

Acute
Rehabilitation
Services
Orientation
Manual

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Mission/Vision

VANDERBILT UNIVERSITY



MEDICAL CENTER

Department of Rehabilitation Services

VUMC Rehab Services Vision and Mission

Vision

VUMC Rehabilitation Services will be the national leader in rehabilitation and wellness by providing personalized care through innovative evidence based practice, research and education.

Mission

The mission of VUMC Rehab Services is to improve the quality of life for our clients and families.

- o We will deliver a quality experience through the continuum of care
- o We will serve as advocates for and partners with our clients, professions and community
- o We will collaborate with multidisciplinary teams throughout VUMC
- o We will utilize innovative therapy interventions and techniques
- o We will advance practice through active participation in research, professional development and student education

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Paycodes

Bi- Weekly (Non- Exempt) Pay Codes

PAY CODES	DESCRIPTION
BRV	Bereavement
D01	\$1 Premium Pay
D02	\$2 Premium Pay
D03	\$3 Premium Pay
D04	\$2.50 Premium Pay
D05	\$5 Premium Pay
D10D	\$10 Premium Pay
D20D	\$20 Premium Pay
D25	\$25 Premium Pay
D30D	\$30 Premium Pay
D4A	\$4 Premium Pay
FMLA	Record Purposes Only
JRY1	Jury Duty (shift 1)
JRY2	Jury Duty (shift 2)
JRY3	Jury Duty (shift 3)
L02D	Lead Differential Pay
NonFMLA	Record Purposes Only
NWK	Non-Worked
OCN	On-Call
OFS1	Offsite (shift 1)
OFS2	Offsite (shift 2)
OFS3	Offsite (shift 3)
OUT-Unpaid	Record Purposes Only
OCV	On-Call Visit (Vanderbilt Home Care Only)
P15	Premium used by (VUMC Parking Only)
P35	Premium used by (VUMC Parking Only)
PAL 1	Paid Administrative Leave (shift 1)
PAL 2	Paid Administrative Leave (shift 2)
PAL 3	Paid Administrative Leave (shift 3)
PLN	Paid Parental Leave
PNS	Flex PTO - Scheduled
PNU	Flex PTO - Unscheduled
SNS	Grandfathered Sick - Scheduled
SNU	Grandfathered Sick - Unscheduled
WORK RULE(Class Code) SPECIFIC	DESCRIPTION
CB2	Call Back 2 Hour Min
CBO	Call Back with Overtime
FOT	Float with Overtime
INS	In-Service
ORI	Orientation
Meal – Unpaid	Meal break Hours - Unpaid
Temp Departure – Unpaid	Temporary Departure - Unpaid

Exempt Pay Codes

PAY CODES	DESCRIPTION
BRE	Bereavement
FMLA	Record Purposes Only
JYE	Jury Duty
NonFMLA	Record Purposes Only
PES	Flex PTO
PLE	Paid Parental Leave
SES	Grandfather Sick
Prior BRE	Bereavement taken in prior closed pay period
Prior JYE	Jury Duty taken in prior closed pay period
Prior PES	Flex PTO taken in prior closed pay period
Prior PLE	Paid Parental Leave taken in prior closed pay period
Prior SES	Grandfather Sick taken in prior closed pay period

Productivity

Adjusted Productivity Explanation

1. Everyone has a yearly expectation, a monthly expectation and a daily expectation
 - a. For full time therapists, the monthly expectation is 233
 - b. For full time assistants , the monthly expectation is 275
 - c. Those who work part time, are clinical coordinators, or have some portion of time taken out due to assigned duties have modified versions of the above
2. The number of days you work does not matter in the calculation for adjusted productivity.
3. The daily expectation is based on the average number of work days in a month (average number/month). For full time people, therapists or assistants, the average number of worked days a month is 22. This stands true even if you work a weekend, because you have flex days. Are there times when your flex day falls into the following month and could perhaps throw off this math? Yes, BUT it is made up in the next month. By the end of the year you have averaged 22 work days a month.
4. Take 22 and divide it into 233 and into 275. That gives a daily average for full time therapists of 10.5 and a daily average for assistants of 12.5. Part time folks and modified productivity people daily averages could be slightly different.
5. Each month, Kelly goes into the online calendar and counts how many days each person has been off that month; she puts the total number of vacation days, sick days, and personal days on a form (called the exempt report) and turns it into payroll by the 5th of every month. Payroll doesn't care about the holidays or professional days so Kelly makes a note of those to the side for anyone who takes them.
6. It is very important for everyone's time to be correct on the online calendar and to be correct by the end of the month. Each person should check the online calendar to see if his days are correct. This is what Kelly turns in to payroll and what she uses to adjust your productivity each month. If you call in and it doesn't get to the calendar it doesn't get counted. If you make a last minute request and it doesn't get on the calendar, it doesn't get counted.
7. Kelly takes the total number of days you were out (except flex days) and multiplies that by your daily average (10.5 or 12.5 or some other number). She subtracts that number from your monthly expectation. That gives Kelly your adjusted expectation.
8. Next, Kelly logs into the rehab website and types each one of our names in and runs productivity for the month; she uses that number as each person's productivity for the month. All Kelly can do is go by the number the website gives her. If you have a different number on your tracking form, she can't use it. The computer program tracks what is actually billed; she uses what was billed. Nine times out of ten, if your numbers don't match, you made a mistake somewhere. One time out of ten, there is an issue with the computer program. However, Kelly does not know there is a computer issue unless folks are regularly checking the computer and comparing it to their notes.

9. Finally, I compare the number from the rehab website to the adjusted productivity I determined. If you are not above or at the adjusted productivity number then Kelly will email you about it.

10. In Summary: Take the numbers of vacation days, sick days, personal days, and professional days you were out for the month, multiple that by your daily average and subtract that number from your monthly expectation to get your adjusted monthly expectation.

Floors

Floors: VUH

11 North: Hematology/General Medicine	11 South: Burns
10 North: Trauma	10 South: Ortho Trauma
10 Tower: Oncology/Stem Cell	9 North: Surgical Stepdown
9 South: General Surgery	9 Tower: Surgical ICU (SICU)
8 North: General Medicine	8 South: Cardiac Stepdown
8 Tower: Medical ICU (MICU)	7 North: Cardiac Stepdown
7 South: Non-surgical Cardiac	7 Tower: Transplant & Surgical Care Unit
6 North: Neurology /Neurosurgery Stepdown	6 Tower: Neuro ICU
6 South: Spine Surgery	5 North: Cardiovascular ICU (CVICU)
5 South: Cardiac Surgery	4 East: Gynecology / Oncology
3 North: Main Recovery Room	3 MCE: Medical Center East Outpatient Surgery
1 st Floor: Emergency Room and TOBS	

Floors: MCN

S74: ACE Unit (Geriatric)	S64: Orthopedics
S54: Palliative Care and General Medicine	S44: Colorectal Surgery and General Medicine
S34: General Medicine	

Pager

Rehab Pager Protocol

1. Requests to rehab pager can be text page, numeric page, or voicemail. To check voicemail: Dial rehab pager: 835-1147, wait for voice message to begin, enter password: *191919. For numeric page, call phone number provided and gather necessary information found on Rehab Pager Tracking Form.
2. All requests to the rehab pager should be redirected to the primary OT and/or PT assigned to the respective floor, *even if the patient is assigned to an assistant*. This allows the OT and/or PT familiar with the case load to follow up with interdisciplinary team and to determine the priority of treatments, if needed. The respective OT /PT is also responsible for contacting the COTA/PTA if they are needed to address an updated note/treatment request, as well as to re-prioritize treatments if necessary. Refer to the daily list of OT/PT floor assignments for pager numbers.
3. If the necessary information (see Tracking Form) is provided in the request, simply contact the respective OT/PT via text or page with the information.
4. If the information is not provided, return the page or voicemail, gather necessary information, and then forward to respective OT/PT.
5. Group pages to all OTs and/or PTs will no longer be necessary when there is a primary therapist assigned where the patient is located. If there is no therapist assigned, i.e. TOBS, EMER, CTU, MCE3, VPH, a group page may be necessary to find a therapist to address the request. Or, the person responding to the rehab pager may need to address the request personally.
6. Record each request on Tracking Form and leave form in folder taped to side of Mark's desk.

Acceptable requests for therapy:

1. Updated note – legitimate requests are only when the following criteria are met:
 - a. Discharge recommendation is placement (SNF or IPR), and
 - b. Expected discharge day is the same day or the following day, and
 - c. The patient has not been treated in over 48 hrs.
2. Treatment, not an updated note – these requests are typically not a priority and may be left on the treatment list for the following day. This should be determined by OT/PT assigned to floor.
3. If therapy documentation does not support discharge recommendation, patient may need to be seen for a treatment to change recommendation or for more supportive documentation. This should be determined by OT/PT assigned to floor.
4. Requests for custom hand splints.

Unacceptable requests for therapy:

1. Evaluation request if there are no therapy orders. Advise caller to have orders entered. Therapist does not enter order.
2. Request to change discharge recommendation from placement (SNF or IPR) to home due to improved status is not necessary. However, the team may still request final therapy treatment to ensure home safety/caregiver training. This should be determined by OT/PT assigned to floor.
3. Back braces and other braces recommended by Otrho are not the responsibility of therapist, i.e. requests for brace adjustments or initial donning/fitting of brace. Bledsoe

boots, hinged knee braces, post-op shoes, knee immobilizers, etc. that are recommended by Ortho need to be placed by the Ortho cast tech (Refer caller to room number 936-1196). For back brace adjustment requests, refer caller to brace company (*Superior*, 615-340-0068 or *Applied Orthotics aka Bulow*, 615-327-9343). If a brace is ordered for patient and is not on the patient when the therapist arrives, the evaluation should be held.

4. Ordering equipment, i.e. canes, walkers – Refer caller to Service Center, 3-9600.
5. Request to transfer patient back to bed. Advise caller that nursing staff can assist and may use a Steady or lift if necessary.

Repeated calls regarding same patient:

1. Inform caller that request to pager has already been made by another team member. Ask caller if the patient was discussed in huddle. If not, advise them to discuss patient with CM or NP who attends huddle in the future, to prevent repeat calls to pager.

Ways to send a page:

1. Open StarPager in Starpanel. Click on StarPager and enter information into labeled fields. Then click sent.
2. Go to www.satellink.net. Then click on the link marked Send-A-Page. Enter the pagers 10 digit phone number and enter message. Then click send.

Voicemail

Instructions

1. INTERRUPT THE CURRENT GREETING BY PRESSING “*”
2. ENTER THE TEMPORARY PASSCODE OF 147014 AND “#” THEN:
3. TO PERSONALIZE YOUR GREETING
 - a. PRESS M (THE 6 KEY) FOR MAILBOX OPTIONS
 - b. PRESS G (THE 4 KEY) FOR GREETING UPDATES
 - c. PRESS P (THE 7 KEY) TO PLAY BACK YOUR GREETING
 - d. PRESS D (THE 3 KEY) IF YOU ARE DISSATISFIED
 - e. PRESS X (THE 9 KEY) TO EXIT WHEN SATISFIED WITH THE GREETING
4. TO CHANGE YOUR PASSCODE
 - a. PRESS M (THE 6 KEY) FOR MAILBOX OPTIONS
 - b. PRESS P (THE 7 KEY) TO CHANGE YOUR PASSCODE
 - c. ENTER YOUR NEW 6 DIGIT PASSCODE THEN PRESS “#”
5. TO PERSONALIZE MAILBOX
 - a. PRESS M (THE 6 KEY) FOR MAILBOX OPTIONS
 - b. PRESS N (THE 6 KEY) TO CHANGE NAME
 - c. PRESS D (THE 3 KEY) TO DELETE IF DISSATISFIED
 - d. PRESS X (THE 9 KEY) TO EXIT WHEN SATISFIED
6. RETRIEVING NUMERIC & VOICEMAIL MESSAGES
 - a. PRESS P (THE 7 KEY) TO PLAY NUMERIC MESSAGES
 - b. PRESS V (THE 8 KEY) TO PLAY VOICEMAIL MESSAGES
 - c. PRESS D (THE 3 KEY) TO DELETE A MESSAGE
 - d. (YOU MUST PLAY A MESSAGE BEFORE IT CAN BE DELETED)
 - e. PRESS K (THE 5 KEY) TO KEEP THE MESSAGE

Ordering Equipment

1. Call Service Center 39600 (in VUH) or 31354 (in MCN)
2. Some adaptive dressing equipment and leg lifter can be found on 10s and 6th floor MCN service centers
3. Typical equipment ordered from Service Center
 - a. Rolling walker
 - i. Inform them if standard or bariatric is needed
 - ii. Make sure you tell them to bring wheels
 - iii. Typically can only order walker or cane for patient not both
 - iv. Come out of floors “budget” and not usually billed to patient
 - b. Platform attachments for rolling walker
 - c. Cane
 - d. Reacher
 - e. Sock aid
 - f. Long handled sponge
 - g. Leg lifter (often referred to as “leash” by other disciplines)
 - h. Long handled shoe horn
 - i. Walker basket
 - j. “Scrotal support” (ie jock strap)
 - k. Multipodus boots
 - l. Pressure relief boots
4. Therapy does not order from service center (nursing or MD must order)
 - a. Knee immobilizer
 - b. Postop shoe
 - c. Cam walker boot
 - d. Bledsoe boot
 - e. Ankle air cast
 - f. Wrist cockup prefabricated splint
 - i. MD typically needs to sign a DME form
 - ii. Form needs to be filled out and returned to Service Center

Discharge Planning Criteria

1. Inpatient Rehabilitation (IPR):
 - a. Patient needs to be able to tolerate 3 hours of therapy per day or 15 hours over 7 days, for certain diagnoses. This should be communicated with the team or documented
 - b. Patient needs to require 2 disciplines. PT and OT, OT and SLP, or SLP and PT
 - c. It is required that 2 disciplines provide evaluations supporting the patient's need for rehabilitation placement for acceptance
 - d. Observation patients can be discharged directly to inpatient rehab
 - e. Inpatient pulmonary rehabilitation is only approved for patients with a pulmonary diagnosis and new or increased oxygen requirements ; the patients must also meet inpatient rehabilitation criteria
2. Skilled Nursing Facility (SNF):
 - a. Patients need at least PT to recommend SNF placement, but more insurance carriers require both PT and OT
 - b. Patient can be skilled for other reasons besides therapy: IV antibiotics, new feeding tube, and wound care for stage III or IV decubiti
 - c. Must be hospitalized 3 midnights with inpatient status
 - d. Observation patients cannot be discharged directly to a SNF with a few exceptions including if a physician speaks to the medical director of the insurance company
 - e. To meet criteria for SNF placement, the patient must have a therapy need and benefit from daily therapy.
 - f. Many facilities have SNF and long term care in the same building, therapy is not required for long term care placement.
3. Assisted Living Facility (ALF) - not a therapy recommendation, this is determined by social work and case management
 - a. This is not a therapy recommendation, from a therapy perspective, we typically recommend home health
 - b. A patient will have to pay out of pocket. Insurance does not cover ALF placement. Average median monthly cost is \$3,395 (www.tnassistedlivingfacilities.org/directory/tn/ retrieved 3/08/17).
 - c. To meet admission criteria, patients must be independent with transfers, ambulation, wheelchair mobility, ADL, and medication management; otherwise, the patient may have to pay additional fees depending upon the facility requirements.
 - d. The patient cannot transfer from the hospital to an ALF, they have to meet certain admission criteria before an ALF will accept them
 - e. It is a good idea to collaborate with care team for these patients to ensure facilities can meet the patient's needs based on information obtained in the evaluation.
4. Home with hospice:
 - a. Patient must have a caregiver 24/7
 - b. The patient can receive PT and OT while receiving hospice care, but many hospice companies do not provide services. Often, this is because they cannot afford to provide it. With this being said, document specifics to why therapy is recommended.
 - c. If home PT and OT is recommended, the specifics regarding what therapy is needed at home will need to be documented (i.e. family training, etc)

5. Home with Continuous Assistance:
 - a. This does not mean 24/7 assist, ONLY document what the patient needs continuous assist performing in the discharge recommendation
 - b. If it is not clear if the patient will have continuous assist at home, the patient must meet criteria in order for therapy to recommend SNF or inpatient rehabilitation placement. You cannot recommend SNF or inpatient rehabilitation based solely on social issues.
6. Home with Outpatient Therapy:
 - a. The patient needs to have transportation to and from therapy
 - b. Some specialty diagnoses are more suited for outpatient therapy rather than home health such as: vestibular rehabilitation, some orthopedic diagnoses, higher level neurological conditions
 - c. A patient cannot receive outpatient therapy if he/she is receiving home health nursing
7. Home with Home Health Therapy:
 - a. The patient must be home bound, which means they can only leave for medical reasons and church
 - b. In order to get home health OT, nursing, Speech Therapy, or PT must 'open the case.'
8. Intermediate Care Facility (ICF) – not a therapy recommendation, this is determined by social work and case management
 - a. Nursing home placement without a skilled intervention
 - b. If the patient was admitted from a ICF and lives there, this is considered their home
 - c. These facilities are sometimes confused with a SNF and an evaluation order might be triggered
 - d. If the patient is receiving therapy in the ICF side, Medicare B is billed.
9. Long Term Acute Care (LTAC) - not a therapy recommendation, this is determined by social work and case management
 - a. Patients meet criteria for medical reasons outside of therapy (i.e. complex wound care, vent dependence, hemodynamically fragile).
 - b. No therapy evaluation is needed for admission
 - c. Patients can receive therapy at the LTAC

Occupational Therapy Prioritization Guidelines

General Principles

1. Patients who can't be discharged until seen by OT must be seen as soon as possible.
2. Patients who are able to participate will be seen before those who are not (participate = awake/alert, follows commands).
3. Extubated patients will be seen before those who are intubated (exception: intubated with RASS score of -1 and following commands).
4. Patients who are not in restraints will be seen before those in restraints (exception are people who have CHI or restraints per protocol)
5. Patients who are in dialysis when orders are received will be seen the next day.
6. Patients who require bracing (TLSO, Aspen, Quick Draw, Knee Brace, Bledsoe, etc.) must have brace before OT evaluation or treatment will be completed.
7. Last minute requests (verbal or written) for either new consults or a treatment may not be seen if it is after 3:00 p.m.; however, every attempt will be made to accommodate the need of the patient and/or the team.
8. Post – surgical patients that the MD would like up day of surgery need to be on the floor by 2:00 p.m. for time for the nerve block to wear off. Patients must be alert.
9. OT orders that are entered to motivate a patient are not appropriate orders. Patients who are able to mobilize but refuse to do not qualify for skilled OT.
10. Refusals: Patients who adamantly refuse therapy (i.e. “I don't need therapy”) will be discharged. Patients who refuse OT will be seen the following day. If patient refuses therapy a third time, he/she will be discharged from therapy.

Prioritization (Organized by Service and ranked from Highest to Lowest)

1. Note: It is assumed that OT will start with *Patient Closest to Discharge*
2. The following services must be seen the day order is issued.
 - a. 23 hour admit/observation patients
 - b. POD-3 STSG
 - c. Hand patients
 - d. Splinting/Casting – All plastics and ortho splints/casts that must be completed
 - e. Whirlpools
3. Splinting/Casting – splinting/casting for general positioning or prevention of contractures
4. Neurosurgery – Elective Backs & Craniotomies
5. Trauma
6. Orthopedics
7. General Neurosurgery (including Neurosurgery ICU)
8. Neurology
9. General Burns
10. Medicine
11. Surgery
 - a. Transplant
 - b. General
 - c. Tumor
 - d. Colo-Rectal
 - e. Head & Neck Cancer
12. Non-Surgical Cardiac
13. Surgical Cardiac
14. Geriatrics

15. Renal

16. ICU

a. CVICU

b. MICU

c. SICU

17. Stem Cell

18. OB/Gyn Oncology

19. General ED

Physical Therapy Orientation Guidelines

General Principles

1. Patients who are able to participate will be seen before those who are not (participate = awake/alert, follows commands consistently).
2. Extubated patients will be seen before those who are intubated (exception: intubated with RASS score of -1 and following commands).
3. Patients who are not in restraints will be seen before those in restraints (exception are people who have CHI or restraints per protocol)
4. Patients who are going to OR within 3 days of receiving orders will be seen after their surgery (exception is trauma: delayed surgery patients).
5. Patients who are in dialysis when orders are received will be seen the next day.
6. Bed rest orders are commonly seen: These patients become lower priority; Bed rest orders indicate that the patient must remain in bed (example of true bed rest is unstable spine). Bed rest does not indicate that the patient may be up with assistance or up for therapy. Recommend update activity orders when entering PT orders if true bed rest is not desired.
7. Screens should be done by MD before PT order is put in for equipment needed for patient to mobilize: We do not fit for braces (i.e. TLSO, Aspen Quick Draw, Hinged Knee Brace, Immobilizer, Bledsoe)
8. Last minute requests (verbal or written) for either new consults or a treatment may not be seen if it is after 3:00 p.m.; however, every attempt will be made to accommodate the need of the patient and/or the team.
9. Post – surgical patients that the MD would like up day of surgery need to be on the floor by 2:00 p.m. for time for the nerve block to wear off. Patients must be alert.
10. PT orders that are entered to motivate a patient are not appropriate orders. Patients who are able to mobilize but refuse to do not qualify for skilled PT.
11. Refusals: Patients who adamantly refuse therapy the first time (i.e. “I don’t need therapy”) will be discharged immediately. Patients who do not adamantly refuse will be seen the next day. If they refuse again, therapy orders will be discharged.

High Priority Patients: Evaluation and Treatments

1. Total Joint Patients
2. Ortho Oncology
3. Discharge Planning
4. Patients who can be discharged as soon as PT evaluates them
5. Uninsured patients who are discharging home and can actively participate in therapy (we may be the only therapy they get)
6. Evaluation for discharge planning with plan already in place for next day
7. Vascular surgery (amputations) – require early discharge planning
8. Plastics patients who are off bed rest and do not have sitting restrictions
9. GSWs with nerve injuries - Need DC recs quickly
10. Multi Trauma with non-op fxs - Need DC recs quickly
11. Trauma Evals for patients admitted to Receiving - Need DC recs quickly
12. Isolated CHIs that are able to participate in PT - Need DC recs quickly
13. New Paraplegics: extubated, spine issues dealt with
14. Burn
 - a. Burn patients on the step down side that have a burn which crosses a joint (this places them at high risk for contractures)
 - b. POD 3 LE STSG (MD protocol states that ROM is re-initiated on POD 3)

- c. Dorsal foot burns
- 15. Unique Therapies
 - a. Whirlpools (driven by physician order)
 - b. Custom splints (splints or casts that are fabricated by therapy)
 - c. Baclofen Trials: PT performs assessment to determine if trial is successful.
- 16. Short Stay
 - a. ED patients with “observation” orders (not being admitted to the hospital) - Medicare guidelines driving quick PT evaluations
 - b. TIA patients - Very short admissions

Medium Priority Patients

- 17. Post Op/Discharge Planning
 - a. Organ transplants – POD 2 or later is better for discharge planning and gives a clearer picture of the patient’s abilities.
 - b. POD 1 donor sites
 - c. Evaluations asking for discharge recommendations, but the patient is not discharging the day the order is received.
 - d. Abdominal surgeries, Cardiothoracic surgeries, Colorectal surgeries, Gyn/Onc surgeries, Vascular surgeries (non-amputations) and Whipple surgeries – POD 2 gives a clearer picture of abilities
 - e. New CVA’s - usually unavailable the day of admit and the day after admit
 - f. Neurosurgery spine surgeries – significant pain POD 1; pain much improved POD 2 and 3
- 18. Other
 - a. LE burns not crossing a joint
 - b. Geriatric Evals (those from ALF/home/independent living)
 - c. H&N patients - drains come out at later dates for exercise
 - d. CHI’s
 - e. ED pt’s with admit orders
 - f. Multi-trauma pts admitted to ICU
 - g. New quads: not vent dependent/or on trach collar trials

Low Priority Patients

- 19. No Discharge Needs
- 20. SJS (TENS) on BU - no immediate discharge needs
- 21. Nursing home residents - discharge usually established
- 22. Exacerbations of disease - usually recover; clearer picture later in admission.
- 23. “Prevent de-conditioning” patients – frequently do not require skilled PT
- 24. Readmits from rehab facilities: may return quickly to rehab facility.
- 25. Nursing Appropriate
 - a. Orthospine surgeries without neuro deficit - rarely have PT needs.
 - b. Swanns - limited mobility (physician guideline) - nursing can get OOB
 - c. Bariatric patients (PT tends to receive orders because nursing is not comfortable getting the patient up)

Weekends: High Priorities

- 26. Total joints
- 27. Ortho Oncology

28. POD3 burns
29. Burns crossing joint
30. Dorsal burns
31. Pediatric burns
32. Patients discharging over the weekend and need one more treatment
33. Isolated fractures if impacting their discharge
34. Whirlpools
35. Custom splints
36. Plastics patients off bed rest and ambulation can be initiated
37. Patients who need updated notes for discharge on Monday can be seen by therapy on Monday morning and the note documented immediately following.

OT and PT Recommended Treatment Frequencies

Orthopedic

	PT	OT
Total Hip's	BID 7 days a week	1 Visit
Total Knees	BID 7 days a week Single and B Knees	1 Visit B Knees
Isolated Fractures	7X/wk	7X/wk
IPOP	7X/wk	NA
Tibial Plateau Ex-Fix Removal	BID 7 days a week	NA

Burns

Deep Partial/Full Thickness that Crosses 1 or more Joints and/or Affects ROM of a Joint

PT	OT
BID 7X/wk	BID 7X/wk

PT Exception: If intubated and sedated 3X/Week

Partial Thickness that Crosses 1 or more Joints and/or Affects ROM of a Joint

5X/wk	5X/wk
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Superficial Burns/Partial Thickness Burns that do NOT Cross a Joint or Affect ROM

1X for education	1X for education
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Donor Sites

1X for education	NA
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Oncology

Allo Stem Cell Transplant

PT	OT
3X/wk without Steroid Myopathy	2X/wk
Up to 5X/wk with Steroid Myopathy	2X/wk

Auto Stem Cell Transplant

2X/wk	2X/wk
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Head and Neck Cancer

3X/wk	2 Visits
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Gyn Onc

3X/wk	2 - 3X/wk
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General Oncology

PT	OT
3X/wk	3 Visits unless ADL issues con't

Trauma

Multi-Trauma

PT	OT
Up to 5X/wk	Up to 5X/wk

Isolated CHI

RANCHO I - II	1-2X/wk	1 - 2X/wk
RANCHO III	2X/wk	2X/wk
RANCHO IV & Up	3X/wk	3-4X/wk

Internal Traumatic Injuries

3X/wk	3X/wk
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Paraplegic (New Onset)

4X/wk	4X/wk
-------	-------

Quadraplegic: (Complete, New)

C1, C2, C3	2X/wk	2X/wk
------------	-------	-------

C4 - C6	3X/wk	3X/wk
---------	-------	-------

Central Cord Syndrome	4X/wk	4X/wk
-----------------------	-------	-------

Incomplete Spinal Cord Injury: Use professional judgement for both disciplines

General Medicine/Geriatrics

General Medicine

PT	OT
3X/wk	3X/wk

Geriatrics

3X/wk	3X/wk
-------	-------

SNF

3X/wk	2-3X/wk
-------	---------

ICF < 3 Months

3X/wk	2-3X/wk
-------	---------

ICF > 3 Months

N/A	N/A
-----	-----

Cardiac

CABG

	PT	OT
No Complications	3X/wk	3X/wk
Complications	4X/wk	4x/wk

AVR/MVR

No Complications	3X/wk	3X/wk
Complications	4X/wk	4X/wk

ICD/Stents

2X/wk	2X/wk
-------	-------

Non-Surgical Cardiac

3X/wk	3X/wk
-------	-------

Pacemaker

Screen	NA
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Transplants

Liver Transplant

PT	OT
3X/wk	3X/wk

Lung Transplant

5X/wk	4X/wk
-------	-------

Heart Transplant

Cardiac Rehab

2-3X/wk	2-3X/wk
---------	---------

No Cardiac Rehab

4X/wk	2-3X/wk
-------	---------

General Surgery

General Surgery

PT	OT
3X/wk	2X/wk

Neurology/Neurosurgery

Crani's

DC to Home

DC to Rehab/SNF

PT	OT
3 visits	3X/wk
4-5X/wk	4-5X/week

Elective Back

DC to Home

DC to Rehab/SNF

3 visits	2X/wk
3X/wk	2X/wk

Elective Neck

DC to Home

DC to Rehab/SNF

3 visits	2 visits
3X/wk	2-3x/wk

CVA's

5X/wk	5X/wk
-------	-------

Baclofen Trials

Per Protocol	Per Protocol
--------------	--------------

Auto-immune Disorders (MS, Guianne-Barre, Mysthenia Gravis, etc...)

	PT
MS	3X/wk

GB & MG:

Low	2X/wk
Medium	4-5X/wk
High	3X/wk

Auto-immune Disorders (MS, Guianne-Barre, Mysthenia Gravis, etc...)

GB & MG:	OT
Chronic, min decline	2-3X/wk
Acute exacerbation	5X/wk

Auto-immune Disorders (MS, Guianne-Barre, Mysthenia Gravis, etc...)

MS:	OT
Chronic, min decline	2-3X/wk
Acute exacerbation	4X/wk

SAH	PT	OT
DC to Home	1-2X/wk	1-2X/wk
DC to Rehab/SNF	3X/wk	3X/wk

Seizures	2-3X/wk	2-3X/wk
----------	---------	---------

Paraplegic	4X/wk	4X/wk
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Quadriplegic		
C1,C2,C3	2X/wk	2X/wk
C4-C6	3X/wk	3X/wk

Incomplete SCI: Use professional judgement for both disciplines

Central Cord Syndrome

4X/wk	4X/wk
-------	-------

ICU

Intubated & Sedated

PT OT

Check with nursing to determine need Key is: tone, risk for contractures Exclusions: Only 1 discipline needs to provide this service
--

Participatory Patients (can be trached or not, arouseable)

5X/wk	5X/wk
-------	-------

Exclusions: Heart transplant patients. Use professional judgement

LVADs

5X/wk	4-5X/wk
-------	---------

Frequency may be decreased once patient leaves ICU depending upon functional status

Intubated & Sedated

PT OT

THA	3X/wk	1 visit
TKA	7X/wk	1 visit

B knees

Intubated & Awake

PT OT

THA	7X/wk	1 visit
TKA	7X/wk	1 visit

B knees

Treatment Frequencies Once Patients Leave the ICU:

PT OT

Treatment Frequency will not change for both disciplines	
--	--

Others

Plastics - Non Burns

PT OT

3X/wk	3X/wk
-------	-------

Not on bedrest is the key

Gyn

1 Visit	N/A
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Vascular Surgery

4X/wk	2-3X/wk
-------	---------

OT Six Clicks (AM-PAC)

General Guidelines

1. Complete for all evaluations and treatments completed
2. Is linked to a G-code if patient is an outpatient/observation status and has Medicare part B then G code will be “dropped” for billing
3. Is based on 1 person assistance and no adaptive equipment/assistive devices
 - a. For example, if patient is moderate assistance x2 then they become maximal assistance
 - b. For example, if patient is maximal assistance x2 they become dependent
4. Rate patient on level of difficulty with personal & instrumental/daily activity
 - a. Lower body dressing
 - b. Bathing (washing, rinsing, drying)
 - c. Toileting (toilet, bedpan, urinal)
 - d. Upper body dressing
 - e. Personal grooming
 - f. Eating Meals
5. Levels of difficulty
 - a. Dependent (unable)
 - b. Mod assist or Max assist (a lot)
 - c. SBA or Min assist (a little)
 - d. Modified independent to independent (none)
6. Produces outcome score out of 24 with a modifier
 - a. CH (0% impaired)
 - b. CI (at least 1% but less than 20% impaired)
 - c. CJ (at least 20% but less than 40% impaired)
 - d. CK (at least 40% but less than 60% impaired)
 - e. CL (at least 60% but less than 80% impaired)
 - f. CM (at least 80% but less than 100% impaired)
 - g. CN (100% impaired)

PT Six Clicks (AM-PAC)

General Guidelines

1. Complete for all evaluations and treatments completed
2. Is linked to a G-code if patient is an outpatient/observation status and has Medicare part B then G code will be “dropped” for billing
3. Is based on 1 person assistance and no adaptive equipment/assistive devices
 - a. For example, if patient is moderate assistance x2 then they become maximal assistance
 - b. For example, if patient is maximal assistance x2 they become dependent
4. Rate patient on level of difficulty with basic mobility
 - a. Bed mobility
 - b. Sit to stand from chair with arms
 - c. Supine to sit
 - d. Bed to chair transfers
 - e. Gait in hospital room
 - f. Stair ambulation 3-5 steps with rail
5. Levels of difficulty
 - a. Dependent (unable)
 - b. Mod assist or Max assist (a lot)
 - c. SBA or Min assist (a little)
 - d. Modified independent to independent (none)
6. Produces outcome score out of 24 with a modifier
 - a. CH (0% impaired)
 - b. CI (at least 1% but less than 20% impaired)
 - c. CJ (at least 20% but less than 40% impaired)
 - d. CK (at least 40% but less than 60% impaired)
 - e. CL (at least 60% but less than 80% impaired)
 - f. CM (at least 80% but less than 100% impaired)
 - g. CN (100% impaired)

Lab Values Interpretation

Billing/CPT Codes

General Guidelines

1. Patient must be under the care of and referred for therapy services by a 'qualified professional':
 - a. Physician
 - b. Optometrist – for low vision services
 - c. Podiatrist – subject to each state's Scope of Practice
 - d. Nurse Practitioner, Physician's Assistance, or Clinical Nurse Specialist – subject to each state's Scope of Practice
2. Require the skills of a PT/PTA. Routine part of nursing care is not covered. (turning patients, walking in hallway)
3. Must have written treatment plan with specific therapeutic goals and modalities/procedures outlined in terms of type, frequency, and duration.
4. Must document functional limitations and short/long term goals which are objective and measurable.
5. The plan of care must be certified/approved by the physician or optometrist.
6. Skills of the therapist are NOT required to maintain functional.
7. Designing a maintenance regimen/HEP required to delay or minimize muscular/functional deterioration in chronic disease is reasonable and necessary to establish and assist the patient with the maintenance program/HEP. No more than 2-4 visits to complete and instruct in the program are considered medically necessary.
8. Not covered when there is a temporary loss or reduction of function that is reasonable expected to improve spontaneously without therapy. (ie: short hospital stay for pneumonia)
9. Not covered to identify patients who might need therapy. (ie: screening)
10. Not covered if they are duplicative of other concurrent rehab services.
11. Educational component of treatment is included in the service described by the CPT code and therefore is NOT a separate charge.
12. Documentation of services is included in the CPT charge and therefore there is not separate coverage for time spent for documentation.
13. The ICD-9 section of this LCD is meant to include 'functional' diagnosis. The functional diagnosis, not necessarily the clinical diagnosis, conveys coverage.

