

## Powered wheelchairs: are we enabling or disabling?

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### Abstract

Following the unsuccessful issue of three powered indoor National Health Service (NHS) wheelchairs, a survey was carried out of 40 users in a London wheelchair service to identify the problems with issue and possible areas for improvement to practice.

The survey identified improvements that were necessary both from the service and the manufacturers' booklets. The improvements include the issue of written instructions and information to complement verbal instruction given at handover. Such information should be as interesting to read as possible, make use of appropriate language and diagrams (especially in area where English is often not the first language), colour, text and print size to maximise comprehension to these severely disabled users and often their elderly relatives or carers.

The importance of the role of the rehabilitation engineer in training the user, giving instruction at handover and annual review are highlighted to ensure that the equipment remains working, suitable and up to date for the individual's needs. Training in interpersonal and communication skills and the importance of recall should also be emphasised.

The implementation of the findings should lead to increasing contact with the service by the user, reduction in repair and replacement costs, regular review, correct supply and will therefore enable users to increase their independence with appropriate equipment.

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### Introduction

The development of the powered wheelchair began with the application of a car starter motor to the tubular cross frame of the wheelchair, with power derived from a car battery. With the development that subsequently followed, the cross frame of the wheelchair was removed and the space beneath the seat became available to hold equipment or the battery (Warren, 1990). Carter in London, produced motorised wheelchairs during the First World War to meet the demands of the large number of surviving paraplegics and amputees from the War (Kamenetz, 1969). With the further increase in the survival of people with physical disabilities in the 1960s and 1970s the demand for powered wheelchairs increased (Wilson, 1986). It has been said that perhaps no single piece of equipment makes a greater contribution to implementing the five basic rights for the disabled outlined by the United States of America Department of Health and Human Services. These rights are the freedom to life, to learn, of movement, to work and for independent living (Brede and Ibler, 1982).

The most obvious benefactors of powered mobility are those users who are completely dependent and who, without the equipment, are unable to move in their environment (Warren, 1990). Others also include those who are less dependent, that is, those who are unable to propel a manual wheelchair more than a few feet or those who through propelling the wheelchair are then unable to perform functional tasks with their remaining energy. Such users include those who may suffer from the following conditions: rheumatoid arthritis, osteoarthritis, cerebral vascular accident,

multiple sclerosis, upper and lower limb amputation, cerebral palsy, tetraplegia, paraplegia, cardiac conditions, motor neurone disease, cervical spondylosis, spinal degenerative diseases, poliomyelitis and muscular dystrophy.

Provision of powered wheelchairs, as with manual wheelchairs, was organised nationally in the United Kingdom (UK) through the Artificial Limb and Appliance Centres (ALAC) until 1991. Patients who were unable to manage a manual chair were referred by their general practitioner (GP) to the Department of Health and Social Security (DHSS) medical officer at the local wheelchair centre. Here an assessment would be carried out to ensure that the candidate was suitable for this equipment using a DHSS form which stated 'Conditions of Eligibility' for patients if they were:

- i) suffering from a defect of the locomotor system or severe chronic lung or heart condition so that to all intents and purposes they were unable to walk;
- ii) unable to propel themselves in an ordinary wheelchair;
- iii) not permanently bedfast;
- iv) able to derive some measure of independence in the home from using a powered indoor chair.

If it was agreed that the patient was suitable and warranted such equipment, the doctor together with the ALAC technical officer (TO) would assess the patient for a suitable model available from the NHS at the time.

In 1986, there were 8,500 users with indoor powered wheelchairs on issue from the National Health Service (NHS) within England and Wales, and 595 on issue in Scotland in 1981 (Scottish Home and Health Department, 1983). By the end of March 1992, the Department of Health reported that there were 8,907 indoor powered wheelchair users in England (Department of Health, 1983), a very small increase in the numbers over six years. The Royal College of Physicians' report on disability stated that the average GP group practice with a list of 10,000 would have 72 wheelchair users and a Health District with a population of 250,000 would therefore have approximately 1,810 persons in wheelchairs (Royal College of Physicians, 1987). A recent study indicated that the number of manual users had increased by 265% in the last 20 years

(Kettle and Rowley, 1990) and today there are almost 700,000 users of NHS wheelchairs alone in England (Aldersea, 1996).

