

Treatment Plan:

1. ↑ dialysis efficiency/time; Review HD treatment
2. Evaluate for inflammation
3. Dietary counseling / ODPS
4. Review medications
5. Check with physician if gastroparesis
6. If CO₂ ↓, correct acidosis; Review HD treatment

Inflammatory Markers:

CRP

Ferritin

Albumin (neg)

Platelet count

Assess for periodontal disease – dental referral or assistance

Check for occult infection

UTI

Pericarditis

DM foot ulcers

Old non-functioning AVGs

Failed kidney transplant

Treat autoimmune disease

Check for Medications that may influence absorption (+/-)

Renvela (beneficial)

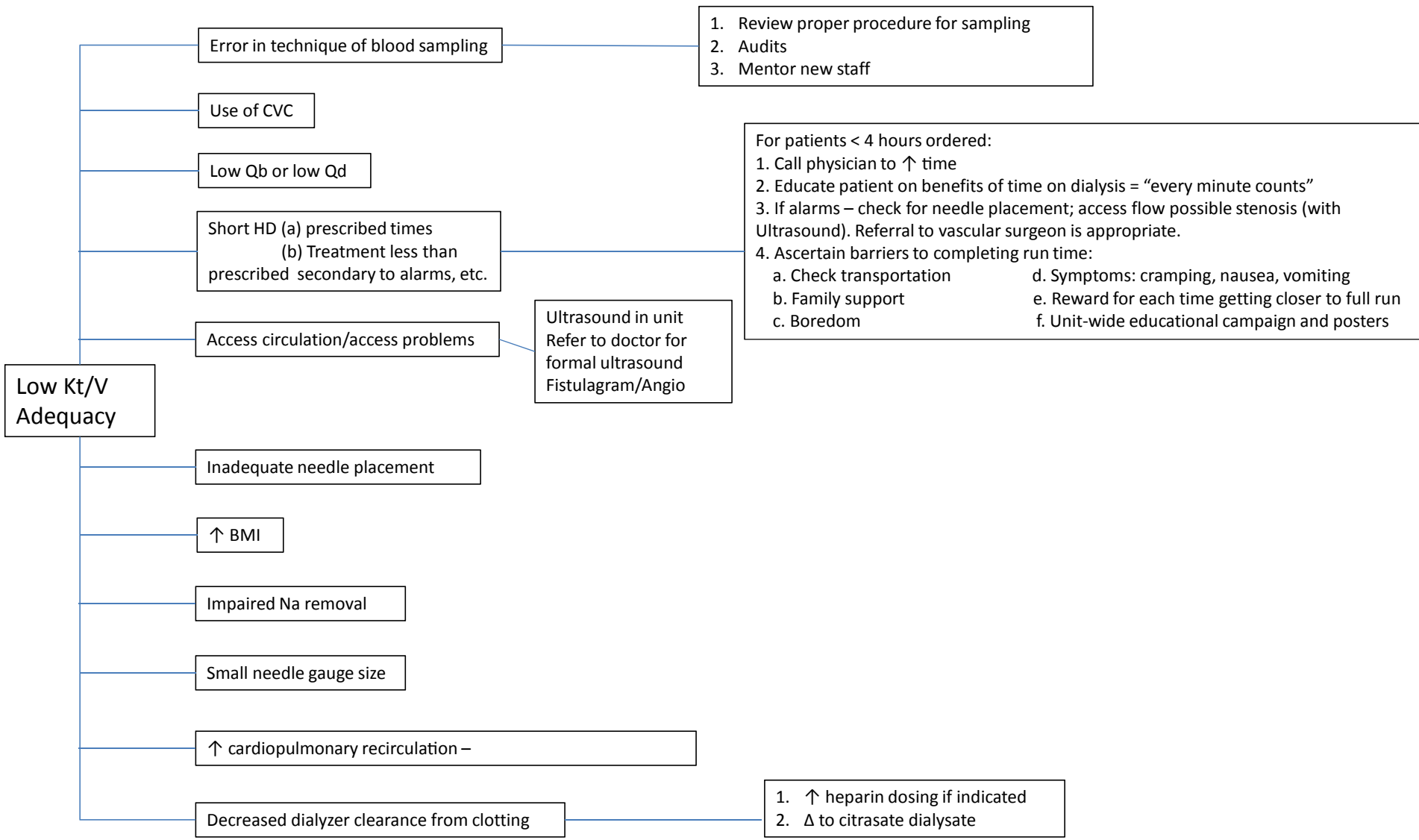
Statins

Heparin

Megace

Omega 3

L-carnitine



Low Kt/V Adequacy

Error in technique of blood sampling

1. Review proper procedure for sampling
2. Audits
3. Mentor new staff

Use of CVC

Low Qb or low Qd

Short HD (a) prescribed times
(b) Treatment less than prescribed secondary to alarms, etc.

