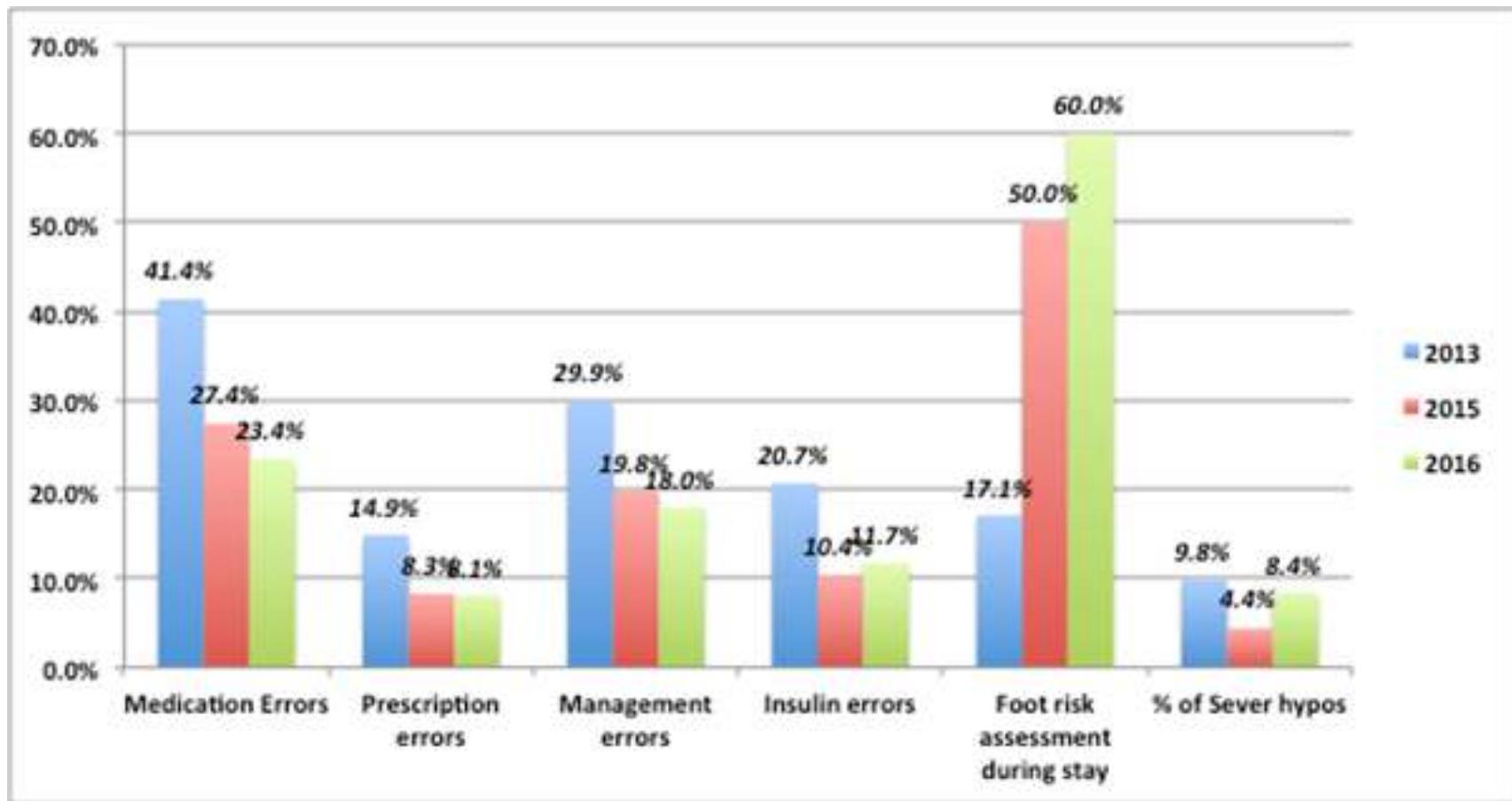


# Supporting material - NADIA report comparison 2013 vs 2015 and 2016

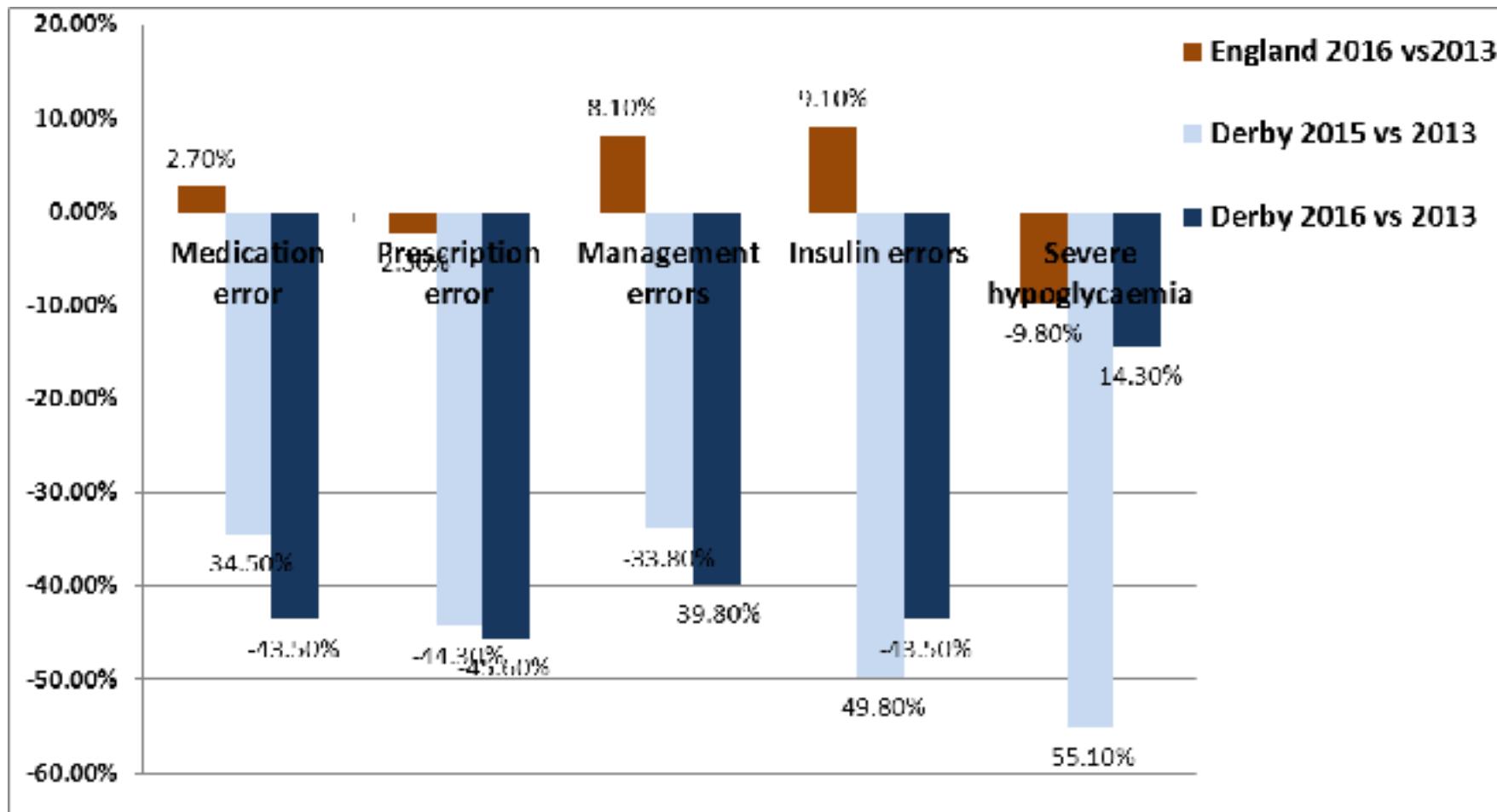
<b><i>Area of improvement- NaDIA</i></b>	<b>2013</b>	<b>2015</b>	<b>2016</b>
<b><i>Medication Errors</i></b>	<b>41.4%</b>	<b>27.4% (↓↓)</b>	<b>23.4% (↓)</b>
<b><i>Prescription errors</i></b>	<b>14.9%</b>	<b>8.3% (↓↓)</b>	<b>8.1% (↓)</b>
<b><i>Management errors</i></b>	<b>29.9%</b>	<b>19.8% (↓↓)</b>	<b>18% (↓)</b>
<b><i>Insulin errors</i></b>	<b>20.7%</b>	<b>10.4% (↓↓)</b>	<b>11.7% (↑)</b>
<b><i>Foot risk assessment during stay</i></b>	<b>17.1%</b>	<b>50% (↑↑)</b>	<b>60% (↑)</b>
<b><i>% of Severe hypos</i></b>	<b>9.8%</b>	<b>4.4% (↓↓)</b>	<b>8.4% (↓)</b>

