

Calcineurin Inhibitor and Sirolimus Titration in the Post Heart Transplant Clinic

Site Applicability

SPH Post Heart Transplant Clinic

Practice Level

Specialized: RN titration of calcineurin inhibitors (CNI) and/or sirolimus may only be performed by RNs who have been orientated to, and are working in, the Heart Transplant Clinic.

Need to Know

The RN needs to know that the patient must be clinically stable before commencing titration schedule using this document. If the RN does not feel confident in his/her practice, they may consult with the pharmacist or the MD. Any concerns around a change in the patient's clinical status such as a new infection, recent rejection or new onset renal dysfunction should be discussed with the MD and a revised plan implemented.

Protocol

Assessment:

Patients suitable for titration:

- Deemed suitable for RN titration by MD
- HEART TRANSPLANT IMMUNOSUPPRESSION TITRATION Prescriber Order completed (PH761)
- Stable rejection profile
 - Last cardiac biopsy "1R" or less
- Adherent to therapy

Prior to titration of CNI and/or sirolimus

Before titrating CNI and/or sirolimus, the RN should review:

- Timing of blood draw to confirm accuracy of level
 - Is blood level a true trough/peak (depending on drug)?
- Has the patient missed any doses?
- Has the patient taken the correct dose?
- Time stage post-transplant

This material has been prepared solely for use at Providence Health Care (PHC), Provincial Health Services Authority (PHSA) and Vancouver Coastal Health (VCH). PHC, PHSA and VCH accept no responsibility for use of this material by any person or organization not associated with PHC, PHSA and VCH. A printed copy of this document may not reflect the current electronic version.

- Current medications (including newly introduced or withdrawn – available on PROMIS)
- Overall clinical state
- Prescriber Orders, noting optimum target levels completed by MD

RN will consult the MD or pharmacist should there be any questions about blood levels or dose changes.

Interventions

- Once deemed suitable and the PPO is completed, the RN can titrate medication with guidance from the titration tables in this document.

CYCLOSPORINE

Time Post Transplant (Months)	Cyclosporine Trough Concentration (ng/mL)	Cyclosporine C ₂ Concentration (ng/mL)
	Tandem Mass Spectrometry Assay	Tandem Mass Spectrometry Assay
ADULT Heart Transplant *** (Nov 2014)		
When eGFR is greater than 45 mL/min/1.73 m²		
Less than 1 month	Not used	1200 to 1400
2 to 3 months	Not used	1000 to 1200
4 to 5 months	Not used	800 to 1100
6 to 12 months	Not used	700 to 1000
12 to 24 months	Not used	600 to 800
Greater than 24 months	Not used	400 to 600
When eGFR is less than 45 mL/min/1.73 m²		
Less than 1 month	Not used	1000 to 1200
2 to 3 months	Not used	800 to 1100
4 to 5 months	Not used	700 to 900
6 to 12 months	Not used	600 to 800
12 to 24 months	Not used	400 to 600
Greater than 24 months	Not used	300 to 400
Patients Transplanted Greater Than 15 Years Ago		
0 to 3 months	300 to 350	Not used
3 to 6 months	200 to 300	Not used
6 to 12 months	150 to 250	Not used
Greater than 12 months	100 to 150	Not used

Taken from BC Transplant Medication Guidelines

http://www.transplant.bc.ca/Documents/Health%20Professionals/Clinical%20guidelines/Clinical%20Guidelines%20for%20Transplant%20Medications_2018.pdf

This material has been prepared solely for use at Providence Health Care (PHC), Provincial Health Services Authority (PHSA) and Vancouver Coastal Health (VCH). PHC, PHSA and VCH accept no responsibility for use of this material by any person or organization not associated with PHC, PHSA and VCH. A printed copy of this document may not reflect the current electronic version.

