

WRIGHT LINEAR PUMP
PROGRAM PROTOCOL

I. Purpose

To establish a standardized protocol for patients admitted to D.T. Watson Rehabilitation Hospital for initial treatment/evaluation with use of the wright Linear Pump for treatment of lymphedema.

II. Admission Criteria

1. Individual has lymphedema of an extremity which has been unsuccessfully managed with other methods of treatment.
2. Individual does not have a medical contraindication to use of a pneumatic compression device.
 - a) cardiovascular disease including congestive heart failure or severe cardiomyopathy
 - b) active infection in the edematous extremity
 - c) active malignancy in the edematous extremity (prior history of malignancy must be free of disease for at least one year)
3. Normal preadmission lab work including CBC electrolytes BUN, creatinine as well as chest x-ray, EKG in individuals over 40 year of age. Duplex studies-lower extremity edema within past 3 months.
4. Patient has a primary care physician who is willing to assume continued care of the patient and monitor response to the Wright Linear Pump if the patient is outside the geographic Pittsburgh area. If geographically feasible patient can be followed by a physiatrist on staff at D.T. Watson.
5. Completion of all information required on the preadmission check list (see attached).

III. Admission Course

Patient will be admitted to D.T. Watson Rehabilitation Hospital for a 72 to 96 hour stay to begin initial treatment and to evaluate effectiveness of the Wright Linear Pump.

1. Physical examination will be performed upon admission and prior to initiating use of the Wright Linear Pump.

III. Admission Course

6. Standard Time Sequences -

- e) In cases of an unusually large extremity or simultaneous compression of two extremities overall cycle will be increased to 140 seconds with 110 seconds "on", 30 seconds "off".
- f) Other time sequences may be used at the clinical discretion of the physician.

7. Pumping Sequence -

This sequence is designed to allow for evaluation of patient tolerance for the Wright Linear Pump while gradually increasing the length of pumping sessions. There is a one hour time off pump at completion of each pumping session.

Two (2) hours
Four (4) hours X2
Six (6) hours X2
Eight (8) hours X2

8. Hospital Course -

Patients are monitored by the nursing staff and physician for evidence of complications, particularly pulmonary edema and skin irritation. Physician is notified for increase in pulse rate greater than 30% of baseline or increase in respiratory rate greater than 50% of baseline. Physician will also be notified of loss of sensation or onset of any neurologic symptoms in the involved extremity.

IV. Patient Education

During the admission a patient will be educated in appropriate use of the Wright Linear Pump including:

- a) Operation of mechanical functions of the Wright Linear Pump
- b) Specifics of his/her individual program for use of the Wright Linear Pump.
- c) Good skin hygiene
- d) Application of appropriate compressive garment
- e) Signs and symptoms of secondary complications due to use of the Wright Linear Pump
- f) Appropriate technique for measuring one's limb circumferences
- g) Measurement of pulse rate

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V. Criteria for Success

1. Decrease in circumferential measurements of the involved extremity
2. Softening of tissue in the involved extremity
3. Increase in flexion of the knee or elbow in the involved extremity
4. Improvement of the overall contour of the involved extremity

VI. Follow-Up Recommendations

1. Weekly measurements of limb circumference
2. Regular follow-up by primary physician. Initial intervals are at two weeks, six weeks, twelve weeks, and six months post discharge
3. Annual visit to physician at D.T. Watson Rehabilitation Hospital if geographically possible.

PRE-ADMISSION CHECKLIST
Wright Linear Pump Patients

PATIENT NAME: _____

DATE: _____

PRE-ADMISSION CHECKLIST

DATE RECEIVED

INFORMATION NEEDED

_____ MEDICAL RECORDS detailing lymphedema and associated conditions (including surgery reports, medical procedures utilized in the treatment of the patient's condition).

_____ Review with physician.

_____ PRIMARY/ATTENDING PHYSICIAN'S current examination (within the last three months of admission) to include blood pressure, medications, medical conditions for which the patient is receiving treatment, U.A., C.B.C., BUN, LFT (liver function tests), creatinine, electrolytes, and chest x-ray (within the last year - 40 years and over). Duplex studies - lower extremity involvement.

_____ COMPLETED measurement chart.

_____ PRE-CERTIFICATION/PRE-AUTHORIZATION from the insurance carrier for admission for the 48 hour evaluation on the Wright Linear Pump.

