

Diabetes Mellitus Type I/DKA

UNFOLDING Reasoning



Jack Anderson, 9 years old

Primary Concept		
Glucose Regulation		
Interrelated Concepts (In order of emphasis)		
<ul style="list-style-type: none"> • Fluid and Electrolyte Balance • Acid-Base Balance • Clinical Judgment • Patient Education • Communication • Collaboration 		
NCLEX Client Need Categories	Percentage of Items from Each Category/Subcategory	Covered in Case Study
Safe and Effective Care Environment		
✓ Management of Care	17-23%	✓
✓ Safety and Infection Control	9-15%	
Health Promotion and Maintenance	6-12%	✓
Psychosocial Integrity	6-12%	✓
Physiological Integrity		
✓ Basic Care and Comfort	6-12%	✓
✓ Pharmacological and Parenteral Therapies	12-18%	✓
✓ Reduction of Risk Potential	9-15%	✓
✓ Physiological Adaptation	11-17%	✓

History of Present Problem:

Jack Anderson is a 9-year-old boy who presents to the emergency department because he has been more sleepy and his breathing is “not normal;” it is deeper and faster, according to his parents. Jack was sick with a respiratory virus two weeks ago but has since recovered. Jack began feeling more tired a few days ago when he started to complain of abdominal pain, headache, muscle aches, and consistently being hungry and thirsty. He is urinating more frequently during the day and at night. His mother reports a normal full-term pregnancy and Jack has been healthy with no known medical conditions.

Personal/Social History:

Jack lives with both parents and two siblings; a younger sister four years old and a 12-year-old brother. Both parents work as middle school teachers in the community. Jack is in the 4th grade and earns above-average marks. He is physically active and plays soccer on the school team.

What data from the histories are RELEVANT and must be interpreted as clinically significant by the nurse?

(NCSBN: Step 1 Recognize cues/NCLEX Reduction of Risk Potential Reduction of Risk Potential)

RELEVANT Data from Present Problem:	Clinical Significance:
RELEVANT Data from Social History:	Clinical Significance:

Patient Care Begins:

Current VS:	P-Q-R-S-T Pain Assessment:	
T: 100.4 F/38.0 C (oral)	Provoking/Palliative:	Made worse with solid food.
P: 136 (regular)	Quality:	Dull and aching
R: 44 (deep/rapid)	Region/Radiation:	Confined to abdomen, generalized within abdominal region
BP: 80/48	Severity:	He states his pain is a 4/10 on the numeric scale.
O2 sat: 98% on RA	Timing:	States, “All the time”
Weight: 64.0 lbs/29.1 kg		

What VS data are RELEVANT and must be interpreted as clinically significant by the nurse?

(NCSBN: Step 1 Recognize cues/NCLEX Reduction of Risk Potential Reduction of Risk Potential/Health Promotion and Maintenance)

RELEVANT VS Data:	Clinical Significance:

Current Assessment:	
GENERAL SURVEY:	Lying on the bed with eyes closed, whimpers with touch, recognizes mom and dad. Fruity odor to the breath.
NEUROLOGICAL:	Lethargic, responding to parents with one-word phrases. Alert & oriented to person, place, time, and situation (x4); muscle strength 5/5 in both upper and lower extremities bilaterally.
HEENT:	Head normocephalic with symmetry of all facial features. PERLLA, sclera white bilaterally, conjunctival sac pink bilaterally. Eyes appear "sunken," mucus membranes dry, tacky mucosa, chapped lips.
RESPIRATORY:	Breath sounds clear with equal aeration on inspiration and expiration in all lobes anteriorly, posteriorly, and laterally, respirations are deep and rapid
CARDIAC:	Pink, warm & dry, no edema, heart sounds regular, pulses slightly weak/thready, equal with palpation at radial/pedal/post-tibial landmarks, cap refill 2 seconds. Heart tones audible and regular, S1 and S2, noted over A-P-T-M cardiac landmarks with no abnormal beats or murmurs.
ABDOMEN:	Abdomen round, soft, and tender to light palpation. BS active in all four quadrants, feeling nauseated
GU:	Voiding large amounts of clear light yellow urine
INTEGUMENTARY:	Skin warm, dry, itchy, flushed, intact, normal color for ethnicity. No clubbing of nails, cap refill <3 seconds, Hair soft-distribution normal for age and gender. Skin integrity intact, skin turgor nonelastic, tenting present.

