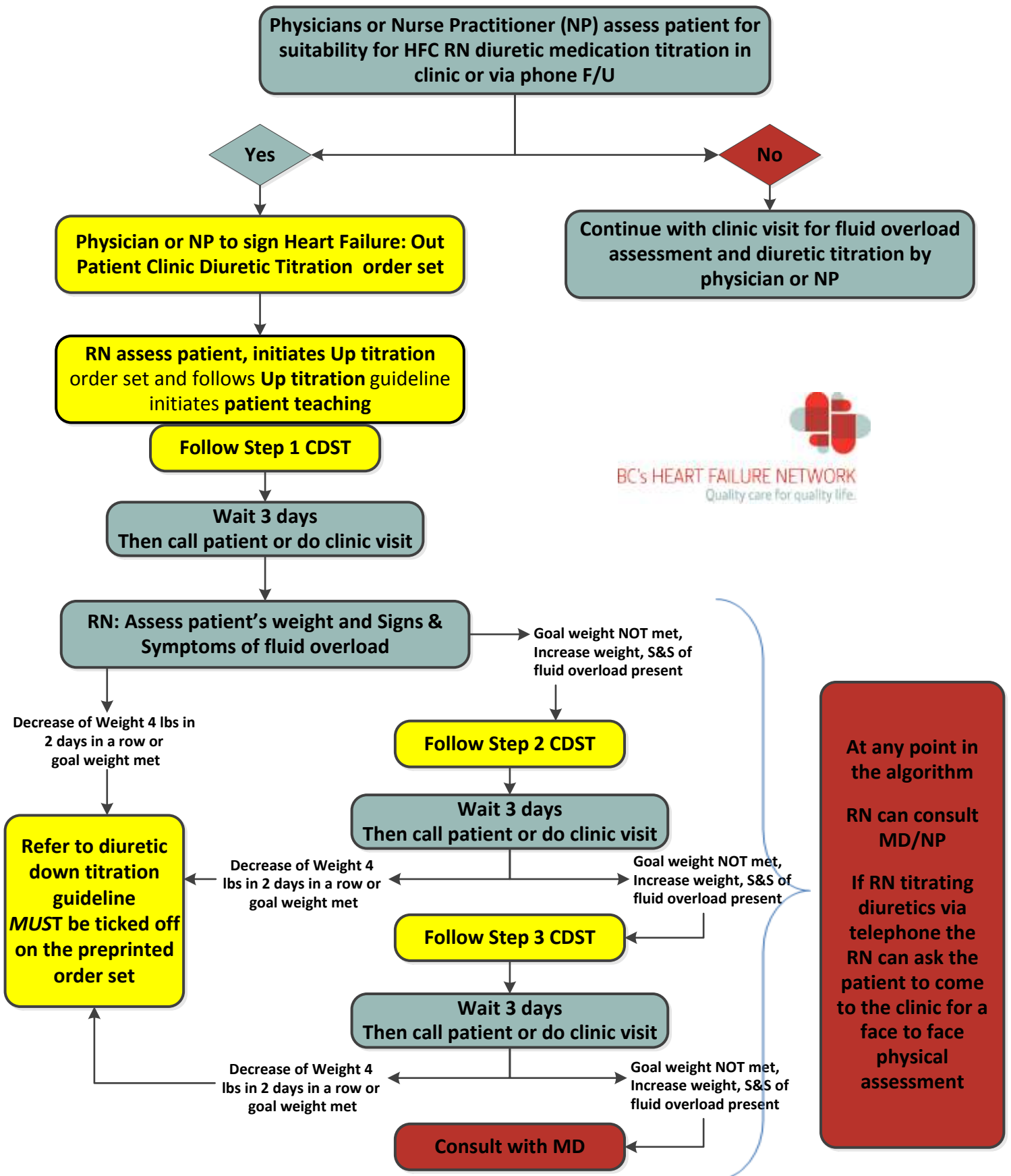


Heart Function Clinic (HFC) Registered Nurse (RN) Diuretic Titration Guideline





Health Authority Logo

Addressograph

Date: _____

Heart Failure: Out Patient Clinic Diuretic Titration Order Set

Allergies:

NYHA Functional class _____ LVEF _____ Date _____ **MRP:**

Page 1 of 2

New onset of Heart Failure Exacerbation of Chronic Heart Failure

- Best possible medication review or pharmanet search at each visit
- Target weight _____
- Weights at each HFC visit
- Instruct patient to weigh themself daily (*in morning with same amount of clothing on*)

Lab tests before start of diuretic if no values in the last 2 weeks

- Electrolytes
- eGFR
- Creatinine
- Urea
- Other _____

Lab test with any change in medication dosage

- Electrolytes 3-5 days after dose change
- Creatinine 3-5 days after dose change
- eGFR 3-5 days after dose change
- Urea 3-5 days after dose change
- BNP (MSP coverage 1 per yr)
- NT proBNP
- Other _____

Dietary

Physical Assessment: at each HFC visit and every 3 days in the HFC if medication titrated (*if titrating the diuretic over the phone the RN will ask the questions outlined in the diuretic up or down titration Clinical decision support too*)

Fluid restriction

- 1.5 - 2 liters (6-8 cups per day)
- Other _____

Diet

- Na _____ (*less than 2000mg restriction is recommended*)

Other _____

Vital signs

- Pulse (with lying and standing B/P)
- B/P
 - Lying
 - Standing
- Identify target Low B/P _____
- Identify target high B/P _____
- Respirations
- O2Sat

Assess: at each HFC visit and every 3 days if medication titrated (*if titrating the diuretic over the phone the RN will ask the questions outlined in the diuretic up or down titration Clinical decision support too*)