_____ Scheduled for admission.

_____ Admitted.

D. T. WATSON REHABILITATION HOSPITAL

Nursing Department Wright Linear Pump Procedure

GOAL: Measurements will be standardized for all patients using the Wright Linear Pump by using the same landmarks and criteria for measuring.

EQUIPMENT: Scrip Skin Marker, Stockinette, Tape Measure

<u>Procedure:</u>	<u>Responsibility</u>
1. Explain procedure to patient.	RN/LPN
2. Five measurements are done on all patients and defined in centimeters.	RN/LPN
3. Using leg/arm graph as guide, on admission: a) measure and mark location of tape on patient's extremity with marker to ensure each measurement is taken in same area for all five measurements by all staff members.	RN/LPN
4. Measurements are taken: a) on admission b) beginning of each pumping session c) after each pumping session d) if settings are changed	RN/LPN
5. Teach patient to measure and document criteria on flow sheet for home management.	RN/LPN
6. Expect return demonstration done satisfactorily for knowledge three (3) times.	RN/LPN
7. Measurements are documented on flow sheet using code: 1-B 2-C 3-D 4-F 5-G MEASURE HELL TO RUMP (lower extremity patients) -- measurements taken at admission and end of evaluation. MEASURE THUMB TO PALM (upper extremity patients) -- measurements taken at admission and end of evaluation.	RN/LPN

D. T. WATSON REHABILITATION HOSPITAL

Nursing Department Operation of the Wright Linear Pump

EQUIPMENT: Wright Linear Pump
3 Hoses
Pneumatic Appliance
Cart
Stockinette
Ace Bandage (Gradient Pressure Stockings)

<u>Procedure:</u>	<u>Responsibility</u>
1. Review of pump manual for information regarding pump, function and operation.	RN/LPN
2. Explain procedure to patient.	RN/LPN
3. Position pump within six (6) feet of a 110AC volt grounded receptacle. All controls and connections on instrument panel board are labeled.	RN/LPN
4. Physician's written order is required for pressure and time sequences as well as all changes made during therapy.	RN/LPN
5A. To set time sequence: (as per physician's order): a) ex: 120 second cycle (90 seconds on, 30 seconds off). 90 seconds - cell A 70 seconds - cell B 50 seconds - cell C b) set "on" time to 90 seconds (1 1/2 minutes). c) set "off" time to 30 seconds. d) set middle delay timer to 20 seconds. e) set far right timer to 20 (this is a 20 second delay between A & B cells; and a 20 second delay between B & C cells).	RN/LPN

Procedure:

Responsibility

- | | |
|---|--------|
| 5B. For extremely large lower extremities (bilateral cases): | RN/LPN |
| a) ex: 150 second cycle (120 seconds on, 30 seconds off). | |
| 120 seconds - cell A | |
| 90 seconds - cell B | |
| 60 seconds - cell C | |
| b) set "on" time to 120 seconds (2 minutes). | |
| c) set "off" time to 30 seconds. | |
| d) set middle delay time WLP I/Delay cell A
WLP II to 30 seconds. | |
| e) set far right timer WLP I/Delay cell B
WLP II to 30 (this is a 30 second delay between A & B cells; and a 30 second delay between B & C cells). | |
| 6. Set system timer to hours user is to be on Linear Pump. | RN/LPN |
| 7. Push system rocker switch to off position. | RN/LPN |
| 8. Connect system extension cord into AC volt hospital current. | RN/LPN |
| 9. Preparation of the extremity appliance and system connection: | RN/LPN |
| a) connect hose to A (air outlet), push hose until it seats on connection base. | |
| b) connect other end of hose with push connection to lower mating connection (hand on arm unit, foot on let unit). | |
| c) The B outlet connects to the center cell of the appliance. | |
| d) The C outlet connects to the upper cell. | |

Procedure:

Responsibility

10. To set pressure sequence:
 - a) Push rocker switch to on position. The system starts in an off pressure mode. At completion of off time/pressure mode, the on time will start inflating at the foot/hand compartment - cell A. Immediately turn locking arm on pressure regulator counter-clock-wise so adjustment on regulator above A outlet can be set at prescribed pressure. Gently tighten locking arm to lock in pressure -- repeat procedure on B and C to the prescribed pressure.
11. Time cycles for accuracy and correct function before application. RN/LPN
12. Teach above procedure to patient for home management. RN/LPN
13. Patient should demonstrate three times knowledge of preparation and operation of the Wright Linear Pump. RN/LPN