Evaluation Guidelines

1. There must be a change from normal functional ability to warrant an evaluation.
2. If multiple body parts or systems are involved, they should all be assessed at evaluation with only one evaluation code used. (i.e. Neck and knee pain)
3. Evaluations from other rehab disciplines are covered as long as their not duplicative.
4. Visits for SOLE purpose of wheelchair management/assessment does not required 97001, it's covered under 97542 wheelchair management.
5. Routine screening, assessments, and routine re-assessments are not covered.
6. Pre-op/post-op instructions for SOLE purpose of HEP and/or assistive device instruction are not covered.

Re-evaluation Guidelines

1. Not routinely covered for purposes of updating the plan of care. Reassessments are part of the routine aspect of intervention.
2. Billed as a separate charge if their has been a significant change/deterioration in patients condition OR

3. Patient exhibits a demonstrable change in functional ability/decline and a re-evaluation of needs to re-establish appropriate treatments goals and interventions is necessary.

Therapeutic Exercise Guidelines

1. Performed on dry land.
2. To restore strength, ROM, flexibility.
3. Passive ROM only for 2-4 visits unless recent surgery. (RTC repair)
4. Therapeutic exercise component of manual lymphatic drainage is covered under 97110 and generally requires no more than 1-2 visits.
5. Not covered for: overall fitness, flexibility, endurance enhancing, aerobic conditioning, weight reduction, maintenance exercises, and passive exercises not aimed at restoring loss of function.
6. Generally 12-18 visits within 4-6 weeks.
7. 1-2 units per visit of code is generally covered.

Gait Training Guidelines

1. Covers FES for SCI patients. (see specific requirements in LCD)
2. Not covered if patients walking ability is not expected to improve.
3. Repetitive walk-strengthening exercise for feeble or unstable patients or to increase endurance or gait distance does not require skilled therapist and is not covered – work on mechanics instead.
4. Generally 12-18 visits within 4-6 weeks.

Therapeutic Activities Guidelines

1. Covers a broad range of rehab techniques that involve movement.
2. Use of functional activities (bending, lifting, carrying, reaching, catching, transfers) to restore functional performance in a progressive manner.
3. Activities are usually directed at a loss or restriction of mobility, strength, balance, or coordination.
4. Generally 10-12 visits.
5. One to two units per visit of code is generally covered.

Self-Care/Home Management Guidelines

- ADL's and compensatory training, meal preparation, safety procedures, instructions in use of assistive technology devices and adaptive equipment.
- One to two units per visit of code is generally covered.

Orthotic Management and Training Guidelines

1. Custom Orthotics
 - a. Components: Assessment, Fabrication, Fitting. These are covered under 'L' code.
 - b. Training – covered under 97760
 - i. To enhance performance of tasks or movements, supports weak or ineffective joints or muscles, reduces/corrects joint limitations/deformities, and/or protects body parts from injury.
 - ii. ROM prior to placing the orthotic/positioner for purpose of maintaining ROM is not covered.
 - iii. Monitoring of the device is NOT covered.

- iv. Reasonable to need 1-2 visits for education/instruction on use of device.
- c. 97116 Gait training and 97535 Self Care are not covered on the same day without a modifier.
- d. Wheelchair positioning for custom fabricated seating system is covered under 97760.

Check Orthotic Guidelines

- 1. For modification of the customized orthotic/prosthetic device.
- 2. Indicated when patient has loss or change of function related to the device. (pain, decreased swelling, skin breakdown, falls)
- 3. Generally 1-2 visits is sufficient.
- 4. One to two units per visit are generally covered.
- 5. Re-evaluation is not covered the same day

Occupational Therapy Evaluation Codes			
	History	Exam	Decision Making
Low Complexity (97165)	Occupational profile and medical and therapy, which includes a brief hx including review of medical and/or therapy records relating to the presenting problems	1-3 performance deficits(physical, cognitive or psychosocial) that result in activity limitations and/or participation restrictions	low complexity using occupational profile, analysis of data from problem-focused assessment and consideration of limited number of treatment options.
Moderate Complexity (97166)	Occupational profile and medical and therapy, which includes a hx including review of medical and/or therapy records relating to the presenting problems and expanded additional review of physical, cognitive or psychosocial review related to current function	3-5 or more performance deficits(physical, cognitive or psychosocial) that result in activity limitations and/or participation restrictions	Moderate complexity using occupational profile, analysis of data from problem-focused assessment and consideration of limited number of treatment options. Minimal to moderate modification of tasks or assistance with the assessment to complete the evaluation component
High Complexity (97167)	Occupational profile and medical and therapy, which includes a hx including review of medical and/or therapy records relating to the presenting problems and extensive additional review of physical, cognitive or psychosocial review related to current function	5 or more performance deficits(physical, cognitive or psychosocial) that result in activity limitations and/or participation restrictions	High complexity using occupational profile, analysis of data from problem-focused assessment and consideration of limited number of treatment options. Minimal to moderate modification of tasks or assistance with the assessment to complete the evaluation component

Physical Therapy Evaluation Codes				
	History	Exam	Clinical Presentation	Decision Making

<p>Low Complexity (97161)</p>	<p>No comorbidities/personal factors that impact POC</p>	<p>1-2 performance deficits(physical, cognitive or psychosocial)</p>	<p>stable/uncomplicated characteristics</p>	<p>low complexity using standardized testing /measurable function of functional outcome</p>
<p>Moderate Complexity (97162)</p>	<p>1-2 comorbidities/personal factors that impact POC</p>	<p>3 or more performance deficits(physical, cognitive or psychosocial)</p>	<p>evolving presentation with evolving characteristics</p>	<p>moderate complexity using standardized testing /measurable function of functional outcome</p>
<p>High Complexity (97163)</p>	<p>3 or more comorbidities/personal factors that impact POC</p>	<p>4 or more performance deficits(physical, cognitive or psychosocial)</p>	<p>clinical presentation with unstable and unpredictable</p>	<p>high complexity using standardized testing /measurable function of functional outcome</p>

Continuing Education Approval

General Guidelines

1. Acute care rehab puts on several courses a year through department (outpatient also puts on several courses per year)
2. Information on course can be found on Vanderbilt Acute Care Rehabilitation Services website (<https://ww2.mc.vanderbilt.edu/rehabilitationservices/26314>):
3. Must fill out request form and return it to Kelly Floyd
4. If it is a course outside of Vanderbilt, typically you need approval from Kelly Floyd by filling out form, make sure there is a PTO spot on calendar, then you must pay for course (unless otherwise determined by Kelly Floyd), attend course, and submit for reimbursement if Kelly Floyd approves

REHAB SERVICES CONTINUING EDUCATION

DUES / FUNDS APPLICATION

(PLEASE COMPLETE ALL ITEMS BELOW)

Therapist Name: _____ Date: _____ SS#: _____

Course Name: _____

Course Location: _____

Instructors: _____

Course Description: _____

(CHECK ONE (1) BLOCK IN EACH CATEGORY BELOW)

<u>TYPE OF COURSE:</u>	<u>PURPOSE OF COURSE:</u>	<u>APPLICATION TO PRESENT SERVICE AREA/JOB ROLE:</u>
<input type="checkbox"/> Therapy Techniques	<input type="checkbox"/> New Program Development	<input type="checkbox"/> Strong
<input type="checkbox"/> Research	<input type="checkbox"/> New Skill Acquisition	<input type="checkbox"/> Moderate
<input type="checkbox"/> Supervision	<input type="checkbox"/> Existing Skill Refinement	<input type="checkbox"/> Indirect
<input type="checkbox"/> Administration	<input type="checkbox"/> Dues-Renew/New	<input type="checkbox"/> Nominal
<input type="checkbox"/> Documentation		
<input type="checkbox"/> Billing /Coding		

*Date of Pre-Approval for pertinent time off _____ by _____

Course Hours Earned: _____ Course Dates: _____

Number of professional leave days to be used: _____

If other than professional leave days to be used, please explain: _____

Comments regarding course benefits: _____

Planned in-service date: _____ In-service scheduled on Rehab calendar

ENTER ESTIMATED COSTS:

REGISTRATION / TUITION: \$ _____

TRAVEL: Airfare: \$ _____

(_____ miles @ .36 per mile)..... Mileage: \$ _____

(_____ nights @ \$ _____ per night) Hotel: \$ _____

(_____ days @ \$ _____ per day).... Food: \$ _____

_____ Parking / Limo: \$ _____

TOTAL: \$ _____

_____ I WILL REGISTER AND PAY FOR COURSE MYSELF

(All monies will be reimbursed upon course/travel completion, with manager approval.)

_____ PLEASE REGISTER AND MAKE PAYMENT FOR ME TO ATTEND

(Be sure to fill out appropriate forms-see attached 'Steps for Traveler Document')

<p>For Administrative Use Only: <input type="checkbox"/> APPROVED <input type="checkbox"/> DENIED</p> <p>Total Amount Approved: \$ _____</p> <p>Manager Signature: _____ Date: _____</p> <p>In-service Scheduled: _____</p>
--

Functional Outcomes Measures

Physical Therapy

1. Timed Up and Go
2. Timed Walk Tests (2 and 6 minutes)
3. DGI
4. 5x Sit to Stand
5. Chelsea Critical Care Physical Assessment
6. Functional Reach Test
7. Modified Ashworth Scale
8. Gait Scale
9. Perme ICU Mobility Score
10. 10- Meter Walk Test

Occupational Therapy

1. Chelsea Critical Care Physical Assessment
2. Functional Reach Test
3. Perme ICU Mobility Score
4. Timed Up and Go
5. Modified Barthel Index
6. Orientation Log
7. Short Blessed Score
8. SLUMS Test
9. MOCA

Orientation Quiz

Ongoing Competency Review Questions:

1. An 80-year-old patient is placed in isolation when infected with methicillin-resistant *Staphylococcus aureus* (MRSA) in their urine. When treating the patient, therapy staff should:
 - a. Gown and glove outside the patient's room and when exiting remove isolation gear inside the room prior to sanitizing at the threshold of the door
 - b. Put gloves on
 - c. Do not take the patient in the hall
 - d. Mask

2. After seeing an acute care patient, to prevent late charting, your documentation must be completed:
 - a. Within 24 hours
 - b. By 2 PM the next day
 - c. By 10 AM the next day
 - d. By the end of the day you saw the patient

3. When asked to complete an updated note, you should:
 - a. Document as soon as possible if the patient has already been treated
 - b. Treat other patients as usual and document the updated note at the end of the day
 - c. Treat the patient as soon as you can and document the note following the treatment
 - d. Both A and C

4. If a patient has a Richmond Agitation and Sedation Score (RASS) score of -2 to +1, can they be evaluated or treated by therapy?
 - a. Yes
 - b. No

5. When you are working with a geriatric patient in the round wing, the patient starts to report dizziness and you notice the patient is pale. What should you do:
 - a. Take vital signs
 - b. Let the patient sit to rest
 - c. Nothing
 - d. Both A and B

6. It is Thursday. A patient was evaluated Monday and has a discharge recommendation for inpatient rehabilitation. The patient has not been seen since the evaluation. During the evaluation, the patient walked 200 feet with minimal assist and completed most ADL with supervision except lower body dressing, which was minimal assist. The team has called and said the patient has progressed well, has been walking with nursing, and is medically ready for discharge. The patient would be able to return home if cleared by therapy. You should:
 - a. Put the patient on the list to be treated tomorrow
 - b. Evaluate/treat another patient
 - c. See the patient that day - Thursday
 - d. None of the above

7. Following a femoral cardiac catheterization, a patient will be on bedrest:
 - a. 1 hour
 - b. Not at all
 - c. 6 hours
 - d. 30 minutes

8. You are doing a chart review on a general medicine patient and notice the patient fell while hospitalized and currently has back pain. A thoracic x-ray shows a compression fracture. What should you do:
 - a. Hold treatment until there is a plan for the patient's compression fracture
 - b. Go ahead with treatment, the patient has out of bed activity orders
 - c. Go ahead with treatment, but only sit edge of bed to minimize back pain
 - d. Hold treatment because of the patient's pain

9. You are doing a chart review and note the patient has been diagnosed with a deep vein thrombosis in the left arm. The patient has been on anticoagulation during their hospital stay and nursing says the patient is OK to treat. What should you do:
 - a. You are not sure, but you plan to ask another therapist if it is OK to see the patient
 - b. You can proceed with treatment
 - c. You could call the team to make sure it's OK to see the patient
 - d. All of the above are correct

10. When mobilizing a patient who has an external ventricular drain (EVD), the nurse must always clamp the drain prior to mobility (choose one):
 - a. True
 - b. False

11. You are doing a chart review on trauma. The patient has conflicting weight bearing restrictions. The activity order says WBAT R LE and progress note says NWB R LE. What is the most appropriate action to take?
 - a. Call the ortho team for clarification
 - b. Let the patient WBAT on the R LE
 - c. Tell the charge nurse about it and ask them to call the team
 - d. Put in a contact note/failed attempt

Ideas to Decrease Refusals

1. Pain or Not feeling well....
 - a. Start by attempting to build rapport saying something like, "I'm sorry to hear that, have you been hurting all day or have you had pain medication recently...." Once this discussion has taken place, say
 - b. Let me talk to your nurse to see if there is anything she can do.
 - c. Let me help you move around, get up, then get you in a better position to help with pain
 - d. Let's work together and give it a try for 5-10 minutes. If your pain gets really bad, we can lie back down and that's good information for me to take back to your doctor.
 - e. It doesn't have to be an hour, just moving is important

- f. We have many patients who actually feel better once the process of moving around is over because it loosens up the joints and muscles
- 2. Tired or Just Returned to bed....
 - a. Start with building rapport by saying something like, "I'm so sorry, our timing is never perfect, but...."
 - b. If you can work with me for 10-15 minutes, I'll help you back to bed.
 - c. I'm not here to do a lot of exercises, I just want to see how well you do with
- 3. Combined Strategies for both Pain and Tired...
 - a. The more you get up and move around, the better you will be able to move in order to get home/out of the hospital faster
 - b. OT or PT is an important part of your recovery. We are similar to a medication. You need to consistently work with us to see improvement
 - c. Therapy is a part of the care plan created with your physician
 - d. Your medical team needs to see consistent performance in order to feel that you are safe to go home/leaving the hospital
 - e. Moving around will help prevent complications of remaining in bed such as pneumonia, getting weaker, and blood clots
 - f. Now is a good time because therapy can often help and give you better tips when you are not feeling as good. It gives us a better picture of what home might be like.

Acute Care Physical Therapy: Tips and Tricks

LINES

Peripheral IV

- Short **catheter** inserted through the skin into a **peripheral vein** (any vein not inside the chest or abdomen)
- **Arm** and **hand** veins are used most commonly, with **leg** and **foot** veins used to a much lesser extent
- Infiltration occurs when an IV fluid or medication accidentally enters the surrounding tissue rather than the vein.
- TIPS:
 - Make sure there is enough slack on the line during mobility.
 - When IV is antecubital or in the wrist, patients usually find this uncomfortable, however, elbow or wrist ROM will not harm the patient.
 - The IV pump will alarm if the line becomes kinked.

Central line

- Usually located in the superior vena cava or inferior vena cava, or within the right atrium of the heart.
- An experienced clinician knowing the appropriate landmarks and/or using an ultrasound probe is needed to place this line safely.
- Surrounding structures, such as the pleura and carotid artery are at risk of damage during placement with the potential for pneumothorax or even cannulation of the artery.
- This has several advantages over a peripheral IV:
 - It can deliver fluids and medications that would be overly irritating to peripheral veins because of their concentration or chemical composition. These include some chemotherapy drugs and total parenteral nutrition (TPN).
 - Medications reach the heart immediately and are quickly distributed to the rest of the body.
 - There is room for multiple parallel compartments (lumen) within the catheter, so that multiple medications can be delivered at once even if they would not be chemically compatible within a single tube.
 - Central venous pressure and other physiological variables can be measured through the line.
- TIPS:
 - Make sure there is enough slack on the lines during mobility.
 - There are no contraindications to shoulder ROM on the side of the central line.

Peripherally inserted central catheter (PICC)

- **PICC lines** are used when intravenous access is required over a prolonged period of time or when medications to be infused would cause quick damage and early failure of a peripheral IV and when a conventional central line may be too dangerous to attempt.
- Typical uses include long **chemotherapy** regimens, extended **antibiotic** therapy, or **total parenteral nutrition** (TPN).
- Line is placed under ultrasound guidance, usually in the arm, and then carefully advanced upward until the catheter is in the superior vena cava or the right atrium. An X-ray must be used to verify that the tip is in the right place when fluoroscopy was not used during the insertion.
- A PICC can be single, double, or triple-lumen.
- The chief advantage of a PICC over other types of central lines is that it is safer to insert with a relatively low risk of uncontrollable bleeding and essentially no risks of damage to the lungs or major blood vessels.
- A PICC can be left in place for months to years if needed for patients who require extended treatment.
- **TIP:** Make sure there is enough slack on the lines during mobility.

Swan Ganz Catheter (Pulmonary Artery Catheter)

- A thin hollow tube called a catheter is inserted through a vein in the neck or groin. It is carefully moved up into the right atrium of the heart and threaded through two heart valves (the tricuspid and pulmonary valve) and placed into the pulmonary artery.
- There is a balloon at the tip of the catheter that is inflated only when measurements are being taken.
- Measures Central Venous Pressure (CVP), Pulmonary Capillary Wedge Pressure (PCWP), Cardiac Index (CI), Stroke Volume (SV), Pulmonary Artery Pressure (PAP), and Cardiac Output (CO).
- Used for the following:
 - Diagnosis of shock states (cardiogenic vs septic vs hypovolemic)
 - Diagnosis of idiopathic pulmonary hypertension
 - Diagnosis of valvular disease, intracardiac shunts, cardiac tamponade, and pulmonary embolus (PE)
 - Monitoring and management of complicated Acute Myocardial Infarction (AMI)
 - Assessing hemodynamic response to medical therapies
 - Management of multiorgan system failure and/or severe burns
 - Management of hemodynamic instability after cardiac surgery
 - Assessment of response to treatment in patients with idiopathic pulmonary hypertension
 - Management of postoperative open heart surgical patients
 - Assessment of valvular heart disease
 - Assessment of cardiac tamponade/constriction
- **TIPS:**
 - There are many lines that are connected to the Swan Ganz. Make sure you have all lines organized prior to mobility.
 - At VUMC, patients are only allowed to transfer bed to chair with this line in place.

Arterial Lines (art line)

- A thin catheter is inserted into an artery, usually the wrist (radial artery), armpit (axillary artery), groin (femoral artery), or foot (pedal artery).
- Line is most commonly used to monitor the blood pressure real-time (rather than by intermittent measurement) and to obtain samples for arterial blood gas measurements.
- TIPS:
 - At VUMC, PT must check with MD before mobilizing patients with femoral art lines.
 - Avoid repetitive ROM to joint that arterial line is near.

Temporary Vascular Catheter (vas cath)

- Can be placed in the groin (femoral) or in the neck (internal jugular).
- It is used for hemodialysis (HD).
- This catheter has a red and blue port.
- TIPS:
 - At VUMC, patients are usually on bed rest if femoral.
 - Patient may do bed exercises except for hip flexion on the side the femoral catheter is placed.
 - No precautions if placed in internal jugular (IJ).

Chest Tubes (CT)

- A CT is a flexible plastic tube that is inserted through the side of the chest into the pleural space.
- It is connected to a canister which can be to suction or to water seal.
- Indications:
 - Pneumothorax: accumulation of air in the pleural space
 - Pleural effusion: accumulation of fluid in the pleural space
 - Chylothorax: a collection of lymphatic fluid in the pleural space
 - Empyema: a pyogenic infection of the pleural space
 - Hemothorax: accumulation of blood in the pleural space
 - Hydrothorax: accumulation of serous fluid in the pleural space
- TIPS:
 - Check with nursing to see if patient can come off of wall suction.
 - Usually patients are able to come off suction for short time during activity.
 - Some patients must have chest tubes remain on suction secondary to air leakage or subcutaneous air; in these cases there is portable suction available for ambulation.
 - Should a chest tube be accidentally pulled, petroleum gauze is best to cover chest tube site to allow air to escape but not enter. If you do not have access to petroleum gauze, use a towel or cloth. Contact nursing and return patient to bed.
 - Avoid tipping canister. If canister becomes tipped, notify nursing.

Intra Arterial Balloon Pump (IABP)

- The IABP is a polyethylene balloon mounted on a catheter inserted into femoral artery then advanced to the aorta until the tip lies just below the origin of the L subclavian artery.
- Used to decrease myocardial oxygen demand while at the same time increasing **cardiac output**. By increasing cardiac output it also increases coronary blood flow and therefore myocardial oxygen delivery. It actively deflates in **systole** increasing forward blood flow by reducing **afterload** and actively inflates in **diastole** increasing blood flow to the **coronary arteries**. These actions have the combined result of decreasing myocardial oxygen demand and increasing myocardial oxygen supply.
- Simply, it reduces the workload of the heart.
- Indications: **cardiogenic shock**, acute mitral regurgitation and septal perforation, unstable **angina**, post **cardiothoracic surgery**, and bridge to heart transplant.
- Complications: Since the device is placed in the femoral artery and aorta it could provoke ischemia, and compartment syndrome. The leg is at highest risk of becoming ischemic if femoral artery becomes obstructed. Placing the balloon too distal from the arcus aortae may induce occlusion of the renal artery and subsequent renal failure. Other possible complications are cerebral embolism during insertion, infection, dissection of the aorta or iliac artery, perforation of the artery and hemorrhage in the mediastinum. Mechanical failure of the balloon itself is also a risk which entails vascular surgery to remove under that circumstance. After balloon removal there is also a risk of 'embolic shower' from micro clots that have formed on the surface of the balloon, and can lead to peripheral thrombosis, myocardial ischemia, hemodynamic decompensation, and late pseudoaneurysm.
- TIPS:
 - Patient on bed rest when IABP placed in the femoral artery
 - IABP can be placed axillary allowing patient is able to get OOB and ambulate.
 - At VUMC, you must have RN present when ambulating patient on IABP.

Endotracheal Tube (ETT)

- Inserted through the mouth into the trachea.
- Most tubes have an inflatable cuff to seal the trachea and bronchial tree against air leakage and aspiration of gastric contents, blood, secretions, and other fluids.
- Primary purpose is to establish and maintain a patent airway and to ensure the adequate exchange of oxygen and carbon dioxide.
- Minor complications: sore throat, lacerations of the lips or gums or other structures within the upper airway, chipped, fractured or dislodged teeth, and nasal injury.
- More serious complications include bronchospasm, laryngospasm, perforation of the trachea or esophagus, and pulmonary aspiration of gastric contents or other foreign bodies resulting in aspiration pneumonitis.
- Hypopharyngeal suctioning.

Tracheostomy (trach)

- Placed surgically via incision on the anterior aspect of the neck and opening a direct airway into the trachea.

- **Indications:**
 - Severe facial trauma
 - Head and neck cancers
 - Large congenital tumors of the head and neck
 - Acute angioedema and inflammation of the head and neck
 - Failed endotracheal intubation
 - Need for long-term mechanical ventilation and tracheal toilet
 - Severe Obstructive Sleep Apnea (OSA)

Tips for working with intubated/trached patients

- When working with a patient who is intubated/trached, be careful to keep the ET tubing/trach tubing in a neutral position as to prevent excessive pulling or pouring of fluid within the tubing down into ETT/trach.
- You should take tubing out of holder when moving patient (ie rolling, transfer to EOB, sit to stand).
- Transfer patient to same side of bed as ventilator.
- Once patient is stable at EOB, then it would be safe to place tubing back in holder.
- It is important to monitor mechanically ventilated patients carefully during treatments especially RR and O2 sats. The RR on the vent is usually more accurate than RR on monitor.

Supplemental Oxygen Delivery

- **Nasal Cannula (NC)**
 - Carries 1–6 liters of oxygen per minute.
- **High Flow Nasal Cannula (HFNC)**
 - High flows of an air/oxygen blend can be administered via a nasal cannula to accurately deliver high volume of oxygen therapy.
 - Respiratory gas humidification allows the high flows to be delivered comfortably via the cannula.
 - Can give up to 15L O2
- **Venturi Mask (Venti mask)**
 - Delivers a constant FiO2 regardless of changes in the ventilatory pattern.
 - Can increased FiO2 to a maximum of 50%.
- **Nonrebreather (NRB)**
 - Permits inhalation of pure O2 (100%).
 - Be careful with COPD patients.

Noninvasive Ventilation

- **CPAP**
 - Continuous positive airway pressure (CPAP) machine was initially used mainly by patients for the treatment of sleep apnea at home, but now is in widespread use across intensive care units as a form of ventilation.
 - The CPAP machine delivers a stream of compressed air via a hose to a nasal pillow, nose mask or full-face mask, splinting the airway (keeping it open under

air pressure) so that unobstructed breathing becomes possible, reducing and/or preventing apnea

- **BIPAP**
 - Provides two levels of pressure: Inspiratory Positive Airway Pressure (IPAP) and a lower Expiratory Positive Airway Pressure (EPAP) for easier exhalation.
 - Typically uses to treat COPD and acute respiratory failure.

Ventilator Settings

- **CPAP (Continuous Positive Airway Pressure)**
 - Patient is spontaneously breathing
 - Lowest vent setting sometimes called wean settings
- **SIMV (Synchronous Intermittent Mandatory Ventilation)**
 - The ventilator delivers preset breaths in coordination with the respiratory effort of the patient.
 - Spontaneous breathing is allowed between breaths.
- **PRVC (Pressure Regulated Volume Control)**
 - The ventilator delivers preset breaths in coordination with the respiratory effort of the patient. With each inspiratory effort, the ventilator delivers a full assisted tidal volume.
 - Spontaneous breathing independent of the ventilator is not allowed.
- **TIPS:**
 - Closely monitor your patient and their vitals, esp. anxiety, need for suction, O2 sats, and RR.
 - Watch patient closely when reaching for mouth.
 - Your patient may begin to cough more when upright due to mucus in lungs mobilizing or gag reflex.
 - You may want RN nearby during mobility for suctioning.
 - At VUMC, PT is allowed to give patient 100% O2 breaths.

Sedation

- When patients are intubated, sedatives are usually initiated.
- Medications usually used for sedation are propofol, precedex, and fentanyl.
- Level of sedation determined by RASS (Richmond Agitation Sedation Scale). The scale ranges from -5 to +4. The more negative, then the more sedated. The more positive, then the more agitated. Zero is normal.
- It is safe to work with patients that are intubated and RASS -1 to +1 as long as patient is hemodynamically stable.

Richmond Agitation–Sedation Scale

+4	Combative	Overtly combative or violent; immediate danger to staff
+3	Very agitation	Pulls on or removes tube(s) or catheter(s) or has aggressive behavior toward staff

+2	Agitated	Frequent nonpurposeful movement or patient–ventilator dyssynchrony
+1	Restless	Anxious or apprehensive but movements not aggressive or vigorous
0	Alert and calm	
-1	Drowsy	Not fully alert, but has sustained (more than 10 seconds) awakening, with eye contact, to voice
-2	Light sedation	Briefly (less than 10 seconds) awakens with eye contact to voice
-3	Moderate sedation	Any movement (but no eye contact) to voice
-4	Deep sedation	No response to voice, but any movement to physical stimulation
-5	Unarousable	No response to voice or physical stimulation

Vasopressors

- This group of drugs is useful for treatment of hypotension.
- Drugs cause vasoconstriction resulting in increase in peripheral vascular resistance
- At high doses, and especially when it is combined with other vasopressors, it can lead to limb ischemia and limb death.
- Ex: Levophed (Norepinephrine) and Vasopressin
- TIPS:
 - Watch BP carefully either by peripheral BP cuff or art line.
 - If patient has had recent increase in pressor dose or recently started on pressors, may want to HOLD PT at that time.

Hemodialysis (HD)

- Process for removing waste and excess water from the blood, and is primarily used to provide an artificial replacement for lost kidney function in people with renal failure.
- May be used for those with an acute disturbance in kidney function (acute kidney injury, previously acute renal failure) or for those with progressive but chronically worsening kidney function—a state known as chronic kidney disease stage 5 (previously chronic renal failure or end-stage kidney disease).
- TIP: PT unable to work with patient on HD at VUMC.

Continuous dialysis

- Continuous veno-venous hemodialysis (CVVHD) or Continuous Renal Replacement Therapy (CRRT)
- Indications: ARF, ARDS, after surgery with cardiopulmonary bypass, refractory congestive heart failure.
- Provides slow and balanced fluid removal and/or hemodialysis
- Usually patient will be on some type of vasopressor.
- TIPS:
 - Ask RN if patient’s BP has remained stable over the last 12-24 hours. If so, PT may be warranted.
 - Have someone watch this line exclusively during mobility.

Peritoneal dialysis

- Performed through port in peritoneal cavity.
- Provides more independence.
- Dialysis usually performed at home 4-5 times daily.
- Patients are at risk for peritonitis.
- TIP: Cannot perform PT while patient is draining or filling.

