

Amputation and Life Care Planning

Compiled by

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History

- Recorded from beginning of written history
- One of the first books: 1517 (by Gersdorff I)
- 1561- Pare' first known prosthetic leg with an artificial joint
- 1696- first known transtibial prosthesis with an unlocked knee joint
- 1863- Suction socket patented in US- uses pressure to suspend the prosthetic limb

Amputation

Basics

- In 1996 (although some data updated 2006), 1.9 million + with limb loss (not including fingers and toes)
- One in 200 has some sort of amputation
- About 20,000 - 30,000 new per year
- Most ages 50 - 70
- Most are men (about 75%)
- About 85% are lower limb
- Most amputations due to vascular disease
- Second most common is due to injury (including electrical)
- Other causes: Infection, tumors, nerve injuries and congenital deformities
(See following slides for categories)

http://www.amputee-coalition.org/fact_sheets/amp_stats_cause.html

Amputation-Classifications

- Trauma
- Tumors/Cancer
- Congenital Limb Deficiency
- Vascular
 - PVD-Peripheral Vascular Disease
 - DM-Diabetes Mellitus

Trauma Related

- Most trauma related amputation are to the upper extremity (~68%)
- More men than women
- Compound fractures, burns, stabs, gunshot wounds, compression injuries
- War zones, landmines
- Work and traffic related accidents
- Natural disasters
- Frostbite
- Infections post trauma or surgery

Tumors/Cancer

- Presentation: swelling/pain
- Bone tumors represent 1/2
 - Soft tissue and skin tumors
- Chemotherapy or radiotherapy
- Infection or tumor regrowth can lead to amputation
- Only small number need amputation
- More complicated amputations
 - transfemoral amputation--AKA
- Younger age
- Cancer related ~3/4 lower extremity

Congenital Limb Deficiency

- Child born with partial or complete absence of one or more limb(s)
 - Transverse--limb only develops to a certain level
 - Longitudinal--absence of bone within the axis of limb
- Occurs in 50 out of 100,000
- Not one specific cause--can be unexpected drug reaction
- First prosthesis at 6-8 mo.--early attempts to stand

Peripheral Vascular Disease (PVD)

- Diseases of the blood vessels
 - Diabetes Mellitus
 - Atherosclerosis
- Almost all BKA
- Greater for people over 60 years old
- Largest cause of amputation

Atherosclerosis

- Plaques deposited in any artery
- Gangrenous foot usually leads to amputation
- Vascular disease

Diabetes Mellitus (DM)

- High incidence of amputation
- Blood glucose levels intermittently raised above normal
- Complications cause small blood vessel damage
 - vision impairment, renal failure, impaired sensation in hands/feet
- Non-healing ulceration in feet can result from poor circulation

Diabetes Mellitus

- High glucose level in wounds encourage bacterial growth/infection which may lead to gangrene
 - Sometimes partial foot amputation possible, but site may not heal--at this point usually needs full amputation
- Have a higher postoperative mortality rate of 8x the expected rate during first year, and 30-50% rate of secondary amputation at 3 years

Surgery

- Goal is to provide a residual limb suitable for prosthetic fitting
- Want the best length with soft tissue covering
- Preserving knee joint/elbow joint shows greater success rate for functional prosthetic use

Post-surgery Care

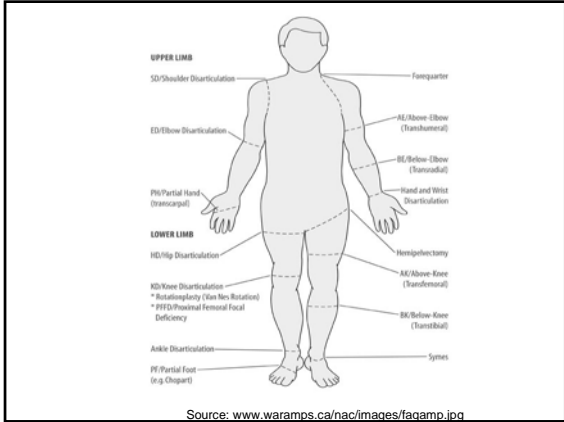
- **Must care for wound after surgery!**
 - Residual limb complications occur from open wounds, bone infections, exostosis (non-cancerous bone growth on bony surface), dermatitis, and soft tissue lesions
- Wash limb daily and examine skin for chafing
- Weight gain affects fit and function

Prosthetic Rehabilitation

- Not the goal for all amputees
 - Refer to Medicare “K” levels
- Consider factors:
 - Age—largest prognostic factor influencing poor mobility in AKA is greater when age 65 +
 - Is mobility attainable?

Types of Amputation: Upper Extremities

- **Hand and Partial-Hand Amputations:** Includes finger, thumb or portion of the hand below the wrist.
- **Wrist Disarticulation:** The limb is amputated at the level of the wrist.
- **Transradial** (below elbow amputations): Any amputation that occurs in the forearm, from the elbow to the wrist.
- **Transhumeral** (above elbow amputations): Any amputation that occurs in the upper arm from the elbow to the shoulder.
- **Shoulder Disarticulation:** An amputation that is at the level of the shoulder, with the shoulder blade remaining. The collarbone may or may not be removed.
- **Forequarter Amputation:** A shoulder disarticulation amputation in which the shoulder blade and collar bone are removed.



- ### Functional Limitations (Upper Extremity)
- Manual/finger dexterity
 - Bilateral dexterity
 - Eye-hand coordination
 - Gripping
 - Grasping
 - Lifting
 - Carrying
 - Sensory (feeling)

Other functional limitations

Decreased strength
 Decreased stamina
 Environmental constraints
 (wet, dusty, gritty)
 Temperature tolerance

(Weed & Sluis, 1990)

Functional Expectations for AE&BE

- Independent in donning and doffing the prosthesis
- Independent in activities of daily living
- Can write legibly with remaining hand
- Has successfully switched dominance (if necessary)
- Drives (if desired)
- Has returned to work (same or modified job)
- Can tie laces with one hand or with the remaining hand and the prosthesis
- Uses a button hook easily
- Has prepared a meal in the kitchen
- Has been shown adaptive equipment for the kitchen and ADL
- Has performed carpentry and automotive maintenance (if desired)
- Wears prosthesis during all waking hours
- Uses the prosthesis for bimanual activities
- Understands the necessity of follow-up