Lungs
Heart sounds
Peripheral edema

JVP
fluid intake, Na restriction

Initiation of Diuretic

- Initial adjustment of current furosemide dosage _____ mg PO X _____ (frequency/duration)
- New initiation of Furosemide _____mg PO X _____ (frequency/duration)
 - Hold if AM weight less than target weight of _____lbs _____kg
- Metolazone _____mg daily 30 min prior to AM dose of Furosemide
- Bumetanide _____mg PO x _____

Caution: (i) eGFR may over estimate renal function in low body weight individuals
(ii) eGFR does not reflect accurate renal function in individuals with fluctuating creatinine levels

If NYHA II-IV consider adding: (unless contraindicated)

- Eplerenone 25mg daily
Increase dose by: 25 mg every _____week(s) to max of 50 mg daily
- Eplerenone 50mg daily

If NYHA III-IV consider adding: (unless contraindicated)

- Spironolactone 12.5mg daily (eGFR 30–49mL/min)
- Spironolactone 25mg daily (eGFR greater than or equal to 50mL/min)

Caution: (i) eGFR may over estimate renal function in low body weight individuals
(ii) eGFR does not reflect accurate renal function in individuals with fluctuating creatinine levels

Up Titration of Furosemide

- HFC RN to Up titrate per the Furosemide Up - Titration Clinical Decision Support Tool

Down Titration of Furosemide

- HFC RN to Down titrate per the Furosemide Down–Titration Clinical Decision Support Tool

Instruction for Patient Education:

- “Limiting Fluid When You Have Heart Failure”
- “Limiting Sodium (Salt) When You Have Heart Failure”
- Heart Failure Zones
- Daily Weight Information
- Heart Failure 101
- Diuretic Medication Resource



Heart Function Clinic Patient Visit Assessment Form

Addressograph must go onto each page of this CDST

* not a key element

Health Authority Logo

Visit Date _____

HISTORY												
Since Last Visit		Yes	No	# Visits/days	Reason							
€ Dr/visit outside of clinic												
€ ER visits												
Device		CRT	ICD	Shocks	How may?	Pacemaker: Yes No						
Symptoms	Better	Same	Worse	Symptoms	Yes	No	Notes					
Fatigue				PND								
Dyspnea				Orthopnea								
Anxiety				Palpitations								
Depression												
Angina				Lightheadedness								
Swelling				GI Complaints								
Legs				Limits to ADL's								
Abdomen				Extra Diuretics								
# of pillows under the head	Normally		Currently	Medication list reviewed with _____								
Social	Notes:			* CPX: Date:	EF _____% Echo MIBI MUGA (circle)		Date:					
PHYSICAL EXAM												
Weight	Last Visit			Current			Target					
Vital Signs	B/P	Lying		Standing		HR	O2 Sat					
Heart Sounds (circle)	S1	S2	S3	S4	Murmurs Grade	Mitral S/D	Aortic S/D	Other				
Lungs: (circle)	Clear	Crackles <1/4		>1/2	JVP (cm)	HJR	Ascites					
Edema: (circle)	+1	+2	+3	+4	Fluid Volume	Euvolemic	Dry	Overloaded				
Activity	Type:		Time:		Program: Structured Unstructured None							
NYHA Class (circle)	I	II	III	IV	N/A	* CCS Angina class (circle)	0	I	II	III	IV	N/A
Clinical Status	Better		Same	Worse		Stable:	Yes		No			

EDUCATION		PLAN OF CARE		
Topic:	Yes	Nurse	MD/NP (Directives and/or plan of care)	
Disease				
Medications				
Fluid				
Salt				
Activity/Exercise				
Smoking				
ETHOL				
Travel				
Stress Management				
Vaccinations				
Advanced care planning				
INVESTIGATIONS				
B/W	Lytes	NT pro BNP	BNP	ECG
Other				

Referrals: _____

Follow Up: Weeks _____ Months _____ Other _____

Signatures: _____ MD NP RN

Print Name _____ MD NP RN

Oral Furosemide Titration Clinical Decision Support Tool

Decision making process to **UP- Titrate Furosemide**

STEP # 1

Assess changes in weight

Weight gain 4 lbs in two days in a row or 5 lbs in a week.

Instruct patient to call clinic if desired weight loss is achieved prior to having blood work done

Things to consider/ Questions to ask at clinic visit or phone F/U (S & S/ Dietary/medication/fluids)

Questions to ask at clinic visit or telephone F/U:

- Are you having more difficulty breathing since your last visit (or phone F/U)
- Do you have cough? Productive or non-productive? When is it worse? Is it a new cough?
- Do you find it harder to breathe when you are lying down?
- Have you changed where you sleep since your last visit eg. Moved from bed to chair?
- Have you increased the # of pillows you sleep with under your head?
- Do you ever wake up at night short of breath?
- Have you noticed increased swelling in your feet, ankles, legs, or stomach?
- Do you notice that your socks are tighter than normal and leaving a mark on your ankle? When you press on your ankle, top of your foot of shin does it leave a dent?
- Do you notice your pants are fitting tighter?
- Have you had to loosen your belt?
- Have you had any nausea or vomiting since the last visit?
- How is your appetite?
- How much have you been peeing? What is the color of your pee? Are there any changes in frequency, amount, or quality?
- Do you get up at night to pee?
- Do you have increased tiredness and have less energy than normal to do daily activities?
- Do you feel lightheaded or dizzy? Is this new for you? How long does it last? What makes it worse?
 - When does it usually happen?

