SIERRA VIEW
MEDICAL CENTER

***SIERRA VIEW LOCAL HEALTH CARE DISTRICT***
***BOARD OF DIRECTORS MEETING***
***465 West Putnam Avenue, Porterville, CA – Board Room***

**AGENDA**
**January 24, 2023**

**OPEN SESSION (4:30 PM – 4:35 PM)**

The Board of Directors will call the meeting to order at 4:30 P.M. at which time the Board of Directors will undertake procedural items on the agenda. At 4:35 P.M. the Board will move to Closed Session regarding the items listed under Closed Session. The public meeting will reconvene in person at 5:00 P.M. In person attendance by the public during the open session(s) of this meeting is allowed in accordance with the Ralph M. Brown Act, Government Code Sections 54950 et seq.

**Call to Order**

**I. Approval of Agendas**
*Recommended Action:* Approve/Disapprove the Agenda as Presented/Amended

The Board Chairman may limit each presentation so that the matter may be concluded in the time allotted. Upon request of any Board member to extend the time for a matter, either a Board vote will be taken as to whether to extend the time allotted or the chair may extend the time on his own motion without a vote.

**II. Adjourn Open Session and go into Closed Session**

**CLOSED SESSION**

As provided in the Ralph M. Brown Act, Government Code Sections 54950 et seq., the Board of Directors may meet in closed session with members of the staff, district employees and its attorneys. These sessions are not open to the public and may not be attended by members of the public. The matters the Board will meet on in closed session are identified on the agenda or are those matters appropriately identified in open session as requiring immediate attention and arising after the posting of the agenda. Any public reports of action taken in the closed session will be made in accordance with Gov. Code Section 54957.1

**III. Closed Session Business**

A. Pursuant to Evidence Code Sections 1156 and 1157.7; Health and Safety Code Section 32106(b): Chief of Staff Report (Time Limit – 5 minutes)

B. Pursuant to Evidence Code Sections 1156 and 1157.7; Health and Safety Code Section 32106(b):

1. Evaluation – Quality of Care/Peer Review/Credentials

2. Quality Division Update –Quality Report

C. Pursuant to Gov. Code Section 54962; Health and Safety Code Section 32106(b): Discussion Regarding Trade Secrets, Strategic Planning (1 Item). Estimated Date of Disclosure – February 2026

D. Pursuant to Gov. Code Section 54962; Health and Safety Code Section 32106(b): Discussion Regarding Trade Secrets, Pertaining to Service (1 Item). Estimated Date of Disclosure – February 2024

E. Pursuant to Gov. Code Section 54956.9(d)(2), Conference with Legal Counsel about recent work product (b)(1) and (b)(3)(F): significant exposure to litigation; privileged communication (1 Item)

To the extent items on the Closed Session Agenda are not completed prior to the scheduled time for the Open Session to begin, the items will be deferred to the conclusion of the Open Session Agenda.

## IV. Adjourn Closed Session and go into Open Session

**OPEN SESSION**

## V. Closed Session Action Taken

Pursuant to Gov. Code Section 54957.1; Action(s) to be taken Pursuant to Closed Session Discussion

A. Chief of Staff Report
*Recommended Action*: Information only; no action taken

B. Quality Review

1. Evaluation – Quality of Care/Peer Review/Credentials
*Recommended Action*: Approve/Disapprove Report as Given

2. Quality Division Update –Quality Report
*Recommended Action*: Approve/Disapprove Report as Given

C. Discussion Regarding Trade Secret – Strategic Planning
*Recommended Action*: Information only; no action taken

D. Discussion Regarding Trade Secret – Pertaining to Service
*Recommended Action*: Information only; no action taken

E. Conference with Legal Counsel about recent work product
*Recommended Action*: Information only; no action taken

## VI. Public Comments

Pursuant to Gov. Code Section 54954.3 - NOTICE TO THE PUBLIC - At this time, members of the public may comment on any item not appearing on the agenda. Under state law, matters presented under this item cannot be discussed or acted upon by the Board at this time. For items appearing on the agenda, the public may make comments at this time or present such comments when the item is called. Any person addressing the Board will be limited to a maximum of three (3) minutes so that all interested parties have an opportunity to speak with a total of thirty (30) minutes allotted for the Public Comment period. Please state your name and address for the record prior to making your comment.

## VII. Consent Agenda

Recommended Action: Approve Consent Agenda as presented

Background information has been provided to the Board on all matters listed under the Consent Agenda, covering Medical Staff and Hospital policies, and these items are considered to be routine by the Board. All items under the Consent Agenda covering Medical Staff and Hospital policies are normally approved by one motion. If discussion is requested by any Board member(s) or any member of the public on any item addressed during public comment, then that item may be removed from the Consent Agenda and moved to the Business Agenda for separate action by the Board.

## VIII. Approval of Minutes

A. **December 20, 2022 Minutes of the Annual Meeting of the Board of Directors**
*Recommended Action*: Approve/Disapprove December 20, 2022 Minutes of the Annual Meeting of the Board of Directors

B. **January 12, 2023 Special Minutes of the Meeting of the Board of Directors**
Recommended Action: Approve/Disapprove January 12, 2023 Special Minutes of the Meeting of the Board of Directors

**IX. CEO Report**

**X. Business Items**

A. **Appointment of Governing Board Director for Zone 3**
*Recommended Actions*:

1. Motion to Appoint Director for Zone 3;
2. Oath of Office to be Administered by President/CEO if Director for Zone 3 is Appointed;
3. Motion to Direct Hospital Administration to Provide Immediate Notification of the Appointment to Tulare County Elections Official as required by Cal. Gov. Code § 1780(d)(1)

B. **December 2022 Financials**
*Recommended Action*: Approve/Disapprove Report as Given

C. **Annual Appointments**

1. **Food and Dietetic Services Director**
*Recommended Action*: Approve Appointment
2. **Environmental Safety/Security Officer,**
*Recommended Action*: Approve Appointment
3. **Patient Safety and Infection Control Officer**
*Recommended Action*: Approve Appointment
4. **Infection Control Officer**
*Recommended Action*: Approve Appointment

D. **Appointment of Central Valley Healthcare Alliance Board Representative**
*Recommended Action*: Appoint CVHA Representative

E. **Proposal for changes to SVLHCD Board Bylaws, Time Change of Regular Meetings**
*Recommended Action*: Motion to Direct Legal Counsel to Modify Bylaws to Reflect the New Desired Meeting Time and Present Draft at the next Regular Meeting

F. **SVLHCD Board of Directors Annual Self Evaluation to comply with SVLHCD Bylaw 4.2**
*Recommended Action*: Information only; no action taken

## XI. Announcements:

A. Regular Board of Directors Meeting – February 28, 2023 at T.B.D.

## XII. Adjournment

**PUBLIC NOTICE**

**Any person with a disability may request the agenda be made available in an appropriate alternative format. A request for a disability-related modification or accommodation may be made by a person with a disability who requires a modification or accommodation in order to participate in the public meeting to Melissa Mitchell, VP of Quality and Regulatory Affairs, Sierra View Medical Center, at (559) 788-6047, Monday – Friday between 8:00 a.m. – 5:00 p.m. Such request must be made at least 48 hours prior to the meeting.**

**PUBLIC NOTICE ABOUT COPIES**

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| MEDICAL EXECUTIVE COMMITTEE | 01/04/2023 |
|---|---|
| **BOARD OF DIRECTORS APPROVAL** | |
| | 01/24/2023 |
| BINDUSAGAR REDDY, MD, CHAIRMAN | DATE |

# SIERRA VIEW MEDICAL CENTER
# CONSENT AGENDA REPORT FOR
# January 24, 2023 BOARD APPROVAL

**The following Policies/Procedures/Protocols/Plans/Forms have been reviewed by the Medical Executive Committee and are being submitted to the Board of Directors for approval:**

| | Pages | Action |
|---|---|---|
| **I. Policies:** | | APPROVE |
| • Abbreviations in the Medical Record | 1-28 | ↓ |
| • Administration of Formula Via Feeding Tube Gravity, Bolus, Pump | 29-36 | |
| • Admission of a Newborn During the Night Shift | 37-40 | |
| • Anticoagulation Policy | 41-82 | |
| • Blood & Blood Components, Administration of | 83-90 | |
| • Boarder Newborns | 91-92 | |
| • Cardiorespiratory Monitoring: Neonate | 93-95 | |
| • Consent/Informed Consent | 96-105 | |
| • Discharge of Patient | 106-108 | |
| • Formulary | 109-114 | |
| • Intra-Aortic Balloon Pump Therapy | 115-118 | |
| • Intravenous Therapy – Newborns | 119-121 | |
| • IV Preparation and Dispensing | 122-135 | |
| • IV to PO Dosage Form Conversion Protocol | 136-138 | |
| • Mechanical Ventilation | 139-144 | |
| • Pediatric Assessment and Nursing Standards | 145-147 | |
| • Pyxis Medication Overrides and Discrepancy | 148-157 | |
| • Standardized Procedures | 158-161 | |
| • Thrombolytic Therapy in Acute Ischemic Stroke | 162-175 | |
| • Wasting or Returning Controlled Substances | 176-178 | |
| • Zosyn Extended Infusion | 179-182 | |
| **II. Pharmacy & Therapeutics Committee (P&T):** | | |
| • Daniel Boken, MD to continue in role as Director of the Antibiotic Stewardship Program | | |
| • Insulin Drip Triglycerides > 1000 Order Set | 183-184 | |

| SUBJECT: **ABBREVIATIONS IN THE MEDICAL RECORD** | SECTION:  |
|---|---|

**Printed copies are for reference only. Please refer to the electronic copy for the latest version.**

**PURPOSE:**

To define the standardized abbreviations and symbols acceptable for use in the medical record at Sierra View Medical Center.

**POLICY:**

There shall be an approved abbreviation list available for use throughout the Hospital. Only abbreviations from this list shall be used in the medical record.

**AFFECTED AREAS/PERSONNEL:** *ALL CLINICAL DEPARTMENTS*

**PROCEDURE:**

1. The HIM Director, Vice President of Patient Care Services and the Vice President of Quality and Regulatory Affairs shall have the authority to add, delete, and otherwise update the abbreviation list as the needs of the hospital shall dictate.

2. The abbreviation list shall be submitted annually to the Medical Executive Committee and for review and approval.

3. The abbreviation list shall be an addendum to this policy and shall be available in all copies of the manual.

**REFERENCE:**

- The Joint Commission. (2022). Hospital accreditation standards. Oakbrook Terrace, Illinois

## SIERRA VIEW MEDICAL CENTER
## APPROVED ABBREVIATION LIST
## ATTACHMENT A

**A**

| | |
|---|---|
| @ | at |
| a | before |
| A1 | aortic first sound |
| A2 | aortic second sound |
| aa | of each |
| A | assistance |
| AAA | abdominal aortic aneurysm |
| AaDO2 | alveolar-arterial oxygen difference |
| AAROM | active assisted range of motion |
| A&O | alert and oriented |
| A&P | auscultation and percussion |
| AB | abortion |
| ABD | abduction |
| abd | abdomen |
| abd pol | abductor pollicis |
| ABG | arterial blood gas |
| abn | abnormal |
| ABX | antibiotics |
| a.c. | before meals |
| AC | acromioclavicular |
| ACL | anterior cruciate ligament |
| ACLS | Advanced Cardiac Life Support |
| ACT | activated clotting time |
| ACTH | adrenocorticotrophic (hormone) |
| ACVD | arteriosclerotic cardiovascular disease |
| A.D. | right ear (auris dextra) |
| ADA | American Diabetic Association |
| Adapt. | Adaptive |
| ADC | average daily census |
| ADD | attention deficit disorder |
| ADH | antidiuretic hormone |
| ADL | activities of daily living |
| ad lib | as desired |
| add pol | adductor pollicis |
| ADM | administrative |
| adm | admission |
| adq | abductor digiti quinti (muscle) |
| AE | above elbow |
| AFB | acid fast bacilli |
| A-fib | atrial fibrillation |

| | |
|---|---|
| ag | antigravity |
| AgNO3 | silver nitrate |
| A/G Ratio | albumin-globulin |
| AGA | appropriate for gestational age |
| AGE | acute gastroenteritis |
| AHD | acute hemodialysis |
| AI | aortic insufficiency |
| AIDS | autoimmune deficiency syndrome |
| AIN | allergic interstitial nephritis |
| AK | above knee |
| AKA | above knee amputation |
| alb | albumin |
| alk.p'tase | alkaline phosphatase |
| alk. | alkaline |
| ALOC | altered level of consciousness |
| ALS | amyotrophic lateralizing sclerosis |
| a.m. | morning |
| AMA | Against Medical Advice |
| amb | ambulatory |
| AMI | acute myocardial infarction |
| amp | ampule |
| amt | amount |
| anes | anesthesia |
| angio | angiogram |
| ANS | autonomic nervous system |
| ant | anterior |
| A/O | alert and oriented |
| AOCD | Anemia of chronic dsease |
| AODM | adult onset diabetes mellitus |
| AP | anterior-posterior |
| APAP | acetaminophen (not abbrev. brand name) |
| APB | abductor pollicis brevis |
| APL | abductor pollicis longus |
| A/P | auscultation and percussion |
| ap | apical pulse |
| approx | approximately |
| appt | appointment |
| appy | appendectomy |
| APS | Adult Protective Services |
| ARDS | adult respiratory distress syndrome |
| ARF | acute renal failure |
| AROM | artificial rupture of membranes |
| ART | Accredited Record Technician |
| art. | arterial |
| art.line | arterial line |
| artic | articulation |

| | |
|---|---|
| A.S. | left ear (auris sinistra) |
| AS | arteriosclerosis |
| ASA | acetylsalicylic acid (aspirin) |
| ASAP | as soon as possible |
| ASCVD | atherosclerotic cardiovascular disease |
| ASD | atrial septal defect |
| ASHD | arteriosclerotic heart disease |
| ASIS | anterosuperior iliac spine |
| ASO | antistreptolysin titre O |
| Assoc. | association |
| asst | assistance |
| as tol | as tolerated |
| ASVD | arteriosclerotic vascular disease |
| asym | asymmetrical |
| A.T.C. | around the clock |
| A.U. | both ears |
| auth | authorize(d) |
| A-V | arteriovenous |
| AV | arterioventricular |
| AVB | atrioventricular block |
| AWMI | anterior wall myocardial infarction |
| ax | axilla |

**B**

| | |
|---|---|
| B+C | board and care |
| Bab. | Babinski |
| Bact | bacterium(a) |
| bal | balance |
| Baso | basophils |
| BBB | bundle branch block |
| BBS | bilateral breath sounds |
| BC | blood culture |
| BG | blood glucose |
| BIB | brought in by |
| b.i.d. | twice daily |
| bilat; bil | bilateral |
| BILI | bilirubin |
| bio | biological |
| BE | barium enema |
| BF | breast feeding |
| BK | below the knee |
| BKA | below knee amputation |
| bld | blood |
| BLE | bilateral lower extremities |
| BLS | basic life support |

| | |
|---|---|
| BM | bowel movement |
| BMEVT | bilateral middle ear ventilation tubes |
| BMR | basal metabolism rate |
| BMT | bilateral myringotomy/tube placement |
| BOA | born out of asepsis |
| BOM | bilateral otitis media |
| BOME | bilateral otitis media with effusion |
| BOOP | bilateral organizing obstructive pnemonia |
| BOW | bag of waters |
| BP | blood pressure |
| BPH | benign prostatic hypertrophy |
| BPPN | benign paroxysmal postural nystagmus |
| BPPV | benign paroxysmal positional vertigo |
| BR | bedrest |
| BRB | bright red blood |
| B.R.P. | bathroom privileges |
| Bs; B/S | blood sugar |
| bs | breath sounds |
| BS | bowel sounds |
| BSA | body surface area |
| BSC | bedside commode |
| BSGT | bedside glucose tolerance |
| BSO | bilateral salpingo-oohorectomy |
| BST | breast stimulation test |
| BSW | Bachelor of Social Work |
| BTL | bilateral tubal ligation |
| BUE | bilateral upper extremities |
| BUN | blood urea nitrogen |
| BUR | back up rate |
| BUS | Bartholin, urethral and Skenes glands |
| BTL | bilateral tubal ligation |
| btl. | bottle |
| bx | biopsy |

**C**

| | |
|---|---|
| C/O | complaints of |
| c | with |
| C | centigrade (celsius) |
| C&S | culture and sensitivity |
| Ca | cancer/carcinoma |
| Ca++ | calcium |
| CABG | coronary artery bypass graft |
| CAD | coronary artery disease |
| cal | calorie |
| Cap. | Capsule |

| | |
|---|---|
| CAPD | continuous ambulatory peritoneal dialysis |
| CAT | CAT Scan |
| Cat | cataract |
| cath | catheter/catheterization |
| Cauc | caucasian |
| CAVH | continuous arteriovenous hemoperfusion |
| CAVHD | continuous ateriovenous hemodialysis |
| CBC | complete blood count |
| CBOME | chronic bilateral otitis media with effusion |
| CBS | chronic brain syndrome |
| cc | cubic centimeter |
| CC | chief complaint |
| CCPD | Continuous Cycling Peritoneal Dialysis |
| CCS | California Children's Services |
| C.C.S. | Certified Coding Specialitst |
| CCU | coronary care unit |
| CDB | cough & deep breathe |
| CDC | Centers for Disease Control and prevention |
| CEA | carcinoembryonic antigen |
| CEO | Chief Exective Officer |
| ceph.floc. | cephalin flocculation test |
| cert. | Certification |
| cerv. | Cervical |
| CFO | Chief Financial Officer |
| CGA | Contact Guard Assist |
| CHAL | central hyperalimentation dialysis |
| CHD | coronary heart disease |
| CHF | congestive heart failure |
| chg | charge |
| CHO | carbohydrate |
| chol | cholesterol |
| Chole | cholecystectomy |
| CHT | Certified Hand Therapist |
| CI | cardiac index |
| CIE | counter immunoelectrophoresis |
| CIN | cervical intraepithelial neoplasia |
| circ | circumcision |
| CIS | carcinoma in situ |
| Cl | chloride |
| Cllig | clear liquid |
| cm | centimeter |
| CMCJ | carpometacarpal joint |
| CMV | cytomegalovirus |
| CNA | Certified Nurse Assistant |
| CNM | Certified Nurse Midwife |
| CNS | central nervous system |

| | |
|---|---|
| CO | cardiac output |
| c/o | complaint(s) of |
| CO2 | carbon dioxide |
| Cocci | coccidioicomycosis |
| Cog | cognitive |
| COG | center of gravity |
| comp | compliance |
| conc. | Concentration |
| cong. | Congestion/congested |
| conj. | Conjunctiva(l) |
| cont. | continuous |
| contr. | Contractions |
| COO | Chief Operating Officer |
| COPD | chronic obstructive pulmonary disease |
| COS | Chief of Staff |
| COTA | Certified Occupational Therapy Assistant |
| C/P | cardiopulmonary |
| CP | cerebral palsy |
| cp | cold pack |
| CPAP | continuous positive airway pressure |
| CPD | cephalopelvic disproportion |
| CPK | creatinine phosphokinase |
| CPM | continuous passive motion |
| CPR | cardiopulmonary resuscitation |
| CPS | Child Protective Services |
| C/R | cardiorespiratory |
| CRC | Cypress Rehabilitation Center |
| CRF | chronic renal failure |
| CRNA | Certified Registered Nurse Anesthetist |
| Cr nn 2-12 | cranial nerves two through 12 |
| CRS | community re-entry skills |
| CRT | Certified Radiology Technician |
| C/S | cesarean section |
| CSF | cerebrospinal fluid |
| CSM | circulation, sensation, motion |
| CSOM | chronic suppurative otitis media |
| C-spine | cervical spine |
| CST | Certified Scrub Technician |
| CT | computerized axial tomography |
| CTR | carpal tunnel release |
| CTS | carpal tunnel syndrome |
| ctx | contraction |
| cu | cubic |
| cu.in. | cubic inch |
| C/V | cardiovascular |
| CVA | cerebrovascular accident |

| | |
|---|---|
| CVD | cardiovascular disease |
| CVP | central venous pressure |
| cx | cervix |
| CXR | chest x-ray |

**D**

| | |
|---|---|
| D&C | dilation and curettage |
| D&I | dry and intact |
| DAT | diet as tolerated |
| DB | diaphragmatic breathing |
| DBW | desired body weight |
| dc | discontinue |
| dep | dependent |
| DC | discontinue |
| dc'd | discontinued |
| D5W | IV Dextrose, 5% in water |
| DDS | Doctor of Dental Surgery |
| DDSc | Doctor of Dental Science |
| decub | decubitus |
| demo | demonstrate |
| Dept | department |
| diam | diameter |
| diff | differential |
| dig. | Digoxin,Lanoxin |
| dil | dilute(d) |
| DIPJ | distal interphalangeal joint |
| disch | discharge |
| dist | distilled |
| DJD | degenerative joint disease |
| DM | diabetes mellitus |
| DMV | Department of Motor Vehicles |
| DNR | Do Not Resuscitate |
| DOA | dead on arrival |
| DOB | date of birth |
| DON | Director of Nursing |
| DPM | Doctor of Podiatric Medicine |
| DPT | diphtheria, pertussis, tetanus |
| Dr. | doctor |
| dr. | dram |
| drng | drainage |
| dsg | dressing |
| DT | diphtheria/tetanus |
| D.T.'s | delirium tremens |
| DTRs | deep tendon reflexes |
| dtr. | daughter |

| | |
|---|---|
| dur. | duration |
| DVT | deep vein thrombosis |
| Dx | diagnosis |

**E**

| | |
|---|---|
| E coli | escherichia coli |
| e.g. | for example |
| ea | each |
| EBL | estimated blood loss |
| EBV | Epstien-Barr virus |
| ECF | extended care facility |
| ECG;EKG | electrocardiogram |
| ECHO | echocardiogram |
| Ed | education |
| ED | emergency department |
| EDC | estimated date of confinement |
| EDD | estimated date of delivery |
| EDW | estimated dry weight |
| EEG | electroencephalogram |
| EENT | eye, ear, nose and throat |
| EFM | external fetal monitor |
| EGD | esophagogastroduodenostomy |
| EJ | external jugular |
| ELF | elective low forceps |
| elix | elixir |
| emerg | emergency |
| EMG | electromyo(myelo)gram |
| EMS | Electric muscle stimulation |
| EMT | Emergency Medical Technician |
| ENG | electroneptagmogram |
| ENT | ear, nose and throat |
| EOA | esophagogastric oral airway |
| EOB | edge of bed |
| EOM | extraocular movements |
| eos | eosinophils |
| EPB | extensor pollicis brevis |
| EPC | electronic pain control |
| Epi | epinephrine |
| epi | epidural |
| EPL | extensor pollicis longus |
| Equip | equipment |
| equiv | equivalent |
| er | external rotation |
| ERD | emergency room |
| ERCP | endoscopic retrograde cholangiopancreatography |

| | |
|---|---|
| ERS | extension rotation sidebend |
| ES | electrical stimulation |
| ESR | erythrocyte sedimentation rate |
| ESRD | end stage renal disease |
| est | estimated |
| ESWL | extracorporeal shockwave lithotripsy |
| et | and |
| etal | and others |
| ET | endotracheal |
| ETA | estimated time of arrival |
| Etc. | et cetera (and so forth) |
| ETCO2 | end tidal carbon dioxide |
| ETIOL | etiology |
| ETOH | ethyl alcohol |
| ev | eversion |
| eval | evaluate(ion) |
| ex | exercise |
| exam | examination |
| exp | expiratory |
| exs | exercises |
| ext | external |
| exte | extension |
| extr | extraction |

**F**

| | |
|---|---|
| F | fundus |
| F/B | followed up |
| FB | foreign body |
| FBS | fasting blood sugar |
| F.C. | FlexCare |
| FCE | functional capacity evaluation |
| FCH | Fresno Community Hospital |
| FCU | flexor carpi ulnaris |
| FDP | flexor digitorum profundus |
| FDS | flexor digitorum superficialis |
| fe | female |
| Fe | iron (ferrum) |
| FESS | functional endoscopic sinus surgery |

**Fetal positions and presentations:**

| | |
|---|---|
| LFA(RFA) | left frontoanterior (right) |
| FP(RFP) | left frontoposterior (right) |
| LFT(RFT) | left frontotransverse)right) |
| LMA(RMA) | left mentoanterior (right) |

| | |
|---|---|
| LMP(RMP) | left mentoposterior (right) |
| LMT(RMT) | left mentotransverse (right) |
| LOA | left occiput anterior |
| LOP | left occiput posterior |
| LOT | left occiput transverse |
| LSA(RSA) | left sacrum anterior (right) |
| LSP(RSP) | left sacrum posterior (right) |
| LST(RST) | left sacrum transverse |
| ROA | right occiput anterior |
| ROP | right occiput posterior |
| ROT | right occiput transverse |
| | |
| FEV | timed forced expiratory volume |
| FFC | fixed flexion contracture |
| FFP | fresh frozen plasma |
| FH | family history |
| FHM | fetal heart monitor |
| FHR | fetal heart rate |
| FHT | fetal heart tones |
| FI | fiscal intermediary |
| fib | fibrillation |
| FIL | fetal intolerance tolabor |
| Flliq | full liquid |
| FIM | Functional Independent Measure |
| Fi02 | fraction of inspired oxygen |
| fl | fluid |
| fl oz | fluid ounces |
| flex | flexion |
| FLM | fetal lung maturity |
| FMS | fine motor skills |
| FNP | Family Nurse Practitioner |
| FOP | foot of bed |
| FPB | flexor pollicis brevis |
| FPL | flexor pollicis longus |
| FR | fluid restriction |
| Fr. | French |
| FRC | Functional Residual Capacity |
| freq | frequency |
| Fri | Friday |
| FROM | full range of motion |
| FRS | flexion rotation sidebend |
| FS | frozen section |
| FSH | follicle stimulating hormone |
| FT | fullterm |
| ft. | foot(feet) |
| FTA | fluorescent treponema antibody |

| | |
|---|---|
| F/U | followup |
| FUO | fever unknown origin |
| FVC | forced vital capacity |
| FVD | fluid volume deficit |
| FVE | fluid volume excess |
| FWB | full weight bearing |
| FWW | front wheeled walker |
| fx | fracture |

**G**

| | |
|---|---|
| G | gravid |
| GA | gestational age |
| GB | gallbladder |
| GBS | Guillian-Barre' Syndrome |
| GC | gonorrhea |
| GCS | Glasgow Coma Scale |
| gd | good |
| gen | general (appearance, anesthetic, etc) |
| GERD | gastroesophageal reflux disease |
| GH | glenohumeral |
| GI | gastrointestinal |
| gm | gram |
| GMC | gross motor control |
| gr | grain |
| GSW | gunshot wound |
| GT | gastrostomy tube |
| GTT | glucose tolerance test |
| gtt | drop |
| gtts | drops |
| GU | genitourinary |
| Gyn | gynecology(ist) |

