Home Hemodialysis Anemia Management Protocol

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Provincial Health Services Authority

The following protocol, on order of physician, transfers anemia management of home hemodialysis patients to non-physician staff (i.e. RNs and renal pharmacists). **This protocol is intended to serve as a guide and cannot replace clinical judgment.** The recommendations included may be inappropriate for specific clinical situations (e.g. patients with hemochromatosis, thalassemia, PRCA, allergy to IV iron or an erythropoiesis stimulating agent (ESA), history of stroke, active malignancy, history of malignancy, etc.). The lowest ESA dosage to achieve acceptable Hgb range should be used. This algorithm is based on the assumption that the patient is compliant to medication and blood work. **Note: ESA refers to both epoetin alfa (Eprex®) and darbepoetin alfa (Aranesp®).**

Any change in Hgb greater than or equal to 15 g/L, OR if Hgb is less than 85 g/L OR if Hgb is greater than 139 g/L AND on ESA (or ESA on hold) → Notify nephrologist

Hgb less than 95 g/L

Receiving ESA?

NO

Check that the previous iron studies have been appropriately monitored and addressed prior to increasing the dose.

Consider starting ESA.
Suggested initial dose: epoetin 100 units/kg/wk or darbepoetin 0.45 mcg/kg/wk. Obtain an order from MD to start anemia protocol.

YES

- Check that the previous iron studies have been appropriately monitored and addressed prior to increasing the dose.
- **If TSAT less than 22%, consider iron load instead of increasing ESA dosage.**

- If no dose increase in the past 5 weeks, **increase ESA dose** as per ESA Dosage Adjustment Tables.
- If dose was increased in past 5 weeks, maintain that dose until next blood work.
- Continue to monitor Hgb at the regular blood work cycle.
- **Notify MD if Hgb is not in target range after 3 consecutive dose increases.** Refer to ESA Hyporesponsiveness Flowchart.

Hgb 95 to 115 g/L and stable

Receiving ESA?

NO

No ESA required. Continue to monitor Hgb at the regular blood work cycle.

YES

Maintain ESA dose and continue to monitor Hgb at the regular bloodwork cycle.

ESA on hold or discontinued because Hgb above target

- **Restart ESA at a reduced dose based on the dose before hold.** Refer to protocol ESA Dosage Adjustment Tables.
- Continue Hgb monitoring at regular blood work cycle.

Hgb greater than 115 g/L

Receiving ESA?

NO

No ESA required. Continue to monitor Hgb at the regular blood work cycle.

YES

Hgb 116 to 125 g/L

- If there has been no dosage reduction in the past 5 weeks, **reduce ESA dosage** as per protocol ESA Dosage Adjustment Tables.
- If there have been dosage reductions in the past 5 weeks, maintain current dose.
- Measure Hgb at the regular blood work cycle.

Hgb greater than 125 g/L

- **Hold ESA**
- Measure Hgb in 2 weeks and reassess Hgb status and ESA dosage.
- If Hgb is greater than 125 g/L after 12 weeks of hold, discontinue ESA - no ESA required.

ESA on hold or discontinued because Hgb above target

Hgb 116 to 125 g/L

If change is greater than 10 g/L from last hemoglobin, then **resume ESA at reduced dose.** Refer to protocol ESA Dosage Adjustment Tables.

Continue to monitor Hgb at the regular bloodwork cycle.

If change is less than or equal to 10 g/L from last hemoglobin, then **continue to hold ESA**.

AFTER Hgb STATUS ASSESSMENT ABOVE, ASSESS IRON STATUS. Refer to page 2 for ferrous fumarate or intravenous iron protocol.

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PAGE 2: ASSESS IRON STATUS (Standard Iron Parameters – TSAT & Ferritin)
If the patient has signs and symptoms of sepsis (e.g. temperature greater than 38', chills, rigors, unexplained hypotension), notify the nephrologist to assess ongoing iron use. If the serum ferritin is above 1000mcg/L, hold intravenous iron.

Notify nephrologist if ferritin less than 20 mcg/L

TSAT less than 22%
REPLETE IRON STORES

If patient is currently not receiving iron therapy:
- **Contact MD to start ferrous fumarate (e.g. 300 mg po HS)**
- If TSAT less than 10%, order ferrous fumarate 300 mg po HS x 1 week, then 600 mg po HS

If patient is currently receiving oral iron therapy:
- Assess iron compliance and proper administration (empty stomach)
- Increase ferrous fumarate by 300 mg/day as tolerated (max. 900 mg/day)

If patient's Hgb greater than 115 g/L, decrease ferrous fumarate dosage to 300 mg po daily.

If ferritin >1000 or Tsat ≥ 50% on 3 or more occasions over the past year, give half the iron loading dose if patient is on IV iron.

If ferritin between 800 -1000 mcg/L, give half IV iron load if patient is on IV iron.

Notify MD if iron parameters remain low after 3 consecutive blood work cycles.

If oral iron ineffective or patient is intolerant, consider giving IV iron.

If the patient is currently on IV iron, continue IV iron as per guidance in this protocol.

Measure TSAT and ferritin at next routine blood work cycle and reassess iron dosage regimen.

TSAT 22% to 49%
MAINTAIN IRON STORES

If receiving PO iron: Continue current maintenance dose

If PO iron is currently on hold due to iron overload: Consider restarting ferrous fumarate 300 mg po HS (this becomes new maintenance dose)

If PO iron not initiated: Consider starting ferrous fumarate 300 mg po HS (maintenance dose)

Measure TSAT and ferritin in 6-12 weeks as per local program policy and reassess iron dosage regimen.

