Hyperglycemic hyperosmolar state

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REPORTING INFORMATION
(To be completed by the CPSP)

Report number:	
Month of reporting:	
Province:	
Today's date:	

Please complete the following sections for the case identified above. If the information asked for below is not readily available, please leave it blank. Strict confidentiality of information will be assured.

CASE DEFINITION FOR HYPERGLYCEMIC HYPEROSMOLAR STATE

Report any patient less than 18 years of age (up to the 18th birthday), with or without a prior diagnosis of diabetes, presenting to hospital with hyperglycemic hyperosmolar state (HHS), defined as:

- Serum glucose concentration of >33 mmol/L
- Serum osmolality of >320 mOsm/kg (calculated or measured)
- Absence of significant acidosis:
  - Serum bicarbonate concentration of >15 mEq/L
  - Arterial/capillary pH of >7.30 or venous pH of >7.25

This case definition is aligned with the current Diabetes Canada *diagnostic criteria for HSS with one important amendment: ketosis is* ***NOT*** *an exclusion factor. The rationale for including ketosis is that the original HHS definition was based on adult presentation, and it is well demonstrated that more than 40% of children and adolescents with type 2 diabetes present with ketones (even if not acidotic).*

Month first seen:_____

SECTION 1 – PATIENT DEMOGRAPHIC INFORMATION

1.1 Month and year of birth: _____ /_____
MM YYYY

1.2 Sex assigned at birth: ❍ Male ❍ Female ❍ Intersex ❍ Unknown

1.3 Province/territory of residence: _____ 1.4 First 3 digits of current residence postal code: __ __ __

1.5 Physician-reported population groups (select all that apply):

❑ Arab	❑ Black	❑ Chinese	❑ Filipino
❑ Japanese	❑ Korean	❑ Latin American	❑ White
❑ First Nations	❑ Inuit	❑ Métis	❑ Unknown
❑ Southeast Asian (e.g., Vietnamese, Cambodian, Laotian)	❑ South Asian (e.g., East Indian, Pakistani, Sri Lankan)	❑ West Asian (e.g., Iranian, Afghan)	❑ Other, specify: _____

SECTION 2 – MEDICAL HISTORY OF PATIENT

2.1 Diabetes type: ❍ Type 1 (T1D) ❍ Type 2 (T2D) ❍ Maturity-onset diabetes of the young (MODY)
❍ Medication induced; specify:_____ ❍ Cystic fibrosis-related ❍ Type not yet determined
❍ Other; specify:_____

2.2 New diabetes diagnosis at time of presentation with HHS? ❍ Yes ❍ No ❍ Unknown
If No, patient's age at diabetes diagnosis: ____ years ***OR*** date of diagnosis: ____ /_____ ❍ Unknown
MM YYYY
If Yes, has patient had prior screening for T1D or T2D? ❍ Yes; approximate date:____/____ ❍ No ❍ Unknown
MM YYYY

2.3 Comorbidities at time of presentation with HHS (select all that apply):
❑ Obesity (i.e., BMI-z score >95th percentile for age and sex)
❑ Hypertension (systolic blood pressure or diastolic blood pressure >95th percentile for age and height)
❑ Dyslipidemia (total cholesterol >5.2 mmol/L; LDL-C >3.4 mmol/L; HDL-C <1 mmol/L; non-HDL >3.8 mmol/L; triglycerides >1.5 mmol/L)
❑ Other, specify: _____
❑ None
❑ Unknown

2.4 Insulin prescribed prior to presentation to the reporting physician: ❍ Yes, specify type: _____ ❍ No
If Yes, specify regimen: ❍ Pump ❍ Single daily injection ❍ Twice daily (BID) injection
❍ Three times daily (TID) injection ❍ Multiple daily injections ❍ None

2.5 Other diabetes medications on presentation to reporting physician: ❍ Yes, specify: _____ ❍ No

2.6 Non-diabetic medications on presentation to reporting physician: ❍ Yes, specify: _____ ❍ No

2.7 Family history of diabetes: ❍ Yes ❍ No ❍ Unknown
If Yes, specify type and affected relative(s) (e.g., grandfather, mother): _____

2.8 Does the patient have access to clean, reliable drinking water? ❍ Yes ❍ No ❍ Unknown

SECTION 3 – CASE PRESENTATION

3.1 Precipitating factors (select all that apply):
❑ Non-adherence with medication, specify medication: _____
❑ Infection, specify: _____
❑ Ischaemic event, specify: _____
❑ Trauma, specify: _____
❑ Insulin administration issue (e.g., pump site failure), specify: _____
❑ Dehydration, specify: _____
❑ Recreational drug use, specify: _____
❑ Other, specify: _____
❑ Unprovoked
❑ Unknown

3.2 Most current height: ____ cm (date: _____ /_____) and most current weight: ____ kg (date: _____ /_____)
MM YYYY MM YYYY

3.3 Vital signs at presentation to your medical centre:
Blood pressure: _____/_____mmHg Heart rate: _____ bpm Respiratory rate: _____
Temperature: _____°C Glasgow Coma Scale (GCS): ___/15