**H**

| | |
|---|---|
| (H) | hypodermic into subcutaneous tissue |
| h | hour |
| H/H | hemoglobin/hematocrit |
| H&H | hemoglobin and hematocrit |
| HA | headache |
| hams | hamstrings |
| HB | heart block |
| HBP | high blood pressure |
| HCL | hydrochloric acid |
| HCO3 | bicarbonate |
| Hct | hematocrit |

| | |
|---|---|
| HCVD | hypertensive cardiovascular disease |
| Hct | hematocrit |
| HD | hemodialysis |
| HEENT | head,eyes,ears,nose and throat |
| HEP | Home Exercise Program |
| Hep | hepatitis |
| Hg | mercury |
| Hgb | hemoglobin |
| hgm | hemogram |
| HHA | Home Health Agency |
| CHHA | Certified Home Health Aide |
| HHN | Hand Held Nebulizer |
| HHRN | Home Health Registered Nurse |
| HHVN | Home Health Vocational Nurse |
| hi cal | high caloric |
| hi chd | high carbohydrate |
| hi pro | high protein |
| hi vit | high vitamin |
| HIE | hypoxic encephalopathy |
| HIV | human immunosuppressive virus |
| HL | heparin lock |
| HLP | hyperlipoproteinemia |
| HM | Human milk |
| HNP | herniated nucleus pulposus |
| H/O | history of |
| HOB | head of bed |
| HOH | hard of hearing |
| HONK | Hyperosmolar nonketosis |
| hosp | hospital |
| H&P | history and physical examination |
| HP | hot packs |
| HPF | high power field (microscopic field) |
| HPI | history of present illness |
| HPPE | hyperpermeability pulmonary edema |
| HR | heartrate |
| hr | hour |
| h.s. | at bedtime |
| ht | height |
| HTL VIII | lab test for AIDS virus |
| HTN | hypertension |
| H2O | water |
| H2O2 | hydrogen peroxide |
| HVD | hypertensive vascular disease |
| Hx | history |
| H20 | water |

**I**

| | |
|---|---|
| I | independent |
| I131 | radioactive iodine |
| IABP | intra-aortic balloon pump |
| IAC | ineffective airway clearance |
| IBCLC | International Board Certified Lactation Consultant |
| ibid | in the same place (ibidem) |
| IBW | ideal body weight |
| IC | iliac crest |
| ICN | Infection Control Nurse |
| ICP | intracranial pressure |
| ICS | intraclavicular space |
| ICT | intermittent cervical traction |
| ICU | Intensive Care Unit |
| ID | identification |
| I&D | incision and drainage |
| IDDM | insulin dependent diabetes mellitus |
| i.e. | that is (id est) |
| IGE | impaired gas exchange |
| IHSS | idiopathic hypertrophic subaortic stenosis |
| ILS | independent living skills |
| IM | intramuscular |
| IMI | brand name abbreviation for a radiant |
| Imp. | impression |
| IMV | intermittnet mandatory ventilation |
| in. | inch |
| inc. | increase |
| inf | inferior |
| inf mono | infectious mononucleosis |
| init | initial |
| inj | injection |
| insp | inspiration(ory) |
| int | internal |
| INTF | interferential |
| I&O | intake and output |
| IOL | intraocular lens |
| IPD | Intermittant Peritoneal Dialysis |
| IPJ | interphalangeal joint |
| IPPB | intermittent positive pressure breathing |
| I.Q. | intelligence quotient |
| IR | internal rotation |
| irrig | irrigate |
| I/S | incentive spirometry |
| ISE | internal scalp electrode |

| | |
|---|---|
| IUD | intrauterine contraceptive device |
| IUP | intra uterine pregnancy |
| IUPC | intrauterine pressure catheter |
| IV | intravenous |
| IVAB | intravenous antibiotics |
| IVC | inspiratory vital capacity |
| IVF | IV fluids |
| IVP | intravenous pyelogram(phy) |
| IV push | intravenous push |
| IVPB | intravenous piggyback |
| IVSS | intravenous soluset |

**J**

| | |
|---|---|
| J.P. | Jackson Pratt (hemovac/bulb) |
| JRA | juvenile rheumatoid arthritis |
| JV | jugular venous |
| JVD | jugular venous distention |
| JVP | jugular venous pressure or pulse |
| jt. | joint |

**K**

| | |
|---|---|
| K | potassium |
| KCI | potassium chloride |
| KDDH | Kaweah Delta District Hospital |
| kg | kilogram |
| K&K | Kline and Kohlmer (test for syphilis) |
| KUB | kidneys, ureters, bladder (x-ray) |
| KVO | keep vein open |

**L**

| | |
|---|---|
| L | liter |
| LAB | laboratory |
| LAD | lactic acid dehydrogenase |
| Lap | laporoatomy |
| LAO | left anterior oblique |
| LAQ | long arc quads |
| lat | lateral |
| LBBB | left bundle branch block |
| LBQC | large base quad cane |
| lb | pound |
| LC | Lactation consultant |
| LCL | lateral collateral ligament |
| LCSW | Licensed Clinical Social Worker |

| | |
|---|---|
| LD | left deltoid |
| LDH | Lindsay District Hospital |
| LE | lupus erythematosus |
| LF | left forearm |
| LFT | lower function test |
| Lg | large |
| LGA | large for gestational age |
| Litho | lithotripsy |
| LLE | left lower extremity |
| LLH | left lateral heelstick |
| LLL | left lower lobe |
| LLQ | left lower quadrant |
| LMH | left medial heelstick |
| LMP | last menstrual period |
| LOB | loss of balance |
| LOC | loss of consciousness |
| LOS | length of stay |
| LP | lumbar puncture |
| LR | lactated ringers |
| LS | lumbosacral |
| L-spine | lumbar spine |
| LSC | left subclavian |
| LSD | lysergic acid diethylamide |
| Lt | left |
| LTV | long term variability |
| LUE | left upper extremity |
| LUL | left upper lobe |
| LUQ | left upper quadrant |
| LVF | left ventricular failure |
| LVH | left ventricular hypertrophy |
| LVN | Licensed Vocational Nurse |
| L&W | living and well |
| LWBS | left without being seen |
| lymph | lymphocyte |
| lytes | electrolytes |

**M**

| | |
|---|---|
| M | male |
| m | minim |
| M1 | mitral first sound |
| M2 | mitral second sound |
| MA | milliamperes |
| MAC | monitored anesthesia care |
| macro | macrocytic(scopic) |
| MAE | moves all extremities |

| | |
|---|---|
| man. | manual(ly) |
| MAR | medication administration record |
| MAT | multifocal atrial tachycardia |
| max. | maximum |
| MAX A | maximum assistance |
| MCA | motorcycle accident |
| mcg | microgram |
| MCH | mean corpuscular hemoglobin |
| MCL | mid clavicular line |
| MCV | mean corpuscular volume |
| MD | Doctor of Medicine |
| mec | meconium |
| MED/SURG | medical/surgical unit |
| meds. | medications |
| MEF | maximal expiratory flow |
| mEq | milliequivalent |
| mg | milligram |
| Mg. | Magnesium |
| mgmt. | Management |
| mgr. | Manager |
| MI | myocardial infarction |
| micro | microscopic(cytic) |
| mid. | middle |
| MIN A | minimal assistance |
| min. | minute |
| ml | milliliter |
| Mlat | mediolateral |
| mm | millimeter |
| MMT | manual muscle test |
| mn | midnight |
| mo. | month |
| mob. | mobility |
| mod. | moderate(ly) |
| MOD A | moderate assistance |
| MOM | milk of magnesia |
| Mon. | Monday |
| monos | monocytes |
| MR | mitral regurgitation |
| MRI | Magnetic Resonance imaging |
| MRSA | methicillin resistant staphylococcus aureus |
| MS | morphine sulfate |
| M/S | multiple sclerosis |
| MSG | massage |
| MSS | medical social services |
| MSW | Medical Social Worker |
| MT | Medical Technologist |

| | |
|---|---|
| MTT | manual therapy |
| M+T | myringotomy and tubes |
| multip | multiparous |
| MVA | motor vehicle accident |
| MVP | mitral valve prolapse |
| MVV | maximum voluntary ventilation |

**N**

| | |
|---|---|
| N | nitrogen |
| N/A | not applicable |
| Na | sodium |
| N.A. | nursing assistant |
| NaCl | sodium chloride |
| NAD | no acute distress |
| NaHCO3 | sodium bicarb |
| NB | newborn |
| NBN | newborn nursery |
| N/C | no charge |
| neg | negative |
| neuro | neurology(ist)(ical) |
| NG | nasogastric |
| NGT | nasogastric tube |
| NH3 | ammonia |
| NICU | Neonatal Intensive Care Unit |
| NIDDM | noninsulin dependent diabetes |
| NKA | no known allergies |
| NKDA | no known drug allergies |
| NKDC | nonketotic diabetic coma |
| NKHHC | nonketotic hyperglycemic-hyperosmolar coma |
| nl | normal |
| NMES | Neuromuscular Electrical Stimulation |
| NN | nerves |
| No. | number |
| noc | at night (nocturia) |
| norm. | normal |
| NP | non-productive |
| NPO | nothing by mouth |
| NS | normal saline |
| N/S | no show |
| NSA | no significant abnormality |
| NSAID | nonsteroidal anti-inflammatory drugs |
| nsg. | nursing |
| NSR | normal sinus rhythm |
| NST | non-stress test |
| NSY | nursery |

| | |
|---|---|
| NT | non-tender |
| N/T | not tested |
| N&T | nose and throat |
| NTG | nitroglycerine |
| nullip | nulliparous |
| N&V | nausea and vomiting |
| NWB | nonweight bearing |

**O**

| | |
|---|---|
| O2 | oxygen |
| OA | occiput anterior |
| OB | obstetrics |
| obl | oblique |
| OBS | organic brain syndrome |
| occ | occasional |
| OCG | oral cholecystogram |
| OCT | oxytocin challenge test |
| O.D. | right eye |
| od | overdose |
| OK | okay |
| OM | otitis media |
| OME | otitis media with effusion |
| OOB | out of bed |
| OPD | outpatient department |
| ophth | opthalmology |
| OPS | outpatient surgery |
| OR | operating room |
| ORIF | open reduction internal fixation |
| ortho | orthopedics |
| O.S. | left eye |
| os | mouth |
| O.T. | occupational therapy |
| O.U. | both eyes |
| oz | ounce |

**P**

| | |
|---|---|
| p | after |
| P | pulse |
| pa | pulmonary artery |
| PA | Physician Assistant |
| P&A | percussion and auscultation |
| PA-C | Physician Assistant-Certified |
| PAC | premature atrial contractions |
| PACO2 | partial pressure carbon dioxide (arterial) |

| | |
|---|---|
| PACU | post anesthesia care unit |
| PAEDP | pulmonary artery end diastolic pressure |
| PAF | paroxysmal atrial fibrillation |
| PAFIB | paroxysmal atrial fibrillation |
| PA&L | poseterior, anterior and lateral chest x-ray |
| palp | palpate(ion) |
| PAP | Papanicolaou smear(test) |
| PAR | post anesthesia room |
| Para | parous(number of viable children) |
| PAT | paroxysmal atrial tachycardia |
| pap | papanicolaou, smear test |
| para | parity |
| path | pathology |
| PAWP | pulmonary artery wedge pressure |
| PBI | protein bound iodine |
| p.c. | after meals |
| PCA | patient controlled analgesia |
| PCE | physical capacity evaluation |
| PCL | posterior cruciate ligament |
| PCN | penicillin |
| pCO2 | partial pressure CO2 |
| PCV | packed cell volume |
| PCWP | pulmonary capillary wedge pressure |
| PDA | posterior descending artery |
| PDR | Physician's Desk Reference |
| PE | physical examination |
| PE tubes | pressure equalizaer tubes |
| ped. | pediatric |
| PEG | percutaneous endoscopic gastrostomy |
| PEEP | positive end expiratory pressure |
| per | by or through |
| peri | perineal |
| PERRLA | pupils equal, regular, react to light and accommodation |
| pf | plantar flexion |
| PF | peak flow |
| PFT | pulmonary function test |
| pg. | page |
| pH | hydrogen iron concentration |
| PH | past history |
| phal | phalanx |
| PI | present illness |
| PID | pelvic inflammatory disease |
| PIP | proximal interphalangeal joint |
| Pit | pitocin |
| PJC | premature junctional contractions |
| PKU | phenylketonuria |

| | |
|---|---|
| P.M. | afternoon |
| PMD | private medical doctor |
| PMH | past medical history |
| PMI | point of maximum impulse |
| PMR | polymyalgia rheumatura |
| PMS | premenstrual syndrome |
| PN | parenteral nutrition |
| PNC | premature nodal contraction |
| PND | paroxysmal nocturnal dyspnea |
| pneumo | pneumoencelphalogram |
| PNG | peripheral nerve glides |
| P.O. | phone order |
| p.o. | per mouth |
| pO2 | partial pressure of oxygen |
| pO4 | phosphate |
| POC | position of comfort |
| POD | postoperative day |
| Polys | polymorphonuclear leukocytes |
| POS | positive |
| post | posterior |
| postop | postoperative |
| POT | plan of treatment |
| POV | private vehicle |
| PP | postpartum |
| P&PD | percussion and postural drainage |
| PPD | purified protein derivative (tuberculin) |
| PRBC | packed red blood cells |
| PRBOW | prolonged ruptured bag of waters |
| pre | before |
| preg. | pregnancy |
| preop | preoperative |
| prep | preparation |
| prev. | previous |
| primip | primiparous (first birth) |
| prn | as necessary; when indicated |
| PROM | premature rupture of membranes |
| iPROM | prolonged ruptre of membranes |
| prog | progress |
| pro time | pro-thrombin time |
| prox. | Proximal |
| PSIS | posterior superior iliac spine |
| P.T. | physical therapy(ist) |
| PT/PTT | pro-thrombin/partial thromboplastin (time) |
| pt | patient |
| PTA | Physical Therapy Assistant |
| P.T.A. | prior to admission |

| | |
|---|---|
| PTC | prior to consult |
| PUD | peptic ulcer disease |
| PUW | pick-up walker |
| PVC | premature ventricular contractions |
| PWB | partial weight bearing |
| PXR | portable chest xray |

**Q**

| | |
|---|---|
| q | every |
| qam | every morning |
| qh | every hour |
| qhs | every bedtime |
| qid | four times a day |
| qns | quantity not sufficient |
| qs | to make sufficient quantity |
| qt | quart |
| QUAD | quadrant |
| quads | quadriceps |

**R**

| | |
|---|---|
| R | right |
| (R ) | rectal thermometer |
| RA | rheumatoid arthritis |
| Rad | radiology |
| RB | read back |
| RBBB | right bundle branch block |
| RBC | red blood cell |
| RBOW | ruptured bag of water |
| RBS | random blood sugar |
| RCNA | restorative certified nursing assistant |
| R.D. | Registered Dietitian |
| RDS | respiratory distress syndrome |
| recert. | recertification |
| reg. | regular |
| rehab | rehabilitation |
| reps | repetitions |
| resp. | respiration(ory) |
| resist. | resistance |
| Rh | Rhesus factor |
| RHD | rheumatic heart disease |
| RHIT | Registered Health Information Technician |
| RL | ringers lactate |
| RLE | right lower extremity |
| RLH | right lateral heel |

| | |
|---|---|
| RLL | right lower lobe |
| RLQ | right lower quadrant |
| RMH | right medial heel |
| RML | right middle lobe |
| RN | Registered Nurse |
| RNA | ribonucleic acid |
| RNFA | Registered Nurse First Assistant |
| RNIP | Registered Nurse Interim Permittee |
| R/O | rule out |
| RO | routine orders |
| ROA | right occiput anterior |
| ROM | range of motion |
| ROP | right occiput posterior |
| ROS | review of systems |
| ROT | right occiput transverse |
| rot | rotation |
| RP | renal panel |
| RPR | rapid plasma regain test (for syphilis) |
| RR | respiratory rate |
| rrot | right rotator cuff |
| RSV | respiratory syncytial virus |
| R/T | released to |
| RTW | return to work |
| RTC | return to clinic |
| RUE | right upper extremity |
| RUL | right upper lobe |
| RUQ | right upper quadrant |
| RV | right ventricle |
| Rx | prescription |

**S**

| | |
|---|---|
| s | without |
| SAB | spontaneous abortion |
| sang. | Sanguineous |
| SAQ | short arc quads |
| Sat | Saturday |
| sat | saturated |
| SBA | stand by assist |
| SBO | small bowel obstruction |
| SCH | supra condylar humerus |
| Schiz | shizophrenia |
| SCI | spinal cord injury |
| SCM | sternocleidomastoid (joint) |
| sec | second(s)(ary) |
| sed.rate | erythrocyte sedimentation rate (blood) |

| | |
|---|---|
| segs | segmented neutrophils |
| serol. | serology |
| serosang. | Serosanguineous |
| SF | side flexion |
| SFB | superficial femoral artery |
| S/G | Swan-Ganz |
| SGA | small for gestational age |
| SGOT | serum glutamic oxaloacetic transaminase |
| SGPT | serum glutamic pyruvic transaminase |
| SH | social history |
| Shldr | Shoulder |
| SI | sacroiliac joint |
| SIADH | syndrome of inappropriate antidiuretic hormone secretion |
| SL | sublingual |
| SLE | systemic lupus erythematosus |
| SLR | straight leg raising |
| SNF | skilled nursing facility |
| SOAP | subjective/objective/assessment/plan |
| SOB | shortness of breath |
| sol | solution |
| SOM | serous otitis media |
| S/P | status post |
| spec | specimen |
| SPgr | specific gravity |
| SR | sinus rhythm |
| SROM | spontaneous rupture of membranes |
| ss | one half |
| SS | soapsuds |
| SSE | soapsuds enema |
| SS# | social security number |
| S/S | signs and symptoms |
| stab | band cell |
| staph | staphylococcus |
| stat | at once |
| strep | streptococcus |
| STSG | split thickness skin graft |
| STV | short term variability |
| St WP | sterile whirlpool |
| Sub-L | sublingual |
| Sub-Q | subcutaneous |
| Sun. | Sunday |
| sup | superior |
| surg | surg(ical)ery |
| SVD | spontaneous vaginal delivery |
| SVDH | Sierra View District Hospital |
| SVT | supraventricular tachycardia |

| | |
|---|---|
| Sx | symptom |
| sym | symmetrical |

**T**

| | |
|---|---|
| T | thermoscan (thermometer) |
| T&A | tonsillectomy and adenoidectomy |
| tab | tablet |
| TAB | therapeutic abortion |
| T&C | type and crossmatch |
| TAH | total abdominal hysterectomy |
| TAR | treatment authorization request (MediCal) |
| TAT | tetanus antitoxin |
| T.B. | tuberculosis |
| TBA | to be admitted |
| T.C. | traffic collision |
| Tbsp | tablespoon |
| TCDB | turn, cough, deep breathe |
| TCDHS | Tulare County Department of Health Services |
| TCU | Transitional Care Unit |
| TEA | thromboendarterectomy |
| tech | technician(ologist) |
| TED | antithromboembolic stockings |
| temp | temperature |
| TENS | transcutaneous electrical nerve stimulator |
| TFT | Thyroid Function Test |
| THEX | therapeutic exercise |
| THR | total hip replacement |
| thru | through |
| Thur. | Thursday |
| TIA | transient ischemic attack |
| TIC | transitional inpatient care |
| tid | three times a day |
| tinct | tincture |
| TJR | total joint replacement |
| TKO | to keep open |
| TKR | total knee replacement |
| TLC | triple lumen catheter |
| TM | tympanic membrane |
| TMJ | temporomandibular joint |
| TMJD | temporomandibular joint dysfunction |
| TMs | tympanic membranes |
| TNS | transcutaneous nerve stimulation |
| TO | telephone order |
| tol. | tolerate(d) |
| TOLAC | trial of labor after cesarean |

| | |
|---|---|
| tomo | tomogram |
| TORB | telephone order read back |
| TORCH | toxoplasmosis, syphilis, rubella, cytomegaloviras, herpes |
| TPA | tissue plasminogen activator |
| TPN | total parenteral nutrition |
| TPR | temperature, pulse, respiration |
| TR | transfer |
| trach | tracheostomy |
| tsp | teaspoon |
| T-spine | thoracic spine |
| Tues. | Tuesday |
| T.U.R. | transurethral resection |
| TURBT | transurethral resection of bladder tumor |
| TURP | transurethral resection of prostate |
| TVH | total vaginal hysterectomy |
| TV | tidal volume |
| Tx | treatment |

**U**

| | |
|---|---|
| U | uranium |
| Ua | urinalysis |
| UAC | umbilical artery catheter |
| U/C, UC | uterine contraction |
| UBW | usual body weight |
| U.C. | unit clerk |
| UCG | urine chorionic gonadotropin |
| UGI | upper gastrointestinal |
| UE | upper extremity |
| UF | ultrafiltration |
| UKE | unknown etiology |
| UMC | University Medical Center |
| UO | undetermined origin |
| Upper GI | upper gastrointestinal |
| URI | upper respiratory infection |
| Uro | urology(ist) |
| U.S. | both eyes |
| US | ultrasound |
| USP | United States Pharmacopoeia |
| UTI | urinary tract infection |
| UV | ultraviolet |

**V**

| | |
|---|---|
| VA | visual acuity |
| Vag | vaginal |

| | |
|---|---|
| VBAC | vaginal birth after cesarean section |
| VC | vital capacity |
| VCH | Valley Children's Hospital |
| VD | venereal disease |
| VDRL | Venereal Disease Research Laboratory |
| VE | vaginal exam |
| Vent | mechanical ventilator |
| VFD | visual field deficit |
| V-fib | ventricular fibrillation |
| via | by way of |
| Vit | vitamin |
| VO | verbal order |
| vol | volume |
| VORB | verbal order read back |
| VPB | ventricular premature beat |
| Vre | Vancomycin Resistant Enterococci |
| VS | vital signs |
| v, vs | versus |
| VSD | ventriculoseptal defect |

**W**

| | |
|---|---|
| w/a | while awake |
| WB | weight bearing |
| WBAT | weight bearing is tolerated |
| WBC | white blood count(cells) |
| W/C | wheelchair |
| WDWN | well developed, well nourished |
| W & | white female |
| W % | white male |
| Wed. | Wednesday |
| WFL | within functional limits |
| WIC | Women, Infants & Children (assistance program) |
| wk | week |
| wlkr | walker |
| wnd | wound |
| WNL | within normal limits |
| w/o | without |
| WP | whirlpool |
| wt | weight |

**X**

| | |
|---|---|
| x | times |
| XRT | radiation therapy |

**Y**

| | |
|---|---|
| yd. | yard |
| yrs | years |

| SUBJECT: **ADMINISTRATION OF FORMULA VIA FEEDING TUBE GRAVITY, BOLUS, PUMP** | SECTION: **Page 1 of 8** |
|---|---|

**Printed copies are for reference only. Please refer to the electronic copy for the latest version.**

**PURPOSE:**

The purpose of this policy is to offer guidance on the administration of enteral nutrients to residents who are unable to eat orally and to ensure optimal absorption of nutrients, without untoward side effects.

**DEFINITIONS:**

1. Enteral Feeding: Delivery of nutrients directly into the stomach, duodenum or jejunum. Also called enteral nutrition (EN).

2. Gastrostomy Tube (GT): A tube that goes through the skin into the stomach. It may be placed there using a technique called percutaneous endoscopic gastrostomy (PEG).

3. Jejunostomy tube (JT): A tube placed into the small intestine. It may be placed there using a technique called percutaneous endoscopic jejunostomy (PEJ).

4. Gravity Method: Allowing the enteral feeding to flow into the tube by hanging the feeding above the patient, without the use of a pump.

5. Bolus Method: Pushing the enteral feeding into the tube in measured increments; may occur several times a day.

6. Continuous Infusion Method: Delivery of the enteral feeding infusion to the feeding tube via a pump at a set flow rate.

**POLICY:**

Residents of Sierra View Medical Center (SVMC) Distinct Part Skilled Nursing Facility (DP/SNF) will receive enteral nutrition according to physician orders and the American Society for Parenteral and Enteral Nutrition (ASPEN) clinical recommendations.

**EQUIPMENT:**

- Gravity Method:

  Feeding formula

  - Graduated container (for formula)
  - 60mL syringe
  - Stethoscope
  - Feeding bag and tubing
  - IV Pole

- Water

- Enteral Feeding Pump:
  - Feeding formula (cans or closed container)
  - Feeding bag and tubing (or spike set)
  - Feeding pump
  - IV Pole
  - Stethoscope
  - 60mL syringe
  - Water
  - Graduated container (for canned formula)

- Bolus Method:
  - Feeding formula (dated when opened, if not used all at once and properly stored per manufacturer's recommendation)
  - Graduated container
  - Stethoscope
  - 60mL syringe
  - Water

**AFFECTED PERSONNEL/AREAS:** *REGISTERED NURSES (RN), LICENSED VOCATIONAL NURSES (LVN)*

**PROCEDURE:**

A. Implementation of Physician Order Regarding Tube Feeding Regimen

1. Charge Nurse will provide a copy of written order to Medication Nurse responsible to named resident's care.

2. Charge Nurse will ensure Physician Order is correctly transcribed in medication administration record (M.A.R.) by comparison to original written order.

3. Charge Nurse and Medication Nurse will initiate change in feeding pump settings per MD Order.

4. Charge Nurse and Medication Nurse will each document MD Order in EMR individually.

B. Enteral Feeding:

1. Provide privacy.

2. Wash hands thoroughly and don gloves.

3. Explain procedure.

4. Check formula can, bag, or container for expiration date.
Properly label with resident's name and room number, formula/water, rate and the date opened/hung.

5. Elevate head of bed at a 35-45 degree angle during the feeding and for at least one hour after the feeding.

6. Verify placement of tube by aspiration and auscultation (refer to procedure for verification of tube placement).

7. Flush feeding tube with 30 to 50mL of water.

C. Bolus Method (follow steps 1 through 7 above, then):

1. Open formula and pour prescribed amount into a graduated container.

2. Properly label with resident's name and room number, formula/water, rate and the date opened/hung.

3. Remove plunger from the 60mL syringe.

4. Attach syringe to feeding tube with Lopez Valve in off position to prevent excess air from entering stomach.

5. Fill syringe with formula to flow through by natural gravity.

6. Open Lopez Valve to allow formula to flow in slowly.

7. When syringe is one quarter full, add formula.

8. Repeat until specified amount is given.

9. The height at which syringe is held determines flow rate.

10. Administer slowly over 15 minutes to prevent untoward effects.

11. If nausea, vomiting, distention, diarrhea or dumping occurs, discontinue feeding (notify the physician).

12. When feeding is completed, flush tube with amount of water specified by physician order, or 30 to 50mL.

13. Plug or close Lopez Valve to feeding tube.

14. Clean syringe and store according to policy.

15. Throw disposable graduated container away or wash plastic graduated container thoroughly for storage until time for next feeding.

D. Intermittent Gravity Method (feedings administered over a 30-40 minute period, then disconnected until next feeding in 3 to 6 hours – complete steps 1 through 7 above, then:

1. Clamp tubing on the gravity bag.

2. Open formula.

3. Properly label with resident's name and room number, formula/water, rate and the date opened/hung.

4. Pour prescribed amount into well-rinsed gravity bag for open system.

5. Spike the container for closed systems.

6. Hang bag or container on IV pole.

7. Prime drip chamber less than half full.

8. Prime tubing by opening roller clamp and allowing formula to fill tubing.

9. Close roller clamp and recap tubing.

10. Unplug feeding tube.

11. Connect feeding tube to gravity bag or container tubing.

12. Open roller clamp to adjust flow of formula.

13. When bag empties, or required amount has been administered, clamp tubing.

14. Disconnect tubing from feeding tube.

15. Flush feeding tube with 30 to 50mL of water or follow with water as ordered.

16. Rinse feeding bag thoroughly with tap water (or cap off spike set tubing of closed system container).

17. Tube feeding bag, syringe and tubing are to be changed every 24 hours and properly dated, labeled and initialed.

18. Record feeding on resident's record in PCS.

E. Pump of Infusion Controller Method (follow steps 1 through 7 of Procedures for Enteral Feeding and then):

1. Clamp tubing on pump bag.

2. Open formula.

3. Properly label with resident's name and room number, formula/water, rate and the date opened/hung.

4. Pour prescribed amount into thoroughly rinsed pump bag and tubing for open system. Do not add new formula to old formula.