If the patient could manage to manoeuvre and handle the selected model, a home assessment would be carried out by the TO to ensure that the environment where the wheelchair was to be used was both safe and suitable. If the visit was satisfactory, the wheelchair would be delivered by the "approved repairer" and a 'hand-over' of the equipment would be completed by the TO separately. Typically the hand-over included the following: inspection of the chair and checking the model delivered was the correct one, demonstration of battery access, maintenance and charging also giving written instructions, checking of the suitability of the seating and controls for operation and use, testing the user under power, and hand-over the model handbook. A conditions of supply information sheet would also be issued. No training was routinely given regarding transfers or manoeuvres in the wheelchair. Annual checks was carried out by the TO service.

In the years prior to devolution of responsibility from central government control, the NHS indoor powered wheelchair range consisted of the following models:

- i) Model 102, a heavy and slow-moving three-wheeled chair with a foot platform. The chair was not readily transportable but turned in a very limited space;
- ii) Model 103, a portable, light-weight aluminium-framed and front-wheel drive chair;
- iii) Models 109 and 110, both steel-framed and front wheel-drive;
- iv) Model 110JX, a more advanced wheelchair which included a brake motor (Williams *et al.*, 1982).

Today, the commonly prescribed powered wheelchairs are: Bencraft's Apollo and Pioneer models, the Barrett Jewel and Gem, the Newton Badger, all of which are rear-wheel drive unlike the earlier models.

A report of the wheelchair service in Scotland stated that some of these earlier models were 'rather jerky to use' through their standard control box. Moving the joy stick would move the chair at a set speed, hence the initial jerk. However more modern proportional controls move the chair at a speed proportional to the movement of the joy stick and are therefore smoother, giving the user more control over the

speed. The report also found that there was 'a major problem with batteries for all powered wheelchairs' (Scottish Home and Health Department, 1983). The batteries that were supplied by the NHS (and continued to be supplied in some areas following the 1991 devolution) were the wet lead-acid variety. With this type of battery most of the charge (up to 80%) should be used up before they are recharged. The wet lead-acid variety require regular topping up with distilled water in all of the 12 chambers, at least monthly and only after charging. If the topping up is carried out before charging, bubbling-over occurs which leads to spillage and the risk of burns to the skin, clothes and floor. Only distilled water should be used with such batteries and this is not supplied by the NHS. The six small caps on each battery have to be removed for the topping up to take place (Male and Massie, 1990). It is important to avoid overfilling the cells as this can cause spillage and burns, or underfilling which can cause corrosion of the plates and eventually a failure of the wheelchair. The safest way to refill the cells is with a special valved dispenser which should be supplied by the approved repairer with the wheelchair. It is also advised that the terminals are smeared with petroleum jelly to prevent corrosion. For safety reasons, it is recommended that the battery should only be charged in a well-ventilated room and not in the main living room or bedroom, as the gases that are given off can cause explosions, (this is the reason why services such as "dial-a-ride vehicles", ambulances, hospital transport and buses frequently refuse to take them on board). For the charging to take place, the user has to come out of the wheelchair and lift the seat canvas for access to the batteries. Charging should take place for eight hours or overnight, and if the chair is not in use it should be charged at least on a monthly basis (Department of Health/Medical Devices Directorate, 1992). The user therefore needs patience, dexterity, a fair mental ability and memory in order to carry out these tasks safely. A good command of the English language an understanding of some technical jargon is also needed to be able to follow the instructions in the booklets issued by the wheelchair manufacturer (Department of Health/Medical Devices Directorate, 1992).

Therefore prior to 1991, users were supplied with a wheelchair, instruction booklet and in

most cases a distilled water bottle for topping up the battery. There was little information or detail in the booklets regarding the charging of the batteries and this varied from one sentence to a quarter of an A5 page. All modifications, repairs and necessary follow-ups at home were carried out by the TO and approved repairer. Therapists were rarely involved in powered wheelchair supply.

Following the McColl Report (1986) and the formation of the Disablement Services Authority, the wheelchair service was devolved to a district level in England in April 1991. Responsibility for prescription, supply, support, review and all the financial implications was handed over to the district therapy teams in most areas. However in some areas the service remained in the hands of the TOs (now called rehabilitation engineers), for example in the North Western Region of England.