Actions/Assessment

Assess fluid intake

- Aim for 1.5 -2 L or 6 -8 cups maximum per day
- Assess sodium intake (< 2000mg max per day)

Review and assess:

- Electrolytes, Urea, Creatinine and eGFR
- Check Electrolytes, Urea Creatinine and eGFR 3-5 days after dose changes (*per printed: Heart Failure: Out Patient Clinic Diuretic Titration Order Set*)
- Diagnostic tests such as echocardiogram, 24hr holter monitor, Magnetic Resonance Imaging (MRI)
- Dietary modifications (sodium, fluid restrictions)

Continue to have patient do daily weights , RN to follow up with phone call to assess weight 3 days after up titration

With Each telephone F/U

- What has your weight been for the last three days
- Ask all the same questions as above

At each HFC visit assess and check

Vital signs:

- Heart rate,
- Blood pressure (lying and standing),
- Respiratory rate,
- Oxygen saturation

Clinic weight

- Identify target weight (done by physician or NP)
- Reinforce measurement of daily weight

Auscultate

- Heart sounds (presence of S3)
- Lungs (assess for adventitious sounds)

Assess

Change in Symptoms

- Dyspnea (at rest or with exertion)
- Edema

Presence of

- Nocturia
- Orthopnea
- Paroxysmal Nocturnal dyspnea (PND)
- Fatigue
- Chest pain
- Lightheadedness or dizziness
- Jugular venous pressure (JVP) assessment
- Peripheral edema (feet, ankles, legs, sacrum)
- Heart sounds (presence of S3)
- Chest auscultation (assess for crackles)
- Abdominal distension or bloating
- Exercise tolerance (has it decreased)
- Inability to lie flat
- Use of extra pillows at night
- Waking at night with episodes of dyspnea, often relieved by sitting up
- Adherence to fluid restriction (should be restricted to 1.5 – 2 L or 6 -8 cups per day)
- Adherence to sodium restriction (< 2000mg per day)
- Weight gain of 4 lbs (2 kg) two days in a row or 5 lbs (2.5 kg) in one week

Review

- current medications (including prescription, herbal and over the counter NSAIDS, potassium supplements)
- Blood tests as per preprinted orders (Urea, Creatinine, Electrolytes, eGFR, BNP or NT-proBNP)
- Diagnostic tests such as echocardiogram, 24hr holter monitor, Magnetic Resonance Imaging (MRI)
- Dietary modifications (sodium, fluid restrictions)

Dose/Drug Changes

Double the patient's current dose for 3 consecutive days or until patient achieves euvolemia **Or**

Start furosemide does as per preprinted Heart Failure: Out Patient Clinic Diuretic Titration Order Set

Doses > 80 mg should be split into twice daily dosing (eg. 40 mg at 0800 and 40 mg at 1400 OR 0800 and 1200)

UNLESS otherwise indicated by MD/NP

Continue to have patient do daily weights , RN to follow up with phone call to assess weight 3 days after up titration

Consult MRP/NP

If patient has met their goal weight

- If Furosemide dose > 120 mg BID

Telephone visit

- if signs and symptoms have worsened
 - increased, edema (ankles/abdomen) , SOB, fatigue, increased usage of pillows to sleep, new or worsening cough, light-headedness, dizziness, weight gain, or no weight loss,

If clinic visit

- if signs and symptoms have worsened
 - increased, edema (ankles/abdomen) , SOB, fatigue, light-headedness, dizziness, JVP increased usage of pillows to sleep, new or worsening cough, weight gain, or no weight loss, new extra heart sound (S3, or S4),
- If patient on ACE-I/ or ARB (Creatinine increasing and eGFR decreasing: as the MRP may need to decreased dosage).

If nurse concerned about patient at any time during the assessment the nurse can change a telephone visit to a clinic visit or emergency room visit

Reassess in 3 days and if fluid/volume overload persists despite optimal medical and nursing interventions proceed to Step 2

Oral Furosemide Titration Clinical Decision Support Tool

Decision making process to **UP- Titrate Furosemide**

STEP # 2

Assess changes in weight/signs and symptoms

After 3 days: reassess fluid status and symptoms

If patient weight is within 5 lbs of target, may continue with up titration or consult MD/NP for further direction

If patient at target weight refer to decision making process table for furosemide down titration or consult MD/NP if no down titration ordered **MUST** call MD

Things to consider/ Questions to ask at clinic visit or phone F/U (S & S/ Dietary/medication/fluids)

- Assess fluid intake
- Aim for 1.5 - 2L or 6 -8 cups maximum per day
- Assess sodium intake (< 2000mg max per day)

Questions to ask at clinic visit or telephone F/U:

- Are you having more difficulty breathing since your last visit (or phone F/U)
- Do you have cough? Productive or nonproductive? When is it worse? Is it a new cough?
- Do you find it harder to breathe when you are lying down?
- Have you changed where you sleep since your last visit eg. Moved from bed to chair?
- Have you increased the # of pillows you sleep with under your head?
- Do you ever wake up at night short of breath?
- Have you noticed increased swelling in your feet, ankles, legs, or stomach?
- Do you notice that your socks are tighter than normal and leaving a mark on your ankle? When you press on your ankle, top of your foot of shin does it leave a dent?
- Do you notice your pants are fitting tighter?
- Have you had to loosen your belt?
- Have you had any nausea or vomiting since the last visit?
- How is your appetite?
- How much have you been peeing? What is the color of your pee? Are there any changes in frequency, amount, or quality?
- Do you get up at night to pee?
- Do you have increased tiredness and have less energy than normal to do daily activities?
- Do you feel lightheaded or dizzy? Is this new for you? How long does it last? What makes it worse?
 - When does it usually happen?