5. Spike container for closed system.

6. Hang bag or container on IV pole.

7. Prime drip chamber less than half full.

8. Prime tubing by opening to roller clamp and allowing formula to fill tubing to empty it of air bubbles.

9. Close roller clamp and recap tubing.

10. Thread tubing from pump bag or container through the controller according to the manufacturer's directions.

11. Open roller clamp.

12. Set flow rate according to manufacturer's directions.

13. Turn pump on.

14. Monitor the resident.

15. Flush feeding tube with 30 to 50mL of water when container empties and at least every shift.

16. Turn off pump, rinse bag and tubing; add new formula as ordered for continuous feeding. DO NOT fill bag with more formula than will be administered in 8 hours for canned formula or 4 hours for reconstituted formula to decrease risk of spoilage and adverse effects to resident. (Closed system container may hang for a maximum of 24 hours.)

17. Pump bags, syringe and tubing are to be changed every 24 hours and properly labeled with date, time, and nurse's initials.

18. Record feeding in resident's record in PCS.

F. Closed System Feeding Guideline: Special Considerations to minimize risk of microbial contamination of enteral formulations:

1. Given at room temperature

2. Insert spike from administration tubing into feeding container

3. Confirm correct patient identity with full patient name and date of birth

4. Change feeding tube and feeding container every 24 hours

5. Change feeding tubing with every new bottle that is hung.

6. Label feeding bottle with resident's name, room, date, formula and rate.

7. Do not re-spike bottle already in use with the new tubing

G. Open System Feeding Guidelines (cans, bottles, powder formulas):

1. Given at room temperature.

2. Clean container top with alcohol wipe/swab before opening.

3. Fill bag with just enough feeding for maximum hang time.

4. Hang canned formula for a maximum of 8 hours.

5. Hang reconstituted formula for a maximum of 4 hours.

6. Allow bag to empty before adding additional formula.

7. Change tubing and feeding container every 24 hours.

8. Any unused portion of canned formula cannot be taken out of resident's room and must be discarded.

9. Formula selected will be from the SVMC Enteral Formulary whenever possible. Other formulas may be used if a patient's unique condition/needs warrant it. Non-formulary products may require up to 72 hours to obtain.

H. Documentation : Record in the resident's medical record in PCS:

1. Date

2. Time of feeding

3. Amount of feeding

4. Method of delivery (bolus, gravity or pump)

5. Route of delivery (NG, GT, JT)

6. Residents' in tolerance of feeding, including:

   a. diarrhea

   b. nausea, vomiting

   c. regurgitation

   d. abdominal distention

   e. residuals 250ml or more

7. If a resident has residuals of 250ml or more, hold the tube feeding and recheck in one hour. If the residuals remain above 250ml, recheck every hour. If the tube feeding is held 24 hours or more, notify the MD and get a Dietary consult.

8. Condition of GT, JT or NG site (i.e., skin at site clean and dry or any drainage or excoriation, plus interventions provided as indicated).

9. Record formula and water amount on intake and output section in PCS. Include:

   a. Water used for flushing after feeding

b. Medication flushes

10. Record measures taken to prevent aspiration such as:

a. Elevation of the head of bed

b. Checking of placement by auscultation

c. Checking of residual of gastric contents

I. Also Record:

1. Changes of administration sets

2. Flow rate checks

3. Mouth care

4. Nasal care

5. Any changes of feeding tubes

**REFERENCES:**


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| SUBJECT: | SECTION: |
|---|---|
| **ADMISSION OF A NEWBORN DURING THE NIGHT SHIFT** | **Page 1 of 4** |

**Printed copies are for reference only. Please refer to the electronic copy for the latest version.**

**POLICY:**

1. Function(s): To establish a standardized procedure to initiate Normal Newborn Orders for the admission and initial care of the normal, term newborn delivered by uncomplicated birth between 10:00 pm and 7:00 am.

2. Circumstances under which the Registered Nurse ( RN) may initiate Normal Newborn Orders:

   a. Setting: Maternal Child Health (MCH) Department

   b. Supervision: Immediate supervision by the Pediatric Hospitalist on duty.

   c. Condition: All newborns delivered at Sierra View Medical Center (SVMC) during the night shift; uncomplicated deliveries of mothers without perinatal or intrapartum risk factors.

   d. Exclusions: Term infants born with complicated intrapartum or birth circumstances, infants less than 37 weeks gestation, infants exhibiting abnormal newborn behaviors and/or having APGAR scores of less than 8 at one and five minutes and less than nine at ten minutes.

**PROCEDURE:**

1. Definition: Registered Nurses responsible for the care of the neonate at the time of birth will utilize the following parameters to determine the need to notify the pediatrician for admission orders during the hours of 10:00 pm and 7:00am.

2. Data Base: Infants at the time of birth

   a. Subjective: Any time the RN is concerned about the status of the newborn.

   b. Objective:

   - Infant's mother is free of perinatal risk factors with uncomplicated labor and delivery
   - Infant's APGAR scores are 8-10 at one minutes, 8-10 at five minutes and 9-10 at ten minutes.
   - Infant exhibits no signs of respiratory, cardiovascular or anatomical abnormalities.
   - Infant vital signs are stable and within normal limits

3. Contraindications:

   a. Unstable infants born with complications in mother's perinatal or intrapartum history, fetal distress, shoulder dystocia, vacuum or ~~forcep~~forceps-assisted delivery, and/or other birth trauma.

   b. Infants less than 37 weeks gestation

   c. Unstable blood glucose levels per Normal Newborn Orders

   d. Any time the infant exhibits:

      - Worsening condition
      - Temperature less than 97.5 or greater than 100.0 ° F (every ½ hour X 2)
      - Persistent pulse rate less than 95 or greater than 180
      - Persistent respiratory rate less than 30 or greater than 60
      - Oxygen saturation (via pulse oximetry) monitoring persistently less than 92% and/or requiring oxygen administration to maintain O2 saturation ~~sats~~ 92-96%

4. Diagnosis: Normal Term Neonate

5. Plan: Evaluate the newborn at the time of delivery, assign APGAR score and complete admission assessment.

   a. Treatment:

      - By 10:00 pm, notify Pediatric Hospitalist on duty or Pediatrician of expected delivery and provide information regarding the mother's perinatal history and intrapartum course and status.
      - If infant meets Normal Newborn parameters, initiate Normal Newborn Orders (via order management) and notify admitting of infant's birth
      - Notify Pediatric Hospitalist after 7:00am or at the time of physician rounds.
      - Notify physician directly as needed if the infant's condition changes.

   b. Consultation Required: None

6. Documentation:

   a. Electronic Medical Record (EMR): Record newborn's initial assessment with APGAR, admission assessment, medication administration, and routine care per unit protocol. All orders to be entered by the MCH RN utilizing the newborn admission order set with the order source of standardized procedure.

   b. Document in EMR when and how the physician was notified of the infant's birth.

   c. Document any follow-up concerns and physician notification as needed.

STAFF AUTHORIZED TO PERFORM THE STANDARDIZED PROTOCOL: RNs

REQUIREMENTS FOR ADMISSION OF NEWBORN DURING NIGHT SHIFT

1. Education: Licensed Personnel (RN)

   a. Current California Registered Nurse License

   b. Basic Life Support (BLS) and Neonatal Resuscitation (NRP) Provider Certification

   c. Completion of the minimum RN competencies for the Labor & Delivery, Postpartum, Nursery/NICU

2. Training: As required by specific licensing board

3. Experience: N/A

4. Initial Evaluation: Upon orientation to Maternal Child Health Unit

5. Continuing Evaluation:

   a. Maintains BLS and NRP provider certification

   b. Completion of Maternal Child Health annual unit-specific clinical competencies.

DEVELOPMENT & APPROVAL of the STANDARDIZED PROCEDURE:

A. **Method:** Interdisciplinary Committee & OB/GYN Department

B. **Review Schedule:** Yearly

**REFERENCES:**

- NPR-I-15 Standardized Procedure Guidelines, California Nursing Practice Act, Article 7 (Approved 11-28-2012) Retrieved from http:// www.rn.ca.gov/regulations/title16.shtml#1470.

| SUBJECT: **ANTICOAGULATION POLICY** | SECTION: **Page 1 of 42** |
|---|---|

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**PURPOSE:**

To provide a guideline for the safe and effective use of anticoagulation for therapeutic use.

**POLICY:**

The clinical pharmacist will monitor oral anticoagulation (e.g., warfarin, rivaroxaban, apixaban) and treatment enoxaparin to maintain therapeutic anticoagulation, minimize anticoagulant toxicity, and maximize the use for each hospital stay to achieve the therapeutic goals.

It is the policy of Sierra View Medical Center (SVMC) to use weight-based heparin dosing guidelines for anticoagulation. The therapeutic objective goal of the weight-based heparin continuous infusion is to maintain an aPTT of 50-79.9 seconds.

**Guidance provided in this policy is not intended to, and should not, replace clinical judgment of the care provider.**

**AFFECTED AREAS/PERSONNEL:** *NURSING, PHARMACY, PHYSICIANS*

**PROTOCOL & PROCEDURE:**

1. Dispensing/Administration
    a. To reduce compounding and labeling errors for anticoagulants, SVMC uses only oral unit dose products, pre-filled syringes, or pre-mixed infusion bags for anticoagulants when these types of products are available.
        i. For pediatric patients, if pre-filled syringe products specifically designed for children are not available, Pharmacy will prepare unit dose products, pre-filled syringes, or pre-mixed infusion bags.
        ii. Pharmacists will clarify all anti-coagulation dosing for pediatric patients.
    b. When heparin or argatroban is administered intravenously and continuously, SVMC uses programmable Alaris infusion pumps in order to provide consistent and accurate dosing.
2. Medication Selection
    a. The initiation and maintenance of anticoagulation therapy will be based on guidelines appropriate to the medication used, to the condition being treated, and to potential drug interactions.
        i. The use of direct oral anticoagulants (DOACs) over vitamin K antagonist (VKA) therapy in non-valvular atrial fibrillation is recommended.[1]
        ii. For venous thromboembolism (VTE) without an associated cancer diagnosis, DOACs (dabigatran, rivaroxaban, apixaban, or edoxaban) are recommended over

VKA therapy and VKA therapy is recommended over low molecular weight heparin (LMWH).[2]

iii. For VTE associated with cancer, LMWH is recommended over VKA or any DOACs.[2]

iv. Consider warfarin in cases of severe allergy or contraindication to DOACs or in cases of end-stage renal disease (ESRD).

3. Ordering Labs[3-8]

a. Patients receiving anticoagulants for therapeutic use will have baseline and current laboratory values available for monitoring and adjusting anticoagulant therapy.

b. Pharmacists will have the ability to order lab work as related to the initiation or continuation of anticoagulation for therapeutic use, including but not limited to:

| **Anticoagulant** | **Baseline Lab Tests (if not done within last 24 hours)** | **Ongoing Lab Tests** | **Recommended Frequency of Current Lab** |
|---|---|---|---|
| Warfarin (Appendix A) | PT/INR, CBC | PT/INR, CBC<br><br><u>As needed:</u><br>AST/ALT, albumin | 1) PT/INR*: daily until INR is stabilized (i.e., INR therapeutic for 5 days on a consistent dosing regimen) then ok to order every 2-3 days<br>2) CBC: every 3 days or as needed<br>3) AST/ALT/albumin: as needed<br>*Additional INR monitoring may be necessary when a patient is started on an interacting drug, enteral feedings or if there is a significant change in diet. |
| Dabigatran (Appendix B) | CBC, SCr | CBC, SCr | 1) CBC: Every 3 days for the first week, then weekly or as needed<br>2) Scr: Every 3 days or as needed |
| Apixaban (Appendix B) | CBC, SCr | CBC, SCr | 1) CBC: Every 3 days for the first week, then weekly or as needed<br>1) Scr: Every 3 days or as |

| Anticoagulant | Baseline Lab Tests (if not done within last 24 hours) | Ongoing Lab Tests | Recommended Frequency of Current Lab |
|---|---|---|---|
| | | | needed |
| Rivaroxaban (Appendix B) | CBC, SCr, AST/ALT | CBC, SCr | 1) CBC: Every 3 days for the first week, then weekly or as needed<br>2) Scr: Every 3 days or as needed |
| Enoxaparin (Appendix C) | CBC, SCr | CBC, SCr<br><br>As needed:<br>Anti-Xa | 1) CBC, SCr: Every 3 days or as needed<br>2) Anti-Xa: as needed for >144 kg, renal insufficiency, pregnant patients |
| Heparin (Appendix D) | aPTT, PT, CBC | CBC, aPTT | 1) CBC: the next day after starting Heparin and every 3 days while on Heparin or as needed<br>2) aPTT will be ordered by nursing staff every 6 hours per protocol during the first 24 hours of treatment. If over 24 hours of therapy & PTT at goal, next lab draw in AM of following day.~~, or until the Heparin infusion results in a therapeutically stable aPTT for 12 consecutive hours.~~ |
| Argatroban (Appendix E) | PT/INR, aPTT, CBC, AST/ALT | aPTT, CBC, ACT (for PCI) | For the argatroban HIT protocol, aPTT to be ordered by nursing<br>1) Order aPTT 2 hours after initiation and 2 hours after each change in rate<br>2) If aPTT level at goal, continue current rate, re-order aPTT level every 2 hours x 2 times.<br>3) If aPTT stays within |

| Anticoagulant | Baseline Lab Tests (if not done within last 24 hours) | Ongoing Lab Tests | Recommended Frequency of Current Lab |
|---|---|---|---|
| | | | therapeutic range, check aPTT daily in AM<br>4) Order aPTT if hemorrage/ thromboembolism suspected<br>5) CBC daily<br>For the argatroban PCI protocol, ACT to be ordered by nursing<br>1) ACT (activated clotting time) to be drawn every 5-10 minutes after bolus infusion or a change in rate if argatroban used for PCI (percutaneous coronary intervention).<br>2) Proceed with procedure if ACT > 300 seconds. |

c. If dose adjustment is required or if the patient becomes sub/supra-therapeutic, the cycle of more frequent monitoring should be repeated until a stable dose response can again be achieved. Pharmacists may order laboratory work as required by anticoagulation protocol.

4. Dosing Guidance

a. Initiation (e.g., dosing, adjustment, drug-drug interaction, drug-food interaction), management and monitoring of therapeutic anticoagulation is detailed below:

i. Warfarin (Appendix A)
ii. Direct oral anticoagulants (dabigatran, rivaroxaban, apixaban, or edoxaban) (Appendix B)
iii. Enoxaparin (Appendix C)
iv. Heparin Titration Protocol (DVT/PE and ACS) (Appendix D)
v. Argatroban Protocol (Appendix E)
vi. Perioperative Management of Anticoagulation (Appendix F)

b. Pharmacist will routinely check patients on therapeutic anticoagulation for drug-drug interactions, concomitant anticoagulation medication (e.g., NSAIDs, clopidogrel, aspirin >81mg) and relevant labs.

i. Ketorolac will not be administered to any patient on therapeutic anticoagulation therapy. The pharmacy will automatically discontinue ketorolac orders and notify the physician.

ii. While on heparin continuous infusion, patients should not receive any non-steroidal anti-inflammatory drugs (NSAIDs), aspirin or aspirin-containing medications.

c. Appropriate objective measures (e.g., Fecal Occult Samples, UA, CBC, etc.) will be monitored as necessary to assess the safety of anticoagulant therapy.

5. Management of bleeding and reversal of anticoagulation

a. When bleeding is suspected, hold anticoagulation and discuss with primary physician for patient management.
b. Assess and/or repeat appropriate objective measures (e.g., Fecal Occult Samples, UA, CBC, etc.) as needed.
c. Review anticoagulation appendices for steps to reverse anticoagulation (Appendix A-D).
d. A summary of reversal dosing for each anticoagulant is provided in Appendix G: Emergent reversal for life-threatening bleeding due to anticoagulant.

6. Safety and Reporting

a. Evaluation of safety practices related to anticoagulation use will be conducted annually by the Medication Safety Committee to identify potential improvement opportunities, and to monitor and measure the effectiveness of improvement actions. This evaluation will include:
    i. Outcome Measures – i.e. Adverse Drug Events Related to Anticoagulants per 100 Admissions with Anticoagulant Administered.
    ii. Process Measures – i.e. Percent of anticoagulant administrations with appropriate laboratory monitoring according to protocol, percent of anticoagulant discharges with appropriate patient/family discharge instructions.
b. Nursing, physicians, pharmacists are to report adverse drug events (e.g., bleeding) with anticoagulation promptly in the electronic incident reporting system.
c. Pharmacy is to review trigger medication (e.g., protamine, vitamin K) report to identify potential adverse drug reaction with anticoagulation. If an adverse drug reaction is present, pharmacy will report the case in the electronic incident reporting system.

7. Discharge Education

a. Nursing will provide education to patients/families specific to the anticoagulant medication that the patient will be discharged on. Discharge education will include:

    i. adherence to medication dose and schedule
    ii. importance of follow-up appointments and laboratory testing (if applicable)

iii. potential drug–drug and drug–food interactions
iv. the potential for adverse drug reactions.

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- Kearon C, Akl EA, Ornelas J, Blaivas A, Jimenez D, et al. Antithrombotic Therapy for VTE Disease: CHEST Guideline and Expert Panel Report. Chest. 2016;149(2):315-352. doi: 10.1016/j.chest.2015.11.026.
- Package insert Heparin. Fresenius Kabi. Lake Zurich, IL 60047. Aug 2017.
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- Package Insert Pradaxa. Boehringer Ingelheim Pharmaceuticals, Inc. Ridgefield, CT 06877. Nov 2015.
- Package Insert Savaysa. Daiichi Sankyo, Inc. Parsippany, NJ. Jan 2015.
- Package Insert Argatroban. Sandoz, Inc. Princeton, NJ 08540. Jan 2011.

**Appendix A: Warfarin**

Individual patient responses to warfarin are highly variable. The guideline that follows is not a substitute for good clinical judgment.

The individual doses recommended below will commonly require modification for situations that include:

- Baseline INR value > 1.2
- Age greater than 65
- Poor nutritional status
- Liver disease
- Otherwise debilitated
- Presence of interacting medications (Table 1)

Upon the request of the physician, the pharmacist will initiate the monitoring process.

1. The pharmacist will monitor for adjustments to the warfarin dose according to:
    a. Desired INR of 2-3 for:
        i. Deep vein thrombosis (DVT)
        ii. Pulmonary embolism (PE)
        iii. Prophylaxis of venous thromboembolism (VTE)
        iv. Prevention of systemic embolism
    b. Desired INR of 2.5-3.5 for:
        i. mechanical prosthetic valve in the mitral position
        ii. mechanical prosthetic value in the aortic position with additional risk factors
    c. Desired INR as specified by physician order

2. The pharmacist will monitor the INR daily when the patient is on warfarin. If the INR is not ordered, the pharmacist will order the INR. No warfarin will be dispensed without the baseline INR.

3. The following guidelines are to achieve an INR of 2 to 3. If different INR range is desired, adjust the dose accordingly.
    a. Initiation
        **i. For patients on unfractionated heparin:**
            **1. Start at 5 mg** on day #1 and day #2, then adjust subsequent daily dose according to INR (see "Maintenance").
                a. Consider **higher dose (7.5mg)** for patients
                    i. weighing greater than 85kg,
                    ii. on medications that can significantly decrease warfarin, response such as rifampin, phenytoin, phenobarbital (see Table 1), or
                    iii. hypothyroidism (does NOT include levothyroxine-treated patient who is currently euthyroid)
            2. Consider **lower dose (2.5 mg)** for:
                i. elderly (> 70 years),
                ii. poor nutrition,

iii. liver disease,
iv. debilitated patient,
v. patient with elevated initial INR, or
vi. on medications that can significantly increase warfarin response such as metronidazole, azole antifungals, sulfonamides, and amiodarone (see Table 1).

**ii. For patients on low molecular weight heparin (LMWH):**

1. **Start at 10 mg** on day #1 and day #2, then adjust subsequent daily dose according to INR (see "Maintenance").
2. Consider **lower dose (5-7.5 mg)** for:
   a. elderly (> 70 years),
   b. poor nutrition,
   c. liver disease,
   d. debilitated patient,
   e. patient with elevated initial INR, or
   f. on medications that can significantly increase warfarin response such as metronidazole, antifungals, sulfonamides, and amiodarone (see Table 1).

b. Maintenance

i. Pharmacist will adjust the dose of warfarin based on the INR

| Day | INR | Dosage |
|---|---|---|
| 3 | < 1.5<br>1.5 – 1.9<br>2 – 3<br>> 3 | 5 – 10 mg<br>2.5 – 5 mg<br>0 – 5 mg<br>0 |
| 4 | < 1.5<br>1.5 – 1.9<br>2 – 3<br>> 3 | 10 mg<br>5 – 7.5 mg<br>0 – 5 mg<br>0 |
| 5 | < 1.5<br>1.5 – 1.9<br>2 – 3<br>> 3 | 10 mg<br>7.5 – 10 mg<br>0 – 5 mg<br>0 |
| 6 | < 1.5<br>1.5 – 1.9<br>2 – 3<br>> 3 | 7.5 – 12.5 mg<br>5 – 10 mg<br>0 – 7.5 mg<br>0 |

c. Patients on warfarin prior to admission

i. If the patient is currently on a stable home warfarin dose and the INR is within the target range, evaluate the patient for any changes in co-morbidities, warfarin sensitivity, warfarin clearance and potential drug interactions.

1. If there are no changes, continue the home dose and monitor the patient daily.
2. If there are changes, evaluate the patient for a dosage change.

**TABLE 1: WARFARIN DRUG INTERACTION TABLE**

| **Drug that can INCREASE effects of warfarin** | | | **Drug that can DECREASE effects of warfarin** | |
|---|---|---|---|---|
| Severe | Moderate to mild | Herbals/Dietary supplements | Severe to moderate | Herbals/Dietary supplements |
| Amiodarone§ | Allopurinol | Alcohol (acute) | Azathioprine | Alcohol (chronic) |
| Fenofibrate and derivatives | Azole antifungals (fluconazole§, ketoconazole§, miconazole§, voriconazole, itraconazole, etc.) | Dong Quai | Bosentan | Ginseng (American) |
| Metronidazole§ | Cephalosporins | Fish oil | Carbamazepine | St. John's Wart |
| Sulfamethoxazole§ | Cimetidine | Garlic | Cholestyramine | Vitamin K |
| Tamoxifen-concurrent use with warfarin contraindicated | Colchicine | Gingko | Griseofulvin | |
| Ginseng (Panax and Siberian)-avoid concurrent use | Corticosteroids | Grapefruit or grapefruit juice | Isotretinoin | |
| | Fluoroquinolones | Vitamin E | Mesalamine | |
| | Gemfibrozil | | Mercaptopurine | |
| | Glyburide | | Methimazole | |
| | Isoniazid | | Phenobarbital¥ | |
| | Levothyroxine | | Phenytoin (chronic use)¥ | |
| | Macrolides (Erythromycin, Clarithromycin, Azithromycin) | | Propylthiouracil | |
| | NSAIDs (increase risk of bleed) | | Ribavirin | |
| | Propafenone | | Rifabutin | |
| | Proton pump inhibitors (e.g., pantoprazole, omeprazole, etc.) | | Rifampin¥ | |
| | Quetiapine | | Sucralfate | |
| | Quinidine | | Sulfasalazine | |
| | Ranitidine | | | |
| | SSRIs (paroxetine, escitalopram, | | | |

| | | | | |
|---|---|---|---|---|
| | fluoxetine, etc.) | | | |
| | Statins | | | |
| | Tetracyclines (doxycycline, etc.) | | | |
| | Tramadol | | | |

***Note:*** *These are common warfarin interactions only, NOT an all-inclusive list.*
¥Consider empirically increasing warfarin dose with concurrent use
§Consider empirically reducing warfarin dose with concurrent use

4. Reversal of Warfarin
   a. If INR >4.5, assess for possible lab error. If lab error is possible (i.e., short draw or hard draw), repeat INR ASAP.
   b. If the patient has any signs or symptoms of bleeding, or if INR > 6, discuss with the primary physician for patient management.
   c. To reverse warfarin, use of 5-10 mg intravenous vitamin K is appropriate for major bleeding events, while 2-5 mg of oral or intravenous vitamin K can be used for non-major bleeding events that require hospitalization.

| INR | CLINICAL SCENARIO | MANAGEMENT |
|---|---|---|
| < 4.5 | No bleeding | • Hold warfarin until INR in therapeutic range then resume warfarin at a lower dose |
| | Rapid reversal required | • Hold warfarin<br>• Consider vitamin K 2.5mg oral |
| 4.5-10 | No bleeding | • Hold warfarin until INR in therapeutic range<br>• Consider vitamin K 2.5mg oral |
| | Rapid reversal required | • Hold warfarin<br>• Give vitamin K 2.5mg oral or 1mg IV infusion |
| >10 | No bleeding | • Hold warfarin until INR in therapeutic range<br>• Give vitamin K 2.5mg oral or 1-2mg IV infusion over 30 minutes, and repeat q24h as needed |
| | Rapid reversal required | • Hold warfarin<br>• Give vitamin K 1-2mg IV infusion over 30 minutes, and repeat q6- 24h as needed |
| Any INR | Serious or life-threatening bleeding | • Hold Warfarin<br>• Give vitamin K 10mg IV infusion over 30 minutes<br>• Give 4F-PCC (see below) |

*Note: If patient is unable to tolerate PO Vitamin K, IV route may be substituted. IV administration of vitamin K has faster onset of action.*

d. Use of 4 factor prothrombin complex concentrate (4F-PCC) is recommended for major bleeding in patients taking warfarin.
    i. Administer 4F-PCC based on INR or low fixed dose
        1. Based on INR or
            a. INR 2-3.9, 25 units/kg (max 2,500 units)
            b. INR 4-6, 35 units/kg (max 3,500 units)
            c. INR >6, 50 units/kg(max 5,000 units)
            d. INR unavailable, use low fixed dose option
        2. Based on Low Fixed Dose
            a. 1,000 units for any major bleed
            b. 1,500 units for intracranial hemorrhage
    ii. If 4F-PCC not available, use plasma 10-15 mL/kg
e. After the bleeding has been controlled, a shared decision-making discussion is needed to determine if and when warfarin should be restarted. A delayed restart is recommended when the bleed occurred in a critical site, the patient has a high risk of re-bleeding or of death from a re-bleed, the source of the bleed cannot be identified, or future surgical interventions are planned.
    i. For patients with gastrointestinal bleeds, restarting oral anticoagulants after ≥7 days has been associated with better outcomes, including improved survival and reduced thromboembolism risk.
    ii. For patients with intracranial hemorrhage, restarting oral antithrombotic agents should usually be delayed for approximately 4 weeks.

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**Appendix B: Direct oral anticoagulants (dabigatran, rivaroxaban, apixaban, or edoxaban)**

The guideline that follows is not a substitute for good clinical judgment. Upon the request of the physician, the pharmacist will initiate the monitoring process.

1. Background

    a. Several direct oral anticoagulants (DOACs) have been approved by the FDA since 2010. Unlike warfarin, these drugs do not require regular blood monitoring. These medications directly inhibit the blood's ability to form blood clots.
    b. DOACs are both rapid and short-acting agents with relatively low bleeding risks and good overall safety profiles. They are considered to be at least as effective as warfarin. Available medications in this category include apixaban (Eliquis), dabigatran (Pradaxa), edoxaban (Savaysa) and rivaroxaban (Xarelto).
    c. Use of DOACs is common for conditions such as non-valvular atrial fibrillation and venous thromboembolism (VTE).