Newham is one of the most deprived boroughs in the country. It is situated in east London and the population is both multiethnic and multicultural. The population comprises: 57% white, 13% Indian, 7% Afro-Caribbean, 6% Pakistani, 4% Bangladeshi, 3% other Asian, 1.5% other black and 0.8% Chinese. The local population therefore has special requirements, relating to, for example, verbal and written information, expectations of the NHS, problems of lower social class and low educational levels. It is a borough which has many facilities and opportunities for the disabled population. These include: day centres, specific cultural groups and centres, an under 65 physically disabled centre, learning difficulties centres, organised holidays for the disabled, outings around and out of the borough for the disabled, a community transport service as well as a council supporting the 'black cab' scheme. The area also has low-entry London Transport buses, educational courses of all types and a central sports centre which caters for the disabled.

At the time of devolution, the Regional Centre Harold Wood had 1042 powered indoor chairs on issue, 26% of the total on issue. The number of powered indoor users for each district in 1991 at devolution is not available. By 1994, the Newham population had increased from 217,000 to 226,000 (1991 Census) and there were 45 powered wheelchair users. The 39 adults and 6 children suffered with disabilities

which included: multiple sclerosis, spinal cord injuries, poliomyelitis, rheumatoid arthritis, cerebral palsy, motor neurone disease, muscular atrophy, osteoarthritis, hemiplegia, amputation and muscular dystrophy.

In Newham, at the time of the survey, users were referred to the service generally by GPs and therapists. They would be assessed for their wheelchair needs and if this included the provision of a powered indoor model, the rehabilitation engineer (RE) would become involved in both the environment check and hand-over procedure. However at this early period of the purchaser/provider split, the purchased RE sessions were limited and therapists also had to cover some of their duties.

Some 18 months after devolution and following three unsuccessful deliveries and hand-overs of indoor powered wheelchairs to new users in this district, it was decided that the area needed to be reviewed to identify problems and possible improvements to practice.

## Method

In December 1993, a three part action research study was undertaken with the aim of reviewing current service to indoor powered wheelchair users. Information was sought in three areas: the past, through a review of users' experiences; the present, through the current practice of others; and finally the future, through the content of training programmes and courses.

### *The past - user survey*

#### *Sample group*

The total number of service users on record was 45. However 5 were excluded from the study as they were either known to be abroad for some time or were recent users and would therefore be less qualified to offer assistance in the survey. The sample group of indoor powered wheelchair users was 40 (1% of the database of wheelchair users). The group consisted of 36 current users and 4 recent ex-users (i.e: chairs returned within the last 12 months as a result of changing social circumstances or an inability to use the chair).

The aim of the questionnaire was to obtain information on the following topics: detail of issue, current level of usage, therapy input before supply, general maintenance, verbal and written information offered and issued, use of

the approved repairer service, wheelchair service support, additional needs unmet by the wheelchair service and ideas for improvement for the future.

#### *Pilot study*

The survey tool was tested with four established users as a pilot study. These four users were specifically selected as they were well-known to the service and known to be expressive of their views. Between them they suffered from a range of disabilities, ages and chronicity of condition. The questionnaire was semi-structured, with both open and closed format to the questions.

The sample group was also interviewed by one of the authors using a semi-structured format to gain further information about the topic area and to obtain comments on the manufacturers' booklets currently issued, namely those of the Bencraft Apollo, Newton Badger, Barrett Jewel and the two booklets given with the Bencraft Pioneer (powered and manual transit models). Comments were requested regarding: the layout/presentation, overall length, print size, paper colour, general clarity, degree of quality of the illustrations if any, and the terminology used. Colour combinations were offered from the following colours: white, pale blue, pale yellow, pale green, pale orange, and pale pink to determine the most favoured background for a booklet's readability. Courier font size 14 was used throughout.

#### *Survey questionnaire*

From the pilot study, comments were noted and the final questionnaire designed. The option of anonymity was offered as the questionnaire was not pre-coded. However if the user wished to be sent any feedback, they were asked to print their name at the end of the form. Also the option of interview either in person or over the telephone was offered but not taken up by users.

The definitive postal questionnaire was sent with a stamped, addressed return envelope and covering letter explaining the reason for the review and emphasising the importance and subsequent application of their views. The questionnaire consisted of four sections and 36 questions, in large print on 6 pages of A4 paper (Appendix 1).

