

### Diabetes Medication Reference - Insulins

Generic (Brand)	Onset	Peak	Duration	Half Life	Dose Adjustments	Appearance	May it be mixed?	When to administer	Additional monitoring to HbA1c and plasma glucose
Insulin lispro (Humalog® U-100)  (Humalog® U-200)	Rapid	0.25-0.5hrs <sup>1</sup>	0.5-2.5hrs <sup>1</sup>	≤5hrs <sup>1</sup>	~1hr <sup>1</sup>	CrCl 10-50mL/min administer 75% of dose; CrCl <10mL/min administer 50% of dose <sup>1</sup>	Clear, colorless <sup>1</sup>	U-100: Yes with NPH only and from the vial only, add rapid acting (clear) insulin to the syringe first and use immediately. <sup>1,3,4</sup>  U-200: Do not mix with other insulins, do not extract from pen, do not administer via continuous infusion, do not give IV <sup>2</sup>	Potassium (hypokalemia risk) <sup>1,2</sup>
Insulin aspart U-100 (Novolog®)		0.2-0.3hrs <sup>3</sup>	1-3hrs <sup>3</sup>	3-5hrs <sup>3</sup>	81min <sup>3</sup>	No adjustments needed <sup>3</sup>	Clear, colorless <sup>3</sup>	Yes with NPH and from the vial only, add rapid acting (clear) insulin to the syringe first and use immediately <sup>3</sup>	Electrolytes, potassium <sup>3</sup>
Insulin glulisine U-100 (Apidra®)		0.2-0.5hrs <sup>4</sup>	1.6-2.8hrs <sup>4</sup>	3-4hrs <sup>4</sup>	42min <sup>4</sup>	No adjustments needed <sup>4</sup>	Clear, colorless <sup>4</sup>	Yes with NPH and from the vial only, add rapid acting (clear) insulin to the syringe first and use immediately <sup>4</sup>	Electrolytes, potassium <sup>4</sup>
Insulin human Inhalation Powder (Afrezza®)		Plasma peak, 12-15 minutes <sup>23</sup>	Peak effect ~ 53 min <sup>24</sup>	180 mins <sup>23</sup>	28-39 mins <sup>23</sup>	Contraindicated in chronic lung disease <sup>23</sup>	N/A	N/A	Single inhalation per cartridge at beginning of a meal <sup>23</sup>
Insulin regular U-100 (Humulin® R, Novolin® R)  Humulin® R U-500	Short	0.5hrs <sup>5</sup>	2.5-5hrs <sup>5</sup>	U-100: 4-12hrs  U-500: up to 24hrs <sup>5</sup>	1.5hrs <sup>5</sup>	CrCl 10-50mL/min administer 75% of dose; CrCl <10mL/min administer 25-50% of dose <sup>5</sup> <b>Humulin® R U-500 should only be used with the U-500 syringe. An Rx for the U-500 syringe is required; Co-prescribe the syringe and vial/do not switch between different types of syringes to avoid confusion</b> <sup>5</sup>	Clear, colorless <sup>5</sup>	U-100: Yes from the vial only, insulin regular should be added to the syringe first <sup>5</sup>  U-500: Do not give IV or mix with other insulins. <sup>5,22</sup>	DM <sup>5</sup> : electrolytes, potassium  DKA/HHS <sup>5</sup> : electrolytes, BUN, SCr, osmolality, venous pH, anion gap, urine output, UA, mental status

Abbreviations:

DM – diabetes mellitus; DKA – diabetic ketoacidosis; HHS – hyperosmolar hyperglycemic state

Storage of Insulin products: Unopened vials and prefilled pens may be stored under refrigeration (36-46 F) until the expiration date or at room temperature (<86 F) for 14-28 days (individual products vary). Refer to individual product information for storage temperature requirements and stability of opened vials and pens. Do not freeze insulin or use insulin after it has been frozen.<sup>25</sup>