If fluid/volume overload persists despite optimal medical and nursing interventions in step 2, proceed to Step 3

Actions/Assessment

Assess previous lab work (Electrolytes, Urea Creatinine, eGFR (*per pre-printed Heart Failure: Out Patient Clinic Diuretic Titration Order Set*))

If up titrating:

Re check: Electrolytes, Urea, Creatinine and eGFR 3-5 days after dose changes (*per printed Heart Failure: Out Patient Clinic Diuretic Titration Order Set*)

Continue to have patient do daily weights

RN to follow up with phone call to assess weight 3 days after up titration

Instruct patient to call clinic if target weight is achieved

With Each telephone F/U and clinic visit

- Assess patient's weight for the last three days
- Ask the patient what has your weight been for the last three days

At each HFC visit assess and check

Vital signs:

- Heart rate,
- Blood pressure (lying and standing),
- Respiratory rate,
- Oxygen saturation

Clinic weight

- Identify target weight (done by physician or NP)
- Reinforce measurement of daily weight

Auscultate

- Heart sounds (presence of S3)
- Lungs (assess for adventitious sounds)

Assess

Change in Symptoms

- Dyspnea (at rest or with exertion)
- Edema

Presence of

- Nocturia
- Orthopnea
- Paroxysmal Nocturnal dyspnea (PND)
- Fatigue
- Chest pain
- Lightheadedness or dizziness
- Jugular venous pressure (JVP) assessment
- Peripheral edema (feet, ankles, legs, sacrum)
- Heart sounds (presence of S3)
- Chest auscultation (assess for crackles)
- Abdominal distension or bloating
- Exercise tolerance (has it decreased)
- Inability to lie flat
- Use of extra pillows at night
- Waking at night with episodes of dyspnea, often relieved by sitting up
- Adherence to fluid restriction (should be restricted to 1.5 L or 6 cups per day)
- Adherence to sodium restriction (< 2000mg per day)
- Weight gain of 4 lbs (2 kg) two days in a row or 5 lbs (2.5 kg) in one week

Review

- current medications (including prescription, herbal and over the counter)
- Blood tests as per pre-printed orders (Urea, Creatinine. Electrolytes, eGFR, BNP or NT-proBNP)
- Diagnostic tests such as echocardiogram, 24hr holter monitor, Magnetic Resonance Imaging (MRI)
- Dietary modifications (sodium, fluid restrictions)

Instruct patient to call if goal weight met

Dose/Drug Changes

- Increase furosemide dose by 100% (consider renal function*)
- consult MD/NP if dose > 120 mg BID

Consult MRP/NP

If patient has met their goal weight

Medications:

- If Furosemide dose > 120 mg BID

Telephone visit:

- if signs and symptoms have worsened
 - increased, edema (ankles/abdomen) , SOB, fatigue, increased usage of pillows to sleep, new or worsening cough, light-headedness, dizziness, weight gain, or no weight loss,

If clinic visit:

- if signs and symptoms have worsened
 - increased, edema (ankles/abdomen) , SOB, fatigue, light-headedness, dizziness, JVP increased usage of pillows to sleep, new or worsening cough, weight gain, or no weight loss, new extra heart sound (S3, or S4),

Lab results:

- If patient on ACE-I/ or ARB (Creatinine increasing and eGFR decreasing: as the MRP may need to decreased dosage).
- If K+ < 3.5 or > 5.5mmol/L
- If eGFR _____ each HFC cut points may vary so check with nephrology re is it 30 or 50 or 60
- If Na ,<130 mmol/L or >150 mmol/L
- If Creatinine increases > 30% from baseline refer to NP or MD for further guidance

If nurse concerned about patient at any time during the assessment the nurse can change a telephone visit to a clinic visit or emergency room visit

Reassess in 3 days and if fluid/volume overload persists despite optimal medical and nursing interventions proceed to Step 3

*Renal guidelines:

- Stage 1 &2 consider referral to nephrologist if urine protein is increasing and eGFR declining > 10% annually or K+ > 6.0 eGFR for this stage is > or equals to 60,
- Stage 3 consider eGFR 30-59 consider referral to nephrologist if urine protein increasing or eGFR > 10% per yr
- Stage 4 eGFR 15-29 refer to nephrologist

Oral Furosemide Titration Clinical Decision Support Tool

Decision making process to **UP- Titrate Furosemide**

STEP # 3

Assess changes in weight/signs and symptoms

After 3 days:

- reassess weight, fluid status and symptoms
- Aim for 1.5 -2 L or 6 -8 cups max per day maximum
- Assess sodium intake (< 2000mg max per day)

If patient at goal weight refer to decision making process table for furosemide down titration or consult MD/NP if no down titration order

Things to consider/ Questions to ask at clinic visit or phone F/U (S & S/ Dietary/medication/fluids)

- Assess fluid intake
- Aim for 1.5 L or 6 cups maximum per day
- Assess sodium intake (< 2000mg max per day)

Questions to ask at clinic visit or telephone F/U:

- Are you having more difficulty breathing since your last visit (or phone F/U)
- Do you have cough? Productive or nonproductive? When is it worse? Is it a new cough?
- Do you find it harder to breathe when you are lying down?
- Have you changed where you sleep since your last visit eg. Moved from bed to chair?
- Have you increased the # of pillows you sleep with under your head?
- Do you ever wake up at night short of breath?
- Have you noticed increased swelling in your feet, ankles, legs, or stomach?
- Do you notice that your socks are tighter than normal and leaving a mark on your ankle? When you press on your ankle, top of your foot of shin does it leave a dent?
- Do you notice your pants are fitting tighter?
- Have you had to loosen your belt?
- Have you had any nausea or vomiting since the last visit?
- How is your appetite?
- How much have you been peeing? What is the color of your pee? Are there any changes in frequency, amount, or quality?
- Do you get up at night to pee?
- Do you have increased tiredness and have less energy than normal to do daily activities?
- Do you feel lightheaded or dizzy? Is this new for you? How long does it last? What makes it worse?
 - When does it usually happen?