### ***The present - wheelchair services***

An open-ended letter was sent to specifically named individuals (either therapist or doctor) at 17 regional Disablement Service Centres and 17 specific therapists at 36 district wheelchair services throughout England and Wales. (These names were available from the national wheelchair service lists and the centres were selected at random). The letter invited the therapists to give information on their local supply procedures and policies including any written information given to new powered wheelchair users.

### ***The future - rehabilitation courses***

A similar letter was sent to two Rehabilitation Course Directors and to two current course participants to establish the detail and time spent on this topic in their educational programmes, particularly concerning the user. These courses would be attended by rehabilitation engineers and therapists.

## **Results**

### ***The past - user survey***

The response rate was 31 (78%) and 4 of these were unsuitable for analysis for the following reasons: one was poorly completed by the carer, two died after the questionnaires were sent out, and one returned the chair after three weeks. The final total analysed was therefore 27. Some 21 (78%) requested feedback.

### ***The chair***

Thirteen (48%) users had had their wheelchair less than two years and 14 (52%) longer than two years (pre-devolution). Some 15 (56%) had been seen by a member of the wheelchair service within the last 12 months and 21 (78%) were using the chair regularly. Only 21 (78%) replied that the chair was in working order and 18 (67%) said the chair was meeting their needs.

### ***Learning to use the chair***

Eighteen (67%) said they had received a home visit before the chair had been issued and 11 (41%) said they had had a trial drive of the chair. Some 20 (74%) had received no therapy training on the handling of the chair and 17 (63%) welcomed an annual therapy visit in the future. Only 17 (63%) said they had been given a contact number for the service.

### ***Looking after the chair***

Twenty-two (81%) said a relative looked after the chair and only 3 (11%) users looked after their own chairs. Some 16 (59%) said they had been taught how to look after the chair and 14 (52%) had received an information booklet about the chair. Nineteen (70%) said they knew who to contact for repairs. Regarding battery charging, 11 (41%) charged batteries every night or overnight 19 (70%). However, 4 (15%) charged it for more than 24 hours. Seven (26%) checked the battery fluid correctly every two weeks, 6 (22%) monthly and 5 (19%) said they never checked the battery. One (4%) replied that they used tap water to top up the batteries.

### ***Repairs***

Seven (26%) said they called the approved repairer (AR) when they needed repairs and 13 (48%) said they contacted the service. 23 (85%) replied that they checked the chair themselves initially if there was a fault. Eight (30%) had had no repairs in the last 12 months but the remainder had had either 1 (30%), 2 or 3 (30%) or more (10%) in this period.

When asked where they stored the chair when not in use, 17 (63%) said by the bedside, 9 (33%) in the corridor/other and 1 (4%) outdoors. Six (22%) transported the chair in a car and 7 (26%) in a bus, all noting that transportation on hospital vehicles was disallowed. Some 24 (89%) said they welcomed an annual check and 25 welcomed a new information booklet about the wheelchair.

### ***The present - wheelchair services***

#### ***Regional wheelchair services***

A total of 8 (47%) replies were received from the 17 DSCs, only 1 (13%) of which issued a locally devised sheet together with Her Majesty's Stationery Office (HMSO) leaflet regarding the do's and don'ts for charging batteries and also the manufacturer's booklet. Four (50%) issued the DHSS leaflet only and 3 (38%) issued the DHSS leaflet and the manufacturer's booklet.

#### ***District wheelchair services***

A total of 23 (64%) replies were received from 36 district wheelchair services across England and Wales, 4 (17%) of which had locally devised an information sheet or booklet on general maintenance, 2 (9%) of these also

gave out the DHSS leaflet and the manufacturer's booklet. Ten (43%) issued the manufacturer's booklet alone, 3 (1%) issued DHSS leaflet alone and 6 (26%) issued both of these.

#### ***The future - rehabilitation courses***

Both course directors replied. Courses available were:

- a) a three-day postgraduate course on wheelchairs and seating; and
- b) a Rehabilitation Engineering Certificate course.

The first course did not cover wheelchair maintenance in detail as it was assumed that such information would be provided by the wheelchair manufacturers/suppliers. The second course did not offer training on how to advise users but the correct procedures for battery charging were taught and the REs were also advised of their responsibility to see that patients understood the procedures.

Of the two course students questioned, one replied saying that they had received no relative written information/instruction on this topic.