What assessment data is *RELEVANT* and must be interpreted as clinically significant by the nurse?

(NCSBN: Step 1 Recognize cues/NCLEX Reduction of Risk Potential Reduction of Risk Potential/Health Promotion & Maintenance)

RELEVANT Assessment Data:	Clinical Significance:

Based on the clinical cues collected so far by the nurse, what additional data is needed ASAP to determine the most likely problem and identify the nursing priority? What orders should the nurse anticipate?

Additional Clinical Data Needed:	Orders to Anticipate:

Lab Results:

Complete Blood Count (CBC)					
	WBC	HGB	PLTs	% Neuts	Bands
Current:	6.2	16.1	252	58	0
Most Recent:	7.2	14.2	210	52	0

What lab results are RELEVANT and must be recognized as clinically significant by the nurse?

(NCSBN: Step 1 Recognize cues/NCLEX Reduction of Risk Potential Reduction of Risk Potential/Physiologic Adaptation)

RELEVANT Lab(s):	Clinical Significance:	TREND: Improve/Worsening/Stable:

Basic Metabolic Panel (BMP)					
	Na	K	Gluc.	Creat.	CO2 (Bicarb)
Current:	130	5.5	680	1.4	16
Most Recent:	138	4.1	118	0.7	22

What lab results are RELEVANT and must be recognized as clinically significant by the nurse?

(NCSBN: Step 1 Recognize cues/NCLEX Reduction of Risk Potential Reduction of Risk Potential/Physiologic Adaptation)

RELEVANT Lab(s):	Clinical Significance:	TREND: Improve/Worsening/Stable:

Misc.					
	Magnesium	Phosphorus	Beta- hydroxybutyrate		
Current:	2.4	2.8	Positive		

What lab results are RELEVANT and must be recognized as clinically significant by the nurse?

(NCSBN: Step 1 Recognize cues/NCLEX Reduction of Risk Potential Reduction of Risk Potential/Physiologic Adaptation)

RELEVANT Lab(s):	Clinical Significance:

Urinalysis + UA Micro												
	Color:	Clarity:	Sp. Gr.	Protein	Gluc.	Ket.	Nitr.	LET	RBCs	WBCs	Bact.	Epi.
Current:	Lt. yellow	Clear	1.015	Neg	4+	4+	Neg	Neg	0	3	None	none

What lab results are *RELEVANT* and must be recognized as clinically significant by the nurse?

(NCSBN: Step 1 Recognize cues/NCLEX Reduction of Risk Potential Reduction of Risk Potential/Physiologic Adaptation)

RELEVANT Lab(s):	Clinical Significance:

Lab Planning: Creating a Plan of Care with a **PRIORITY** Lab:

(Reduction of Risk Potential/Physiologic Adaptation)

Lab:	Normal Value:	Clinical Significance:	Nursing Assessments/Interventions Required:
Potassium Value: 5.5	 Critical Value:		

Lab:	Normal Value:	Clinical Significance:	Nursing Assessments/Interventions Required:
Glucose Value: 680	 Critical Value:		

Clinical Reasoning Begins...