Sepsis

- Potentially deadly medical condition that is characterized by a whole-body inflammatory state and the presence of a known or suspected infection.
- The body may develop this inflammatory response by the immune system to microbes in the blood, urine, lungs, skin, or other tissues.
- Common infections are peritonitis, urinary tract infection or pyelonephritis, meningitis, bacterial pneumonia or cellulitis.
- In hospitalized patients, common sites of infection include intravenous lines, surgical wounds, surgical drains, and decubitus ulcers.
- Septicemia or bacteremia refers to the presence of pathogenic organisms in the bloodstream, leading to sepsis.
- Septic shock is defined as sepsis with refractory arterial hypotension or hypoperfusion abnormalities in spite of adequate fluid resuscitation.
- When severe, may also include end organ dysfunction. Examples are acute lung injury (ALI), acute respiratory distress syndrome (ARDS), encephalopathy, liver dysfunction, acute kidney injury (AKI) or acute renal failure (ARF), and systolic and diastolic heart failure.
- Symptoms of sepsis can include:
 - Confusion or delirium
 - Hypotension
 - Tachycardia
 - Hypothermia
 - Hyperventilation
 - Fever

Gastrointestinal Bleed (GI bleed)

- Loss of blood in the gastrointestinal tract, from the pharynx to the rectum.
- Upper GI bleed - An upper source is characterized by hematemesis (vomiting up blood) and melena (tarry stool containing altered blood).
- Lower GI bleed - indicated by bright red blood per rectum (BRBPR).
- Causes:
 - Anal fissure
 - Hemorrhoids

- Cancer
- Intestinal polyps (a pre-cancerous condition)
- Abnormal blood vessels in the lining of the intestines (also called angiodysplasias)
- Diverticulosis
- Crohn's disease or ulcerative colitis
- Esophageal varices
- Esophagitis
- Gastric (stomach) ulcer
- Mallory-Weiss tear
- Radiation injury to the bowel
- Testing
 - EGD
 - Colonoscopy
 - PCV (Hematocrit)
 - Adult males: 42%-54%
 - Adult women: 38%-46%
- TIPS:
 - Not indicated if patient is actively bleeding.
 - Check Packed Cell Volume (PCV) or hematocrit (HCT).
 - Percentage of blood volume that is occupied by red blood cells.
 - If getting blood products, check with nursing if okay to mobilize.

Diabetes Mellitus (DM)

- Lifelong (chronic) disease in which there are high levels of sugar in the blood.
- Insulin is a hormone produced by the pancreas to control blood sugar. Diabetes can be caused by too little insulin, resistance to insulin, or both.
- Normal process by which food is broken down and used by the body for energy. Several things happen when food is digested:
 - A sugar called glucose enters the bloodstream. Glucose is a source of fuel for the body.
 - An organ called the pancreas makes insulin. The role of insulin is to move glucose from the bloodstream into muscle, fat, and liver cells, where it can be used as fuel
- People with diabetes have high blood sugar because their body cannot move sugar into fat, liver, and muscle cells to be stored for energy. This is because either:
 - Their pancreas does not make enough insulin
 - Their cells do not respond to insulin normally
 - Both of the above
- High blood sugar (hyperglycemia) symptoms:

- Blurry vision
- Excess thirst
- Fatigue
- Frequent urination
- Hunger
- Weight loss
- Low blood sugar (hypoglycemia) symptoms:
 - Double vision or blurry vision
 - Fast or pounding heartbeat
 - Feeling cranky or acting aggressive
 - Feeling nervous
 - Headache
 - Hunger
 - Shaking or trembling
 - Sleeping trouble
 - Sweating
 - Tingling or numbness of the skin
 - Tiredness or weakness
 - Unclear thinking
- Fasting blood glucose level -- diabetes is diagnosed if it is higher than 126 mg/dL twice. Levels between 100 and 126 mg/dL are called impaired fasting glucose or pre-diabetes. These levels are risk factors for type 2 diabetes.
- Patient with DM: controlled BG usually 80-150 mg/dL before meals.
- Emergency situations:
 - Diabetic hyperglycemic hyperosmolar coma - condition of extremely high blood sugar levels, dehydration, and decreased consciousness
 - Diabetic ketoacidosis (DKA)
 - Usually trigger by an illness or infection
 - Occurs when the body cannot use sugar (glucose) as a fuel source because there is no insulin or not enough insulin. Fat is used for fuel instead.
 - Byproducts of fat breakdown, called ketones, build up in the body.
 - In high levels, ketones are poisonous.
 - Blood glucose levels rise (usually higher than 300 mg/dL) because the liver makes glucose to try to combat the problem. However the cells cannot pull in that glucose without insulin.
 - Symptoms can include: deep, rapid breathing, dry skin and mouth, flushed face, fruity smelling breath, nausea and vomiting, and stomach pain
- Can cause secondary problems:
 - Diabetic retinopathy
 - Diabetic nephropathy
 - Diabetic neuropathy

- Delayed healing
- Diabetic ulcers

Lung Disease

Restrictive

- **Respiratory diseases** that restrict lung expansion resulting in a decreased lung volume, an increased work of breathing, and inadequate ventilation and/or oxygenation.
- Pulmonary function test (PFT) demonstrates a decrease in the forced vital capacity (FVC).
- Causes:
 - **Asbestosis** caused by long-term exposure to asbestos dust.
 - **Radiation fibrosis**, usually from the radiation given for cancer treatment.
 - Certain drugs such as **amiodarone**, **bleomycin** and **methotrexate**.
 - As a consequence of another disease such as **rheumatoid arthritis**.
 - **Hypersensitivity pneumonitis** due to an allergic reaction to inhaled particles.
 - **Acute respiratory distress syndrome (ARDS)**, a severe lung condition occurring in response to a critical illness or injury.
 - **Idiopathic pulmonary fibrosis (IPF)**.
 - **Idiopathic interstitial pneumonia**, of which there are several types.
 - **Sarcoidosis**.
 - **Eosinophilic pneumonia**.
 - **Lymphangioleiomyomatosis**.
 - Pulmonary **Langerhans' cell histiocytosis**.
 - **Pulmonary alveolar proteinosis**.
 - Neuromuscular diseases, including **Myasthenia gravis** and **Guillain Barre**.
 - Nonmuscular diseases of the chest wall, e.g. **kyphosis** and **obesity**.

Obstructive

- **Respiratory disease** characterized by **airway obstruction**.
- It is generally characterized by inflamed and easily collapsible airways, obstruction to airflow, and frequent office visits and hospitalizations.
- Types of obstructive lung disease include:
 - **Asthma** - Airways are hyper responsive and become inflamed producing excess mucus. The muscles around the airways tighten making the airways narrower. Asthma is usually triggered by breathing in things in the air such as dust or pollen that produce an allergic reaction. It may be triggered by other things such as an **upper respiratory tract infection**, cold air, exercise or smoke. Asthma causes recurring episodes of wheezing, breathlessness, chest tightness, and coughing.
 - **Bronchiectasis** - Abnormal, irreversible dilatation of the bronchi caused by destructive and inflammatory changes in the airway walls.
 - **Bronchitis** - Hyperplasia and hyper secretion of mucus glands.
 - **Chronic obstructive pulmonary disease (COPD)** – Progressive condition that is not fully reversible. The term COPD includes the conditions **emphysema** and

chronic bronchitis although most patients with COPD have characteristics of both conditions to varying degrees. The residual volume, the volume of air left in the lungs following full expiration, is often increased in COPD, as is the total lung capacity, while the vital capacity remains relatively normal. The increased total lung capacity (hyperinflation) can result in the clinical feature of a "barrel chest" - a chest with a large front-to-back diameter that occurs in some individuals with COPD. The most common cause of COPD is cigarette **smoking**. COPD is a gradually progressive condition and usually only develops after about 20 **pack-years** of smoking. COPD may also be caused by breathing in other particles and gases. Severe **emphysema** has been treated with **lung volume reduction surgery**, with some success in carefully chosen cases. **Lung transplantation** is also performed for severe COPD in carefully chosen cases. **Alpha 1-antitrypsin deficiency** is a fairly rare genetic condition that results in COPD (particularly **emphysema**) due to a lack of the antitrypsin protein which protects the fragile alveolar walls from protease enzymes released by **inflammatory processes**.

- **TIPS:**
 - Patients with COPD are CO₂ retainers, therefore, their O₂ sats are usually mid to high 80s with activity. Be careful increasing supplemental O₂ as increased O₂ results in increased CO₂ resulting in decreased respiratory drive.
 - Monitor O₂ sats at rest and with activity.
 - Educated COPD patients on pursed lip breathing.
 - Educated patients with lung disease on energy conservation (i.e. sitting to perform tasks, increased rest breaks, etc).
 - Educated patients who use supplemental O₂ on smoking cessation or to at least remove supplemental O₂ when smoking!

Cardiac

How the Heart Works

- A healthy heart beats about 60 to 80 times per minute to pump blood throughout the body. The right and left sides of the heart work together. Blood that is low in oxygen first enters the right upper chamber (right atrium) of the heart. The blood flows from the right atrium to the lower chamber (right ventricle) through the open tricuspid valve. The blood then travels through the pulmonary artery to the lungs where oxygen is added. Oxygen-rich blood then returns to the left side of the heart. The blood flows from the left upper chamber (left atrium) to the lower chamber (left ventricle) through the open mitral valve. From the left ventricle, the blood is pumped into a network of arteries (blood vessels) that carry the blood throughout the body.
- Blood passes through a valve before leaving each chamber of the heart. There are four valves in your heart; valves make sure blood flows in only one direction through your heart.

Congestive Heart Failure (CHF)

- **Systolic heart failure (systolic dysfunction)**
 - Occurs when the heart muscle does not contract with enough force, so there is not enough oxygen-rich blood pumped throughout the body.
- **Diastolic heart failure (diastolic dysfunction)**

- Occurs when the heart contracts normally (a normal ejection fraction) but the ventricle does not relax or fill properly, so less blood enters the heart.
- **Ejection fraction (EF)**
 - Measurement of the amount of blood pumped out of the left ventricle with each heartbeat.
 - In most cases, the term “ejection fraction” refers to left ventricular ejection fraction.
 - 50-70% Normal
 - 36-49% Below Normal
 - 35-40% May confirm diagnosis of systolic heart failure
 - <35% May be at risk for life threatening irregular heartbeats
 - Ejection fraction is usually expressed as a percentage. A normal heart pumps a little more than half the heart’s blood volume with each beat.
 - A LVEF of 65%, for example, means that 65% of the total amount of blood in the left ventricle is pumped out with each heartbeat.
 - The LVEF may be lower when the heart muscle has become damaged due to a heart attack, heart muscle disease (cardiomyopathy), or other causes.
 - An EF of 35 to 40% may confirm a diagnosis of systolic heart failure. Someone with diastolic failure can have a normal EF.
 - An EF of less than 35% increases the risk of life- threatening irregular heartbeats that can cause sudden cardiac arrest (loss of heart function) and sudden cardiac death. An implantable cardioverter defibrillator (ICD) may be recommended for these patients.
 - Your EF can go up and down based on your heart condition and the therapies that have been prescribed.

Signs of heart failure:

- Shortness of Breath (Dyspnea)
 - When the heart begins to fail, blood backs up in the veins attempting to carry oxygenated blood from the lungs to the heart. As fluid pools in the lungs, it interferes with normal breathing. In turn, you may experience breathlessness during exercise or other activities. As the condition worsens, shortness of breath may occur when at rest or asleep. These periods of breathlessness may leave you feeling exhausted and anxious.
- Fatigue
 - As heart failure becomes more severe, the heart is unable to pump the amount of blood required to meet all of the body's needs. To compensate, blood is diverted away from less-crucial areas, including the arms and legs, to supply the heart and brain. As a result, people with heart failure often feel weak (especially in their arms and legs), tired and have difficulty performing ordinary activities such as walking, climbing stairs or carrying groceries.
- Chronic Cough or Wheezing
 - The fluid buildup in the lungs may result in a persistent cough or wheezing, that may produce phlegm (a thick, mucous-like substance) that may be tinged with blood.
- Rapid or Irregular Heartbeat

- The heart may speed up to compensate for its failing ability to adequately pump blood throughout the body. Patients may feel a fluttering in the heart (palpitations) or a heartbeat that seems irregular or out of rhythm. This often is described as a pounding or racing sensation in the chest.
- Lack of Appetite or Nausea
 - When the liver and digestive system become congested they fail to receive a normal supply of blood. This can make you feel nauseous or full, even if you haven't eaten.
- Mental Confusion or Impaired Thinking
 - Abnormal levels of certain substances, such as sodium, in the blood and reduced blood flow to the brain can cause memory loss or disorientation, which you may or may not be aware of.
- Fluid Buildup and Swelling
 - Because blood flow to the kidneys is restricted, the kidneys produce hormones that lead to salt and water retention. This causes swelling, also called edema, that occurs most often in the feet, ankles and legs.
- Rapid Weight Gain
 - The fluid build-up throughout the body, may cause you to gain weight quickly.

The Stages of Heart Failure – NYHA Classification

In order to determine the best course of therapy, physicians often assess the stage of heart failure according to the New York Heart Association (NYHA) functional classification system. This system relates symptoms to everyday activities and the patient's quality of life.

Class	Patient Symptoms
Class I (Mild)	No limitation of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, or dyspnea (shortness of breath).
Class II (Mild)	Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in fatigue, palpitation, or dyspnea.
Class III (Moderate)	Marked limitation of physical activity. Comfortable at rest, but less than ordinary activity causes fatigue, palpitation, or dyspnea.
Class IV (Severe)	Unable to carry out any physical activity without discomfort. Symptoms of cardiac insufficiency at rest. If any physical activity is undertaken, discomfort is increased.

Testing you may see in charts:

- Blood tests
 - Creatinine: normal range 0.6 – 1.5 mg/dL
 - B-type Natriuretic Peptide (BNP)

- BNP is a substance secreted from the ventricles (lower chambers of the heart) in response to changes in pressure that occur when heart failure develops and worsens.
- The level of BNP in the blood increases when heart failure symptoms worsen, and decreases when the heart failure condition is stable.
- Females with no CHF (55-64) 32
- Females with no CHF (75+) 78
- Males with no CHF (55-64) 20
- Males with no CHF (75+) 48
- Mild heart failure 186
- Moderate heart failure 791
- Severe heart failure 2013

- **Chest x-ray (CXR)**

- Shows the size of your heart and whether there is fluid build-up around the heart and lungs.

- **Echocardiogram (ECHO)**

- Graphic outline of the heart's movement.
- During an echo, a probe is placed on the surface of your chest. This wand sends ultrasound waves that provide pictures of the heart's valves and chambers so the pumping action of the heart can be studied.
- Echo is often combined with an ultrasound to find changes in the blood flow across the heart's valves and the pressure within the heart's chambers.

- **Electrocardiogram (EKG or ECG)**

- Records the electrical impulses in the heart. During the test, small, flat, sticky patches called electrodes are placed on your chest. The electrodes are attached to an electrocardiograph monitor (EKG) that charts your heart's electrical activity on graph paper.

- **Stress Test**

- An exercise stress test is used to provide information about how the heart responds to stress. It usually involves walking on a treadmill or pedaling a stationary bike at increasing levels of difficulty, while the electrocardiogram, heart rate, and blood pressure are monitored. When one is not able to do activity, medications may be used to "stress" the heart. This is called a pharmacological stress test.

Coronary Artery Disease

- Narrowing of the small blood vessels that supply blood and oxygen to the heart.
- Leading cause of death in the United States for men and women.
- Caused by the buildup of plaque in the arteries to your heart.
- Risk factors for heart disease:
 - Age. The risk of heart disease increases with age.
 - Gender. Men have a higher risk of getting heart disease than women who are still getting their menstrual period. After menopause, the risk for women is closer to the risk for men.
 - Genes. If your parents or other close relatives had heart disease, you are at higher risk.
 - Race. African Americans, Mexican Americans, American Indians, Hawaiians, and some Asian Americans also have a higher risk for heart problems.
 - Diabetes is a strong risk factor for heart disease.
 - High blood pressure increases your risks of heart disease and heart failure.
 - Extra cholesterol in your blood builds up inside the walls of your heart's arteries (blood vessels).
 - Smokers have a much higher risk of heart disease.
 - Chronic kidney disease can increase your risk.
 - People with narrowed arteries in another part of the body (examples are stroke and poor blood flow to the legs) are more likely to have heart disease.
 - Substance abuse (such as cocaine).
 - Obesity.
 - Not getting enough exercise and feeling depressed or having excess stress are other risk factors.

Myocardial Infarction (MI or “heart attack”)

- The interruption of blood supply to a part of the heart, causing heart cells to die. This is most commonly due to occlusion (blockage) of a coronary artery following the rupture of a vulnerable atherosclerotic plaque, which is an unstable collection of lipids (fatty acids) and white blood cells (especially macrophages) in the wall of an artery. The resulting ischemia (restriction in blood supply) and oxygen shortage, if left untreated for a sufficient period of time, can cause damage or death (*infarction*) of heart muscle tissue (*myocardium*).
- Classical symptoms of acute myocardial infarction include sudden chest pain (typically radiating to the left arm or left side of the neck), shortness of breath, nausea, vomiting, palpitations, sweating, and anxiety (often described as a sense of impending doom).
- Women may experience fewer typical symptoms than men, most commonly shortness of breath, weakness, a feeling of indigestion, and fatigue.
- Approximately one quarter of all myocardial infarctions are "silent", without chest pain or other symptoms.
- Check Troponin levels in chart.

- Very sensitive and specific indicators of damage to the heart muscle
- A patient who had suffered from a myocardial infarction would have an area of damaged heart muscle and so would have elevated cardiac troponin levels in the blood.
- Normal troponin is < 0.05 .
- PT is indicated 24 hours after troponins have begun to trend down.

Non ST Elevation Myocardial Infarction (NSTEMI)

- Does not cause changes on an electrocardiogram (ECG), however, chemical markers in the blood indicate that damage has occurred to the heart muscle.
- In NSTEMI, the blockage may be partial or temporary, and so the extent of the damage relatively minimal.

ST segment elevation myocardial infarction (STEMI)

- Is caused by a prolonged period of blocked blood supply.
- It affects a large area of the heart muscle, and so causes changes on the ECG as well as in blood levels of key chemical markers.

Things to consider when treating a patient post MI:

- During interview, ask patient what their s/s were prior to their MI.
- Ask patient to tell you if they have any recurrence of these s/s during activity.
- If s/s occur, notify nursing immediately.
- PT is contraindicated if patient actively having MI or troponin level still trending up.
- Activity should be held until 24 hours after first downtrending troponin.

Cardiac Catheterization (AKA: heart cath, coronary angiography)

- An invasive imaging procedure that involves putting a catheter in the femoral or radial artery and guiding it to your heart with the aid of a special x-ray machine.
- There are two types of cardiac catheterization, left and right. In a left heart catheterization, contrast dye may be injected through the catheter and x-ray movies of your valves, coronary arteries, and heart chambers are taken. Right heart catheterization does not require contrast dye and is used to measure heart function.
- Once the catheter is in place, it can be used to perform a number of procedures including angioplasty, PCI (percutaneous coronary intervention) angiography.
- Percutaneous coronary intervention (PCI) is a therapeutic procedure to treat the stenotic (narrowed) coronary arteries of the heart found in coronary heart disease. These stenotic segments are due to the build up of cholesterol-laden plaques that form due to atherosclerosis.
- Bare-metal stents (BMS) are vascular stents without a coating. They are mesh-like tubes of thin wire.
- Drug-eluting stents (DES) are coronary stents placed into narrowed, diseased peripheral or coronary arteries that slowly releases a drug to block cell proliferation.
- TIP: Check with MD team/RN regarding hours of bedrest post procedure.

Cardiomyopathy

- This disease changes the heart muscle and weakens it. The weakened heart muscle may become thin and get larger. The entire heart muscle is weak and pumps less effectively.
- Over time, the heart goes into a state of pump failure. It cannot supply the body with enough blood flow. Often, it is a long term (chronic) disease and you will have to adjust your lifestyle. Treatment rarely cures cardiomyopathy, but may reduce the symptoms.
- Types of Cardiomyopathy
 - Dilated Cardiomyopathy - heart muscle is “too thin”.
 - Hypertrophic Cardiomyopathy - heart muscle is “too thick”.
 - Restrictive Cardiomyopathy - heart muscle cannot relax and fill well with blood.

Heart Valve Disease

- There are four valves in the normal heart.
 - Mitral valve: allows the blood to flow from the left atrium into the left ventricle.
 - Tricuspid valve: between the right atrium and the right ventricle which stops the backflow of blood between the two.
 - Aortic valve: between the left ventricle and the aorta.
 - Pulmonary valve: between the right ventricle and the pulmonary artery,
- These valves control the flow of blood through the chambers of the heart. Valves open wide enough for blood to flow through, then close tightly so the blood does not leak backward.
- When one or more of these valves is damaged, the flow of blood changes. Damaged valves may be due to a birth defect, infections or rheumatic heart disease that scars the valves. Valve damage can occur with aging.
- Valve disease often results from a narrowing of the valve opening (stenosis) and/or leaking of a valve (regurgitation). A narrow valve restricts blood flow through the heart. A leaking valve results in less blood being pumped through the heart as blood leaks backward. The valve problems cause strain on the heart as it must work harder. The heart muscle becomes stretched.
- Irregular beats, shortness of breath, swelling, and the formation of blood clots can result.
- In the early stages of valve disease, medicines, diet and exercise can control signs.
- When signs worsen, surgery is often needed to repair or replace the diseased valve.
- Many diseases can impair the pumping action of the ventricles. For example, the muscles of the ventricles can be weakened by heart attacks, infections (myocarditis) or toxins (alcohol, some chemotherapy agents).
- Diseases such as hemochromatosis (iron overload) or amyloidosis can cause stiffening of the heart muscle and impair the ventricles' capacity to relax and fill; this is referred to as diastolic dysfunction. The most common cause of this is longstanding high blood pressure resulting in a thickened (hypertrophied) heart.
- Many disease processes can impair the pumping efficiency of the heart to cause congestive heart failure. In the United States, the most common causes of congestive heart failure are:
 - coronary artery disease
 - high blood pressure (hypertension)

- longstanding alcohol abuse
- disorders of the heart valves
- unknown (idiopathic) causes

Heart Failure Medicines

Angiotensin Converting Enzyme (ACE) Inhibitors

- Used for the treatment of hypertension.
- These medications block the formation of angiotensin II, a hormone with many potentially adverse effects on the heart and circulation in patients with heart failure.
- These drugs have demonstrated a remarkable improvement of symptoms in patients, prevention of clinical deterioration, and prolongation of survival.
- They have been recently been shown to prevent the development of heart failure and heart attacks.
- Examples of ACE inhibitors include:
 - captopril (Capoten)
 - enalapril (Vasotec)
 - lisinopril (Zestril, Prinivil)
 - benazepril (Lotensin)
 - ramipril (Altace)

Beta-blockers

- Certain hormones, such as epinephrine (adrenaline), norepinephrine, and other similar hormones, act on the beta receptors of various body tissues and produce a stimulative effect. The effect of these hormones on the beta receptors of the heart is a more forceful contraction of the heart muscle.
- Beta-blockers are agents that block the action of these stimulating hormones on the beta receptors of the body's tissues.
- In congestive heart failure, however, the stimulating effect of these hormones, while initially useful in maintaining heart function, appears to have detrimental effects on the heart muscle over time.
- Studies have demonstrated an impressive clinical benefit of beta-blockers in improving heart function and survival in individuals with congestive heart failure who are already taking ACE inhibitors.
- TIP: Beta blockers suppress the HR, therefore, with activity their HR will not increase appropriately. Use their BP to determine activity tolerance.

Digoxin

- Stimulates the heart muscle to contract more forcefully.

Diuretics

- Important component of the treatment of congestive heart failure to prevent or alleviate the symptoms of fluid retention.
- These drugs help keep fluid from building up in the lungs and other tissues by promoting

the flow of fluid through the kidneys.

- Prevents deterioration of the patient's condition thereby avoiding hospitalization.
- Potential side effects of diuretics include: dehydration, electrolyte abnormalities, low potassium levels, and low blood pressure.
- It is important to prevent low potassium levels by taking supplements. Such electrolyte disturbances may make patients susceptible to serious heart rhythm disturbances.
- Examples of various classes of diuretics include:
 - furosemide (Lasix)
 - hydrochlorothiazide (Hydrodiuril)
 - bumetanide (Bumex)
 - torsemide (Demadex)
 - spironolactone (Aldactone)
 - metolazone (Zaroxolyn)
- TIP: Patients call this their “water pill”. Diuretics increase the frequency of urination. Therefore, during a treatment session, be mindful of this. You may want to stick near the restroom or place an undergarment on patient.

Things to consider when treating a patient with heart failure

- Heart failure patients are often admitted with volume overload and have a daily fluid restriction; check with nursing before getting them anything else to drink besides what is already in the room.
- If patients are on high doses of diuretics, nursing has to take strict measurements of liquids going in and out. Therefore, if your patient does not have a foley, make sure there is a “hat” in the commode to measure their urine.
- Watch for arrhythmias. For example, atrial fibrillation, PVC, V tach.
- When taking history, patient may tell you they sleep in recliner which is due to paroxysmal nocturnal dyspnea. They have too much fluid in their lungs and are unable to lie flat.
- Treat to patient’s tolerance.
- If patient with lower EF, you should expect to see fatigue and shortness of breath with minimal activity requiring frequent rest breaks.
- Patient may benefit from education on energy conservation (i.e. sitting to perform dressing, cooking, etc). May also benefit from tub bench and having strategically placed chairs within the home for rest breaks.

Atrial fibrillation (AF or A-fib)

- Most common **cardiac arrhythmia** (abnormal heart rhythm).
- The upper chambers of your heart (atria) experience chaotic electrical signals. As a result, they quiver. The AV node — the electrical connection between the atria and the ventricles — is overloaded with impulses trying to get through to the ventricles. The ventricles also beat rapidly, but not as rapidly as the atria.
- Its name comes from the fibrillating (i.e., quivering) of the heart muscles of the atria, instead of a coordinated contraction.
- Characteristic findings are the absence of P waves, with unorganized electrical activity in their place, and irregular R-R intervals due to irregular conduction of impulses to the ventricles

- Can be associated with a rapid ventricular response (RVR) which is any ventricular rate greater than 100 beats per minute (bpm).
- Some people are **asymptomatic** despite having frequent episodes, while others experience symptoms that are troubling or incapacitating.
- May result in **palpitations**, **fainting**, **chest pain**, or **congestive heart failure**.
- People with AF usually have a significantly increased risk of **stroke** (up to 7 times that of the general population).
- Stroke risk increases during AF because blood may pool and form clots in the poorly contracting atria and especially in the **left atrial appendage** (LAA).
- Atrial fibrillation may be treated with medications which either slow the heart rate or revert the heart rhythm back to normal.
- Cardioversion is a noninvasive conversion of an irregular heartbeat to a normal heartbeat using electrical or chemical means:
 - Electrical cardioversion involves the restoration of normal heart rhythm through the application of a DC electrical shock.
 - Chemical cardioversion is performed with drugs, such as amiodarone, dronedarone, procainamide, dofetilide, ibutilide, propafenone or flecainide.
- Surgical and catheter-based therapies (ablation) may also be used to prevent recurrence of AF in certain individuals.
- People with AF are often given **anticoagulants** such as **warfarin** (Coumadin) to protect them from stroke.

Things to consider when treating a patient with atrial fibrillation

- If patient has atrial fibrillation with RVR, PT is contraindicated.
- Check with nursing to make sure patient is **rate controlled**.
- When patient is on Coumadin, INR must be in appropriate range. INR for patient on Coumadin is 2-3.
- Monitor patient, as some patients are asymptomatic.
- Check with MD team regarding HR ranges acceptable for therapy. At Vanderbilt, PT is stopped when patient sustains HR over 130.
- If patient becomes symptomatic, take a rest break and can attempt further activity as patient tolerates.

Some patients may require surgery to correct their heart disease. May include the following:

- **Pacemaker**
 - Medical device that uses electrical impulses, delivered by electrodes contacting the heart muscles, to regulate the beating of the heart.
 - The primary purpose of a pacemaker is to maintain an adequate heart rate, either because the heart's native pacemaker is not fast enough, or there is a block in the heart's electrical conduction system.
 - Modern pacemakers are externally programmable and allow the cardiologist to select the optimum pacing modes for individual patients.
 - Some combine a pacemaker and defibrillator in a single implantable device. Others have multiple electrodes stimulating differing positions within the heart to improve synchronisation of the lower chambers of the heart.

- **ICD (defibrillator)**
 - Electrical impulse generator which is implanted in patients who are at risk of sudden cardiac death due to ventricular fibrillation and ventricular tachycardia.
 - The device is programmed to detect cardiac arrhythmia and correct it by delivering a jolt of electricity.

- For the above, the generator is inserted in the left shoulder area where an incision is made below the collar bone creating a small pocket. The lead or leads (the number of leads varies depending on the type of pacemaker) are fed into the heart through a large vein using a fluoroscope to monitor the progress of lead insertion.
- **TIPS:**
 - Vanderbilt precautions are no lifting/pushing/pulling > 10 lbs with the affected extremity and no shoulder flexion > 90 degrees for 6 weeks.
 - Consider modifications for dressing tasks.

- **Coronary Artery Bypass Graft (CABG)**
 - Used to treat severe CAD.
 - Arteries or veins from elsewhere in the patient's body (usually from the leg) are grafted to the coronary arteries to bypass atherosclerotic narrowings and improve the blood supply to the coronary circulation supplying the myocardium.
 - Usually performed through median sternotomy, however, can be done through minimally invasive techniques.
 - **TIPS:**
 - Vanderbilt precautions for median sternotomy are no lifting/pushing/pulling > 10 lbs for 4 weeks.
 - Must consider modifications for mobility in order to maintain patient's precautions.
 - Only able to use assistive device (AD) for balance.

- **Valve Replacements**
 - Indicated for regurgitation (leaky) or stenosis.
 - Valve replaced through median sternotomy or minimally invasive technique.
 - Recently, have begun seeing valves replaced via heart cath.

- **Heart Transplant**
 - Performed through median sternotomy.
 - Patient will begin immunosuppression drugs post op.
 - Will need to wear mask when out of room.

- **Left Ventricular Assist Device (LVAD)**
 - It is a battery-operated, mechanical pump-type device that is surgically implanted through median sternotomy. It helps maintain the pumping ability of a heart that can't effectively work on its own.
 - 3 devices used at VUMC:
 - HeartMate II

- Is a continuous flow rotary LVAD.
- Has only moving part which is a small spinning rotor that receives power from the Systems Controller.
- The rotor moves blood thru the pump which is capable of providing flow from 3 to 10 L per minute.
- Ruby and ceramic barons (low thermal conductivity).
- It is VALVELESS.
- PVAD (Paracorporeal Ventricular Assist Device)
 - Easily implanted and removed as the pump lies outside the body allowing support of a wide range of patient sizes.
 - Appropriate for short or long term support and FDA approved for bridge to transplant and post cardiomy recovery.
 - Inside are 2 mechanical tilting disc valves that maintain unidirectional flow.
- IVAD (Implantable Ventricular Assist Device)
 - Only implantable device that offers left, right and biventricular support.
 - Appropriate for short or long term support and FDA approved for bridge to transplant and post cardiomy recovery.
 - Inside are 2 mechanical tilting disc valves that maintain unidirectional flow.

