

Review of Medication and Expressed Breast Milk Incidents at the Alberta Children's Hospital, Calgary, Alberta

Executive Summary

Three medication incidents and one expressed breast milk incident occurred on the same nursing unit at the Alberta Children's Hospital in Calgary, Alberta over the course of two months. Three of the incidents occurred within three weeks of one another. On February 6, 2009 a two year old child received five oral medications intravenously that were intended for administration through a gastrostomy tube for an enteral feed. The patient required transfer to the pediatric intensive care unit for treatment. On February 7, 2009 a four year old patient was given approximately a 15 fold overdose of a narcotic analgesic (fentanyl) as an intravenous (IV) bolus dose. The overdose was not recognized until the following day and no active interventions were made based on vital signs. The third incident occurred February 24, 2009 and involved a six year old child who received a 5 fold overdose of immunosuppressive oral therapy (azathioprine). Three doses were administered before the overdose was recognized. Lab results showed evidence of bone marrow suppression. A fourth incident occurred March 31, 2009 whereby a nine day old infant received the incorrect expressed breast milk. No immediate adverse effects were identified.

In accordance with section 14 of the Health Quality Council of Alberta Regulation 130/2006 under the *Regional Health Authorities Act*, the Alberta Health Services requested the Health Quality Council of Alberta (HQCA) to study, assess and inquire into* (*hereafter known as "review") the above incidents that occurred in the Alberta Children's Hospital (ACH) for the purpose of improving patient safety and health care quality. The HQCA was charged with identifying the causes and contributing factors of the medication and expressed breast milk incidents at the ACH. Comparison to best practices in medication safety and expressed breast milk processes and review of other Alberta Health Services (AHS) paediatric tertiary care centres with regard to medication and expressed breast milk safety fell within the scope of this review. Key findings and systemic applications will be considered by the AHS for sharing with relevant health care organizations provincially and nationally to improve the safety of medication and expressed breast milk practices and for reducing the likelihood of recurrence of similar events.

A review team was struck by the HQCA, under the direction of Executive Sponsor, Dr. John Cowell, MD, FRCPC, Chief Executive Officer, HQCA, and led by Linda Poloway, BScPharm, FCSHP, Patient Safety Lead, HQCA. The balance of the Review Team consisted of three individuals with expertise in the areas of patient safety and quality; David Matheson, M.Math, MD, FRCPC, Associate Professor Emeritus Department of Pediatrics, University of British Columbia, Principal DMMD Consultants Inc, Maria Golberg RN MN ACNP ET, Nurse Practitioner, Stollery Children's Hospital and Consuelo Ong, RN, BN, Clinical Nurse Educator, Alberta Children's Hospital were selected. Assisting in the review of human factors impacting medication safety and expressed breast milk processes were Munira Jessa, MAsc, PEng, Human Factors Engineer, Patient Safety Specialist and Susan Chisholm, M.Sc., Human Factors Consultant, both of Alberta Health Services – Calgary.

Information gathering, fact finding and validation as well as discovery of causes and contributing factors were conducted under the auspices of the Quality Assurance Committee of the HQCA and were protected under Section 9 of the *Alberta Evidence Act*. While the object of the review was primarily the ACH, the Review Team examined processes, reviewed documentation and conducted interviews at the Stollery Children's Hospital (Stollery), located in the Walter MacKenzie Centre, Edmonton, Alberta. Within the AHS – Edmonton, neonatal care is provided on two sites, the Walter MacKenzie Centre and the Royal Alexandra Hospital. Thus, expressed breast milk practices and processes at the Neonatal Intensive Care Unit located at the Royal Alexandra Hospital were additionally examined by the human factors consultants.

The incidents were reviewed with full transparency provided by the administration, staff and physicians of the Alberta Children's Hospital, Calgary, the Stollery Children's Hospital, Edmonton and the Royal Alexandra Hospital, Edmonton; candid and open dialogue on medication and expressed breast milk practices as well as other patient

safety topics relevant to the incidents allowed the Review Team to examine all causal issues and provide a comprehensive report.

In the case of the patient who received oral medications intravenously which were intended for delivery through a gastrostomy tube, the primary cause lay in use of a parenteral system (pump, tubing, and syringe) commonly used to deliver intravenous (IV) therapy that was also used to deliver enteral therapy. This was compounded with the failure to trace the lines back to the source to determine if IV or enteral delivery was intended plus absence of labels on lines to identify contents and route. Of significance a similar incident occurred about 3 years prior and recommendations to mitigate the recurrence of such an event were not fully implemented. Three other contributing factors were identified.

The fentanyl overdose incident revealed ineffective communication between the physician prescriber and the nurse regarding a verbal order for analgesia. The lack of an independent double check for the dose and use of an adult parenteral drug monograph led to incorrect confirmation of the dose, which was approximately 15 times that of a usual dose for a patient of similar age and weight. Identification of three other contributing factors was made.

The absence of a medication reconciliation process was the primary cause of the azathioprine overdose. The addition of a potential unrecognized language barrier and failure to perform a safe dose per weight check by medicine, nursing and pharmacy enabled a 5 fold overdose of the drug to be given. Four other contributing factors were identified.

The administration of the wrong expressed breast milk had occurred several times previously at the ACH. In 2006 a full review was undertaken and 11 recommendations made. Incomplete implementation of those recommendations and less than optimal learning from this experience was the primary cause of the expressed breast milk mix up in March, 2009. The lack of a heightened awareness by nursing and the parents of the potential risks of viral pathogen transmission through expressed breast milk contributed significantly to the incident.

The report has implications for improved patient safety across several health care sectors and it is anticipated that broad sharing of the learnings of this review will occur.