

HIP-LEVEL AMPUTATION—A REPORT OF A SURVEY OF THE UNITED STATES MILITARY VETERANS^a

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During the year 1960, a survey was made of hip-level amputee veterans of the United States military services who were located through the sixty-seven Veterans Administration Regional Offices. The following report attempts to evaluate the results of this survey.

The primary purpose of the study was to ascertain the extent of utilization of the tilting-table prostheses furnished service-connected veterans of World War II. In addition, it was hoped that some evaluation could be made of their experience with the Canadian hip prosthesis (1), which had been made available to an increasing number of the group since 1955. An attempt was also made to discover what general socio-economic adjustments had been necessitated by the fact of amputation.

For the first time in the history of the world a military organization—the United States Army—carried out definitive functional rehabilitation of the amputee. In 1945, T. C. Thompson described this program (2). Essential surgical care and treatment were provided shortly after injury in the war zone theater of operations. After being returned to the United States, the hip-level amputees were grouped at hospitals where commercial prosthetic facilities were locally available. Two centers—the Walter Reed General Hospital in Washington, D.C. and the Lawson General Hospital

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in Atlanta, Georgia—had such facilities nearby where the majority of these amputees received such special care and treatment.

At these two Centers, definitive surgery was given where indicated. Group care in physical and occupational therapy especially suited to the needs of hip-level amputees was provided. This pre-prosthetic therapy was directed toward general well-being of the individual as well as to specific conditioning of the hind-quarter stump area.

Through Army government contract, the nearby commercial limb-fitting facilities measured, fabricated, and fitted the patients with the conventional tilting-table prostheses of willow wood covered with rawhide, most of which were equipped with hip locks and some with knee lock mechanisms. At the Washington, D.C. limb company, some of these prostheses were furnished with aluminum shin and thigh pieces to lighten them somewhat.

Post-prosthetic training was given each amputee through individual and group therapy. At each Center, one therapist was assigned specifically to work with the group of hip-level amputees. Every effort was made to prepare the men prosthetically for useful civilian lives. General postural training, together with gait training and instruction in the mechanics and care of the limb, were provided.

After service separation the veterans came under the jurisdiction of the Veterans Administration Prosthetic and Sensory Aids Service, whose function it is to supply medical care, necessary prostheses and equipment, and current information on the best available aids for their specific needs. This work is administered through the Veterans Administration Regional Office in whose area the veteran resides and is projected as a continuing service during the life of the veteran. This is provided under Public Laws administered by the Veterans Administration.

In 1955, the Canadian-type prosthesis became available on government contract through commercial sources throughout the country. Its reported improved mechanical features and weight-bearing principles quickly received the acclaim of all those concerned with the care and treatment of hip-level amputees. It was hoped that the amputees themselves would adapt readily to this prosthesis and would experience appreciably increased functional use over that of the predecessor limb, the tilting-table.

In 1960 a detailed questionnaire (Fig. 1, Front and Back) was mailed to all the service-connected hip-level amputees known to the Veterans Administration Regional Offices. Of the 135 questionnaires distributed, 90 were returned in completed form. Three of those returned, however, had been answered by the next-of-kin of deceased veterans, and these replies were therefore discarded. The remaining 87 replies were separated on the basis of various criteria before final evaluation.

The first grouping made was on the basis of date of amputation. Because of the known variation in treatment methods existent between the World War I and World War II periods, and because of possible variations

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VETERANS ADMINISTRATION REGIONAL OFFICE
415 Pine Street
St. Louis 2, Missouri

QUESTIONNAIRE FOR THE HIP-LEVEL AMPUTEE

1. Name _____ VA Claim No. _____
2. Mailing Address _____
3. Age _____ Height _____ Weight _____
4. Amputation right or left leg _____ Both _____
5. Have you any other disabilities? _____ If so, what? _____

6. Civilian occupation prior to amputation _____
7. Brief record of occupation since amputation _____

8. Date of amputation at hip level _____
9. Was amputation caused by injury or tumor? _____
10. Name of surgeon, if remembered _____
11. Hospital where performed _____
12. Date of separation from military service _____
13. Date first fitted with "Tilting Table" limb _____
14. Hospital where fitted with "Tilting Table" limb _____
15. How many legs since first fitted? _____ Approximate dates when
obtained _____
16. How many hours per day do you wear the leg? _____
17. For what length of time was each leg serviceable? _____
18. Have you depended on a leg regularly in your occupation? _____
19. Do you use canes? _____ Crutches? _____ No aid at all? _____

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FIGURE 1. Front.