Hematology/Oncology [11n/10t/outpatient]

Common Abbreviations

APML	Acute Promyelocytic Leukemia
AML	Acute Myeloid Leukemia
ALL	Acute Lymphoid Leukemia
CML	Chronic Myeloid Leukemia
CLL	Chronic Lymphoid Leukemia
MDS	Myelodysplastic Syndrome
NHL	Non-Hodgkin Lymphoma
HL	Hodgkin Lymphoma
DLBCL	Diffuse Large B-Cell Lymphoma
BMT	Bone Marrow Transplant
RIC	Reduced Intensity Conditioning
MUD	Matched Unrelated Donor
MRD	Matched Related Donor
PBSCT	Peripheral Blood Stem Cell Transplant
DCSCT	Double Cord Stem Cell Transplant
UCBT	Umbilical Cord Stem Cell Transplant
GVHD	Graft Versus Host Disease

Overview of Cancers and Blood Disorders

1. Leukemia: cancer of blood cells (starts in bone marrow and blood)
 - a. Blood Consists of
 - i. Blood stem cells develop into 1 of 3 main blood cell components:
 1. RBC
 2. Platelets
 3. WBC
 - ii. Lymphocytes - protect against germs; make up lymphoid tissue
 - iii. B cells: protect by maturing into plasma cells, then making antibodies
 - iv. T cells: destroy directly or boost/slow activity of other immune system cells
 - v. Granulocytes - contain enzymes that destroy germs
 - vi. Neutrophil
 - vii. Basophil
 - viii. Eosinophil
 - ix. Monocytes - become macrophages that destroy germs by surrounding and digesting them
 - b. Classification:
 - i. Acute vs Chronic
 1. Acute:
 - a. Cells not able to mature properly
 - b. Immature cells continue to reproduce and build up
 2. Chronic:
 - a. Cells mature partly, but not completely
 - b. Cells appear normal but do not fight infection as well as normal cells

- c. These cells usually live longer, build up, and crowd our normal cells
 - ii. Lymphocytic vs Myeloid
 - 1. Lymphocytic: start in immature forms of lymphocytes
 - 2. Myeloid: start in early forms of myeloid cells; the cells that make WBC (other than lymphocytes), RBC, or platelet-making cells
- 2. Lymphoma: cancer of lymphocytes (starts in lymph system)
 - a. Classification:
 - i. Non-Hodgkin's: Absence of Reed-Sternberg cell
 - ii. Hodgkin's disease: Presence of Reed-Sternberg cell
- 3. Sarcoma:
 - a. Soft tissue - develop from fat, muscle, nerves, fibrous tissues, blood vessels, deep skin tissue
- 4. Osteosarcomas
 - a. develop in bone
- 5. Carcinoma: cancer arising in epithelial tissue of the skin or of the lining of the internal organs
 - a. Types:
 - i. Basal cell
 - ii. Squamous cell
 - iii. Renal cell
 - iv. Adenocarcinoma
 - v. Invasive ductal carcinoma
 - vi. Ductal carcinoma in situ (DCIS)
- 6. MDS: a group of blood and bone marrow disorders
 - a. Stem cells do not mature as expected
 - b. The number of immature cells (blasts) and abnormally developed cells (dysplastic cells) increase
 - c. Can progress to acute myeloid leukemia (AML)

Chemotherapy Treatments

- 1. R-CHOP: Rituximab + Cyclophosphamide + Doxorubicin Hydrochloride (Hydroxydaunomycin) + Vincristine Sulfate (Oncovin) + Prednisone
 - a. Treats: Non-Hodgkin's Lymphoma
- 2. Hyper-CVAD: Cyclophosphamide + Vincristine Sulfate + Doxorubicin Hydrochloride (Adriamycin) + Dexamethasone
 - a. Treats: ALL and some Non-Hodgkin's Lymphoma
- 3. FOL-F-IRI: Folinic acid (Leucovorin, calcium folinate, or FA) + Fluorouracil (5FU) + Irinotecan (Campto)
 - a. Treats: colorectal cancer
- 4. DA-EPOCH - R: Dose Adjusted + Etoposide + Prednisone + Oncovin (Vincristine) + Cyclophosphamide + Hydroxydaunorubicin (Doxorubicin) + Rituximab
 - a. Treats: B-Cell Lymphoma
- 5. FLAG-IDA: Fludara + Cytarabine + Idarubicin
 - a. Treats: AML
- 6. 7&3: Cytosar + Daunorubicin + Idarubicin + Mitoxantrone
 - a. Treats: AML
- 7. Clag-M: Cladribine + Cytarabine + Mitoxantrone

- a. Treats: AML
- 8. HiDAC: High Dose Cytarabine
 - a. Treats: AML
- 9. RICE: Rituximab + Ifosfamide + Carboplatin + Etoposide + Mesna
 - a. Treats: Non-Hodgkin's Lymphoma
- 10. CBV: Cetuximab + BCNU (Carmustine) + VP-16 (Etoposide)
 - a. Treats: Lymphoma with stem cell transplant
- 11. FLU/BU/Thymo: Fludarabine + Busulfan + Thymoglobulin
 - a. Treats: Graft vs Host disease

Oncology/Chemotherapy Guidelines

1. Common side effects of chemotherapy include fatigue, nausea/vomiting, diarrhea, and mucositis, peripheral neuropathy, and edema.
2. Be mindful of patients with metastatic disease/lytic lesions; resistive exercise and/or manual muscle testing is typically contraindicated due to risk of fracture
3. Many patients spend prolonged time in the hospital during their treatment, sometimes upwards of 30+ days (specifically those patients with blood cancers who are receiving initial chemotherapy treatment)
4. Neutropenic Precautions- Check with the nurse to determine if the patient needs to wear a mask once they exit the room. The patient's WBC will be listed under their labs in Star Panel. It is best not to cover on 11N if you are ill or suspect you are coming down with an illness. If in doubt wear a mask. Avoid covering 11N if you have received the nasal flu mist for ~ 1 week since you have received a live strain of the flu.
5. 10T Gym-There is a gym located in the back hallway on 10T that is open for patient and therapy treatment use. Equipment includes stationary bike, Nu-Step, Total Gym and mat table. Feel free to utilize the gym as needed, but be sure to thoroughly clean equipment once finished. Of note, patients on contact precautions are not allowed to use the gym.
6. "Walk Nashville" Is a map on 11N in which patients can track distance walked while in-patient. The map highlights local landmarks and their respective distances from VUMC. The number of laps the patient walks on the unit can then be converted to miles. The patient can chart their progress daily on an activity log. This serves to provide a walking goal for patients to minimize risk for immobility/inactivity.

Stem Cell/Bone Marrow Transplant Guidelines

1. A stem cell transplant is a procedure that delivers healthy bone marrow stem cells into a patient whose marrow is not working properly or has been ablated by chemo/radiation.
2. There are 3 types of transplants:
 - a. Autologous/autograft- Healthy bone marrow is taken from the patient prior to chemotherapy or radiation treatment.
 - b. Allogeneic/allograft- Stem cells come from another individual. Matched related donor (MRD) or matched unrelated donor (MUD).
 - i. Patients receiving an allograft transplant will be under strict watch, living close to the hospital for the first 100 days following transplant. Patients typically live in a local apartment during this time.
 - ii. Patients are initially neutropenic and are required to wear a mask in public during this time to reduce risk of infection.

- iii. Anti-rejection drugs are needed to suppress the immune system after transplant, thus placing patients at increased risk for infection.
 - iv. A major complication with allograft transplants is graft vs host disease (GVHD). The transplanted stem cells can attack the patient's own body. Common symptoms related to acute GVHD are diarrhea, skin rash, and/or abnormal liver function. Chronic GVHD symptoms may include dry eyes and/or mouth, scleroderma, scarring of the lungs, and chronic diarrhea.
 - v. High-dose steroids are the most effective treatment for acute GVHD. Unfortunately steroid induced myopathy is a common side effect of this medication.
 - vi. Proximal muscle groups are most affected by steroid myopathy (hip flexors, quads, shoulder girdle muscles).
 - vii. A comprehensive rehabilitation approach is critical to minimize fatigue, weakness, deconditioning, and physical impairment in the SCT population.
- c. Umbilical cord blood transplant
3. Prior to transplant the patient undergoes ablative/myeloablative treatment. The patient receives high doses of chemotherapy and/or radiation (conditioning). This process destroys the patient's abnormal blood cells or cancer. It also minimizes graft rejection.
 4. In some cases, the patient may receive lower levels of radiation or chemotherapy prior to transplant. This is referred to as a reduced intensity, nonmyeloablative, or mini transplant i.e. RIC MUD (reduced intensity conditioning /matched unrelated donor).
 5. Following transplant, it takes approximately 10 - 20 days for the new stem cells to establish themselves this is referred to as engraftment.

Stem Cell Pre/Post Transplant (outpatient clinic)

1. This program has been developed for the allogeneic stem cell transplant patients. These patients are likely to encounter complications related to GVHD and have an increased risk for functional decline.
2. Out-patient physical therapy takes place within the Stem Cell Clinic on the 2nd floor of the TVC. Physical therapist is available in the clinic Monday, Wednesday, and Friday from 1:00 until 4:00 pm.
3. Pre and Post Transplant PT evaluation
 - a. Pre-transplant evaluation is performed to:
 - i. Determine physical readiness for transplant
 - ii. Establish a baseline
 - iii. Identify musculoskeletal problems early
 - iv. Initiate early patient participation in exercise or skilled PT services
 - b. Post transplant the patient may return to the clinic for a subsequent PT evaluation (i.e. if steroids are initiated, there is a change in function, fall, etc). This data can then be compared to the baseline evaluation and specific goals can be formulated to address deficits present.
 - c. There is also a re-evaluation template for patients who have had a significant change in their status after a hospitalization. Patients do not require an outpatient re-evaluation every time they are admitted to the hospital; rather, a re-evaluation only needs to be done if the patient has had a prolonged hospital admit or a significant decline in status.
 - d. Common Assessments completed during evaluation:

- i. 50 ft Walk Test – Patients are timed as they walk a distance of 25 ft, turn around, and walk back to the starting point. The patient is instructed to walk as fast as possible.
- ii. 6 Minute Walk Test – Patients are asked to walk as far and as fast as possible for 6 minutes.
- iii. Forward Reach – Patients should stand next to a wall with his/her shoulder forward flexed to 90*, elbow extended, wrist at neutral, and fingers extended. Keeping the heels on the floor, the patient should reach forward along the ruler as far as possible. This distance reached should be measured and recorded in centimeters.
- iv. Repeated Sit-to-Stand – Ask the patient to sit in a standard chair with armrests. Then ask the patient to rise to a standing position and then to return to a sitting position, as quickly as possible 2 times. Measure how long it takes him/her to do this. Then, give the patients a few seconds to relax and then repeat the test only this time allow the patient to use UE to assist.
- v. Unilateral Stance – Have the patient stand on either foot holding the opposite foot off the ground without touching the floor. Next, have the patient repeat on the other side. The goal is for the patient to achieve 20 seconds each leg.

Burns [11s/outpatient]

Trauma [10n]

General Guidelines

1. The trauma unit is a 31 bed unit on 10N, consisting of 14 ICU beds (beds 1-14) and 17 step down beds (beds 15-31)
2. New patients are admitted to either the ICU (beds 1-10) or to receiving (beds 19-25)
3. Trauma is broken down into three primary teams
 - a. T1 consists of ICU beds 1-14, managed by a medical team made up of attending physician, fellow, residents and NP
 - b. T2 consists of step down beds 15-31, managed by an attending and NPs
 - c. T3 consists of trauma patients who have stabilized and transferred off of the floor to any other floor in the hospital, managed by an attending physician and NPs
4. Member of acute rehab attends Trauma Huddle Monday to Friday in the family conference room on 10N at 10:00AM on Mondays and 10:30AM on Tuesday-Fridays
5. Upon arrival, patients will receive a whole body CT known as a traumagram to determine underlying injuries present (head, chest, abdomen, pelvis, spine).
 - a. Additionally XRays may be done for obvious deformities or pain in extremities
6. Based on traumagram findings/injuries, additional services will be consulted including but not limited to: *ortho trauma, ortho hand, ortho spine, neurosurgery, plastics, burns, psychiatry* and/or *vascular*.
7. Traumagrams MUST be finalized prior to therapy eval/intervention. The trauma residents/nurse practitioners are responsible for finalizing these and this will be noted on the patients face sheet in STARPANEL.
8. Patients may be admitted with a “stat name” if their identity is unknown at time of admission.
9. Patients who are a security risk or who have been involved in a violent crime will be placed under an alias. This name will consist of a *FISH, FLOWER* combination (ie Grouper, Dandelion).
 - b. Patients considered a security risk will also have a restricted visitor list
10. Visitors of patients are limited to 2 at a time, and they must have a pass from the security guard prior to entering the unit.
11. Visiting hours vary based on ICU/step down patients.
12. All new patients will be placed in a cervical collar until this has been radiographically cleared AND the NP or senior resident (or higher) clears via a painless PROM/palpation screen. If the patient is unable to accurately report pain with this (ie due to CHI) the c-collar will remain in place even if it has been radiographically cleared.
 - c. Cervical collars should never be removed by PT/OT staff, and the RN should be informed immediately if the patient has removed his/her collar. Pillows are NOT to be placed behind a patients head if he/she is wearing a cervical collar as this disrupts alignment and function of the brace.
13. Check in with RN prior to therapy eval/treatment to determine if the patient is appropriate to be seen and/or if they can be taken off tele monitor, O2, chest tube on suction, etc.
14. After eval/treatment be sure to hook the patient back up to appropriate monitors and take a BP.
15. Portable tele monitors and portable suction are available in the ICU for use
16. Trauma frequently performs bedside procedures that may otherwise be done in the OR. These include abdominal wash-outs, ex-laps, trachs, PEGs, fasciotomies and IVC filters. These procedures may close down part of the unit for short time periods so be aware of this when mobilizing surrounding patients.

Spine Clearance

1. Once the traumagram is finalized spine injuries will be considered first. Patients will remain flat in bed in reverse trendelenburg position until their spine has been cleared.
2. If the spine is cleared on the traumagram then OOB activity orders will come from the trauma service
3. Transverse process and spinous process fractures do not typically require a spine team consult unless multiple levels are affected.
4. All other spine injuries will require a spine consult for either ortho spine or neurosurgery (depending on which team is on call the day of the patients admission).
5. If a spine consult is placed, the plan must be finalized and completed with OOB activity clearance prior to initiation of therapy services.
6. OOB activity orders/need for brace will be found in STARPANEL under inpatient orders, but it is encouraged to double check this with the operative note/latest progress note written in the chart.
7. Surgical fixation required:
 - a. Surgery must be completed with upright films done with or without appropriate brace as ordered by the consulting spine service
 - b. Upright films must be done, read and cleared with OOB orders placed by spine service prior to intervention (or verbal order from NP after they have spoken to spine)
8. Non-operative management:
 - a. A brace may or may not be indicated for non-op patients, and this should be specifically listed in the activity order and progress note
 - b. If a brace is or is not recommended, the patient will still need to have upright films done prior to OOB activity
 - c. Uprights must be done, read and cleared with OOB orders placed by the consulting spine service prior to intervention by therapy (or as above a verbal order from NP is ok if they have spoken to the spine team)
9. Common braces include: TLSO, TLSO with hip spica, CTLSO, CTO, LSO, Jewitt brace, Minerva brace, Aspen TLSO, and quickdraw. Most all braces must be donned/doffed in supine via log roll unless specified (ie quickdraw for comfort may be donned EOB).

Orthopedic Injuries

1. All orthopedic injuries are handled by ortho trauma, ortho hand and/or plastics.
2. WB activity orders will be entered by appropriate consult service
3. Activity orders should be placed in StarPanel under in-patient orders
4. Operative notes, and/or progress notes should also specify WB status
5. If conflicting WB status is found, page NP or consulting service for clarification
6. *PELVIC*, *HIP* and *FEMUR* fractures need an operative plan and definitive fixation if determined to require surgical intervention prior to therapy intervention with documented WB status by ortho.
7. Fractures in traction contradict therapy intervention
8. Pelvic fractures may initially be non-op with orders for 'post-mobilization films' in which patients will have films taken after they have worked with therapy. Pending films patients may or may not require surgical intervention.
9. *FOOT*, *ANKLE*, *TIB/FIB*, *TIBIAL PLATEAU*, *PATELLA* and any *UE* fractures are ok to mobilize even if the patient will eventually require surgical intervention. All of these

fractures can be assumed to be NWB even if the orders are not specified in STARPANEL.

10. Frequently an ex-fix will be temporarily placed on a patient prior to permanent fixation
11. *CLAVICLE* and *SCAPULA* fractures are frequently documented as non-op but WB orders/ROM orders are missing; it is best to page the team or contact trauma NP for clarification.
12. When in doubt, call the operator who will be able to provide the pager numbers of either the ortho trauma or ortho hand NP/resident on call.

Penetrating Injuries

1. Patients with penetrating injuries such as GSW, stab wound, impalement, etc will only have traumasgrams/localized films (specifically spine films) performed in the area that would suggest possible damage.
2. Vascular injuries are managed by either trauma or the vascular team
3. Fractures are managed by either ortho trauma, ortho hand or plastics
4. Spine injuries will be managed by neurosurgery or ortho spine who will provide OOB clearance/orders; if there is no spine injury the trauma team will provide OOB clearance/orders

Abdominal Injuries

1. Patients with abdominal injuries will frequently have an open abdomen which will be managed by the trauma service.
2. Patients with an open abdomen are NOT appropriate for EOB/OOB activity.
3. If the abdomen is closed to fascia or there is a wound vac in place, the patient can mobilize if the trauma team has given clearance.
4. Frequently an abdominal binder will be used when mobilizing these patients
5. In bed ROM evals may be initiated with these individuals as well even with an open abdomen including P/AROM exercise, again with clearance from trauma.

Intubated Patients

1. Typically therapy intervention is held for orally intubated patients until they are extubated or trached.
2. If the patient is intubated but has had an ortho injury repaired and/or the spine is clear/stable, or a CHI with abnormal tone noted, a supine in-bed ROM eval may be completed if the patient is hemodynamically stable.
3. Typically either OT or PT will follow until the patient is able to mobilize; ROM eval and treat does not necessarily warrant both services

Traumatic Brain Injuries (TBI)/Closed Head Injuries (CHI)

1. Patients with TBI/CHI will have a neurosurgery consult upon admission OOB activity/clearance will still come from the trauma service.
2. If an EVD is present, therapy can be initiated once patient has successfully undergone clamping trials. The EVD MUST be clamped prior to EOB/OOB activity.
3. Severe TBI/CHI may go to the OR for a craniectomy. If this is the case, the patient will have bone flap precautions but can mobilize as appropriate with clearance from the trauma service.
4. After swelling has gone down, a custom helmet may be worn to protect the bone flap

5. Serial casts may be appropriate for patients with increased tone due to TBI/CHI, and PT/OT will work together to fabricate these.

Additional Consult Requests

1. Plastics/Burns
 - a. If a patient goes to the OR with plastics or burns, activity orders from these services may provide specific orders that will take precedence over other orders placed by ortho, etc.
 - b. Page the consult service of plastics or burns if there is a question regarding ROM, or mobility in these patients.
2. Psych
 - a. Patients admitted with self-inflicted injuries or suicide attempts will have a psych consult and will most likely have a discharge plan to an inpatient psychiatric facility once medically stable for discharge.
 - b. PT/OT discharge recommendations may determine if a patient can go directly to inpatient psych or if they will need a stay in inpatient rehab prior to.
 - c. PT/OT evals are frequently required for an inpatient psych facility to accept the patient

Specialty Equipment

1. Rotating Bed
 - a. Specialty bed for patients with unstable spinal fractures that are not hemodynamically stable enough to go to the OR and cannot be turned in supine for pressure relief
 - b. The patient is placed in supine and then secured appropriately and then the bed will rotate the patient slowly R and L
2. Roto-Prone Bed
 - a. Specialty bed for patients with severe lung injuries
 - b. The patient is placed in supine and strapped in appropriately with the bed then rotating the patient to the prone position and keeping them there while slowly rotating R and L
3. VDR (Volumetric Diffuse Respirator)
 - a. Specialty ventilator for patients with severe lung injury

**In patients who are on either of the above specialty beds or on the VDR therapy intervention will be held.

Ortho Trauma [10s]

Common Abbreviations

2/2	Secondary to
ACDF	Anterior Cervical Discectomy and Fusion
AKA	Above the Knee Amputation
BKA	Below the Knee Amputation
BSC	Bed Side Commode
DVT	Deep Vein Thrombosis
EOB	Edge of Bed
ExFix	External Fixation
f/u	Follow Up
Fx	Fracture
HOB	Head of Bed
MVC	Motor Vehicle Collision
MVA	Motor Vehicle Accident
NAE	No Acute Events
NWB	Non Weight Bearing
OA	Osteoarthritis
ORIF	Open Reduction Internal Fixation
PMH	Past Medical History
PSF	Posterior Spinal Fusion
PWB	Partial Weight Bearing
RA	Rheumatoid Arthritis
RW	Rolling Walker
s/p	Status Post
TDWB	Touch Down Weight Bearing
THA	Total Hip Arthroplasty
TKA	Total Knee Arthroplasty
TLIF	Transforaminal Lumbar Interbody Fusion
W/C	Wheelchair

Types of Braces

1. CTO (cervical thoracic orthosis)
2. Jewett brace
3. C-collar (cervical collar- hard or soft, and Miami J or Aspen)
4. TLSO (thoracolumbar sacral orthosis)
5. Quickdraw brace
6. HKB (hinged knee brace)
7. Knee immobilizer/static knee brace
8. Wrist cockup
9. Thumb spica
10. Postop resting hand splint (postop dressing)

For further protocols and policies please see Medical Center North/Orthopedic Procedures

General Guidelines

1. Patients on the surgical ICU include primarily the following: general surgery, liver transplant, head and neck cancer surgery, trauma overflow, orthopedic surgery patients requiring ICU care.
2. Rooms 27- 61 are SICU rooms, and SICU MD's and NP's round on these patients. PT/OT orders can be obtained from these MD's/NP's. (MD/NP work room is to the left of patient room 9625, and they can often be found there and are willing to answer questions.)
3. Rooms 1-25 are surgical stepdown rooms. The patient's primary team is responsible for these patients, and questions and orders go through them. If the SICU has open beds, patients from other areas may be transferred there. They are considered "boarders" and are followed by their primary team (There is a green capital "B" on their doors.).
4. Talk to the patient's nurse before and after evaluating or treating them. They know the most about the patient's condition and precautions. Ask them if the patient has recently received any medications (e.g. BP meds, pain meds) that might affect their safety with mobility/standing activities in order to more safely monitor the PT/OT session.
5. Determine if the patient has the bed alarm or a chair alarm activated prior to mobilizing the patient. Reactivate these alarms at the end of the PT/OT session. Keep the room curtain open at the end of the PT/OT session if the patient has been determined to be a falls risk.
6. These patients need to stay on their monitor or a portable monitor during treatment unless they have transfer orders to a non-monitored floor or their nurse says they are stable enough to come off the monitor for PT. Use your clinical judgment regarding using or not using portable telemetry with stepdown patients especially for patients with a cardiac history. Documenting vitals is helpful in monitoring a patient's response to treatment and for rehab facilities to note when screening patients for admission. The portable monitors are located on the back (ICU) hall on the counter and next to the large red travel monitors, to the right if you are facing the charge nurse. It is recommended that you change out the battery pack for a fully charged one before using. Please clean and return monitors here after use. Place patients back on their monitor in their room and run their blood pressure before leaving.
7. Before treatment, be aware of all lines and drains on the patient and around the bed. Examine a post-op abdomen before mobilizing to check for drains, indwelling pain catheters, chest tubes, dressings, wound vacs. Pin or secure drains so they do not hang and ideally toward the front so the patient will not sit or lie on them.
8. Dressings, safety pins, finger monitors, extension tubing and other supplies can be found in the carts in the rooms. The access code to the carts is 1234 "Enter."
9. There is a dedicated wheelchair for PT/OT use in the equipment room for use when ambulating patients in the interest of fall prevention. The combination on the lock is F-A-L-L.
10. The service center on 9T has inflatable seat cushions for patients who are prone to pressure areas when sitting. Do not place a pillow under these seat cushions when the patient is sitting in a bedside chair. You can place folded blankets under the blue cushions to raise the height of the chair seat. The service center also has abdominal binders which can be trimmed to the appropriate size. Items taken from the service center need to be scanned before being taken for inventory purposes. You can access the scanner by scanning the bar code taped to the inventory monitors, identifying the patient

for whom you are getting supplies, then scanning the item's bar code on the cart with the scanning gun.

11. Respiratory supplies are also found in the 9T service center to the right of the door as you enter. Extension oxygen tubing, adaptors, venti tubing, nasal cannulas can be found there. They do not need to be scanned for inventory since Respiratory Therapy stocks their supplies.
12. Oxygen tanks are located both in the clean utility room and in the 9T service center. Place used tanks in the dirty utility room. Wheels for the tanks are in the clean and dirty utility room.
13. 9T has Smooth Moves patient handling equipment in the equipment room. Some total lift slings are in the 9T service center in the cabinet under the counter. Sara slings can be ordered through the hospital service center. Slippery sheets are with the linen in the clean utility room.
14. Warm blankets are located in the clean utility room.
15. Neuro chairs are stored in the middle hallway where x-ray equipment is located (door is marked "radiology").
16. Walkers are stored in the equipment room. You may find walkers in the dirty utility room as well. Clean walkers after using and return them to the equipment room.
17. Thoracic walkers can be found in the middle hallway across from the clean/dirty utility rooms.

Liver Transplants

1. Donor is matched to a potential recipient on the basis of several factors: ABO blood type, body size, degree of medical urgency and MELD score (Model for End-Stage Liver Disease)
2. Model for End-Stage Liver Disease (MELD): a reliable measure of mortality risk in patients with end stage liver disease. MELD is a numerical scale used for adult liver transplant candidates and the range is from 6 (less ill) to 40 (gravely ill). The individual score determines how urgently a patient needs a liver transplant within the next three months. The number is calculated using the most recent laboratory tests.
3. Cannot go to SNF due to cost of anti-rejection medications
4. Have to stay local for 30 days and have 24 hour/day caregiver x30 days to be listed for transplant
5. Typically have 2 right sided JP drains after surgery with large crescent moon scar on stomach
6. 3 Month Mortality based on MELD score
 - a. 40 or more -- 71.3% mortality
 - b. 30-39 -- 52.6% mortality
 - c. 20-29 -- 19.6% mortality
 - d. 10-19 -- 6.0% mortality
 - e. <9 -- 1.9% mortality

Partial Hepatectomy

1. Surgical procedure to remove tumors in the liver. Removing the cancerous portion of the liver may help to prevent the disease from spreading more.

Dialysis

1. If patient has a femoral vas cath for dialysis, PT/OT need clarification on clearance to mobilize.
2. Hemodialysis (HD)
 - a. Process for removing waste and excess water from the blood, and is primarily used to provide an artificial replacement for lost kidney function in people with renal failure.
 - b. May be used for those with an acute disturbance in kidney function (acute kidney injury, previously acute renal failure) or for those with progressive but chronically worsening kidney function—a state known as chronic kidney disease stage 5 (previously chronic renal failure or end-stage kidney disease).
 - c. PT/OT unable to work with patient on HD at VUMC.
3. Continuous veno-venous hemodialysis (CVVHD) or Continuous Renal Replacement Therapy (CRRT)
 - a. Indications: ARF, ARDS, after surgery with cardiopulmonary bypass, refractory congestive heart failure.
 - b. Provides slow and balanced fluid removal and/or hemodialysis
 - c. Usually patient will be on some type of vasopressor.
 - d. Ask RN if patient's BP has remained stable over the last 12-24 hours. If so, PT/OT may be warranted. One person watches this line exclusively during mobility.
4. Peritoneal Dialysis
 - a. Performed through port in peritoneal cavity.
 - b. Provides more independence.
 - c. Typically unable to see patient while they are “filling” and “emptying”
 - d. Patients are at risk for peritonitis.

Head and Neck Surgeries

1. Precautions:
 - a. Fistula or infection—Hold AROM until approved by MD. Usually these patients have to wait until they are discharged to begin AROM exercises.
 - b. Chyle leak—Hold AROM exercises until cleared by MD. Chyle is a milky lymph liquid that may leak into the operative area and can be seen in the JP drains. It is normally managed by diet or further surgery.
2. Glossectomy: surgery to remove all or part of the tongue. This surgery is used to treat tongue cancer.
 - a. Partial – removal of part of the tongue
 - b. Hemi – one side of the tongue is removed
 - c. Total – total removal of the tongue
3. Laryngoscopy: an examination of the back of the throat, including the voice box (larynx). Direct laryngoscopy uses a tube called laryngoscope, which is placed in the back of your throat. The tube may be flexible or stiff. This procedure allows the doctor to see deeper in the throat and to remove a foreign object or sample of tissue for biopsy.
4. Tracheostomy: surgical procedure to create an opening through the neck into the trachea (windpipe). A tube is usually placed through this opening to provide an airway and to remove secretions from the lungs. This tube is called a tracheostomy tube or trach tube.

5. Mandibulectomy: procedure that is used to eradicate disease that involves the lower jaw or mandible. This procedure can be used in various settings, including infectious etiologies (e.g. osteomyelitis), osteoradionecrosis, or a benign (e.g. ameloblastoma) or malignant neoplastic process (e.g. invasive squamous cell carcinoma) that involves the jaw. The area removed is then replaced with either: a muscle and skin 'flap', or a combination of metal pate, skin, muscle, and/or bone 'flap'
6. Selective neck dissection: This is the least invasive of the head and neck surgeries. Semi-reclining is often the most comfortable position for performing their exercises.
7. Bilateral selective neck dissection: Same as for selective neck dissection yet on bilateral neck.
8. Modified and radical neck dissection: These surgeries are more invasive. You can emphasize supporting the involved upper extremity(s) by placing thumb in a belt loop, crossing arms, placing hands in pockets, etc.

Radial forearm free flap (RFFF)

1. These patients are to be PFWB for two weeks.
2. Ambulate with a platform walker initially, as needed, progressing to a standard or rolling walker at two weeks post-op if walker is still needed.
3. The goal is to avoid wrist extension for the first two weeks to protect the skin graft on the donor arm.
4. You may see a wound vac on the donor arm.
5. Begin gentle wrist AROM exercises POD 14 (splint should be off sooner). Tell the patient to avoid extreme wrist extension and remind them to avoid lifting heavy objects.
6. If the plastics team has done the RFFF, protocol for starting wrist ROM is as follows: When the dressing comes down on POD 5, if the skin graft has taken, the patient may begin ROM of the hand and wrist. The plastics team normally enters this information in Wiz or in their daily note.
7. If these flaps include a bony component (osteocutaneous radial forearm free flap/OCRFFF) they are harvested by a hand surgeon and undergo ORIF of the radius. In these cases, these patients are PFWB on the donor UE and have wrist movement precautions until they see the hand surgeon for splint removal.
8. The hand service drives the onset of movement and will assess the patient's need for hand therapy.

Fibular free flap (FFF)

1. Begin gentle heel cord stretching POD 6.
2. The patient is to be NWB initially in order to protect the skin graft on the donor leg, and it is important that they be out of bed and mobilizing early.
3. You may see a wound vac on the donor leg.
4. Drs. Sinard, Mannion, and Rhode often allow their patients to be WBAT around POD 5.
5. If this is not clear in the orders, ask the OTO team.
6. If the plastics team has done the FFF, they will indicate when they want WB to start, and you may see an indwelling Doppler monitor.
7. Assess for the most appropriate assistive device as needed.

Scapular free flap (SFF)

1. Begin AAROM exercises to donor arm POD 7 (unless otherwise ordered) in semi-reclining or supine to comfort.
2. Emphasize to the patient that they should avoid resistive use of the donor arm for the first six weeks due to donor muscle being detached and reattached to the scapula.
3. Instruct the patient in pendulum exercises to be performed when they are comfortable bending at the waist to perform them.
4. The patient can be provided a sling for comfort until they can tolerate ambulating without the sling.
5. Remind the patient to elevate the donor arm on pillows when resting.

Pec flap

1. Begin gentle AAROM to donor side shoulder POD 3.
2. The extent of the incision into the axilla will often determine tolerance for ROM.
3. Emphasize the importance of ROM to the donor side shoulder and instruct in self-assisted ROM.

Cervicofacial advancement flap

1. Sometimes seen in conjunction with other head and neck surgical reconstruction.
2. Ask the team about head/neck movement restrictions.
3. Often these flaps have tight closures and need a week or more for primary healing.
4. Patients can be instructed to start performing their head and neck exercises on a designated date

Lateral thigh free flap

1. No restrictions, only if neck JP drains are present.

Iliac crest free flap

1. Bed to chair only usually until POD 3 then WBAT for ambulation with/without assistive device depending on comfort.

Lateral arm free flap

1. Triceps are divided and will be most affected.
2. Begin gentle UE AROM exercises POD 5.

Rectus free flap

1. No restrictions, only if neck JP drains are present.

Carotid replacement

1. Does not affect the course of PT.
2. AROM exercises may be initiated according to guidelines related to drain removal.

Necrotizing Fasciitis

1. An infection caused by bacteria.
2. It can destroy skin, fat, and the tissue covering the muscles within a very short time.
3. The disease sometimes is called flesh-eating bacteria.
4. When it occurs on the genitals, it is called Fournier's gangrene.

Gastrointestinal Perforation (Perforated Bowel)

1. A hole that develops through the whole wall of the esophagus, stomach, small intestine, large bowel, rectum, or gallbladder. This condition is a medical emergency.
2. Gastrointestinal perforation can be caused by a variety of illnesses. These include: Appendicitis, Cancer, Crohn's disease, Diverticulitis, Gallbladder disease, Peptic ulcer disease, Ulcerative colitis

Gastrointestinal Bleed (GI bleed)

1. Loss of blood in the gastrointestinal tract, from the pharynx to the rectum.
2. Upper GI bleed - An upper source is characterized by hematemesis (vomiting up blood) and melena (tarry stool containing altered blood).
3. Lower GI bleed - indicated by bright red blood per rectum (BRBPR).
4. Causes: Anal fissure, Hemorrhoids, Cancer, Intestinal polyps (a pre-cancerous condition), abnormal blood vessels in the lining of the intestines (also called angiodysplasias), Diverticulosis, Crohn's disease or ulcerative colitis, Esophageal varices, Esophagitis, Gastric (stomach) ulcer, Mallory-Weiss tear, Radiation injury to the bowel
5. Testing: EGD, Colonoscopy, Labs
6. Tips:
 - a. Check labs
 - b. PT/OT not indicated if patient is actively bleeding.
 - c. If getting blood products, check with nursing if okay to mobilize.

