The Pan Mersey APC advocates the use of <u>NICE guidelines in the management of diabetes</u> and has issued a summary of <u>recommendations to reduce errors in prescribing and administration</u>. This insulin identification chart aims to reduce the risk of unintentional duplication of similar insulins. Pharmacokinetic data on the onset and duration of action should only be used as a guide to the type of insulin and must not replace clinical judgement.

Advice for all healthcare professionals

- All insulin requires specialist initiation of prescribing.
- Always prescribe insulin using the brand name, the strength and the form of delivery.
- If specified, the dose must include a frequency and be expressed as a number of units followed by the word 'units' spelled out in lower case.
- Ensure that patients read the pictorial or written information supplied and understand which insulin they are using so that they can be sure they are on the right treatment, especially if the patient has been transferred from standard-strength insulin to high-strength insulin.
- Insulin passports should be issued when prescribing insulin: The adult patient's passport to safer use of insulin.
- Never use a syringe to withdraw insulin from a pre-filled pen or penfill cartridge.

Types of insulin regimen

One, two, or three insulin injections per day

These are usually injections of short-acting insulin or rapid-acting insulin analogue, mixed with intermediate-acting insulin (biphasic regimen). Long acting and intermediate acting insulins may also be used without rapid or short acting insulin.

Multiple daily injection basal-bolus insulin

The person has injections of short-acting insulin or rapid-acting insulin analogue before meals, together with one or more separate daily injections of intermediate-acting insulin or long-acting insulin analogue to cover the basal requirement.

Continuous subcutaneous insulin infusion (insulin pump)

This is a programmable pump and insulin storage reservoir that gives a regular or continuous amount of insulin (usually in the form of a rapid-acting insulin analogue or short-acting insulin) by a subcutaneous needle or cannula. Insulin pumps can be supplemented by short-acting insulin or rapid-acting insulin analogue injections

Insulin can also be used in combination with oral antidiabetic medication in type 2 diabetes.

More comprehensive information on meters, medications, pens and pumps available in the UK can be found at diabetes.org.uk.

APC board date: 20 Nov 2016 | Last updated: 31 Oct 2019
Review date: Oct 2021 (or earlier if there is significant new evidence relating to this recommendation)
APC administration provided by Midlands and Lancashire Commissioning Support Unit

Safety statement Version: 2.1

Rapid acting analogue Onset, duration, usual timing [1,2,3] Delivery system [4] Presentation Preparation **Apidra** Onset: 10 – 20 minutes 100 units/ml 10 ml vial *Duration*: 1.5 – 4 hours U100 insulin syringe with needle[†], INJEX 30, InsuJet, Glulisine Usual timing: just before / with / infusion pump system Analogue just after meals; or continuous 100 units/ml 3 ml cartridge infusion† Apidra® 100 Uni AllStar PRO, JuniorSTAR ⊕, Autopen24, INJEX 30, InsuJet 100 units/ml 3 ml pre-filled pen SoloStar **NovoRapid** 100 units/ml 1.6ml cartridge Onset: 10 – 20 minutes NovoRapi *Duration*: 3 – 5 hours PumpCart (infusion pump system) Aspart **PumpCart** Usual timing: just before / with / Analogue just after meals; or continuous 100 units/ml 10 ml vials infusion† U100 insulin syringe with needle[†], INJEX 30, InsuJet, infusion pump system 100 units/ml 3 ml cartridge 3 ml NovoRapid® Penfill® NovoPen 5, NovoPen Echo ⊕, INJEX 30, InsuJet 100 units/ml 3 ml pre-filled pen NovoRapid® FlexPen FlexPen® 100 units/ml 3 ml pre-filled pen NovoRapid® **FlexTouch** FlexTouch®

[†] If administration by syringe or infusion pump is necessary, a 10 ml vial should be used.

[•] half unit increments.