Actions/Assessment

Recheck results of lab tests

If up titrating: Re check: Electrolytes, Urea, Creatinine , and eGFR 3-5 days after dose changes (*per pre-printed Heart Failure: Out Patient Clinic Diuretic Titration Order Set*)

If up to high doses of Furosemide +/- Metolazone, some sites may labs sooner than 4-7 days

At each HFC visit assess and check

Vital signs

- Heart rate,
- Blood pressure (lying and standing),
- Respiratory rate,
- Oxygen saturation

Clinic weight

- Identify target weight (done by physician or NP)
- Reinforce measurement of daily weight

Auscultate

- Heart sounds (presence of S3)
- Lungs (assess for adventitious sounds)

Assess

Change in Symptoms

- Dyspnea (at rest or with exertion)
- Edema

Presence of

- Nocturia
- Orthopnea
- Paroxysmal Nocturnal dyspnea (PND)
- Fatigue
- Chest pain
- Lightheadedness or dizziness
- Jugular venous pressure (JVP) assessment
- Peripheral edema (feet, ankles, legs, sacrum)
- Heart sounds (presence of S3)
- Chest auscultation (assess for crackles)
- Abdominal distension or bloating
- Exercise tolerance (has it decreased)
- Inability to lie flat
- Use of extra pillows at night
- Waking at night with episodes of dyspnea, often relieved by sitting up
- Adherence to fluid restriction (should be restricted to 1.5-2 L or 6 -8 cups per day)
- Adherence to sodium restriction (< 2000mg per day)
- Weight gain of 4 lbs (2 kg) two days in a row or 5 lbs (2.5 kg) in one week

Review

- current medications (including prescription, herbal and over the counter)
- Blood tests as per preprinted orders (Urea, Creatinine, Electrolytes, eGFR, BNP or NT-proBNP)
- Diagnostic tests such as echocardiogram, 24hr holter monitor, Magnetic Resonance Imaging (MRI)
- Dietary modifications (sodium, fluid restrictions)

Instruct patient to call if desired weight loss is achieved prior to having blood work done

Dose/Drug Changes

If fluid/volume overload persists despite optimal medication therapy Consultation with NP or MRP to consider:

Addition of metolazone 2.5- 5 mg 30 min prior to morning furosemide dose.

Start with 3 days or 3 x/week dosing

OR

If used at your site consider changing to Bumetanide as oral absorption may be improved.

Any addition or changes in medication that are outside of the preprinted order set MUST be written as an order by MRP/ NP or a verbal telephone order

For phone F/U patients who continue to be fluid/volume overloaded, consider clinic visit for nursing and MD assessment

Consult MD/NP

If fluid/volume overload persists despite optimal medical and nursing interventions consult NP or MRP is essential

Medications:

- If Furosemide dose > 120 mg BID

Telephone visit:

- if signs and symptoms have worsened
 - increased, edema (ankles/abdomen) , SOB, fatigue, increased usage of pillows to sleep, new or worsening cough, light-headedness, dizziness, weight gain, or no weight loss,

Clinic visit:

- if signs and symptoms have worsened
 - increased, edema (ankles/abdomen) , SOB, fatigue, light-headedness, dizziness, JVP increased usage of pillows to sleep, new or worsening cough, weight gain, or no weight loss, new extra heart sound (S3, or S4),

Lab results:

- If patient on ACE-I/ or ARB (Creatinine increasing and eGFR decreasing: as the MRP may need to decreased dosage).
- If K+ < 3.5 or > 5.5mmol/L
- If eGFR _____ each HFC cut points may vary so check with nephrology re is it 30 or 50 or 60
- If Na ,<130 mmol/L or >150 mmol/L
- If Creatinine increases > 30% from baseline refer to NP or MD for further guidance

Renal guidelines:

- Stage 1 &2 consider referral to nephrologist if urine protein is increasing and eGFR declining > 10% annually or K+ > 6.0 eGFR for this stage is > or equals to 60,
- Stage 3 consider eGFR 30-59 consider referral to nephrologist if urine protein increasing or eGFR > 10% per yr
- Stage 4 eGFR 15-29 refer to nephrologist

Registered Nurse Diuretic Down Titration Guideline

If patient reaches goal weight or kidney function worsening or showing signs and symptoms of volume depletion

Follow Step # 1 Down Titration

Wait 3 days
Then call patient or do clinic visit

If patient reaches goal weight or kidney function worsening or showing signs and symptoms of volume depletion

Follow Step # 2 Down Titration

Wait 3 days
Then call patient or do clinic visit

If patient reaches goal weight or kidney function worsening or showing signs and symptoms of volume depletion

Follow Step 3 CDST

Call the physician or nurse practitioner at any point in the steps if the:

- Patients weight increases by 4 lbs from one step to the next
- Patient showing signs of fluid overload
- Patient showing signs and symptom of fluid depletion



Oral Furosemide Titration Clinical Decision Support Tool

DECISION MAKING PROCESS TO : **Down-Titrate Furosemide**

STEP # 1

Volume Stable – (Euvolemic)

Assessment (physical/S&S)/ Question to ask at clinic visit or phone F/U

Identify target weight (done by physician or NP)

Reinforce daily weight

Goal weight met? Or weight decreasing?

