

Psychosocial Issues in the Field of Prosthetics and Orthotics

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ABSTRACT

The involvement of psychologists in medical settings has grown at a tremendous rate in recent years, with an ever-increasing number of medical environments developing and promoting interdisciplinary collaboration, and thus enabling psychologists to extend their practice beyond the traditional mental health model. In the context of prosthetic and orthotic practice, we suggest that the realization of the potential of technological innovations in this field may only fully be achieved by equipping prosthetists and orthotists not only with the technical expertise they require but also by fostering an awareness of the importance of psychosocial issues in amputation and rehabilitation, and an understanding of the psychological complexities pertaining to the therapeutic context. Rehabilitation after amputation is fundamentally dependent on the patient's psychological adjustment to the injury; hence, practitioners' sensitivity to psychosocial issues has clear practical implications both for successful prosthetic fitting and rehabilitation, and for continuing development and innovation in the discipline. This article highlights a number of key psychosocial issues of particular relevance to prosthetic and orthotic practice and of special importance to the rehabilitation of the amputee. (*J Prosthet Orthot.* 2002; 14:19–22.)

Rehabilitation after amputation is fundamentally linked with the individuals' psychological adjustment to the injury. Typically, however, the most immediate challenge facing an individual after an amputation is acquiring a prosthesis and becoming proficient in its use. Consequently, numerous studies concentrate primarily on ensuing physical adjustment and the prosthesis and factors that facilitate or impede this adjustment process,^{1–3} whereas affording little consideration to psychosocial, demographic, and disability related factors.⁴ A review of articles published in the *JPO* from its inception to mid-1999 is consistent with this observation. The last decade has witnessed relatively few substantive psychological contributions to the *JPO* and very few papers relating to prosthetics and orthotics in psychology journals. Although professional practice in prosthetics and orthotics may not necessitate an in-depth knowledge of the complexity and diversity of associated psychological disorders, professionals should be aware of the psychological issues that may influence the rehabilitation of their patients.

Hence, the aim of this article is to briefly introduce a number of pertinent psychosocial issues and to create an awareness of the importance of these issues for orthotists and prosthetists.

PSYCHOTHERAPEUTIC ISSUES IN REHABILITATION

From a psychological perspective, rehabilitation begins as soon as amputation is considered an appropriate intervention. Early contact with rehabilitation services can be beneficial in providing counseling, information, and advice, and in facilitating the development of realistic rehabilitation goals and expectations. Considerable evidence suggests that appropriate preparation for surgery eases patient's rehabilitation, including the length of time they remain inpatients and the amount of medication they require.⁵

Readjusting to life after amputation is likely to be challenging for most people. Difficulties in adjustment are typically associated with reports of depression, feelings of hopelessness, low self-esteem, fatigue, anxiety, and sometimes suicidal ideation. A multitude of related problems, including maladaptive coping behaviors (eg, drug/alcohol consumption), greater disability, poorer social functioning, and loss of functional independence, may result from difficulties in psychological adjustment.⁶ Rates of clinical depression found in out-patient settings have been found to range from 21% to 35%.^{7,8} Significant levels of anxiety, grief, and social isolation among people with amputations have also been reported.^{9–11} Therefore, specific, structured therapeutic interventions for problems such as depression, anxiety, sexual difficulties, substance addiction or drug overuse, and pain may be needed.¹² Such intervention may operate through individual, couple, family, or group therapies.

Patients undergoing amputation as a result of traumatic injury, especially in motor vehicle accidents, may also expe-

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rience posttraumatic stress disorder (PTSD). PTSD is characterized by a range of symptoms evidenced after exposure to a traumatic stressor (DSM-IV). The traumatic stressor usually involves actual or threatened death or serious injury, or a threat to the physical integrity of the self or others. The individual's response to the stressor must involve intense fear, helplessness or horror. PTSD is characterized by three primary clusters of symptoms: 1) reexperiencing the trauma, 2) avoidance of trauma reminders, and 3) hyperarousal.¹³ PTSD can be a difficult problem to treat in its own right¹⁴; the loss of limb(s) and perhaps other body scarring may confound and interact with the psychological sequelae of traumatic experiences. Furthermore, in the case of amputation, the traumatic stressor may not be temporally delineated but rather experienced across time, incorporating aspects of both the initial amputation operation and the subsequent management of the wound and stump. Reexposure to the stressor may occur in conjunction with visits to the clinic for routine limb fitting and follow-up. In such cases, early rehabilitation efforts must include interventions specifically designed to address the implications of both PTSD and disruptions in body image in order to reduce the potential for prosthesis rejection.