2. Initiation/Monitoring:

    a. Prior to initiating, pharmacist will assess for appropriate indication, baseline renal function (e.g., CrCl), and hepatic function (e.g. ,Child-Pugh) as needed.
    b. Drug-drug interactions will be assessed throughout duration of therapy / hospital stay (Table 2).

3. Indication and Dosing (including renal and hepatic adjustment):[1-5]

| **Indication** | **Dabigatran** | **Rivaroxaban** | **Apixaban** | **Edoxaban** |
|---|---|---|---|---|
| Non-valvular AF | CrCl >30 mL/min: 150 mg BID | CrCl >50 mL/min: 20 mg daily with evening meal | 5 mg BID | CrCl >50 to ≤95 mL/min: 60 mg daily |
| | CrCl 15–30 mL/min: 75 mg BID<br>*Per ACCP, C/I in CrCl <30*[5] | CrCl 15–50 mL/min: 15 mg daily with evening meal | 2.5 mg BID, if 2 of 3 characteristics: SCr ≥1.5 mg/dL, age ≥80 yo, weight ≤60 kg | CrCl 15–50 mL/min: 30 mg daily |
| | CrCl <15 mL/min or on dialysis: Not recommended<br>*Per ACCP, C/I in CrCl <30*[5] | CrCl <15 mL/min or on dialysis: Not recommended | | CrCl <15 mL/min: Not recommended |
| | CrCl 30–50 mL/min with concomitant P-gp inhibitors (e.g., | | | NOT recommended for CrCl >95 mL/min due to increased |

| Indication | Dabigatran | Rivaroxaban | Apixaban | Edoxaban |
|---|---|---|---|---|
| | Dronedarone, ketoconazole PO): 75 mg BID | | | risk of ischemic stroke |
| | CrCl <30 mL/min with concomitant P-gp inhibitors: Avoid co-administration | | | Avoid use with rifampin |
| DVT or PE treatment | CrCl >30 mL/min: 150 mg BID after at least 5 days of parenteral anticoagulation | 15 mg BID with food x 21 days for initial treatment, then 20 mg once daily with food | 10 mg BID x 7 days, then 5 mg BID | CrCl >30 mL/min: Start after at least 5 days of parenteral anticoagulation >60kg: 60 mg daily ≤ 60kg: 30 mg daily |
| | CrCl ≤30 mL/min or on dialysis: Not recommended | CrCl <30 mL/min: Not recommended | *Not studied in CrCl ≤ 25 or SCr > 2.5* | CrCl 15–50 mL/min or on certain P-gp inhibitors: 30 mg once daily<br><br>Avoid use with rifampin |
| ↓ in recurrent DVT/PE | CrCl >30 mL/min: 150 mg BID after at least 5 days of parenteral anticoagulation | 20 mg daily with food | 2.5 mg BID | |
| | CrCl ≤30 mL/min or on dialysis: Not recommended | CrCl <30 mL/min: Not recommended | *Not studied in CrCl ≤ 25 or SCr > 2.5* | |
| DVT, PE prophylaxis after hip or knee replacement | CrCl >30 mL/min after achievement of hemostasis: If given day of surgery, 110 mg 1–4 h postop; after day of surgery 220 mg once daily x 10-14 days (max 35 days) | Initial dose 6–10 h after surgery provided hemostasis established: 10 mg daily x 10-14 days (max 35 days) | 2.5 mg BID x 10-14 days (max 35 days) | |

| Indication | Dabigatran | Rivaroxaban | Apixaban | Edoxaban |
|---|---|---|---|---|
| | | | | |
| | CrCl ≤30 mL/min or on dialysis: Not recommended | CrCl <30 mL/min: Not recommended | *Not studied in CrCl ≤ 25 or SCr > 2.5* | |
| | CrCl <50 mL/min with concomitant P-gp inhibitors: Avoid co-administration | | | |
| Acute Medically Ill patient: VTE prophylaxis | | 10 mg once daily for 31 to 39 days<br><br>Avoid use with CrCl <30 mL /min | | |
| Acute Coronary Syndrome & Coronary Artery Disease | | Off Label: 2.5 mg twice daily, in combo w/aspirin<br><br>Avoid use with CrCl <30 mL/min | | |
| Postpercutaneous coronary intervention w/stent placement & Nonvalvular afib. | | Off Label: CrCl >50 mL/minute 15 mg once daily with food<br><br>CrCl 30 to 50mL/min: 10 mg once daily<br><br>Avoid use with CrCl <30 mL/min | 5 mg twice daily<br><br>Unless patient has any 2 of the following: Age ≥80 years, body weight ≤60kg, or serum creatinine ≥1.5 mg/dL, then reduce to 2.5mg twice daily | |
| Superficial Vein thrombosis, acute symptomatic | | Off label: 10 mg once daily for 45 days<br><br>Avoid use with CrCl <30 mL/min | | |
| Indefinite Anticoagulation *If patient at risk for recurrent VTE following >6 months of therapeutic anticoagulation | | 10 mg once daily | 2.5 mg twice daily | |

| Indication | Dabigatran | Rivaroxaban | Apixaban | Edoxaban |
|---|---|---|---|---|
| | | | | |
| Hepatic Function Dosing Considerations | | Not recommended in moderate-severe hepatic impairment (Child-Pugh class B/C) or hepatic disease with coagulopathy | Not recommended in patients with severe hepatic impairment (Child-Pugh class C) | Not recommended in moderate-severe hepatic impairment (Child-Pugh class B/C) or hepatic disease with coagulopathy |

Table 2: Direct Oral Anticoagulants Drug Interactions Table[1-4,6]

| DOAC | Interacting Medication | Effect on DOAC | Labeled Guidance; Comments |
|---|---|---|---|
| Dabigatran | P-gp inducer: rifampin | ↓ Dabigatran exposure | Concomitant use should generally be avoided. |
| | P-gp inhibitors: ketoconazole, dronedarone | ↑ Dabigatran exposure if concomitant severe renal impairment | If CrCl 30–50 mL/min: ↓ to 75 mg BID during concomitant use |
| | P-gp inhibitors: ketoconazole, dronedarone, verapamil, amiodarone, quinidine, clarithromycin, ticagrelor | | If CrCl 15–30 mL/min: avoid concomitant use |
| Apixaban | Strong dual P-gp and CYP3A4 inducers: rifampin, carbamazepine, phenytoin, St. John's wort | ↓ Apixaban exposure | Avoid concomitant use |
| | Strong dual P-gp and CYP3A4 inhibitors: ketoconazole, itraconazole, ritonavir, clarithromycin | ↑ Apixaban exposure | In patients on 5 mg or 10 mg BID, ↓ dose by 50% when co-administered. Avoid co-administration with 2.5 mg BID |
| Rivaroxaban | Combined P-gp and strong CYP3A4 inducers: rifampin, carbamazepine, phenytoin, St. John's wort | ↓ Rivaroxaban exposure | Avoid concomitant use; may decrease rivaroxaban efficacy |
| | Combined P-gp and strong CYP3A4 inhibitors: ketoconazole, itraconazole, HIV protease inhibitors (ritonavir, lopinavir/ritonavir, indinavir), conivaptan | ↑ Rivaroxaban exposure | Avoid concomitant use |
| | Combined P-gp and moderate CYP3A4 inhibitors: diltiazem, | ↑ Rivaroxaban exposure in patients | In CrCl 15 to <80 mL/min, rivaroxaban should not be |

| | | | |
|---|---|---|---|
| | verapamil, amiodarone, dronedarone, erythromycin | with renal impairment | used concomitantly unless the potential benefit justifies the potential risks<br><br>*No evidence of interaction observed in ROCKET AF between treatment assignment and outcomes in patients using ≥1 combined P-gp and moderate 3A4 inhibitors (including amiodarone, diltiazem, and verapamil)* |
| Edoxaban | P-gp inducer: rifampin | ↓ Edoxaban exposure | Avoid concomitant use |
| | Strong P-gp inhibitors: ritonavir, nelfinavir, saquinavir, indinavir, cyclosporine | ↑ Edoxaban exposure | Avoid concomitant use in patients taking edoxaban for treatment of VTE |
| | P-gp inhibitors: verapamil, quinidine, azithromycin, clarithromycin, itraconazole, ketoconazole | ↑ Edoxaban exposure | ↓ to 30 mg daily during concomitant administration for patients taking edoxaban for the treatment of VTE. Dose reduction is not recommended for AF indications.<br><br>*In ENGAGE AF, a ↓ dose of edoxaban as a result of concomitant P-gp inhibitor use (verapamil, quinidine, dronedarone) was associated with ↓ edoxaban exposure and a relative ↑ in risk of stroke or systemic embolism with edoxaban relative to warfarin* |

*AF, atrial fibrillation; BID, twice daily; CrCl, creatinine clearance; ENGAGE AF, Effective Anticoagulation With Factor Xa Next Generation in Atrial Fibrillation trial; P-gp, P-glycoprotein; ROCKET AF, Rivaroxaban Once Daily Oral Direct Factor Xa Inhibition Compared with Vitamin K Antagonism for Prevention of Stroke and Embolism Trial in Atrial Fibrillation; and VTE, venous thromboembolism.*

4. Reversal of DOACs[7]
    a. When bleeding is suspected, hold anticoagulation and discuss with primary physician for patient management.

b. Use of a reversal agent should be reserved only for patients with a life-threatening bleed or a major bleed in a critical site. Recommended reversal agents for DOACs include:

| | First line | Second line | Not indicated | Notes |
|---|---|---|---|---|
| **Dabigatran** | Administer 5g idarucizumab IV* (typically provided as two separate vials each containing 2.5 g/50 mL) | If idarucizumab* not available, administer 4F-PCC or aPCC 50 units/kg IV | Plasma | Consider activated charcoal for known recent ingestion (within 2-4 hours) |
| **Edoxaban** | Administer 4F-PCC 50 units/kg IV | If 4F-PCC not available, administer aPCC 50 units/kg IV | Idarucizumab*, Plasma | Consider activated charcoal for known recent ingestion (within 2-4 hours) |
| **Rivaroxaban or Apixaban** | Administer andexanet alfa* | If andexanet alpha* not available, administer 4F-PCC 50 units/kg IV or aPCC 50 units/kg IV | Idarucizumab*, Plasma | Consider activated charcoal for known recent ingestion (within 2-4 hours) |
| | **Timing of Last Rivaroxaban or Apixaban Dose before Andexanet Alfa Initiation** | | | |
| | **< 8 hrs ago or unknown** | | **≥ 8 hrs ago** | |
| **Rivaroxaban** >10 mg or unknown **Or Apixaban** > 5 mg or unknown | **High dose andexanet alfa*:** Initial IV Bolus: 800 mg at a target rate of 30 mg/min Follow-on IV Infusion: 8 mg/min for up to 120 minutes | | **Low dose andexanet alfa*:** Initial IV Bolus: 400 mg at a target rate of 30 mg/min Follow-on IV Infusion: 4 mg/min for up to 120 minutes | |
| **Rivaroxaban** ≤ 10 mg **Or Apixaban** ≤ 5 mg | **Low dose of andexanet alfa*** Initial IV Bolus: 400 mg at a target rate of 30 mg/min Follow-on IV Infusion: 4 mg/min for up to 120 minutes | | | |

*4F-PCC, 4 factor prothrombin complex concentrate; aPCC, activated PCC*
**Idarucizumab and andexanet is non-formulary and not in stock at SVMC*

c. After the bleeding has been controlled, a shared decision making discussion is needed to determine if and when the DOAC medication should be restarted. A delayed restart is recommended when the bleed occurred in a critical site, the patient has a high risk of re-bleeding or of death from a re-bleed, the source of the bleed cannot be identified, or future surgical interventions are planned.
   i. For patients with gastrointestinal bleeds, restarting oral anticoagulants after ≥7 days has been associated with better outcomes, including improved survival and reduced thromboembolism risk.
   ii. For patients with intracranial hemorrhage, restarting oral antithrombotic agents should usually be delayed for approximately 4 weeks.

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**Appendix C: Enoxaparin**

The clinical pharmacist will monitor enoxaparin to maintain therapeutic anticoagulation, minimize anticoagulant toxicity, monitor laboratory trends, and maximize the use of each hospital stay to achieve the therapeutic goals.

The guideline that follows is not a substitute for good clinical judgment. Upon the request of the physician, the pharmacist will initiate the monitoring process.

1. Background[1-2]:
    a. Enoxaparin is a low molecular weight heparin (LMWH) derived from porcine heparin. Enoxaparin must be administered parenterally by the subcutaneous route (about 90% bioavailability), and may also be administered by IV. Enoxaparin binds to Anti-thrombin III to inhibit coagulation factors Xa and IIa at a ratio of between 2:1 and 4:1, whereas unfractionated heparin inhibits these factors at a 1:1 ratio.
    b. Time to peak plasma availability is 3 – 5 hours with a half-life of 3 – 6 hours in patients with normal renal function. Enoxaparin is metabolized in the liver and excreted renally.
2. Indications[1]
    a. Prophylaxis of DVT in abdominal surgery, hip replacement surgery, knee replacement surgery, or medical patients with severely restricted mobility during acute illness.
    b. Outpatient treatment of acute DVT without pulmonary embolism.
    c. Inpatient treatment of acute DVT with or without pulmonary embolism.
    d. Prophylaxis of ischemic complications of unstable angina and non-Q-wave myocardial infarction [MI].
    e. Treatment of acute ST-segment elevation myocardial infarction [STEMI] managed medically of with subsequent percutaneous coronary intervention [PCI].
3. Monitoring
    a. BLACK BOX WARNING: Epidural or spinal hematomas may occur in patients receiving enoxaparin and are receiving neuraxial anesthesia or undergoing spinal puncture, which results in long-term or permanent paralysis. Consider the benefits and risks before neuraxial intervention in patients who are or will be taking enoxaparin for thromboprophylaxis. Nursing and Physicians to monitor patients frequently for signs and symptoms of neurological impairment, and treat urgently if neurological compromise is noted.[1]
    b. Drug-drug, drug-disease, & drug-procedure interactions will be assessed throughout duration of therapy / hospital stay. [2-3]
    c. Anti-factor Xa activity is the most accurate measure anticoagulation with enoxaparin, however ordering this lab is both expensive and time-consuming (3-5 day turn-around time), so it is not useful in most situations. However, it should be considered in high risk patients (morbid obesity over 144 kg, pregnancy, and renal dysfunction) who will be on enoxaparin long term. [1-2]
        a. Anti-Xa activity should be measured 4 to 6 hours after the dose.[6-11]

| Indication | Patient Population | Anti-Xa activity target | Notes |
|---|---|---|---|
| Mechanical heart valve | Non-pregnant high-risk | 0.5 to 1 units/mL | Monitoring anti-Xa activity is not necessary. |

| | | | |
|---|---|---|---|
| (bridging anticoagulation) | patients | | However, some experts recommend monitoring, if possible.[9] |
| | Pregnant patients | 0.8 to 1.2 units/mL[8] | Some experts recommend higher anti-Xa targets (e.g., 1 to 1.2 units/mL) for mechanical mitral valves and lower targets (0.8 to 1 units/mL) for mechanical aortic valves.[10] |
| VTE treatment | High-risk patients | Once-daily dosing: >1 units/mL [6]<br><br>Twice-daily dosing: 0.6 to 1 units/mL | Note: Twice-daily dosing is recommended in pregnant patients [6-7] |
| VTE prophylaxis | Pregnant women | 0.2 to 0.6 units/mL[11] | |

4. Dosing [1-3]

| Indication | Dosage Regimen | Comments |
|---|---|---|
| DVT prophylaxis in abdominal surgery | 40 mg once a day subcutaneously for 7 to 10 days. | * Start 2 hours prior to surgery<br>* Adjust dose for patients with severe renal impairment (CrCl <30 mL/min) |
| DVT prophylaxis in hip or knee replacement surgery | 30 mg every 12 hours subcutaneously for 7 to 10 days.<br>For hip replacement, 40 mg once a day for 7 to 10 days may be considered. | * For 30 mg dose, start 12 to 24 hours after surgery providing hemostasis has been established.<br>* For 40 mg dose, start 12 hours prior to surgery.<br>* Continued prophylaxis of 40 mg once a day for an additional 3 weeks is recommended.<br>* Adjust dose for patients with severe renal impairment (CrCl <30 mL/min) |
| Medical patients during acute illness with severe mobility restriction | 40 mg once a day subcutaneously for 6 to 11 days. | * Adjust dose for patients with severe renal impairment (CrCl <30 mL/min) |
| Treatment of DVT without PE (outpatient) | 1 mg/kg subcutaneously every 12 hours for at least 5 days until a therapeutic oral | * Start warfarin therapy when appropriate (usually within 72 hours).<br>* Adjust dose for patients with severe renal impairment (CrCl <30 mL/min)<br>* Round doses to the nearest 10 mg. |

| | | |
|---|---|---|
| | anticoagulant effect with warfarin has been achieved (INR 2.0-3.0) | |
| Treatment of DVT with or without PE (inpatient) | 1 mg/kg subcutaneously every 12 hours or 1.5 mg/kg once a day for at least 5 days until a therapeutic oral anticoagulant effect with warfarin has been achieved (INR 2.0-3.0) | * Start warfarin therapy when appropriate (usually within 72 hours).<br>* Adjust dose for patients with severe renal impairment (CrCl <30 mL/min)<br>* Round doses to the nearest 10 mg. |
| Unstable angina and non-Q-wave myocardial infarction [MI] | 1 mg/kg subcutaneously every 12 hours in conjunction with aspirin therapy (100 to 325 mg daily) for at least 2 days and continued until clinical stabilization. | * Adjust dose for patients with severe renal impairment (CrCl <30 mL/min)<br>* Round doses to the nearest 10 mg. |
| Acute ST-segment elevation myocardial infarction [STEMI] | A single IV bolus of 30 mg plus a 1 mg/kg subcutaneous dose, then 1 mg/kg subcutaneously every 12 hours. | * Max 100 mg for first two doses, then 1 mg/kg for remaining doses.<br>* Dosage adjustments are recommended for patients 75 years of age and older. (see below)<br>* All patients with confirmed STEMI should receive aspirin therapy 75 to 325 mg per day unless contraindicated.<br>* Adjust dose for patients with severe renal impairment (CrCl <30 mL/min)<br>* Round doses to the nearest 10 mg. |
| Acute ST-segment elevation myocardial infarction [STEMI] (geriatric patients aged 75 and older) | DO NOT use IV bolus. 0.75 mg/kg subcutaneously every 12 hours. | * Max 75 mg for first two doses, then 0.75 mg/kg for remaining doses.<br>* All patients with confirmed STEMI should receive aspirin therapy 75 to 325 mg per day unless contraindicated.<br>* Adjust dose for patients with severe renal impairment (CrCl <30 mL/min)<br>* No dose adjustments are needed for other indications in geriatric patients unless there is renal impairment.<br>* Round doses to the nearest 10 mg. |

*Note: Patients dosed by weight should be dosed using actual body weight (up to 144 kg).[2] Round all doses to the nearest 10 mg.*

5. Renal Adjustment [1]
   a. No dose adjustment is recommended for patient with mild (CrCl 50-80 mL/min) and moderate (CrCl 30-50 mL/min) renal impairment, all these patients should be closely monitored for signs and symptoms of bleeding.
   b. For patients with severe renal impairment (CrCl <30 mL/min), the pharmacist will automatically perform a renal dose adjustment, and document their action in the patient's EHR.
   c. Enoxaparin should not be used for patients with renal dysfunction on dialysis for the following reasons:
      a. There is no FDA indication for enoxaparin use in dialysis patients.
      b. Patients with severe renal impairment (CrCl <30 mL/min) have a 65% increase in AUC over patients with normal renal function, however, in one study, hemodialysis patients had a two-fold higher AUC than the control population.
      c. Enoxaparin has been associated with hyperkalemia in patients with renal failure.

LOVENOX (ENOXAPARIN) RENAL DOSE ADJUSTMENTS PER INDICATION

| **Indication** | **Dosage Regimen for CrCl < 30 mL/min** |
|---|---|
| DVT prophylaxis in abdominal surgery | 30 mg administered subcutaneously once daily |
| DVT prophylaxis in hip or knee replacement surgery | 30 mg administered subcutaneously once daily |
| Medical patients during acute illness with severe mobility restriction | 30 mg administered subcutaneously once daily |
| Treatment of DVT with or without PE (outpatient) | 1 mg/kg administered once daily (rounded to the nearest 10 mg) |
| Treatment of DVT with or without PE (inpatient) | 1 mg/kg administered once daily (rounded to the nearest 10 mg) |
| Unstable angina and non-Q-wave myocardial infarction [MI] | 1 mg/kg administered once daily (rounded to the nearest 10 mg) |
| Acute ST-segment elevation myocardial infarction [STEMI] | 30 mg single IV bolus plus a 1 mg/kg subcutaneous dose followed by 1 mg/kg administered once daily (rounded to the nearest 10 mg) |
| Acute ST-segment elevation myocardial infarction [STEMI] (geriatric patients aged 75 and older) | 1 mg/kg administered subcutaneously once daily (no initial bolus) (rounded to the nearest 10 mg) |

6. Guideline for converting from enoxaparin to oral anticoagulants

a. Bridging enoxaparin to warfarin: When warfarin therapy is appropriate, initiate within 72 hours of starting enoxaparin, and continue concomitant administration for at least 5 days. Discontinue enoxaparin only after INR is above 2.0 for two consecutive days. [1,5]
b. Conversion from enoxaparin to rivaroxaban/apixaban: Discontinue enoxaparin and initiate rivaroxaban ≤2 hours prior to the next regularly scheduled evening dose of enoxaparin.

7. Management of enoxaparin for invasive surgical procedures[1]
   a. Refer to the dosing chart above for surgical treatment.
8. Reversal of enoxaparin
   a. Protamine partially reverses the anticoagulant effect of LMWHs (~60%)
   b. Administer protamine; do not exceed rate of 5 mg/min, max dose 50 mg
   c. If enoxaparin was given within the last 8 hours, give 1 mg of protamine for every 1 mg of enoxaparin given.
   d. If enoxaparin administered within 8-12 hrs or if bleeding continues or patient has renal impairment, give a second dose of 0.5 mg of protamine for every 1 mg of enoxaparin given.
   e. Administer by slow IV injection over ~10 minutes; **maximum single dose: 50 mg.**
   f. If enoxaparin administered >12 hrs, protamine is unlikely to be helpful.
   g. Note: In patients receiving enoxaparin (LMWH) for prophylaxis (i.e., not a full therapeutic dose), the NCS/SCCM guidelines suggest against reversal.[12]

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**Appendix D: Heparin Titration Protocol (DVT/PE and ACS)**

**PURPOSE:**

To outline the procedure to safely administer IV heparin in therapeutic doses to delay clotting and prevent formation or extension of a thrombus. The institution utilizes indication-specific heparinization, ordered via computerized physician order entry (CPOE.) There are two distinct dosing order sets which are respective to the following two indications: non-cardiac (Deep Vein Thrombosis and Pulmonary Embolism (DVT/PE)) and cardiac (Acute Coronary Syndromes (ACS)).

**POLICY:**

1. It is the policy of Sierra View Medical Center to use weight-based heparin dosing guidelines for anticoagulation.
    a. All bolus doses are to be calculated and administered in UNITS/KG.
    b. All constant infusions and intra-infusion titrations will be in UNITS/KG/HR.
2. The therapeutic objective goal of the weight-based Heparin continuous infusion is to maintain an aPTT of 50-79.9 seconds.

**AFFECTED PERSONNEL/AREAS:** *NURSING, PHARMACY, PHYSICIANS*

**EQUIPMENT:**

- Alaris IV Infusion Smart Pump
- Heparin for bolus (1000units/mL vial)(from Pyxis)
- Pre-Mixed bag of heparin (heparin 25,000 units in 500ml (50units/mL) of D5W) available from Pyxis.
- Dedicated IV tubing and access.
- IV bag label

**PROCEDURE:**

1. The following three baseline labs should be obtained immediately (STAT) if they have not been ordered in last 24 hours. They may be ordered by the RN, per this protocol, in the first 24 hours of treatment.
    a. CBC (auto diff)
    b. Prothrombin Time (PT)
    c. Partial Thromboplastin Time (aPTT)
        i. aPTT will be ordered by nursing staff every 6 hours per protocol during the first 24 hours of treatment, or until the Heparin infusion results in a therapeutically stable aPTT for 12 consecutive hours.
2. Identify the patient using TWO identifiers as outlined in the policy Medication Administration Principles and Procedures.
3. Verify the physician's order and dose using TWO licensed staff members.

a. Check that the indication corresponds to the ordered set and follow the directions within the set. (The major difference between the two order sets/indications is that ACS (cardiac) patients are also receiving antiplatelet medications and therefore are at a higher risk for bleeds, requiring a lower heparin bolus and initial continuous infusion rate.) Protocol detailed at the end of this section.

4. Preparation and administration of Heparin bolus dose:
   a. Obtain appropriate Heparin vial from Pyxis
   b. Pull appropriate Heparin bolus dose from vial.
      i. 80 units/kg (non-cardiac) **not to exceed 8,000 units**
      ii. 60 units/kg (cardiac) **not to exceed 4,000 units**
   c. Have second RN or Pharmacist verify the "5 Rights."
   d. Administer via IV push over 1 minute via cannula at IV site.
   e. Document administration.
5. Preparation and administration of Heparin continuous infusion:
   a. Obtain the premix Heparin bag (25,000units/500mL of D5W) from Pyxis.
   b. Appropriately label the premixed Heparin bag.
   c. Connect tubing to Heparin solution bag, through Alaris infusion pump and attach directly to cannula at IV site.
   d. Use a dedicated line.
   e. "Power on" the Alaris infusion pump, and select the appropriate indication-specific weight-based guardrails (i.e. DVT/PE or ACS.)
   f. Enter patient's total/actual body weight (Kg) into the smart pump and confirm that the rate correctly corresponds with the appropriately ordered set.
      i. 18 units/kg/hr (non-cardiac)
      ii. 12 units/kg/hr (cardiac)
   g. The infusion rate is not to exceed 1800 units/hr (36mL/hr) unless authorized by prescriber.
   h. Have second RN or Pharmacist verify the "5 Rights."
   i. "Start" the continuous infusion.
   j. Immediately after bolus administration and initiation of continuous infusion RN is to place lab orders for Q6HR Partial Thromboplastin STAT Timed (aPTT) for the next 24 hours, "per protocol."
6. Lab monitoring:
   a. In between each Q6HR aPTT lab result, and corresponding rate titrations, observe patient for signs and symptoms of bleeding (notify physician if any of the following occur)
      i. Observe urine for blood
      ii. Check gums for bleeding (use soft toothbrush)
      iii. Check for bruises
7. Q6HR aPTT Lab Results:
   a. During on-site pharmacy hours, Pharmacist's will help manage bolus/rate adjustments as needed per protocol. Pharmacists will place a call to nursing with recommendations & enter pertinent labs into the system as needed per protocol.
   b. Titrate Heparin continuous infusion rate (or administer additional bolus as outlined above, if protocol directs) according to the patient's most recent aPTT as outlined in the appropriate Heparin-weight based titration protocol in the addendums below.

c. **The therapeutic objective goal of the Heparin continuous infusion is an aPTT of 50-79.9 seconds**
d. Once two consecutive Q6HR labs report aPTTs that are between 50-79.9 seconds, then hold at current infusion rate and monitor next default ordered 0500 aPTT. (place aPTT order for next day at 0500 if it currently is not placed, per protocol)
e. Continue Heparin continuous infusion at therapeutic rate until physician gives order for transition to outpatient therapy. Contact physician if duration has exceeded 48 hours.
f. If aPTT returns >100 seconds, then stop infusion for 60 minutes. Consult physician, and decrease rate by 3 units/kg/hr if/when infusion is started again. Order aPTT for 6 hours from re-initiation of infusion.

