
CLINICAL REPORT

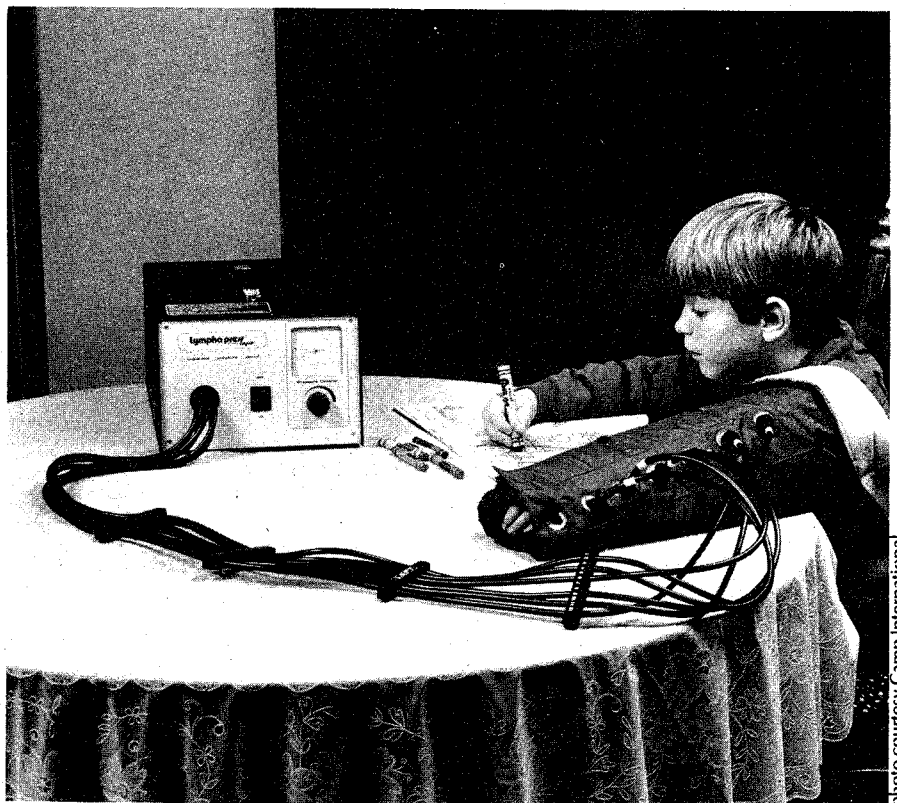
Home Therapy for Lymphedema

By Aileen McLeod P.T., M.C.S.P., M.C.P.A.
Senior Physiotherapist
Hospital for Sick Children

The recent introduction of multi-cell intermittent external pneumatic compression (I.E.P.C.) pumps onto the medical market has given renewed hope to patients with this condition as well as to the health care profession. Patients with primary or secondary lymphedema, if left unmanaged, suffer from a cosmetically unacceptable, enlarged extremity which can complicate and limit their normal daily activities. Now with the addition of the multi-cell I.E.P.C. unit to the number of home programs, many patients are being helped with this condition. (1,2)

In 1951, Dr. Conrad Jobst had devised a single cell pump which was reported to assist in controlling swelling of an extremity when used in conjunction with a pressure gradient garment. (3) This early device delivered a cycled, uniform pressure through a single sleeve, intermittently inflating for ninety seconds and deflating for thirty seconds. This prolonged cycle dictated the use of relatively low pressures (30-50mmHg.). In some cases of secondary lymphedema this unit was proven to be useful. However, in many cases of primary lymphedema it has proven relatively ineffective. Kinmonth et al (4,5) have shown the lymphatic vessels in patients with primary lymphedema to be distinctly different from those of normal patients and those with secondary lymphedema.

It is the relatively recent advent of the multi-cell I.E.P.C. pumps which has given reason for the renewed hope. In 1980 Zelikovski et al (6,7) and Partsch et al (8) reported on the use of pressure wave therapy in the management of lymphedema producing "a highly satisfactory clinical



Medical devices, similar to the one shown above are available with five, six and eight air compartments enabling effective treatment as the child develops.

condition which can be maintained by using medical compression stockings..." The relatively inadequate results obtained using the single cell units caused Zelikovski and his co-workers to examine closely the pneumatic devices already available. They concluded that two factors were evident: (a) compression using a single-cell sleeve distributed pressure in all directions so that only part of the desired pressure could reach the

lymph proximally via any remaining lymph vessels; and (b) the long duration of the pressure cycle precluded the use of high pressures. The design of a new pneumatic device—the Lympha-Press—addressed these two issues.