Rapid acting analogue Onset, duration, usual timing [1,2,3] Delivery system [4] Preparation Presentation Humalog Onset: 15 minutes 100 units/ml 10 ml vial U100 insulin syringe with needle[†], INJEX 30, InsuJet, Lispro *Duration*: 2 – 5 hours Usual timing: just before / with / infusion pump system Analogue just after meals; or continuous infusion† 100 units/ml 3 ml cartridge Humapen Luxura HD ⊕, Humapen Savvio, Autopen Classic, INJEX 30, InsuJet 100 units/ml 3 ml pre-filled pen KwikPen 200 units/ml 3 ml pre-filled pen KwikPen 100 units/ml 3 ml pre-filled pen Junior KwikPen Onset: 4 minutes 100 units/ml 10 ml vial Fiasp ▼ U100 insulin syringe with needle[†], INJEX 30, InsuJet, *Duration*: 3 – 5 hours Aspart Usual timing: just before / with / infusion pump system Analogue just after meals; or continuous infusion† 100 units/ml 3 ml cartridge Fiasp® Penfill® 100 units/mL NovoPen 5, NovoPen Echo ⊕, INJEX 30, InsuJet 100 units/ml 3 ml pre-filled pen Fiasp **FlexTouch**

[†] If administration by syringe or infusion pump is necessary, a 10 ml vial should be used.

[•] half unit increments.

Rapid acting analogue				
Preparation	Onset, duration, usual timing [1,2,3]	Delivery system [4]	Presentation	
Insulin lispro Sanofi ▼ Lispro Analogue	Onset: 15 minutes Duration: 2 – 5 hours Usual timing: just before / with / just after meals; or continuous infusion†	100 units/ml 10 ml vial U100 insulin syringe with needle [†] , INJEX 30, InsuJet, infusion pump system 100 units/ml 3 ml cartridge AllStar PRO, JuniorSTAR ⊕, Autopen24, INJEX 30, InsuJet 100 units/ml 3 ml pre-filled pen SoloStar	Insulin lispro Sanofi Insulin lispro Sanofi Insulin lispro Insulin Insulin lispro Insulin Insul	

Short acting / neutral				
Preparation	Onset, duration, usual timing [1,2,3]	Delivery system [4]	Presentation	
Actrapid Soluble <i>Human</i>	Onset: < 30 minutes Duration: 7 – 8 hours Usual timing: 30 minutes before meals	100 units/ml 10 ml vial U100 insulin syringe with needle‡, INJEX 30, InsuJet	Actrapid® 100 IU/ml Solution for injection Insulin human (rDNA) SC. TV UKE	
Humulin S Soluble Human	Onset: 30 minutes – 1 hour Duration: 6 – 12 hours Usual timing: 20 – 45 minutes before meals	100 units/ml 10 ml vial U100 insulin syringe with needle‡, INJEX 30, InsuJet	Humulin 20 Um 20 Um	
		100 units/ml 3 ml cartridge Humapen Luxura HD ⊕, Humapen Savvio, Autopen Classic, INJEX 30, InsuJet	Hearth Later 1 10 10 10 10 10 10 10 10 10 10 10 10 1	

[†] If administration by syringe or infusion pump is necessary, a 10 ml vial should be used. ‡ If administration by syringe is necessary, a 10 ml vial should be used.

[→] half unit increments.

Short acting / neutral				
Preparation	Onset, duration, usual timing [1,2,3]	Delivery system [4]	Presentation	
Hypurin Porcine Neutral Soluble Porcine	Onset: 30 minutes – 1 hour Duration: 6 – 8 hours Usual timing: 30 minutes before meals	100 units/ml 10 ml vial U100 insulin syringe with needle‡, INJEX 30, InsuJet 100 units/ml 3 ml cartridge	TOMI TOWN NOW THE STATE OF THE	
		Autopen Classic, INJEX 30, InsuJet	HYPURIN® PORCINE Neutral Solution For Impection	
Insuman Rapid Soluble Human	Onset: < 30 minutes Duration: 7 – 9 hours Usual timing: 15 – 20 minutes before meals	100 units/ml 3 ml cartridge AllStar PRO, JuniorSTAR ⊕, Autopen24, INJEX 30, InsuJet	Insuman® Rapid 100 IU/ml sough acoupt Solution for injection	

