, encouraging an optimistic but realistic outlook for the patient's return to work and resumption of customary daily tasks, ensuring that the patient is maintaining good stump and prosthetic care, and educating the attorney and jury with regard to rehabilitation potential and advances in prosthetic design and development.

Introduction
Partial or total amputation of an extremity can cause profound vocational handicaps, depending on the extent of injury, the extremity affected, and the client's occupation. The rehabilitation counselor should intervene early to coordinate health care delivery and to help the patient adjust to the loss. Amputees require special counseling for physical and psychosocial complications that make them unreceptive to prosthesis fitting and vocational rehabilitation.

Approximately 358,000 to 500,000 major upper and lower extremity amputees presently reside in the United States, and their numbers grow by 22,000 to 25,000 per year. Over 1,867,000 individuals in the United States are missing a portion of or all of a finger or a toe, and their number grows by 106,000 per year. This high prevalence and incidence of amputation in the United States make it a relatively common impairment in cases seen by the vocational rehabilitation professional (Table 1).

Of the 22,000 to 25,000 new amputations occurring each year approximately 70% to 80% affect males at a rate 2.5 times greater than that of females. The fact that the highest incidence of amputation occurs in the middle and older age groups takes the vocational implications of such impairment profound. Young
and middle aged adult males’ amputations typically result from trauma while older age groups’ amputations generally occur secondary to disease processes. 75% to 85% of all amputations are lower limbs, although the division between right and left amputations remains about equal.

**Causes of Amputation**

Robert E. Tooms (*Campbell’s Operative Orthopedics*, 1980) suggests that the primary indication for amputation is irreversible loss of blood in a diseased or injured limb. In that circumstance tissue begins to deteriorate and die, producing toxins that can spread throughout the remainder of the body and endanger life. Other indications for amputation include damage to the extremity of such a severe nature that function cannot be restored or can be improved through the application of a prosthesis. Uncontrollable infection in an extremity, malignant tumors, and congenital anomalies may also be indications for surgical amputation.

**Table 1**

**Prevalence and Incidence in 12 Months of 1977 Extremity Amputations**

<table>
<thead>
<tr>
<th>Impairment</th>
<th>Prevalence in Thousands</th>
<th>Incidence in Thousands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absence of Major Extremity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper Extremity Only</td>
<td>358</td>
<td>22</td>
</tr>
<tr>
<td>Lower Extremity Only</td>
<td>91</td>
<td>Not Available</td>
</tr>
<tr>
<td>Absence of Entire Finger(s) or Toe(s) Only</td>
<td>264</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>1,867</td>
<td>106</td>
</tr>
</tbody>
</table>

Prevalence is defined as the estimated number of conditions in existence at time of survey (1977). Incidence is defined as the estimated number of conditions having their onset in a specified time period.

The number one cause of amputation is still peripheral vascular disease, such as arteriosclerosis and diabetes mellitus. The second most frequent cause, traumatic injury, affects males under age 50 to the largest extent. Because the greatest indications for amputation are irreversible loss of blood supply or damage to the extremities so severe as to preclude reconstruction, it is usually not difficult for the surgeon to determine when amputation is needed. Generally, every attempt is made to save the limb at first, so in the case of severe injury, it usually takes several days for the surgeon to determine that amputation is appropriate.

It should be noted that thermal burns, frostbite, and electrical burns may be sufficiently severe to result in amputation. It is an infrequent occurrence, and it can result in the need for substantial vocational rehabilitation intervention, particularly when psychological factors and/or chronic pain result from the injury.
The third most frequent cause of amputation is infection. The most serious infection and, therefore, the one most likely to precipitate the drastic surgical measure of amputation is fulminating gangrene. Chronic osteomyelitis and infected nonunited fracture sites are also included in this category.

Tumors, nerve injuries, and congenital anomalies are the most frequent causes of surgical amputation.

Although amputations may result from congenital anomalies, infection, peripheral vascular disease, and tumors, the primary focus of this reading assignment is trauma. Nevertheless, the broad range of information provided on prostheses, surgical cost, treatment times to maximize medical improvement, duration and cost of rehabilitation programs, and aids for independent function are applicable to all amputations regardless of etiology.

This is important because trauma is not the only cause of amputation leading to litigation. Medical malpractice that results in congenital anomalies, infection, or peripheral vascular disorders subsequently, amputation may also be brought to litigation.

Complications
Of the broad range of physical and emotional complications can develop, the latter tend to be more intractable to treatment.

Physical Complications
Complications of extremity amputations include the formation of a neuroma (a sensitive tumor of nerve cells growing at the end of severed nerves) and skin-care problems. Skin problems may occur secondary to contact dermatitis from irritants in the prosthetic components or from lack of ventilation or poor skin hygiene. Stump contracture and stump contour problems may also develop relative to the prosthetic fitting. Additional complications include infection, necrosis of the skin edges, and phantom sensation stemming from a feeling on the patient’s part that the missing extremity remains present.

Works Cited:
Tooms, R. E. (1980). *Campbell’s Operative Orthopedics*. (Full Citation Missing).