8. Transitioning to outpatient anticoagulants:
   a. Low Molecular Weight Heparin (Enoxaparin)
      i. Discontinue Heparin and initiate Enoxaparin within 1 hour.
   b. Direct Oral Anticoagulants (Apixaban (Eliquis), Rivaroxaban (Xarelto))
      i. Discontinue Heparin and immediately give first dose of Apixaban or Rivaroxaban.
9. Contraindications to Heparin continuous infusion:
   a. Patients should not receive any non-steroidal anti-inflammatory drugs (NSAIDS), aspirin or aspirin containing medications.
   b. Patients with epidural catheters should not receive anticoagulant therapy during infusion and until four hours post-catheter removal.
   c. Do not administer IM.
   d. Primary IV lines should not be used for blood draws.
10. Reversal of Heparin IV
    a. **Heparin overdosage, following IV administration:** As blood heparin concentrations decrease rapidly after heparin administration, adjust the protamine dosage depending upon the duration of time since heparin administration as follows:

| Neutralization Dose of Protamine for IV Heparin Overdosage | |
|---|---|
| Time Elapsed | Dose of Protamine (mg) to Neutralize 100 units of Heparin |
| Immediate | 1 to1.5 |
| 30 to 60 min | 0.5 to 0.75 |
| >2 h | 0.25 o 0.375 |

       i. 1 mg of protamine neutralizes ~100 units of heparin; **maximum single dose: 50 mg.** If the aPTT remains elevated, may repeat dose at 0.5 mg of protamine for every 100 units of heparin.
       ii. When heparin is given as a continuous IV infusion, only heparin given in the preceding 2 to 3 hours should be considered when administering protamine. For example, a patient receiving heparin 1,250 units/hour will require ~30 mg of protamine for reversal of heparin given in the last 2 to 2.5 hours
    b. **Intracranial hemorrhage associated with heparin**
       i. Heparin-mediated (full dose infusions): 1 mg protamine for every 100 units of heparin administered in the previous 2 to 3 hours; administer by slow IV injection over ~10 minutes; **maximum single dose: 50 mg.** If the aPTT remains elevated, consider administering 0.5 mg protamine for every 100 units of heparin.
11. Reversal of Heparin SQ

a. Consider reversal for prophylactic subcutaneous doses of heparin when aPTT is significantly prolonged.
b. **Heparin overdosage, following SubQ injection:** IV: 1 to 1.5 mg protamine per 100 units heparin; this may be done by a portion of the dose (e.g., 25 to 50 mg) given slowly IV followed by the remaining portion as a continuous infusion over 8 to 16 hours (the expected absorption time of the SubQ heparin dose).

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**CROSS REFERENCES:**

- MEDICATION ADMINISTRATION – SVMC Policy and Procedure

## HEPARIN DEEP VEIN THROMBOSIS AND PULMONARY EMBOLISM WEIGHT BASED TITRATION PROTOCOL

| Heparin Infusion – DVT/PE (Non-cardiac) | |
|---|---|
| Bolus: | 80 units/kg (Max 8,000 units) |
| Starting Rate: | 18 units/kg/hr |
| Titration: | q6hrs determined by aPTT as described below: |

**Heparin Infusion (DVT/PE) TITRATE Per Protocol**

| **PROTOCOL:** | | |
|---|---|---|
| **Condition** | **Dose/Route** | **Instructions** |
| Starting Rate | 18 Units/Kg/Hr<br>Not to exceed 36 mL/Hr (1,800 Units/Hr) unless Dr. Authorized | Bag: 25,000 Units/500 mL<br>Concentration: 50 Units/mL<br>STAT aPTT in 6 hours to be ordered by the nurse after start of infusion. Then follow table below. |
| aPTT (Seconds) | Bolus: Infuse over 1 min | Infusion Rate Adjustment/Labs |
| 35.9 or less | Give IV Bolus of 80 Units/Kg *Not to exceed 8,000 Units | Increase Rate By 4 Units/Kg/Hr<br>~~Not to exceed 36 mL/Hr~~<br>STAT aPTT in 6 hours to be ordered by the nurse. |
| 36-49.9 | Give IV Bolus of 40 Units/Kg *Not to exceed 4,000 Units | Increase Rate By 2 Units/Kg/Hr<br>~~Not to exceed 36 mL/Hr~~<br>STAT aPTT in 6 hours to be ordered by the nurse. |
| 50-79.9 | No Bolus | Maintain current infusion rate if during initial 24 Hr therapy. STAT aPTT in 6 hours to be ordered by the nurse. If over 24 hrs of therpay aPTT in AM. |
| 80-99.9 | No Bolus | Decrease infusion rate by 2 Units/Kg/Hr.<br>STAT aPTT in 6 hr to be ordered by the nurse. |
| 100 or greater | No Bolus | Stop infusion for 60 minutes. (Clarify with MD if less than 24 hrs of therpay). Then decrease rate by 3 Units/Kg/Hr. STAT aPTT in 6 hrs to be ordered by the nurse after restart of infusion. |
| Signifcant Bleeding | | Stop infusion immediately; STAT CBC and aPTT |
| Starting Rate: 18 Units/Kg/Hr | | |
| If aPTT 100 or greater: Stop infusion x60 minutes, (Clarify with MD if less than 24 hours post thrombolytic….) | | |

## HEPARIN ACUTE CORONARY SYNDROME WEIGHT BASED TITRATION PROTOCOL

| Heparin Infusion – ACS (cardiac) | |
|---|---|
| Bolus: | 60 units/kg (Max 4,000 units) |
| Starting Rate: | 12 units/kg/hr |
| Titration: | q6hrs determined by aPTT as described below: |

**Heparin Infusion (ACS) TITRATE Per Protocol**

| **PROTOCOL:** | | |
|---|---|---|
| **Condition** | **Dose/Route** | **Instructions** |
| Starting Rate | 12 Units/Kg/Hr<br>Not to exceed 20 mL/Hr (1,000 Units/Hr) unless Dr. Authorized | Bag: 25,000 Units/500 mL<br>Concentration: 50 Units/mL<br>STAT aPTT in 6 hours to be ordered by the nurse after start of infusion. Then follow table below. |
| aPTT (Seconds) | Bolus: Infuse over 1 min | Infusion Rate Adjustment/Labs |
| 35.9 or less | Give IV Bolus of 60 Units/Kg *Not to exceed 4,000 Units | Increase Rate By 4 Units/Kg/Hr<br>~~Not to exceed 20 mL/Hr~~<br>STAT aPTT in 6 hours to be ordered by the nurse. |
| 36-49.9 | Give IV Bolus of 30 Units/Kg *Not to exceed 2,000 Units | Increase Rate By 2 Units/Kg/Hr<br>~~Not to exceed 20 mL/Hr~~<br>STAT aPTT in 6 hours to be ordered by the nurse. |
| 50-79.9 | No Bolus | Maintain current infusion rate if during initial 24 Hr therapy. STAT aPTT in 6 hours to be ordered by the nurse. If over 24 hrs of therpay aPTT in AM. |
| 80-99.9 | No Bolus | Decrease infusion rate by 2 Units/Kg/Hr.<br>STAT aPTT in 6 hr to be ordered by the nurse. |
| 100 or greater | No Bolus | Stop infusion for 60 minutes. (Clarify with MD if less than 24 hrs of therpay). Then decrease rate by 3 Units/Kg/Hr. STAT aPTT in 6 hrs to be ordered by the nurse after restart of infusion. |
| Signifcant Bleeding | | Stop infusion immediately; STAT CBC and aPTT |
| Titrate to: aPTT 50-79.9 | | |
| Starting Rate: 12 Units/Kg/Hr | | |
| If aPTT 100 or greater: Stop infusion for 60 minutes. (Clarify with MD if less than 24 hrs of therpay). Then decrease rate by 3 Units/Kg/Hr. STAT aPTT in 6 hrs to be ordered by the nurse after restart of infusion. | | |

**Appendix E: Argatroban Protocol**

**PROTOCOL EXCLUSION:**

- Use immediately preceding or during surgical/invasive procedures
- If patient has indwelling epidural/intrathecal catheter, consult anesthesia

**GENERAL CONSIDERATIONS:**

1. Indication: Anticoagulation for patients with Heparin-Induced Thrombocytopenia (HIT) or history of HIT.
2. Contraindications:
    a. Hypersensitivity to argatroban or any component of the formulation
    b. Overt major bleeding
    c. Suspected intracranial hemorrhage
3. Cautions:
    a. Uncontrolled hypertension
    b. Hepatically impaired (total serum bilirubin greater than 1.5 mg/dL, AST/ALT greater than or equal to 3x of upper normal limit)
    c. Heart failure/severe anasarca
    d. multi-organ dysfunction (MODS)

**INITIATING ARGATROBAN**

1. Must be ordered under approval of Critical Care Intensivist, Cardiologist, or Hematologist.
2. Stop all heparin or low-molecular weight heparin, including flushes or locks.
3. Label all IV sites or catheters as "NO HEPARIN."
4. Draw baseline labs listed below prior to starting argatroban infusion.
5. Initial argatroban infusion dose based on patient status (choose one):
    a. For non-critically ill patients with normal hepatic function:
        i. Initiate argatroban infusion at 2 mcg/kg/min
    b. For critically ill patients with heart failure, MODS, severe anasarca, post-cardiac surgery or hepatic insufficiency (Child-Pugh Class B and C):
        i. Initiate argatroban infusion at a reduced rate of 0.2 mcg/kg/min. Rate set at physician's discretion.
    c. For patients with or at risk of heparin induced thrombocytopenia (HIT) undergoing percutaneous coronary intervention (PCI):
        i. Initiate argatroban at 25 mcg/kg/min and administer a bolus of 350 mcg/kg via a large bore intravenous line over 3 to 5 minutes
        ii. Avoid use in patients with clinically significant hepatic impairment or elevations of ALT/AST $\geq 3 \times$ ULN (has not been studied).
6. Adjust rate of infusion based on Argatroban Protocols Below. Two RN signatures required.
7. Laboratory Monitoring:
    a. Draw Baseline PT/INR, aPTT, CBC, and Hepatic Panel if not done within last 24 hours.
    b. aPTT two hours after the start of the argatroban infusion for HIT. Adjust rate to aPTT results according to the Argatroban Protocol for HIT below.
    c. Repeat aPTT as indicated in the Argatroban Protocol for HIT below.
    d. CBC daily while on Argatroban.

e. ACT (activated clotting time) to be drawn every 5-10 minutes after bolus infusion or a change in rate if Argatroban used for PCI (percutaneous coronary intervention). Proceed with procedure if ACT > 300 seconds.

8. Monitoring and adjusting argatroban infusion:
   a. Adjust infusion rate of argatroban based on the Argatroban Protocol
   b. Monitor for signs/symptoms of bleeding. Notify MD if noted.

**EPIDURAL MANAGEMENT:** (exception: anticoagulation and epidural management are part of the invasive procedure)

1. It is recommended that epidural catheter is removed if argatroban IV treatment is desired.
2. Argatroban infusion should be discontinued a minimum of 4 hours before epidural placement to allow aPTT to normalize.
3. Argatroban infusion should not be started until 24 hours after catheter removal or administration of single dose epidural/spinal anesthesia, unless approved by anesthesiologist.

**SURGICAL MANAGEMENT:**

1. Argatroban should be discontinued a minimum of 4 hours before procedures to allow aPTT to normalize (unless it is part of the procedure).
2. Surgeons should decide when it is safe to resume anticoagulation after surgery. Argatroban can usually be resumed when hemostasis is achieved (approximately 12 hours), unless it is a standard part of post-operative care.

**CONVERSION TO OTHER ANTICOAGULANT**

1. **Conversion to warfarin:** Because there may be a combined effect on the INR when argatroban is combined with warfarin, loading doses of warfarin should not be used.
   a. Warfarin therapy should be started at the expected daily dose.
   b. Minimum of 5 days overlap with argatroban and warfarin until INR is within target range. NOTE: Argatroban prolongs the INR, therefore it must overlap with warfarin until INR > 4. When INR is > 4 and warfarin therapy has overlapped for 5 days and:
      i. If rate is ≤ 2 mcg/kg/min stop infusion
         1. Obtain INR 4-6 hours, after stopping argatroban infusion
         2. If INR 2-3 (therapeutic), continue with warfarin monotherapy
         3. If INR < 2 (sub-therapeutic), resume argatroban at previous rate & repeat procedure the following day
      ii. If rate is > 2 mcg/kg/min reduce rate to 2 mcg/kg/min
         1. Obtain INR in 4-6 hours, if INR >4, stop argatroban
         2. Obtain INR 4-6 hours, after stopping argatroban infusion
         3. If INR 2-3 (therapeutic), continue with warfarin monotherapy
         4. If INR < 2 (sub-therapeutic), resume argatroban at previous rate & repeat procedure the following day
2. If starting enoxaparin after an argatroban drip is discontinued (i.e., if HIT is ruled out), give the 1st dose of enoxaparin 1 hour after shutting off the argatroban. Timing of initiation of argatroban after enoxaparin injection will be determined by patient's clinical status.
3. If starting fondaparinux after an argatroban drip is discontinued, give the 1st dose of fondaparinux 1 hour after shutting off the argatroban. If starting argatroban drip after therapeutic fondaparinux is discontinued, start the argatroban drip 22 hours after the last fondaparinux dose.

3. No IM injections if possible when the patient is on an anticoagulant.

**ARGATROBAN PROTOCOL**

**ARGATROBAN PROTOCOL: HEPARIN INDUCED THROMBOCYTOPENIA**

Stop all heparin containing products, then follow the protocol below:

| **PROTOCOL:** | | |
|---|---|---|
| **Condition** | **Dose/Route** | **Instructions** |
| Starting Rate* | 2 mcg/kg/min | |
| After Initiation | Order aPTT level | 2 hours later |
| Goal aPTT | 45-90 seconds | Not to exceed 100 seconds without physician approval |
| If aPTT level < 45 seconds | Increase rate by 20% (ml/hr x 1.2) | Re-order aPTT level in 2 hours |
| If aPTT level 45-90 seconds | Continue at same rate | If aPTT within range, continue current rate, re-order aPTT levels every 2 hours x 2 imes. If aPTT stays within therapeutic range, order aPTT level the following morning. |
| If aPTT level > 90 seconds | Hold for 2 Hours, then | Restart at 50% previous rate<br>New rate = ml/hr x 0.5<br>Recheck aPTT in 2 hours |
| Order aPTT levels | | 1. Every morning<br>2. Two hours after any change with dose immediately prior to resuming infusion<br>3. Hemorrage/thromboembolism suspected<br>4. Or at additioanl checks at MD discretion |
| Max Rate | 10 mcg/kg/min | |
| STOP IMMEDIATELY | Any sign of bleeding | |

Adverse reactions (>10%)
- Chest pain
- Hypotension
- Genitourinary tract hemorrhage.

***For Critically-ill patients (e.g., heart failure, MODS, severe anasarca, post-cardiac surgery or hepatic insufficiency):**

Stop all heparin containing products, then follow the protocol below:

| **PROTOCOL:** | | |
|---|---|---|
| **Condition** | **Dose/Route** | **Instructions** |
| Starting Rate* | 0.2 mcg/kg/min | |
| After Initiation | Order aPTT level | 2 hours later |
| Goal aPTT | 50-100 seconds | Not to exceed 100 seconds without physician approval |
| If aPTT level < 50 seconds | Increase rate by 20% (ml/hr x 1.2) | Re-order aPTT level in 2 hours |

| | | |
|---|---|---|
| If aPTT level 50-100 seconds | Continue at same rate | If aPTT within range, continue current rate, re-order aPTT levels every 2 hours x 2 imes. If aPTT stays within therapeutic range, order aPTT level the following morning. |
| If aPTT level > 100 seconds | Hold for 2 Hours, then | Restart at 50% previous rate<br>New rate = ml/hr x 0.5<br>Recheck aPTT in 2 hours |
| Order aPTT levels | | 1. Every morning<br>2. Two hours after any change with dose immediately prior to resuming infusion<br>3. Hemorrage/thromboembolism suspected<br>4. Or at additioanl checks at MD discretion |
| Max Rate | 10 mcg/kg/min | |
| STOP IMMEDIATELY | Any sign of bleeding | |

**ARGATROBAN PROTOCOL: PERCUTANEOUS CORONARY INTERVENTION**

Avoid use in patients with clinically significant hepatic impairment or elevations of ALT/AST ≥3 × ULN (has not been studied).

Stop all heparin containing products, then follow the protocol below:

| **PROTOCOL:** | | |
|---|---|---|
| **Condition** | **Dose/Route** | **Instructions** |
| Starting Rate | 25 mcg/kg/min and adminiser a bolus of 350mcg/kg over 3-5 minutes | Check ACT 5-10 minutes after bolus infusion<br>Proceed with procedure if ACT > 300 seconds |
| After Initiation | Order aPTT level | 5-10 minutes |
| If ACT < 300 seconds | Give an additional 150 mcg/kg bolus, and increase infusion rate to 30 mcg/kg/minute | Recheck ACT in 5 to 10 minutes |
| If ACT 300-450 seconds | Continue rate during the procedure | |
| If ACT > 450 seconds | Decrease infusion rate to 15 mcg/kg/minute | Recheck ACT in 5 to 10 minutes |
| If dissection, impending abrupt closure, thrombus formation during PCI, or inability to achieve ACT >300 seconds | Give an additional bolus of 150 mcg/kg, and increase rate to 40 mcg/kg/minute | Recheck ACT in 5 to 10 minutes after each additional bolus or change in infusion rate |
| Post-PCI anticoagulation | If required, see HIT protocol. | |

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## Appendix F: Perioperative Management of Anticoagulation

1. Many surgical procedures can be safely performed without interrupting systemic anticoagulation. Please review most current guideline recommendations, assess thromboembolic and bleeding risk before interrupting systemic anticoagulation for procedures.

2. Bridging preoperatively is generally reserved for individuals considered at high risk of thromboembolism (e.g., recent embolic stroke or systemic embolic event in the last 3 months, mechanical mitral valve, mechanical aortic valve and additional stroke risk factors, atrial fibrillation and very high stroke risk (CHADS2 score of 5 or 6), venous thromboembolism (VTE) within the previous 3 months, coronary stenting within the previous 12 weeks, previous thromboembolism during interruption of chronic anticoagulation). [1]

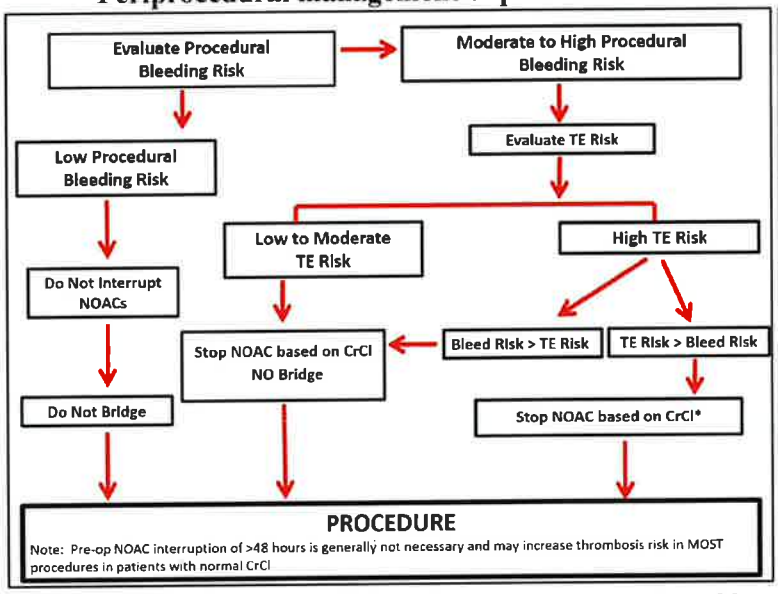
3. If anticoagulation needs to be stopped before procedure follow the below steps for patients on:
   a. Warfarin [2]

| **Day (Around Procedure)** | **Protocol** |
|---|---|
| −5 | Stop warfarin |
| −3 | Start bridging* agent (e.g., LMWH) |
| −1 | Stop bridging* agent 24 hr prior to procedure If INR > 1.5, administer oral vitamin K (1 – 2mg), INR should be ≤ 1.4 before procedure. |
| 0 | Day of procedure |
| 1 | Resume warfarin within 24 hr. Resume bridging agent within 24 hr for low bleed risk. |
| 2–3 | Resume bridging agent within 48 to 72 hr for high bleed risk procedures |
| 5–10 | Stop bridging agent when INR reaches ≥2.0 |

* Bridging preoperatively is generally reserved for patients with high risk of thromboembolism. Bridging is not recommended for patients with atrial fibrillation without high risk of thromboembolism.

   b. Direct oral anticoagulants (dabigatran, rivaroxaban, apixaban, or edoxaban)[3]

**Periprocedural management of patients on DOACs**




| Peri-Procedural Bleeding Risk | | |
|---|---|---|
| **Low** | **Moderate** | **High** |
| Minor Dental | SVT ablation | Cardiovascular/Thoracic Surgery |
| Minor Dermatologic | ICD Implant | Intra-abdominal/Pelvic surgery |
| Opthalmologic | Endoscopy with Biopsy | Major Orthopedic Surgery |
| Endoscopy without Biopsy | Prostate Biopsy | Neurosurgery |
| | Cardiac catheterization via radial artery | Cardiac catheterization via femoral artery |

| Peri-Procedural Thromboembolic Risk | |
|---|---|
| **Low** | **Moderate to High** |
| $CHA_2DS_2VASc \leq 1$ | $CHA_2DS_2VASc > 2$ |
| No Stroke/TIA, VTE within 3 months | Stroke/TIA, VTE within 3 months |
| Heterozygous Factor V Leiden<br>Heterozygous PT gene mutation | Protein C or S Deficiency<br>Antithrombin Deficiency<br>Antiphospholipid Syndrome |

*CrCl indicates creatinine clearance; ICD, implantable cardioverter-defibrillator; PT, prothrombin time; SVT, supraventricular tachycardia; TE, thromboembolic event; TIA, transient ischemic attack; and VTE, venous thromboembolism.*
**Bridging with low molecular weight heparin (LMWH) may be considered in patients with a history of systemic embolus in the last 6 weeks.*

**If DOACs need to be interrupted for procedure:**

| | **Renal Function** | **Interval between last dose and procedure** | **Procedure** |
|---|---|---|---|
| Dabigatran | CrCl ≥50 mL/min | Last dose 24 hrs before procedure | Cardiac Catheterization and PCI |
| | CrCL <50 mL/min | Last dose 72 hrs before procedure | |
| Dabigatran | CrCl ≥80 mL/min | Last dose 24 hrs before procedure | Electronic Device Implantation |
| | CrCl 50-79 mL/min | Last dose 36 hrs before procedure | |
| | CrCl <50 mL/min | Last dose 48 hrs before procedure | |
| Rivaroxaban, apixaban and edoxaban | All CrCl | Last dose 24 hrs before procedure | Any Procedure |

*NOTE: No anticoagulant is administered the day of the procedure.*

4. The decision to resume antithrombotic therapy after the procedure should be guided by thromboembolic risk.[3]
   a. For procedures with low bleeding risk: resume anticoagulation 24 hours after surgery[1]
   b. For procedures with high bleeding risk: resume anticoagulation 48-72 hrs after surgery[1]

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**Appendix G: Emergent reversal for life-threatening bleeding due to anticoagulant.**

| *Drug* | *Trade Name* | *Elimination Half-life* | *Removed by dialysis* | *Emergent reversal for life-threatening bleeding* |
|---|---|---|---|---|
| | | ***Vitamin K Antagonist*** | | |
| **Warfarin** | Coumadin<br>Jantoven | 20-60 hours<br>Peak effect: 5-7 days<br>Duration: 2-5 days | No | Reversal strategies are INR-based (see Appendix A) |
| | | ***Direct Oral Anticoagulants (DOACs): Xa inhibitors*** | | |
| **Apixaban** | Eliquis | 12 hours<br>Longer in renal impairment | No | If ingested within 2 hours, give activated charcoal 1 g/kg (max 50 g).<br>Consider 4F-PCC at 50 units/kg x 1 (one dose only; do not re-dose)<br>Some experts recommend andexanet alfa for life-threatening bleeding only after other hemostatic measures (e.g., antifibrinolytic therapy and drug removal with activated charcoal) have been shown to be ineffective. |
| **Edoxaban** | Savaysa | 10-14 hours<br>Longer in renal impairment | No | |
| **Rivaroxaban** | Xarelto | Healthy: 5-9 hours<br>Elderly: 11-13 hours<br>Longer in renal impairment | No | |
| | | ***Direct Thrombin Inhibitors*** | | |
| **Argatroban** | | 39-51 minutes<br>Longer in hepatic impairment (181 min) | 20% | Turn off infusion.<br>Consider 4F-PCC at 50 units/kg x 1 (one dose only; do not re-dose) |
| **Dabigatran** | Pradaxa | 12-17 hours<br>Up to 28 hours in severe renal impairment | 57% | If ingested within 2 hours, give activated charcoal 1 g/kg (max 50 g).<br>Consider idarucizumab, administered as 2 consecutive IV infusions of 2.5 g vials over 5 minutes each. The second 2.5 g vial must be administered within 15 minutes of the first vial.<br>If idarucizumab not available, consider 4F-PCC at 50 units/kg x 1 (one dose only; do not re-dose) |
| **Bivalirudin** | Angiomax | 25 minutes<br>Up to 3.5 hour in severe renal impairment | 25% | Turn off infusion.<br>Consider 4F-PCC at 50 units/kg x 1 (one dose only; do not re-dose) |
| | | ***Heparins*** | | |

| | | | | |
|---|---|---|---|---|
| **Enoxaparin** | Lovenox | 4.5-7 hours<br>Longer in severe renal impairment | No | Protamine partially reverses the anticoagulant effect of LMWHs (~60%)<br>Administer protamine; do not exceed rate of 5 mg/min, max dose 50 mg<br>If last dose was within 8 hours PTA, for each 1mg of enoxaparin, administer 1 mg of protamine<br>If last dose was 8-12 hours PTA, for each 1 mg of enoxaparin administer 0.5 mg of protamine<br>If last dose was >12 hours PTA, protamine is unlikely to be beneficial |
| **Heparin, unfractionated (UFH) IV** | | 1-2 hours (dose-dependent) | No | Turn off infusion<br>Protamine neutralizes heparin.<br><br>Use the preceding 2-3h rate of UFH to dose protamine. For each 100 units of UFH, administer 1 mg of protamine. Do not exceed rate of 5 mg/min (max 50 mg).<br><br>Reversal of heparin given within last 3 hours<br>a)Dose immediately after UFH dose: 1 mg of protamine for each 100 units of UFH<br>b) Dose within 60min after UFH dose: 0.5 mg of protamine for each 100 units of UFH is 0.5<br>c)Dose ≥ 2-3 hours after UHF dose: 0.25 mg of protamine to each 100 units of UFH<br><br>If aPTT remains elevated, can repeat protamine - for each 100 units of UFH, administer 0.5mg of protamine. |
| | | ***Pentasaccharide*** | | |
| **Fondaparinux** | Arixtra | 17-21 hours<br>Prolonged in renal impairment and elderly | 20% | Consider 4F-PCC at 50 units/kg x 1 (one dose only; do not re-dose) |

*4F-PCC, 4 factor prothrombin complex concentrate; PTA, prior to admission*

**REFERENCES:**


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| SUBJECT: | SECTION: |
|---|---|
| **BLOOD & BLOOD COMPONENTS, ADMINISTRATION OF** | ***Provision of Care, Treatment and Services (PC)*** |
| | **Page 1 of 8** |

**Printed copies are for reference only. Please refer to the electronic copy for the latest version.**

**PURPOSE:**

- Provide guidelines for preparation, administration and monitoring of the patient receiving a blood transfusion.
- To ensure that the treating physician has obtained an informed consent from the patient.
- To provide the patient with the opportunity to exercise the right to give an informed consent or refusal for the transfusion recommended by the physician.
- To provide the patient with the opportunity to acknowledge that the physician adequately explained the benefits, risks, complications, alternatives to transfusion and discussed all information concerning the transfusion to the patient's satisfaction.