- Yes
- No

Resolution of HF signs and symptoms

- Dyspnea (at rest or with exertion) Orthopnea
- Lightheadedness or dizziness
- Chest pain
- Fatigue
- Peripheral edema (feet, ankles, legs, sacrum)
- Abdominal distension or bloating

Jugular venous pressure (JVP) assessment

At each HFC visit assess and check

Vital signs

- Heart rate,
- Blood pressure (lying and standing),
- Respiratory rate,
- Oxygen saturation
- Clinic weight

Auscultate

- Heart sounds (presence of S3)
- Lungs (assess for adventitious sounds)

Assess

Change in Symptoms

- Dyspnea (at rest or with exertion)
- Edema

Presence of

- Nocturia
- Orthopnea
- Paroxysmal Nocturnal dyspnea (PND)
- Fatigue
- Chest pain
- Lightheadedness or dizziness
- Jugular venous pressure (JVP) assessment
- Peripheral edema (feet, ankles, legs, sacrum)
- Heart sounds (presence of S3)
- Chest auscultation (assess for crackles)
- Abdominal distension or bloating
- Exercise tolerance (has it decreased)
- Inability to lie flat
- Use of extra pillows at night
- Waking at night with episodes of dyspnea, often relieved by sitting up
- Adherence to fluid restriction (should be restricted to 1.5 -2 L or 6 -8 cups per day)
- Adherence to sodium restriction (< 2000mg per day)
- Weight gain of 4 lbs (2 kg) two days in a row or 5 lbs (2.5 kg) in one week

Review

- current medications (including prescription, herbal and over the counter)
- Blood tests as per preprinted orders (Urea, Creatinine. Electrolytes, eGFR, BNP or NT-proBNP)
- Diagnostic tests such as echocardiogram, 24hr holter monitor, Magnetic Resonance Imaging (MRI)
- Dietary modifications (sodium, fluid restrictions)

Assess for S & S of volume depletion (dehydration)

- Lightheadedness/dizziness
- Dry lips or mouth
- Increased thirst
- Tired
- Decreased urine output
- Eyes stop making tears
- Decrease in sweating
- Confusion
- Hypotension
- Tachycardia
- Constipation
- Orthostatic hypotension
- Gout or pseudo gout symptoms
- Leg cramps (electrolyte imbalances)

Things to consider and more questions to ask

Check: Electrolytes, Urea, Creatinine and eGFR 3-5 days after dose changes (*per pre-printed Heart Failure: Out Patient Clinic Diuretic Titration Order Set*)

Continue to have patient do daily weights, RN to follow up with phone call to assess weight 3 days after down titration

With Each telephone F/U

- What has your weight been for the last three days
- Aim for 1.5 -2 L or 6 -8 cups max per day
- Assess sodium intake (< 2000mg max per day)

Questions to ask at clinic visit or telephone F/U:

- Are you having more difficulty breathing since your last visit (or phone F/U)
- Do you have cough? Productive or nonproductive? When is it worse? Is it a new cough?
- Do you find it harder to breathe when you are lying down?
- Have you changed where you sleep since your last visit eg. Moved from bed to chair?
- Have you increased the # of pillows you sleep with under your head?
- Do you ever wake up at night short of breath?
- Have you noticed increased swelling in your feet, ankles, legs, or stomach?
- Do you notice that your socks are tighter than normal and leaving a mark on your ankle? When you press on your ankle, top of your foot of shin does it leave a dent?
- Do you notice your pants are fitting tighter?
- Have you had to loosen your belt?
- Have you had any nausea or vomiting since the last visit?
- How is your appetite?
- How much have you been peeing? What is the color of your pee? Are there any changes in frequency, amount, or quality?
- Do you get up at night to pee?
- Do you have increased tiredness and have less energy than normal to do daily activities?
- Do you feel lightheaded or dizzy? Is this new for you? How long does it last? What makes it worse?
 - When does it usually happen?

Dose or Drug changes

- If target weight met and/or signs and symptoms of volume depletion :
- Decrease Furosemide by 50%

Consult MD/NP

If target weight met

Fluid Depletion

Telephone visit

Increased

- Lightheadedness/dizziness
- Fatigue
- Confusion
- Gout or pseudo gout symptoms
- Leg cramps (electrolyte imbalances)

Clinic Visit

Increased

- Lightheadedness/dizziness
- Fatigue
- Confusion
- Gout or pseudo gout symptoms
- Leg cramps (electrolyte imbalances)
- symptomatic hypotension
- Tachycardia
- postural orthostatic hypotension

BE AWARE that fluid/volume overload may reoccur with down titration

Telephone visit:

- if signs and symptoms have worsened
 - increased, edema (ankles/abdomen) , SOB, fatigue, increased usage of pillows to sleep, new or worsening cough, light-headedness, dizziness, weight gain, or no weight loss,

Clinic visit:

- if signs and symptoms have worsened
 - increased, edema (ankles/abdomen) , SOB, fatigue, light-headedness, dizziness, JVP increased usage of pillows to sleep, new or worsening cough, weight gain, or no weight loss, new extra heart sound (S3, or S4),

Lab results:

- If patient on ACE-I/ or ARB (Creatinine increasing and eGFR decreasing: as the MRP may need to decreased dosage).
- If Creatinine increases > 30% from baseline refer to NP or MD for further guidance
 - If Serum Potassium <3.5 mmol/L
 - If Serum Potassium > 5.5mmol/L
 - If Na ,<130 mmol/L or >150mmol/L
 - If worsening renal function despite reduction in maintenance furosemide dose
 - If Serum creatinine increases > 30% from baseline refer to NP or MD for further guidance
 - If eGFR _____ each HFC cut points may vary so check with nephrology re is it 30 or 50 or 60

Renal guidelines:

- Stage 1 & 2 consider referral to nephrologist if urine protein is increasing and eGFR declining > 10% annually or K+ > 6.0 eGFR for this stage is > or equals to 60,
- Stage 3 consider eGFR 30-59 consider referral to nephrologist if urine protein increasing or eGFR > 10% per yr
- Stage 4 eGFR 15-29 refer to nephrologist

Oral Furosemide Titration Clinical Decision Support Tool

DECISION MAKING PROCESS TO : **Down-Titrate Furosemide**

STEP # 2

Volume Depletion (Dry)

Assessment (physical/S&S)/ Question to ask at clinic visit or home F/U

Target weight or below target weight met?