Small Bowel Resection (SBR)

1. Surgery to remove part or all of the small bowel. It is done when part of the small bowel is blocked or diseased.
2. Most digestion (breaking down and absorbing nutrients) of the food you eat takes place in the small intestine.

Whipple (PANCREATICOUDODENECTOMY)

1. The most commonly performed surgery to remove tumors in the pancreas.
2. In a standard Whipple procedure, the surgeon removes the head of the pancreas, the gallbladder, part of the duodenum which is the uppermost portion of the small intestine, a small portion of the stomach called the pylorus, and the lymph nodes near the head of the pancreas. The surgeon then reconnects the remaining pancreas and digestive organs so that pancreatic digestive enzymes, bile, and stomach contents will flow into the small intestine during digestion. In another type of Whipple procedure known as pylorus preserving Whipple, the bottom portion of the stomach, or pylorus, is not removed.
3. In both cases, the surgery usually lasts between 5-8 hours.

Gastrojejunostomy

1. Surgical anastomosis between the stomach and the small intestine.

Colostomy

1. Surgical resection of the healthy end of the large intestine or colon through an incision in the anterior abdominal wall brought through to the surface of the skin (stoma).
2. In a colostomy takedown, the two ends of the colon are reconnected and the area where the stoma was created and the abdomen are closed.

Ileostomy

1. Surgical resection of the small intestine (the ileum) out onto the surface of the skin to form a "stoma".
2. With a temporary ileostomy, all or part of the colon is removed, but at least part of the rectum is left intact.

Pancreaticojejunostomy

1. Surgical connection of the pancreatic duct with the small intestine.

Roux-En-Y (ROUX-EN-Y HEPATICOJEJUNOSTOMY OR CHOLEDOCHOJEJUNOSTOMY)

1. Surgical reconstruction to reestablish bile flow involving the small intestine to provide drainage without reflux, used as a treatment for sclerosing cholangitis, injured bile ducts, and bile duct tumors.

Exploratory Laparotomy (EX-LAP)

1. Operation where a cut is made into the abdomen. It is a method used to explore the abdomen, a diagnostic tool that allows physicians to examine the abdominal organs.

Cholecystectomy

1. Surgical procedure to remove the gallbladder

Esophageal Perforation

1. A hole in the esophagus. The esophagus is the tube food passes through as it goes from the mouth to the stomach.
2. CAUSES: The contents of the esophagus can pass into the mediastinum, the surrounding area in the chest, when there is a hole in the esophagus.
3. Often results in infection of the mediastinum (mediastinitis). The most common cause of an esophageal perforation is injury during a medical procedure. However, the use of flexible instruments has made this problem rare. The esophagus may also become perforated as the result of: A tumor, Gastric reflux with ulceration, Previous surgery on the esophagus, Swallowing a foreign object or caustic chemicals such as household cleaners, disk batteries, and battery acid, Trauma or injury to the chest and esophagus

Enterocutaneous Fistula (ECF)

1. An abnormal connection that develops between the intestinal tract or stomach and the skin. As a result, contents of the stomach or intestines leak through to the skin.
2. Often occur after bowel surgery. Other causes include: infection, perforated peptic ulcer, inflammatory bowel disease, Crohn's disease or ulcerative colitis. An ECF may also develop from an abdominal injury or trauma, such as a stabbing or gunshot.

Hernia Repair

1. A hernia occurs when inner layers of abdominal muscle become weakened. The lining of the abdomen then bulges out into a small sac, and part of the intestine or abdominal tissue may enter the sac. Hernias occur most commonly in the groin (inguinal hernia), the navel (umbilical hernia), and at the incision site of a previous surgery.

Thoracentesis

1. Procedure to remove fluid from the space between the lining of the outside of the lungs (pleura) and the wall of the chest.
2. Used to find the cause of a pleural effusion. The procedure also might be done to help you breathe easier.

Video-Assisted Thoracoscopic Surgery (VATS)

1. A minimally invasive surgical technique used to diagnose and treat problems in the chest.
2. During a video-assisted thoracoscopic surgery procedure, a tiny camera (thoracoscope) and surgical instruments are inserted into your chest through several small incisions. The thoracoscope transmits images of the inside of your chest onto a video monitor, guiding the surgeon in performing the procedure.
3. Surgeons use the video-assisted thoracoscopic surgery technique to perform a variety of operations.

Bronchoscopy

1. Procedure that allows doctors to look at your airway through a thin viewing instrument called a bronchoscope. During a bronchoscopy camera.gif, your doctor will examine your throat, larynx, trachea, and lower airways.
2. Bronchoscopy may be done to diagnose problems with the airway, the lungs, or with the lymph nodes in the chest, or to treat problems such as an object or growth in the airway.

Lung Surgery

1. Biopsy of an unknown growth
2. Lobectomy: to remove one or more lobes of a lung
3. Lung transplant
4. Pneumonectomy: to remove a lung
5. Pleurodesis: surgery to prevent the buildup or return of fluid to the chest
6. Surgery to remove an infection or blood in the chest cavity (empyema)
7. Surgery to remove small balloon-like tissues (blebs) that cause pneumothorax
8. Wedge Resection: to remove part of a lobe in a lung

Thoracotomy

1. A surgical cut that a surgeon makes to open the chest wall.

Nephrectomy

1. Kidney removal, or nephrectomy, is surgery to remove all or part of a kidney.
 - a. Partial Nephrectomy: part of one kidney removed
 - b. Simple Nephrectomy: all of one kidney removed
 - c. Radical nephrectomy: removal of one entire kidney, surrounding lymph nodes, and the adrenal gland

Esophagectomy

1. Surgery to remove part or all of the esophagus. After it is removed, the esophagus is rebuilt from part of your stomach or part of your large intestine.
2. Often have epidural, chest tube, Dobhoff tube, NG tube, foley, etc
3. Good to have two sets of hands for initial evaluation.

Hyperthermic Intraperitoneal Chemotherapy (HIPEC)

1. Cancer that has spread to the lining surfaces of the peritoneal (abdominal) cavity from primary colorectal cancer, ovarian cancer, gastric cancer, appendiceal cancer or from mesothelioma and pseudomyxoma peritonei--known as peritoneal carcinomatosis, are often difficult to treat.
2. The term "Intraperitoneal" means that the treatment is delivered to the abdominal cavity. The term "Hyperthermic Chemotherapy" means that the solution containing chemotherapy is heated to a temperature greater than normal body temperature.
3. Before HIPEC is administered, cytoreductive surgery is performed. This surgery is the removal of all visible tumors throughout the peritoneal cavity.
4. During the HIPEC procedure, the surgeon will continuously circulate a heated sterile solution--containing a chemotherapeutic agent--throughout the peritoneal cavity to kill any remaining cancer cells.
 - a. HIPEC has several benefits as compared to standard chemotherapy:
 - b. HIPEC is a single treatment done in the operating room, while standard chemotherapy requires multiple treatments
 - c. 90% of the chemotherapy drug stays within the abdominal cavity, making it less toxic for the patient
 - d. It allows for a more intense dose of chemotherapy

Sepsis

1. Potentially deadly medical condition that is characterized by a whole-body inflammatory state and the presence of a known or suspected infection.
2. The body may develop this inflammatory response by the immune system to microbes in the blood, urine, lungs, skin, or other tissues.
3. Common infections are peritonitis, urinary tract infection or pyelonephritis, meningitis, bacterial pneumonia or cellulitis.
4. In hospitalized patients, common sites of infection include intravenous lines, surgical wounds, surgical drains, and decubitus ulcers.
5. Septicemia or bacteremia refers to the presence of pathogenic organisms in the bloodstream, leading to sepsis.
6. Septic shock is defined as sepsis with refractory arterial hypotension or hypoperfusion abnormalities in spite of adequate fluid resuscitation.
7. When severe, may also include end organ dysfunction. Examples are acute lung injury (ALI), acute respiratory distress syndrome (ARDS), encephalopathy, liver dysfunction, acute kidney injury (AKI) or acute renal failure (ARF), and systolic and diastolic heart failure.
8. Symptoms of sepsis can include:
 - a. Confusion or delirium
 - b. Hypotension
 - c. Tachycardia
 - d. Hypothermia
 - e. Hyperventilation
 - f. Fever

Atrial Fibrillation (AF or A-FIB)

1. Most common cardiac arrhythmia (abnormal heart rhythm)

2. The upper chambers of the heart (atria) experience chaotic electrical signals. The AV node-the electrical connection between the atria and the ventricles is overloaded with impulses trying to get through to the ventricles. The ventricles also beat rapidly but not as rapidly as the atria.
3. Its name comes from the fibrillating (IE quivering) of the heart muscles of the atria, instead of a coordinated contraction.
4. Can be associated with a rapid ventricular response (RVR) which is any ventricular rate greater than 100 beats per min (bpm).
5. Some individuals are asymptomatic despite having frequent episodes, while others experience symptoms that are troubling or incapacitating.
6. May result in palpitations, fainting, chest pain or congestive heart failure.
7. Some individuals with A-fib have a significantly increased risk of stroke.
8. Stroke risk increases during A-fib because blood may pool and form clots in the poorly contracting atria and especially in the left atrial appendage (LAA).
9. A-fib may be treated with medications which either slow the heart rate or revert the heart rhythm back to normal.
10. Cardioversion is a noninvasive conversion of an irregular heartbeat to a normal heartbeat using electrical or chemical means:
11. Electrical cardioversion involves the restoration of normal heart rhythm through the application of DC electrical shock.
12. Chemical cardioversion is performed with drugs, such as amiodarone, dronedarone, procainamide, dofetilide, propafenone or flecainide.
13. Surgical and catheter-based therapies (ablation) may also be used to prevent recurrence of A-fib in certain individuals.
14. People with A-fib are often given anticoagulants such as warfarin (Coumadin) to reduce risk of stroke.
15. If a patient has atrial fibrillation with RVR, PT/OT is contraindicated.
16. Check with nursing to make sure patient is rate controlled
17. When a patient is on Coumadin, INR must be in an appropriate range.
18. Monitor patients, as some patients are asymptomatic
19. If patient becomes symptomatic, take a rest break and can attempt further activity as patient tolerates.

Lung Disease

1. Restrictive:
 - a. Respiratory diseases that restrict lung expansion resulting in a decreased lung volume, an increased work of breathing, and inadequate ventilation and/or oxygenation
 - b. Causes:
 - i. Asbestosis
 - ii. Radiation fibrosis
 - iii. Acute respiratory distress syndrome (ARDS), a severe lung condition occurring in response to a critical illness or injury
 - iv. Idiopathic pulmonary fibrosis (IPF)
 - v. Sarcoidosis
2. Obstructive:
 - a. Respiratory disease characterized by airway obstruction

- b. Generally characterized by inflamed and easily collapsible airways, obstruction to air flow, and frequent office visits and hospitalizations
- c. Types include:
 - i. Asthma
 - ii. Bronchiectasis
 - iii. Bronchitis
 - iv. Chronic obstructive pulmonary disease (COPD)
- d. Tips:
 - i. Patients with COPD are CO₂ retainers, therefore, their O₂ sats are usually mid to high 80's with activity. Be careful increasing supplemental O₂ as increased O₂ results in increased CO₂ resulting in decreased respiratory drive.
 - ii. Monitor O₂ sats at rest and with activity.
 - iii. Educate COPD patients on pursed lip breathing.
 - iv. Educate patients with lung disease on energy conservation (e.g. sitting to perform tasks, increasing rest breaks, etc.)

Common Drains/Lines

1. Jackson Pratt Drain (JP)
 - a. Used to remove fluids that build up in an area of the body after surgery.
 - b. Removes fluids by creating suction in the tube.
2. Hemovac Drain
 - a. Placed into a vascular cavity where blood drainage is expected after surgery, such as with abdominal and orthopedic surgery.
 - b. Suction is maintained by compressing a spring-like device in the collection unit. As the drainage accumulates in the collection unit, it expands and suction is lost.
3. Accordion Drain
 - a. Small, compact and allows for patient complete ambulation
 - b. One hand operation to activate suction
 - c. Delivers initial vacuum of approximately 4.5 psi (230 mm Hg)
 - d. Reverts to gravity drainage after bellows re-expansion preventing back-up
 - e. Closed system for infection control
4. Chest Tube (CT)
 - a. Drains blood, fluid, or air from around the lungs allowing the lungs to fully expand. A flexible plastic tube is inserted through the side of the chest into the pleural space and is connected to a canister which can be to suction or to water seal.
 - b. Indications:
 - i. Pneumothorax: accumulation of air in the pleural space
 - ii. Pleural effusion: accumulation of fluid in the pleural space
 - iii. Chylothorax: a collection of lymphatic fluid in the pleural space
 - iv. Empyema: a pyogenic infection of the pleural space
 - v. Hemothorax: accumulation of blood in the pleural space
 - vi. Hydrothorax: accumulation of serous fluid in the pleural space
 - c. Tips:
 - i. Check with nursing to see if patient can come off of wall suction
 - ii. Usually patients are able to come off suction for short time during activity
 - iii. Some patient must have chest tubes remain on suction secondary to air

leakage or subcutaneous air; in these cases there is portable suction available for ambulation.

- iv. Should a chest tube be accidentally pulled, petroleum gauze is best to cover chest tube site to allow air to escape but not enter. If you do not have access to petroleum gauze, use a towel or cloth. Contact nursing and return patient to bed.
 - v. If canister tipped, clamp tubing and notify nursing
5. Wound Vac
 - a. Conducts negative pressure wound therapy (NPWT). The device consists of a dressing which is fitted with a tube and attached to the wound VAC.
 - b. Negative pressure wound therapy is most commonly used with chronic wounds which are not responding to other forms of treatment and sometimes with surgical wounds which have reopened.
 6. Tunneled Epidural Catheter (TEC)
 - a. Very thin, flexible tube that is implanted into the spine (specifically, the epidural space) and tunneled under your skin. Through it, the patient can receive ongoing
 - b. Doses of medication that stops nerves in the spinal cord from sensing pain.
 7. Patient Controlled Analgesia (PCA)
 - a. Method of pain control that gives patients the power to control their pain. In PCA, a computerized pump called the patient-controlled analgesia pump, which contains a syringe of pain medication as prescribed by a doctor, is connected directly to a patient's intravenous (IV) line
 8. Total Parenteral Nutrition (TPN)
 - a. Method of feeding that bypasses the gastrointestinal tract. Fluids are given into a vein, which provides most of the nutrients the body needs. This method is used when a patient cannot or should not receive feedings or fluids by mouth.
 9. Bowel Management System (BMS)
 - a. Temporary containment device, indicated for bedridden or immobilized, incontinent patients with liquid or semi-liquid stool.
 - b. It is designed to safely and effectively contain and divert fecal matter, protect patients' wounds from fecal contamination, and reduce both the risk of skin breakdown and spread of infection.
 10. Percutaneous Endoscopic Gastrostomy (PEG)
 - a. Flexible feeding tube is placed through the abdominal wall and into the stomach. PEG allows nutrition, fluids and/or medications to be put directly into the stomach, bypassing the
 11. Dobhoff Tube (DHT)
 - a. Small-bore, flexible, nasogastric (NG) feeding tube that is used to administer nourishment and medicine to people who cannot ingest anything by mouth.
 - b. The tube is inserted into the stomach by way of the nasal passage.
 - c. Unlike a tube used for gastrointestinal drainage, there is no suction attached to a Dobhoff tube.
 12. Nasogastric Tube (NGT)
 - a. A flexible tube that is passed through the nose and down through the nasopharynx and esophagus into the stomach.
 - b. It can be used to remove the contents of the stomach, including air, to decompress the stomach, or to remove small solid objects such as poison, from the stomach.
 - c. If you can ambulate the patient and interrupt suction, clamp the tube to prevent

stomach contents from draining out of the tube.

d. Reconnect after treatment.

13. Central Line

a. Usually located in the superior vena cava or inferior vena cava, or within the right atrium of the heart.

b. This has several advantages over a peripheral IV:

i. It can deliver fluids and medications that would be overly irritating to peripheral veins because of their concentration or chemical composition. These include some chemotherapy drugs and total parenteral nutrition (TPN).

ii. Medications reach the heart immediately and are quickly distributed to the rest of the body.

iii. There is room for multiple parallel compartments (lumen) within the catheter, so that multiple medications can be delivered at once even if they would not be chemically compatible within a single tube.

iv. Central venous pressure (CVP) can be measured through the line.

v. CVP: venous BP (pressure of blood returning to the heart)

c. Tip:

i. Make sure there is enough slack on the lines during mobility.

ii. There are no contraindications to shoulder ROM on the side of the central line.

14. Peripherally Inserted Central Catheter (PICC)

a. PICC lines are used when intravenous access is required over a prolonged period of time, or when medications to be infused would cause quick damage and early failure of a peripheral IV, and when a conventional central line may be too dangerous to attempt.

b. Typical uses include long chemotherapy regimens, extended antibiotic therapy, or total parenteral nutrition (TPN).

c. Line is placed under ultrasound guidance, usually in the arm, and then carefully advanced upward until the catheter is in the superior vena cava or the right atrium. An X-ray must be used to verify that the tip is in the right place when fluoroscopy was not used during the insertion.

d. A PICC can be single, double, or triple-lumen.

e. The chief advantage of a PICC over other types of central lines is that it is safer to insert with a relatively low risk of uncontrollable bleeding and essentially no risks of damage to the lungs or major blood vessels.

f. A PICC can be left in place for months to years if needed for patients who require extended treatment.

15. Arterial Line (ART LINE)

a. Monitors BP real-time (rather than by intermittent measurement)

b. A thin catheter is inserted into an artery, usually the wrist (radial artery), armpit (axillary artery), groin (femoral artery), or foot (pedal artery).

c. Intra-arterial blood pressure measurement is more accurate than measurement of BP by noninvasive means, especially in the critically ill.

d. Permits the rapid recognition of BP changes that is vital for patients on continuous infusions of vasoactive drugs

e. Tip: Avoid repetitive ROM to joint that arterial line is near.

Respiratory in the SICU

1. Nasal cannula
 - a. When a patient requires greater than 6L supplemental O₂, they may be put on a high flow nasal cannula which is easily identified by its darker green tubing. Up to 15L O₂ can be given this way.
 - b. Another type of nasal cannula used on the SICU is Optiflow which is attached to ventilator-type tubing which leads to a humidification and warming chamber.
2. Trach Collar
 - a. Used when a patient has been trached normally due failure to wean from the ventilator or oral/airway edema following head and neck cancer surgery or trauma to the airway
 - b. Supplemental oxygen is also referred to as FiO₂ or fractional index of O₂. Room air is 21% FiO₂. SICU patients may be on 28-50% trach collar. The percentage of O₂ can be determined by reading the dial over the water bottle at the wall O₂ outlet. It is documented as % FiO₂ and not by liters of O₂.
 - c. When converting a trach collar to portable O₂ for ambulation, it is necessary to obtain a venti tube kit from the SICU service center. The corresponding adaptor is identified by matching the percentage of O₂ written on the end and identifying how many liters of O₂ are needed which is also on the end of the adaptor. Many tanks go directly from 6L to 10L, so if an adaptor indicates 8L is required, set the tank to 10L.
3. Face Mask
 - a. Delivers a constant FiO₂ to both the nose and the mouth to a maximum of 50%
4. Nonrebreather
 - a. Allows inhalation of 100% O₂, is a face mask with a bag attached
5. BIPAP:
 - a. Provides two levels of pressure, one during inspiration and a lower pressure during expiration
 - b. Typically used to treat acute respiratory failure
6. CPAP
 - a. CPAP machine delivers a stream of compressed air via a hose to a nasal pillow, nose mask, or full face mask, splinting the airway (keeping it open under air pressure) so that unobstructed breathing becomes possible reducing and/or preventing apnea.
7. Ventilator
 - a. CPAP (Continuous Positive Airway Pressure)
 - i. Patient is spontaneously breathing.
 - ii. Lowest vent setting sometimes called wean settings.
 - b. SIMV (Synchronous Intermittent Mandatory Ventilation)
 - i. The ventilator delivers preset breaths in coordination with the respiratory effort of the patient.
 - ii. Spontaneous breathing is allowed between breaths.
 - c. PRVC (Pressure Regulated Volume Control)
 - i. The ventilator delivers preset breaths in coordination with the respiratory effort of the patient. With each inspiratory effort, the ventilator delivers a full assisted tidal volume.
 - ii. Spontaneous breathing independent of the ventilator is not allowed.
8. Tips:

- a. Closely monitor your patient and their vital signs—SpO₂, RR, need for suctioning.
- b. Watch patient closely when they reach for their mouth.
- c. Patient may begin coughing more when upright due to mobilization of mucus or gagging.
- d. You may want the nurse nearby during mobility for suctioning or helping with tubing.
- e. Therapist is allowed to give patient 100% O₂ breaths (on vent panel) during treatment if patient needs a boost.

Early Mobility in the SICU

1. The SICU early mobility policy is attached.
2. Nurses do an excellent job of mobilizing their patients out of bed accordingly. They have been told not to wait for PT/OT before mobilizing their patients unless they have questions for us and concerns regarding patient safety they would like PT/OT to address.
3. The nurses provide PROM unless there is a concern for contractures or positioning requiring a PT or OT consult.
4. Intubated patients and early mobility
 - a. If an intubated patient is medically stable and able to actively participate in PT/OT, with the approval of their nurse they can be mobilized into dangling, transferred to a bedside chair, or even ambulated on the vent. Ambulating a vented patient requires their nurse, respiratory therapy, PT or OT, and possibly more hands to help with equipment.
5. The generic upper and lower extremity exercises can be printed off from the SICU site. Go to www.medschool.vanderbilt.edu/trauma-and-scc/MDSCC-Manual. Click on “Patient Management Guidelines” and click on “Mobility Exercises.”

VANDERBILT UNIVERSITY MEDICAL CENTER
MULTIDISCIPLINARY SURGICAL CRITICAL CARE

SURGICAL INTENSIVE CARE UNIT EARLY MOBILITY POLICY

Goal: As ICU survival rates improve, critical care clinicians are faced with the responsibility of mitigating the short-term and long-term consequences of critical illness that pose significant challenges to the quality of life of patients. As demonstrated by Schweickert et al. in 2011, "the benefits of early mobilization include reductions in delirium, in length of stay in the ICU and hospital as well as improvements in strength and functional status at discharge." The goal of the SICU Early Mobility Policy is to deliver early, appropriate, and safe physical therapy to SICU patients in order to optimize recovery, prevent and improve ICU acquired weakness, reduce ventilator days and therefore ventilator-associated pneumonia, and decrease length of ICU stay.

Eligibility: All patients admitted to the Surgical Intensive Care Unit.

Process:

- Each SICU patient will be evaluated upon admission and daily during rounds by the Mobility Safety Screen below. Any patient passing the Mobility Safety Screen criteria will be considered eligible for progressive mobilization (as described below), unless the SICU Attending or the primary team attending specifies via an order in the medical record that it is unsafe to mobilize that particular patient.

Mobility Safety Screen:

- ❖ No hemodynamic instability or active resuscitation
- ❖ No ongoing SpO₂ ≤ 88% or FiO₂ ≥ 70; RR ≤ 8 and ≥ 35/min; PEEP ≥ 12cm H₂O
- ❖ No recent agitation (RASS ≥ +2 in last 4 hours)
- ❖ No active myocardial ischemia or arrhythmias
- ❖ No active seizures
- ❖ No contraindication for mobility (open abdomen, unstable spine, difficulty airway, VDR ventilation, surgical procedure requiring immobilization, comfort care, etc.)
- ❖ No femoral vascular devices
- ❖ No sustained systolic blood pressure >180mmHg or HR >130/min

- If the patient passes the Safety Screen criteria above, then the following algorithm will be utilized to delineate the patient's level of mobility based on level of arousal utilizing the patient's RASS score.

Stupor/Coma RASS -4/-5	Awakens to Voice RASS -3	Alert and Calm RASS -2/-1/0/+1
Passed Mobility Safety Screen	Passed Mobility Safety Screen	Passed Mobility Safety Screen
Bedside RN Initiated Passive ROM	Bedside RN initiated progressive mobility ranging from: PROM Sit/Dangle PT Consult to be put by ICU team	Bedside RN initiated progressive mobility ranging from: Passive/Active ROM Sit/Dangle Stand Walk

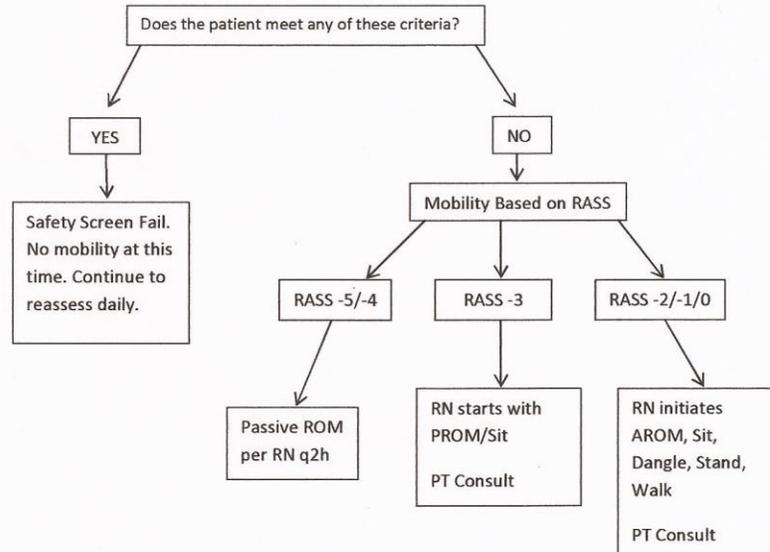
Adapted from Morris *Crit Care Med* 2008
Brummel, et al. *Physical Therapy*, 2012 ePub

- The Bedside Nurse is responsible for initiating progressive mobility based on criteria above including passive ROM, active ROM, sitting/dangling, and walking. A PT/OT Evaluation before mobilization is NOT required for the Bedside Nurse to initiate mobilization.
- Patient's progress with mobility will continue to progress as tolerated. Cessation of mobility session with the RN will be determined by the following criteria.
 - Symptomatic drop in mean arterial pressure (e.g., dizziness, light-headedness, syncope)
 - Heart rate <40 or >150 /min
 - Respiratory rate <8 or >40 breaths/min
 - Systolic blood pressure >180 mm Hg
 - Pulse oximetry <88%
 - Marked ventilator dysynchrony
 - Significant patient distress (nonverbal cues, gestures)
 - New arrhythmia, concern for myocardial ischemia
 - Concern for airway device integrity
 - Fall

- k. Endotracheal tube removal
- 8. Passive range of motion (PROM)
 - a. Passive ROM should be performed on appropriate SICU patients every two hours, alternating bilateral upper extremities and bilateral lower extremities in coordination with turning.
 - b. The bedside nurse is ultimately responsible for ensuring passive ROM is performed. This can be performed by the family after education from the physical/occupational therapist, nurse, or care partner.
 - c. Pamphlets will be distributed to family including diagrams of PROM maneuvers and instructions on its performance. T
 - d. The bedside nurse will be responsible for assuring safety with lines and tubes during family assisted passive range of motion.

SICU Early Mobility Flow Chart

1. Hemodynamic instability or active resuscitation
2. SpO2 \leq 88% or FiO2 \geq 70; RR \leq 8 and \geq 35/min
3. Ongoing agitation (RASS \geq +2 in last 4hours)
4. Active myocardial ischemia or arrhythmias
5. Active seizures
6. Contraindication for mobility (open abdomen, unstable spine, difficulty airway, VDR ventilation, surgical procedure requiring immobilization, comfort care, etc.)
7. Femoral vascular devices
8. Sustained systolic blood pressure $>$ 180mmHg or HR $>$ 130/min



Criteria for Cessation of Physical Therapy Session for the RN:

- Symptomatic drop in mean arterial pressure (e.g., dizziness, light-headedness, syncope)
- Heart rate $<$ 40 or $>$ 150 /min
- Respiratory rate $<$ 8 or $>$ 40 breaths/min
- Systolic blood pressure $>$ 180 mm Hg
- Pulse oximetry $<$ 88%
- Marked ventilator dysynchrony
- Patient distress (nonverbal cues, gestures)
- New arrhythmia, concern for myocardial ischemia
- Concern for airway device integrity
- Fall
- Endotracheal tube removal

1. ANKLE STRETCH

Cup patient's heel in your hand and let foot rest against your forearm. Stretch calf slowly, holding for a count of 10 (10 seconds.) then relax.



Repeat 10 times.

Repeat with other foot.

Do 2 times a day.



2. ANKLE PUMPS



With leg relaxed, ask patient to bend ankle up and down.

Repeat 10 times.

Repeat with other leg.

This exercise can be done often during the day. (No limit.)

3. KNEE BENDING AND STRAIGHTENING

Cup patient's heel in your hand and help them slowly bend their hip and knee as far as comfortable then straighten knee.



Repeat 10 times.

Repeat with other leg.

Do 2 times a day.



4. LEG OUT TO THE SIDE AND BACK TO THE MIDDLE



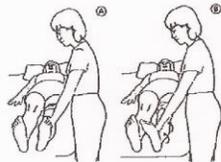
Hold the patient's leg at their heel and knee. Help them slowly slide their leg out to the side and back to the middle.

Repeat 10 times.

Repeat with other leg.

Do 2 times a day.

5. HIP ROLLING IN



Place your hands on patient's ankle and knee and help them slowly roll their leg in.

Repeat 10 times.

Repeat with other leg.

Do 2 times a day.

6. HIP ROLLING OUT



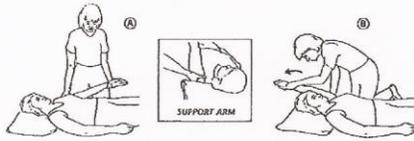
Place your hand on patient's ankle and knee and help them roll their leg out.

Repeat 10 times.

Repeat with other leg.

Do 2 times a day.

7. SHOULDER--RAISING OVERHEAD



Hold patient's hand and place your other hand behind their shoulder for support. Help the patient raise their arm slowly overhead as far as comfortable.

Repeat 10 times.

Repeat with other arm.

Do 2 times a day.

8. SHOULDER--SLIDING OUT TO THE SIDE

Hold patient's elbow and wrist. Elbow may be bent or straight. Help the patient slowly move their arm out to the side and back to the middle.

Repeat 10 times.

Repeat with other arm.

Do 2 times a day.



9. ELBOW--BENDING AND STRAIGHTENING

(Patient can be lying on their back, too.)

Hold patient's hand and place your other hand under their elbow. Help them to slowly bend and straighten their elbow.

Repeat 10 times.

Repeat with other arm.

Do 2 times a day.



10. WRIST--BENDING FORWARD AND BACKWARD

Hold patient's wrist in one hand. With your other hand, help them bend their wrist slowly down and then back as far as comfortable.

Repeat 10 times.

Repeat with other wrist.

Do 2 times a day.



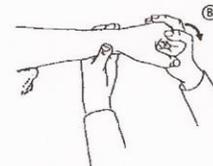
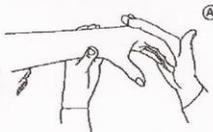
11. FINGERS--BENDING AND STRAIGHTENING

Hold patient's wrist with one hand. With your other hand help the patient bend and straighten their fingers.

Repeat 10 times.

Repeat with other hand.

Do 2 times a day.



CASE

Case Studies for Discussion:

1. Mrs. A. has squamous cell carcinoma of her tongue. She underwent an oral cavity composite resection (OCCR) including partial glossectomy, R neck dissection (ND), and

L radial forearm free flap (RFFF) for reconstruction of her tongue and is on the SICU for flap monitoring. She has a trach and is on 35% FiO₂ via trach collar. She has 2 JP drains on the R side of her neck and 1 at the antecubital fossa of her L elbow above her splinted forearm. She has an IV in her R UE and a PCA pump. She is 75 years old and uses a walker at baseline. You have PT/OT orders to mobilize her/teach ADL and teach her the appropriate exercises, discharge recs. She is in bed when you arrive, and the nurse has agreed with you getting the patient up and ambulating with her.