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20. Have you been fitted with the new Canadian-type hip-disarticulation leg? _____
21. If so, when? _____ Have you used it regularly since? _____
22. If not, why not? _____

23. What are its advantages? _____

24. What are its disadvantages? _____

25. How has the amputation affected your life in general? _____

26. Any additional comment you'd like to make. _____

FIGURE 1. Back.

in both type of treatment and the length of time existing between the date of amputation and the date of survey for World War II veterans and post-World War II amputees, the division into three major groups was determined: Group I—World War I (4 respondents); Group II—World War II (56 respondents); and Group III—post-World War II (27 respondents).

A further division was made to indicate whether the amputation was of the right leg, left leg, or bilateral.

All except one of the Group I and Group II amputations were necessitated by injuries. Thirteen of the Group III amputations were because of injuries, and fourteen were because of tumors. Although this distinction was recognized in the tabulation, the evaluation of results was made with-

out regard to cause of amputation, since the express purpose of the survey was to determine the success of utilization of prosthetic therapy without consideration of cause of amputation.

Determination of extent of use of the prosthesis was made by translating the replies to Question No. 16 (Fig. 1, Front) into three degrees of utilization based on the following criteria: *Continuous Use*—inference of daily use; *Part-time Use to an Advantage*—use to some degree other than daily, yet sufficient to suggest some amount of regular dependence; *Abandoned Entirely or Used Negligibly*—no regularly scheduled use inferred and complete abandonment suggested or stated.

The respondents were questioned as to their dependence on additional aid in the form of canes, crutches, or wheelchairs in an attempt to determine the functional use of the prosthesis as compared with its cosmetic use alone. The type and amount of additional aid was also indicative of the relative confidence placed by the amputee on the prosthesis itself and on his ability to utilize it satisfactorily.

Questions No. 20 through No. 24 (Fig. 1, Back) were directed toward a determination of the number of amputees who had attempted use of the newer Canadian-type limb and their experience resulting from such use. Sufficient space was provided for whatever comments the respondents wished to make concerning advantages and disadvantages of this prosthesis.

At the end of the questionnaire, the respondents were asked how the amputation had affected their lives in general. Space was provided to comment generally on both this question and on any aspect of their experience as amputees. It was hoped that some reflection of their general socio-economic adjustment could be noted.

The replies in each of the above categories were tabulated both numerically and by percentages (Tables 1 and 2).

The questions on the survey form were phrased as briefly and worded as generally as possible in an attempt to avoid coloring the replies by demanding or encouraging the use of specific terms.

Extent of Use of Prosthesis (Tables 1 and 2): Of the total group of 87 respondents, 50 indicated that they wore their prostheses "continuously" as opposed to occasional or negligible use. Of these, two were in Group I, 33 were in Group II, and 15 were in Group III. Five of the total number of 87 respondents stated that their use of the limb was part-time, but to an advantage. Two of these were in Group II and three were in Group III. Thirty-two of the respondents stated that they did not use the limbs at all; of these, two were in Group I, 21 were in Group II, and nine were in Group III.

In a comparison of extent of use of the prosthesis within the individual group as determined by the time-of-amputation criterion used in this survey, the following percentage results are noted (Table 2)^b; Group I amputees

^b See also Figure 2.

indicated 50 percent wore the limb continuously and 50 percent abandoned it entirely; in Group II, 59 percent wore the limb continuously, 4 percent wore it occasionally, and 37 percent abandoned it entirely or used it negligibly; in Group III, 56 percent wore the limb continuously, 11 percent wore it occasionally, and 33 percent did not use it at all (Fig. 2).

Of the five bilateral amputees responding to the survey questionnaire, three wore their prostheses continuously; the remaining two had abandoned prosthetic use entirely.

Additional Aid Required (Tables 1 and 2): Of the 87 survey respondents, 21 required the additional aid of a cane or canes to some degree. Thirty-two of them said that the use of crutches was required most or all of the time. One of these was a bilateral amputee. Only eight stated that a wheelchair was essential, and of these eight dependent on the wheelchair four were bilateral amputees. Twenty-six respondents stated that they required no additional aid at all.

