Medications

Amlodipine 10mg, oral, daily
- antihypertensives, calcium channel blockers
- The patient is taking amlodipine to manage hypertension.
- The patient's blood pressure and pulse must be checked prior to administration and throughout therapy (Vallerand et al., 2017)

Lisinopril 5mg, oral, daily
- antihypertensive, ACE inhibitors
- The patient is taking lisinopril in conjunction with amlodipine to manage hypertension.
- Monitor the patient's blood pressure, pulse, electrolyte levels, creatinine and BUN during therapy (Vallerand et al., 2017)

Lantus insulin glargine 18 units at bedtime
- antidiabetic, hormones, pancreatics
- Insulin is a long-acting insulin meant to regulate the patient's blood sugar throughout the night.
- Assess the patient's blood sugar and signs of hypoglycemia such as anxiety, chills, restlessness and lightheadedness (Vallerand et al., 2017)

Humalog sq before meals ($\frac{BS-150}{30}$) units
- antidiabetics, hormones, pancreatics
- Humalog is taken by the patient to manage blood sugar levels around mealtime.
- Assess the patient's blood sugar and watch for signs of hypoglycemia such as chills, anxiety, and restlessness (Vallerand et al., 2017).

Humalog sq meal coverage, 1 unit per 8 grams of carbohydrates, every 6 hours, PRN
- antidiabetics, hormones, pancreatics
- Humalog is taken by the patient to manage blood sugars depending on carbohydrate intake.

Assess the patient's blood sugar and watch for signs of hypoglycemia

Demographic Data

Admitting diagnosis: Diabetic Ketoacidosis (DKA)

Age of client: 17-years-old

Sex: male

Weight in kgs: 41.2kg

Allergies: gluten

Date of admission: 9/19/2022

Psychosocial Developmental Stage: adolescent, socially withdrawn for age

Cognitive Development Stage: adolescent, no known cognitive deficits

Admission History

The patient initially presented to the Emergency Department (ED) complaining of dysuria and "bladder" pain during urination. During interview, the patient stated that it has been happening for weeks, and that he took some NSAIDs to treat the dysuria. The medications helped for a little bit, but it ultimately did not resolve, resulting in the patient's admission. He denied any back or abdominal pain, and upon triage, his blood sugar was over 500mg/dL. Currently, he denies any pain.

Pathophysiology

Disease process: Diabetic ketoacidosis (DKA) happens as a result of unregulated blood sugar. In type 1 Diabetes Mellitus, the body goes into starvation mode when no insulin is administered. Due to the complete absence of insulin from destroyed pancreatic beta cells, there is no other source of insulin. The absence of insulin signals the liver to breakdown other sources of energy such as protein and fat, which results in the production of ketones or ketoacids (Capriotti & Frizzell, 2020). Ketones are strong acids that change the body's pH (Capriotti & Frizzell, 2020). The patient has not not been taking his insulin as prescribed, and has gone into diabetic ketoacidosis. His blood sugar was out of range when he came into the hospital, and had complaints of urinary pain. He was eventually admitted with a primary diagnosis of diabetic ketoacidosis, as evidenced by his low CO2 level, which was caused by hyperventilation in an attempt of the lungs to eliminate acid from the body (Capriotti & Frizzell, 2020).

S/S of disease: The symptoms of ketoacidosis can include, vomiting, nausea, dehydration, and coma (Capriotti & Frizzell, 2020). The patient did not present with any of these classis manifestations upon triage.

Method of Diagnosis: The patient was diagnosed with DKA for having a blood glucose level greater than 250mg/dL, low pH and ketonuria. DKA also involves an arterial pH of less than 7.3, serum bicarbonate level lower than 18 mEq/L, ketonuria and ketonemia (Capriotti & Frizzell, 2020).

Treatment of disease: DKA is treated with fluid replacement to counteract dehydration, and insulin administration to lower blood glucose levels (Capriotti & Frizzell, 2020). Due to electrolyte imbalance, electrolytes may also be replaced depending on the physician's evaluation.