Generic (Brand)	Onset		Peak	Duration	Half Life	Dose Adjustments	Appearance	May it be mixed?	When to administer	Additional monitoring to HbA1c and plasma glucose
Insulin NPH (Humulin® N, Novolin® N)	Inter-mediate	1-2hrs <sup>6</sup>	4-12hrs <sup>6</sup>	14-24hrs <sup>6</sup>	4.4hrs <sup>7</sup>	No adjustments needed <sup>6</sup>	Cloudy or milky <sup>6</sup>	Yes, NPH should be drawn up <i>after</i> all other types of insulin <sup>6</sup>	Before every use the vial should be rolled between the palms to get good consistency of the suspension. Administered once to twice daily. <sup>6</sup>	Electrolytes <sup>6</sup>
Insulin glargine <b>U-100</b> (Lantus®, Basaglar®)  Toujeo® SoloSTAR® <b>U-300</b>	Long	3-4hrs <sup>8</sup>	No pronounced peak <sup>8</sup>	>=24 to 30 hrs <sup>8</sup>	24hrs <sup>9</sup>	No adjustments needed <sup>8</sup>	Clear, colorless <sup>8</sup>	No, do not mix with other insulins, do not extract from insulin pen <sup>8</sup>	Once daily, anytime of day, but always at the same time every day <sup>8</sup>	Electrolytes <sup>8</sup>
6 hrs <sup>8</sup>		12-16hrs <sup>19</sup>	5 days to steady state conc <sup>19</sup>							
Insulin degludec (Tresiba® FlexTouch® <b>U-100</b> <b>U-200</b>		1 hr <sup>20</sup>	9hrs <sup>20</sup>		25hrs <sup>20</sup>	No adjustments provided, monitor glucose levels closely in renal/hepatic impairment <sup>20</sup>	Clear, colorless <sup>21</sup>	No-do not mix with other insulins <sup>20</sup>	Once daily <sup>20</sup>	Electrolytes, lipid profile, renal/hepatic function <sup>20</sup>
Insulin detemir <b>U-100</b> (Levemir®)		3-4hrs <sup>10</sup>	3-9hrs <sup>10</sup>	6-23hrs (dose dependent) <sup>10</sup>	5-7hrs (dose dependent) <sup>10</sup>	No adjustments needed <sup>10</sup>	Clear, colorless <sup>10</sup>	No <sup>10</sup>	Once to twice daily. When given twice daily administer 12 hours from morning dose or with the evening meal <sup>10</sup>	Electrolytes, lipid panel, renal function <sup>10</sup>
70% insulin aspart protamine suspension 30% insulin aspart injection (Novolog® Mix 70/30)	Mixed	10-20min <sup>11</sup>	1-4hrs <sup>11</sup>	18-24hrs <sup>11</sup>	~8-9hrs <sup>11</sup>	No adjustments needed <sup>11</sup>	Cloudy or milky <sup>11</sup>	No <sup>11</sup>	Usually twice daily. Administer within 15 minutes before or after a meal. Vial should be rolled between the palms to achieve proper consistency <sup>11</sup>	Electrolytes <sup>11</sup>
75% insulin lispro protamine 25% insulin lispro (Humalog® Mix 75/25)		0.25-0.5hrs <sup>12</sup>	1-6.5hrs <sup>12</sup>	14-24hrs <sup>12</sup>	Cannot be calculated <sup>13</sup>	No adjustments needed <sup>12</sup>	Cloudy or milky <sup>12</sup>	No <sup>12</sup>	Once to twice daily. Give 15 minutes before a meal. Vial should be rolled between the palms to achieve proper consistency <sup>12</sup>	Electrolytes <sup>12</sup>
50% insulin lispro protamine 50% insulin lispro (Humalog® Mix 50/50)			0.8-4.8hrs <sup>12</sup>							
70% insulin NPH 30% insulin regular (Humulin® Mix 70/30, Novolin® Mix 70/30)		0.5hrs <sup>14</sup>	2-12hrs <sup>14</sup>	18-24hrs <sup>14</sup>	Cannot be calculated <sup>15</sup>	No adjustments needed <sup>14</sup>	Cloudy or milky <sup>14</sup>	No <sup>14</sup>	Once to twice daily 30 minutes before a meal. Vial should be rolled between the palms to achieve proper consistency <sup>14</sup>	Electrolytes <sup>14</sup>