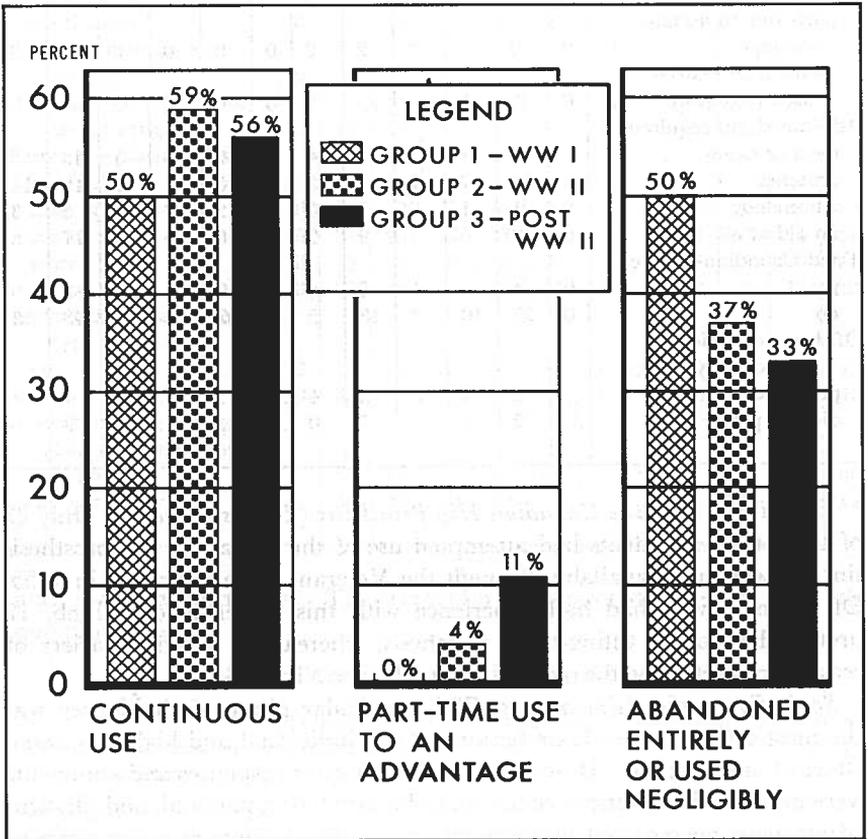


FIGURE 2. Comparison of extent of use of prosthesis within individual group.

TABLE 1

(Total Number of Responses—87)

Code: Group I—World War I
 Group II—World War II
 Group III—Post-World War II

Amputee data	Right Leg			Left Leg			Both Legs			Total		
	I	II	III	I	II	III	I	II	III	I	II	III
Total amputations in group	0	27	15	4	27	9	0	2	3	4	56	27
Amputation caused by:												
injury	0	27	7	3	26	3	0	2	3	3	55	13
tumor	0	0	8	1	1	6	0	0	0	1	1	14
Extent of use of prosthesis:												
continuous	0	16	9	2	15	5	0	2	1	2	33	15
part-time to an advantage	0	0	1	0	2	2	0	0	0	0	2	3
abandoned entirely or used negligibly	0	11	5	2	10	2	0	0	2	2	21	9
Additional aid required:												
cane or canes	0	8	1	1	7	4	0	0	0	1	15	5
crutches	0	10	7	2	9	3	0	0	1	2	19	11
wheelchair	0	1	1	0	2	0	0	2	2	0	5	3
no aid at all	0	8	6	1	9	2	0	0	0	1	17	8
Tried Canadian-type leg:												
yes	0	4	5	1	9	4	0	0	0	1	13	9
no	0	23	10	3	18	5	0	2	3	3	43	18
Of those who tried Canadian-type leg:												
preferred	...	2	4	0	2	4	...	...	...	0	4	8
did not prefer	...	2	1	1	7	0	...	...	...	1	9	1

Experience with the Canadian Hip Prosthesis (Tables 1 and 2): Only 23 of the total respondents had attempted use of the Canadian hip prosthesis since it was made available through the Veterans Administration in 1955. Of the men who had had experience with this newer type of limb, 12 preferred it to the tilting-table prosthesis, whereas 11 stated a variety of reasons for preferring the older tilting-table type (Table 3).