1. **Interpreting relevant clinical data, what is the primary problem(s)? What primary health-related concepts does this primary problem represent?** *(NCSBN: Step 2 Analyze cues/NCSBN: Step 3 Prioritize hypotheses Management of Care/Physiologic Adaptation)*

Problem(s):	Pathophysiology of Problem in OWN Words:	Primary Concept:

2. *Is this patient at risk for a change in status that could lead to an adverse outcome due to age, susceptible host, or other factors?* (NCSBN: Step 2 Analyze cues/Management of Care)

Risk Factors for Developing Complication:	Rationale:

3. *What is the worst possible/most likely complication(s) to anticipate based on the primary problem of this patient?* (NCSBN: Step 2 Analyze cues/Reduction of Risk Potential/Physiologic Adaptation)

Worst Possible/Most Likely Complication to Anticipate:		
Nursing Interventions to PREVENT this Complication:	Assessments to Identify Problem EARLY:	Nursing Interventions to Rescue:

Collaborative Care: Medical Management

4. *State the rationale and expected outcomes for the medical plan of care.* (Pharm. and Parenteral Therapies)

Care Provider Orders:	Rationale:	Expected Outcome:
Establish two large bore peripheral IVs Admit to the Pediatric ICU NPO Vital signs every 30 minutes with neurological checks every hour Continuous cardiac monitor STAT finger stick for blood glucose then every one hour Administer NS 20 mL/kg IV BOLUS (over one hour) then begin ½ NS with 20 mEq KCL at maintenance rate (1,000 mL for first 10 kg + 500 mL for next 10 kg over 24 hours) After fluid bolus start IV Regular insulin infusion at 0.05 unit/kg/hour Once blood glucose level is less than 300 mg/dL or the blood glucose fall is more than 100 mg/dL, change IV fluids above to Dextrose 5% in 0.45 NaCl		

with 20 mEq KCL Strict I &O and daily weight Ondansetron 2 mg/mL IV push prn every 4 hours nausea Acetaminophen suppository per rectum 350 mg PRN every 4 hours comfort or temp > 38.5 C (>101.3 F)		
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PRIORITY Setting:

5. Which Orders Do You Implement First and Why? (Management of Care)

Care Provider Orders:	Order of Priority:	Rationale:
<ul style="list-style-type: none"> • Obtain finger stick blood glucose • Start IV insulin after bolus is given and monitor blood glucose carefully • Obtain VS • Accurate I and O • Place on a cardiac monitor • Initiate two large bore IVs and administer fluid bolus followed by maintenance/replacement 		

Collaborative Care: Nursing

6. What nursing priority (ies) will guide your plan of care? (NCSBN: Step 4 Generate solutions/Step 5: Take action Management of Care)

Nursing PRIORITY:		
PRIORITY Nursing Interventions:	Rationale:	Expected Outcome:

7. **What body system(s) will you assess most thoroughly based on the primary/priority concern?**
(Reduction of Risk Potential/Physiologic Adaptation)

PRIORITY Body System:	PRIORITY Nursing Assessments:

8. **What psychosocial/holistic care PRIORITIES need to be addressed for this patient?**
(Psychosocial Integrity/Basic Care and Comfort)

Psychosocial PRIORITIES:		
PRIORITY Nursing Interventions:	Rationale:	Expected Outcome:
CARE/COMFORT:		
EMOTIONAL (How to develop a therapeutic relationship):		

Dosage Calculations

- Weight 64 lbs. Convert to kg: _____
- Administer 0.9% NS 20 mL/kg bolus over one hour. Calculate IV bolus: _____
- Administer regular insulin infusion at 0.05 units/kg/hour. Calculate units/hour: _____
- Regular insulin IV is 250 units/250 mL 0.9% NS. Calculate hourly IV drip rate: _____

Evaluation: Four hours later...

Evaluate the response of your patient to nursing and medical interventions during your shift. All physician orders have been implemented that are listed under medical management.

Jack has been transferred from the ED to pediatric ICU two hours ago. His blood glucose is now 442 (this is an appropriate value based on the average of 50-75 mg/dL/hour correction). His insulin gtt is infusing at 1.5 units/hour. You just collected the following clinical data:

Current VS:	Admission (4 hours):	Current PQRST:	
T: 98.9 F/37.2 C (oral)	T: 100.4 F/38.0 C (oral)	Provoking/Palliative:	
P: 92 (reg)	P: 136 (regular)	Quality:	Dull and aching
R: 24 (reg)	R: 44 (deep/rapid)	Region/Radiation:	Confined to abdomen, generalized within abdominal region
BP: 100/60	BP: 80/48	Severity:	2/10 numeric scale
O2 sat: 98% on RA	O2 sat: 98% on RA	Timing:	States "All the time"
Blood Glucose: 442			