Medium- and long-acting			
Preparation	Onset, duration, usual timing [1,2,3]	Delivery system ^[4]	Presentation
Humulin I Isophane Human	Onset: 30 minutes – 1 hour Duration: 22 hours Usual timing: about 30 minutes before meals or bed, usually once	100 units/ml 10 ml vial U100 insulin syringe with needle‡, INJEX 30, InsuJet	
	or twice daily	100 units/ml 3 ml cartridge Humapen Luxura HD ⊕, Humapen Savvio, Autopen Classic, INJEX 30, InsuJet	Humulin® 100 NAMM
		100 units/ml 3 ml pre-filled pen KwikPen	Pharmacher Pharma

 $[\]ensuremath{\ddagger}$ If administration by syringe is necessary, a 10 ml vial should be used.

[→] half unit increments.

Preparation	Onset, duration, usual timing [1,2,3]	Delivery system ^[4]	Presentation
Hypurin Porcine Isophane Isophane	Onset: < 2 hours Duration: 18 – 24 hours Usual timing: as advised by healthcare team, once or twice	100 units/ml 10 ml vial <i>U100 insulin syringe with needle‡, INJEX 30, InsuJet</i>	Tomi Isophane Isophane Isophane Isophane insulin injectic Internation to adding Internation to adding the adding Internation to a damp in the adding the a
Porcine	daily	100 units/ml 3 ml cartridge Autopen Classic, INJEX 30, InsuJet	PORCINE Isophane ≥ 2 S
Insulatard Isophane <i>Human</i>	Onset: < 1.5 hours Duration: 24 hours Usual timing: as advised by healthcare team, once or twice	100 units/ml 10 ml vial U100 insulin syringe with needle‡, INJEX 30, InsuJet	Insulatard® 100 Ul/ml Suspension injectable Insuline humaine (ADNr)
	daily	100 units/ml 3 ml cartridge NovoPen 5, NovoPen Echo ⊕, INJEX 30, InsuJet	(Insulatard® Penfill®)
		100 units/ml 3 ml pre-filled doser InnoLet	50 1 110 455 40° 35° 30° 25 35° 30° 25
Insuman Basal Isophane Human	Onset: < 1 hour Duration: 11 – 20 hours Usual timing: 45 – 60 minutes before meals, usually once or twice daily	100 units/ml 5 ml vial U100 insulin syringe with needle‡, INJEX 30, InsuJet	Insuman® Basa Supension for injectiful furman Subcutaneous use.
		100 units/ml 3 ml cartridge AllStar PRO, JuniorSTAR ⊕, Autopen24, INJEX 30, InsuJet	Insuman* Basal 100 IU/ml Suspension for injection in a castridge
		100 units/ml 3 ml pre-filled pen SoloStar	Insuman Basal SoloStar 100 N/mal suspension for injection

[‡] If administration by syringe is necessary, a 10 ml vial should be used.

[•] half unit increments.