- Yes No

Resolution of HF signs and symptoms continues

- Improvement of dyspnea (at rest or with exertion)
- Decreased Orthopnea
- Decreased episodes of lightheadedness or dizziness
- Decreased frequency and exacerbations of Chest pain
- Decreased Fatigue
- Reduced or absence of peripheral edema (feet, ankles, legs, sacrum)
- Reduced or absence of abdominal distension or bloating
- Decrease or no Jugular venous pressure (JVP)

Assess lab results:

- Serum Creatinine levels increase by >30% from baseline
- Serum potassium > 5.5mmol/L (some sites use 5.3 so this will change in their guideline)
- eGFR has it increased or decreased from last time

At each HFC visit assess and check

Vital signs

- Heart rate,
- Blood pressure (lying and standing),
- Respiratory rate,
- Oxygen saturation

Auscultate

- Heart sounds (presence of S3)
- Lungs (assess for adventitious sounds)

Assess

Change in Symptoms

- Dyspnea (at rest or with exertion)
- Edema

Presence of

- Nocturia
- Orthopnea
- Paroxysmal Nocturnal dyspnea (PND)
- Fatigue
- Chest pain
- Lightheadedness or dizziness
- Jugular venous pressure (JVP) assessment
- Peripheral edema (feet, ankles, legs, sacrum)
- Heart sounds (presence of S3)
- Chest auscultation (assess for crackles)
- Abdominal distension or bloating
- Exercise tolerance (has it decreased)
- Inability to lie flat
- Use of extra pillows at night
- Waking at night with episodes of dyspnea, often relieved by sitting up
- Adherence to fluid restriction (should be restricted to 1.5 -2 L or 6 -8 cups per day)
- Adherence to sodium restriction (< 2000mg per day)
- Weight gain of 4 lbs (2 kg) two days in a row or 5 lbs (2.5 kg) in one week

Review

- current medications (including prescription, herbal and over the counter)
- Blood tests as per preprinted orders (Urea, Creatinine. Electrolytes, eGFR, BNP or NT-proBNP)
- Diagnostic tests such as echocardiogram, 24hr holter monitor, Magnetic Resonance Imaging (MRI)
- Dietary modifications (sodium, fluid restrictions)

Assess for S & S of volume depletion (dehydration)

- Lightheadedness/dizziness
- Dry lips or mouth
- Increased thirst
- Tired
- Decreased urine output
- Eyes stop making tears
- Decrease in sweating
- Confusion
- Hypotension
- Tachycardia
- Constipation
- Orthostatic hypotension
- Gout or pseudo gout symptoms
- Leg cramps (electrolyte imbalances)

Things to consider and more questions to ask

Check: Electrolytes, Urea, Creatinine, and eGFR 3-5 days after dose changes (*per pre-printed Heart Failure: Out Patient Clinic Diuretic Titration Order Set*)

Continue to have patient do daily weights , RN to follow up with phone call to assess weight 3 days after down titration

With Each telephone F/U

- What is your weight been for the last three days

Questions to ask at clinic visit or phone F/U:

- Are you having more difficulty breathing since your last visit (or phone F/U)
- Do you have cough? Productive or nonproductive? When is it worse? Is it a new cough?
- Do you find it harder to breathe when you are lying down?
- Have you changed where you sleep since your last visit eg. Moved from bed to chair?
- Have you increased the # of pillows you sleep with under your head?
- Do you ever wake up at night short of breath?
- Have you noticed increased swelling in your feet, ankles, legs, or stomach?
- Do you notice that your socks are tighter than normal and leaving a mark on your ankle? When you press on your ankle, top of your foot of shin does it leave a dent?
- Do you notice your pants are fitting tighter?
- Have you had to loosen your belt?
- Have you had any nausea or vomiting since the last visit?
- How is your appetite?
- How much have you been peeing? What is the color of your pee? Are there any changes in frequency, amount, or quality?
- Do you get up at night to pee?
- Do you have increased tiredness and have less energy than normal to do daily activities?
- Do you feel lightheaded or dizzy? Is this new for you? How long does it last? What makes it worse?
 - When does it usually happen?