Current Assessment:	
GENERAL SURVEY:	Pleasant, in no acute distress, calm, body relaxed, no grimacing, appears to be resting comfortably.
NEUROLOGICAL:	Alert & oriented to person, place, time, and situation (x4); muscle strength 5/5 in both upper and lower extremities bilaterally.
HEENT:	Head normocephalic with symmetry of all facial features. PERRLA, sclera white bilaterally, conjunctival sac pink bilaterally. Lips, tongue, and oral mucosa pink and moist.
RESPIRATORY:	Breath sounds clear with equal aeration on inspiration and expiration in all lobes anteriorly, posteriorly, and laterally, nonlabored respiratory effort on room air.
CARDIAC:	Pink, warm & dry, no edema, heart sounds regular, pulses strong, equal with palpation at radial/pedal/post-tibial landmarks, brisk cap refill. Heart tones audible and regular, S1 and S2 noted over A-P-T-M cardiac landmarks with no abnormal beats or murmurs.
ABDOMEN:	Abdomen round, soft, and nontender. BS active in all 4 quadrants
GU:	Voiding without difficulty, urine clear/yellow
INTEGUMENTARY:	Skin warm, dry, intact, normal color for ethnicity. No clubbing of nails, cap refill <3 seconds, Hair soft-distribution normal for age and gender. Skin integrity intact, skin turgor elastic, no tenting present.

1. What data is *RELEVANT* and must be interpreted as clinically significant by the nurse?

(NCSBN: Step 1 Recognize cues/Reduction of Risk Potential/Health Promotion and Maintenance)

RELEVANT VS Data:	Clinical Significance:	TREND: Improve/Worsening/Stable:
RELEVANT Assessment Data:	Clinical Significance:	TREND: Improve/Worsening/Stable:

2. *Has the status improved or not as expected to this point? Does your nursing priority or plan of care need to be modified in any way after this evaluation assessment? (NCSBN: Step 6 Evaluate outcomes/Management of Care, Physiological Adaptation)*

Evaluation of Current Status:	Modifications to Current Plan of Care:

3. *Based on your current evaluation, what are your CURRENT nursing priorities and plan of care? (NCSBN: Step 4 Generate solutions/Step 5: Take action/Management of Care)*

CURRENT Nursing PRIORITY:		
PRIORITY Nursing Interventions:	Rationale:	Expected Outcome:

*It is now the end of your shift. Effective and concise handoffs are essential to excellent care and, if not done well, can adversely impact the care of this patient. You have done an excellent job to this point; now finish strong and give the following SBAR report to the nurse who will be caring for this patient:
(Management of Care)*

S ituation:
Name/age: BRIEF summary of primary problem:
B ackground:
Primary problem/diagnosis: RELEVANT past medical history: RELEVANT background data:
A ssessment:
Most recent vital signs: RELEVANT body system nursing assessment data:

<p>RELEVANT lab values:</p> <p>TREND of any abnormal clinical data (stable-increasing/decreasing):</p> <p>How have you advanced the plan of care?</p> <p>Patient response:</p> <p>INTERPRETATION of current clinical status (stable/unstable/worsening):</p>
<p>Recommendation:</p>
<p>Suggestions to advance the plan of care:</p>

Education Priorities/Discharge Planning

What educational/discharge priorities will be needed to develop a teaching plan for this patient and/or family?

(Health Promotion and Maintenance)

Education PRIORITY:	
PRIORITY Topics to Teach:	Rationale:

Caring and the “Art” of Nursing

What is the patient likely experiencing/feeling right now in this situation? What can you do to engage yourself with this patient’s experience, and show that he/she matters to you as a person? (Psychosocial Integrity)

What Patient is Experiencing:	How to Engage:

Use Reflection to Develop Clinical Judgment

What did you do well in this case study?	What knowledge deficits did you identify?
What did you learn?	How will you apply learning caring for future patients?