Relevant Lab Values/Diagnostics

Urine culture (negative) positive for MRSA

A positive urine culture in the urine indicates a urinary tract infection. Individuals with Diabetes are at a higher risk of developing infections (Capriotti & Frizzell, 2020).

Glucose POC (60-99mg/dL) 221mg/dL

An elevated blood glucose level is a result of unmanaged diabetes (Capriotti & Frizzell, 2020).

AST (5-34 U/mL) 559 U/mL

ALT (0-55 U/mL) 776 U/mL

Alkaline Phosphatase (40-150 U/mL) 373 U/mL

Elevated AST, ALT and alkaline phosphatase are a result of liver disease (Capriotti & Frizzell, 2020). The patient is known to have liver damage and hepatomegaly as a complication of unmanaged Diabetes Mellitus Type 1.

CO2 (22.0 -29.0 mmol/L) 19.0 mmol/L

Low CO2 levels is a result of hyperventilation by the lungs to get rid of acids in the body during diabetic ketoacidosis (Capriotti & Frizzell, 2020).

Medical History

Previous Medical History: celiac disease, seizures, metabolic acidosis, growth failure, acute kidney injury, hypertension in child, elevated liver enzymes, DKA, ADHD

Prior Hospitalizations: The patient has been hospitalized multiple times for DKA. The most recent visits were on 2/21/2022 and 1/08/2022.

Other hospitalizations:

9/6/2022 for dehydration with hyponatremia

7/12/2022 – for hyperglycemia

3/31/2022 – for hypertension in child

Past Surgical History: N/A

Social needs: the patient needs help with medical insurance coverage due to mother and father being divorced, the patient has had multiple admissions for DKA and needs help with health maintenance

Active Orders

Glucose AC/HS – every 3 hours

The patient's blood sugar has been unregulated for a long time, and it needs to be monitored to prevent further decline in health, especially due to DKA.

Strict I/O every 4 hours

The patient's DKA can result in electrolyte imbalance. The patient also has known liver damage, so tracking the patient's I/O helps in evaluating his fluid status.

Neurological Status check every 4 hours

DKA can result in cerebral edema, which can be monitored by assessing the patient's neurological status and level of consciousness.

Notify physician of critical vital signs

The patient has DKA, hypertension, and liver damage, which can all result in a rapid decline in health status. It is crucial for the provider to be notified of critical values to prevent further complications and deterioration.

Assessment	
General	The patient is a pleasant 17-year-old boy. He does not appear to be in distress. He is neat. His nails are untrimmed and soiled. The patient appears to be in a happy mood and frequently smiles and laughs. Patient appears to be more juvenile than current developmental stage
Integument	No cuts, lesions, bruises or rash noted throughout the body; skin is cool and dry; skin color is appropriate for race; no pitting edema noted in all extremities; some minor blemishes on left leg that appear to be red spots
HEENT	Head is normocephalic and atraumatic; no cuts, lesions, bruises, or rash noted; uvula is midline; oral and nasal mucosa are intact; teeth are complete; tongue is clear; oral mucosa pink and moist; no drainage in ears or nose; no jugular vein distension noted
Cardiovascular	Heart sounds are clear and strong; HR is normal, and rhythm is normal; S1 and S2 present; no S3 or S4 sounds auscultated; no murmurs, gallops, no bruits noted; pulses are strong in the upper extremities, and hard to palpate in the lower extremities, but are otherwise palpable
Respiratory	Respirations are nonlabored; respirate rate and rhythm are regular; lung sounds are clear in the upper lobes and diminished in the lower lobes; no crackles, wheezes, rhonchi auscultated
Genitourinary	The patient denies any penile discharge; pt denies cuts, lesions, bruises or rashes in genitourinary area; he does report pain only when he urinates, and that he urinates more than 10x a day, he states that the amount of urine varies every time
Gastrointestinal	Abdominal sounds are normoactive in all quadrants; distension and hepatomegaly palpated in upper quadrants; no pain upon palpation in all quadrants; LBM was 9/23/2022; no cuts, lesions or bruising visualized
Musculoskeletal	Normal ROM in all extremities; gait is balanced; pedal pushes and pulls are strong and equal +3; hand grips are strong and equal +3; the patient is able to walk around the room with no difficulty
Neurological	Pupils are equal, round, reactive and accommodating; MAEW; patient is alert to person, place, time and situation x4, no neurological deficits noted; EOM movement intact in all directions; patient wears corrective eye glasses
Most recent VS (highlight if abnormal)	**Time:** 12pm **Temperature:** 97.8 F **Route:** axillary **RR:** 20 **HR**: 114 **BP and MAP:** 120/87, MAP = 98 **Oxygen saturation:** 99% **Oxygen needs:** N/A
Pain and Pain Scale Used	Patient denies pain, nonverbal signs of pain absent