Socio-Economic Adjustments: This particular phase of the survey was the most difficult to evaluate because of the individual and highly personal effect of amputation. However, a wide variety of responses and comments were made to the questions concerning the social, occupational, and physical adjustments necessitated by amputation. Table 4 contains a sampling of the responses and comments to those questions pertaining to occupational

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TABLE 2

(Results in Percentages)

Code: Group I—World War I
 Group II—World War II
 Group III—Post-World War II

Amputee data	Right Leg			Left Leg			Both Legs			Total		
	I	II	III	I	II	III	I	II	III	I	II	III
Percentage of total amputations (87)	0	31	18	5	31	10	0	2	3	5	64	31
Percent amputations caused by:												
injury	0	100	47	75	96	33	0	100	100	75	98	48
tumor	0	0	53	25	4	67	0	0	0	25	2	52
Percent extent of use of prosthesis:												
continuous	0	59	60	50	56	56	0	100	33	50	59	56
part-time to an advantage	0	0	7	0	7	22	0	0	0	0	4	11
abandoned entirely or used negligibly	0	41	33	50	37	22	0	0	67	50	37	33
Percent requiring additional aid:												
cane or canes	0	30	7	25	26	44	0	0	0	25	27	19
crutches	0	37	46	50	33	33	0	0	33	50	34	41
wheelchair	0	3	7	0	8	0	0	100	67	0	9	11
no aid at all	0	30	40	25	33	23	0	0	0	25	30	29
Percent tried Canadian-type leg:												
yes	0	15	33	25	33	44	0	0	0	25	23	33
no	0	85	67	75	67	56	0	100	100	75	77	67
Percent of those trying Canadian-type leg:												
preferred	...	50	80	0	22	100	...	...	...	0	31	88
did not prefer	...	50	20	100	78	0	...	...	...	100	69	12

and social adjustments. The responses are quoted directly from the questionnaires.

TABLE 3.—Comments on Canadian-type Prosthesis

These comments on the advantages and disadvantages of the Canadian-type limb are personal opinions quoted directly from the replies of those 23 amputees having had experience with this prosthesis.

Advantages:

“Easy to sit or stand with having no locks and I like the bucket and belt arrangement from the support angle . . .”

TABLE 3.—Continued

"Lighter in weight. Free hip and knee joint an advantage and the plastic socket holds it in place better."

"Somewhat lighter in weight—possibility of less broken hip joints."

"Lighter weight. Walk is more natural. More control of leg. Better appearance."

"Easier on clothes; quieter; easy action; if it had a hip lock it would be great."

"No hip lock, swings true, comfortable to wear and knee lined up slightly behind the hip joint to help keep knee from buckling."

"No worry from hip or knee locks; less tiring as a follow-through can be used in walking; plastic bucket stays the same."

"Fits more comfortably; smoother steps; does away with hip lock."

"Did away with cumbersome hip lock: allows freer walking—more natural gait when coupled with polymatic knee—best yet."

"It has automatic knee lock while the other types do not."

"Easy to walk with; no locking or unlocking when rising or sitting; more natural gait; more natural swing through; much simpler mechanically."

"There is no comparison between it and a tilting-table leg. The Canadian leg walks in about half the effort, they walk 100 percent more normal, after you have learned how to walk on them."

Disadvantages:

"It is not for walking in wind and I don't care for the thigh being so small."

"No benefits over old leg. Also too unsteady. Hard to sit down."

"Uncomfortable around the waist and I would like my socket to come up higher over the hip bone."

"Does not perform as expected—very poor appearance—requires more effort to use—instability; appearance; increased destruction of clothes; difficulty in keeping adjusted; excessive heat due to plastic; Canadian leg is as so many other gimmicks fastened on amputee supposedly correcting the tendency to throw one side of body forward—has not done so—marked narrowness of thigh portion and absence of fullness in hip area makes a very lopsided, crippled appearance; has tendency to ride up at knee when driving, locking steering wheel—rather annoying; solid plastic bucket tends to tear out bottom of pants instead of side whenever you sit on hard chair or bench."

"Too difficult to control; have no confidence in leg; cannot wear outside of house; have fallen during practice; no control; unstable; extremely unnatural looking; awkward."

"I never could walk with it with any security; no security for one who had been conditioned to wear the conventional type for 14 years."