#### **Discussion**

Following the NHS management inquiry in 1983 there was a proliferation of surveys in the NHS that were largely managerially led and focused on the hotel aspects of service such as quality of catering, physical amenities for inpatients or the access to health care facilities. Following the government white paper, 'Working for Patients' (The Health Service, 1989), it was envisaged that surveys would increase in seeking patients' views on information needs, interpersonal and organisational aspects of care and the value of medical treatment (Fitzpatrick, 1991).

Patient satisfaction survey results are important outcome measures and used systematically can provide feedback that offers alternative ways of organising or providing healthcare. A survey was therefore carried out in the authors' district to find out about patients' experiences with the service provided and to ascertain how procedures could be improved in the future.

Although a postal survey is less sensitive to patients' concerns and is unable to clarify ambiguities, it was the chosen method here as it held no interviewer bias, provided patient

anonymity and required less staff input and costs. Ley *et al.*, (1976), in a study of medical inpatients, found that patients replying to postal questionnaires were no more likely to be satisfied than those who did not reply. The interviewing and content analysis of the individual discussions also helped in obtaining quality information.

The equipment had been on issue both pre- and post-devolution, for both more and less than two years. Typically such equipment costs approximately £1,000. Only 78% of the population surveyed were using the equipment regularly and for the same percentage it was in working order. However for only 67% was the equipment meeting their needs and only half had been seen by staff from the wheelchair service in the last 12 months. Regular reviews of this group would therefore ensure the wheelchair is meeting users' needs and remaining appropriately issued. Only half said they had had a home visit before the equipment was issued and yet this had previously been carried out by the TOs. Only 41% had had a trial before issue, thus indicating that these users had not attended the service for assessment prior to issue to see if such equipment would in fact meet their individual needs or more appropriately had a trial at home. Twelve (45%) incorrectly charged and checked wet batteries which leads to exposure of the plates in the battery and reduced battery capacity.

The quality of information given to users was poor. Some 37% said they did not have the telephone number of the service and 30% who to contact for repairs. The majority of these severely disabled users had relatives who maintained their chairs (81%) or carried out the maintenance themselves (11%) yet 41% had not been told how to use the chair and 48% had no instruction booklet that they could remember. This is in line with the findings of other surveys (Kettle *et al.*, 1992). Some were overcharging or incorrectly charging/maintaining the batteries and the majority (70%) had needed repairs to the equipment in the last 12 months. Expensive equipment that is difficult for disabled users to manage is therefore being issued with poor maintenance, without maintenance information and costing the service and the NHS money through visits, repairs and replacement of equipment (e.g. batteries).

The information given to these users was locally poor but little different from the national picture at the time. Few (5%) services had developed any local information sheets since devolution. The majority were issuing the DHS sheet with the chairs and some also the manufacturer's booklet. But as 93% of users said they wanted a new booklet, the usefulness of the current manufacturers booklet is questioned and some users interviewed said the booklets were too difficult to comprehend. The equipment issued is difficult for the disabled user and their carers (often elderly) to manage, yet few changes have been seen in its supply until the 1990s in the NHS.

Until recently, the same models of powered wheelchairs were supplied and yet problems with some aspects of the wheelchairs were identified more than 10 years ago.

Gel sealed batteries have been available in the UK for the private market for the last 30 years. They are called 'maintenance free' batteries and require no topping up. They can be charged in any room as no gases are given off and there is a special charger for them. The user can safely remain seated in the wheelchair during the charging process unlike with the wet type. The charging procedure is much the same as the lead-acid variety but it does take longer, and the user should be informed about this. This change of action often causes problems or users changing from 'wet' to sealed batteries. Transportation of this type of battery is not subject to restriction as spillage is near impossible.

Control boxes are now available that ease the charging process with front-access design for charging and with larger pin connectors.

### **Information**

Written information has been described as frozen language, selective in its description of reality providing limited feedback but constantly available (Klug Redman, 1988). It is an efficient way to transmit information and as it is visual it can stimulate memory (Waring Rorden, 1987). It is of value only when it is used in conjunction with direct patient explanation and should never replace direct patient contact. It is a helpful form of reference and review of the information that has already been given (Goldberg, 1980; Renner and Smith, 1987). It can also act as a reinforcement

of information already given as the client may remember little of what he/she has been told (Sloan, 1984). This may be due to his/her inability to concentrate through medication, advanced age or physical disorders (Waring Rorden, 1987). As written information is frozen language patients can come back to it in their own time, thus controlling their rate of comprehension. Written information is often kept and referred to more than once and by more individuals than the patients themselves, for example carers and family.