PATIENT CARE

1. Assess skin for symptoms of infection or phlebitis. Notify physician of abnormal findings. RN/LPN
2. Measurements are taken of six (6) areas (see procedure). Mark on graph flow sheets. RN/LPN
3. Blood pressure, pulse and respiration are taken prior to pumping program. RN/LPN
4. Apply stockinette over leg, fitting snugly and wrinkle free. RN/LPN
5. Apply appliance and inflate. RN/LPN

Procedure:

Responsibility

PATIENT CARE

- | | |
|---|--------|
| 6. Turn rocker switch to "on". | RN/LPN |
| 7. Recheck for correct functioning. | RN/LPN |
| 8. Instruct patient to call nurse for symptoms designated on flow sheet for loss of sensation. | RN/LPN |
| 9. Supply regarding materials or TV for recreation diversion while pumping. | RN/LPN |
| 10. Keep leg/arm in horizontal position -- patients may have back rest with no restrictions. | RN/LPN |
| 11. Vital signs and pump function are checked after one (1) hour of first pumping session. Thereafter, every two (2) hours these checks are performed. | RN/LPN |
| 12. Checks are documented on flow sheets using code letters for measurements and patient comments. | RN/LPN |
| 13. Chart time using 24 hours clock on flow sheets. | RN/LPN |
| 14. Take measurements before, after and with each resetting of the pump. Heel to rump and thumb to palm measurement is taken at admission and after completion of the evaluation. | RN/LPN |
| 15. Instruct patient how to take pulse. | RN/LPN |
| 16. Discontinue treatment if B/P is 160/100 and Pulse is 110. | RN/LPN |
| 17. Extremity is wrapped with a new ace bandage with figure "8" when off the pump. | RN/LPN |
| 18. Patient may be up in wheelchair with elevating leg rests during off time. (Lower extremity patients.) | RN/LPN |

Procedure:

Responsibility

PATIENT CARE

- | | |
|---|--------|
| 19. Ambulation to bathroom only with ace bandages. | RN/LPN |
| 20. Intake and output recorded. | RN/LPN |
| 21. Daily weight recorded. | RN/LPN |
| 22. Document on chart all problems -- i.e. failure of pump, skin, respiratory, blisters, if pumping procedure was stopped early and document why. | RN/LPN |

D. T. WATSON REHABILITATION HOSPITAL

Home Instructions for the Wright Linear Pump

Patient: _____ M.D.: _____

Medications: _____

Date: _____ Pumping Time: _____

Time Sequence: _____ Pressures Sequence: _____

DO'S

1. Call Lymphedema Coordinator if any problems arise.
2. Keep a diary of weekly measurements done at home. Also, record comments/problems. Call after one (1) month on home program.
3. Follow pumping instructions as written unless your physician makes changes.
4. Call the primary physician for symptoms of respiratory problems such as shortness of breath, increased rate of breathing, coughing, if your resting pulse is increased by 20 points over your normal pulse.
5. Call your primary physician for any symptoms of infection such as redness, increased warmth, increased swelling.
6. Avoid anything that could cause trauma such as cuts, scratches, burns, insect bites - as these may lead to infection.
7. Wear shoes when walking.
8. Keep your feet or hands clean and dry.
9. Keep extremity wrapped with ace bandage or use gradient pressure stockings (as prescribed) when off the pump unless ordered otherwise by your physician.
10. Keep the affected extremity horizontal when pumping.
11. Stop the pump is symptoms of loss of sensation such as pain, coldness, pins and needles, cramping or other similar symptoms appear and investigate.
12. Follow through with physician visits as recommended. Here we recommend visits: 6 weeks, 12 weeks and 6 months post-discharge. Follow-up with physician who cared for your at D. T. Watson in one (1) year if possible.
13. Wear loose fitting clothing. Constrictive clothing will decrease circulation.
14. Check skin thoroughly for signs of pressure after pumping such as redness, blisters, etc. Report to primary physician anything that persists greater than 20 minutes.
15. Wear cotton stockings or stockinettes under the pneumatic appliance (pump sleeve) when pumping to absorb moisture and prevent friction.

DON'TS

1. Make changes on your pump without consulting your physician.