Psychosocial research on the sequelae of amputation has adopted an almost exclusive focus on the negative impact the event has on the persons' life and well-being (eg, ^{15,16}). Recently, there has been an attempt to redress this imbalance by identifying factors that promote positive adjustment.¹⁷ For example, Dunn¹⁸ investigated the salutary effects of finding positive meaning in a disabling experience, being an optimist, and perceiving control over disability and reported that 77% of the sample reported that something good had arisen from their amputation. Similarly, Gallagher and MacLachlan¹⁷ report that 49% of their sample indicated that something good had happened as a result of their amputation and that this was associated with more favorable health and physical capability ratings, greater adjustment to limitation, and lower athletic activity limitation. The process of how to promote positive meaning is as yet an under researched area of amputee psychology.

BODY IMAGE, EMBODIMENT AND THE "SENSE OF SELF"

Body image, "that picture or scheme of our own body which we form in our minds,"¹⁹ is a dynamic construction, subject to continual deconstruction, revision, and reconstruction in response to both internal and external stimuli. The body image establishes distinctions by which the body is usually understood. The me/not me distinction, however, is not exclusively based on physical form; rather, as Groz²⁰ notes, "inanimate objects when touched or on the body for long enough become extensions of the body image sensation."

The experience of amputation engenders disruption of body image that is subsequently associated with varying degrees of body image alteration. Reconceptualization of body

image after amputation requires the incorporation of both the loss of the limb as well as probable phantom sensation of the limb, and in some instances the incorporation of prostheses, canes, and crutches into the body image.²¹ This potential for the incorporation of inanimate objects into the body image leads us to the related concept of "embodiment," a concept that has recently witnessed a resurgence of interest, especially among social scientists (eg, ^{22,23}). "Embodiment" may be defined as giving physical expression to an abstract idea. In the context of the amputation experience, the way in which an amputee experiences him- or her-self and how they construct meaning out of their experience will influence their attitude toward the wearing of a prosthesis. A given prosthesis may embody ability for one individual because they feel that it *enables* them to perform certain physical functions and social roles, whereas the same prosthesis may embody disability in someone else because they view it as *prohibiting* those functions and roles. Experiences of one's own body are the basis for all other life experiences²¹; hence, health professionals must be aware of the importance of the amputees' relationship with their prosthesis as a physically and psychically invested aspect of the self and its potential to symbolize how they relate to the world.

IMPLICATIONS OF AGE AND DEVELOPMENTAL STAGE

The age at which one receives an amputation is an important factor in adjustment²⁴; however, consensus has not been reached regarding the nature of this relationship. For a young traumatic amputee, limb loss and the accompanying loss of function may represent the loss of life opportunities, whereas for an elderly person with peripheral vascular disorder, amputation may offer increased mobility and/or an easing of physical distress.^{7,18} Limited support for the hypothesis that older adults (age 65+) with amputations are less prone to psychological adjustment difficulties compared with younger adults has been reported.^{7,18,25} In contrast, Rybarczyk et al.^{16,26} report a significant relationship between older age and fewer amputation-related body image concerns but no correlation between age and overall adjustment to amputation. Similarly, Fisher and Hanspal²⁴ suggest that individuals suffering traumatic limb loss at any age are likely to suffer subsequent difficulties with their body image but that these relationships are more striking in the younger age groups. Rybarczyk et al.²⁷ suggest that, contradictory findings notwithstanding, older adults may not experience as strong a reaction as younger adults because the amputation and attendant changes in mobility and body image are perceived as an undesirable but relatively "on-time" occurrence.

Another factor with implications for both adjustment and prosthetic use is the individual's developmental stage. Congenital limb deficiency, acquired limb deficiency, and traumatic loss of limbs will each represent distinctive developmental challenges to a child and their relationship to siblings, parents, clinicians, teachers, and others. Some de-

velopmental stages are likely to be more significant than others in terms of the individuals' vulnerability to the issues associated with body image and self-worth precipitated by amputation.²⁷ For example, the beginning of adolescence accompanied by increased concern about emerging sexuality and hence physical appearance may herald adjustment difficulties in a previously well-adjusted child amputee.