Cyclosporine Titration Table

	Level within 15% of target	Level over or under 15% of target	Lower limit (RN to contact MD for advice)	Upper limit (RN to contact MD for advice)
Cyclosporine	No change	Adjust by 25 mg/dose to 50 mg per day	See PPO	See PPO
FOLLOW-UP BLOODWORK	Resume routine bloodwork protocol	<ul style="list-style-type: none"> 0 to 3 months post-transplant: 1 week post-change More than 3 months post transplant: UNDER target, repeat in 1 week OVER target, repeat within 1 month 		

TACROLIMUS

Time Post-Transplant (Months)	Tacrolimus Trough Blood Concentration (ng/mL) 12 hours Post-Dose Tandem Mass Spectrometry Assay
ADULT Heart Transplant Recipients (Nov 2014)	
Less than 3	9 to 12
3 to 6	8 to 9
6 to 12	6 to 8
Greater than 12	4 to 8

Tacrolimus Titration Table

	Level within 15% of target	Level over or under 15% of target	Level less than 3	Level greater than 15
Tacrolimus	Repeat if indicated	Adjust by 0.5 mg per dose (BID) or 1 mg per day	Contact MD	Hold dose x1 and contact MD
FOLLOW-UP BLOODWORK		<ul style="list-style-type: none"> 0 to 3 months post-transplant: 1 week post-change More than 3 months post-transplant: UNDER target, repeat in 1 week OVER target, repeat within 1 month 		

SIROLIMUS

Time Post Transplant (Months)	Sirolimus Trough Concentration (ng/mL)* (When sirolimus is used with tacrolimus or cyclosporine +/- mycophenolic acid and steroids)	Sirolimus Trough Concentration (ng/mL)* (When sirolimus is used as a single agent +/- steroids)
ADULT Heart Transplant Recipients (Nov 2014)		
All	4 to 8	8 to 12

*Tandem Mass Spectrometry Assay

Sirolimus Titration Table

	Level within 15% of target	Level over or under 15% of target	Lower limit	Upper limit (RN to contact MD for advice)
Sirolimus	Repeat if indicated	Adjust by 1 mg per dose. May require alternate day dose changes as drug is once a day only.	Contact MD if on sirolimus WITH calcineurin inhibitor (CNI) and level is: Less than 3 If on sirolimus alone: Less than 6	More than 15 hold dose and contact MD
FOLLOW-UP BLOODWORK	Routine bloodwork	<ul style="list-style-type: none"> 0 to 3 months post-transplant: 1 week post-change More than 3 months post-transplant: UNDER target, repeat in 1 week OVER target, repeat within 1 month 		

Documentation

The RN will document titrations in the Heart Transplant Immunosuppression Titration Summary (Form NF493)

Documents involved:

- Prescriber order (form 761)
- Patient Biography (form HH151)
- Immunosuppression Titration summary (form HH181)

This material has been prepared solely for use at Providence Health Care (PHC), Provincial Health Services Authority (PHSA) and Vancouver Coastal Health (VCH). PHC, PHSA and VCH accept no responsibility for use of this material by any person or organization not associated with PHC, PHSA and VCH. A printed copy of this document may not reflect the current electronic version.

Patient and Family Education

- Transplant book
- BCT website
(http://www.transplant.bc.ca/Documents/Health%20Professionals/Clinical%20guidelines/Clinical%20Guidelines%20for%20Transplant%20Medications_2018.pdf)

References

BC Transplant. (2018) Clinical guidelines for transplant medications. Provincial Health Services Authority. Accessed at: www.transplant.bc.ca

Effective Date:	26-JUN-2018		
Posted Date:	DD-MMM-YYYY		
Last Revised:	DD-MMM-YYYY		
Last Reviewed:	DD-MMM-YYYY		
Approved By: (committee or position)	PHC	PHSA	VCH
	Professional Practice Standards Committee		
Owners: (optional)	PHC	PHSA	VCH
	Cardiac		

This material has been prepared solely for use at Providence Health Care (PHC), Provincial Health Services Authority (PHSA) and Vancouver Coastal Health (VCH). PHC, PHSA and VCH accept no responsibility for use of this material by any person or organization not associated with PHC, PHSA and VCH. A printed copy of this document may not reflect the current electronic version.