

# Coronary bypass surgery in a patient with hemophilia A: the critical role of the hemophilia nurse clinician

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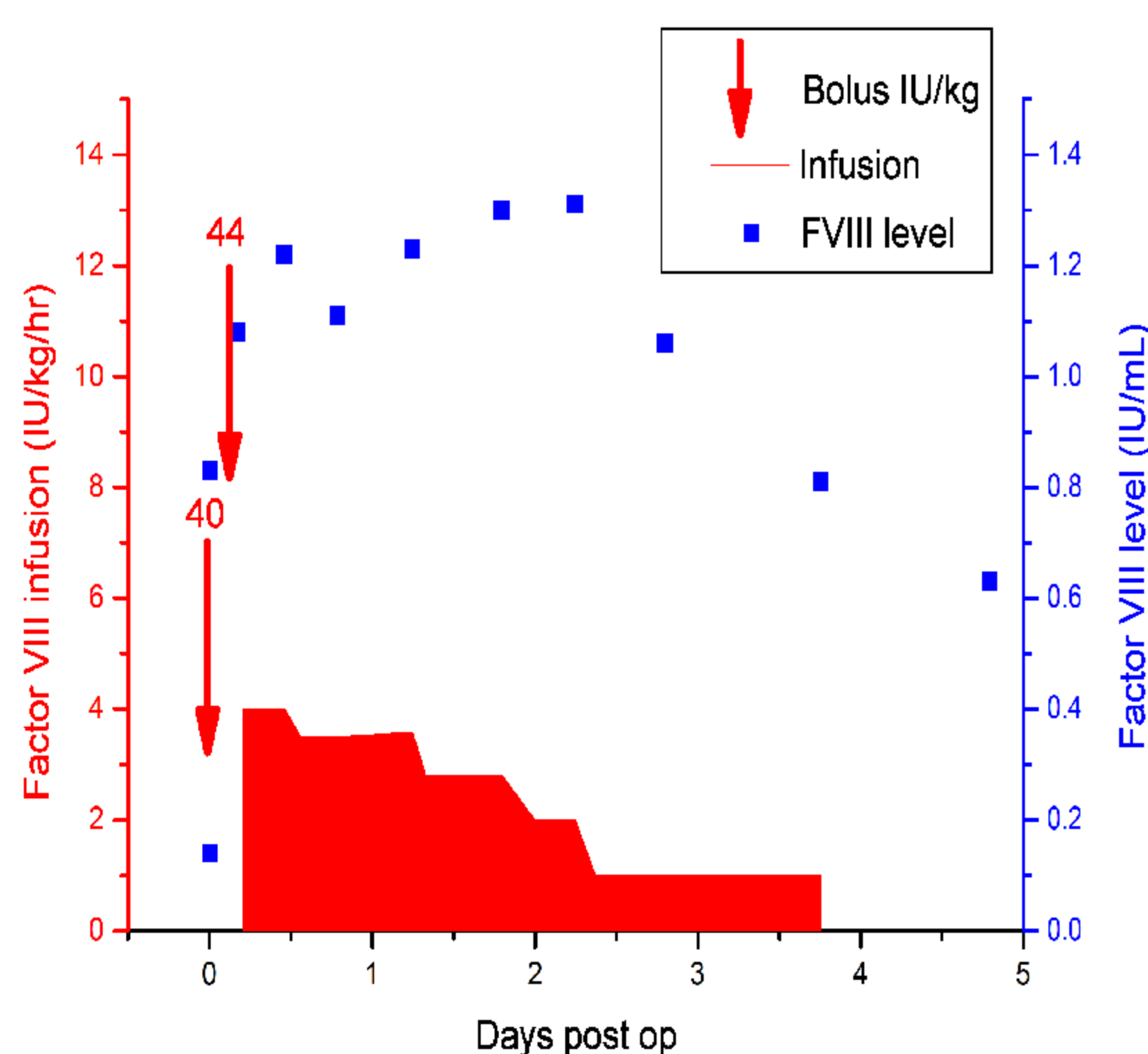
## Introduction