- For patients < 4 hours ordered:
1. Call physician to ↑ time
 2. Educate patient on benefits of time on dialysis = "every minute counts"
 3. If alarms – check for needle placement; access flow possible stenosis (with Ultrasound). Referral to vascular surgeon is appropriate.
 4. Ascertain barriers to completing run time:

a. Check transportation	d. Symptoms: cramping, nausea, vomiting
b. Family support	e. Reward for each time getting closer to full run
c. Boredom	f. Unit-wide educational campaign and posters

Access circulation/access problems

Ultrasound in unit
Refer to doctor for formal ultrasound
Fistulagram/Angio

Inadequate needle placement

↑ BMI

Impaired Na removal

Small needle gauge size

↑ cardiopulmonary recirculation –

Decreased dialyzer clearance from clotting

1. ↑ heparin dosing if indicated
2. Δ to citrasate dialysate

Hypercalcemia

Hyperparathyroidism (+ tertiary hyperparathyroidism)
Vitamin D analogs
Calcium based PO4 binders
Adynamic bone disease (check for bone pain/fractures)
(ESRD & MBD) aluminum toxicity

Medications
Thiazides
Lithium
*Vitamin A (found in ocvites)
Theophylline

Malignancy
PTHrP
1 α hydroxylase (ex renal) = increased calcitriol
Bone metastasis
Multiple myeloma

Chronic granulomatous disorders
Sarcoid; TB

Endocrine
hyperthyroid /adrenal insufficiency

Immobilization
Parenteral nutrition
Milk alkali syndrome
Dialysate

Action Plan:

1. Review list of all patients still on calcium-based binders or supplements and discontinue
 - a. Assess for financial barriers to alternatives
 - b. Assess for compliance / education
 - c. Contact physician if appropriate
 - d. Check dialysate Calcium composition
 - e. Check for use of Sensipar if PTH > 300
 - f. Stop all Vitamin D or D analogs

2. Review list of medications

3. For patients with no calcium supplements, Vit D or calcium-based binders who are still \uparrow calcium
 - a. If Calcium persist \geq 11.0, consider these other causes
 - b. Obtain order to check labs for: iPTH, PTHrP, TSH, SPEP, 1,25 OH-D CXR
 - c. Review problem list for these issues
 - d. Contact physician for further evaluation

Hypertension

Increased sympathetic activity = \uparrow SVR (possibly caused by activation of receptors in the kidney by uremic metabolites)

a. Check outlier Kt/V to assure adequacy which can cause \uparrow sympathetic activity

Abnormal endothelial cell functions

*Volume overload = secondary to \uparrow CO and \uparrow SVR (may not see edema)

a. Assess ID weight gains on all outliers
b. Assess outliers who are hypertensive and coming in **AT** their ordered dry weight = challenge weights down until normotensive
c. Re-assess all dry weights on hospitalized patients
d. Review all meds to assure no NSAIDs

Unit-wide target:

- a. Education on the risks volume overload
- b. Contact primary nephrologists to lower target weights in CyberREN with order to continue to challenge down
- c. Review last dialysis run from hospital
- d. For patients above target weight, incrementally challenge volume down to achieve dry weight
- e. Poster campaign
- f. Lower dialysate sodium if appropriate to help with removal of sodium load
- g. \uparrow time on dialysis to facilitate slow volume removal at $\leq 11-13$ ml/kg/hr
- h. \uparrow frequency of dialysis if appropriate
- i. Use of UF profile especially #17

ESAs (can cause \uparrow of 10mmHg or $>$)

a. Review all outliers for high ESA requirement and initiate worksheet

BP measurement - pre sys BP overestimates (target pre: 140/90; post: 130/80) "controversy"
- interdialytic values?
- post sys underestimates by 7 mmHg

a. Allow patient to sit for several minutes before taking measurement
b. Assess cuff size especially after hospitalizations, etc.

Medications

Review when BP meds are taken

Hyperparathyroidism

Check outliers for \uparrow iPTH and review treatment plan

Call primary nephrologist for orders if appropriate