Written information is therefore a useful adjunct for the health care professional when imparting complex instructions to clients especially when their cognitive level may be reduced due to age, illness, tiredness, educational level, language problems or a lack of familiarity with the jargon.

A considerable amount of information written for patients has been found to be too difficult to read as it is at too high a level (Ley, 1989). It is also often poorly designed and many leaflets are written in language that fails the standard tests for readability (Smith, 1992). The average reading age of the British population has been found to be nine years (Greenhalgh, 1990). If written information is too complex it can be off-putting (Robertson, 1987) and if it is not presented in an interesting manner, can be boring, therefore losing the patient's attention. It can be simplified by using shorter words and sentences. Manufacturers booklets should therefore incorporate such findings to ensure the information they give to users and carers is correct, useful, comprehensible and interesting to read making maximum use of diagrams.

In 1979, Ley found that patients fail to recall much of what they are told and amongst other findings that age and intelligence are not related to recall. If patients write down in their own words what they are told, this has been found to marginally improve recall (Thompson, 1984). Ley and Spelman (1987), in a study of patients recalling outpatient statements given by doctors, found that instruction and advice were more likely to be forgotten than statements of diagnosis. A further study by Ley (1972) found that patients recall what they are told first and what they consider to be most important but they still forget far too much. Ley (1982) found that

patients remain dissatisfied with communication, often not understanding what is being said and often forgetting what they are told. Ley and Spelman (1987) argue that patients remain dissatisfied because they do not understand what they are told, are too diffident to ask questions and because they forget too much of what they are told. Therefore it is vital that the traditional powered wheelchair 'handover' is supported with written information.

Good interpersonal skills, with a demonstration of empathy, concern and respect, have also been found to improve patients' ability to recall information. It is thought that good interpersonal skills reduce the patient's anxiety, permitting better comprehension of instruction and advice (Stephens, 1967; Lazare *et al.*, 1978). The 'teacher' or person handling over such powered wheelchair maybe the 'crucial factor in the process'.

Professional jargon has been found to be either meaningless or misinterpreted by patients (Korach and Negrete, 1972; Boyle, 1970). Patients can also use jargon which may vary with age and ethnically distancing health care worker and patient. Therefore it is important that health care workers check that the information has been understood by both parties. In powered handovers, this would also include a paid or family carer.

## Conclusion

The devolution of the wheelchair service has in many cases, made it more responsive to the population needs of the area, especially where local developments have taken place. The older model of NHS chairs are now being replaced by a variety of powered chairs that should meet the local needs more appropriately. Accessories, such as batteries and control boxes, are now available that are easier for the user and carer to manage and handle. The referral and assessment procedure should be more responsive to the individual with mobility needs. But such improvements are not seen all over England and improvements for powered users have been slow.

Although the sample group is only 1% of the total users of the Newham wheelchair service, they are the most severely disabled of the population. The study has identified a number of areas needing further development both

within the service and from manufacturers.

There is a need for a better user information booklet, using as many diagrams as possible to cover problems of language, sight, comprehension and intellectual level. Appropriate paper, colour and font size should also be considered together with careful selection of technical language. Production in a variety of languages or with little text would also be an appropriate consideration. The booklet should include information about charging, maintenance, faults and be personalised to include local contact numbers for example to increase user ownership.

The importance of the role of the RE at handover and annual equipment review, is highlighted and their role in ensuring that these severely disabled users and their carers have equipment available to them which is up to date, easy to use and appropriate. Verbal explanation should always be complemented with written information and the RE should ensure that users understand what is being explained in their own 'language'. Annual equipment checks should include an update of the equipment to ensure that the users, often with deteriorating conditions, receive the most appropriate current equipment to alleviate their problems.

There is also a clear need for regular review and training for the REs regarding the importance of interpersonal and communication skills, recall and information giving at handover and review.

The addition of these procedures should help to ensure that local costs are kept to a minimum through: correct supply and usage, minimal repairs and replacements, fewer examples of misuse and poor maintenance and regular contact with the Service though the annual reviews. Such procedures should also ensure that the users are enabled to be as independent as possible within their environments and that the amount of help they require with the wheelchair from relatives and carers, is kept to a minimum.

