

Some Thoughts About Nomenclature For Limb Prosthetics¹

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In a document (3) published in 1974, Hector W. Kay reported on decisions made by the Task Force on Standardization of Prosthetic-Orthotic Terminology of the Committee on Prosthetic-Orthotic Education of the National Academy of Sciences relating to nomenclature for limb prosthetics. The gist of this report was that the currently accepted system of "Americanisms" should be abandoned in favor of an international terminology; specifically that amputation levels and corresponding prostheses should be named in the same fashion as the then recently developed technique for naming transverse congenital deficiencies that essentially "present as amputation-like stumps" (1). In effect, by bowing to the necessity of comparing the new congenital terminology back to the (presumably unacceptable) standard terminology the Task Force nullified the argument in favor of the change. If the situation currently prevailing is all that clear then why change it?

The Task Force acknowledged this point explicitly on pages 38-39 by stating that prosthetics nomenclature was much clearer than orthotics nomenclature, and therefore, there was less urgency in modifying it. The most telling argument against the prevailing situation was that amputations at or about the same level were referred to by different names: "knee disarticulation" versus "exarticulation" versus "Gritti-Stokes." In considering the other points made in the introduction, it is difficult to see how they apply to prosthetics nomenclature to any degree approaching the same fashion that they apply to the confused state of orthotic

nomenclature that prevailed at that time. That the orthotic nomenclature in use needed urgent overhaul is undisputed, but to argue by inference that similar drastic efforts should be made in prosthetics is invalid and completely overlooks the confusion that is likely to result if drastic changes are introduced. Events since 1974 seem to bear out this point. The revised orthotics nomenclature has been adopted wholeheartedly, precisely because it fills a pressing need; no such ground swell of popular support has arisen for modification of prosthetic nomenclature. A similar situation undoubtedly exists in the classification of congenital limb deficiencies. The system for classifying longitudinal deficiencies has been accepted at least in part because it clearly fulfills a need. To the best of the author's recollection he has never heard anyone refer to a transverse deficiency in terms of the system; rather the phrase "congenital BK" (or whatever) is far more likely to be used.

It may be taken then that no argument exists favoring dropping of the current system of prosthetic nomenclature. It may also be stated that no argument exists for adopting the proposed new nomenclature; quite the opposite view. Change for the sake of change, and without much prospect for clear, overwhelming benefits to accrue is illogical, especially when considered in light of the confusion and resentment it is likely to engender.

That confusion is apt to result strikes me as all too likely. To name what remains by specifically citing what was removed is more than a lit-

tle perplexing. The use of the words leg, thigh, arm, and forearm as they are used in the proposed terminology are totally foreign to most Americans; when Americans say "leg" they mean from the hip down, not from the knee down. While it is all well and good to avoid fobbing "Americanisms" off on the rest of the world, any new terminology adopted should not represent a radical departure from the old since a very large proportion of the modern prosthetic literature is written in terms of current usage. The proposed system is not at all elegant with its system of trailing modifiers, nor does it readily lend itself to abbreviation and acronyms. Compare the simplicity and tidiness of "AFO" or "BK" with "leg, partial (middle $\frac{1}{3}$)."

The situation in which any method of classifying congenital limb deficiencies is employed is not at all comparable to the situation in which a system is meant to be used by highly specialized individuals about a very complex, although small, group of patients. Not only is clarity of communication of vast importance, but a high degree of motivation is needed for mastering a complicated vocabulary. The world of "acquired amputation" is not nearly so exclusive a domain. A vast population of personnel, widely differing in educational level and motivation (surgeons, prosthetists, therapist, engineers, case workers, clerical help, administrators, bureaucrats, etc.) must communicate to each other in terms that are mutually acceptable. Furthermore, the two causes of limb loss are quite different in terms of prognosis and attending complications (phantom pain/sensation, neuromas, bony overgrowth to name but a few). To lump congenital problems and acquired amputations together, and gloss over the distinctions, is to do someone a disservice.

Where do we stand then? The need is for a clear, explicit system of nomenclature that is readily applicable to both amputations and prostheses and can be simply translated. It should be written in terms of well defined, distinct anatomical sites and make distinctions only where clearly distinguishable functional implications exist. A joint (or to be even more precise a joint line) is a clear and well defined anatomical unit, whereas reference to one of

the limb segments is vague and must be qualified (mid-thigh, distal humerus, etc.). Reference to a "below-knee amputation" or "above-elbow amputation" is not altogether illogical then. It is interesting that we should so readily accept the method as applied to orthotics (AFO, CTLSO) yet stand ready to abandon it if reference to prosthetics. I still feel that a case can be made for referring to an AFO as a below-knee orthosis (BKO) (as they still do at NYU) and that prosthetic and orthotic terminology be brought into total harmony.

One useful point from the 1974 report of the Task Force, and that is the distinction of amputation versus disarticulation. Amputation (besides its wider connotation encompassing the entire field) refers to the severing of a limb through the shaft of diaphysis. It was intended by the task force that disarticulation should refer not only to severance through the joint space (without the cutting of bone) but also to those instances when the remaining long bone was cut distal to the distal epiphyseal plate. This argument may be extended by inference to include all amputations through the distal condyles and thus encompass all procedures such as the "Gritti-Strokes." Functionally there is little to distinguish a true knee disarticulation from those amputations performed through the condyles and the prostheses are essentially identical.