The Lympha-Press delivers a pressure wave massage through a series of over-lapping cells in a sleeve—(up to 12) in rhythmic cycles from distal to proximal. The total cycle time is twenty-five seconds which includes a total inflation time of twenty seconds. This shorter cycle time allows the use of higher pressures (120-150 mmHg.)

Copyright © 1989 Home Health Care Publishing Inc. All rights reserved.
Reproduction without written permission is strictly prohibited

CLINICAL REPORT

without causing discomfort to the patient or compromising the venous circulation.

At the Hospital For Sick Children, where the multi-cell I.E.P.C. pumps have been part of the home care program for 5 years, patients are typically admitted to hospital for a 3-5 day trial period following evaluation. Each patient is fully examined by the usual physical methods. Specific pre and post-pump evaluations consist of measurements of limb circumference, volume using water displacement method, and flexibility and photographs. Height and weight are also recorded. During the entire hospitalization, chest auscultation, blood pressure, fluid in-take and out-put are recorded regularly as well as any subjective complaints of discomfort especially in the pumped extremity.

Other components of the home program include elevation of the foot of the bed 4-6 inches, individual pumping routine with the limb in elevation, use of a recommended compression garment which must be worn every time the limb is dependent—a length of Neoprene can be used to wrap the leg from the base of the toes to the knee to facilitate showering), specific exercise routine to use the muscle pump to augment the compression given by the pressure garment, and education on proper use of the compression garments, skin hygiene and prevention of infection. It must be emphasized again that all components of the home program must be followed if the benefit is to be maximized.

Approximately 2000 Lympha-press units have been sold in North America to date and the majority of these are used in home programs. The decision to make the Lympha-Press the unit of choice are based on the following: (a) short cycle time of 25 seconds, and therefore the ability to use higher pumping pressures, (b) relative ease of application of the unit, (c) the ability to get sleeves to fit all age groups (infants to adults) and (d) the early positive response to the pumping routine.

Six of nine patients on the Hospital



Aileen McLeod explains how multi-cell compression pumps are used in the home program at the Hospital for Sick Children. The treatment is used to help children with primary lymphedema.

for Sick Children's home program have been followed for two years and have shown a positive response to the full regime. The mean decrease in the involved limbs by circumferential measurement is 6.9 cms. or 23%

There is little doubt that the latest development of pressure-wave I.E.P.C. massage therapy as an adjunct to a conservative home program

offers a much needed advancement to the medical management of lymphedema. ■

**Aileen McLeod P.T., M.C.S.P.,
M.C.P.A.
Senior Physiotherapist
Hospital For Sick Children
Toronto**

References

1. **RICHMAND DM, O'DONNELL TF, ZELIKOVSKI A**, Sequential pneumatic compression for lymphedema. A controlled trial. *Arch. Surg.* 1985; 120:1116-1119.
2. **RAINES JK, O'DONNELL TF, KALISHER L, DARLING RC**. Selection of patients with lymphedema for compression therapy. *Amer. J. of Surg.* 1977;133:430-436
3. **NELSON PA**, Recent advances in treatment of lymphedema of the extremities. *Geriatrics.* 1966;21:162-173.
4. **KINMONTH JB, TAYLOR GW, TRACY GD, MARSH JD**. Lymphedema; clinical and lymphangiographic studies of a series of 107 patients in which the lower limbs were affected. *Brit. J. of Surg.* 1957;45:1-10

5. **KINMONTH JB, TAYLOR GW**. Lymphatic circulation in lymphedema. *Ann.Surg.*1954; 139:129-136
6. **ZELIKOVSKI A, MELAMED I, MANOCK M, UCRA I**. The Lympha-Press, a new pneumatic device for the treatment of lymphedema—clinical trial and results. *Folia. Angiol.* 1980;28:165-169.
7. **ZELIKOVSKI A, MANOCH M, GILER Sh, UCRA I**. Lympha-Press. A new pneumatic device for the treatment of lymphedema of the limbs. *Lymphology* 1980;13:68-73.
8. **PARTCH H, MOSTBECK I, LEITNER G**. Experimental investigations on the effect of a pressure wave massage apparatus (Lympha-Press) in lymphedema. *Phlebologie und Proktologie.* 1980;2:124-128