**POLICY:**

It is the policy of Sierra View Medical Center (SVMC) to verify, by means of the Blood & Blood Component Transfusion Record, that the patient's informed consent has been obtained by the treating/attending physician, before the patient receives a blood/blood component transfusion.

**AFFECTED AREAS/PERSONNEL:** *ALL PATIENT CARE AREAS*

EQUIPMENT:

1. IV pole and infusion pump
2. Solution of 0.9% Normal Saline IV bag
3. IV #18 or #20 gauge needle/catheter and accompanying equipment per IV Start Procedure
4. Blood administration set (Y-tubing with specific filter)
5. Prepared transfusion administration form / "pick-up slip"
6. Blood warmer (physician order is required for non-emergent use)
7. Pressure Infusion Cuff (physician order required)
8. Gloves

**PROCEDURE:**

PHYSICIAN RESPONSIBILITIES:

1. It is the exclusive duty and responsibility of the attending and/or treating physician to obtain informed consent.

2. It is the responsibility of the attending and/or treating physician to document in the medical record that a discussion was held with the patient, and that an informed consent was given. Any special circumstances should also be documented. The physician may also place into the record a copy of any written material he/she gave to the patient.

HOSPITAL PERSONNEL RESPONSIBLITIES:

1. If, at the time the Transfusion Consent Form is presented to the patient, the patient voluntarily indicates doubt or confusion about the blood/blood component transfusion and consequently there is a question raised as to whether or not informed consent has been obtained, the physician will be contacted immediately. Under no circumstances should the healthcare provider (e.g. Registered Nurse) attempt to obtain the patient's informed consent in such a situation.

2. Although the hospital personnel cannot and should not be responsible for securing the patient's informed consent and for giving the patient the information that is required in order to secure the patient's informed consent, it can be expected that patients will ask hospital staff who are performing a procedure pursuant to the physician's orders, questions about what they will be or are doing. Hospital personnel generally may answer such questions.

3. If it appears that the patient has significant questions about the nature of the procedure and its benefits or risks, which indicate that he/she may not have been given sufficient information about the transfusion or does not understand the information he/she was given, the hospital personnel should contact the patient's physician in order to allow him/her to answer the questions and thereby help to ensure that the patient has given an informed consent to the transfusion procedure.

COMPLETING THE HOSPITAL'S CONSENT FORM:

1. ***Time and Date of Signature***: The time and the date on the form should be the time and date the form is signed by the patient or the patient's legal representative, the date and time of the transfusion.

2. ***Witness***: One person should serve as a witness, then the patient or the patient's legal representative signs the form. The witness should be a responsible staff member of SVMC who, according to licensure or experience, understands the information provided.

PACKED RED BLOOD CELLS (PRBC) AND FRESH FROZEN PLASMA (FFP)

A. Ordering and Obtaining Blood Products

1. A physician order will include the component requested and number of units to be infused.

2. Explain the procedure to the patient and obtain written authorization.

3. The laboratory will draw a second sample of blood for T&C at a separate phlebotomy to reduce the risk of error in transfusion for non-emergent red cell transfusions, when patients have been ordered to receive packed cells and have no prior history of blood type. In the event of an emergent need for blood, the emergency release protocol will be followed (See Lab policy on comparison of past blood bank records).

B. Obtain blood product(s) from the lab.

1. Ascertain from the electronic record that the blood product is ready for use. Take the request for blood component slip, or "pick-up slip," to the lab. *This must be signed by the blood bank technologist and the clinical representative. This slip becomes part of the medical record.*

2. A clinical representative, defined as an employee in a clinical service and designated by the Charge Nurse, can pick up the blood and will double check the following with the blood bank technologist: If any of the information is missing or does not match, the blood cannot be released (Exception: type compatible but not type specific units).

   a. Patient's name

   b. Identification number

   c. Blood group, Rh type and antibody screen,

   d. Donor number

   e. Donor blood group and Rh type

   f. Expiration date and time

   g. Blood product ordered

3. Blood Bank Technologist, clinical representative, RN/LVN will sign the Blood Bank computer-generated Unit Issue Card, which becomes a part of the medical record. The record will be printed with all the pertinent patient blood bank information. There must be exact verification of all information before the unit leaves the blood bank.

***NOTE**: No more than 1 unit is to be removed from the Blood Bank at a time with the exception of a massive bleed, transfusion during dialysis or surgical patient with monitored refrigeration available for storage.*

C. Preparing the patient

1. Provide transfusion reading material to the patient and/or family member(s) and allow for questions.

2. Obtain transfusion informed consent after the physician has spoken to the patient.

   a. Patient must agree and sign consent to the administration of blood/blood product(s) prior to the transfusion and prior to staff picking up the blood from the Blood Bank. If the patient refuses the transfusion, the refusal form must be completed.

3. Established IV access with #18 gauge catheter (preferred) prior to obtaining blood from Blood Bank. A #20 gauge catheter may be used in the event that a larger vein is not accessible. A #23 gauge catheter may be used for pediatric patients. ***(See pediatric policy: "Pediatric Blood Transfusion")***

4. Vital signs, including temperature, will be taken and recorded in the Transfusion Administration Record prior to start of transfusion.

D. At the bedside

1. The blood product will be verified by the transfusionist and scanned as the second verification. Scanning should include all indicators as listed below in order to qualify as the second verification. If unable to scan, the blood product can be verified with two (2) qualified licensed staff against the "Transfusion Administration Record" at the bedside. The one individual conducting the identification verification must be the qualified transfusionist who will administer the blood or blood component to the patient. At least two unique identifiers are used in the verification process and will be conducted after the blood or blood component matching the order has been issued or dispensed. The following information will be verified:

   a. Patient's name

   b. DOB

   c. Patient Account Number

   d. BBK#

e. Blood unit number

f. Donor blood group and Rh type

2. The patient's identification is verified by checking the name, date of birth and BBK.

3. The two (2) licensed staff sign in the space provided on the "Transfusion Record" if scanning is not used.

E. Preparation for Transfusion

1. Wash hands thoroughly. Put on gloves.

2. Run 0.9% Normal Saline solution through the "Y" tubing to remove air and clamp tubing. Make sure the fluid level in the drip chamber is above the entire filter.

3. Gently agitate the unit of blood to distribute all the cells.

4. Gently open either outlet of the plastic blood container.

5. Insert the "Y" tubing into the blood container.

F. Administration

1. Check the patient's vital signs and record on the Blood Administration Record.

2. Check to make sure that the IV site is patent. Apply arm board, if necessary, and then begin transfusion.

3. Check IV insertion site, rate of flow, and monitor for side effects. Vital signs are taken every 15 minutes times two, then PRN and at the completion of the transfusion.

4. Observe the patient closely for signs of reaction, e.g. fever (2 degrees F above the baseline), chills, rash, flank or ~~abdominal, chest or~~ back pain, hypotension (30mmHg below baseleine), dypnea, or uticaria (hives).~~SOB and condition of infusion site.~~ ***Stop the transfusion if a reaction is suspected.*** Review "Blood & Blood Components, Transfusion Reaction" Policy.

***NOTE**: If a hemolytic reaction or anaphylactic reaction is going to occur, it usually will happen after a very small volume of blood enters the patient's circulation. A febrile reaction (2 degrees F above the baseline) may occur at any point during the transfusion or even after the transfusion.*

G. Completion of Transfusion

1. Clamp blood component bag.

2. If another unit of blood is to be transfused, obtain from the laboratory and repeat above steps. If transfusion is completed, flush the line with solution of 0.9% Normal Saline and resume parenteral infusion or maintain IV lock.

**NOTE: The filter within the "Y" tubing can be used for a maximum of four hours or two units of packed red blood cells. If maximum time or number of units has been reached, the tubing must be changed prior to the administration of additional units of blood.**

3. Remove blood products and tubing

   a. Dispose of blood bag and tubing in appropriate biohazard container.

   b. Return blood bags to the lab only when a reaction is suspected.

   c. The Unit Issue Card is affixed to the patient's lab sheet in the medical record.

4. Document the patient's response to the transfusion.

PLATELETS

A. Platelets should be infused rapidly due to loss of viability (1.5 to 2 hours, but less than 4 hours).

B. Use the same procedure as when ordering and verifying PRBC's.

FRESH FROZEN PLASMA (FFP)

A. Use same procedure as when ordering and verifying PRBCs.

*NOTE: Laboratory will need 30 minutes advance notification to thaw the unit.*

B. Administration rate for adult infusion of FFP should be at 200ml/hr. Give slowly if circulatory overload is a potential problem.

SPECIAL CONSIDERATIONS

A. Blood components must be started within 30 minutes after being signed out from Blood Bank, and should be completely infused within 4 hours.

   1. Unused blood should be returned immediately to the Blood Bank within 30 minutes of issue.

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2. If the blood is returned after 30 minutes, it may not be re-issued and must be discarded by the Blood Bank.

3. Blood should not be laid in the sunlight, on top of microwave units, or near a heat source that could result in prolonged warming.

4. No drugs or fluids other than 0.9% NaCl should be given through the IV port where the blood is infusing.

B. Informed consent must be signed prior to administration of blood component(s).

C. Reading material must be provided to the patient and/or family. A "Patient's Guide to Blood Transfusions" by the California Department of Health Services will be provided in English. Pamphlets will also be available in Spanish.

D. The patient has the right to refuse the transfusion.

E. Type and screen is good for 72 hours but still requires a cross match before blood is made available.

F. Massive Bleed Protocol and initiation of process to obtain large amounts of blood rapidly:

1. In the event of a Massive Bleed (e.g. gun shot in the ED, DIC in the OR or OB), the provider will direct the RN to contact blood bank and state "Emergency release of uncross matched blood for a massive bleed in _____."

2. Blood bank will issue 2-4 units of PRBCs and 1 unit of FFP upon request, per specific situation and will work closely with nursing services to provide continued blood products as needed. Cross matched blood will be utilized upon availability.

3. Responsible physician will sign for release of uncross matched blood upon completion of the procedure.

DOCUMENTATION

A. Complete all information on the "Transfusion Administration Record"

**REFERENCES:**


- Kelly, William (2022). Health and Willness. Blood transfusion reactions: a comprehensive nursing guide. obtained from https://healthandwillness.org/blood-transfusion-reactions/
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**CROSS REFERENCES:**

- *Pediatric Blood Transfusion* – SVMC Policies and Procedures
- *Blood and Blood Components, Transfusion Reaction* – SVMC Policies and Procedures

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| SUBJECT: **BOARDER NEWBORNS** | SECTION: **Page 1 of 2** |
|---|---|

**Printed copies are for reference only. Please refer to the electronic copy for the latest version.**

**PURPOSE:**

To establish nursing guidelines in the care of boarder newborns

**POLICY:**

1. Boarder newborns are infants who do not need intensive neonatal care but still require continuing care until determined eligible for discharge ~~require a continuity of care that cannot initially be carried in the home. Examples include, but are limited to:~~

   ~~a. Treatment for hyperbilirubinemia~~

   ~~b.~~a. Child Welfare Services case

2. The infant remains in the hospital upon discharge of the mother until the infant is appropriately treated and can be discharged home.

3. When the mother is discharged, the baby is changed to boarder status in the accommodations section of Meditech.

**AFFECTED AREAS/ PERSONNEL**: *MCH DEPARTMENT/NURSING STAFF*

**PROCEDURE:**

1. Obtain an order from the pediatrician for infant's status to be changed to "Boarder".
2. Unit Clerks will notify Admitting Department and Case Management that the infant's accommodation has been changed to "Boarder" along with current diagnoses.
3. Instruct mother/parents of desire for their participation in care while the infant remains in the hospital and arrange for times they can come to visit and care for the infant, or encourage parents to remain with infant at all times.
4. If mother is breastfeeding and it is appropriate, instruct her in breast pumping, milk storage and transport to the hospital for the infant.
5. Provide an area where mother/parents can visit, care for, and feed infant.
6. Constantly maintain a level of communication and education in the care of this infant with the mother/parents.
7. The nurse will attend to the infant's needs when the mother is not present.
8. Boarder newborns will not be left unattended ~~in the nursery.~~ at any circumstances and will be assigned a staff. if mom is not staying with the infant.

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9. Parent's ID bracelet must be matched with the infant's ID bracelet each time the parents visit.

DOCUMENTATON:

Document in the Electronic Medical Record (EMR):

- Intake and output
- Vital signs as ordered
- Maternal/parental visits
- Care provided by mother/parents when in unit
- Maternal/parental response to teaching
- Verbalization of understanding of all care given to infant

| SUBJECT: | SECTION: |
|---|---|
| **CARDIORESPIRATORY MONITORING: NEONATE** | 3 **Page 1 of 4** |

**Printed copies are for reference only. Please refer to the electronic copy for the latest version.**

**PURPOSE:**

To establish nursing guidelines for the care of neonates on cardiorespiratory monitors and/or pulse oximeter. .

**POLICY:**

1. Cardiorespiratory monitors will be used per physician order when continuous assessments of heart and respiratory rates are required.

2. Physician order will include alarm limits if heart rate less than 90.

3. Cardiorespiratory monitoring should be used for all infants requiring intensive or intermediate care as well as infants at risk for apnea and rhythm disorders. Infants that should have cardiorespiratory monitoring include but are not limited to the following:

    a. Gestational age less than 37 weeks

    b. Birth weight less than 2.5 Kg (5 lbs.)

    c. Infants requiring gavage feedings

    d. Infants receiving supplemental oxygen

    e. Infants with temperature instability (hypo/hyperthermia)

    f. Infants with respiratory distress (tachypnea, grunting, retractions, nasal flaring)

    g. Infants with sepsis

    h. Infants that require resuscitation (Apgar less than 7 at 5 minutes)

**AFFECTED AREAS/ PERSONNEL:** *MCH DEPARTMENT /RNs*

EQUIPMENT:

- Cardiorespiratory monitor
- Neonatal Electrodes
- Pulse oximeter
- Pulse oximeter probe

**PROCEDURE:**

1. Place equipment at newborn's bedside and plug into electrical outlet.

2. Pulse Oximeter:

   a. May be used only when cardiac monitor is not available and/or for neonates that do not need intensive cardiorespiratory monitoring ( For ex.-grower feeder ) A neonate on any form of respiratory support will use a cardiac monitor at all times while in the Neonatal Intensive Care Unit.(NICU.)~~alone or with cardiac monitor.~~

   b. Check probe site every 4 hours and change site every 8 hours.

   c. Pulse oximeter is most accurate when the waveform on the light emitting diod (LED) readout is consistent, correlates with the pulse and the peripheral site is warm.

Site may be loosely covered with occlusive tape to prevent ambient light from affecting accurate reading.( i.e. light source from phototherapy).

3. Cardiac Monitor:

   a. Set monitor alarm limits:

      - Heart rate: High 200; Low 90
      - Respiratory delay apnea greater than 20 seconds
      - Set audio volume

   b. Clean skin thoroughly if stable with soap and water at the chosen sites (vernix hampers conduction).

   c. Place electrodes:

      - Red/white – right chest
      - Black – left chest
      - Green – left lower chest

   d. Inspect sites every shift for signs of irritation.

   e. Change leads every 3 days or prn.

4. If the monitor alarm sounds, check infant immediately. Assess breathing, heart rate and color.

5. If the infant is not in distress, silence the alarm, check the connections and leads, then reset the alarm.

6. If the infant is not breathing, stimulate and if there is no response, initiate cardiopulmonary resuscitation (CPR) per NRP guidelines. ~~Activate "Code White"~~. Notify the Pediatrician.

7. Accuracy of both monitors should be checked every 4 hours by simultaneously checking the apical pulse and respiratory rate with a stethoscope and comparing the results with readouts on the monitor panel.

8. Print copy of ECG that is questionable and place in the chart.

DOCUMENTATION:

~~1. Document signs/symptoms leading to use of the monitors.~~

1.

2. Every beginning of shift, after receiving report, RN should check and document on nurses notes that monitor has been checked:

   a. Limits set

   b. Alarms on and functioning

3. Document on nursery flow sheet when electrodes have been replaced.

4. Document episodes of apnea/bradycardia and any treatment ordered or prescribed after referring the events.

5. Document time when monitors were discontinued.

**REFERENCES:**


- PC, EC, §70547 (b) (9) (18).
- American Academy of Pediatrics & American College of Obstetrics and ~~Gynecologist~~ Gynecologist. (2017). Guidelines for perinatal care (8th Ed.). Elk Grove Village, IL: Authors.
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- Mattson, S. & Smith, J. E. (2016). Core curriculum for maternal-newborn nursing (5th ed.). St. Louis, MO: Elsevier Saunders.
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| SUBJECT: **CONSENT/INFORMED CONSENT** | SECTION: ***Provision of Care, Treatment & Services (PC)*** **Page 1 of 10** |
|---|---|

**Printed copies are for reference only. Please refer to the electronic copy for the latest version.**

**PURPOSE:**

The purpose of this Consent/Informed Consent Policy is (1) to address the different types of consent; (2) to define when consent or informed consent must be obtained and (3) to describe the process for obtaining and documenting consent.

**POLICY:**

Every competent person has the fundamental right of self-determination over his/her person and property. Individuals who are not competent have the right to be represented by another person who will act in their best interest and carry out their known desires. Consent must be freely given and must not be obtained through the exercise of either duress or coercion. The right to self-determination includes the right to refuse recommended treatment. The patient, or the patient's surrogate decision-maker, has the right to refuse treatment *(See Patient Care Services Policy & Procedure Manual: "AMA Discharge".)*

Patients and surrogate decision-makers must be able to understand what they are being asked to authorize. Therefore, communication will be in a language or mode that can be understood by the patient or surrogate decision-maker.

**AFFECTED PERSONNEL/AREAS**: *ALL SERVICE LINES WHERE CONSENTS ARE REQUIRED*

TYPES OF CONSENTS:

All procedures require consent however, not all require an "Informed Consent."

A. **Consent for General Medical Care**

Upon presentation or as soon thereafter as reasonably possible (see "Emergency Exception" below), the patient or the patient's surrogate decision-maker will be asked to consent to general medical care (i.e. blood draw, x-rays) and the general terms and conditions for receiving care from the hospital. This will be presented in the form of the "Conditions of Admission". This form not only authorizes general medical and nursing care to be provided, it also establishes financial responsibility.

1. Frequency in which Form will be obtained; a "Conditions of Admission" form will be obtained for each patient visit with the exceptions below.

   a. Patients will receive and sign a "Conditions of Admission" form yearly at the Rural Health Clinic.
   b. Patients receiving care at the Cancer Treatment Center and Community Wellness Center will receive and sign a "Conditions of Admission" form once a month on the first visit of the month.

B. **Informed Consent**

"Informed Consent" is required for those procedures which go beyond general medical care and are complex or involve material risks that are not commonly understood *(See Section 5.1"Procedures That Require Informed Consent".)* The patient's physician is responsible for providing the information the patient needs in order to make an informed decision and for obtaining the patient's informed consent or refusal for the recommended procedure. The hospital's role in the informed consent process is to verify that the physician obtained the patient's (or patient's surrogate decision maker's) informed consent before the physician is permitted to perform the procedure or that an exception applies (such as the emergency exception) that allows treatment to proceed.

1. Procedures that Require Informed Consent: -- COMPLEX PROCEDURES

Informed consent must be obtained for procedures that are "complex" in that they involve material risks that are not commonly understood. Specifically informed consent must be obtained for:

a. All major or minor surgery which involves an entry into the body either through an incision or through the use of natural openings. There must be a valid consent for each procedure or operation. Once signed, the consent may be used for further stages of the original procedure or for complications arising therefrom.

b. Any procedure involving general or regional anesthesia, moderate or deep sedation, whether or not entry into the body is involved.

c. All non-operative procedures which involve more than a slight risk of harm to patients, or which involve the risk of a change in patient's body structures. Examples of such include, but are not limited to: lithotripsy, radiation treatments, thyroid ablation.

d. All chemotherapy.

e. For the insertion of central lines and the insertion of PIC lines, including those inserted at bedside.

***NOTE: If there is a doubt as to whether a procedure requires an informed consent, it is appropriate for the physician to obtain one.***

2. Special Requirements:

The law has established specific procedures that require not only informed consent but also additional considerations such as defined waiting periods, specific educational brochures, and other requirements specific to the procedure. Listed below are those informed consent procedures that have special considerations. Refer to California Hospital Association (CHA) Consent Manual for specifics on the following procedures:

a. Blood transfusion

b. Human immunodeficiency virus (HIV) blood tests

c. Bilateral tubal ligations, hysterectomies and other procedures that result in sterilization

d. Treatment for breast or prostate cancer

e. Psychotropic/antipsychotic medications (skilled nursing facilities)

3. Physician Responsibility

The physician is responsible for providing the information necessary for a patient or an incompetent patient's surrogate decision-maker to make an "informed decision". The physician is responsible for providing information if a patient or surrogate decision-maker expresses confusion or requests clarification or more information. Physicians may provide fact sheets to relay such information.

4. Staff Responsibility

The role of the staff is to ensure that the patient or surrogate decision-maker has received sufficient information from the physician regarding the procedure to allow them to make an informed choice to consent to the procedure. The staff may discover that the decision-maker still has questions. Any doubt or confusion expressed by the patient regarding the procedure or operation must be immediately referred to the physician. The patient or surrogate decision-maker should not be asked to sign the "Consent to Surgery or Special Procedure Form," until satisfactory clarification is supplied by the physician.

5. Documenting Informed Consent

Prior to the procedure, the physician must have evidence in the chart that he or she has conveyed the information required for an informed decision, either by, a) signing the Physician Certification section on the Consent form, b) having dictated such in a pre-operative note (present in the chart), c) history and physician examination report (present in the chart), d) short form history and physical, e) by writing a progress note in the patient's record or f) providing a copy of a form from the physician's office evidencing informed consent.

The physician documenting that "informed consent obtained" (or similar) shall mean the fact that all the required elements in the informed consent process as required by the Joint Commission, Centers for Medicare & Medicaid Services (CMS) and state law have been met.

a. Except in cases of emergency (as defined above), surgery or the procedure may not proceed unless evidence of informed consent is on the record. The nursing

staff shall be responsible for verifying this has been included in the chart prior to the procedure or the nurse must contact the physician providing the service to obtain documentation.

b. Non-emergency procedures will be delayed or cancelled until the informed consent process has been completed and fully documented.

c. For blood transfusions ONLY, in the absence of a signed note in the medical record by the physician, which recounts the discussion with the patient of the risks, benefits and alternatives of the transfusion, a consent form signed by the patient is acceptable. In this circumstance, the witnessed patient signature on the consent form is to be obtained by the RN only after verbalization by the patient that he/she has been fully informed by the physician about the blood transfusion, that he/she has no further questions and agrees to proceed. The physician will document informed consent using the methods mentioned above.

6. Shared Responsibility for Informed Consent

Practitioners other than the patient's attending physician(s) may have a duty to secure consent when they will provide specialized services at the request of or together with the patient's attending physician. Examples include, but are not limited to: Anesthesia, special diagnostic or therapeutic radiology, nephrology, gastroenterology, or pulmonary procedures.

a. The practitioner who will provide the specialized service (i.e. the anesthesiologist, radiologist or other specialist) should describe the nature of the services he/she will provide and any specific risks and possible complications associated with such service.

7. Duration of the Informed Consent

Informed consent may be considered to have continuing force and effect until the patient or surrogate decision-maker revokes the consent or until circumstances change so as to materially affect the nature of, or the risks of the procedure and/or the alternatives to the procedure to which the patient has consented, in which case the physician has a duty to explain the nature of the treatment, possible complications, and/or effects of the treatments, alternatives, risks and benefits to the patient in light of the changed circumstances.

C. **Emergency Exception – Implied Consent**

1. When the Emergency Exception Applies

When a patient lacks capacity to make a healthcare decision and treatment is immediately necessary to prevent death or permanent disability or to alleviate severe pain, and a

surrogate decision-maker cannot be contacted, treatment may proceed because it is an emergency and consent will be implied in such circumstances.

2. Limits on Treatment That May be Provided

The treatment that may be provided without consent is that which is necessary to treat the emergency. While the treatment proceeds, efforts must continue to be made to contact a surrogate decision-maker. The emergency exception may not be invoked to authorize treatment that has been refused by the patient or an incompetent patient's surrogate decision-maker.

3. Documentation of the Emergency

The medical determination that an emergency exists should be carefully documented by the physician. The physician does not sign a consent form on behalf of the patient. Such consent is implied by law from the existence of the emergency. There is no requirement to have a second physician confirm that a medical emergency exists, but if such a consultation is obtained, the consulting physician must document his or her findings in the patient's medical record. The efforts made to identify and talk with a qualified surrogate decision-maker should be documented in the patient's record.

D. **Other Consents**

1. Consent for Release of Information

Consent may be required for the release of protected health information. *(See Health Information Management Policy & Procedure Manual: "Release of Patient Information from the Medical Record".)*

2. Consent To Transfer

A patient being transferred to another hospital should be informed of the need for and alternatives to the transfer, the proposed transportation plans, and the risks and benefits, if any. *(See Patient Care Services Policy & Procedure Manual: "EMTALA Intrafacility Transfers.")*

3. Discontinuing Life Sustaining Treatment

Consent to discontinue life-sustaining treatment shall be obtained and documented as addressed in the Patient Care Services Policy & Procedure Manual: *DNR Physician Order, Guidelines for Use.*

4. Consent for Release of or refusal to release Identifying Information:

Any patient receiving a medical device that is subject to tracking under 21 U.S.C Section 360i(e), may under CFR Section 821.55 refuse to have their name, address, telephone

number, social security or other identifying information released to the device manufacturer. This information is noted on the "Consent to Surgery or Special Procedure" form. It is the responsibility of the hospital to document the patient's refusal and forward such back to the device manufacturer.

## IDENTIFYING WHO MAY GIVE CONSENT

### A. Capacity to Consent

A person may give a valid consent only if he/she has "capacity," which means he/she is able to understand the nature and consequence of a decision and to make and communicate the decision. Patients who have been given pain medication or pre-operative medication may be competent to verify they have given consent so long as the patient has capacity, i.e., the ability to understand the nature and consequences of the decision. If the patient lacks capacity, a surrogate decision-maker should be consulted.

### B. Patient's Lacking Capacity: Identifying Surrogate Decision-Makers

1. Adults. If an adult lacks the capacity to make medical decisions, a surrogate decision-maker must be identified. *(Refer to House-Wide Policy & Procedure Manual: "Surrogate Decision-Maker – Selection of.")*

2. Special rules apply to whom may make decisions for certain procedures, including commitment for mental health treatment, convulsive therapy, psychosurgery, sterilization or abortion and the special standards on who may consent for these procedures on behalf of an incompetent patient are addressed in the CHA Consent Manual or consult with Risk Management.

3. If the patient lacks capacity and does not have a surrogate decision-maker, a multidisciplinary committee may be appointed to act on behalf of the patient pursuant to the House-Wide Policy & Procedure: Healthcare Decisions for Unrepresented Patients.