PHANTOM SENSATION AND PHANTOM PAIN

Phantom limb sensation, the feeling of the presence of the amputated limb, is a pervasive response to amputation. Recent studies estimate the incidence of nonpainful phantom at approximately 80% to 100%.²⁸⁻³⁰ When possible, it is important for clinicians to discuss the possibility of such sensations with the patient before surgery, to provide assurance that this is a frequent and "normal" occurrence, and to be able to respond constructively to these phenomena that often appear to patients as "bizarre experiences."

Postamputation pain in the phantom limb, often described as burning, cramping, and shock-shooting,³¹ can be an extremely distressing problem.²⁸ Incidence rates for phantom limb pain range from 46% to 90%.^{29,30,32} Appropriate preoperative preparation can eliminate the feeling that one is going crazy or being a "bad" patient by complaining of a pain that persists after surgery.³³ The as yet unexplained etiology of phantom limb pain means that there is no definitive treatment. Interventions employed with limited success include medication, neurophysiological manipulations, neurosurgical procedures, and psychological manipulations.³⁴⁻³⁶ A good review of strategies for controlling phantom limb pain is provided by Williams and Deaton.³⁷

PSYCHOLOGICAL ASSESSMENT

Clearly, the evaluation of preamputation protocols and of the effectiveness of psychotherapeutic interventions requires some form of specialized assessment. However, there is also a case for undertaking routine psychometric assessment of the salient experiences of amputees in order to further tailor interventions to their specific needs. This is likely to be especially important in the increasingly evidence-based context in which we operate. There are two generic assessment devices in this regard: the Prosthesis Evaluation Questionnaire (PEQ)³⁸ and the Trinity Amputation and Prosthetic Experience Scales (TAPES).³⁹ The PEQ is a self-report questionnaire comprising of 10 subscales: four prosthetic function scales, two mobility scales, three psychosocial scales, and one well-being scale. The TAPES, is also a self-report quality of life questionnaire and comprises nine subscales: three psychosocial scales, three activity restriction scales, and three satisfaction subscales. The TAPES has the advantage of being able to predict stump pain, phantom limb pain, and the extent of prosthetic use. Equipping prosthetists and orthotists with relevant information gleaned from such assessments may further enhance their understanding of the "pa-

tient/consumer" perspective and allow the development of more collaborative working relationships.

SUMMARY

In summary, we suggest that whereas professional practice in prosthetics and orthotics may not necessitate an in-depth knowledge of associated psychological disorders, professionals should be aware of the psychological issues that may influence the rehabilitation of their patients. Such knowledge may help to facilitate appropriate referrals and enhance the collaborative process of multidisciplinary teamwork.

REFERENCES

1. Pohjolainen T, Alaranta J. Lower limb amputations in Southern Finland, 1984-1985. *Prosth Orthot Int*. 1991;12:9-18.
2. Kent R, Fyfe N. Effectiveness of rehabilitation following amputation. *Clin Rehabil*. 1999;13(Suppl. 1):43-50.
3. Sherman RA. *Phantom Pain*. New York: Plenum Press; 1997.
4. Grise MC, Gauthier-Gagnon C, Martineau GG. Prosthetic profile of people with lower extremity amputation: Conception and design of a follow-up questionnaire. *Arch Phys Med Rehabil*. 1993;74:862-870.
5. Butler D, Turkal NW, Seidl JJ. Amputation: Preoperative psychological preparation. *J Am Board Fam Pract*. 1992;5:69-73.
6. Garafalo JP. Psychological adjustment in medical populations. *Curr Opin Psychiatry*. 2000;13:647-653.
7. Williamson GM, Schulz R, Bridges MW, Behan AM. Social and psychological factors in adjustment to limb amputation: Psychosocial perspectives on disability [Special Issue]. *J Soc Behav Pers*. 1994;9:249-268.
8. Kashani JH, Frank RG, Kashani SR, Wonderlich SA, Reid JC. Depression among amputees. *J Clin Psychiatry*. 1983;44:256-258.
9. Schubert DSP, Burns R, Paras W, Sioson E. Decrease of depression during stroke and amputee rehabilitation. *Gen Hosp Psychiatry*. 1992;14:133-141.
10. Frierson RL, Lippmann SB. Psychiatric consultation for acute amputees: Report of a ten year experience. *Psychosomatics*. 1987;28:183-189.
11. Thompson DM, Haren D. Living with an amputation: The patient. *Int Rehabil Med*. 1983;5:165-169.
12. Williamson GM, Walters AS. Perceived impact of limb amputation on sexual activity: A study of adult amputees. *J Sex Res*. 1996;33:221-230.
13. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. Fourth Edition. Washington, DC: American Psychiatric Association; 1994.
14. Lindsay SJE. Fears and anxiety: Treatment. In: Lindsay SJE, Powell GE, eds. *The Handbook of Clinical Adult Psychology*. Second Edition. London: Routledge; 1994.