### Initial Dosing Guideline

"Start low, and go slow"<sup>16</sup>

1 unit for every 10g of carbohydrate<sup>16</sup>

**Intensive Insulin dosing**<sup>17</sup>: Starting dose= 0.3-0.5 units/kg/day Basal-bolus regimen: 50% basal, 50% bolus

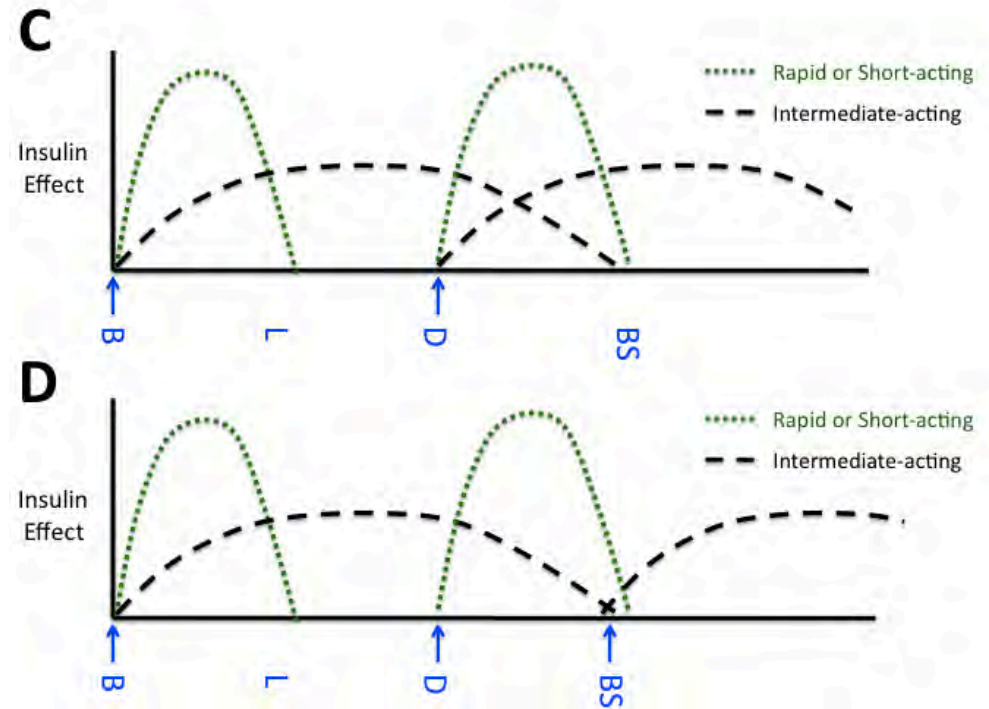
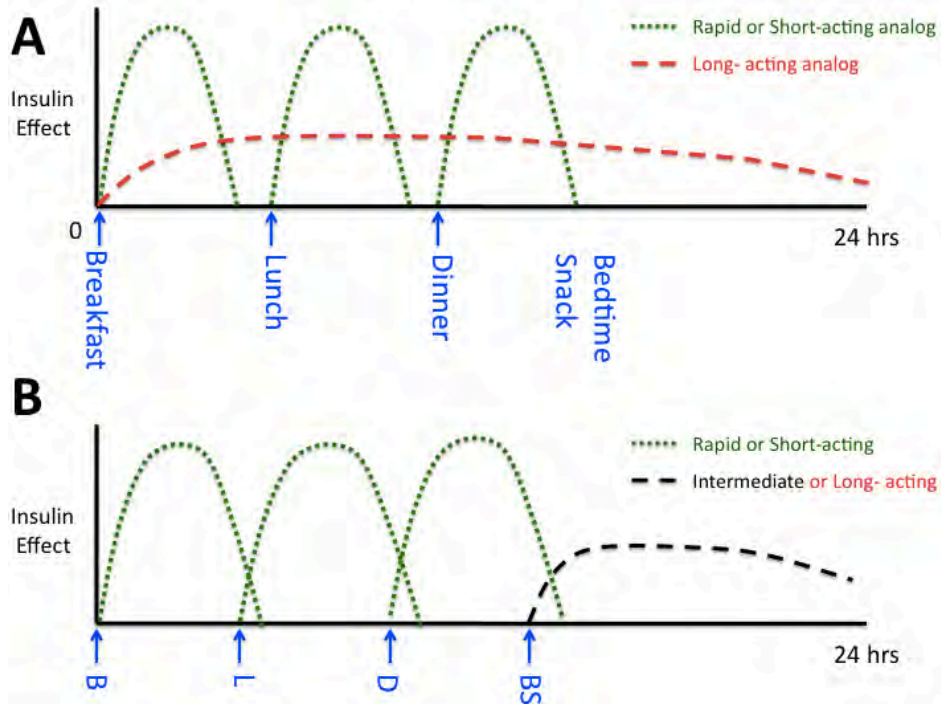
**Split-mix regimens**: varies by number of injections/products used

Typical starting regimen: Insulin glargine 10 units at bedtime ± mealtime coverage<sup>16</sup>

### Use of Insulin Pens: (eg. FlexTouch®, SoloSTAR®, FlexPen®, ReliOn®, KwikPen®)

- Insulin pens and needles should not be shared with other people
- Use a new needle for each injection
- Use of insulin pens requires training and education to insure delivery of the correct dosage
- Follow directions for the proper storage of pens

### Sample Dosing Regimens<sup>18</sup>:



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