

Intrapartal Diabetes Mellitus

Although most diabetic clients go to term with spontaneous labor, close management of the intrapartal period is necessary for optimal outcome.

This plan of care is to be used in conjunction with the first five plans of care in this chapter, concerning the three stages of labor, or with CP: Cesarean Birth, as indicated.

CLIENT ASSESSMENT DATA BASE

(Refer to CP: Diabetes Mellitus, Prepregnancy/Gestational and to the intrapartal assessment tool at the beginning of this chapter.)

Circulation

BP may be elevated.

History of ankle/leg edema.

Rapid pulse, pallor, diaphoresis (hypoglycemia).

Ego Integrity

Reports concerns regarding labor, impending delivery, and possible effects of diabetes on outcome

Anxious, irritable, increased tension

Elimination

Polyuria

Food/Fluid

May report episodes of hypoglycemia, glycosuria

Polydipsia, hunger (hyperglycemia)

Dependent edema

Ketonuria, elevated serum glucose

Sexuality

Large amount of amniotic fluid on rupture of membranes (suggests hydramnios)

Teaching/Learning

May have been hospitalized during the prenatal period for complications such as poor diabetic control, PIH, and preterm labor due to polyhydramnios

DIAGNOSTIC STUDIES

Serum Glucose: May or may not be elevated.

Glycosylated Hemoglobin (HbA_{1c}): Reflects diabetic control during the preceding 5 wk.

Urinalysis: Reveals presence of glucose and ketones (hyperglycemia, ketoacidosis, and nutritional status) and albumin (PIH).

Ultrasonography and Pelvimetry: Evaluates fetal size, and risk of macrosomia and shoulder dystocia.

Amniocentesis for lecithin to sphingomyelin (L/S) Ratio and Saturated Phosphatidyl Choline (SPC):

Determines fetal lung maturity. SPG levels are better predictors of lung maturity than L/S ratio.

NURSING PRIORITIES

1. Monitor client/fetal status and progress of labor.
2. Maintain normoglycemia (euglycemia).
3. Provide emotional support to the client/couple.

4. Promote successful delivery of an appropriate-for-gestational-age (AGA) infant.

NURSING DIAGNOSIS:	Trauma, risk for/Gas Exchange, risk for impaired fetal
Risk Factors May Include:	Inadequate maternal diabetic control, presence of macrosomia or IUGR
Possibly Evidenced By:	[Not applicable; presence of signs/symptoms establishes an <i>actual</i> diagnosis]
DESIRED OUTCOMES/EVALUATION CRITERIA—NEONATE WILL:	Be full-term, AGA, free of injury. Display normal levels of serum glucose, free of signs of hypoglycemia.

ACTIONS/INTERVENTIONS

RATIONALE

Independent

Review prenatal course and maternal diabetic control.

Maternal hyperglycemia in the prenatal period promotes macrosomia, placing the fetus at risk for birth injury caused by shoulder dystocia or CPD. If the client has severe vascular involvement associated with diabetes (class C to F), the fetus often suffers IUGR and is at risk for hypoxia during the stress of labor, owing to uteroplacental ischemia. In addition, a high maternal glucose level at delivery stimulates the fetal pancreas, resulting in hyperinsulinemia, which can result in potentially severe neonatal hypoglycemia when the fetus is delivered and removed from the hyperglycemic environment.

Check maternal urine at each voiding for glucose/ketones, and albumin. Monitor blood pressure. (Refer to CP: Pregnancy-Induced Hypertension.)

Elevated glucose and ketone levels indicate maternal ketoacidosis, which can result in fetal acidosis and potential CNS injury. Elevated ketone levels alone suggest malnutrition/starvation affecting fetal growth. Elevated protein levels may indicate maternal vascular changes associated with PIH (occurs in 12%–13% of pregnant diabetics), which may reduce oxygen transfer to the fetus.

Monitor temperature as indicated. Note character of vaginal discharge.

There is increased risk of ascending infection in diabetic clients, which may result in neonatal sepsis.

Encourage lateral recumbent position for client during labor.

Promotes placental perfusion and increases oxygen available for fetal uptake.

Perform or assist with vaginal examination to determine progress of labor.