The role of the therapist in the assessment for a powered chair and training users to ensure they maximise the use of the equipment and hence increase their independence were also identified. An initial assessment form used by therapists has now been developed for local use. Their role in assessment reviews should also be



highlighted (Kettle *et al*, 1992).

## REFERENCES

- ALBERT T, CHADWICK S (1992). How readable are practice leaflets? *Br Med J* 305, 1266-1268.
- ALDERSEA P(1996). Wheelchair and prosthetic service project review-London: Department of Health.
- BARTLETT EE, GRAYSON M, BARBER R, LEVINE DM, GOLDEN A, LIBBER S (1984). The effects of physician communication skills on patient satisfaction, recall and adherence. *J Chronic Dis* 37, 755-764,
- WILSON A BENNETT (1986). Wheelchairs: a prescription guide Rehabilitation Press
- BREDE AL, IBLER I (1982). The motorised wheelchair: new freedom, new responsibility, new problems. *Dev Med Child Neur* 24, 366-371.
- BOYLE CM (1970). Difference between patients and doctors' interpretation of some common medical terms. *Br Med J* 1, 286-289.
- DEPARTMENT OF HEALTH/MEDICAL DEVICES DIRECTORATE (1992). Wheelchair battery charging and maintenance Wheelchair Evaluation Centre MDD/DTS/IB (doc E4 10/92).
- DEPARTMENT OF HEALTH (1993). Wheelchairs and Artificial Limbs (England) Government Statistical Service-London: HMSO.
- FITZPATRICK R(1991). Survey of patients satisfaction. I- Important general considerations. *Br Med J* 302, 887-889.
- GREENHALGH T (1990). User leaflets. *Br Med J* 300, 420-421.
- GOLDBERG S (1980). Do it yourself: a guide to writing literature. *Nurs Admin Qu* 4(2), 30-33.
- KAMENETZ HL (1960). The Wheelchair Book. Illinois: C C Thomas,
- KETTLE M, ROWLEY C (1990). National survey of wheelchair users -Leeds: University of Leeds, Rheumatology & Rehabilitation Research Unit.
- KETTLE M, ROWLEY C, CHAMBERLAIN MA (1992). A national survey of wheelchair users. *Clin Rehabil* 6, 67-73.
- KLUG REDMAN B (1988). Teaching tools: printed and non-printed materials. The place of patient education in health care. In: The process of patient education.-St Laws: CV Mosby. p150-220.
- KORSCH BM, NEGRETE VF (1972). Doctor-patient communication. *Sci Am* 227, 66-272.
- LAZARE A, ELSENTHANS S, FRANK A, STOECKLE J (1978). Studies on a negotiated approach to patienthood. In: The doctor-patient relationship in the changing health scene./edited by Gallagher EB: Bethesda, MD: Geographic Health Studies.
- LEY P (1972). Primacy, rated importance and the recall of medical information. *J Health Soc Behav* 13, 311-317.
- LEY P, BRADSHAW PW, KINCEY JA, ATHERTON ST (1976) Increasing patients satisfaction with communication *Br J Soc Clin Psychol* 15, 403-413.
- LEY P (1979). Memory for medical information. *Br J Soc Clin Psychol* 18, 245-255.
- LEY P (1982). Understanding, memory, satisfaction and compliance. *Br J Clin Psychol* 21, 241-254,
- LEY P, SPELMAN MS (1987). Communicating with the patient.-London: Staples Press.
- LEY P (1989). Improving patients understanding recall, satisfaction and compliance. In: Health Psychology process and application./edited by Broome AK-London. Chapman & Hall.
- MCCOLL I (1986). Review of the Artificial Limb and Appliance centre services -London: HMSO.
- MALE J, MASSIE B (1990). Choosing a wheelchair.-London: RADAR.
- RENNER JM, SMITH CE (1987). Teaching patients, families and communities about their medical problems. In: Nurses in partnership with other health professions./edited by Smith CE.-Philadelphia: WB Saunders. p331-355
- ROYAL COLLEGE OF PHYSICIANS (1987). Physical Disabilities in 1986 and beyond.-London: Royal College of Physicians.
- ROBERTSON L (1987). Memory functioning in those who age normally and abnormally: a literature review. *Br J Occup Ther* 50, 53-58
- SCOTTISH HOME AND HEALTH DEPARTMENT (1983). The Wheelchair Service in Scotland-Edinburgh: HMSO.
- STEPHENS JM (1967). The process of schooling: a psychological examination -New York: Holt Rinehart & Winston. p13.
- SLOAN PJM (1984). Survey of patient information booklets. *Br Med J* 288, 915-919.
- SMITH T (1992). Information for patients. *Br Med J* 305, 1242.
- THOMPSON J (1984). Compliance. In: The experience of illness. Fitzpatrick R, Hinton J, Newman S, Scambler G, Thompson J.-London: Tavistock Publications.
- WARING RORDEN J (1987) How to choose and use teaching materials. In: Nurses as health teachers: a practical guide.-Philadelphia. WB Saunders p143-166.
- WARREN CG(1990). Power mobility and its implications. *J Rehabil Res Dev, Clin Suppl* 2, 74-85
- WILLIAMS E, HILL H, CREWE R, COCHRANE G (1982). Wheelchairs: a guide to clinical prescription.-London: DHSS.
- WORKING FOR PATIENTS (1989).-London: HMSO.