Mixed	Mixed			
Preparation	Onset, duration, usual timing [1,2,3]	Delivery system [4]	Presentation	
Humulin M3 30% soluble 70% isophane Human	Onset: 30 – 60 minutes Duration: 22 hours Timing: 20 – 45 minutes before meals	100 units/ml 10 ml vial U100 insulin syringe with needle‡, INJEX 30, InsuJet		
		100 units/ml 3 ml cartridge Humapen Luxura HD →, Humapen Savvio, Autopen Classic, INJEX 30, InsuJet	Humulin [®] M3 100 IUml Supposed for reporting of Chemistry	
		100 units/ml 3 ml pre-filled pen KwikPen	Harmaday W. 3 Kwilk Part 100 kmd Formation Will Same 100 kmd Formation State of Same 100 kmd F	
Hypurin Porcine 30/70 Mix 30% neutral	Onset: < 2 hours Duration: 24 hours Timing: as advised by healthcare team, usually within 30 minutes of	100 units/ml 10 ml vial U100 insulin syringe with needle‡, INJEX 30, InsuJet	10ml 10ml 30,70 Mix Saverson, For Injection In	
70% isophane <i>Porcine</i>	a meal twice a day	100 units/ml 3 ml cartridge Autopen Classic, INJEX 30, InsuJet	3ml HYPURIN® PORCINE 30/70 Mix Suspension For Injection	
NovoMix 30 30% soluble aspart 70% protamine aspart	Onset: 10 – 20 minutes Duration: 24 hours Timing: just before / with / just after meals	100 units/ml 3 ml cartridge NovoPen 5, NovoPen Echo ⊕, INJEX 30, InsuJet 100 units/ml 3 ml pre-filled pen FlexPen	NovoMix® 30 Penfill® 100 units/ml 1superation for injection NovoMix® 30 FlexPen®	
Human				

[‡] If administration by syringe is necessary, a 10 ml vial should be used.

[•] half unit increments.

Mixed			
Preparation	Onset, duration, usual timing [1,2,3]	Delivery system [4]	Presentation
Insuman Comb 15 15% neutral 85% isophane Human	Onset: 30 – 60 minutes Duration: 11 – 20 hours Timing: 30 – 45 minutes before meals	100 units/ml 3 ml cartridge AllStar PRO, JuniorSTAR ⊕, Autopen24, INJEX 30, InsuJet	Insuman Comb T: 100 IU/ml suspension for injection
Insuman Comb 25 25% neutral 75% isophane Human	Onset: 30 – 60 minutes Duration: 12 – 19 hours Timing: 30 – 45 minutes before meals	100 units/ml 5 ml vial U100 insulin syringe with needle‡, INJEX 30, InsuJet	Insuman ® Combination for injection for inje
		100 units/ml 3 ml cartridge AllStar PRO, JuniorSTAR →, Autopen24, INJEX 30, InsuJet 100 units/ml 3 ml pre-filled pen SoloStar	Insuman® Comb 25 100 IU/ml Suspension for injection In a cartridue Insuman® Comb25 100 IU/ml ourgenoum for injection in a per filled pen, invalid framan Solotiar Solotiar
Insuman Comb 50 50% neutral 50% isophane Human	Onset: < 30 minutes Duration: 12 – 16 hours Timing: 20 – 30 minutes before meals	100 units/ml 3 ml cartridge AllStar PRO, JuniorSTAR ⊕, Autopen24, INJEX 30, InsuJet	Insuman® Comb 58 100 IU/ml Suspension for injection in a cartridge

[‡] If administration by syringe is necessary, a 10 ml vial should be used.

[•] half unit increments.

Mixed	Mixed				
Preparation	Onset, duration, usual timing [1,2,3]	Delivery system [4]	Presentation		
Humalog Mix 25 25 % lispro 75% lispro protamine Analogue	Onset: 15 minutes Duration: 22 hours Timing: just before / with / just after meals; usually once or twice a day	100 units/ml 10 ml vial U100 insulin syringe with needle‡, INJEX 30, InsuJet, infusion pump system 100 units/ml 3 ml cartridge Humapen Luxura HD	Humalog® Mix 25" 100 U/ml suspension for Injection to distribution Humalog® Mix 25" 100 Um Mulkerif Contending to typicals (Contending to typicals (C		
Humalog Mix 50 50% lispro 50% lispro protamine Analogue	Onset: 15 minutes Duration: 22 hours Timing: just before / with / just after meals; usually once or twice a day	100 units/ml 3 ml cartridge Humapen Luxura HD, Humapen Savvio, Autopen Classic, INJEX 30, InsuJet 100 units/ml 3 ml pre-filled pen KwikPen	Humalog Mix 50 100 U/ml suspension for injection in controlling Humalog Mix 50 100 Um Kw/iR Pon 10		