Prolonged labor may increase risk of fetal distress. Also with prolonged labor, diabetic control may deteriorate, resulting in negative effects on the fetus. In addition, a slowing of fetal descent and prolonged stage II may suggest macrosomia of fetus requiring additional assessment/intervention.

Collaborative

Review results of prenatal tests, such as biophysical profile (BPP), NST, CST, and estimation of fetal size.

Obtain or review results from amniocentesis and ultrasonography.

Monitor maternal serum glucose level via fingerstick per protocol.

Monitor FHR with continuous fetal monitoring device, preferably with an internal electrode.

Initiate IV infusion of 5% dextrose solution, as indicated.

Prepare for induction of labor using oxytocin (Pitocin) or for cesarean birth, if medically indicated as a result of complications.

Assist with McRoberts maneuver, apply suprapubic pressure as appropriate.

Arrange for pediatrician, neonatologist, or neonatal intensive care unit nurse to be present in delivery room, as indicated.

Provides information about placental reserve for fetal oxygenation during intrapartum period, and identifies potential LGA/macrosomic fetus with risk of CPD/shoulder dystocia.

Provides information about fetal lung maturity; helps predict intensity of medical support needed in delivery room. Because fetal hyperinsulinemia interferes with surfactant production, the L/S ratio is not a good predictor of fetal maturity in the diabetic client; the presence of SPG is considered a reliable indicator.

Levels vary during labor, owing to increased energy needs, depletion of glycogen levels, and a medically induced fasting state.

Tachycardia, bradycardia, or late decelerations with reduced variability indicate fetal hypoxia possibly related to diabetic vascular changes, which reduce uteroplacental perfusion.

It may be possible to maintain euglycemia without administering glucose until active labor starts. Glucose needs vary in the active phase, and some sources recommend dextrose infusion to equal 2.55 mg/kg/min. (Refer to ND: Injury, risk for maternal.)

Delivery is indicated when medical evidence supports belief that intrauterine environment is potentially more harmful to the fetus than the extrauterine environment, e.g., presence of hypertension, poor metabolic control. Cesarean birth may be indicated in presence of macrosomia/CPD or rapidly deteriorating fetal status. (Refer to CP: The Preterm Infant, for discussion of newborn complications.)

Shoulder dystocia may occur following delivery of fetal head, especially when fetus weighs more than 4000 g, with incidence ranging from 13%–31%. Having client sharply flex thighs against her abdomen changes the angle of the maternal pelvis and may facilitate delivery of the anterior shoulder and decrease risk of brachial plexus stretching and clavicular fracture.

Helps ensure that the best-qualified professionals are available for assisting with or carrying out any necessary emergency measures.

NURSING DIAGNOSIS:

Risk Factors May Include:

Possibly Evidenced By:

Injury, risk for maternal

Inadequate diabetic control (hypertension, severe edema, ketoacidosis, uterine atony/overdistension and dystocia)

[Not applicable; presence of signs/symptoms establishes an *actual* diagnosis]

**DESIRED OUTCOMES/EVALUATION
CRITERIA—CLIENT WILL:**

Maintain serum glucose levels below 100 mg/dL.

Display stable vital signs.

Be free of injury/complications.

ACTIONS/INTERVENTIONS

RATIONALE

Independent

Note time/content of last meal; amount/type/time of last dose of insulin. Ascertain recent serum glucose levels and any fluctuations. Observe for signs and symptoms of hypoglycemia.

Useful in predicting client's needs. As client progresses into active labor, her metabolism increases, making her more prone to a hypoglycemic episode.

Check urine at each voiding for glucose, ketones, and protein.

Elevated ketone levels alone indicate a state of starvation. Elevated glucose and ketones reflect ketoacidosis. Elevated protein levels accompanied by edema and elevated BP suggest PIH.

Monitor vital signs every hour during induction. Monitor BP every 15 min.

Clients with diabetes mellitus are at risk for developing PIH. Pitocin increases sodium/water reabsorption from the kidney tubules, possibly elevating BP readings.

Assess quality, duration, and frequency of contractions.

Dystocia may occur as a result of CPD related to macrosomia.

Evaluate skin turgor, pulse and temperature, and condition of mucous membranes.

If serum glucose is initially elevated, dehydration may occur as a result of osmotic diuresis (glycosuria) and restriction of oral intake.

