

INSULIN Comparison Chart

1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17

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Type of Insulin	Form 100u/ml	Source	Onset (hrs)	Peak (hrs)	Duration (hrs)	Comments
Rapid acting Insulin lispro Humalog ☞ Insulin aspart NovoRapid ☞	{clear} v, c ^{xv} , p ^{xv} v, p	Recombinant DNA tech. analog	0.25+ ♦minimum variability between sites ♦less early night hypoglycemia than reg. ♦1 unit is equal to ~15g of carbohydrate	<0.75 - 2.5	3.5 - 5	DOSING: 0.5 - 1 u/kg/day lean body weight • Administration: Regular – 20-30min ac Lispro – within 10 min ac MIXING: • Compatibilities: Regular with all insulins; NPH with Regular; Lente/Ultralente with Regular; Lispro with NPH, UltraLente • always draw up short-acting/ R insulin first to prevent contamination with longer acting • mixtures should be injected immediately as alterations in formulations' pharmacodynamics occur dependent on concentration and elapsed time • phosphate buffer in NPH causes U/L to become shorter-acting when mixed HYPOGLYCEMIA: ♦ Symptoms: Mild/moderate = sweating, tremor, tachycardia, hunger, lethargy, weakness Severe = confusion, disorientation, altered behavior/speech, seizures, coma ♦ Incidence: higher with intensive vs conventional; (in UKPDS risk of ANY hypoglycemic event/yr: glyburide=21%; insulin =28% {1.8% severe} ♦ Treatment: Mild = fruit juice, sugar cubes, glucose tabs/gel package LifeSavers (glucose/dextrose absorbed directly, don't require prior digestion) Severe (e.g. unconscious) = 1mg glucagon IM/SC; 50 ml D50W ♦ Prevention: regular monitoring/exercise, balanced meals OTHER SIDE EFFECTS: ♦ Weight gain: greater in intensive vs conventional (4.6kg/5yrs DCCT ^{11,12}); encourage diet & exercise to minimize • Lipodystrophy - must rotate sites SC VARIABILITY: ♦ onset/peak/duration for SC insulins is highly variable between patients and even at different times for the same patient; the longer acting the insulin, the greater the variability seen (e.g. +/- 15% with Reg; +/- 30% with NPH) SUPPLEMENT DOSING: rapid or short acting insulin used to correct hyperglycemia; often given with prandial insulin dose; conservative dose: Type 1 DM=1 U per 2.7 _{mmol/L} above target BG; Type 2 DM=1 U per 1.7 _{mmol} above target BG (caution if <3 hours since previous insulin, or if planning exercise soon after, etc.)
Short-acting or Regular Insulin Humulin R Novolin ge Toronto Iletin II R	{clear} v, c v, p ^{xv} , s ^{xv} v	Recombinant DNA tech. Human Pork	0.5 - 1 Note: For very large doses , a special 500 U/ml Humulin R is also available	2 - 5	5 - 8	
Intermediate-acting or NPH Humulin N Novolin ge NPH Iletin II NPH	v, p ^{xv} , c v, p ^{xv} , s ^{xv} v	Recombinant DNA tech. Human Pork	1 - 2 ♦ Human analog insulins generally shorter acting than Beef/Pork insulins. ♦ Beef insulin no longer made in Canada; available from the UK through Health Canada-Special Access Program.	4 - 12	14 - 18 (range 12-24)	
Premixed Humulin 20/80 30/70 Novolin GE 10/90; 20/80 30/70 40/60; 50/50 Humalog Mix25 ☞	c ^{xv} v, c p v, p ^{xv} , s ^{xv} p c, p ^{xv}	Recombinant DNA tech. Human	0.5 - 1	2-12 Dual Peak	14 - 18 (range 12-24)	
Intermediate-acting or Lente Humulin L Novolin ge Lente Discontinued 2003 Iletin II Lente	v v	Recombinant DNA tech. Human Pork	2-4	7-15	12-24	
Long-acting or Ultra Lente Humulin U Novolin ge Ultralente Discontinued 2003	v	Recombinant DNA tech. Human	3- 4	8 - 24	24 - 28	
Insulin Glargine Lantus ✕ ⊗ ♦ Approved ²⁰⁰² ; available in Canada – Feb 2005	{clear}	analog	>1.5	No Peak	>20	

INSULIN REGIMEN	SCHEDULE	COMMENT
Conventional Regimens H/A = Humalog (lispro) or NovoRapid (aspart) R = Regular/Toronto N = NPH L = Lente U = Ultralente	OD insulin: N or L before breakfast	Simple but generally poor control (e.g. meal related hyperglycemia); <24hr coverage
	BID insulin: N or L before breakfast & supper	Improved morning control & overnight coverage; no provision for meal coverage
	BID insulin: { R or H/A ac breakfast & supper and N or L ac breakfast & supper }	Most common; better meal control
	BID insulin: { R or H/A ac breakfast & supper and N or L ac breakfast and U ac supper }	U more likely to last till next morning
	BID insulin: { R or H/A ac breakfast & supper and N or L ac breakfast & bedtime }	Most likely to last till next morning
Multidose Intensive Regimens (MDI) (~40% of total insulin dosed as basal insulin)	R or H/A TID ac; N, L or U ac supper or hs	Good control, flexible regarding meals; demands frequent & consistent testing at start
	R or H/A TID ac; N,L or U BID (ac breakfast & supper or bedtime	Better suited for people with varying schedules; flexibility with regards to meals
Intensive Continuous SC Infusion (CSII)	R or H/A basal and boluses prn; rapid analogues preferred	More flexible & better control; ↑ \$; ↑ risk of rapid ketoacidosis, etc upon d/c
Insulin + Oral Hypoglycemics	common: N or U at bedtime, with 1-2 oral agents during day	Less insulin requirement ~0.1u/kg & weight gain than insulin alone (esp. Metformin!)

Forms: v=vial p=pen c=cartridge s=syringe; ac=before meals CSII=continuous subcutaneous insulin infusion d/c=discontinuation ☞=Exception Drug Status (EDS) in Sask. ✕ =Nonformulary Sk. ▼ covered by NIHB

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