- a) What other information do you need from the nurse?
 - b) What are her precautions?
 - c) What will you do to get Mrs. A. and the room organized?
 - d) What equipment do you need?
 - e) What exercises will you teach her?
 - f) Where can you find head and neck guidelines and copies of the exercises?
-
- a. *Does Mrs. A. need to be on oxygen for her out of bed activities? Has she recently taken any meds that might make her dizzy or otherwise need extra precaution to prevent falls? Does she need a chair alarm?*
 - b. *PWB L UE x 2 wks. so no pushing through L hand till then, start active exercises L wrist in 2 wks., falls, JP drains, supplemental O₂*
 - c. *Plan to get Mrs. A. out of the R side of the bed to prevent use of her L UE for her transfer. Place bedside chair on R side of bed and make sure it is locked. Check to see if bed alarm needs to be disarmed. Find all JP's and pin them to her gown where you can see them. Unplug IV pole and keep it to the R of the patient during transfer and ambulation. Organize telemetry wires to prevent tangling. Check for presence/location of foley cath and place it where it won't get caught under patient during transfer. Ask Mrs. A. if she needs to press her PCA pump.*
 - d. *Potentially an O₂ tank and wheels and venti tubing to adapt her trach collar O₂ requirements, L platform rolling walker, assume you will need a portable monitor since patient is on the SICU, safety pins for JP's*
 - e. *Head and neck exercises, L wrist exercises*
 - f. *Guidelines on cabinet door in MCE office where printed exercises are located, also check rehab shared drive, exercises in MCE office cabinet, also in folders in 7N room*
-
2. Mr. B. has lung cancer. He underwent a R thoracotomy for R lower lobe resection and has a R CT which is on wall suction. He is on the SICU due to a cardiac history, and his recovery has been complicated by A-fib which is rate controlled by meds. He is on 2L supplemental O₂ via nasal cannula. He has an IV in his L UE and a PCA pump. You have PT/OT orders for mobilization/ADL and discharge recs. He is in bed when you arrive, and the nurse has agreed with you getting the patient up and mobilizing him to his tolerance.
- a) What other information do you need from the nurse?
 - b) What are his precautions?
 - c) What do you need to do get Mr. B. and the room organized?
 - d) What equipment do you need?
 - e) What will be you be monitoring in particular while ambulating?
 - f) What exercises and adaptations for bathing/dressing are especially important for this patient?

- a. *Has Mr. B. recently taken any meds that might make him dizzy or otherwise need extra precaution to prevent falls? What is the maximum heart rate recommended for this patient? Does he need a chair alarm? You do not necessarily need to ask about supplemental O2 since Mr. B. is on 2L perhaps for maintenance reasons while in bed. You can monitor his SpO2 during the initial transfer to the edge of the bed and determine his O2 needs yourself. Get a tank and wheels and bring his nasal cannula if in doubt or if he drops below 92% with the transfer.*
- b. *He has a chest tube and his chest tube is to wall suction. Check the activity orders to see if the patient can come off wall suction to ambulate AND check the chest tube orders under treatment orders to see if there is a suction requirement. If so, you will need portable suction to move away from the bed.*
- c. *Examine Mr. B.'s surgical site for location and chest tube. Ask Mr. B. if he wants to press his PCA pump before getting up. Mr. B. may do better getting out of the L side of the bed in order to avoid discomfort from rolling onto his chest tube. Decide where you want to place his bedside chair in relation to CT with suction tube, O2 tubing length, and telemetry lines. Check to see if bed alarm needs to be disarmed. Unplug IV pole and keep it to the L of the patient during transfer and ambulation. Organize telemetry wires. Check for presence of foley cath.*
- d. *Thoracic walker might be best for hanging CT, holding portable suction, O2 tank, portable monitor (needed due to patient being SICU patient and needing close monitoring of heart rate as well as SpO2 while mobilizing). Portable suction is in equipment room or on crash carts (ask charge nurse before using one from crash cart and replace suction canister after use—place used one in patient's room for future use). Have a chair nearby or resting place in mind in case patient needs to sit and rest.*
- e. *Heart rate (remember, patient is rate controlled for A-fib) and SpO2*
- f. *R shoulder exercises due to presence of chest tube—work toward full flexion, abduction, also deep breathing exercises to ensure full excursion of ribs. Encourage the use of a tub seat when showering. Teach him to dress his R arm first and to bring his foot up to his opposite knee to assist with donning socks*

3. Which of the following lines/pieces of equipment can be safely be disconnected for treatment? When would you want to keep them during mobilization?

- Heart monitor
 - *Keep on SICU patients, patients with cardiac histories, arrhythmias, disconnect only when you are assured patient has not had previous heart rate issues per nurse*
- Pulse oximeter
 - *Keep on SICU patients, patients already wearing supplemental O2 or who tend to desat with activity per nurse, disconnect for patients who have been sitting well even with exertion*
- Arterial line
 - *Cannot disconnect the actual line but can disconnect from the monitor via the large connection on the wire, keep connected if nurse indicates, most SICU patients can be disconnected for mobility away from bed (be sure to have nurse zero the art line upon reconnection)*
- Central line

- *Normally attached to IV, nurse may offer to pause and disconnect for mobility, otherwise keep connected and watch for kinking or pulling on patient*
- Feeding tube
 - *Dobhoff and PEG—ask nurse before pausing tube feeds and be sure to resume them before leaving patient*
- Swan Ganz catheter
 - *Never disconnected, okay to transfer patients out of bed to chair, have nurse watch Swan while moving patient*
- Nasogastric tube
 - *Ask nurse if NG tube can be clamped for mobility. Patient may need NG to remain to suction to prevent accumulation of gastric fluids and vomiting.*
- Epidural
 - *This small catheter carrying medication into the epidural space of the spinal cord is for pain management and cannot be disconnected. It originates from a yellow box usually hanging near the head of the bed. Carry the box with you during mobility, and be sure not pull excessively on this line or get it caught under the patient.*
- PCA pump
 - *This pain pump is connected to the patient's IV line. It can be paused by the nurse and disconnected for patient mobilization.*

4. Mr. J. is a 56 y/o male admitted through the ED to the general medicine floor (8N) with AMS and SOB. His medical team concluded that his symptoms were related a progression of his diseases. His MELD score is 30. His past medical history is HTN, anemia, DMII, syncope, hepatopulmonary syndrome and end stage liver disease. PT/OT completed an initial evaluation two days after his admission date on 4/1/16. The rehab team's discharge recommendations were Home with 24 hr. care/assistance and HHPT/OT.

During his admission he underwent a liver transplant on 4/5/16. He has now transferred to an SICU bed on 9T. He was extubated on 4/6/16.

On this date (4/7/16) his lab values for the day are glucose 250, hematocrit 42%, hemoglobin 9.9, potassium 3.6, and his sodium is 138. His vital signs for the last three hours are blood pressure 145/72, 160/78, 179/75 and now it is 168/98. His heart rate has ranged from 90 to 110 and his oxygen on 3 liters is 87-94%.

a. Based on these lab values and vital signs, do you think this patient is appropriate for PT/OT intervention?

Sometimes in clinical cases we need more information on the patient. However, if we are purely looking at the lab values and vital signs right now, I would say that the patient is appropriate to be seen because their vitals are stable. Even though the blood pressure is high, I would ask the RN if any BP medications have been given recently. The glucose is within functional normal limits, but it is also on the high side. His O2 has dropped below 90%, however, with his medical

h/o hepatopulmonary syndrome, his O2 reserve may be lower than an average patient. Again, in my opinion, I would see this patient, but I would monitor blood pressure and monitor vitals.

b. Would you complete a treatment note or a re-evaluation on this patient?

As a therapist you would complete a re-evaluation due to this patient having undergone a significant medical change (liver transplant). If you were going to see this patient as an assistant, following his medical record review, you would need to notify your supervising therapist and let him/her know that a therapist would need to see this patient to update POC/goals. The medical team may have already placed a new rehab consult, and then it would show up as a PRN order on the list.

c. Based on the patient's medical history and admitting diagnosis/medical course, what are some appropriate questions to ask related to PLOF?

I think it is important to have a detailed explanation of his activity tolerance (both long term/short term). Ask if he checks his O2 levels at home or if he utilizes supplemental O2 at home. If so, what does he normally measure and how much supplemental O2 does he utilize? If the patient is confused, ask the patient's family member/primary caregiver. It will also be important to ask where the patient lives (city). This will be important information when determining discharge recommendations due to the requirement that patients reside locally to be near VUMC (less an hour's drive) following liver transplant.

Upon sitting up, Mr. J. reports that he feels dizzy and as if he might faint.

a. What issues might be causing these symptoms?

Here are some issues I came up with that could be reasons why he feels dizzy or might faint and has shortness of breath. One might be orthostatic hypotension. Maybe he was lying down when they took the blood pressure at first and now that we have him sitting up his blood pressure has dropped. Maybe the blood pressure medication has started to kick in and dropped his blood pressure. Maybe he has increased or decreased glucose. That 250 level for him may be on the high side and he is feeling the effects of that. Possibly because he is NPO and receiving insulin his glucose could have decreased and he is feeling dizzy.

b. What would you monitor in this case and what would you do in this situation?

I would monitor the heart rate, blood pressure (check BP in supine, sitting, and, if able, standing), and oxygen level and see if the symptoms resolve within one to two minutes. If not, I would lie the patient down and recheck the vitals and communicate with the RN or the MD.

5. Ms. S. is a 40 y/o female admitted from an OSH with necrotizing fasciitis. Patient has a medical h/o IV drug use and colitis. Patient is s/p irrigation and debridement of necrotizing fasciitis of the right flank from abdomen extending to left thigh. Patient with prolonged intubation (1 week) requiring trach placement. Patient admitted to the SICU for airway monitoring. PT/OT has been consulted.

a. What precautions would we consider while in room and what would we need to include in our documentation?

Important precautions to consider would be the % of supplemental O₂ (documented as ___% $\dot{V}iO_2$ via trach collar; can also include amount in liters), any drain placement, monitoring of vitals, and that patient is a falls risk.

b. What would you need to do to get patient/room organized before mobilization?

Consider the need for a portable O₂ tank and converter for the trach collar (located on right side in 9T service center). Keep patient monitored with portable monitor. Pin any drains to gown before mobilization.

Surgical Stepdown [9n/s]

9 North

1. 9N is a monitored floor. The patients on this floor include the same as on the SICU/9T, trauma/10N overflow, and medicine/8N/8S overflow
2. 9N supplies and linens are accessed behind the nurses station as well as from the side and back hallways.
3. The break room is located to the right of the nurses station on the left side of the hall. The code is '234'
4. Guidelines:
 - a. Talk to the nurse before treating the patient.
 - b. On 9N, patients must stay on their monitor unless they have orders in the medical record to be off their monitors. Portable monitors are located in every room on 9N
 - c. Be aware of all lines and drains including chest tubes to wall suction. Portable suction machines will be ordered by the patient's nurse for ambulation outside of the room. The location of the portable suction machine varies. Start by checking in the storage areas between rooms 10 & 11
 - d. Lung transplant patient's need to wear masks when ambulating outside their rooms
 - e. Oxygen tanks are available in the storage areas between rooms 10 & 11
 - f. 9N Neuro chairs, large, stretchy footies for patients with edematous and bariatric feet are located in the supply room
 - g. Reachers, long-handled sponges, and leg lifters are located in the supply room
 - h. Thoracic walkers aid in carrying oxygen, chest tubes, and foley catheters
 - i. Walkers and a few crutches are located in the storage areas between rooms 10/11

9 South

1. 9S is a non-monitored floor. The patients on this floor include the same as 9N.
2. Head and neck cancer surgery patients, liver transplants patients, bariatric surgery patients, urology and endo/oncology, gyno/oncology, and thoracic surgery patients are often transferred to this floor.
3. Talk to nursing prior to treating the patient
4. Neuro chairs are shared between 9N and 9S
5. 9S supplies and linens are accessed from behind the 9S nursing station with access doors from side and back hall.
6. The 9S break room is located to the right before you enter 9S and before patient rooms. The code is '241'

Free Flap Dangle Protocol

1. Begin dangling the surgical extremity on post operative day (POD) 6.
2. Dangle the surgical extremity for 10 minutes 4times daily while patient is awake waiting at least 1 hour between each dangle session being POD 6.
3. Increase dangle time by 10 minutes every 24 hours (example POD 7 dangle 20 minutes 4times daily and POD 8 dangle 30 minutes 4timers daily).
4. Once up to 2hours 4times daily, may dangle the surgical extremity ad lib or all day.
5. When surgical extremity is not in the dangle position elevate on 2 pillows.
6. Precautions: if flap becomes swollen, blue, congested, or other visible clinical signs of not tolerating the dangle stop advancement.

7. If there are no swollen, blue, or congestion events typically full ad lib dangle occurs about POD 16.
8. To access dangle protocol: go to wiz order, click on web button to left of the sign off button, click on e-docs, type in word dangle, click on search, you will then be able to view protocol and print it

Post-surgical stepdown

1. Noncritical patients after surgery(excluding cardiac and neuro)
2. Often come from SICU, trauma, or directly from surgery
3. Postop patients often need PT/OT for retraining and compensatory training given new precautions, functional impairments, and safety concerns prior to discharge
4. Precautions and considerations: often have numerous/various drains, chest tubes on suction or may be taken off suction, NGT occasionally must remain to suction, abdominal binders for abdominal surgeries (not in activity orders rather in nursing orders/treatments, lung transplants have sternal precautions x6 weeks, wound vac often with plastics patient

General Guidelines for Head/Neck Surgery Patients

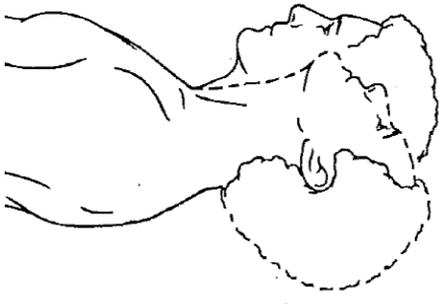
1. Many of these patients will have both PT and OT orders entered. Sometimes they do not require both services to see them. PT can screen the order and may see the patient first to determine if OT is required. OT input is valuable for geriatric patients as well as for patients with upper extremity limitations due to neck surgery or upper extremity donor sites for free flaps. OT consultation is also needed for patients who have undergone orbital exenteration as part of their head and neck cancer surgery.
2. These patients may perform active head and neck exercises with drains in. Many of these protocols are physician-driven, and they may be instructed by their physician to perform activity different from the protocol.
3. Sometimes these patients leave the day after surgery and may even leave with their drains still in. Please attempt to see these patients early in the day and teach them their exercises before they are discharged.
4. When you evaluate the patient, it is all right to assess cervical and shoulder AROM for evaluation purposes. The patient can perform cervical/shoulder motions.
5. Advise these patients not to drive until it is okay with their physician. Also, they should not lift anything heavier than a gallon of milk for the first five weeks to allow for healing.
6. Please inform the patient that when they return to the oto clinic post-operatively they may be referred to outpatient PT at their MD's discretion. If you note deficits during the evaluation, encourage them to ask their MD about them if they do not improve by their follow up visit.

*These exercises do contact's 2 times
3 times a day. Call with any questions.
Created By: Andrea Antone (MS) 835-1147 (leave a voice message)*

Oct 09, 2007
head and neck ex's

CERVICAL SPINE - 4 AROM: Neck Extension

Bend head backward to comfort



Repeat 5 times per set.
Do 1 sets per session.
Do 3 sessions per day.

CERVICAL SPINE - 3 AROM: Neck Flexion

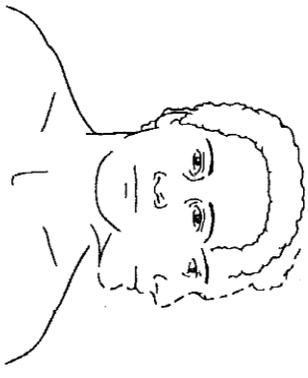
Bend head forward to comfort.



Repeat 5 times per set.
Do 1 sets per session.
Do 3 sessions per day.

CERVICAL SPINE - 1 AROM: Neck Rotation

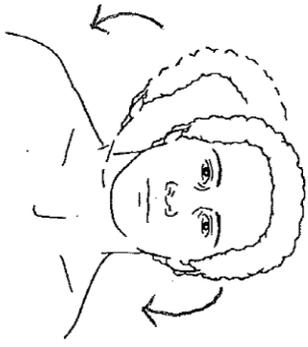
Turn head slowly to look over one shoulder, then the other to comfort.



Repeat 5 times per set. Do 1 sets per session.
Do 3 sessions per day.

CERVICAL SPINE - 2 AROM: Lateral Neck Flexion

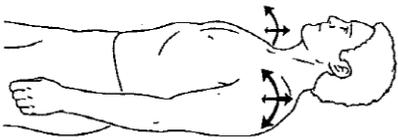
Slowly tilt head toward one shoulder, then the other to comfort. Keep nose pointed forward, shoulders relaxed.



Repeat 5 times per set. Do 1 sets per session.
Do 3 sessions per day.

CERVICAL SPINE - 22A Strengthening:
Shoulder Shrug (Phase 1)

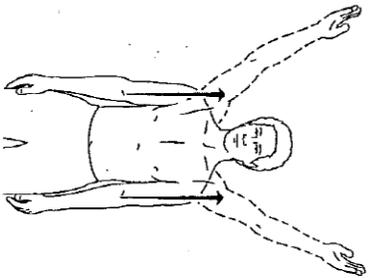
Shrug shoulders up and down,
forward and backward.



Repeat 5 times per set.
Do 1 sets per session.
Do 3 sessions per day.

SHOULDER - 83 ROM: Flexion (Standing)

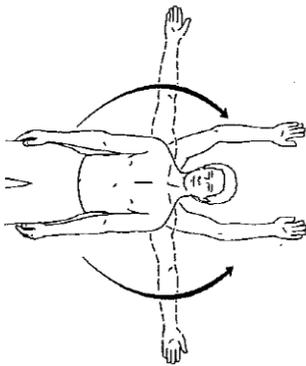
Sitting in a chair or standing,
bring arms straight out in front
and raise as high as possible
without pain.



Repeat 5 times per set.
Do 1 sets per session.
Do 3 sessions per day.

SHOULDER - 84 ROM: Abduction (Standing)

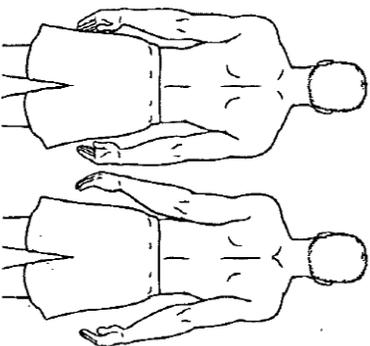
Sitting in a chair or standing, bring arms straight out from
sides and raise as high as possible without pain.



Repeat 5 times per set. Do 1 sets per session.
Do 3 sessions per day.

SHOULDER - 101 Scapular Retraction (Standing)

With arms at sides,
pinch shoulder blades
together.



Repeat 5
times per set.
Do 1 sets
per session.
Do 3 sessions
per day.

Medical Intensive Care (MICU) [8t]

General Information

1. Located on the 8th floor of the critical care tower
2. Medical receptionist's number – 615-322-0938
3. The MICU has 3 teams (MICU 1, MICU 2 and MICU NP). Each team consists of an attending, a fellow, residents, and interns. Each team has a pager number in WIZ. They round each morning for several hours. They are always on the floors unless they are covering a stat. PT/OT round with fellows between 11:00am-12:00pm to discuss caseload and appropriateness of orders for next day.
4. You can look at the sign on each door to determine which team the patient is on along with the pager number for that team.
5. The case manager that covers MICU is Kirsten Vascik. Stacy Jones is the social worker. They are available when needs arise however we do not communicate with them on a daily basis.
6. Patients with respiratory impairments are usually admitted to this floor along with patients admitted with medicine overdose, liver failure awaiting transplant, and anoxic head injuries.
7. Ask nurse FIRST if it is appropriate to take patients off monitors. If nursing requests constant monitoring or PT prefers to monitor patient, the portable monitors are located in the closet behind the charge nurse's desk. Batteries are located on the counter across from room 8609.
8. Swipe your badge to get into supply room and clean and dirty utility rooms
9. Femoral Vas Cath – if there is a concern discuss with team
10. CVVHD (CRRT) – may work with patient if BP is stable
11. Vasopressors
 - a. This group of drugs is useful for treatment of hypotension.
 - b. Pressors usually seen in the MICU are levophed and dopamine
12. Tips for working with intubated patients
 - a. When working with a patient who is intubated, be careful to keep the ETT in a neutral position as to prevent excessive pulling or pouring of fluid within the tubing down into ETT.
 - b. You should take ETT out of holder when moving patient (ie rolling, transfer to EOB, sit to stand).
 - c. Once patient is stable at EOB, then it would be safe to place ETT back in holder.
 - d. It is important to monitor intubated patients carefully during treatments especially RR and O2 sats. The RR on the vent is usually more accurate than RR on monitor.
13. Sedation
 - a. Medications usually used for sedation are propofol, precedex, and fentanyl
 - b. Level of sedation determined by RASS (Richmond Agitation Sedation Scale). The scale ranges from -5 to +4. The more negative, then the more sedated. The more positive, then the more agitated. Zero is normal.
 - c. OT/PT works with patients that are intubated and mildly sedated. PT/OT usually becomes involved when a patient is a RASS -1.
 - d. Richmond Agitation–Sedation Scale

Score	Term	Description
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+4	Combative	Overtly combative or violent; immediate danger to staff
+3	Very agitation	Pulls on or removes tube(s) or catheter(s) or has aggressive behavior toward staff
+2	Agitated	Frequent nonpurposeful movement or patient–ventilator dyssynchrony
+1	Restless	Anxious or apprehensive but movements not aggressive or vigorous
0	Alert and calm	
-1	Drowsy	Not fully alert, but has sustained (more than 10 seconds) awakening, with eye contact, to voice
-2	Light sedation	Briefly (less than 10 seconds) awakens with eye contact to voice
-3	Moderate sedation	Any movement (but no eye contact) to voice
-4	Deep sedation	No response to voice, but any movement to physical stimulation
-5	Unarousable	No response to voice or physical stimulation

14. Vent Settings

a. CPAP

- i. Continuous positive airway pressure
- ii. Patient is spontaneously breathing
- iii. Lowest vent setting
- iv. Usually when OT/PT begins working with patient

b. SIMV

- i. Synchronous intermittent mandatory ventilation
- ii. The ventilator delivers preset breaths in coordination with the respiratory effort of the patient. Spontaneous breathing is allowed between breaths.

c. PRVC

15. Pressure Regulated Volume Control

- a. The ventilator delivers preset breaths in coordination with the respiratory effort of the patient. With each inspiratory effort, the ventilator delivers a full assisted tidal volume. Spontaneous breathing independent of the ventilator is not allowed.

16. Noninvasive Ventilation

a. CPAP

- i. A continuous positive airway pressure (CPAP) machine was initially used mainly by patients for the treatment of sleep apnea at home, but now is in widespread use across intensive care units as a form of ventilation.

- ii. The CPAP machine delivers a stream of compressed air via a hose to a nasal pillow, nose mask or full-face mask, splinting the airway (keeping it open under air pressure) so that unobstructed breathing becomes possible, reducing and/or preventing apnea
- b. BIPAP
 - i. Provides two levels of pressure: Inspiratory Positive Airway Pressure (IPAP) and a lower Expiratory Positive Airway Pressure (EPAP) for easier exhalation.

General Medicine [8n] and Cardiac Stepdown [8s]

1. 8north is a general medicine floor (including Riven teams 1-6, Riven 11, Nonteaching private practice, Morgan teams 1-4, Rogers hepatology, Rogers pulmonary, Rogers ID, Rogers GI, Rogers renal)
2. Riven team and private practice are attending only (no residents or medical students)
3. Rogers and Morgan teams have medical students, residents, fellows, and attendings
4. 8south is a cardiac stepdown floor and has 6 general medicine "stepdown" beds as well
5. Common diagnoses on unit are: cancer, cellulitis, spine compression fractures, COPD, decubitus ulcers, electrolyte abnormalities, general debilitation/failure to thrive, hepatic encephalopathy, HIV/AIDS, pneumonia, CF, CHF, diabetes, falls, rhabdomyolysis, dementia, TB, and altered mental status.
6. Physical therapy primary focus: discharge recommendations, assess for assistive devices/braces and AFOs/mobility devices, gait training, balance, home safety, caregiver training, home safety, determine if OT/SLP are needed if not ordered, and 6minute walk test for patients on lung transplant list (at least weekly).
7. Occupational therapy primary focus: discharge recommendations, medication management, assess need for adaptive equipment, caregiver training, home safety, cognition for I/ADLs, sustained activity tolerance, ROM, splinting, and energy conservation.
8. "Bedrest" orders- frequently means patient is not allowed to get up without assistance. If therapy orders states OOB/therapy orders status ambulation/recent daily notes say OOB or ambulation usually patient not on bedrest. Page patient's primary team to request clarification and order changed.
9. Patients with must have troponins downtrending (or clearance from primary medical team if not clearing due to kidney issues).
10. Patients with DVT or PE must be on anticoagulation x24 hours prior to therapy evaluation.
11. SNF placement factors:
 - a. Therapy (PT and OT or PT alone)
 - b. IV antibiotics
 - c. Wound care with Stage III or IV ulcer or new PEG tube.
 - d. Patient does not need therapy evaluations if going for IV antibiotics or wound care.
12. If there is a possibility of transition to nursing home placement/intermediate care facility once therapy is completed then recommend SNF. It is typically difficult to admit someone to an intermediate care facility from any other setting besides SNF. Patients from an intermediate care facility typically do not require a PT/OT evaluation to return unless they had a decline in function.
13. Effects of bedrest for geriatric patients: patients 65 years and older lose 30% of there strength and endurance for every day they are in bed. This is why a geriatric patient that is on bedrest x3 days will not likely be able to return directly home at discharge.
14. HIV/AIDS patients: In general it takes 2 months for HAART therapy to produce results for patient. If you evaluate HIV/AIDS patient who has not been on HAART therapy previously the true rehab potential will not be known for 2 months. If functional status is limited it is recommended that patient discharge to SNF. If the patient improves after two months patient can transfer to inpatient rehab facility. If the patient does not significantly improve then they can transition to the intermediate care facility.
15. Respiratory isolation: There are 2 negative pressure rooms on 8 north (other rooms can become negative pressure if air filter is placed in room). Used for patients who are on

respiratory isolation. Students cannot work with airborne patients since require N95 masks. Patients must stay in room unless medically necessary tests/procedures only approved by team. HIV/AIDS patients are on respiratory isolation until TB has been ruled out if patient comes in with respiratory symptoms or fever.

16. Cystic fibrosis (CF): Patient will often be on contact isolation due to infection or contact for reverse isolation to protect the patient from outside infection. Often the team will ask for a 6 minute walk test to be performed in order for the patient to qualify for the lung transplant list (if medically appropriate). Nursing staff can also perform this test. Kelly agreed to minimum physical therapist completing 6minute walk test once per week if active on transplant list.
17. Geriatric team consults: there may be geriatric patients that are being followed by other services instead of geriatric primary team. Geriatric team will do a geriatric consult for patients with physicians request one. You can suggest to the primary team that the geriatric team be consulted if you feel expertise could benefit from patient. When speaking to primary team, make sure primary team understands why.
18. Neutropenic precautions: patient has low white blood cell count thus making it harder to fight off infection. There will be a sign on patient's door. Patient must wear mask when out of room and if you are sick you wear a mask into room.
19. General medicine conference: Monday to Friday 10:30-11:30am is the general medicine conference. The secretary for general medicine keeps all physicians pagers while in conference, so you will not be able to reach. You can send text message with your question and ask for contact when out of conference.
20. Member of acute rehab attends General Medicine Huddle Monday, Wednesday, and Friday in the Brittingham Conference Room (backside of 7t) 1355 Morgan 3, 1410 Morgan 1, 1425 Morgan 2, 1440 Morgan 4, 1455 pulmonary, 1510 ID

Transplant and Surgical Care Unit [7t]

General Guidelines

1. Patients typically have had a transplant (kidney or liver) or are on dialysis at home
2. Can have general medicine, geriatric, cardiac, trauma, and ortho overflow
3. If patient has had a heart/lung transplant they must wear a mask out of room (or you must wear one into room if possibly sick)
4. No restrictions on kidney or liver transplants unless lab values/team indicates otherwise
5. Nurse information is located on sheets/video board across from 7609 and charge nurse desk
6. All nurses have cell phone you can call if unable to locate nurse (located on nurse information sheet/video board)
7. Check for all possible drains prior to mobilization (often have dialysis access, JP drains, accordion drains, etc)
8. Majority have telemetry boxes to monitor heart rhythm and is monitored by someone on another floor
9. Due to patients often having hepatic encephalopathy check with nursing staff prior to intervention regarding chair alarm/bed alarm/safety concerns

Dialysis

1. If patient has a femoral vas cath for dialysis, PT/OT need clarification on clearance to mobilize
2. Hemodialysis (HD)
 - a. Process for removing waste and excess water from the blood, and is primarily used to provide an artificial replacement for lost kidney function in people with renal failure
 - b. PT/OT unable to work with patient on HD at VUMC.
3. Peritoneal Dialysis
 - c. Performed through port in peritoneal cavity
 - d. Typically unable to see patient while they are “filling” and “emptying”
 - e. Patients are at risk for peritonitis

Cardiac/Vascular Stepdown [7n/7s/5s] and Cardiac Observation (COBS)

1. There are four categories of cardiac teams that are separated as follows: cardiac surgery, heart failure, arrhythmia, and general/other. All major lines (Swan, arterial, mechanical ventilation etc.) are removed before a patient transfers to the step down unit. Typically, catheters, pacer wires, chest tubes, JP drains, O2 lines, and telemetry leads are the main lines that require organization prior to mobility.
2. 5S can have has patients with a Swan. They allow up to 2 at one time
3. All patients on these floors are cardiac monitored, which means they MUST be monitored at all times.
4. Check with nursing prior to seeing all patients; heart rhythms and rates can change quickly and they are the best source of information to determine if a patient is stable and ready for therapy.
5. All patients need EOB/OOB activity orders; if they are on bedrest you will need to call the team pager to obtain them.
6. Vascular patients seen on these floors include LE amputations, LE bypass grafts (fem-fem, fem-pop, axillary-fem, etc.), aortobifem bypass, AAA repairs.
7. For vascular patients with LE amputations (i.e. toes amps, transmet amps, ray amps), they are NWB on the operative extremity following surgery unless otherwise specified by the vascular team. This is important to remember as vascular does not enter a weight bearing status in the activity order set.
8. Patients with BKA's should be in a knee immobilizer when they come out of the operating room; you may remove this for ROM, but must replace it once treatment is complete. If no KI is present, call vascular
9. Patients with BKA's and AKA's come out of the operating room with sciatic and femoral nerve blocks; these are placed/removed by the acute pain service. Patient may mobilize with these blocks; the lines terminate into small pouches and are time released (i.e. the patient does not have to push a button like the PCA pumps).
10. Cardiac Observation (COBS)
 - a. Located on 5t. Enter it from the left/back hall entrance to the tower building.
Cardiac observation patients and cardiac cath patients.
11. Occupational Therapy's Role with Cardiac Patient's in the Acute Care Setting
 - a. Cardiac patients are often limited in endurance, which impacts performance of ADL and IADL tasks.
 - b. Patient's who have had a sternotomy have sternal precautions to adhere to while performing ADL tasks.
 - c. OT intervention focuses on compensatory strategies for self care tasks, education on energy conservation techniques, relaxation techniques, and home or work modifications.
 - d. Compensatory Strategies:
 - i. One handed dressing techniques
 - ii. Adaptive equipment
 - e. Energy Conservation Techniques:
 - i. Provide patient with energy conservation techniques
 - f. Deep Breathing Techniques:
 - i. Dyspnea Control Postures
 1. When sitting, bend slightly forward at waist and prop forearms on table or thighs
 2. When standing, lean forward and prop on countertop, shopping

cart, etc.

ii. Pursed-Lip Breathing

1. Purse lips
2. Exhale through pursed lips
3. Inhale deeply through nose
4. Exhalation should take twice as long as inhalation

iii. Diaphragmatic Breathing

1. Patient lies supine, inhales slowly and exhale through pursed lips
2. Book placed below xiphoid process helps as visual cue (rise with inhalation, fall with exhalation)

g. Basal Metabolic Equivalent (MET)

i. Energy cost of an activity

Basal Metabolic Equivalent Table of Self-Care and Homemaking Tasks

MET Level	Self Care	Ambulation and Household Tasks
1.2	Eating, Seated	Hand Sewing
1.5		Sweeping Floor Machine sewing
1.65	Transfers, bed to chair	
2	Washing face and hands, brushing hair	
2.5	Seated sponge bath Standing sponge bath Dressing and Undressing	Dusting Kneading Dough Hand washing small items
2.6		Vacuuming
3.0	Seated warm shower	Preparing a meal
3.5	Standing shower, warm	Climbing stairs at 24 feet/min
3.6	Bowel movement on toilet	
3.9		Making a bed
4.2	Hot Shower	
4.4		Changing bed linens
4.7	Bowel movement on bedpan	
5.0	Sexual intercourse	Walking up stairs at 30 feet/min

Spine Surgery (Ortho Spine/Neurosurgery) [6s]

Neck Surgeries

1. Always check the activity orders for these patients and check with the nursing staff prior to mobilization
2. These patients may be required to wear a cervical collar or cervical thoracic orthosis (CTO).
3. Cervical collars must remain on the patient at all times unless otherwise specified in the orders. These patients will receive a second set of cervical pads for showering. These are typically seen with cervical fusions.
4. The CTO is to be worn when the patient is upright. The patient will wear a cervical collar when in the bed. In elective surgeries/fusions, these braces may be donned sitting EOB unless otherwise specified in the orders. These braces are typically utilized for lower cervical/upper thoracic surgeries/fusions.
5. If a patient has had removal of hardware (ROH), it is not assumed that the pt can don their brace on the edge of the bed. Clarify with the neurosurgery NP and/or MD. Don the brace in supine until clarification can be obtained.
6. These patients have restrictions that include no bending, twisting or lifting >5lbs.
7. The patient may have a JP. Safety pins may be found in the supply room and the drain should be attached to the gown during mobility so that gravity is not pulling down on it. Be careful not to roll over or put weight on these drains.
8. Some patients may not require a brace. Avoid extreme neck flexion and extension with these patients. Ask the NP or team to clarify any questions regarding ROM activities.
9. Some patients may receive a soft cervical collar to wear when riding in a car to avoid unexpected or sudden movements.
10. Full manual muscle testing of the shoulders and elbows should not be completed with these patients, only mild testing is permitted. Full AROM is permissible

Back Surgeries

1. Always check the activity orders for these patients and check with nursing staff prior to mobilization. The activity order will provide information on the type of brace needed.
2. These patients may develop a CSF leak in surgery and have 24 hour bedrest orders. Check the operative note for the time OR contact the NP/MD for details.
3. The most common sign of a CSF leak is a severe headache when upright. If this occurs, return the patient to supine and alert the team of your findings.
4. All back surgery patients will need to abide by strict spine precautions. These include no bending, twisting or lifting more than 10 pounds. We often use the synonym BLT to help patients remember these precautions.
5. There are different braces your patients may have for mobilization. Check the activity orders. Some patients do not require the use of a brace. Common braces are TLSO and Aspen quickdraw.
6. Some patients have fusions starting in the lower thoracic to upper lumbar region through the sacrum. These patients maybe needs adaptive equipment for home use and lower body dressing.
7. Aspen quick draws are simple and use Velcro. They do not provide stability but serve as reminders for back precautions.
8. The neurosurgery service allows all elective surgery patients who have been stabilized to don their braces EOB. ALL braces may be donned sitting EOB unless otherwise specified.