Long-acting analogue				
Preparation	Onset, duration, usual timing [1,2,3]	Delivery system [4]	Presentation	
Abasaglar ▼ Glargine Analogue	Onset: 30 – 60 minutes Duration: 24 hours Timing: once daily at any time but	100 units/ml 3 ml cartridge Humapen Luxura HD ⊕, Humapen Savvio, Autopen Classic, INJEX 30, InsuJet	ABASAGLAR® TO U/mL 00.800.	
	at the same time each day	100 units/ml 3 ml pre-filled pen KwikPen	ABASACLAR KAMPAN 100 Ulmd Litterprise interprises	

[‡] If administration by syringe is necessary, a 10 ml vial should be used.

[→] half unit increments.

Long-acting analogue Onset, duration, usual timing [1,2,3] Delivery system [4] Preparation Presentation Onset: 30 – 60 minutes 100 units/ml 3 ml pre-filled pen Semglee ▼ Duration: 24 hours Glargine Timing: once daily at any time but Analogue at the same time each day Onset: 30 – 60 minutes 100 units/ml 10 ml vial Lantus U100 insulin syringe with needle‡, INJEX 30, InsuJet Glargine Duration: 24 hours Timing: once daily at any time but Analogue at the same time each day 100 units/ml 3 ml cartridge Lantus 100 units/ml AllStar PRO, JuniorSTAR ⊕, Autopen24, INJEX 30, InsuJet 100 units/ml 3 ml pre-filled pen Lantus SoloStar SoloStar 100 units/ml 3 ml cartridge Levemir Onset: 30 – 60 minutes Levemir[®] Duration: 24 hours Detemir NovoPen 5, NovoPen Echo ⊕, INJEX 30, InsuJet *Timing*: once daily at any time but Analogue 100 units/ml 3 ml pre-filled pen at the same time each day; for FlexPen twice daily dosing, the evening 100 units/ml 3 ml pre-filled doser dose can be in the evening or at InnoLet bedtime Toujeo 300 units/ml 1.5 ml pre-filled pen Onset: 30 – 60 minutes TOUJEO" SoloSto SoloStar Duration: 24 – 36 hours Glargine Timing: once daily at any time but 300 units/ml 3 ml pre-filled pen Analogue at the same time each day DoubleStar (2 unit increment)

[‡] If administration by syringe is necessary, a 10 ml vial should be used.

[•] half unit increments.

Long-acting analogue				
Preparation	Onset, duration, usual timing [1,2,3]	Delivery system [4]	Presentation	
Tresiba Degludec Analogue	Onset: 30 minutes – 1.5 hours Duration: > 42 hours Timing: once daily at any time but at the same time each day	100 units/ml 3 ml cartridge NovoPen 5, NovoPen Echo ⊕, INJEX 30, InsuJet 100 units/ml 3 ml pre-filled pen FlexTouch	Tresiba® 100 units/mL Penfill® Tresiba® Tresiba® Tresiba® Tresiba® Tresiba® Tresiba® Tresiba® Tresiba®	
		200 units/ml 3 ml pre-filled pen FlexTouch (2 unit increment)	Tresiba® 200 Perfouds and the state of the	

References

- 1. Datapharm (2019). electronic Medicines Compendium [online]. Available at https://www.medicines.org.uk/emc [Accessed May 2019]
- 2. Haymarket (2019). MIMS [online]. Available at https://www.mims.co.uk/ [Accessed May 2019]
- 3. Diabetes UK (2017). Diabetes update: Insulins [online]. Available from https://www.diabetes.org.uk/resources-s3/2017-11/wallchartinsulins.pdf [Accessed May 2019]
- 4. Diabetes UK (2017). Diabetes update: Meds & Kit [online]. Available from https://shop.diabetes.org.uk/products/meds-kits-for-healthcare-professionals [Accessed May 2019]

The author would like to thank Lilly, Mylan, Novo Nordisk, Sanofi, and Wockhardt, for their contribution of images.