3.4 Signs and symptoms at presentation to your medical centre (select all that apply):

❑ Acanthosis nigricans	❑ Polydipsia	❑ Polyuria	❑ Weight loss
❑ Nausea/vomiting	❑ Malaise/weakness	❑ Circulatory shock	❑ Dry mouth/tongue
❑ Visual acuity changes	❑ Headache	❑ Altered level of consciousness	
❑ Seizure	❑ None	❑ Other, specify:_____	

3.5 Investigations at presentation to your medical centre (as available):

Parameter	Value					Units
pH	❍ Arterial: _____		❍ Venous: _____		❍ Capillary: _____	
Serum glucose						mmol/L
Serum ketones						mmol/L
Capillary ketones						mmol/L
Serum lactate						mmol/L
Serum β-hydroxybutyrate						mmol/L
Serum urea						mmol/L
Serum osmolality						mOsm/kg
Serum bicarbonate						mEq/L
Serum sodium (measured)						mEq/L
Serum potassium						mEq/L
Serum phosphate						mEq/L
Serum magnesium						mEq/L
Serum calcium						mEq/L
Serum creatinine						µmol/L
White blood cells	White blood count: _____			Neutrophils: _____		$\times 10^9$ cells/L
Creatinine kinase						U/L
Urine ketones						mmol/L
Urine dipstick ketones	❍ Trace	❍ Mild	❍ Moderate	❍ Large	❍ Very Large	

SECTION 4 – HOSPITAL COURSE

4.1 Date of presentation with HHS to first point of care: _____ /_____ /_____
DD MM YYYY

4.2 Presentation acuity and interval to therapy:

4.2.1 Days of illness prior to presentation at first point of care: _____ days

4.2.2 First point of care: ❍ Nurse practitioner-run primary care centre ❍ Family medicine primary care centre ❍ Paediatric primary care centre ❍ Community hospital ❍ Tertiary care centre

4.2.3 Approximate distance/time travelled to first point of care:_____ km / ____ hours ❍ Unknown

4.2.4 Approximate distance/time travelled from first point of care to tertiary hospital: _____ km / _____ hours ❍ Unknown

4.2.5 Time from first presentation to commencement of therapy (e.g., IV fluid initiation): ____ hours, ____ minutes ❍ Unknown

4.2.6 Mode of transfer to tertiary hospital: ❍ Land ambulance ❍ Air ambulance ❍ Not applicable

4.2.7 Highest level of care: ❍ Emergency department ❍ Community hospital paediatric ward ❍ Endocrine ward ❍ Tertiary hospital paediatric ward ❍ Paediatric intensive care unit ❍ Other, specify:_____

4.3 Hospital length of stay: _____ days

4.4 Interventions (select all that apply):

❑ IV fluid initial bolus; specify volume: ____mL/kg
Type: ❍ 0.9 sodium chloride (NaCl) ❍ 0.45 NaCl ❍ Ringer's lactate ❍ Colloid ❍ Other, specify:_____

❑ IV fluid in first 24 hours; specify total volume: ____L
Type: ❍ 0.9 NaCl ❍ 0.45 NaCl ❍ Ringer's lactate ❍ Colloid ❍ Other, specify:_____

❑ IV insulin; specify rate: _____U/kg/hour

❑ IV bicarbonate

❑ IV potassium

❑ Thromboprophylaxis

❑ None

4.5 Complications (select all that apply):

❑ Hyperkalemia; specify maximum value: _____ mEq/L

❑ Hypokalemia; specify minimum value: _____ mEq/L

❑ Cerebral edema; confirmed via:
❍ Computerized tomography ❍ Magnetic resonance imaging ❍ Clinical diagnosis; specify GCS: _____

❑ Rhabdomyolysis; maximum creatinine kinase: _____U/L

❑ Malignant hyperthermia-like syndrome; maximum temperature: _____°C

❑ Hypoglycemia; minimum serum glucose: _____mmol/L

❑ Thrombo-ischaemic event(s); specify: _____

❑ Impaired renal function; maximum serum creatinine: _____ µmol/L

❑ Death

❑ Other, specify: _____

❑ None

4.6 Insulin at discharge: ❍ Pump ❍ Daily injection ❍ BID injection; specify insulin type: _____
❍ TID injection; specify insulin type: _____ ❍ Premixed insulin ❍ None

4.7 Other diabetes medications at discharge: ❍ Yes, specify: _____ ❍ None

SECTION 5 – ADDITIONAL INFORMATION

5.1 Are you willing to be contacted by the Canadian Paediatric Surveillance Program (CPSP) for further information on this questionnaire? ❍ Yes ❍ No

SECTION 6 – REPORTING PHYSICIAN

6.1 Which of the following best describes your practice?

❍ General paediatrician; specify: ❑ Primary care practice ❑ Community hospital ❑ Tertiary care hospital

❍ Paediatric emergency physician

❍ Paediatric endocrinologist

❍ Paediatric intensivist

❍ Other, specify: _____

First name_____ Surname_____

Address_____

City_____ Province_____ Postal code_____

Telephone number_____ Fax number_____

E-mail_____ Date completed_____

Thank you for completing this form

(HHS 06/2023)