The quest to eliminate eponyms means that a Syme's amputation should be referred to as an ankle disarticulation. This may well be the case but if ever there is an exception that proves the rule this is it. The Syme's procedure is seductively appealing but oftentimes performed with discouraging results. Apparently considerable skill and attention to detail are necessary to preserve the heel pad and keep the attendant blood vessels intact, and to cut the tibia in the proper plane; nor are all patients with peripheral vascular disease who might otherwise benefit by it suitable candidates. Perhaps it is then that the eponym should be retained in tribute to this great Scottish surgeon and in warning to those who might seek to emulate his example.

The Task Force recommended that amputations through the long bones (BK, AK, BE, AE,)

should further specify through which third the amputation was performed. Earlier it was stated that distinctions should be made only when there are clearly distinguishable functional implications. This is intended for the sake of brevity. There is only one level where such a further breakdown may be considered truly useful and that is the below-elbow (residual pronation/supination is a function of residual length). Otherwise it is hard to draw inferences about amputee performance as affected by stump length nor is it particularly easy to relate changes in socket shape and prosthetic prescription to changes in length. A clear functional distinction exists between a knee-disarticulation socket although both have more or less quadrilateral brims. It is far more difficult to distinguish differences between a socket for a long above-knee stump and short one. If it is considered desirable to provide any indication about stump length then it should probably be given as a percentage of the bone length on the sound side. This is far more precise and is readily possible with a few simple measurements and calculations. Indeed, with today's proliferation of hand-held calculators it should provide clinicians with many hours of innocent fun. Partial foot and partial hand amputations should be left out of the classification scheme, as are hand and foot orthoses in the orthotic system of nomenclature.

At the meeting of the Working Group 1 it was decided that prostheses (St. Andrews,

Scotland, April 1980) orthoses should be referred to as devices or systems and not as components. To me the proper word is device; to refer to a molded plastic ankle-foot orthosis with Velcro strap as a system is surely a case of verbal inflation. Webster's Collegiate Dictionary defines a "System" as a regularly interacting or interdependent group of items forming a unified whole. It defines "device" as a piece of equipment or mechanism designed to serve a special purpose or perform a special function. An example familiar to all is a stereo system. Essentially such a system consists of a signal source (turntable, recorder, or receiver) an amplifier, and transducers (loudspeakers or headphones); each is complete and self contained but helpless without the other two elements. In a like fashion the totality of patient, prosthesis/orthosis, and peripheral elements (shoes, canes, etc.) forms a system of interdependent elements. To me the use of the word "system" to refer to a prosthesis or orthosis, however complicated, is another example of creeping "computerese" or "technicalese" (as is "interface") that must be avoided. Do patients access their sockets or input their stumps? Does a decubitus ulcer constitute impact?

To reiterate then a case is made for preserving the present terminology (Table 1) and for not adopting the system for classifying transverse congenital deficiencies. It is suggested that prostheses and orthoses be referred to as "devices", not as "systems".

Table 1

Partial Foot (P.F.)	Partial Hand (P.H.)
Symes (S)	Wrist Disarticulation (W.D.)
Below Knee (B.K.)	Below Elbow (B.E.)
Knee Disarticulation (K.D.)	Elbow Disarticulation (E.D.)
Above Knee (A.K.)	Above Elbow (A.E.)
Hip Disarticulation (H.D.)	Shoulder Disarticulation (S.D.)
Hemipelvectomy (H.P.)	Forequarter (Fq.)

Hemicorporectomy (H.C.)

Abbreviations would be for prosthesis (P) or amputation (A) to construct appropriate acronyms (B.K.P., B.K.A.)

Table 2

	American Usage	French	German	Russian?	Chinese?	Spanish?	Arabic?
Amputation	Amputation						
Disarticulation	Disarticulation	A					
Foot	Foot	D					
Ankle	Ankle	A					
Knee	Knee	K					
Hip	Hip	H					
Hand	Hand	H					
Wrist	Wrist	W					
Elbow	Elbow	E					
Shoulder	Shoulder	S					
Above	Above	A					
Below	Below	B					
Partial	Partial	P					

Footnotes

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² This document was prepared for use by the working Group I (Classification & Nomenclature) of Technical Committee 168 (Prosthetics & Orthotics) of the International Standards Organizations

References

- (1) Harris, E.E., A new orthotics terminology: a guide to its use for prescription and fee schedules, *Orthotics and Prosthetics*, 27:2:6-19, June 1973.
- (2) Harris, R.I., *The history and development of Syme's amputation. Selected Articles from Artificial Limbs*, pp 233-272. Robert E. Krieger Publishing Co., Inc., Huntington, New York, 1970.
- (3) Kay, Hector W., *A proposed nomenclature for limb prosthetics. Orthotics and Prosthetics*, Vol. 28, No. 4, pp 37-47, Dec. 1974.