### C. Minors

In general, parental consent is required for treatment of persons under the age of 18. A minor may give consent for his/her own treatment in the following instances:

1. If married or previously married OR any of the following:

   a. Emancipated – over 15, not living at home and who manages their own financial affairs. Must complete an *Emancipated Minor* form.

   b. Pregnant, and under 18 – for care related to prevention or treatment of pregnancy (except sterilization, if never married).

c. Under 18 and on active duty with the Armed Services.

d. 12 or older for care of contagious reportable diseases, rape, sexual assault, drug or alcohol-related problems.

e. For the period of time a minor college student is residing away from the home of his/her parents and managing their own affairs, they would be considered emancipated for this purpose.

2. Minors on Probation or in Custody of Law Enforcement may have treatment consent authorized by the Probation Department.

a. Every effort should be made to contact the parents for consent.

b. If the situation is a life-threatening one, the physician may utilize the Emergency Consent Procedure.

c. The Probation Officer may authorize treatment by court order. They will have special forms that will become part of the patient's record.

3. Minor seeking treatment, but the parent is not available:

a. Every effort should be made to contact the parents for consent.

b. The parent may have authorized someone else to sign consent in his/her absence. Such authorization must be presented in writing.

c. SB592 (June 1994) sets forth the circumstances under which an adult relative who is not the parent, legal guardian, or conservator of a minor, may provide consent for medical treatment of a minor.

- The minor must be living with the adult family member. (Babysitting for the day does NOT qualify.)
- The adult must be a "qualified relative". This is defined in the law as a spouse, parent, stepparent, brother, sister, stepbrother, stepsister, half-brother, half-sister, uncle, niece, nephew, first cousin or any person denoted by the prefix "grand" or "great", or the spouse of any of the persons specified in this definition, even after the marriage has been terminated by death or dissolution.
- The adult must advise the parents of the proposed medical treatment and have received no objection, or the adult must be unable to contact the parents.

- The adult must complete the "Caregiver's Authorization Affidavit" in which he/she attests that the elements outlined above are true and correct. The form must remain as part of the patient's medical record.

- The affidavit becomes invalid when the health care provider learns that the minor no longer lives with the caregiver. However, affidavits printed before January 1, 2005 which contain the statement that: "This affidavit is valid for only one (1) year from the date of signature" must be brought forward in the chart for multiple visits.

- Special rules apply to situations involving adopted minors, minors relinquished for adoption when the adoption is not finalized, treatment of minors who are injured during school hours, abandoned minors, minors in the custody of the juvenile court, adjudicated, dependent minors of the court, minors in custody of foster parents, and minors who are suspected victims of abuse. The special rules for such situations are addressed in the CHA Consent Manual, Chapter 2, or consult with Risk Management.

If consent is not available and the physician feels that the treatment is indicated, the Emergency Consent Procedure should be implemented.

WITNESSING

1. Role of the Witness:

The person who is asked to serve as a witness has a very limited role in the process. The person is expected only to confirm that the person signing the form appeared reasonable, competent, and appeared to understand what he/she was signing. The person who is asked to serve as the witness for procedural consents should not answer any questions the patient may have about the proposed surgery or procedure and should refer all such questions back to the physician.

2. Documentation:

The witness should legibly print his/her name, sign the document and note the date and time the witness signed the document.

OBTAINING AND DOCUMENTING CONSENT BY TELEPHONE, FACSIMILE AND E-MAIL

1. Obtaining Consent From Person Not Physically Present:

It may be necessary to obtain consent from a person who is not physically present at the hospital. In such cases, the information that would be conveyed to the decision-maker if he/she were present in the hospital must be conveyed using alternative means. If the surrogate decision-maker is not available to sign the required documents, the forms can be sent by mail, e-mail or facsimile

and returned by mail, e-mail or facsimile. Electronic signatures (e.g., fax copies or scanned documents with signatures) can be accepted.

2. If the consent form cannot be sent or returned by mail, e-mail or facsimile, then the hospital can have a staff member read the form and obtain a verbal agreement. The conversation should be witnessed by a second staff member and both should sign the form, indicating the date and time the form was read and the verbal consent given. The best method is a telephone conversation that allows a full discussion of the information.

METHODS OF RECORDING SIGNATURES AND INFORMATION

1. All entries on the form must be in ink.

2. Unless there is reason to believe otherwise, the information provided by a person concerning the patient's name, the surrogate decision-maker's name and relationship to the patient will be accepted as true. Compliance should be contacted if there is any reason to believe such information is inaccurate.

3. If the patient is not able to write his/her name, a mark "X" is obtained and witnessed by two persons. When someone other than the patient signs, note the relationship of the signer to the patient. If the patient is unable to write his/her name, a mark may be used. Print the patient's name in full and instruct the patient to place an "X" mark above or next to the name. Below the patient's mark, note the reason for the "X" mark. Two hospital representatives must witness the mark and sign the form as witnesses.

**REFERENCE:**

- California Hospital Association (CHA), Consent Manual (2019). https://www.sierra-view.com/documents/consent2019_enterprisenew.pdf.
- 21 U.S.C Section 360i (e) (2017). https://www.law.cornell.edu/uscode/text/21/360i.
- Title 21. Code of Federal Regulations (CFR) Section 821.55 (2012). https://www.govinfo.gov/app/details/CFR-2012-title21-vol8/CFR-2012-title21-vol8-sec821-55.

**CROSS REFERENCES:**

1. Health Information Management Policy & Procedure Manual:
   a. *Release of Patient Information*
2. Patient Care Services Policy & Procedure Manual:
   a. *EMTALA – Interfacility Transfers, MSE, Emergency Care and Stabilization*

b. *DNR Physician Order, Guidelines for Use*

c. *AMA Discharge Request (Against Medical Advice)*

3. House-Wide Policy & Procedure Manual:

a. *Surrogate Decision Maker – Selection of*

b. *Unrepresented Patients- Healthcare Decisions for*

c. *Interpretive Services: Language Assistance Program*

d. *Patient Admission Process*

| SUBJECT: **DISCHARGE OF PATIENT** | SECTION: ***Provision of Care, Treatment and Services (PC)*** **Page 1 of 3** |
|---|---|

**Printed copies are for reference only. Please refer to the electronic copy for the latest version.**

**PURPOSE:**

The discharge of the patient from the hospital should ensure continuity of care in the transition from hospital to home, or from hospital to another facility.

**POLICY:**

The staff nurse is responsible for seeing that the patient is discharged with appropriate instructions, all personal property and valuables. Other professional services, including Patient Registration,, Financial Services, Pharmacy, Social Services and Case Management, assist in the discharge planning. The staff nurse and social services is responsible for making sure that a patient has transportation to get home.

**AFFECTED AREAS/PERSONNEL:** *ALL INPATIENT CARE UNITS*

**PROCEDURES:**

***Planning of Discharge:***

1. Discharge planning begins upon admission and continues through the hospital stay.

2. Patient and family teaching are a part of this preparation and are included in the nursing care plan.

3. Social Services, Case Management and other staff are involved as appropriate and approved by the attending physician.

***Discharge:***

1. An order by the attending physician must be obtained prior to discharge.

2. At the time of discharge, nursing will complete the discharge instruction and a copy will be given to the patient.

3. It is the responsibility of the staff nurse to make certain that the patient is discharged with all of his/her personal effects.

    a. Make special note of the presence of eyeglasses, contact lenses, hearing aids and prosthesis.

    b. The nurse or aide must check dresser drawers, closet, over-bed table and bathroom.

    c. If the patient has valuables in the Admitting Safe, he/she will present the claim check and be given their belongings, in accordance with the "Valuables" policy.

4. All patients are to be escorted out of the hospital

5. At the time of actual discharge, notify appropriate departments.

6. Minor children are to be discharged to the custody of their legal guardian. *In the event the legal guardian is not available prior arrangements for discharge pick up need to be made. Upon pick up the authorized person must provide staff with proper identification before releasing the minor in to their custody. The identification should be copied and place in the medical record before discharge. Examples :of proper identification should include but not limited to driver license, passport, or picture identification)*

***Medication:***

1. All drugs brought in by the patient on his admission will be returned to him/her at the time of discharge.

2. Discharge prescriptions must be filled at an outpatient pharmacy of the patient's choice. The prescription will be electronically sent to the pharmacy of the patient's choice. If a prescription cannot be electronically sent, the patient will be given a prescription to take to their pharmacy.

3. Patient's will receive at the time of discharge drug information regarding their discharge prescriptions that will include; use, storage, relevant warnings, contraindications, drug interactions, and the importance of compliance with directions.

4. Upon discharge, unused medications in the patient's cassette or in the medication refrigerator will be returned to the pharmacy.

***Home Health Care/Durable Medical Equipment:***

1. If the patient is under the care of a particular home health agency, or equipment supplier, Social Services/Nursing will continue with those arrangements and notify the agency of the patient's discharge.

2. Patient will be asked about any preference of home health agency using the Outpatient Services preference form. If the patient has no preference, referral will be given to any available agency that can provide the requested service.

3. Social Services will maintain a list of home health agencies and suppliers of durable medical equipment and will coordinate arrangements and referrals as needed.

***Documentation:***

1. The nurse caring for the patient is responsible for documenting the following:

    a. Condition of patient including surgical wounds and decubiti, if present.

b. Prescription, dressing, or equipment sent with the patient.

c. Method of discharge, i.e. wheelchair or ambulance gurney.

d. Place discharged to:

- Home
- Name of Skilled/ of other Care Facility
- Name of Acute Care Hospital

e. Verification of patient's and or family member knowledge of home care and/or limitations.

f. Signature and date.

For family members or responsible party not present on the patients discharge steps include:

- Phone call to verbally explain all discharge and care instructions
- Ensure a copy of all discharge instructions including any follow up appointments is sent with the patient
- Verification of the patients, family member or responsible party's verbal understanding of all provided instructions is understood.
- Discharge nurse documents the name, of the family member or responsible party, date and time confirming phone instructions where given.

**REFERENCES**

- Pharmacy Law: California Edition (2019) San Clemente, California Law Tech Publishing Group.

**CROSS REFERENCES:**

- *Patient Belongings and Valuables* – SVMC Policies and Procedures

| SUBJECT: **FORMULARY** | SECTION: **Page 1 of 6** |
|---|---|

**Printed copies are for reference only. Please refer to the electronic copy for the latest version.**

**PURPOSE:**

To provide an ongoing process whereby the Pharmacy Department and the medical staff of Sierra View Medical Center (SVMC), working through the activities of the Pharmacy and Therapeutics (P&T) Committee, evaluates and selects those drug products considered to be the most useful in patient care according to need, effectiveness, safety and cost.

**DEFINITION:**

**Formulary:** An approved list of medications that can be used in all patient care areas of Sierra View Medical Center.

**POLICY STATEMENT:**

It is the policy of Sierra View Medical Center that the maintenance and updating of the formulary of approved medications is the responsibility of the Department of Pharmacy Services via the Pharmacy and Therapeutics (P&T) Committee.

**PROCEDURE:**

A. The Formulary:

1. Will be compiled and maintained by the Pharmacy Service under the general direction of the Pharmacy and Therapeutics Committee.

2. Will be distributed appropriately to members of the medical staff, nursing staff and other professionals, so that it may be immediately available to them, either in printed form, via the SVMC intranet, or via SVMC website.

3. Will be revised, and approved by the medical staff annually.

4. Will consist of a listing of all drugs and pharmaceutical agents, legend and non-legend, in general use in the Medical Center, which contains:

   a. An alphabetical listing with generic and trade name references

   b. A code key that will note use restrictions

When drugs are added to the SVMC formulary, they are approved for all FDA-approved indications and for all age groups.

B. Changes to the Formulary

1. Additions, deletions or other changes to the Formulary will be made only with the approval of the Pharmacy and Therapeutics Committee

2. Additions

- Persons desiring additions will complete a form, "Application for Addition to the Sierra View Medical Center Formulary"
- The request is submitted to the Committee through the Pharmacy or a Committee member.
- The requesting person may be required to appear before the Committee for clarification of the nature of the drug and its use.
- The medication request is read into the minutes of the Pharmacy and Therapeutics Committee.
- A subcommittee to review additions shall be formed to consist of the/their sponsor, a Clinical Pharmacist and any other interested individuals.
- A review of the medication is required before medications will be added to the Formulary which consists of at least the following:
  - Formulary Item
  - Recommendation
  - Pharmacological Action/Comparison
  - Formulary Impact
  - Safety Data
  - Economic Impact
  - Summary
  - References

The clinical summary will be used as a tool to inform the professional staffs of the Medical Center about the approved medications.

Education must be given when necessary to all staff involved, including nursing, medical residents, and pharmacy staffs.

3. Deletions:

   - Shall be made for drug items which are no longer used, which have become obsolete, which have been replaced with superior agents, or which should be deleted for other reasons, including newly discovered safety information.
   - The Director or a senior pharmacist will bring such drugs to the attention of the Committee immediately for newly discovered safety issues, but no less than annually for all other time the entire formulary is reviewed.

4. Monitoring:

   - Any new addition to the formulary will be monitored over the next 12 months for reports of untoward side effects or adverse reactions which may require a re-evaluation of formulary status.
   - New reports of adverse reactions, warnings, precautions, and other safety concerns for established formulary medications will be reviewed, and proactively identified for possible reevaluation of formulary status.
   - Additions, deletions, evaluation data, and other important topics will be presented to the medical staff through a newsletter of the Pharmacy and Therapeutics, which will be published approximately quarterly.

5. Clinical Informatics/ACS will be notified of any formulary changes once they are approved and education has been provided, as appropriate, so the electronic pharmacy and ordering systems can be updated to reflect the changes/shortages.

**ADDENDUMS:**

"Application for Addition to the Sierra View Medical Center Formulary" Formulary 2018 Drug List

**REFERENCES:**

- The Joint Commission (~~2019~~2021). Hospital accreditation standards. Joint Commission Resources. Oak Brook, IL.
- American Society Hospital Pharmacists Best Practices.(2018). Retrieved from http://digital.ashp.org/ASHP_Best_Practices_2015-2016.

**KEY WORDS:** Formulary; Medications, P&T

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**Addendum A**
**PHARMACY AND THERAPEUTICS COMMITTEEAPPLICATION FOR ADDITION TO THE SIERRA VIEW MEDIAL CENTER FORMULARY**

**INSTRUCTIONS:**

- Formulary application is restricted to medical and surgical staff members, and clinical pharmacists.
- Department chairman or department director co-signature is required.
- Use sound sources of information. [Example: Review articles, drug information sources (Micromedex), or practice guidelines]. Expert consultants in the therapeutic area of interest may also be very useful.
- Return this form to the Director of Pharmacy.
- The sponsoring member or clinical pharmacist must be present at the committee meeting for the request to be evaluated.

**PHARMACY AND THERAPEUTICS COMMITTEE**
**APPLICATION FOR ADDITION TO THE SIERRA VIEW MEDICAL CENTER FORMULARY**

PLEASE COMPLETE THE FOLLOWING INFORMATION:

**FORMULARY ITEM:**

Generic Name:

Trade Name:

Dosage Form:

Cost per usual treatment day:

**PHARMACOLOGY:**

Therapeutic Class:

Mechanism of Action:

Uses:

FDA Approved Indications:

Non FDA Approved Indications:

Primary Medical Use Area & population served (Highest Volume):

Circle those that apply: Neonatal Pediatric Adult Geriatric

Expected Volume of Use (# of treatment courses per month or per year):

**COMPARISON TO OTHER AGENTS ON THE FORMULARY:**

What agents on the SVMC Formulary are currently utilized to treat patients with similar indications to the drug being requested?

What advantages does this agent provide over the treatments (efficacy, adverse effects, convenience, cost)?

Are the agents on the SVMC Formulary which should be considered for deletion if this item is approved?

**SAFETY DATA:**

Have there been any reports, including sentinel event advisories, of serious adverse effects from the use of this agent?

Does this agent pose any potential risk to patients or employees (via errors or abuse potential) at SVMC either medically or due to packaging or dose form idiosyncrasies?

Is the drug on the NIOSH List of Antineoplastic and Other Hazardous Drugs in Healthcare Settings list?
Circle one: Yes or No

If yes please circle corresponding group.
Group 1 (Antineoplastic)
Group 2 (Non-Antineoplastic with criteria for hazardous drug)
Group 3 (Adverse reproductive risks)

**COST DATA:**

What will be the usual dose, duration of therapy and cost per treatment course for this agent?

Compare costs, direct and indirect, that may occur with addition of this agent.

ADJUNCTIVE TREATMENT MORE LESS UNKNOWN

ADJUNCTIVE

MONITORING
(LABS, X-RAYS)

HOSPITALIZATION

**PATIENT OUTCOME ASSESSMENT:**

Will patient outcome be improved by this agent?

Yes_____ No____

If yes, in what regard (cure-rate, disease prevention, decreased hospitalization and use of resources, fewer complications, quality of life).

**ADDITIONAL INFORMATION:**

Was this application prompted by a representative of the drug's manufacturer?

Yes_____ No____

Do you have a financial interest in having this drug added to the formulary?

Yes_____ No____

_____ _____
SVMC Faculty or Pharmacist Date

_____ _____
Department Chairman /Director Date

| SUBJECT: **INTRA-AORTIC BALLOON PUMP THERAPY** | SECTION: *Patient Care Services* **Page 1 of 4** |
|---|---|

**Printed copies are for reference only. Please refer to the electronic copy for the latest version.**

**PURPOSE:**

To provide safety guidelines for staff caring for patient with a requiring counter pulsation by Intra-Aortic Balloon Pump (IABP).

**DEFINITIONS:**

**Intra-Aortic Balloon Therapy (IABP):** A cardiac assist device consisting of an invasively placed balloon catheter (IABP) attached to a bedside pump console that controls balloon inflation and deflation. Inflation/deflation is timed to the cardiac cycle. The therapy is designed to increase coronary perfusion and decrease myocardial oxygen consumption.

**Critical Care Registered Nurse define in this policy:** A registered nurse competent in intensive care management with specific competency in IABP management. These RN's include the ICU and Cardiovascular Cath Lab.

**POLICY:**

A. Only IABP patients with catheter placed for augmentation will be consider for admission to ICU patients. Patients with high potential for cardiac surgery needs should not be admitted but transferred to higher level of care.

**Indications but not limited to the following:**

1. Refractory unstable angina.
2. Impending myocardial infarction (MI).
3. Acute MI with mechanical impairment as a result of mitral regurgitation, ventricular septal defect, papillary muscle dysfunction
4. Intractable ventricular tachycardia as a result of myocardial ischemia.
5. Refractory ventricular arrhythmias.
6. Cardiogenic shock.
7. Support for diagnostic percutaneous revascularization and interventional procedures.
9. Emergency support following PTCA or high-risk percutaneous coronary interventions.

**Contraindications but not limited to the following:**

1. Severe Aortic Insufficiency.
2. Thoracic and abdominal aortic aneurysms.
3. Severe calcific aorta-iliac disease or peripheral vascular disease.
4. Prosthetic graft in thoracic aorta.

B. The patient with an IABP will be cared for by a critical nurse as defined by this policy. The patient will be considered high acuity and received 1:1 nurse to patient ratio as needed by a nurse who has IABP competency.

C. Revalidation of IABP knowledge and skills will be done annually.

D. IABP will be inserted in the cardiac cath-lab and stabilized for transport before transfer to the ICU.

E. Cardiovascular Cath Lab leadership will attempt to put a cath lab team on call for emergent issues requiring the patient to return to the Cardiovascular Cath Lab for further intervention. This team will need to be on call until the catheter is removed. If an on call team is not available, must consider transferring patient to another facility for higher level of care. *Note: If the patient cannot*

*be transferred, leadership will be made aware. The Cardiovascular Cath Lab leadership and Critical Care Services leadership will work together to construct a safe plan for the patient's needs.*

**AFFECTED PERSONNEL/AREAS:** *CARDIAC CATHETERIZATION LABORATORY (CCL) AND INTENSIVE CARE UNIT (ICU)*

**EQUIPMENT:**

- IABP, helium gas supply.
- ECG and arterial pressure monitoring supplies.
- Single-Pressure transducer system.
- Emergency equipment available for immediate use.

**PROCEDURE:**

A. Before transfer to ICU: Counter pulsation should began immediately after insertion and verification by X- ray in the procedure room

B. Review manufacture manual for IABP equipment use which is kept attached to the IABP machine.

C. Keep limb straight to not kink tubing, use log roll technique to maintain straight limb

D. Head of bed should be kept 30-45 degrees to avoid aspiration and prevent upward migration of catheter

E. Perform a baseline physical assessment this should include all items that are included in the maintenance monitoring section of this policy:

F. **Maintenance Monitoring**

a. Assessment of circulation, including capillary refill on pedal and left radial pulses. This should be done every 15 minutes for the first hour then hourly. *(The IABP or thrombus can obstruct flow to distal extremities; if the catheter migrates to high, it can obstruct flow to the left subclavian artery.)*

b. Monitor blood pressure and MAP during counter pulsation every hour and every 15 minutes during vasoactive drip titration

c. Presence of dorsalis pedialis posterior tibial pulses (these can be marked with indelible ink to facilitate checks) Distal pulses should be checked every 15-30 minutes for the first 6 hours then hourly with VS to monitor for limb ischemia.

d. Monitor Vital Signs (VS) every 15-30 minutes for the first 6 hours then hourly until catheter is removed.

e. Arterial balloon pressure and cardiac output index every hour (can use NICOM for continuous value recording)

f. Neurological checks every hour

g. Urine output every hour

h. Insertion site and dressing evaluation, every hour for 8 hours then every 4 hours monitoring for oozing and hematoma. *(if abnormal finding contact provider immediately)*

i. Palpate extremity with regular physical assessment to monitor for swelling and tension every 4 hours

j. Auscultate bowel sounds every 4 hours with regular physical assessment to detect evidence ischemia Ankle brachial index (ABI) every 4 hours

k. ECG and IABP waveform every 4 hours and prn, print and place strip in the patient chart

l. Observe skin temperature color, sensation, and movement of extremity *(notify provider if dusky, cool, mottled, painful, numb or tingling)*

m. Strict and accurate intake and output daily

n. Monitor weight daily

G. **Ankle Brachial Index (ABI):**

a. Obtain a brachial systolic pressure
b. Record the highest pressure as the "B" brachial pressure
c. Place the blood pressure cuff on the ankle same side at the IABP catheter
d. Using a Doppler find the posterior tibial artery or dorsalis pedis, inflate cuff and listen for the first sound record this as "A" systolic ankle pressure
e. Then divide the "A" ankle by "B" brachial
Example: ankle systolic pressure= 110
Brachial systolic pressure =140
110 divided by 140= .78= 78% flow

*(Normal ABI is 097-100%) nursing should contact physician if ABI is below 60% or if patient has signs of vascular compromise*

f. **Interpreting Result:** greater than 1.3 results may not be reliable because of calcified vessels such as someone with diabetes, this will show falsely elevated pressures.
1.01 to 1.3: correlate with history
0.97 to 1 normal
0.8 to 0.96 mild ischemia
0.4 to .079 moderate to severe ischemia
0.39 or less severe ischemia in danger of limb loss

H. **Trouble Shooting:**

a. **Suspected Balloon Pump leak:**

*Observe for loss of augmentation or lack of normal pressure waveform (gas could be gradually leaking from the balloon)
*Check for blood in the catheter or connecting tubing.
* Notify physician, you may need to stop counter pulsation. Prepare for removal of IABP

b. **Actual Balloon perforation (blood in catheter)**
*place IABP on standby
*Clamp catheter
*Disconnect the catheter from the IABP console
*Notify physician and prepare for removal/replacement

c. **ALARMS:**
* Refer to Operators Manuel

**REFERENCES:**


- Maquet Getinge Group. (2018, December). Mechanisms of Counterpulsation Clinical Support Manual. Wayne, New Jersey, United States of America: Datascop Corp.
- Nettina, S. M. (2019). Lippincott Manual of Nursing Practice 11th edition. Philadelphia: Wolters Kluwer.
- Weigand, D.L. (2017). AACN Procedure Manual for High Acuity, Progressive, and Critical Care 7th edition. St. Louis: Elsevier.


**CROSS REFERENCES:**
**Intra-Aortic Balloon Pump (IABP) Management**

| SUBJECT: **INTRAVENOUS THERAPY - NEWBORNS** | SECTION: **Page 1 of 3** |
|---|---|

**Printed copies are for reference only. Please refer to the electronic copy for the latest version.**

**PURPOSE:**

To set guidelines for the initiation and implementation of intravenous (IV) therapy for newborns.

**POLICY:**

1. Intravenous therapy, including blood components and intravenous medication ordered by the physician will be administered by an infusion pump and micro-set or infusion pump and with Buretrol to ensure accuracy and safety.
2. Neonatal IV sites will be visualized every 1 hour and prn while fluids are infusing.
3. IV will be flushed with 0.5 mL normal saline before and after medication administration.

**AFFECTED AREAS/ PERSONNEL:** *MCH STAFF, RNs*

EQUIPMENT:

- Infusion pump with appropriate tubing
- IV fluids as ordered by physician (usually 10% D/W – Infants less than 1000 grams may require 5% D/W)
- Tape
- Angio catheter, butterfly
- Sterile gauze/cotton balls
- Flush solution (normal saline)
- Armboard
- Betadine and alcohol wipes
- Gloves
- Tegaderm

**PROCEDURE:**

1. Assemble equipment.
2. Check physician's order and ~~and~~ cross check with label on bottle or bag for accuracy.
3. Set up infusion pump.

4. Secure proper lighting and comfortable position.

5. Select a vein, considering the following:

   a. Location

   b. Condition of vein

   c. Purpose of the infusion

   d. Duration of the therapy

6. Select a needle to match the vein size.

7. Obtain assistance as necessary to position and/or hold patient.

8. If starting IV in an extremity, select an armboard using the following guidelines:

   a. The board should be softly padded with cloth.

   b. Toes should not be taped over the side of the board.

   c. Fingers or toes should be visible and taped in a comfortable position.

9. Flush angio catheter or butterfly with flush saline solution.

10. Hold catheter/butterfly with bevel up. Remove the needle cover. Position the needle in the direction of the venous flow. Place the needle tip to one side of the vein.

11. Advance the needle until blood backflows into the tubing or hub as the needle is advanced. Release tourniquet.

12. Inject 0.5 mL of flush into the vein. It should flush easily. Observe for subcutaneous infiltration. Activate safety device.

13. Anchor angio catheter or butterfly with tape to allow maximum visualization of the site.

14. After two unsuccessful attempts at starting an IV, assistance must be considered.

15. Attach the IV tubing to the needle and set the rate of infusion. . The pump should be set to an hourly rate so it alarms on an hourly basis that would prompt the nurse to peform the hourly IV site check.~~No more than two (2) hours of fluid will be added to the Buretrol at one time~~.

16. For active infants, apply shield/soft restraint to protect the IV site, but not to interfere with the visualization of the site or infusion. Position infant as comfortably as possible while protecting IV. Visualize the site every 1 hour and as necessary. (PRN)~~prn.~~

17. Change solution every 24 hours, change tubing every 72 hours, and label. Document ~~document~~ in the Electronic Medical Record (EMR).

PATIENT/FAMILY EDUCATION:

Inform parents/family members about procedure and reason for intravenous infusion.

DOCUMENTATION: Document on EMR the date, time, site needle type and size, IV fluid and infusion rate.

- Label tubing according to hospital policy
- Parent family education

**REFERENCE:**

- PC, MM §70547 (b)(22)
- Gardner, S. L., Carter, B. S., Hines, M. E., & Hernandez, J. A. (2021). Merenstein & Gardners Handbook of Neonatal intensive Care (9th ed.). St Louis, MO: Elsevier.

| SUBJECT: **IV PREPARATION AND DISPENSING** | SECTION: *Pharmaceutical Services* **Page 1 of 14** |
|---|---|

**Printed copies are for reference only. Please refer to the electronic copy for the latest version.**

**PURPOSE:**

To provide guidelines to ensure quality sterile compound products are produced by using consistent validated methods.