## NADIA results for Derby 2013, 2015 and 2016

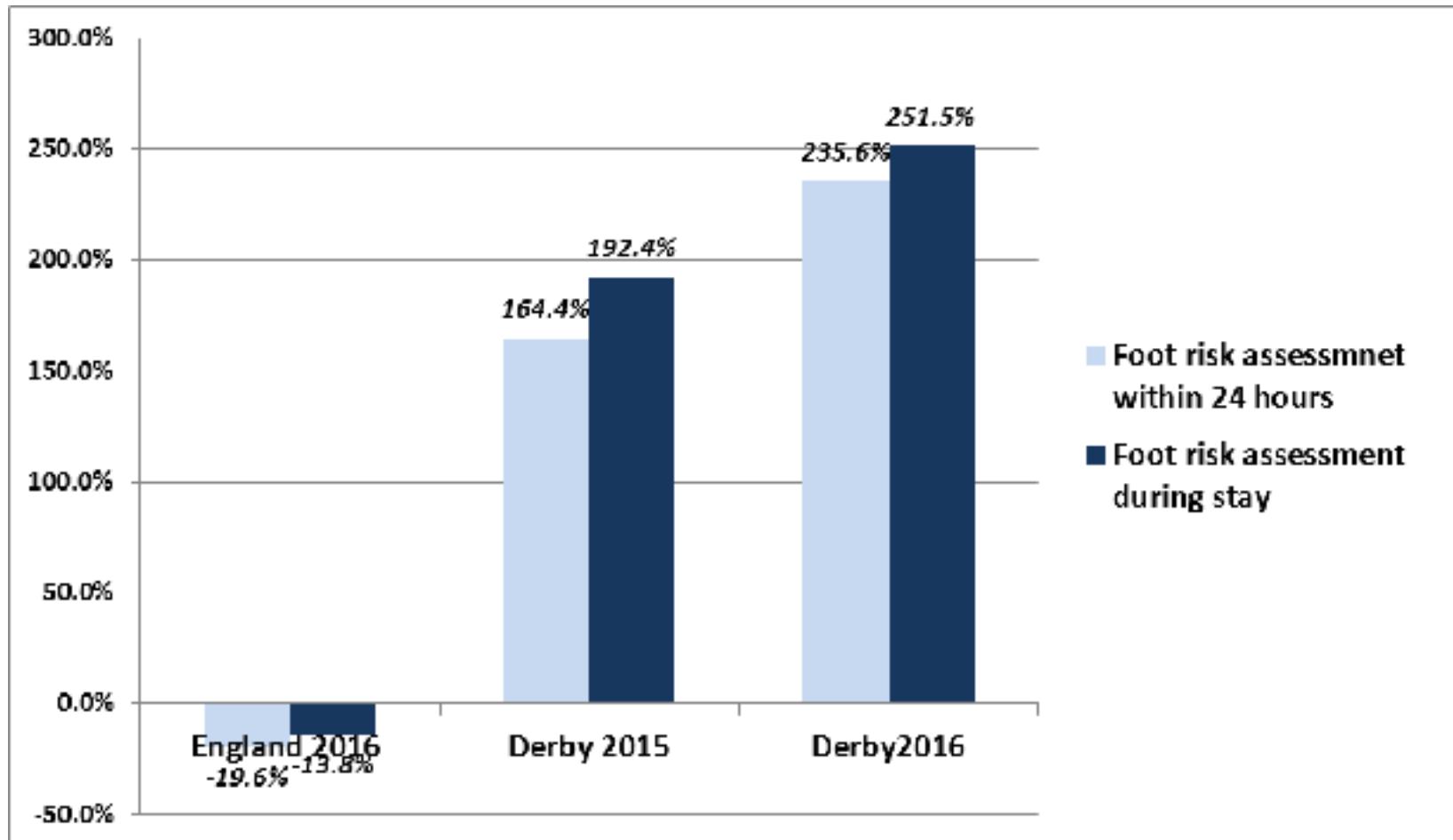


# Percentage change in errors (NADIA). comparing

## England 2016, Derby 2016 & 2015 vs 2013



# Percentage change in Foot risk assessments- NADIA 2013 vs 2015 and 2016



## Supporting material - Email from NADIA team congratulating on the improvement

We received an email from NADIA HSCIC (HEALTH AND SOCIAL CARE INFORMATION CENTRE)

Dear Colleagues,

We are writing to you regarding the recent publication of the National Diabetes Inpatient Audit (NaDIA) 2015 results for [Royal Derby Hospital](#). After analysing the recently published hospital level results of the audit, we were pleased to find that the hospital has improved significantly in the below areas:

<b>Area of Improvement</b>	<b>2013 (%)</b>	<b>2015 (%)</b>
Medication errors	41.4%	27.1%
Prescription errors	14.9%	8.3%
Management errors	29.9%	19.8%
Insulin errors	20.7%	10.4%
Foot risk assessment during stay	17.1%	50.0%
% Severe hypo	9.8%	4.4%

Firstly, we would like to congratulate you on the improvements outlined above and the work you have been doing to improve these areas.

---

## Email from Medical Director conveying appreciation from the Trust Board

**Subject:** National Diabetes Audit - Thanks from the Board

Dear All,

At Trust Board yesterday, the results of the latest national Diabetes Inpatient Audit were described in the quality report. The Trust Board asked me to pass on their appreciation and thanks for the excellent work of the Insulin Safety Group in improving outcomes of our patients and placing the Trust in the best quartile in so many categories