"Am unable to get adjusted to it. Cannot move fast enough in crowd or on uneven terrain. No hip lock."

"Very heavy. Had to be worn very tight about waist. Uneven gait; hard on back but necessary to raise limb off ground. Tendency to buckle unless locked properly."

"Extremely hot. All the artificial limbs which I have used, save for the first, have made me helpless in the field, since I cannot walk over extremely rocky ground nor through high weeds. It also makes riding horseback extremely difficult due to the fact the pressure from the leg is transferred through the belt to the right hip."

"The plastic has a tendency to cause perspiration due to the lack of air holes, while the other types do not."

"The leg rubs the scar tissue on my hip; the leg is too heavy; cannot get around in it to work."

"Prosthetists qualified to build or repair Canadian legs are few; walking rate not easily speeded up."

TABLE 4.—*Socio-Economic Effects of Amputation*

The following comments are quoted directly from the replies to Questions No. 25 and No. 26 of the survey form: "How has the amputation affected your life in general?" "Any additional comment you'd like to make."

The occupation of the respondent quoted at the time of survey is included in parentheses following each comment.

"When you stop to think—it hasn't affected it too much one way or the other. I still could move fast enough to catch my wife—so things ain't too bad yet. My biggest complaint is that there is still not a stump sock of the right dimensions out for this type of amputation. It seems that a sock could be designed that would be better than the present." (Office Mgr.)

"Am living a life where I am limited as to what I can do. I need help in maintenance of our home, but otherwise am living a happy life in spite of a number of limitations. I am married and have had 4 children since the amputation. This keeps me busy enough so that I have very little time to think about these limitations." (Cutter-grinder Machine Operator)

"It has slowed me down in production 50 percent." (Clergyman)

"Has made life a little more serious, still get around some of course . . . had to change type of work but went to school." (Postal Clerk)

"Caused me to retire from my job with the railroad." (Unemployed)

"Yes, there are many sports in which I use to enjoy, but there is still one sport in which I still enjoy and that is golf. I believe all amputees should play the game. I used to be able to do odd jobs such as painting, carpentry, and landscaping in which I can't do now." (Production Control Specialist)

"Life is very difficult." (Part-time Citrus Picking House Worker)

"I have had to completely rebuild my life to be able to live with my disability. I feel the Veterans Administration should make more effort to give equal benefits to the few unilateral amputees in regard to wheelchair-adapted homes. I, for one, have received no benefits in this direction, yet without my artificial leg I am confined to my wheelchair." (Insurance Agent)

"Has caused an obesity problem through lack of mobility. The compensation paid by the V.A. has let me go to college for eight years. I have compensated for my disability by going to college and preparing for a teaching degree. At the present time I lack only my dissertation on the Ph. D. degree." (Assistant Professor, Faculty of State University)

"I'm getting along about normal. I bowl in two leagues. I am able to swim fairly well." (Pump Serviceman)

"To this I say NO! These things each individual must overcome by doing those things he likes most regardless of the effort it takes. I find that keeping on the go, so to speak, and out in public, people soon never notice the canes nor the difference in walking. I don't want people to get the idea I'm a show-off, however." (Unit Control Service Manager)

"Aside from change from naval career to civilian engineering job, biggest change was move to a mild weather climate in southern California." (Production Engineer, Pacific Missile Range)

"None, except for a few physical capabilities. I have been steadily employed most of the time since discharge. I have learned to water ski and enjoy swimming and boating. I also bowl occasionally." (Linotype Operator)

"Forced to change to a drier climate because of extreme phantom pain I get in damp climate. My sexual life also affected. I get tired easily walking on one leg." (Bookkeeper)

"Miss sports, dancing, and having people feel at ease around me." (Accountant)

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TABLE 4.—Continued

“Have back trouble when standing too long or if too active and stomach trouble when sitting long over drawing table.” (Commercial Artist)

“I find it hard to keep my weight down.” (Field Engineer and Sales Representative)

“Outside of walking I do most anything I desire. As I age, I've slowed down because of backaches, but still lead an active, normal life.” (Hand-manufacturer of Precision Dental Instruments)