9. If a patient has had removal of hardware (ROH), it is not assumed that the pt can don their brace on the edge of the bed. Clarify with the neurosurgery NP and/or MD. Don the brace in supine until clarification can be obtained.
10. Please order adaptive equipment or assistive devices POD #1 (if possible). This makes it easier for the assistants when they return to see the patient on POD #2.

Neurology/Neurosurgery/Neurology Intensive Care Unit (NICU) [6N/6T]

General Guidelines

1. 6T3 is the neuro ICU with both neurosurgery and neurology patients.
2. 6N is the neurosurgery step down unit and contains both neurosurgery and neurology patients.
3. 6T3 includes beds 6601 to 6661 with four even numbered beds (6440-6446) in the middle hallway and one on the end; 6656 is across from 6659 and 6661.
4. 6601-6646 are ICU beds, the rest of the beds are ICU stepdown, which is not the same as a floor bed.
5. The team pager numbers can be found on the white dry erase boards throughout the intensive care unit.
6. The ICU is run by the neurocare team – anesthesia. This team manages the patient's from a medical/critical illness standpoint and rounds on each patient in ICU status every morning. However, the primary team (neurosurgery or neurology) is in charge of the patient's care and activity orders.
7. Neurology and neurosurgery participate in a morning discharge planning huddle at 8:15 AM along with nursing, therapy, case management, and social work. The neurology residents and neurosurgery nurse practitioners facilitate huddle.
8. There are 3 case managers and 3 social workers as well as a discharge planner that cover the patients on the neurology and neurosurgery caseloads.
9. There are 7 nurse practitioners for neurosurgery. They cover according to service. There is one for the tumor service; 3 for spine, including ortho-spine; 1 for the movement disorder team; and 2 for the endovascular service.
10. Always check with the nursing staff on the ICU prior to mobilizing a patient or removing the monitors. Portable monitors are available in the equipment room (code 432*).
11. Handouts of home safety information have been created for craniotomies and back surgeries. It is important patients receive this information prior to discharge. It is preferred these are provided on POD #1. These are located near the MR desks on 6T3 and 6N.
12. Patients who have had a lumbar puncture are on bedrest for 2 hours following the procedure.
13. The neurology service has a stroke and a general neurology team. The stroke team follows all stroke patients and the general team follows all other neuro dxs ie: multiple sclerosis (MS), guillian barre syndrome, etc.
14. Vanderbilt is a Comprehensive Stroke Center. As a result there are benchmarks that must be met. As part of these requirements, a skilled OT, PT, and/or ST assessment is required for every stroke patient unless the doctors can document the patient is back to his/her baseline. If you visualize/observe a patient to be independent and a formal assessment is not needed, a contact note should be placed in the medical record so the coding person can qualify this and we meet this benchmark with every stroke patient.

Craniotomies

1. These patients have typically undergone resections in various areas of the brain.
2. We see these patients for home safety and to determine if functional limitations exist. We have a home safety handout.
3. These patients should avoid bending over, lifting, or straining due to increased pressure, dizziness, and pain.
4. The HOB should be kept >30* at all times for swelling purposes.
5. Offer these patients assistive devices and AE as needed - no restrictions.

6. Though uncommon, these patients may develop a cerebrospinal fluid leak (CSF). Signs may include a severe headache when upright that is worse than surgical pain OR a clearish fluid leaking from the nasal cavity. Immediately return the patient to supine and alert the nursing staff if this occurs with your patient.
7. There is also the potential for post-op swelling following a crani. The effects are most pronounced by post-op day 2. This may translate into a decline in mental/physical performance.

Craniectomies

1. These patients have had a bone flap from the skull removed usually for swelling purposes and to allow decompression of the brain.
2. The flap may be stored in the abdomen or frozen; check the stomach for incisions. Most recently, they have consistently been frozen.
3. Some of these patients will have helmets for OOB activities. However, most get their helmets upon discharge. The neurosurgery NP is responsible for obtaining the helmet. Rarely, a bicycle helmet is used for this purpose.
4. Be careful not to touch the area where the flap was removed and not to bump it against anything.
5. Those with an occipital flap removal will generally have a foam donut for the back of their heads.
6. If the patient has no bone flap, the side where the bone flap is missing should be listed as a precaution on the evaluation.

External ventricular drains (EVDs)

1. External ventricular drains (EVDs) are placed in patients with hydrocephalus or with increased intracranial pressures (ICPs). These drains collect excess cerebrospinal fluid (CSF). These are typically placed surgically. They are open when the patient is in bed.
2. EVDs are gravity dependent. They are lined up with the patient's external auditory meatus when draining. If the drain is below the ear, the patient will drain too much; if too high, not enough.
3. The neurosurgeons prefer the patient's ICP be below 20. When monitoring, this is a purple line on the monitor. Monitoring is ineffective when the EVD is open or the drain is no longer in line with the ear. If there is a question regarding ICP, ask the nursing staff.
4. Lumbar drains are placed for an increase in CSF as well. These drains are typically opened for a period of time and then clamped off, controlling the amount of CSF that is drained.
5. **THESE DRAINS MUST BE CLAMPED PRIOR TO MOBILIZING THE PATIENT OR EVEN MOVING/RAISING THE HEAD OF THE BED!!!!!!!!!!**
6. Patients who have a subdural JP drain or Subdural Evacuating Port System (SEPS) drain placed for SDH are not to be mobilized until the drain is removed.

Stroke:

1. Do not mobilize patients with "BEDREST" activity orders unless you receive a verbal order. Either put in a failed attempt or call/text page the team.
2. Some stroke patients will have permissive hypertension goals. These are noted at the end of the neurology notes. Check the latest progress note or with nursing for the most up to date parameters.
3. Hemorrhagic stroke patients will typically have a lower BP parameter to avoid a larger bleed. Ischemic stroke patients will typically have a higher parameter to perfuse the

damaged brain tissue. Always ask the nurses what the blood pressure parameters are as they may have changed.

4. Always monitor a stroke patient unless otherwise told. Monitoring blood pressure and staying within parameters is extremely important in these patients.
5. If a patient is noted to be *pressure dependent*, perform your assessment in supine first to establish a baseline. Monitor the pt's blood pressure throughout activity so any neuro changes can be co-related with the patient's BP. Return the pt to supine and report your finding to the nurse and team if a change in the patient's neuro exam is observed.
6. Patients who have received tPA are on bedrest x 12 hours after administration of tPA and must be put back to bed after therapy evaluations until they reach the 24 hour mark.

Subarachnoid Hemorrhages

1. Subarachnoid hemorrhages (SAH) can be caused traumatically or atraumatically. Typically we see atraumatic SAH on the neuroscience floor.
2. Atraumatic SAHs have several causes. If the cause was an aneurysm or arteriovenous malformation (AVM), the aneurysm or AVM must be secured either by coiling, embolization, gluing, or removal via craniotomy prior to mobilization. Mobilizing an unsecured aneurysm or AVM could lead to further bleeding. Usually the surgeons do a CT angiography or diagnostic cerebral angiogram to determine the cause of the SAH.
3. If a patient comes in with a new SAH and PT/OT are consulted, make sure to find the cause prior to mobilization and put a hold on these patients if an aneurysm or AVM is present and/or has not been secured. Also, if an aneurysm/AVM is suspected and not diagnosed, the patient should be placed on hold until definitive diagnosis or reason for the SAH is found.
4. SAH have precautions that include: dimmed lighting, quiet environment, avoiding extremes such as hot and cold, and avoiding straws. A sign is placed on these patient's doors. We will not usually have orders on a patient under precautions.
5. SAH are at risk for vasospasms for up to 3 weeks post bleed. Pt's will be monitored via transcranial Doppler ultrasound (TCD) on M, W, F of each week. Check these reports or the neurology progress reports to find out if a patient is in vasospasm.
6. When a patient develops vasospasms, the patient can typically be mobilized unless they are symptomatic from a neurological standpoint. It's always a good idea to check with the nurse practitioner prior to mobility.
7. SAH blood pressure goals may vary depending on whether the patient is in vasospasm so always confirm with the nursing staff or doctors.

Baclofen Trials

1. PT participates in intrathecal baclofen trials (ITB). These trials are for patients with spasticity and assesses for the need for an intrathecal baclofen pump. Patients are assessed 3-4 times during their hospital stay.
2. The baclofen trial forms are housed in the MR's drawer on the 6N floor. Use this for the modified ashworth scale and spasm scale. This will make the trial much smoother for you.
3. Patients are typically admitted on Sunday and the trial is performed on Monday. Get to the patient's room no later than 8:30 for a pre-trial assessment.
4. Patients are typically NPO prior to the injection. It may be difficult for the doctors to do the LP bedside and the patient may need to undergo anesthesia for the injection.
5. You will perform a pre-trial assessment prior to the initial injection of baclofen. Always give the nurse your pager number and let him/her know you are finished with your pre-assessment. Have the nurse page you with the time your patient was injected.

6. The patient must remain on bedrest for 2 hours following the injection and will typically be lying in a supine position.
7. You will re-assess the patient every 2 hours from the initial injection time up until a 6 hour mark. If the patient was injected later, a 6 hour assessment is not necessary.
8. The baclofen is most effective at the 4 hour assessment. It begins to wear off after 4 hours.
9. Let the nurse or team know when you are finished as the patient will discharge shortly after your last assessment.
10. The trial is deemed successful if the patient's spasticity dropped 2 grades on the Modified Ashworth Scale in one muscle group. It is also the therapist's discretion to deem a trial successful based on the subjective findings of the patient (ease of transfers, toileting, hygiene, dressing, etc).
11. It takes approximately 24 hours for the full effects of the baclofen to wear off if it was effective. This is important for those patients who rely on spasticity for mobility to be aware of for safety.

Epilepsy Monitoring Unit

1. 6N has an epilepsy monitoring unit (EMU). Patients will undergo continuous electroencephalography (EEG) to monitor electrical activity to pinpoint seizures in the brain.
2. Patients undergoing continuous EEG are not usually seen by therapy. However, you may get the occasional consult. The patient can mobilize as far as the cables will allow.

General Neurology

1. Conversion and malingering disorders are seen in forms of strokes or spinal cord injuries on the neuro floors. Treat these patients as you would any patient with the present deficits. A technique that helps with these patients is to distract them during functional tasks and you may see inconsistencies in the presentation of their symptoms.
2. Patients with Guillian Barre Syndrome or any form of demyelinating disorder may undergo IVIG therapy for several days while in the hospital. Often, patients are admitted for this therapy.
3. Some patients will undergo plasmaphoresis exchange (PLEX). This is done in most autoimmune disorders. These patients are typically off the floors in the morning but are okay for therapy in the afternoon. They go to dialysis daily for their treatment.
4. General neurology houses a number of patients with different disorders. Contact the team with any questions.

Cardiovascular Intensive Care Unit (CVICU) [5N]

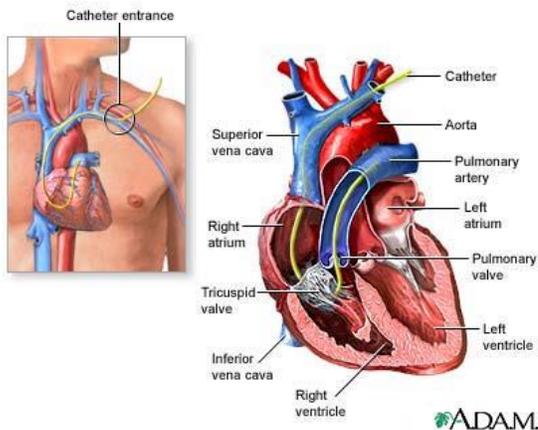
1. Patients are to be monitored continuously unless specified by nursing staff. There are portable monitors available when mobilizing patients in the CVICU.
2. It is best to communicate with nurse prior to working with patients.
3. There are 3 teams on this unit.
 - a. The cardiac surgery team (CSX) consists of a critical care intensivist, cardiac surgery fellow, and nurse practitioners
 - b. The cardiac critical care team (CCU) consists of an attending, cardiac fellow and residents.
 - c. The vascular team consists of an attending, residents and nurse practitioner.
4. For cardiac surgery, there are nurse practitioners present daily and each one is assigned patients to follow for the day. If you have questions about your patient, it is best to communicate with the nurse practitioner assigned to that patient. The patient's RN knows the nurse practitioner or sometimes the nurse practitioner's name and number is written on the patient's white board.
5. If your patient is on the cardiac critical care team, then you should communicate with the residents. There are usually on the floor and sitting at the middle nurse's station across from room 12.
6. If your patient is on the vascular team, the cardiac surgery nurse practitioners follow these patients until moved to step down floors. The vascular patients housed on this unit are usually complicated AAA repairs or aortofemoral bypasses. When these patients leave the CVICU, they transfer to the stepdown cardiac floors, usually 6S.
7. Cardiac surgeries usually seen in the CVICU include CABG (Coronary Artery Bypass Graft), valve replacements or repairs (for example: aortic valve replacement abbreviated AVR or aortic valve repair abbreviated AVr), heart transplants, LVAD (Left Ventricular Assist Device) and lung transplants.
8. If CABG or AVR/AVr is done emergently, then it would be performed via median sternotomy. If elective, then could be performed minimally invasive through an anterior/lateral thoracotomy or partial sternotomy. You must look at the operative note to determine which approach was taken in order to determine post op precautions.
9. A CABG can be performed on pump (OPCABG) or off pump (CABG) which will be stated in the operative note. On pump means that the surgery was performed with the patient on the heart lung bypass pump.
10. Double lung transplants have sternal precautions x 8 weeks. Try to see as often as possible.
11. Patients awaiting heart transplant will also be on this unit. They usually stay for several weeks. Some of these patients will have a Swan Ganz catheter intact or an IABP (intraaortic balloon pump) which usually stay in place until the heart transplant is performed.
 - a. If your patient has a Swan Ganz intact, then they are not allowed to walk. The CCU team usually orders PT for strength and sustained activity tolerance. Exercise options for these patients include an arm bike that can be used as a leg bike that can be left in the patient's room and a standing exercise program. Depending on the patient's compliance, PT can provide an exercise program and follow up once per week to make any changes.
 - b. If your patient has an IABP that is placed femorally, then they are on bedrest. If their IABP is axillary, then this patient is able to walk in the halls with PT, but you must have an RN present.

12. Heart failure patients are often admitted with volume overload and have a daily fluid restriction; check with nursing before getting them anything else to drink besides what is already in the room. There should be a sign on the door.
13. Atrial fibrillation/flutter - check with nursing to make sure they are rate controlled. DO NOT mobilize any patient in an UNCONTROLLED a-fib/flutter rate.
14. Flolan is a medicine used to treat pulmonary HTN; It can be administered via a face mask, intravenously or small canister on vent; when flolan is located on canister on vent, the canister must remain upright.
15. Sternal Precautions (patients with median sternotomy)
 - a. Patients are not to lift, push, or pull more than 10 pounds resistance (about the weight of a gallon of milk) for four weeks.
 - b. Patients cannot get in shower until pacer wires and/or chest tubes are pulled.
 - c. Patients are not to drive for 2-4 weeks. Physician will advise.
 - d. Patients are not to use vacuum cleaner for four weeks.
 - e. Patients are allowed to use an assistive device provided that they need for balance rather than support; they are NOT allowed to hold themselves up with an assistive device
16. Pacemaker/ICD precautions
 - a. Patients are not to reach above 90 degrees shoulder flexion/abduction with pacemaker or ICD involved extremity for 6 weeks.
 - b. Pacemakers are generally placed on the L side, but can be on the R.
 - c. Patients are given a sling to wear for 24 hours after pacemaker placement, but can be removed and discarded after this time.
 - d. Patients are not to lift more than 10 pounds for 6 weeks.
 - e. Exercise can be performed with UE 90 degrees or below.
 - f. Do not get incision wet for 14 days.
 - g. TENS is contraindicated.
 - h. A patient may become dizzy or collapse prior to ICD firing.
 - i. If ICD has recently fired, check with nursing staff or physician prior to treating patient.
 - j. If an ICD fires while you are working with a patient, you may feel an electrical current. Inform nursing if ICD fires.
17. External Temporary Pacemaker and Pacer Wires
 - a. Pacer wires are blue with a brown and white cord to the temporary pacemaker box.
 - b. Patient may not get out of bed for two hours following removal of pacer wires.
 - c. Do not get pacer wires wet
 - d. All post op patients will have pacer wires.
 - e. Watch pacer box closely with activity. Recommend holding box personally with activity.
18. Transvenous Pacer (TVP)
 - a. The pacer wires are blue with a gray cord to the temporary pacemaker box.
 - b. Patients are on bed rest with this type of temporary pacer.
 - c. It is usually located in the subclavian or femoral vein
19. Chest Tubes
 - a. Check with nursing to see if patient can come off of wall suction.
 - b. Usually patients are able to come off suction for short time during activity.

- c. You may mobilize patients directly after chest tube removal if approved by nursing.
- d. A smaller number of patients must have chest tubes remain on suction secondary to air leakage or subcutaneous air; in these cases there is portable suction available for ambulation. Check with nursing staff.
- e. Should a chest tube be accidentally pulled, petroleum gauze is best to cover chest tube site to allow air to escape but not enter. If you do not have access to petroleum gauze, use a towel or cloth. Contact nursing and return patient to bed.

20. Swan Ganz Catheter

- a. A thin hollow tube called a catheter is inserted through a vein in the neck or groin. It is carefully moved up into the right atrium (upper chamber) of the heart and threaded through two heart valves (the tricuspid and pulmonary valve) and placed into the pulmonary (lung) artery.
- b. This catheter is used to detect heart failure or sepsis, monitor therapy, and evaluate the effects of drugs. It allows direct, simultaneous measurement of pressures in the right atrium, right ventricle, pulmonary artery, and the filling pressure ("wedge" pressure) of the left atrium.
- c. It is a yellow wire with multiple lumens.
- d. Patients only allowed to transfer from bed to chair until line is pulled.



21. Femoral Artery Line

- a. A thin catheter inserted into an artery and is most commonly used to monitor the blood pressure real-time (rather than by intermittent measurement) and to obtain samples for arterial blood gas measurements. An arterial line is usually inserted in the wrist (radial artery), armpit (axillary artery), groin (femoral artery), or foot (pedal artery).
- b. Check with MD team regarding activity.

22. Femoral Vascular Catheter

- a. This is a temporary catheter that is placed in the groin and is used for hemodialysis.
- b. This catheter has a red and blue port.
- c. Patients are usually on bed rest with this catheter intact unless otherwise specified by MD team
- d. Patient may do bed exercises except for hip flexion on the side the catheter is placed.

23. Intra Arterial Balloon Pump (IABP)

- a. Patient on bed rest when IABP placed in the femoral artery
- b. When placed in axillary location, then patient is able to get OOB and ambulate.
- c. Must have RN present when ambulating patient on IABP.
- d. Once RN staff determine patient is stable, then therapy may ambulate patient without RN present.
- e. The IABP is a polyethylene balloon mounted on a catheter, which is generally inserted into the aorta through the femoral artery in the leg. The balloon is guided into the descending aorta, approximately 2 cm from the left subclavian artery.
- f. Used to decrease myocardial oxygen demand while at the same time increasing cardiac output. By increasing cardiac output it also increases coronary blood flow and therefore myocardial oxygen delivery. It actively deflates in systole increasing forward blood flow by reducing afterload thus, and actively inflates in diastole increasing blood flow to the coronary arteries. These actions have the combined result of decreasing myocardial oxygen demand and increasing myocardial oxygen supply
- g. Inflation of the balloon can be triggered according to the patient's electrocardiogram, their blood pressure, a pacemaker (if they have one), or by a pre-set internal rate.
- h. Indications: cardiogenic shock, acute mitral regurgitation and septal perforation, unstable angina, post cardiothoracic surgery, and bridge to heart transplant

24. Left Ventricular Assist Device (LVAD)

- a. The left ventricle is the large, muscular chamber of the heart that pumps blood out to the body. A left ventricular assist device (LVAD) is a battery-operated, mechanical pump-type device that's surgically implanted. It helps maintain the pumping ability of a heart that can't effectively work on its own
- b. HeartWare and HeartMate II is the device used at VUMC currently
 - i. Is a continuous flow rotary LVAD
 - ii. Has one moving part which is a small spinning rotor that receives power from the Systems Controller (the brain).
 - iii. The rotor moves blood thru the pump which is capable of providing flow from 3 to 10 L per minute
 - iv. Ruby and ceramic bearings (low thermal conductivity)
 - v. It is VALVELESS!!
- c. Since LVAD is valveless, you will be unable to detect an O2 sat or BP like usual.
- d. Patients will come out of OR with art line. You need to monitor MAP (mean arterial pressure) from art line. Usually, MD team likes it around 60.
- e. As far as HR, patient may have an underlying HR. However, if no underlying HR, then you will be unable to get accurate HR.
- f. Monitor these patients by signs and symptoms (ie diaphoresis, SOB, cyanosis, etc).
- g. Patient with be on AC power in bed. If you would like to go further than that line allows, you will need to place patient on batteries.
- h. Make sure controller (the brain) is securely attached to abdominal binder or has special binder for LVAD patients.
- i. Do not let controller fall off patient/binder. This is connected to the power cord which is exiting the patient's abdomen. This site needs to heal adequately to avoid infection.
- j. These patients have sternal precautions.

- k. How to switch from A/C (wall power) \leftrightarrow battery
 - i. Obtain charged battery from charger
 - 1. Press button on front of battery, if all 5 lights are green, then battery is fully charged
 - ii. Place charged battery in holder.
 - 1. Make sure battery clicks in!!
 - iii. Place holster on patient and place batteries in holster securing with velcro strap.
 - iv. Starting with black cord, unscrew cord from AC power and attach to closest battery ensuring plenty of slack on cord.
 - 1. Cords requiring unscrewing and pulling from power source then pushing and screwing to the battery to achieve proper connection.
 - 2. Once cord is pulled from a power source, there will be a loud beeping until attached to another power source.
 - v. Then move to white cord, unscrewing from AC power and attaching to available battery with the same steps as above.
 - vi. Make sure brain is securely attached to patient before mobility!!
 - vii. Perform these steps in reverse when going back to AC power.

Gynecology / Oncology [4east]

General Guidelines

1. Located on the 4th floor of MCE and 4th floor VUH
2. Typically PT gets more evaluations due to bedrest patients requiring therapy program
3. Can be pregnancy, post-partum, gynecology surgery, gynecology, or oncology patients
4. Check with nurse prior to entering patient's room for any acute medical status change
5. Typically need to bring any equipment with you

TOBS

1. Located on the 1st floor of The Vanderbilt Clinic (TVC). It is down the hall from the ED.
2. Rooms begin with "15".
3. All patients admitted to this unit are considered observation status with an expectation that they will be hospitalized for 72 hours or less. If the patient converts over from observation to Inpatient status than they are transferred to a floor in the hospital.
4. The patient population is strictly observation patients for all medical teams (with Riven/general medicine observation patients being largest patient population)
5. All beds have portable telemetry.
6. Supplies are located in the back right of the unit. Linens are located in a room on the back hallway.

Emergency Room (ED)

1. Emergency Room consists of 3 “pods”- “A” pod is located on the 1st floor of VUH to right of central hallway door as you enter. “B” pod is located on the 1st floor of VUH to left of central hallway door as you enter. “C” pod is located across the hall on the 1st floor of VUH.
2. “A” pod typically houses trauma, orthopedic injuries, TIA/CVA, PE/DVT, and critically ill patients. “B” and “C” pod typically house medicine patients, smaller orthopedic injuries, and more stable patients.
3. Utilization Management reviews all of the emergency room patients daily to determine if they meet criteria for hospital admission or if they should be in observation status. Patients may be listed as being admitted in the AM but then listed as observation status in the PM or even after discharge.
4. To check if a patient is in observation status you can print the Medilinks list and look for any patients that have any red writing in the MRN column (OP, E, A - medicare). Another way to check is by going into Medilinks select Reports >TVUH>Orders> Acute Medicare OP, E, A with Active Orders. This will show everyone in the hospital that is in observation status.
5. If the patient has an observation status order and an admit order, the patient is in observation status. The admit order does not negate the observation status one.
6. Management of Observation Patients
 - a. All emergency room patients should be looked at in Star Panel in the AM and the PM to determine if they are in observation status or not.
 - b. All patients in observation status should be evaluated in a timely manner pending medical work-up or clearance (ie. ruling out a fracture, determining a weight bearing status, ruling out a PE/DVT, ect...)
 - c. If the word observation is anywhere in the orders then that patient is in observation status.
 - d. If you are unable to evaluate an observation patient you should either document a failed attempt note or add a comment to that patient’s order in MediLinks.
 - e. Use the CBOR templates found in charting category when documenting observation patients.
7. Discharge recommendations for Observation Patients
 - a. In general, insurance will only pay for home with home health therapy or inpatient rehab
 - b. Insurance will not pay for an observation patient to discharge to a SNF however there are a few exceptions to this rule thus you will need to speak to the patient’s SW or CM.
 - c. If SNF is the appropriate discharge recommendation and the patient’s insurance will not cover SNF, contact the team to inform them you are recommending a SNF and why.

Recovery Room/ Medical Center East (MCE) Outpatient Surgery

1. Recovery room (VHR) is
 - a. Located on the 3rd floor of VUH. When leaving the office, turn left and head for VUH elevator bank. Go down hallway right before elevator bank and it is on the left hand side with double wooden doors. The code to enter is the hospital wide code.
2. MCE (HR with a letter and number such as HRD4) is located in Medical Center East
 - a. Is the surgical observation area or the same day surgery area
 - b. The letter indicates the pod they are in and number corresponds to the patient room number.
 - c. Located on 3rd floor MCE. When leaving the office, turn right into day surgery waiting room. Turn left at the reception desk and enter through double doors.
3. Perform PT/OT evaluations for orthopedic patients and day surgery patients.
4. You will have to take all necessary equipment with you to these areas as there is not storage for PT/OT equipment. It is best to call area prior to going to ensure your patient has not discharged or moved room.
5. Nurse or medical receptionist can call for any needed equipment for discharge (such as reacher, sockaid, long handled sponge, cane, crutches, walker, etc)

Medical Center North (MCN)

General Information

1. Floors: 3rd General Medicine, 4th Colorectal, 5th Palliative Care and General Medicine, 6th Orthopedic, 7th Geriatric/ ACE Unit (Acute Care of the Elderly)
2. Loaner rehabilitation equipment for patient usage is kept in 6413 (rehab gym). Loaner equipment is labeled with MCN Rehab or VUH Rehab. If patient requires equipment for discharge, therapist or case manager should order prior to discharge. When patient is discharged the equipment should be picked up by staff and returned to 6413. Dirty/used equipment is placed on right side of room. Clean equipment is on the wall at back of room. Wheelchairs are locked with a chain (keys are located in the drawer on your right as you enter 6413).
3. Theraband/Theraputty is located in the drawers on the right as you enter 6413.
4. Rolling walker (standard and bariatric), platform attachments, axillary crutches, and straight canes can be obtained for home usages from Materials Management/Service Center. Adolescent rolling walker can be ordered from Children's Hospital or obtained by case manager.
5. Specialty equipment (such as AFO, spinal orthosis, hip orthosis) can be ordered by MD/PA/NP from outside vender.
6. Smooth Moves equipment is available on all units equipment rooms. If you borrow other Smooth Moves equipment from another unit, you are responsible for speaking to CSL prior to taking it, cleaning it, and returning equipment.

Floors

1. 3rd floor
 - a. General medicine patients.
 - b. Room numbers begin with "34" and encircle nurses station except for 2 rooms in hallway near nurses station.
 - c. Member of acute rehab attends Riven Huddle 3 days per week (Monday, Wednesday, and Thursday) on 8th floor ICU conference room at 11am.
 - d. Patient information board is located on wall across from nurse station .
 - e. Supplies and linens are located in the supply room across from the stairwell behind the nurse station.
2. 4th floor
 - a. Colorectal patients, general medicine, and overflow orthopedic/trauma patients.
 - b. Room numbers begin with "44".
 - c. Colorectal patients are usually very mobile after surgery and PT evaluations are entered for difficulty mobilizing after surgery.
 - d. Patient information board is located on the wall behind the nurse station.
 - e. Supply room is located across from the hallway stairwell and linens are located across from the back stairwell.
3. 5th floor
 - a. General medicine and palliative care patients.
 - b. Room numbers begin with "54".
 - c. Patient information board is located on the wall behind the medical receptionist at the nurses desk.
 - d. Supplies are located across from the hallway stairwell. Cold nutrition items are in refrigerator in locked room off pantry across from nurses desk. Linens are kept in 2 cabinets on back side of nurses desk.