## Appendix 1 Electric chair user survey

Please tick boxes where you can. Ask a relative or carer to help you if you need to.

### SECTION 1: Your electric chair

1. When was your chair issued to you?

in the last month     in the last 6 months     in the last year     in the last 2 years     longer

2. Which District wheelchair service it come from? .....

3. When were you last seen by someone from a wheelchair service?

in the last month     in the last 6 months     in the last year     longer

4. Do you still use your chair?

yes     no

5. Is your chair still working properly?

yes     no

6. Does the chair still meet your needs?

yes     no

### SECTION 2: Learning to use your chair

1. Did a therapist discuss your needs with you before you were given an electric chair of your own?

yes     no

2. Did she see you at home?

or at a wheelchair centre?

3. When your chair was delivered to you, were you or our carer taught how to look after it and charge up the batteries?

yes     no

4. Were you told who you could contact if you were ever unhappy with your chair?

yes     no

5. How many times were you visited by a therapist to help you get used to your new chair at home?

none     once     2 or 3 times

6. Would you welcome an annual visit by a therapist from the wheelchair service?

yes     no

### SECTION 3: Looking after your electric chair.

1. Who looks after your electric chair and charges it up for you?

yourself     relatives     carer     homehelp     other  .....

2. Was that person taught how to charge up the batteries by someone from the wheelchair service?

yes     no

3. Were you given an information booklet or leaflet about the chair?

yes     no

4. If yes, was it written in clear print?

yes

no

was it too technical?

yes

no

were there enough helpful pictures?

yes

no

was there too much information?

yes

no

5. Were you told who to contact if you needed repairs or replacement of parts to the chair?

yes

no

6. How often do the batteries get charged up?

every night

twice a week

once a week

when the on/off light is flashing

7. How long are the batteries left to charge up for?

less than 4 months

overnight

24 hours

8. Do you stay sitting in the chair whilst the batteries are being charged?

yes

no

9. How often are the fluid levels checked inside the batteries?

once a fortnight

once a month

once every 3 months

once a year

10. How often does your chair get checked over for worn tyres, fraying wires, loose parts, torn seat canvas, etc.?

once every 3 months

once every 6 months

once a year

never

11. What do you use to top-up the fluid in the batteries?

distilled water

tap water

12. Where do you keep the chair when you are not using it?

by the bed

in the corridor

in an outdoor shed

outside

13. Do you feel happy with the way your chair is looked after?

yes

no

14. Would you welcome an annual maintenance check for the chair?

yes

no

15. Do you ever need to take the chair in a car?

yes

no

16. Do you ever need to take it in a dial-a-ride cab or transport bus?

yes

no

17. Please write down any problems you have had taking your electric chair on any transport.

18. Imagine you are a new electric chair user, and you have been given an information booklet. What kind of things would you like the booklet to tell you?

**SECTION 4: Getting your electric chair repaired**

1. Who would you contact if your chair needed repairing or a part needed replacing?

.....

2. Have you never needed repairs or parts replacing?

yes

no

3. If yes, please state what kind of repairs you he had done?

.....

4. How many times have you had to call someone this year?

none

once

two or three times

how many times

5. When you think something is wrong with the chair do you bother to check anything on the chair before contacting the repairer?

yes

no

6. If you had an easy-to-understand booklet, would you use it to help you look after your chair?

yes

no

If you would like to have a copy of the new information booklet sent to you when it is finished, please print your name clearly here:

.....

.....