“Plain words as high as I am my life is ruined. Hard to live a normal life. I am off balance, and if I am not careful I get lots of falls from wheelchair if I try reaching for things. Ruin all good chairs, I am shaped like end of a bullet and it bothers me to sit on something hard. My folks say I have the car seat and all chair seats out of shape. Plain words being a high amputee I am something people look at in the zoo. Find life harder every day as I grow older. And I am not able to keep up with living prices on what Uncle Sam pays. Prices have gone out of sight and the little raise we have gotten doesn't come up to price of things to live.” (Unemployed, Bilateral amputee)

“There are disadvantages to being in this condition, on the other hand, wonderful things have happened. “It's great to live in God's wonderful world.” (Shoe Repairman)

“This has interfered with employment.” (Unemployed)

“Farming occupation could not be continued and had to find employment that would allow me to be seated.” (Real Estate Salesman)

“Of course it has! No way of telling if I would have been more or less happy or successful if it had not happened.” (Owner of Small Printing Business)

“I believe it has made me a more dependable person.” (Chief, Prosthetic and Sensory Aids Service, VARO)

“When I am out of work it makes it harder to get another job because insurance doesn't cover an amputee.” (Factory Worker)

“I think life is about as normal as it would have been otherwise, and probably more meaningful since I came so close to losing it. I am happily married, have two fine children, and am engaged in a rewarding teaching career.” (High School Teacher)

COMMENT

Some previously unappreciated facts concerning this group of military veteran hip-level amputees were revealed by the responses obtained in the survey made in 1960 through the Veterans Administration Regional Offices.

Emotional acceptance of the fact of amputation would appear to be paramount to successful utilization of prosthetic therapy. Definitive functional rehabilitation in a carefully prescribed and administered program was made available to this group during and after World War II. Even though the treatment received was uniformly administered, the survey responses revealed widely divergent attitudes and degrees of success in prosthetic utilization.

The survey results would seem to indicate that an average of 55 percent of all respondents in all Groups had used a prosthesis continuously. An average of 40 percent had either abandoned prosthetic use entirely or reduced such use to a negligible amount. Only 5 percent maintained occasional use of a prosthesis. It would appear that individual falls into a

pattern of either regular dependence or of complete abandonment of the limb.

This pattern would seem to be related to vocational and avocational skills, since these activities reflect either the need for use of the limb or no requirement for such utilization. The vocations of the respondents cover a wide range of skill, education, and training requirements. Among the vocations listed by the respondents were teachers, draftsmen, factory workers, farmers, a physician, and a clergyman. It was noted that some of the men who, because of amputation, were unable to resume their pre-military occupations acquired new skills and additional education to equip themselves in several instances for more highly-paid employment than they had previously. Others who were likewise unable to return to their previous means of employment simply retired from any regular occupation. Nearly all those who continued in regular employment were continuous wearers of a prosthesis, whether or not the limb was an actual requirement of their work.

Avocational pursuits covered a range from television-viewing to water-skiing. The favorite activities as judged by the number of times they were mentioned were swimming, bowling, and small-game hunting.

The comparatively small number of amputees who have attempted use of the Canadian-type prosthesis may be attributable to the relative newness of this device at the time that the survey was made, only five years after its original availability to this group. Since new limbs are procured only after the preceding ones are worn out, some period of time must pass before all the amputees in the surveyed group will obtain replacement limbs of any type. A further survey at some time in the future would probably give a more accurate reflection of the Canadian-type prosthesis's successful utilization.

Recognition should still be made, however, of the response to the Canadian-type limb as indicated by the comments from the survey form. Again, satisfactory acceptance seems to be on the basis of the individual's attitude. The comments in Table 3 should be studied in the realization that the features of a particular prosthesis which are advantageous in one situation may be disadvantageous when the limb is put to a different use. Therefore, the vocational and avocational pursuits of the individual may color his attitude in regard to the particular type of prosthesis he prefers. The comments in Table 3 are, therefore, accompanied by an indication of the respondent's interests.

SUMMARY

In a survey of United States military veteran hip-level amputees made in 1960 it was found that 55 percent of the respondents reported continual use of a prosthesis in their routine pursuits.

It would appear that the individual falls into a pattern of either regular dependence on the limb or of its complete abandonment. This pattern

is seemingly related to vocational and avocational skills requiring utilization of a prosthesis. A variety of occupations was reported, including teaching, factory work, professional careers including a physician and a clergyman, and leisure-time activities ranging from television-viewing to water-skiing, with the greatest preference voiced for bowling, swimming, and small-game hunting.

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