Well done indeed!

Best wishes

Nigel

Dr Nigel Sturrock  
Executive Medical Director

# Supporting material - Electronic prescription screen shot

Patient List Orders Results Documentation Observations Patient Info Emergency ECG Images E-Care Note PACS Images e-Leave

Filter: Orders All Status: All

From:	05 Oct 2016	To:	41
Order Selector:	41	Show New Orders...	
Display Format:	By Department: Requested by Requested By Details		

1. PHARM	LANTUS (Insul. In Glargine) · Schleifer (Disposable Pen) 10 Units · Structured Insulin Dosing ONCE daily at 8pm Subcutaneous	19-Jan-17	Active Master Order	
2. PHARM	NOVORAPID (Insulin Aspart) · FlexPen (Disposable Pen) 11-41 Units · Structured Insulin Dosing THREE times a day (8am,1pm,6pm) Subcutaneous if preprandial glucose high please give Novorapid as follows (Banane 12/14 U-1 unit, 15/17 U-2 units, 18/19 U-3 units, 21-4 units)	19-Jan-17	Active Master Order	
3. PHARM	NOVORAPID (Insulin Aspart) · FlexPen (Disposable Pen) 1 Unit(s) · Structured Insulin Dosing ONCE IMMEDIATELY (STAT) Subcutaneous	18-Jan-17	Completed	
4. PHARM	LAN L10 (Insul. In Glargine) · S. Lyle (Disposable Pen) 16 Units · Structured Insulin Dosing ONCE daily at 8pm Subcutaneous	11-Jan-17	Active Master Order	
5. PHARM	HUMULIN M 3 (Human insulin B proasic) · NovoPen (Disposable Pen) 20 Units · Structured Insulin Dosing ONCE Daily at 8am Subcutaneous Give with Food	17-Jan-17	Discontinued	18-Jan-17 09:54
6. PHARM	HUMULIN M 3 (Human insulin B proasic) · NovoPen (Disposable Pen) 14 Units · Patient Managed Dosing ONCE daily at 8am Subcutaneous Give with Food	15-Jan-17	Discontinued	18-Jan-17 09:54