15. Gallagher P, MacLachlan M. Psychological adjustment and coping in adults with prosthetic limbs. *Behav Med*. 1999;25:117–124.
16. Rybarczyk BD, Nyenhuis DL, Nicholas JJ, Schulz R, Alioto RJ, Blair C. Social discomfort and depression in a sample of adults with leg amputations. *Arch Phys Med Rehabil*. 1992;73:1169–1173.
17. Gallagher P, MacLachlan M. Positive meaning in amputation and thoughts about the amputated limb. *Prosth Orthot Int*. 2000;24:196–204.
18. Dunn DS. Well-being following amputation: Salutary effects of positive meaning, optimism and control. *Rehabil Psychol*. 1996;41:285–302.
19. Schilder P. *The Image and the Appearance of the Human Body*. New York: International Universities Press; 1950.
20. Grosz E. *Volatile Bodies: Toward a Corporeal Feminism*. Sydney: Allen and Unwin; 1994.
21. Novotny M. Psychosocial issues affecting rehabilitation. *Prosthetics*. 1991;2:373–393.
22. Sampson E. Establishing embodiment in psychology. In: Stam H, ed. *The Body and Psychology*. London: Sage; 1998.
23. Burkitt I. *Bodies of Thought: Embodiment, Identity and Modernity*. London: Sage; 1999.
24. Fischer K, Hanspal RS. Body image and patients with amputation: Does the prosthesis maintain the balance? *Int J Rehabil Res*. 1998;21:355–363.
25. Frank RG, Kashani TR, Kashani SR, Wonderlich SA, Umlauf RL, Ashkanazi GS. Psychological response to amputation as a function of age and time since amputation. *Br J Psychiatry*. 1984;144:493–497.
26. Rybarczyk B, Nyenhuis DL, Nicholas JJ, Cash S, Kaiser J. Body image, perceived social stigma, and the prediction of psychosocial adjustment to leg amputation. *Rehabil Psychol*. 1995;40:95–110.
27. Rybarczyk B, Nicholas JJ, Nyenhuis DL. Coping with a leg amputation: Integrating research and clinical practice. *Rehabil Psychol*. 1997;42:241–256.
28. Sherman RA. Stump and phantom limb pain. In: Portenoy, R, ed. *Neurologic Clinics of North America*. 1989;7:249–263.
29. Melzack, R. Phantom limbs. *Sci Am*. 1992;266:120–126.
30. Jensen T, Rasuussen P. Phantom pain and related phenomena after amputation. In: Wall PD, Melzack R, eds. *Textbook of Pain*. New York: Churchill Livingstone; 1994.
31. Sherman RA, Griffin V, Evans C, Grana A. Temporal relationships between changes in phantom limb pain and in surface EEG. *Biofeedback Self-Regul*. 1992;17:320.
32. Van Duesen J. *Body Image and Perceptual Dysfunction in Adults*. London: WB Saunders; 1990.
33. Sherman RA, Sherman CJ, Bruno G. Psychological factors influencing chronic phantom limb pain: An analysis of the literature. *Pain* 1985;6:47–55.
34. Davis RW. Phantom sensation, phantom pain and stump pain. *Arch Phys Med Rehabil*. 1993;74:79–91.
35. Sherman RA, Sherman CJ. A comparison of phantom sensations among amputees whose amputations were of civilian and military origins. *Pain* 1985;21:91–97.
36. Jaeger H, Maier C. Calcitonin in phantom limb pain: A double-blind study. *Pain*. 1992;48:21–28.
37. Williams AM, Deaton SB. Phantom limb pain: Elusive yet real. *Rehabil Nurs*. 1997;22:73–78.
38. Legro MW, Reiber GD, Smith DG, del Aguila M, Larsen J, Boone D. Prosthesis evaluation questionnaire for persons with lower limb amputations: Assessing prosthesis-related quality of life. *Arch Phys Med Rehabil*. 1998;79:931–938.
39. Gallagher P, MacLachlan M. Development and psychometric evaluation of the Trinity Amputation and Prosthesis Experience Scales (TAPES). *Rehabil Psychol*. 2000;45:130–154.