Note presence, quality, and consistency of bloody show. If excess bleeding is present, notify physician.

Clients with diabetes are prone to hemorrhage, owing to abruptio placentae or overdistension of the uterus resulting from polyhydramnios or macrosomia.

Have glucagon available at the bedside.

If serum glucose falls rapidly below 60 mg/dL, administration of glucagon may be necessary to trigger conversion of glycogen to glucose.

Collaborative

Review results of ultrasonography and pelvimetry.

Macrosomic infant may cause prolonged labor and necessitate operative vaginal or cesarean birth.

Monitor serum glucose level every hour until stable, then every 2–4 hr. Use client's own glucose reflectance meter, if available.

Levels vary during labor, owing to increased energy needs, depletion of glycogen levels, and medically induced state of fasting. Self-monitoring promotes involvement/sense of control, is more economical and faster than laboratory testing.

Maintain glucose level between 60 and 100 mg/dL:

Intrapartal glucose levels play a crucial role in outcome of pregnancy.

Initiate intravenous infusion of 5% dextrose solutions as indicated;

IV infusion prevents dehydration and maintains serum glucose, avoiding depletion of glycogen stores.

Administer subcutaneous or IV regular insulin infusion as appropriate;

Double rate of infusing dextrose for subsequent hour if blood glucose levels fall below 60 mg/dL; Use Biostator Glucose Controller (Miles Laboratories), if available.

Prepare for induction of labor by administration of oxytocin (Pitocin), or cesarean birth, if indicated. (Refer to CPs: Labor Induced/Augmented; Cesarean Birth.)

Obtain CBC, blood type, and cross-match, if surgical procedure is planned.

Avoid use of solutions that contain glucose to expand the maternal plasma volume prior to regional block anesthesia or if cesarean birth is indicated.

Labor increases sensitivity to insulin, often reducing insulin requirements. Therefore, low doses (up to 2.0 units/hr) are usually sufficient to maintain normoglycemia. Additional insulin may not be required during stage II labor and immediately after delivery; IV infusion of insulin is discontinued at the end of stage III labor. Note: Long-acting insulin, if part of client's normal regimen, is discontinued at onset of labor/day before planned induction. Provides glucose to counteract hypoglycemia.

This is a closed-loop system that delivers insulin or dextrose, depending on the individual's needs, and eliminates need for repeated serum glucose sampling.

May be necessary to ensure maternal and newborn well-being.

Ensures availability of blood products in the event that replacement is needed as a result of hemorrhage.

Solutions containing glucose rapidly elevate serum glucose levels beyond normoglycemia.

NURSING DIAGNOSIS:

May Be Related To:

Possibly Evidenced By:

DESIRED OUTCOMES/EVALUATION CRITERIA—CLIENT/COUPLE WILL:

Anxiety [specify level]

Situational "crisis"/threat to health status (maternal or fetal)

Increased tension, apprehension, fear of unspecified consequences, sympathetic stimulation

Verbalize awareness of feelings concerning diabetes and labor.

Use appropriate coping strategies.

ACTIONS/INTERVENTIONS

RATIONALE

Independent

Arrange for continued presence of primary nurse or other support person (e.g., doula) during labor. Position call light for easy access if primary nurse out of the room, and inform them summons will be answered promptly. Notify couple of substitute personnel and introduce them.

Enhances continuity of care. Client/couple needs to know they are not alone and that immediate help is available, especially who will respond in absence of primary nurse.

Ascertain present response to labor and to medical management; assess effectiveness of support systems.

Provides baseline assessment for future comparisons; identifies strengths to use and potential problems.

Involve couple in activities as much as possible.
Encourage use of relaxation and breathing techniques.

Explain all procedures; reinforce information from other healthcare providers.

Encourage questions and verbalization of concerns.

Keep couple informed concerning progress of labor.
Be positive, providing accurate information.

Keep couple informed of fetal status.

Provides a feeling of control over situation.

Knowledge of what is occurring helps to decrease fears.

An open and encouraging atmosphere decreases intimidation by procedures or equipment, allowing concerns to be expressed and dealt with.

Information on labor progress, given in a straightforward, open manner, can be helpful in diminishing concerns about the unknown. Provides reinforcement for efforts.

Helps to alleviate/minimize concerns and fosters trust.