<u>If patient is unable to tolerate or adhere to oral iron regimen:</u>
Schedule IV iron regularly as per nephrologist's prescription. Measure TSAT and ferritin every 12 weeks (at at least 1 week after last iron dose)

<u>Usual maximum single doses tolerated of common agents:</u>
- Iron isomaltoside (Monoferric) 500-1000mg IV q 3-6 months (infusion time varies) This is the equivalent of a loading dose.
- If patient is currently on Iron Sucrose, please switch to Iron Isomaltoside (Monoferric) 500 mg IV q 3 months.

TSAT greater than or equal to 50%
POSSIBLE IRON OVERLOAD

HOLD IRON

Measure TSAT and ferritin at next routine blood work cycle and reassess iron dosage regimen.

Note: Notify MD if iron indices remain high for 3 consecutive blood work cycles.

*** If iron blood work appears unusual compared to previous results (e.g. replacement of iron stores, TSAT goes from less than 25% to greater than 49%) repeat the blood work before initiating next action.

Home Hemodialysis Anemia Management Protocol: ESA Dosing Adjustment Table

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The following tables provide guidance for most dosage adjustments. If a patient's Hgb cannot be maintained within the desired range with 3 consecutive dose modifications using the dosage schedule below, contact a nephrologist or renal pharmacist for advice. If a patient's erythropoiesis stimulating agent (ESA) dosage is not available in the tables below, please contact a nephrologist for ESA dosage modification. The lowest ESA dosage to maintain Hgb within acceptable range should be used.

Darbepoetin Alfa (Aranesp®) Dosage Adjustment Table

Pre-filled syringes available include: 10 mcg, 20 mcg, 30 mcg, 40 mcg, 50 mcg, 60 mcg, 80 mcg, 100 mcg, 130 mcg and 150 mcg.

Current Dose	Increase Dose*	Decrease Dose*
10 mcg every 2 weeks	10 mcg every 1 week	D/C, check Hgb in 2 weeks
10 mcg every 1 week	20 mcg every 1 week	10 mcg every 2 weeks
20 mcg every 1 week	30 mcg every 1 week	10 mcg every 1 week
30 mcg every 1 week	40 mcg every 1 week	20 mcg every 1 week
40 mcg every 1 week	50 mcg every 1 week	30 mcg every 1 week
50 mcg every 1 week	60 mcg every 1 week	40 mcg every 1 week
60 mcg every 1 week	80 mcg every 1 week	50 mcg every 1 week
80 mcg every 1 week	100 mcg every 1 week	60 mcg every 1 week
100 mcg every 1 week	130 mcg every 1 week	80 mcg every 1 week
130 mcg every 1 week	150 mcg every 1 week	100 mcg every 1 week
150 mcg every 1 week	No further increase, check with nephrologist	130 mcg every 1 week

***For dosage increase or decrease, change interval to use up current syringes before starting new dosage. Refer to ESA Dosing Interval Adjustment Table.**

Epoetin Alfa (Eprex®) Dosage Adjustment Table

Pre-filled syringes available include: 1000 units, 2000 units, 3000 units, 4000 units, 5000 units, 6000 units, 8000 units and 10,000 units.

Current Dose	Increase Dose*	Decrease Dose*
1,000 units every 1 week	2,000 units every 1 week	D/C, check Hgb in 2 weeks
2,000 units every 1 week	3,000 units every 1 week	1,000 units every 1 week
3,000 units every 1 week	2,000 units 2 times per week	2,000 units every 1 week
2,000 units 2 times per week	3,000 units 2 times per week	3,000 units every 1 week
3,000 units 2 times per week	4,000 units 2 times per week	2,000 units 2 times per week
4,000 units 2 times per week	5,000 units 2 times per week	3,000 units 2 times per week
5,000 units 2 times per week	6,000 units 2 times per week	4,000 units 2 times per week
6,000 units 2 times per week	8,000 units 2 times per week	5,000 units 2 times per week
8,000 units 2 times per week	10,000 units 2 times per week	6,000 units 2 times per week
10,000 units 2 times per week	8,000 units 3 times per week	8,000 units 2 times per week
8,000 units 3 times per week	10,000 units 3 times per week	10,000 units 2 times per week
10,000 units 3 times per week	No further increase, check with nephrologist	8,000 units 3 times per week

***For dosage increase or decrease, change interval to use up current syringes before starting new dosage. Refer to ESA Dosing Interval Adjustment Table.**

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DARBEPOETIN ALFA (ARANESP®) DOSING INTERVAL ADJUSTMENT TABLE (to use up current supplies at home)

CURRENT DOSE	INCREASED DOSE CHANGE INTERVAL TO	DECREASED DOSE CHANGE INTERVAL TO
10 mcg every 1 week	Every 5 days	HOLD
20 mcg every 1 week		Every 10 days
30 mcg every 1 week		
40 mcg every 1 week		
50 mcg every 1 week		
60 mcg every 1 week		
80 mcg every 1 week		
100 mcg every 1 week		
130 mcg every 1 week		
150 mcg every 1 week	Check with MD	

EPOETIN ALFA (EPREX®) DOSING INTERVAL ADJUSTMENT TABLE (to use up current supplies at home)

CURRENT DOSE	INCREASED DOSE CHANGE INTERVAL TO	DECREASED DOSE CHANGE INTERVAL TO
1,000 units every 1 week	Every 5 days	HOLD
2,000 units every 1 week		Every 10 days
3,000 units every 1 week		
2,000 units twice per week	Every 3 days	Every 5 days
3,000 units twice per week		
4,000 units twice per week		
5,000 units twice per week		
6,000 units twice per week		
8,000 units twice per week		
10,000 units twice per week		
8,000 units three times per week	Every 2 days	Every 3 days
10,000 units three times per week	Check with MD	

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