**DEFINITION:**

**Designated Persons-** The pharmacist in charge and the IV sterile product lead technician will serve as the designated persons who are assigned to be accountable and responsible for the operation and performance of the compounding facility and personnel.

**PEC-Primary Engineering Control-** A device that provides an International Organization for Standardization (ISO) Class 5 or better environment through the use of non-turbulent, unidirectional high efficiency particulate air (HEPA)-filtered first air for compounding sterile preparations.

**Segregated Sterile Compounding Area-** A designated space for sterile-to-sterile compounding where a PEC is located.

**Aseptic Processing/Preparation**- The technique involving procedures designed to preclude contamination (of drugs, packaging, equipment, or supplies) by microorganisms during processing.

**ISO Class 5 Environment**- One that contains no more than 3,520 particles per cubic meter that are 0.5 microns or larger in size.

**Vertical Laminar Airflow Hoods**- A device used to achieve the ISO Class 5 environment that sweeps filtered air from top to bottom.

**CAI- Compounding Aseptic Isolator-** A unidirectional HEPA-filtered airflow isolator that creates a positive pressure controlled environment. It is designed to provide worker protection from exposure to undesirable levels of airborne drug and to provide an aseptic environment for compounding sterile preparations.

**CACI- Compounding Aseptic Containment Isolator-** A unidirectional HEPA-filtered airflow isolator that creates a negative pressure controlled environment. It is designed to provide worker protection from exposure to undesirable levels of airborne drug and to provide an aseptic environment for compounding sterile preparations.

**High-Efficiency Particulate Air (HEPA) filter** - A filter composed of pleats of filter medium separated by rigid sheets of corrugated paper or aluminum foil that direct parallel flow that removes air particles 0.3 micrometers or larger.

**CSP-** Compounded sterile product.

**Critical Site** – Any direct pathway through which contaminants may enter a sterile product (e.g. the point at which a needle pierces a vial stopper).

**First Air** – First air is the uninterrupted flow of air from the HEPA filter.

**Beyond use date (BUD) –** Beyond Use Date is the date and hour after which a CSP must not be used.

In-Use Time –The time before which a conventionally manufactured product or a CSP must be used after it has been opened or needle punctured (e.g. after a container closure of a vial has been penetrated). It cannot exceed the BUD or the manufacturer's expiration date.

Category 1 Compounded Sterile Product (CSP)- Category 1 is a risk-based approach defined in USP 797 that establishes a specific BUD for products, personnel qualifications, environmental monitoring, release testing required for sterile compounding. It assigns a BUD of 12 hours at room temperature and 24 hours refrigerated. SVMC BUD for products made in the main hospital pharmacy will not exceed 12 hours.

Category 2 Compounded Sterile Product (CSP)- Category 2 is a risk-based approach defined in USP 797 that establishes a specific BUD for products, personnel qualifications, environmental monitoring, release testing required for sterile compounding. It assigns a BUD of greater than 12 hours at room temperature or greater than 24 hours when refrigerated.

**POLICY STATEMENT:**

It is the policy of Sierra View Medical Center (SVMC) that sterile pharmaceutical products will be prepared using accepted standards of practice.

**PROCEDURE:**

A. Sterile compounded products must be made in pharmacy in an ISO Class 5 PEC environment.

   a. Sterile compounded products may be made outside of an ISO Class 5 environment only in the case of an emergency where waiting could result in harm to a patient.

      i. These preparations shall be labeled "for immediate use only" and administration shall begin no later than one hour following the start of the compounding process.

      ii. Unless the immediate use preparation is immediately and completely administered by the person who prepares it, then the preparation shall bear a label with the following information:

         1. Patient identification
         2. Names and amounts of all ingredients, may not exceed three ingredients.
         3. Name or initials of person preparing it

4. Exact one hour beyond use date and time
5. If administration has not begun within the one hour, then the preparation will be discarded.
6. Any unused source containers with residual drug shall be properly discarded.

iii. The segregated compounding area in the main hospital pharmacy provides ONLY category 1 sterile-to-sterile preparations.

iv. The compounding process in the main hospital pharmacy shall not involve more than two entries into any one container or package (e.g. bag, vial) of sterile infusion solution or administration container or device.

b. All active and inactive ingredients used in sterile compounding at SVMC shall be procured from a supplier registered with the Food and Drug Administration (FDA).

c. Category 1 or 2 CSP's may be prepared at SVMC's Cancer Treatment Center's Suite B nonhazardous sterile product IV room.

B. Master Formulas For Sterile Preparations must be present before the pharmacy can compound any sterile preparations. A master formula document must contain the following elements:

a. Name , strength, dosage form

b. Quantity prepared

c. Active ingredients

d. Equipment to be used

e. The maximum allowable beyond use date for the preparation, and the rationale or reference source justifying its determination.

f. Sierra View Medical Center's main pharmacy has a maximum BUD of 12 hours, as per USP 797 guidance for a category 1 facility.

g. Sierra View's Cancer Treatment Suite B is a nonhazardous product room is a Category 2 facility. The maximum BUD will not exceed 8 days for refrigerated items.

h. Inactive ingredients to be used and amounts

i. Specific and essential compounding steps used to prepare the drug.

j. Quality reviews required at each step in the preparation of the drug.

k. Post-compounding process, and any required post-compounding process and procedures, qualitative checks, including visual check and pharmacist initials that signify final product check.

l. Instructions for storage and handling of the compounded drug preparation.

m. Physical description of final preparation and final container to be used.

n. Where the pharmacy does not routinely compound a preparation, then recordation may occur on the prescription document itself.

o. Any other information that may be needed to describe the operation and ensure its reproducibility.

p. Professional reference to cite where the compounding information can be found.

C. The methodology for determining the formulation of the sterile product shall be:

a. Consulting appropriate professional references

i. USP 797
ii. American Society of Health System Pharmacist
iii. Trissel's Drug Compatibility
iv. Lexi Comp Drug Information
v. Drug manufacturer package insert

D. A compounding log will be present and contain all of the following elements:

a. Name and strength, dosage form of the compounded drug preparation

b. Date that the drug preparation was compounded

c. Identity of pharmacy technician and pharmacist who performed the PRE check and POST compounding check.

d. Quantity of each ingredient

e. Manufacturer, expiration date, and lot number of each component

f. A pharmacy assigned unique reference or lot number

g. BUD: SVMC main pharmacy (max 12 hours) and CTC Suite B a Category 2

h. The final quantity or amount of drug preparation compounded for dispensing

i. Visual check of final product.

j. Master formula recorded as reference.

k. The log will be separated alphabetically by active ingredient. All logs will be kept for three years and will be filed alphabetically by the active ingredient's generic name. The last year's compounded drugs will be kept in the pharmacy. Any previous years will be kept at a designated pharmacy storage site as per approved Board of Pharmacy waiver to store records off site.

E. The most common source of contamination of sterile products is from personnel. The two most common causes of these contaminations are via particle shedding from personnel and improper manipulation of equipment.

a. Contamination from personnel due to shedding can be reduced by proper hand hygiene, gowning and gloving.

i. Personnel who are experiencing rashes, sunburn, weeping sores, conjunctivitis, or active respiratory infections shall not compound sterile products.

F. Compounding personnel shall not wear cosmetics, hand, wrist, or other visible jewelry, artificial nails, or extenders. Natural nails shall be kept neat and trimmed.

G. Hand hygiene and donning of personal protective equipment (PPE) will take place in the anteroom:

a. Shoe covers.

b. Hair/beard cover should contain all hair.

c. Mask should be worn to cover from bridge of nose to chin.

d. Hands and forearms will be vigorously washed with soap (~~Chlorhexidine)~~ and water for at least 30 seconds.

- Remove debris from under fingernails, if present, using a nail cleaner (pick) under warm water.
- Hands and forearms shall be washed vigorously with soap and water for at least 30 seconds.
- Dry hands and forearms up to the elbows with low-lint disposable towels.

- A clean non-shedding gown dedicated to use in the compounding area shall be donned. Gowns that are open (tied) in the back are to be utilized.
- Prior to donning sterile gloves, use Sterillium© and allow at least three minutes of dwell time.
- Put on appropriate sized sterile gloves and apply sterile 70% alcohol and allow to dry.

e. Gloves should be disinfected immediately before compounding begins, before inserting hands into CAI, and before entering or re-entering the PEC and after contact with non-sterile objects.

f. Gloves that become contaminated by contact with non-sterile surfaces should be disinfected with sterile 70% isopropyl.

g. Gloves should be changed whenever contaminated (spills, etc.), torn or every 30 minutes.

h. The CAI fixed glove assembly shall don sterile gloves OVER the CAI isolator gloves immediately before non-hazardous compounding. These sterile gloves must be changed by each individual whenever continuous compounding is ceased and before compounding starts again or when a rip or tear is visible.

H. Personnel will not prepare compounded sterile products until training is complete and competency validated as per SVMC policy STERILE PRODUCTS:EDUCATION AND COMPETENCY.

a. Personnel will have their competency validated on a yearly basis. There will be dates and signatures reflecting all annual reviews of the policies and procedures by the pharmacist-in-charge.

b. Periodic quality checks will be performed per policy. Failure of any quality test will result in the employee being unable to compound sterile products until retrained and competency validated.

I. Proper conduct in the sterile processing area also protects from contamination.

a. Food and drink are prohibited in all areas of the IV Room.

b. Actions such as talking and coughing should be directed away from the work area.

c. Any unnecessary motion within the hood should be avoided to minimize the turbulence of air flow.

d. Activities in the sterile products room should only be related to the procedures for parenteral preparations.

e. No cardboard boxes may be in the ante-room or segregated compounding area. Supplies shall be wiped down with sterile alcohol before placing them in the anteroom and buffer room.

J. Proper technique in the ISO Class 5 environment is required to prevent contamination.

a. The critical principle in using laminar airflow hoods is that nothing should interrupt the flow of air between the HEPA filter and the critical site.

b. To maintain sterility, nothing should pass behind a sterile object in a vertical flow hood. Materials placed within the laminar flow hood disturb the patterned flow of air blowing from the HEPA filter. When laminar air flow is moving on all sides of an object, the zone of turbulence is created that may extend six times the diameter of the object. For these reasons, it is advisable to work with objects at least six inches from the sides and front of the hood without blocking air vents, so that unobstructed airflow is maintained between the HEPA filter and sterile objects.

c. Overcrowding of the critical work area may interfere with airflow and increase the potential for compounding errors. Only one individual may work in a hood at one time.

d. Items introduced into the CAI/Hood and their critical sites (vial stopper, IV bag septum) or hood shall be disinfected with 70% sterile alcohol and allowed to dry before aseptic manipulations begin.

K. Although the laminar air flow hood provides an aseptic environment, safe for the manipulation of sterile products, it is essential that strict aseptic technique be used in conjunction with proper hood preparation.

L. All equipment (syringes, needles, bags, devices) will be used according to standard references to ensure quality, stability and compatibility. Up to date references are available in the pharmacy.

M. Ampule Use

a. Before an ampule is opened, any solution visible in the top portion (head) should be moved to the bottom (body) by swirling the ampule in an upright position.

b. To make an ampule break properly, the ampule neck is cleansed with an alcohol swab and the swab should be left in place. Pressure should be exerted on both thumbs, pushing away from oneself in a quick motion to snap open the ampule.

c. Ampules should not be opened toward the HEPA filter of the laminar flow hood or toward other sterile products within the hood.

d. To withdraw medication from an ampule, the ampule should be tilted and the bevel of the needle placed in the corner space (or shoulder) near the opening. As fluid is withdrawn, increase the angle of tilt so that more of the ampule contents flows into the shoulder.

e. Use a filter needle or filter straw to withdraw the ampule contents, and then switch to a regular needle before expelling the solution from the syringe. Alternatively, a regular needle may be used to draw the solution from the ampule, but a filter needle must be used when expelling the solution from the syringe.

f. All ampules are to be immediately discarded and are not to be stored for any length of time.

N. Vial Use

a. Vials with drugs in solution can be multi dose or single dose.

b. Multi dose vials contain a small amount of preservative agent. The presence of these substances does not make the solution self-sterilizing and the use of strict aseptic technique is still required. Common substances used as preservatives include benzyl alcohol, parabens, phenol and benzalkonium chloride. Due to their toxicity, solutions with preservatives should not be used in preparations for pediatric or neonatal patients or for epidural or intrathecal dosage forms.

c. Unless otherwise specified by the manufacturer, a multi-dose container stored according to the manufacturer's specifications is used in its entirety or its remaining contents are labeled with a BUD and discarded within 28 days from initial opening or puncture. Any multidose container not stored properly or not labeled with a BUD or if BUD is incorrect, the container and drug must be immediately discarded.

d. Single dose vials do not contain preservative.

i. Most protective covers do not guarantee sterility of the rubber stopper. Before the stopper is penetrated, it must be swabbed with 70% isopropyl alcohol and allowed to dry.

ii. Needle entry into vials with rubber stoppers should be done cautiously to avoid the creation of rubber core particles.

d. Single-dose containers of a compounded sterile drug preparation, other than an ampule, such as a bag, bottle, syringe or vial, are used in their entirety or their remaining contents are to be labeled with a BUD and discarded within the following time limit, depending on the

environment:

i. When needle punctured in an environment with air quality worse that ISO Class 5,will be used immediately and the remainder discarded
ii. When needle punctured in an environment with ISO Class 5 or better air quality, within six hours, unless otherwise specified by the manufacturer.

O. The Role of the Pharmacist

a. As physician's orders are received, the pharmacist will enter the order into the computer, preferably selecting premixed preparations.

b. Medications not available in premixed form will be entered in the computer as part of a multiple item compound that includes the appropriate volume of a compatible base solution.

c. A label will be generated from the computer system.

d. The pharmacist will check ALL ingredients (and calculations) prior to a pharmacy technician commencing any compounding. This PRE check will be documented on the compounding log.

e. Upon completion of the compounding, the pharmacist will visually inspect the product for visible turbidity, cloudiness, i.e., qualitative inspection of the final product and document this on the compounding log, a POST Check..

P. The Role of the Pharmacy Technician

a. Disposal of Supplies Upon Completion of Sterile Compounding

i. Needles will be discarded in puncture resistant, sealable containers often called "sharp" containers.
ii. Do NOT recap needles before discarding them into the "sharps" container.
iii. Syringes and containers that do not have medication in them that is not considered to be Resource Conservation and Recovery Act (RCRA) waste shall be disposed of in blue pharmaceutical waste bins.
iv. Nonhazardous, empty vials may be discarded in the regular trash.

b. Intravenous Piggy Back Set- Up Procedures

i. An intravenous admixture ward list will be printed twice a day by pharmacy technicians. This list will create intravenous admixture labels that will need to be affixed to either premixed (from the manufacturer) admixtures and, if there are

no premixed solutions available, then the admixture will be compounded in the compounding aseptic isolator.

ii. Any frozen solutions shall be thawed from the Pharmacy service refrigerator.

iii. Using the oldest frozen preparation that will not expire within the 24 hour dispensing period, the technician will label each solution specifically for the patient, drug and dose.

iv. Expiration dates on the frozen solutions will be checked to assure the oldest acceptable date.

v. Docking of proprietary bag to vial systems for future activation must be done in accordance with USP 797 in an ISO Class 5 environment.

c. Pediatric Syringe Preparation Procedure

i. The intravenous admixture ward list will be printed twice a day.

ii. Patients with doses due before the next list is printed will have those labels segregated from the work list.

iii. The amount of drug needed for compounding based on total patient requirements shall be determined.

iv. Materials required for aseptic medication transfer should be gathered and placed in the CAI antechamber and sprayed with sterile alcohol.

v. The supplies and drug shall be transferred into the CAI mixing chamber and allowed to sit undisturbed for at least three minutes to allow for the CAI to purge any airborne particles.

vi. The technician will call the pharmacist into the IV room for a PRE check on the materials and calculations for the preparation to be compounded. The identity and quantity of each component will be validated by the pharmacist BEFORE the addition is performed.

vii. After the pharmacist signs off on the PRE check on the compounding log, the appropriate amount of medication containing solutions for syringe preparation shall be diluted (in the CAI) by the technician.

viii. The calculated amount of drug shall be drawn into the syringe.

ix. Aseptically, the technician will inject the syringe contents into the predetermined base solution and apply the patient-specific label.

x. The patient-specific label is immediately applied and the product is removed from the CAI and made available for the pharmacist to do a final quality check.

xi. The remaining drug in the source container shall be discarded.

d. Large volume parenteral preparation procedure:

i. Solution fill list and labels are obtained as described in the pediatric syringe preparation.

ii. Labels are assembled according to additive type.

iii. The outer wraps of solutions are removed upon reintroduction into the CAI. The large volume bags are sprayed with sterile alcohol in the CAI antechamber.

iv. The materials for compounding (drugs and syringes, etc.) are placed in the mixing chamber in the CAI and allowed to sit for a minimum of three (3) minutes to allow for the particulate to return to an ISO class 5 state.

v. The pharmacist is called into the IV room and the identity, quantity and calculations are reviewed with the technician prior to the pharmacist signing the compounding log and prior to the technician compounding the sterile product.

vi. The patient specific label is immediately applied and the product is removed from the CAI and made available for the pharmacist to do a final quality check.

Q. Sterile product preparation and verification PRE procedure to be done by the technician BEFORE and during the pharmacist's PRE compounding check:

a. Drugs and equipment and patient specific label (needles/syringes/alcohol wipes/etc.) necessary to prepare and mixture will be assembled for the pharmacist to review with the technician.

b. Ingredients will be carefully checked for accuracy using the master formula and label. All products selected for use in compounding shall be verified by the pharmacist prior to any compounding activity. In addition, calculations will be verified with the pharmacist during the PRE CHECK phase of compounding.

c. The Pharmacist will then sign and date the compounding log acknowledging the technician has assembled all proper materials, drugs, equipment and has reviewed any and all pertinent calculations.

Q. Procedure for transferring necessary ingredients and equipment into the CAI. All items will be carefully wiped down with sterile alcohol and allowed to dry before being placed in the CAI.

a. Only ingredients to make one admixture should be in the CAI.

b. Items will be arranged in a manner that does not block or disrupt airflow.

c. After the compounding materials are in the CAI, a purge time of three (3) minutes will pass before beginning any compounding activities.

d. Gloves will be disinfected with sterile alcohol and allowed to dry.

e. A pharmacist will check ingredients and calculations prior to compounding.

f. Admixture will be prepared using aseptic technique.

g. Trash will be managed in a way that does not obstruct airflow.

h. Admixture will be removed from the CAI and labeled.

i. Label will be signed by the employee and the beyond use date will be written on the label.

j. Employee preparing and pharmacist checking the IV will inspect the IV for leakage, foreign matter precipitate or cloudiness.

k. All ingredients and supplies will be removed from CAI and kept together for verification by a pharmacist.

R. Sterile product labels must contain the following elements:

a. The generic names of the drugs

b. The quantity or volume and strength of the active ingredient (s)

c. The name of the patient

d. The direction for use

e. The date of dispensing

f. The name and address of the compounding pharmacy and dispensing pharmacy if different.

g. An order number to identify the prescription, e.g., lot number or pharmacy reference number(prescription number).

h. The name of the prescriber

i. Beyond Use Date (BUD)

j. Date compounded

k. Route of administration

l. Rate of administration for IV admixtures

m. Instructions for storage & handling or warning labels if needed

n. All hazardous drugs shall bear a label which states, "Chemotherapy-Dispose of Properly" or "Hazardous-Dispose of Properly"

S. Statement the "Drug was compounded in pharmacy" if preparation was not outsourced.

T. Beyond Use Dating (BUD) will be assigned to all drug products based on manufacturer's chemical stability recommendations or in accordance with the standards for sterility testing found in USP 797 , whichever is shorter.

a. SVMC's main pharmacy exclusively prepares sterile-to-sterile transfers in a low risk level ISO class 5 PEC that is located in a segregated compounding area, i.e., Category 1 classification. The preparations use sterile ingredients with no more than two (2) punctures into final container. **The maximum BUD is 12 hours for all compounded sterile products**.

b. The Cancer Treatment Center (CTC) suite B prepares hazardous and non-hazardous compounded sterile products by using sterile to sterile transfers in a negative pressure hood and room and a positive pressure room and hood, respectively. The products produced at this location will qualify for Category 2 and MAY have a BUD of not greater than 30 hours at room temperature and 9 days refrigerated.

U. Single-dose and multi-dose container dating

a. A single-dose container (not an ampule) must be used entirely or discarded:

i. Within six hours, if needle-punctured or opened in an ISO Class 5 environment. If a puncture time is not noted on the container, the container must be immediately discarded.

ii. Within one hour if needle-punctured or opened in a worse than ISO Class 5 environment.

b. An ampule is a single-dose container that must be used immediately and not stored for any timeframe.

c. A multi-dose container must be used or discarded within 28 days (or shorter if specified by manufacturer).

V. Documentation Retention

a. All records of compounding and materials used to compound sterile preparations shall be maintained in a readily retrievable form for three (3) years from the date the record was last in effect.

b. The pharmacy will maintain records of the acquisition, storage and destruction of any components used in compounding.

W. Whenever a change in a policy or procedure occurs, the pharmacist in charge will notify the staff via a meeting or email. Staff shall sign off on changes acknowledging changes and intent to comply. Any material failure to follow the pharmacy's written policies and procedures shall constitute a basis for disciplinary action by the Board of Pharmacy.

X. This policy and all policies related to sterile IV compounding will be reviewed annually by the pharmacist in charge, and recordation of the annual review shall be present on each policy and be readily retrievable upon request by the Board of Pharmacy.

Y. All pharmacy staff who compound sterile products or who are responsible for training staff who work in the sterile product environment shall review all policies related to sterile products annually. Documentation of the annual staff review shall be readily retrievable for the State Board of Pharmacy.

Z. In the event of a drug recall, the written plan found in DRUG RECALL PROCEDURE shall be followed.

AA. The Department of Pharmacy will not handle or compound any infectious materials in the sterile compounding area.

**EDUCATION:**

SVMC Staff: All pharmacist and pharmacy technicians will receive education regarding sterile product preparation and aseptic technique.

**REFERENCES:**


- The Joint Commission (2022). Hospital accreditation standards. Joint Commission Resources. Oak Brook, IL.
- Pharmacy Law: California Edition (2022) San Clemente, California: Law Tech Publishing Group.
- USP 797. (n.d.). Retrieved March 19, 2020 from http://www.usp.org/compounding/general-chapter-797.

| SUBJECT: | SECTION: |
|---|---|
| **IV TO PO DOSAGE FORM CONVERSION PROTOCOL** | *Clinical Pharmacy Drug Protocols* **Page 1 of 3** |

**Printed copies are for reference only. Please refer to the electronic copy for the latest version.**

**PURPOSE:**

To provide a process for changing parenteral medications to the oral/enteral route when medically appropriate. The advantages of this program are:

To provide an oral/enteral dosage form with comparable bioavailability to the intravenous form, which has been shown to decrease length of hospitalization

To reduce the added risks associated with continued intravenous therapy

To lower overall medication and associated costs to the patient and the hospital

Additional benefits include greater patient comfort, decreased nursing needs, and easier ambulation.

**POLICY:**

Orders for approved intravenous (IV) medications are automatically changed to PO (by mouth) administration form when medical staff approved conditions and guidelines are met, and the switch is appropriate.

**AFFECTED AREAS/PERSONNEL:** *MEDICAL STAFF, PHARMACY, NURSING*

**PROCEDURE:**

1. Patients must meet the following criteria in order to be considered for automatic IV to PO conversion of the selected medications. If the patient does not meet all criteria listed below, they will not be considered for automatic IV to PO conversion.

   **Inclusion Criteria**

   a. The patient must be on IV therapy for at least 24 hours before IV to PO conversion consideration.
   b. The patient is tolerating scheduled medications and diet (orally, or via NG or G tube).
   c. The patient is not on a pre-operative or -procedure or post-operative or -procedure fast.
   d. The patient has not experienced any recurrent nausea, vomiting or diarrhea for at least 24 hours.
   e. The patient does not have documented esophophageal sphincter imcompetence.
   f. The patient does not have an active gastrointestinal bleed.
   g. The patient does not have documented problems with oral absorption (i.e., ileus, short bowel syndrome, celiac sprue, inflammatory bowel disease or malabsorption syndrome).
   h. The patient is not at risk for aspiration (e.g., decreased consciousness, seizures, etc.).

   **Additional criteria for antibiotic/antifungal agents**

   a. The patient is afebrile for at least 24 hours (temp $< 100.4^{\circ}$ F).

b. The patient is clinically improving (white blood cell count decreasing, bands decreasing, improved signs and symptoms as documented in prescriber progress notes).

c. The infection is at a site where an oral agent will achieve an adequate level (not endocarditis, meningitis, brain abscess, orbital cellulitis, other CNS infections, osteomyelitis, and endophthalmitis).

d. The patient is not septic, and is hemodynamically stable (heart rate ≤ 100 beats/minute, respiratory rate ≤ 24 breaths/minute, and systolic blood pressure > 90 mm Hg without vasopressor support).

e. For documented fungemia, fluconazole will continue IV for 7 days before PO switch.

2. The pharmacist may automatically switch the following medications to the oral dosage form, if the conditions under section 1 of this policy are met:

***Antimicrobials***

| Medication | Intravenous Dose | Oral Equivalent |
|---|---|---|
| **Azithromycin** | 250 mg IV daily<br>500 mg IV daily | 250 mg PO daily<br>500 mg PO daily |
| **Ciprofloxacin** | 200 mg IV every 12 hours<br>400 mg IV every 12 hours<br>400 mg IV every 8 hours | 250 mg PO every 12 hours<br>500 mg PO every 12 hour<br>750 mg PO every 12 hours |
| **Clindamycin** | 600mg-900mg IV every 8 hours | 300mg-450 mg PO every 8 hours |
| **Doxycycline** | 100 mg IV every 12 hours | 100 mg PO every 12 hours |
| **Levofloxacin** | 250 mg IV daily<br>500 mg IV daily<br>750 mg IV daily | 250 mg PO daily<br>500 mg PO daily<br>750 mg PO daily |
| **Fluconazole** | 100 mg IV daily<br>200 mg IV daily<br>400 mg IV daily | 100 mg PO daily<br>200 mg PO daily<br>400 mg PO daily |
| **Linezolid** | 600 mg IV every 12 hour | 600 mg PO every 12 hours |
| **Metronidazole** | 500 mg IV every 8 hours | 500 mg PO every 8 hours |
| **Rifampin** | 600 mg IV daily | 600 mg PO daily |
| **Trimethoprim / Sulfamethoxazole (TMP/SMX)** | 5-20 mg TMP/kg/day in 3-4 divided doses IV | As close to 1:1 conversion of TMP as possible:<br>1 double strength = 160 mg TMP<br>1 single strength = 80 mg TMP |
| **Voriconazole** | 3-4 mg/kg IV every 12 hours (maintenance dose) | <40 kg: 100 mg PO every 12 hours<br>≥40 kg: 200 mg PO every 12 hours |

***Others***

| Medication | Intravenous Dose | Oral Equivalent |
|---|---|---|
| **Famotidine** | 20 mg IV every 12 hours | 20 mg PO every 12 hours |
| **Ranitidine** | 50 mg IV every 6 or 8 hours | 150 mg PO every 12 hours |
| **Pantoprazole** | 40 mg IV daily | 40 mg PO daily (lansoprazole 30mg NG daily when applicable) |