Nursing Diagnosis 1	Nursing Diagnosis 2	Nursing Diagnosis 3
Rationale Risk for unstable blood glucose level related to insufficient diabetes management as evidenced by a blood sugar level over 500mg/dL upon hospital triage.	**Rationale** Risk for acute confusion related to hyperglycemia as evidenced by diabetic ketoacidosis and blood sugar over 500mg/dL upon hospital triage.	**Rationale** Ineffective health maintenance related to Diabetes Mellitus as evidenced by multiple admissions for diabetic complication of diabetic ketoacidosis.
Interventions **Intervention 1:** Monitor the patient for signs and symptoms such as lethargy, malaise, blurred vision, polyuria, polydipsia, and polyphagia (Phelps, 2020). These symptoms indicate hyperglycemia. **Intervention 2:** Check and evaluate the patient's electrolyte levels (Phelps, 2020). High blood sugar levels may result in hypokalemia and hyponatremia, which are essential for proper cardiac functioning.	**Interventions** **Intervention 1:** Assess the patient's neurological status and level of consciousness every 4 hours (Phelps, 2020). Changes in neurological status may indicate cerebral edema. **Intervention 2:** Educate the patient and his family about the importance of ensuring that changes in the patient's neurological status may indicate a decline in the patient's neurological function (Phelps, 2020). The patient is at a high risk of neurological decline due to DKA.	**Interventions** **Intervention 1:** Reevaluate the patient's attitude, understanding and knowledge of Diabetes Mellitus Type 1 (Phelps, 2020). Educate the patient about the potential complications of unregulated blood sugar levels, and reinforce the importance of health management in maintaining health status. **Intervention 2:** Teach the patient about his laboratory values and correlate these values to their implications on his quality of life.
Evaluation of Interventions The patient's blood sugar will remain within desired limits, and any symptoms associated with hyperglycemia will be investigated and reported to the provider. Any changes in electrolyte levels will also be evaluated, and any critical value will be addressed. Insulin will be administered for hyperglycemia, and the patient will remain in stable condition.	**Evaluation of Interventions** The patient's neurological status will be assessed every 4 hours, and any changes will be immediately reported to the provider. The patient and his family will understand that changes in level of consciousness can indicate a change in neurological function. They will verbalize that the provider will be notified if it happens.	**Evaluation of Interventions** The patient will show understanding of his disease process. He will ask questions regarding improved health management, especially blood sugar control. The patient will be able to verbalize the implications of elevated lab values and their consequences.

References (3):

Capriotti, T. & Frizzell, J.P. (2020). *Pathophysiology: Introductory concepts and clinical perspectives.* (2nd ed.). F.A. Davis Company.

Phelps, L.L. (2020). *Sparks and Taylor's nursing diagnosis reference manual* (11th ed.). Wolters Kluwer

Vallerand, A. H., Deglin, J. H., & Sanoski, C. A. (2017). *Davis's drug guide for nurses*. F.A. Davis Company.