- e. Therapy is often asked to evaluate and treat palliative care patients who may or may not be at end of life. Communicate with nurse as well as case manager regarding teams specific needs from therapy.
 - f. If picture of butterfly is on the patients door they are actively dying and therapy is not appropriate.
4. 6th floor
- a. Orthopedic patients.
 - b. Room numbers begin with “64”.
 - c. Member of acute rehab attends Orthopedic Huddle Monday to Friday at 9:15am (at nurses station)
 - d. If further information is needed it is typically quicker to page team NP/PA and then resident. Only at last resort do you page resident.
 - e. Patient information board is located behind the medical receptionist at the nurse desk.
 - f. Supplies are kept in locked room across from the hallway stairwell. Linens are kept in 2 cabinets on back side of nurses desks. Cold nutrition items are in refrigerator in locked room off pantry across from nurses desk.
 - g. Rehab staff are advised to read operative report for any orthopedic surgery specific information related to post-op care of patient. If any discrepancy in orders look to attending MD operative report and then contact NP/PA for team for order clarification. NP/PA will contact attending MD and relay information to therapy. Do not guess which order is correct. If no NP/PA page the junior resident on the team.
 - h. PA/NP/resident pager numbers are posted on the cabinets over the desk area in 6413.
 - i. Braces/specialty splints are routinely orders after certain procedures/injuries. Must be ordered by NP/PA/reside. Therapy does not obtain and do not complete initial fittings (should be done by nurse/cast tech/NP/PA/resident).
 - j. Most orthopedic patients will require home exercise program. Individualized can be printed off via the software system. Diagnosis specific home exercise programs have been preprinted and are located in top drawer of small file cabinet near the door in 6413.
5. 7th floor
- a. ACE unit (acute care of the elderly) houses geriatric patients.
 - b. Room numbers begin with “74”. Rooms encircle nurses station and down entire hallway.
 - c. Member of acute rehab attends Geriatric Huddle Monday to Friday at 11:00 am (across from 7432).
 - d. ACE unit is a locked unit.
 - e. Supplies and linens are located in locked rooms in the unit.
 - f. Patient information board is located behind the nurses desk.

THA/TKA Overview

1. The following treatment guidelines are for the standard joint arthroplasty patient. Any specific restrictions/precautions would be present in the PT post-op orders and would supercede these treatment guidelines.
2. THA:

- a. Day of Surgery/Initial Evaluation
 - i. Instruct/review THA dislocation precautions
 - ii. Initiate APs & BLE isometrics in supine – encourage patient to perform these exercises q 30 minutes while awake
 - iii. May begin supine AAROM to operative LE as tolerated
 - iv. Instruct in bed mobility using leg lifter on operative limb if needed
 - v. Transfer training using appropriate assistive device, WBAT on operative limb
 - vi. Gait training with assistive device, WBAT operative LE
 - vii. Ice packs to operative hip for pain & edema management as patient tolerates – must use 20 minutes for benefit; try 1 ice pack in groin/inguinal area of surgical hip & another at lateral or posterior aspect of surgical hip
 - b. POD 1 – Discharge
 - i. Review THA dislocation precautions each therapy visit
 - ii. Supine exercises – APs, LE isometrics, AAROM to operative limb with no restriction to single plane movements
 - iii. Gait training – progress from rolling walker/crutches to cane at PTs discretion
 - iv. Stair training prior to discharge home
 - v. BID treatment sessions
3. TKA/Bilateral TKA/UKA:
- a. General Information:
 - i. Pillow under the operative knee is not allowed! If sidelying, patients may have a pillow between their knees. A pillow or folded towel placed under the foot/ankle of the operative leg with the patient lying supine in bed (knee & toes facing ceiling) is encouraged for a passive hamstring stretch – goal is to maintain this stretch for 30 minutes TID
 - ii. Cooling machine or ice packs are used for pain & edema management & should be worn prn & definitely after PT sessions unless the patient does not tolerate the cool; the cold therapy must be used for 20 minutes for benefit; patients are instructed to keep cooling machine/ice off the operative knee twice as long as duration of cold on knee (if used ice for 20 minutes, leave off for 40 minutes before reapplying)
 - b. Day of Surgery/Initial Evaluation
 - i. Initiate APs & isometrics (quad sets, hamstring sets) to BLE
 - ii. Begin range of motion exercises to operative LE in supine &/or sitting with no restriction to motion
 - iii. Bed mobility training using leg lifter on operative LE only if needed
 - iv. Transfer training with assistive device, WBAT on operative limb
 - v. Gait training with appropriate assistive device, WBAT
 - c. POD 1 – Discharge
 - i. P/A/AAROM operative LE – any exercise you like working on knee flexion & extension as well as hip abduction; closed chain exercises (mini-squats, SLS, weight shifting in standing, etc)
 - ii. Soft tissue work on operative LE hamstrings (quads are typically too edematous to initiate this in the immediate post-op phase)

- iii. Femoral/tibial joint mobilization (Grades I & II) to increase joint motion – the only TKA you would not mob would be a hinged TKA (most often used with tumor patients)
- iv. Quad sets, SAQ/TKE, SLR, any quad strengthening exercises you wish
- v. Hamstring stretching: any you like. Drs. Shinar & Polkowski encourage patients to place folded pillow under their operative foot/heel when lying supine (keep & toes facing ceiling) to accomplish passive HS stretch – goal for this stretch position is 30 minutes TID (ask family & nursing staff to assist with this stretch)
- vi. Gait training, WBAT on operative LE
- vii. Stair training prior to discharge home
- viii. BID treatment sessions

Orthopedic Rehabilitation Guidelines

1. Pelvic Fractures

- a. Trauma to the pelvis may result in a variety of fractures – Open Book, Saddle, Lateral Compression, Vertical Shear, Pubic Rami, Ilium, etc. Fractures may or may not be surgically repaired based upon the fracture pattern, location, bone quality and surgeon preference.
- b. Precautions / Restrictions:
 - i. Weight bearing may be limited based upon the fracture type, location, etc.
 - ii. Hip range of motion and strengthening exercises to the patients tolerance.
 - iii. Patients, in general, may sit upright but may prefer to “slouch” sit.
- c. Treatment:
 - i. Daily treatment consisting of mobility/gait training on level surfaces & stairs,
 - ii. APs/isometrics BLE prn, AAROM LE with motion to patient unless otherwise
 - iii. ordered, HEP (Early LE Rehab usually appropriate)

2. ORIF Acetabulum Fracture

- a. Internal fixation performed following traumatic displaced fracture of the acetabulum. Traumatic posterior hip dislocation (TPHD) is frequently associated with acetabulum fractures; closed reduction of the hip is performed ASAP followed by operative fixation.
- b. Precautions / Restrictions:
 - i. Protective weight bearing, typically TDWB, on the operative leg.
 - ii. Use of an assistive device for ambulation ~ 12 weeks.
 - iii. Lower extremity range of motion and strengthening exercises as tolerated; no restrictions to motion unless specifically stated by the attending surgeon.
- c. Treatment:
 - i. Daily to BID treatment (dependent upon patient progress); bed mobility training using leg lifter on involved LE, gait training on level surfaces & stairs (NWB/TDWB – non-op, TDWB – after ORIF), APs/isometrics BLEs prn, AAROM involved LE with no motion restrictions unless specific motion (flexion) restrictions are ordered; home exercise program with f/u PT services as indicated.

3. Hip Fractures

- a. Most hip fractures require operative fixation. The type of fixation is dependent upon the fracture location (femoral head, femoral neck, Intertrochanteric, Subtrochanteric), fracture pattern, patient's age, bone quality, open wound/extensive soft tissue damage and surgeon preference.
 - b. Femoral head and neck fractures may be repaired using Percutaneous Pins (CRPP), Dynamic Hip Screw (DHS), Trochanteric Femoral Nail (TFN), Bipolar Hemiarthroplasty or Total Hip Arthroplasty (THA).
 - c. Intertrochanteric fractures may be fixated with CRPP, DHS, TFN, Bipolar or THA. Subtrochanteric fractures may be repaired using an Intermedullary Nail (IMN), or TFN.
4. Bipolar Hemiarthroplasty
- a. A fixation device used for femoral head, femoral neck & IT hip fracture repair. The prosthesis is one piece, a femoral component with an acetabular cup fixated to the femoral stem; the femoral head of the prosthesis articulates within the acetabular cup, which articulates within the patient's acetabulum. No surgical intervention is performed in the acetabulum.
 - b. Precautions / Restrictions:
 - i. Weight bearing as tolerated ambulation using an assistive device.
 - ii. Avoid extreme Simultaneous / Combination movements of the operative hip. Patients are allowed to fully flex, extend, abduct, adduct, or rotate their operative hip in cardinal planes of motion. Movement restrictions are observed ~ 6 weeks post-operatively.
5. ORIF Hip Fractures
- a. Precautions / Restrictions:
 - i. Weight bearing status per attending orthopedic surgeon; varies from NWB to WBAT; generally, WBAT is allowed unless the surgeon is concerned over fracture hardware purchase, the presence of osteoporetic bone or extensive soft tissue damage/open wounds.
 - ii. No hip dislocation precautions following ORIF of hip fractures with No restrictions to hip range of motion; all motions are to patient tolerance.
 - b. Hip Fracture Treatment:
 - i. BID treatments; APs/isometrics q 2 hours while awake; AAROM operative LE with no restrictions to hip motion for ORIF, avoid 'combination' movements of operative hip with bipolar hemiarthroplasty; bed mobility training using leg lifter on operative LE; gait training using appropriate assistive device with WB as ordered by the attending orthopedic surgeon; stair training prior to discharge home; home exercise program & f/u PT services as indicated.
6. Total Hip Arthroplasty (THA)
- a. An elective procedure for patients with hip pain secondary to OA, RA, AVN, traumatic arthritis, or tumor. The prosthesis consists of an acetabular component (metal cup and liner which may be metal, ceramic or polyethylene) and a femoral component. The prosthesis may be implanted by cement or cementless fixation; cementless fixation is the choice for Vanderbilt surgeons. Revision THA components at Vandy are cementless. Rehab following Revision THA follows the same guidelines as Primary THA.
 - b. Precautions / Restrictions:

- i. Dislocation precautions – avoid combination movements of the operative hip for as long as the spacer is in place.
 - ii. NWB-TDWB on the operative lower extremity.
 - iii. Hip range of motion, strengthening and positioning (avoidance of rotational extremes) to the patient’s tolerance.
 - c. Treatment:
 - i. Daily sessions, depending upon patient progression with mobility; APs/isometrics q 30 minutes during waking hours; bed mobility training using leg lifter on operative LE; supine AAROM to operative limb; gait training, WB per the surgeon on level surfaces & stairs; ice packs to operative hip prn for pain control as patient desires; home exercise program & f/u PT as needed.
9. Hip Core Decompression
- a. A surgical procedure performed in the early stages of avascular necrosis (AVN) of the femoral head to promote revascularization of the femoral head. In this procedure, a core of bone is removed from the femoral head utilizing a lateral approach. This procedure is an attempt to postpone the need for THA.
 - b. Precautions / Restrictions:
 - i. Strict NWB on the operative extremity for 12 weeks.
 - ii. No limitations on hip range of motion or strengthening exercises.
 - c. Treatment:
 - i. Daily – BID sessions; many of these patients are discharged home POD 1 after PT session; APs/isometrics q 30 minutes while awake; bed mobility training using leg lifter on operative LE; NWB operative LE gait training with assistive device on level surfaces & stairs; AAROM operative LE with NO restrictions to motion; home exercise program with f/u PT as indicated.
10. Total Knee Arthroplasty (TKA)
- a. An elective surgery for patients with debilitating knee pain secondary to arthritic conditions or tumor. The prosthesis consists of tibial, femoral, and patellar components. Implants at VUMC are cemented. Patients undergoing revision or bilateral TKA follow the same rehab program as unilateral TKA.
 - b. Precautions / Restrictions:
 - i. Weight bearing as tolerated ambulation with an assistive device.
 - ii. Per AAOS guidelines for return to sports - avoid running and jumping in contact sports (lifelong) unless a mobile-bearing implant is used.
11. Uni-Condylar Knee Arthroplasty (UKA)
- a. An elective surgical procedure for knee pain due to OA, RA, or traumatic arthritis with uni-compartmental joint disease. One compartment of the knee is resurfaced, either medially or laterally, with the prosthesis. Knee rehab is as for TKA. The goal is for discharge home POD 1 with this patient population.
12. Patella-Femoral Arthroplasty(PFA)
- a. An elective surgical procedure for knee pain due to cartilage degeneration Over the distal femur. A metal implant is placed in the trochlear groove and a plastic patellar implant on the resurfaced patella. Knee rehab is the same as for TKA with goal of discharge home on POD 1.
 - b. Treatment:

- i. Same for TKA/UKA/PFA; BID sessions until discharge; all adult reconstruction surgeons are treating their patients uniformly except Dr. Holt's
- ii. patients are to sleep in a knee immobilizer on the operative knee for
- iii. 2 weeks after their surgery for a passive hamstring stretch; attempt to initiate PT DOS, if unable begin POD 1 a.m. with APs/BLE isometrics
- iv. q 30 minutes while awake, bed mobility training using leg lifter on the
- v. operative LE, WBAT transfer/gait training with appropriate assistive device on level surfaces, supine &/or sitting AAROM operative knee with emphasis on knee flexion/extension & hip abduction, hamstring stretching exercises, quad strengthening, cooling machine to operative knee while in bed; stair training; instruction in home exercise program (handouts given by PT) with f/u PT services arranged prior to discharge home by case manager.

13. TKA Resection

- a. Performed for infected TKA. The knee prosthesis is surgically removed and the alignment/ space between the femur and tibia is maintained by an articulating antibiotic spacer. Long-term antibiotic therapy is instituted following TKA resection. When the infection is cleared, TKA Revision is performed.
- b. Precautions / Restrictions:
 - i. WB per surgeon orders with articulating spacers, typically TDWB but may be WBAT.
 - ii. No motion restrictions with articulating spacer; patients are typically placed in a protective hinged knee brace until TKA revision.
 - iii. Avoid any varus/valgus strain to knee joint as the spacer can dislocate.
- c. Treatment:
 - i. Daily sessions, dependent upon patient progression with exercises and mobility; POD 1- Discharge – APs/isometrics every 30 minutes while awake, bed mobility training using leg lifter on operative LE, transfer/gait training on level surfaces and stairs using assistive device with weight bearing status as ordered by surgeon; if an articulating spacer is present, gentle A/AAROM exercises to operative extremity (hip, knee, ankle, foot) in hinged knee brace (perform exercises & mobilization wearing knee brace), general muscle strengthening to operative extremity (no weights or theraband to knee joint musculature), home exercise program & f/u PT services as necessary.

14. Foot

- a. Precautions / Restrictions:
 - i. Weight bearing status is dependent upon the fracture location and/or surgical reconstruction. Ankle arthrodesis, calcaneal and talar fractures are NWB; ankle fractures WB may vary from NWB to WBAT.
 - ii. Metatarsal Fractures should be protected with a hard sole shoe or boot when ambulating.
- b. Treatment:
 - i. Bed mobility/ gait training using assistive devices on level surfaces and stairs; “knee walkers” are especially beneficial in this patient population if the patient has difficulty maintaining correct weight bearing status; “knee walkers” are currently covered by most commercial insurance plans and

several local DME companies have rental plans – contact the orthopedic SW or case manager if patients wish to pursue rental of this device.

15. Spine

a. Precautions / Restrictions:

- i. Current orthopedic spine surgeons typically do not use bracing following elective thoracic &/or lumbar surgical procedures; cervical collars are used following elective c. spine procedures. Bracing is used for traumatic spinal fractures by orthopedic surgeons and are typically worn for 12 weeks. If the surgeon orders thoracic &/or lumbar bracing, patients must wear their spinal orthosis any time they are in an upright position. The brace should be applied while the patient is lying supine, unless otherwise stated by the surgeon. This is accomplished by “log-rolling” the patient side-to-side (avoiding trunk rotation).
- b. General orthopedic post-operative spinal restrictions are avoid any spinal rotation or “twisting” activities, avoid excessive forward spinal flexion (bend/flex at hips instead of spine)and do not lift any object weighing more than 1 gallon of milk (~ 9 lbs) for 6 -12 weeks.
- c. No spine specific exercise for 6-12 weeks until healing has occurred. Patients may perform active or active-assisted exercises with the upper or lower extremities in the presence of general muscle weakness.

16. Total Shoulder Arthroplasty (TSA)

- a. An elective surgical procedure for severe shoulder pain secondary to OA, RA, AVN, traumatic arthritis, or tumor of the shoulder. A surgical procedure also performed following traumatic 3- or 4-part Humeral Head Fracture.
- b. Initiation of rehab varies by surgeon from post-operative Day 1 to 2 weeks post-op.
- c. Precautions / Restrictions:
 - i. Shoulder range of motion is performed in the plane of the scapula; ~ 40 degrees of shoulder abduction.
 - ii. Timing of beginning rehab varies between surgeons (Dr. Kuhn - no motion to operative shoulder for 2 weeks) as well as does treatment guidelines with specifics communicated to rehab staff by specific surgeon.
 - iii. NWB on the operative upper extremity for 6 weeks. Most surgeons use a specialty arm sling which is placed following surgery during this time frame.

17. External Fixators

- a. A closed reduction method of fracture repair using percutaneous pins/wires allowing easy access to soft tissues in the event of needed wound care.
- b. Precautions / Restrictions:
 - i. Extremities may be moved, supported, and/or suspended by lifting the external fixator; this will not displace the fixator.
 - ii. No restriction to range of motion to joints proximal and/or distal to the fixation device.
 - iii. Weight bearing status per surgeon.

18. Intermedullary Nail

- a. An internal fixation device used to treat traumatic fractures in the long bones. There are proximal and distal incisions, which may limit range of motion at 2 joints and contribute to significant edema of the entire extremity.

- b. Precautions / Restrictions:
 - i. Primarily a weight bearing implant, however, fracture pattern as well as the presence of any soft tissue injuries dictates specific weight bearing status; open fractures are usually NWB.
 - ii. Exercise program should be aggressive to the entire operative extremity, focusing on joint range of motion and muscle strengthening.
19. Allograft
- a. A complex, intricate surgical procedure involving the removal of part or all of a damaged bone which is then replaced / reconstructed with a cadaveric human bone. Most often performed on patients with skeletal tumors or necessary because of bone deficiency / loss due to previous surgical procedures or massive skeletal trauma.
 - b. Precautions / Restrictions:
 - i. Weight bearing status per orthopedic surgeon; generally, protective / limited weight bearing.
 - ii. With tumor patients, the specific rehab program will be outlined by the attending orthopedic surgeon. DO NOT initiate any exercise program with Dr. Schwartz's tumor resection patients unless specific exercises are ordered by the surgeon; if in doubt, contact the resident on the orthopedic oncology service regarding specific rehab interventions.
 - c. Treatment:
 - i. Daily treatment sessions focusing on bed mobility training using leg lifter on operative LE as needed, transfer training, gait training with appropriate assistive device and WB status per surgeon on level surfaces & stairs; patients with WBAT status are not required to use an assistive device unless the patient &/or therapist deem it necessary for safe mobilization.

General Orthopedic Guidelines

1. When moving the patient, always support the injured extremity at the joints.
2. Use the palm of your hands, not fingertips, to move or support the patient.
3. The patient will experience less discomfort if you support the injured extremity and allow the patient to do the actual moving.
4. When assisting the patient out of bed, exit the bed on the side of the unaffected extremity.
5. Take your time. Moving patients too quickly leads to pain and can result in injury.
6. Pillows should be used to elevate an injured extremity, giving support to the entire extremity, unless contraindicated by the injury/surgical procedure. When the patient is sidelying, pillows to the back and hips and between the knees provide support and proper body alignment.
7. Most orthopedic patients can and should be turned side-to-side. As a general rule, the patient should be turned toward their unaffected side whenever possible; tilting to the affected side is also possible.
8. Patients with orthopedic injuries, especially spinal injury/surgery, should be turned as a unit avoiding spinal rotation. Beds should be made with a "turning sheet" placed on top of the bottom sheet. This can be used to support the patient's shoulders and hips as they are slowly turned sideward.
9. Most spinal and lower extremity braces are to be applied with the patient lying supine in bed. Most braces may be removed for skin checks/assessment. If in doubt, ask the physician for skin check and brace wear clarification.

10. Potential Complications

a. Compartment Syndrome

- i. The clinical entity of increased pressure within a myofascial compartment leading to ischemia and possible necrosis of the elements within the compartment. **THIS IS A SURGICAL EMERGENCY**, which usually requires release of the compartments by fasciotomy.
- ii. Risk Factors
 1. Blunt trauma, with or without fractures, particularly “bumper” injuries to the tibia
 2. Circumferential burns
 3. Injection/infiltration injuries
 4. Revascularization after arterial anastomosis
 5. An unconscious patient with a compressed limb
- iii. Clinical Observation
 1. Pain with passive stretch of the muscle groups contained within that compartment
 2. Pain out of proportion of the injury
 3. Pallor/poor capillary refill
 4. Paresthesias/Paralysis, particularly in the distribution of the nerves within the compartment
 5. Pulselessness distally
- iv. Objective Findings
 1. Increased compartmental pressures as measured by a pressure monitor
 2. PAIN with passive stretch is the most reliable clinical finding
 3. Pulselessness alone is a poor indicator – a compartment syndrome can exist with a
 4. Strong distal pulse
 5. Paresthesias may be the first and only finding
- v. Treatment
 1. Monitoring using a pressure monitor every 2 hours
 2. Surgical decompression (fasciotomy), typically with delayed wound closure

b. Deep Vein Thrombus (DVT)

- i. Thrombophlebitis describes a condition in which there is both a clot and inflammation.
- ii. Risk Factors
 1. Obesity
 2. Immobility
 3. Individuals with traumatic injury, including fractures
 4. Prior history of DVT
- iii. Clinical Observation-
 1. Redness, pain, edema, tenderness in the extremity
 2. Increased girth in the extremity as compared to the non-affected limb
 3. Tenderness to palpation along the veins
 4. Positive Homan sign is possible
- iv. Treatment/Prevention

1. TED stockings
 2. Sequential compression device use
 3. Ankle pumps and isometric exercises
 4. Mobilization
 5. Anticoagulation therapy
- c. Fat Embolism Syndrome
- i. Fat embolism is the presence of fat globules in the bloodstream that become deposited in the pulmonary circulation. Fat embolism syndrome is the pulmonary insufficiency commonly associated with fat emboli.
 - ii. Risk Factors
 1. Total joint replacement
 2. Multiple trauma injuries
 3. Crush injuries
 4. Fractures in bones containing marrow fat
 - a. Femur
 - b. Tibia
 - c. Humerus
 - d. Pelvis
 - e. Ribs
 - iii. Clinical Observation-
 1. Chest pain may be present
 2. Apprehension
 3. Behavior changes (may be subtle initially)
 4. Restlessness
 5. Agitation
 6. Irritability
 7. Confusion
 8. Lethargy
 9. Respiratory changes
 10. Dyspnea
 11. Tachypnea
 12. Wheezes
 13. Tachycardia
 - iv. Treatment
 1. Oxygen
 2. Crystalloid fluid replacement
 3. Heparin therapy
- d. Hemorrhage
- i. Hemorrhage is the abnormal loss of blood from the body.
 - ii. Risk Factors
 1. Dislodged blood clot due to stress at an operative site
 2. Infection
 3. Erosion of a blood vessel by a fracture
 4. Fractures
 5. Surgery
 6. Abnormal clotting mechanisms
 7. Anticoagulants
 8. Ulcers

- iii. Clinical Observation-
 - 1. Anxiety, dizziness, weakness
 - 2. Restlessness
 - 3. Rapid, shallow respiration's
 - 4. Cold, moist skin
 - 5. Decrease in blood pressure
 - 6. Excessive drainage from wounds or drain output
 - 7. Decreased urine output
- iv. Treatment
 - 1. Apply direct pressure/pressure dressing at bleeding site
 - 2. Volume replacement
 - 3. Vitamin K or factor replacement
 - 4. Iron
 - 5. Surgery to locate bleeding site or suturing/resuturing wound or incision

ORTHOPEDIC ABBREVIATIONS, PROCEDURES AND DEFINITIONS:

AAROM	Active, Assisted Range of Motion
AE	Above Elbow
AEA	Above Elbow Amputation
AFO	Ankle Foot Orthosis
AKA	Above Knee Amputation
Allograft	A cadaveric human bone transplant
Amputation	Surgical removal of part or all of a body tissue or extremity
AROM	Active Range of Motion
Arthrodesis	Fusion of a joint to relieve pain by eliminating motion
ASF	Anterior Spinal Fusion
AVN	Avascular Necrosis
Avulsion	Ligaments torn loose from their attachment to the bone
BB	Both bones
BBFA	Both bones of the forearm
BE	Below Elbow
BEA	Below Elbow Amputation
Bipolar Hemiarthroplasty	Surgical implant for treatment of hip fractures
BK	Below Knee
BKA	Below Knee Amputation
BLE	Bilateral Lower Extremity
C sp	Cervical Spine

Compartment Syndrome	Increased pressure within a myofascial compartment
Contusion	Bruising with bleeding into the soft tissue
CR	Closed Reduction
CRPP	Closed Reduction with Percutaneous Pinning
CTLS	Cervical, Thoracic, Lumbar Spine
CTLSO	Cervical/Thoracic/Lumbar Spinal Orthosis
DCP	Dynamic Compression Plate
DCS	Dynamic Compression Screw
DF	Dorsiflexion
DHS	Dynamic Hip Screw
Disarticulation	Amputation through a joint
Dislocation	Separation of contact between the bones of a joint
DJD	Degenerative Joint Disease
DSG	Wound Dressing
ER	External Rotation
EV	Eversion
Ex Fix	External Fixator
Fasciotomy	Surgical procedure to decompress fascial compartments
FFWB	Foot-Flat Weight Bearing
Fracture	Partial or complete breakage of bone
FWB	Full Weight Bearing
Fx	Fracture
Halo Brace	Continuous skeletal traction/bracing for the treatment of Cervical spine fractures to maintain boney alignment
Hemipelvectomy	Surgical resection of the hemi-pelvis & LE; may be performed as an internal limb-salvage procedure
HKAFO	Hip/Knee/Ankle/Foot Orthosis
IMN	Intramedullary Nail
INV	Inversion
IR	Internal Rotation
Jt	Joint
KAFO	Knee/Ankle/Foot Orthosis
L-sp	Lumbar Spine
LBP	Low Back Pain
LE	Lower Extremity
LLC	Long-Leg Cast
LL	Leg Length; Lumbar Laminectomy
LLD	Leg Length Discrepancy
LLE	Left Lower Extremity
LSO	Lumbar/Sacral Orthosis
LUE	Left Upper Extremity
MCA	Motorcycle Accident
M/L	Medial/Lateral
MVA	Motor Vehicle Accident
NWB	Non-Weight Bearing
OA	Osteoarthritis
OOB	Out-of-Bed
ORIF	Open Reduction Internal Fixation

Osteotomy	Surgery to attempt to realign joint surfaces
OT	Occupational Therapy
PF	Plantar Flexion
PP	Percutaneous Pinning
PROM	Passive Range of Motion
PSF	Posterior Spinal Fusion
PT	Physical Therapy
PWB	Partial Weight Bearing – 50% weight bearing
RA	Rheumatoid Arthritis
RCP	Reconstruction Compression Plate
RLE	Right Lower Extremity
ROM	Range of Motion
RUE	Right Upper Extremity
SA	Shoulder Arthroplasty
SAC	Short-Arm Cast
SCFE	Slipped Capital Femoral Epiphysis
Scoliosis	Curvature of the spine
SI	Sacro-Iliac Joint
SLC	Short-Leg Cast
SLR	Straight Leg Raise
SLWC	Short-Leg Walking Cast
S/P	Status post
Strain	Injury to a muscle, tendon or ligament caused by excessive pull, use or forcible stretch
Subluxation	Partial separation of a joint
TDWB	Touch-Down Weight Bearing
TEA	Total Elbow Arthroplasty
THA	Total Hip Arthroplasty
THR	Total Hip Replacement
TKA	Total Knee Arthroplasty
TKR	Total Knee Replacement
TLS	Thoracic/Lumbar Spine
TLSO	Thoracic/Lumbar Spinal Orthosis
TSA	Total Shoulder Arthroplasty
T-sp	Thoracic Spine
TSR	Total Shoulder Replacement
TTA	Trans-Tibial Amputation
TTP	Tender-to-Palpation
TTWB	Toe-Touch Weight Bearing - < 15 lbs.
UE	Upper Extremity
UKA	Uni-condylar Knee Arthroplasty
WB	Weight Bearing
WBAT	Weight Bearing as Tolerated

ABBREVIATIONS COMMON TO REHAB:

A	Assist
ABD	Abduction
ADD	Adduction
ADL	Activities of Daily Living
AMB	Ambulate
ANT	Anterior
AAROM	Active, Assisted Range of Motion
AP	Anterior/Posterior; Ankle Pumps
B	Bilateral
BADL's	Basic Activities of Daily Living
BID	Twice Daily
BLE	Bilateral Lower Extremities
BUE	Bilateral Upper Extremities
CGA	Contact-Guard assistance
CHI	Closed Head Injury
COTA	Certified Occupational Therapy Assistant
CP	Cold Packs
CTx	Cervical Traction
D	Dependent
DF	Dorsiflexion
DIP	Distal Interphalangeal Joint
Dx	Diagnosis
ECF	Extended Care Facility
ER	External Rotation
ES	Electrical Stimulation
EV	Eversion
EX	Exercise

/, EXT	Extension
EVAL	Evaluation
FES	Functional Electrical Stimulation
, FL	Flexion
FFWB	Foot-Flat Weight Bearing
FWB	Full Weight Bearing
Fx	Fracture
GT	Gait
HEP	Home Exercise Program
HH	Home Health
HHA	Home Health Agency; Hand-Held Assistance
HI	Home Instruction
HP	Hot Pack
HS	Hamstrings
HOB	Head-of-Bed
I	Independent
IADL's	Intermediate Activities of Daily Living
INV	Inversion
IP	Interphalangeal Joint
IR	Internal Rotation
Jt	Joint
LBQC	Large-Based Quad Cane
LLE	Left Lower Extremity
LTG	Long-Term Goal
LUE	Left Upper Extremity
Ms	Muscle
MAX	Maximal
MCP	Metacarpal Phalangeal Joint
MH	Moist Heat
MIN	Minimal
MMT	Manual Muscle Test
Mob	Mobilization
MOD	Moderate
MVT	Movement
NH	Nursing Home
NWB	Non-Weight Bearing
OHF	Overhead Frame
OOB	Out-of-Bed
OT	Occupational Therapy/Therapist
PIP	Proximal Interphalangeal Joint
PF	Plantar Flexion
PNF	Proprioceptive Neuromuscular Facilitation
POST	Posterior
PRE	Progressive Resistive Exercises
PROM	Passive Range of Motion
PROX	Proximal
PT	Physical Therapy/Therapist
PT	Posterior Tibialis

PTA	Physical Therapy Assistant
PTx	Pelvic Traction
PWB	Partial Weight Bearing
QD	Every Day
QS	Quadriceps; Quad Sets
R	Right
REPS	Repetitions
RLE	Right Lower Extremity
ROM	Range of Motion
RUE	Right Upper Extremity
Rx	Treatment; Prescription
SAQ	Short-Arc Quads
SBA	Stand-By Assistance
SBQC	Small-Based Quad Cane
SCU	Sub-Acute Unit
SLR	Straight Leg Raise
SNF	Skilled Nursing Facility
SP	Speech Pathology
STG	Short Term Goal
SW	Social Work
TDWB	Touch-Down Weight Bearing
THER EX	Therapeutic Exercise
TENS	Transcutaneous Electrical Nerve Stimulation
TID	Three Times Daily
TT	Transfer Training
TTWB	Toe-Touch Weight Bearing
TX	Traction; Treatment; Trauma
US	Ultrasound
UV	Ultraviolet
VMO	Vastus Medialis Oblique
WB	Weight Bearing
WBAT	Weight Bearing as Tolerated
W/C, WC	Wheelchair
WFL	Within Functional Limits
WNL	Within Normal Limits
WP	Whirlpool
Wt	Weight

Vanderbilt Psychiatric Hospital (VPH)

General Information

1. Call to VPH prior to walking to VPH patient in order to ensure patient availability
2. Chart review at VUMC
3. Know patient's full name prior to visiting VPH
4. Wear your name badge
5. Sign in and out at VPH desk
6. You will be escorted to room and out after visit
7. If patient requires reacher/sockaid/cane/walker therapist can order, however, typically requires equipment to be kept by nursing staff. If patient requires equipment after the MD will write a script and outpatient
8. OT/PT not appropriate for patients who simply refuse to participate in activities or to get out of bed. The patient needs to have specific skilled therapy acute care needs
9. Patient's with developmental delays or diagnoses such as CP would be better served by a pediatric clinician; the pediatric therapy pager is 835-1161
10. It is up to VPH to accept a patient for admission that has IPR/SNF recommendation

Coverage:

1. If an adult VPH patient has continued OT/PT needs, acute rehab OT/PT is responsible for continued care of that patient
2. If a VPH patient comes in to the VOI and needs a splint, one of the acute care OTs needs to make the splint; VPH is an inpatient facility; the OT will need to get a written order from the MD; to document on the patient, the OT will have to search under "find a patient" and add charting