

INSULIN

Purpose: To facilitate the appropriate use of insulin during pregnancy in type 1 diabetes mellitus (DM), insulin-requiring type 2 DM, and insulin-requiring gestational diabetes mellitus (GDM).

ASSESSMENT	EDUCATIONAL APPROACH	RATIONALE & CLINICAL MANAGEMENT GUIDELINES
TYPE /ACTION /STORAGE		
<ul style="list-style-type: none"> ◆ Assess knowledge of the following: <ul style="list-style-type: none"> • Type, action, and dosage. 	<ul style="list-style-type: none"> ◆ Explain: <ul style="list-style-type: none"> • Action of insulin(s) being used. 	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>For additional guidelines regarding insulin use, refer to appropriate sections throughout the manual (e.g., Medical Management, Postpartum, Hypoglycemia, etc).</p> </div> <ul style="list-style-type: none"> ◆ All pregnant women with GDM or pre-existing DM who require insulin to control hyperglycemia may use the insulin analogues lispro or aspart (rapid-acting) or short-, intermediate-, and long-acting human insulins.¹⁻⁵ When indicated, rapid- or short-acting insulin can be administered by continuous subcutaneous insulin fusion. ◆ Extended long-acting insulin analogues (such as glargine and detimer) require additional study before they should be used in pregnancy.^{1,2} ◆ Premixed insulins are not recommended during pregnancy, as they do not allow individual dose adjustment as required. ◆ Individuals using insulin previous to pregnancy should be alerted to anticipated changes in insulin requirements during pregnancy. ◆ Dosage may increase 2 -fold⁶ by the end of the third trimester (usually peaking by 28 to 32 weeks).³ There is no formula for determining the insulin dose. It must be arrived at according to the individual's response and regularly adapted to the changing needs of pregnancy.¹

ASSESSMENT	EDUCATIONAL APPROACH	RATIONALE & CLINICAL MANAGEMENT GUIDELINES
TYPE/ ACTION/ STORAGE (cont)		
<ul style="list-style-type: none"> • Timing. • Storage. 	<ul style="list-style-type: none"> • Timing of insulin injection related to timing of meals. • Proper storage. 	<ul style="list-style-type: none"> ◆ Various insulin regimens are available. Timing of insulin administration should be determined by individual SMBG assessment, lifestyle, meal plan, activity, and potential for adherence.⁷ ◆ Insulin stored at room temperature should be used within 30 days. Insulin not used within this time should be kept in the refrigerator. Care should be taken to keep insulin away from excessive heat, and it should never be frozen.^{8,9}
ADMINISTRATION		
<p data-bbox="128 824 604 889"><i>PREPARING AND INJECTING INSULIN</i></p> <ul style="list-style-type: none"> ◆ Assess: <ul style="list-style-type: none"> • Preparation. • Injection technique. 	<ul style="list-style-type: none"> ◆ Discuss: <ul style="list-style-type: none"> • Appropriate preparation prior to injection. ◆ If appropriate, discuss guidelines for mixing/ drawing up insulins. ◆ If possible, observe injection procedure. 	<ul style="list-style-type: none"> ◆ Do not use if it appears clumpy, slightly coloured, or frosted after shaking.^{8,9} ◆ Care should be taken to ensure uniform suspension of immediate- and long-acting insulins. NPH insulin in pen cartridges need to be tipped back and forth or rolled at least 20 times.¹⁰ ◆ When mixing insulins, it is most common that rapid- or short-acting (clear) insulin be drawn into the syringe before the intermediate- or long-acting (cloudy) insulin. ◆ Mixed insulin should be injected at once.^{8,9} Mixed insulins should not sit as the action of the rapid- or short-acting insulin may be blunted.

ASSESSMENT	EDUCATIONAL APPROACH	RATIONALE & CLINICAL MANAGEMENT GUIDELINES
ADMINISTRATION (cont)		
<p data-bbox="138 370 594 435">PREPARING AND INJECTING INSULIN (cont)</p> <ul style="list-style-type: none"> <li data-bbox="191 943 520 971">• Site selection/rotation. <li data-bbox="191 1105 443 1133">• Injection devices. <li data-bbox="191 1263 569 1291">• Adjustment of insulin doses. 	<ul style="list-style-type: none"> <li data-bbox="621 467 1062 560">◆ Discuss: <ul style="list-style-type: none"> <li data-bbox="667 500 1062 560">• Appropriate sites for insulin injection. <li data-bbox="667 943 1062 971">• Need for proper site rotation. 	<ul style="list-style-type: none"> <li data-bbox="1100 500 1934 592">◆ All injection sites used before pregnancy are suitable for use during pregnancy. Some may choose not to use abdominal sites; this is an individual choice. <li data-bbox="1100 630 1902 690">◆ Pinching up the skin will help ensure subcutaneous injection and prevent intramuscular injection.^{8,9,11} <li data-bbox="1100 727 1797 787">◆ The needle should be injected at a 90° angle. Very lean individuals may use a 45° angle. <li data-bbox="1100 824 1934 917">◆ When using the shorter (6 mm or 8 mm) needles, care should be taken not to withdraw the needle too quickly (i.e., count slowly to 10 or 20), before the insulin can dissipate.^{8,9} <li data-bbox="1100 954 1934 1079">◆ Sites should be rotated systematically (approximately 1 inch apart) and anatomically, i.e., thigh to thigh, arm to arm, etc., for time of day. Consideration should include thought for planned exercise (see <i>Physical Activity section</i>). <li data-bbox="1100 1117 1871 1144">◆ Syringes, insulin pen devices, and insulin pumps may be used. <li data-bbox="1100 1182 1913 1242">◆ For multiple daily injections (MDI) therapy, insulin pen devices may be more convenient than syringes. <li data-bbox="1100 1279 1545 1307">◆ See <i>Medical Management section</i>. <li data-bbox="1100 1344 1860 1372">◆ See <i>DCPNS Policy Procedures for Insulin Dose Adjustment</i>.¹²

REFERENCES

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