Dose or Drug changes

Consider holding next dose of Furosemide then reduce by 50%

(*per: pre-printed Heart Failure: Out Patient Clinic Diuretic Titration Order Set*)

NOTE: some patients may never be able to be weaned from their diuretic , if you find the patient goes back into failure when on the down titration guideline, you should consult the NP/MD as the down titration order may have to be discontinued

Consult MD/NP

If target weight met

Fluid Depletion

Telephone visit

Increased

- Lightheadedness/dizziness
- Fatigue
- Confusion
- Gout or pseudo gout symptoms
- Leg cramps (electrolyte imbalances)

Clinic Visit

Increased

- Lightheadedness/dizziness
- Fatigue
- Confusion
- Gout or pseudo gout symptoms
- Leg cramps (electrolyte imbalances)
- symptomatic hypotension
- Tachycardia
- postural orthostatic hypotension

BE AWARE that fluid/volume overload may reoccur with down titration

Telephone visit:

- if signs and symptoms have worsened
 - increased, edema (ankles/abdomen) , SOB, fatigue, increased usage of pillows to sleep, new or worsening cough, light-headedness, dizziness, weight gain, or no weight loss,

Clinic visit:

- if signs and symptoms have worsened
 - increased, edema (ankles/abdomen) , SOB, fatigue, light-headedness, dizziness, JVP increased usage of pillows to sleep, new or worsening cough, weight gain, or no weight loss, new extra heart sound (S3, or S4),

Lab results:

- If patient on ACE-I/ or ARB (Creatinine increasing and eGFR decreasing: as the MRP may need to decreased dosage).
- If Creatinine increases > 30% from baseline refer to NP or MD for further guidance
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 - If worsening renal function despite reduction in maintenance furosemide dose
 - If Serum creatinine increases > 30% from baseline refer to NP or MD for further guidance
 - If eGFR _____ each HFC cut points may vary so check with nephrology re is it 30 or 50 or 60

Renal guidelines:

- Stage 1 &2 consider referral to nephrologist if urine protein is increasing and eGFR declining > 10% annually or K+ > 6.0 eGFR for this stage is > or equals to 60,
- Stage 3 consider eGFR 30-59 consider referral to nephrologist if urine protein increasing or eGFR > 10% per yr
- Stage 4 eGFR 15-29 refer to nephrologist

Oral Furosemide Titration Clinical Decision Support Tool

DECISION MAKING PROCESS TO : **Down-Titrate Furosemide**

STEP # 3

Worsening Renal Function

Assessment (physical/S&S)/ Question to ask at clinic visit or home F/U

Assess lab results:

- Serum Creatinine levels increase by >30% from baseline
- Serum potassium >5.5mmol/L (some sites use 5.3 so this will change in their guideline)
- eGFR has it increased or decreased from last time

With Each telephone F/U

- What is your weight been for the last three days
- Identify target weight (done by physician or NP)
- Reinforce daily weight

At each HFC visit assess and check

Vital signs

- Heart rate,
- Blood pressure (lying and standing),
- Respiratory rate,
- Oxygen saturation

Auscultate

- Heart sounds (presence of S3)
- Lungs (assess for adventitious sounds)

Assess

Change in Symptoms

- Dyspnea (at rest or with exertion)
- Edema

Presence of

- Nocturia
- Orthopnea
- Paroxysmal Nocturnal dyspnea (PND)
- Fatigue
- Chest pain
- Lightheadedness or dizziness
- Jugular venous pressure (JVP) assessment
- Peripheral edema (feet, ankles, legs, sacrum)
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- Abdominal distension or bloating
- Exercise tolerance (has it decreased)
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- Waking at night with episodes of dyspnea, often relieved by sitting up
- Adherence to fluid restriction (should be restricted to 1.5 -2 L or 6 -8 cups per day)
- Adherence to sodium restriction (< 2000mg per day)
- Weight gain of 4 lbs (2 kg) two days in a row or 5 lbs (2.5 kg) in one week

Review

- current medications (including prescription, herbal and over the counter)
 - Blood tests as per preprinted orders (Urea, Creatinine. Electrolytes, eGFR, BNP or NT-proBNP)
 - Diagnostic tests such as echocardiogram, 24hr holter monitor, Magnetic Resonance Imaging (MRI)
 - Dietary modifications (sodium, fluid restrictions)
- Assess for S & S of volume depletion (dehydration)

- Light headedness/dizziness
- Dry lips or mouth
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- Tired
- Decreased urine output
- Eyes stop making tears
- Decrease in sweating
- Confusion
- Hypotension
- Tachycardia
- Constipation
- Orthostatic hypotension
- Gout or pseudo gout symptoms
- Leg cramps (electrolyte imbalances)

Things to consider and more questions to ask

Check: Electrolytes, Urea , Creatinine and eGFR 3-5 days after dose changes (*per printed Heart Failure: Out Patient Clinic Diuretic Titration Order Set*)

Reinforce the importance of daily weights ,

RN to follow up with phone call to reassess weight 3 days after down titration

With Each telephone F/U

- What is your weight been for the last three days

Questions to ask at clinic visit or telephone F/U:

- Are you having more difficulty breathing since your last visit (or phone F/U)
- Do you have cough? Productive or nonproductive? When is it worse? Is it a new cough?
- Do you find it harder to breathe when you are lying down?
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- Do you feel lightheaded or dizzy? Is this new for you? How long does it last? What makes it worse?
 - When does it usually happen?

Continue to have patient do daily weights

RN to follow up with phone call to assess weight 3 days after down titration

Dose or Drug changes

- If furosemide not on hold then **Decrease** Furosemide by 50%
- May need to decrease or stop *spironolactone* [RN: **MUST** consult with MD/NP to obtain order]
- May need to stop ACE/ARB and change to hydralazine plus a nitrate [RN: **MUST** consult with MD/NP to obtain order]
- Discussion with MD/NP the possibility of referring to Nephrologists

Consult MD/NP

If target weight met

Fluid Depletion

Telephone visit

Increased

- Lightheadedness/dizziness
- Fatigue
- Confusion
- Gout or pseudo gout symptoms
- Leg cramps (electrolyte imbalances)

Clinic Visit

Increased

- Lightheadedness/dizziness
- Fatigue
- Confusion
- Gout or pseudo gout symptoms
- Leg cramps (electrolyte imbalances)
- Symptomatic hypotension
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