- Age-related conditions such as cardiovascular disease have become increasingly more common among persons with hemophilia (1).
- We report on a 71 year old male with mild hemophilia A (baseline FVIII approximately 14%) who underwent coronary artery bypass surgery at the St. Boniface Hospital in Winnipeg, Canada. The hospital is specialized in cardiac surgery but unfamiliar with the surgical management of hemophilia.
- We administered recombinant FVIII by continuous infusion. Continuous infusion eliminates extreme peaks and troughs in the plasma FVIII levels observed with intermittent bolus infusion while reducing overall factor usage. Continuous infusion may improve patient outcomes and is considered by many to be optimal treatment for patients with hemophilia A undergoing major surgery (2, 3).
- To safely carry out the surgery, strategic planning including identification of needs and potential obstacles was undertaken.

## Obstacles and Solutions

- ❖ Education and resources to support pharmacy and cardiac surgical nursing staff in the reconstitution and infusion of FVIII products.  
*The hemophilia nurse clinician was on site the day of the surgery to:*
  - Oversee the continuous infusion
  - Train the pharmacists in reconstitution of the product under laminar flow conditions
  - Assist the coronary care nurses in the set up of the continuous infusion using a mini-pumpAll changes in dosage and infusion rate were made under the direction of the hematologist and the hemophilia nurse clinician.
- ❖ Operationalizing of frequent measurement of factor FVIII levels and transport of samples from the cardiac care unit to the hemophilia treatment centre.  
*Samples were transported between the facilities via taxicab. Arrangements were made for samples collected at night to be spun and frozen at St. Boniface Hospital and transported the following day for processing.*
- ❖ Transcription of orders between the hematologist and intensivist.  
*By convenient coincidence, the intensivist in the cardiac surgical unit was also certified in hematology. This helped bridge communication between the hemophilia treatment team and eliminated the need for co-signatures on orders.*
- ❖ Management of factor inventory to avoid excess and deficient stock.  
*At the time of surgery there was no process in place to reissue stock between facilities or patients. Careful stewardship was needed to avoid waste. Daily communication between the hemophilia nurse clinician and St. Boniface Hospital blood bank ensured that FVIII product was ordered as needed and appropriate vial sizes supplied to accommodate syringes for continuous infusion and bolus infusions.*

## FVIII administration and levels during continuous infusion



The patient received a bolus of 40 IU/kg FVIII 1 hour preoperatively. FVIII level 1 hour post bolus was 0.83 IU/mL. Cardiopulmonary bypass was performed conventionally with heparin anticoagulation and reversal by protamine at the completion of bypass. One unit of packed red blood cells was administered intraoperatively. A repeat bolus of 44 IU/kg FVIII was given after discontinuation of cardiopulmonary bypass. A continuous infusion of FVIII was started at 4 IU/kg/hour as soon as the patient was admitted to the cardiac surgical intensive care unit. Our goal was to maintain the FVIII level at 1.0 IU/mL. The continuous infusion was discontinued on postop day 5, after removal of the indwelling vascular catheters, pacemaker wires, and chest tubes. Twice-daily bolus dosing was used for the next 6 days. Total factor consumption was 49,337 IU (685.2 IU/kg) of which 17,438 IU (35%) was delivered by continuous infusion. Antifibrinolytic therapy (tranexamic acid) was used in conjunction with FVIII. Hemostasis was satisfactory at all time points. Chest tube drainage was within acceptable range (10-80mL/hr) during the first 24 hours. The patient experienced a drop in hemoglobin to 69g/L on postop day 5 and was transfused with one unit of packed red blood cells. Discharge from hospital occurred on postop day 13 on aspirin and daily FVIII replacement factor. Inhibitor screen has remained negative.

## Conclusions

This case illustrates the successful perioperative management of a patient undergoing coronary artery bypass surgery at an off-site facility and the critical role of the hemophilia nurse clinician. Our experience highlights the need for: A) a checklist of resource requirements to facilitate the preoperative planning process; and B) a process to reissue unused stock of recombinant FVIII between facilities. We also recognize that educational resources for other care providers involved sporadically in the care of hemophilia patients would be valuable. An example is the education module developed by the University of North Carolina Hospital (4).

## References

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