Initiation and Titration of IV Treprostinil Using CRONO-5 Pump

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Purpose: Initiating and titrating IV treprostinil on the CRONO-5 pump versus the CADD-Legacy pump may provide advantages. This case is an example of successful initiation and up-titration of IV treprostinil using the CRONO-5 pump.

Background: Treprostinil is approved for subcutaneous or intravenous use for WHO Group I PAH. The half-life of treprostinil allows infusion via miniature pumps at low flow rates. Appropriate candidates for miniature pumps include patients with adequate support systems, manual dexterity, a desire for a smaller pump and the ability to understand more complex programming. Historically, patients are transitioned from the CADD-Legacy to the CRONO-5 pump once they achieve a stable treprostinil dose. PH healthcare providers cite larger dose increments, complex programming at the onset of therapy and more frequent concentration changes as compared to the CADD-Legacy as obstacles to initiating therapy with the CRONO-5 pump.

Methodology: A 48 year old female LVN with systemic sclerosis associated PAH presented in March 2010. Diagnostic RHC in April 2010 demonstrated RAP 13, PAP 101/48/67, PCWP 8, Fick Cl 1.99 L/min/m², PVR 15.3 WU. The patient was initially treated with tadalafil 40 mg daily with significant clinical improvement. She was enrolled in the ATHENA trial for additional PAH therapy and at the end of the trial, inhaled treprostinil was added to her regimen. In January 2012, the decision was made to transition to parenteral therapy using IV treprostinil. She requested the CRONO-5 pump due to her work situation and fibromyalgia which limited her ability to carry a heavier pump.

IV treprostinil was initiated via PICC at 2 ng/kg/min and increased by 1 ng/kg/min (5mcl/hr) every two days to 30 ng/kg/min over two months. The CRONO-5 pump infusion rate ranged from 200-370 ml/hr. A total of six concentration changes occurred, three from 2-9 ng/kg/min and three from 10-30 ng/kg/min. In Feb. 2013 she reported improved stamina and activity level with each dose increase.

Findings: Repeat RHC in July 2012 demonstrated improved hemodynamics. On May 15, 2013, the IV treprostinil dose was 73 ng/kg/min with an improved 6 MWT of 420 m. This patient reported no difficulty up-titrating treprostinil in 1 ng/kg/min increments. There were no symptoms associated with sudden prostanoid increase or decrease due to changes in treprostinil concentration. Prostanoid side effects (headache and diarrhea) were managed with pain medication and loperamide. She reported satisfaction with the size and ease of carrying the pump and reported no difficulty with programming.

Implications: Patients who are candidates for the CRONO-5 pump can be initiated and up-titrated to effective doses of IV treprostinil. Dose charts should be designed with manageable dosing increments. IV access with a PICC line with a low prime volume may be preferable at the onset of therapy when concentration changes are more frequent.