ELM JIN 43 Human Insulin Biovicin Kwikpen (Disposable Pen) 20 Unit(s) Structured Insulin Dosing Lantus only at 6pm Subcutaneous GrowthFees	7-Jan-17 09:41	8-Jan-17 09:54	✓	TE							
LANTUS Insulin Egryne) Soester (Disposable Pen) 16 Unit(s) Structured Insulin Dosing Lantus only at 6pm Subcutaneous	✓	15-Jan-17 09:58		TE							
KYOROPE (Insulin/aspalt)  Kwikpen (Disposable Pen) 0-4 Unit(s) Structured Insulin Dosing THREE times a day 11am, 3pm, and Subcutaneous if premeal glucose: high please give NovoRapid as follows: Glucose: 12-14 mmol L <sup>-1</sup> ; 15-17.9 2 units, 18-20.9 3 units, >21 4 units		8-Jan-17 09:27						pw	pw		

## Supporting material - EPMA screen shot 3

## Insulin subcutaneous administration



Administered At

Date: 18-Jan-2017



Time: 18:00

**Supporting material - EPMA  
screen shot 4**

## Task Information

Task: LANTUS (Insulin Glargine) -  
Solostar (Disposable Pen)

Start Date/Time: 18-Jan-17 09:58

Stop Date/Time:

## Advisory Message

			18Jan17	
		Observation	18:00	
		Blood Glucose Level	26.9 mmols	
		Time of last Blood Glucose	17:00	
		Insulin Administered	Other (please spe...	
		Dose of Insulin Given	16 Unit(s)	
		Patient Self Administered	No	
		Additional Comments		

Performed By: Eaton, Tina ( Nurse )

Entered By:

OK

Cancel

Calculate

View Comment

Item Info

Help

# Supporting material - Ward assurance data

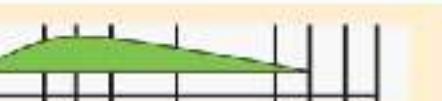
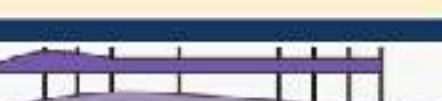
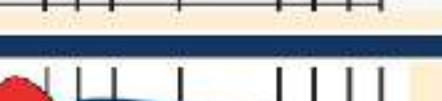
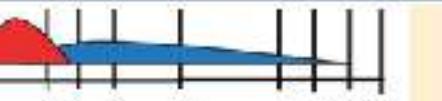
	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16
Continence	94.29%	97.46%	97.52%	96.19%	96.28%	94.66%	92.92%	94.11%	95.63%	96.12%	94.75%	96.16%	96.27%
Control	95.35%	97.81%	96.99%	95.93%	97.71%	93.55%	95.00%	93.94%	96.95%	92.31%	95.90%	97.56%	98.29%
Diabetes	No Data	29.73%	42.11%	29.65%	25.23%	32.46%	32.28%	39.35%	59.90%				
Dignity	98.72%	99.10%	99.20%	98.99%	99.30%	98.53%	99.21%	98.81%	98.85%	99.09%	98.30%	98.80%	99.06%
Discharge	94.07%	94.21%	93.35%	94.12%	85.33%	83.06%	82.84%	84.78%	92.15%	93.16%	94.47%	92.99%	93.77%
Falls	98.41%	97.42%	98.90%	97.85%	98.74%	97.04%	96.98%	96.16%	97.12%	97.37%	95.93%	95.57%	97.10%
IPC	96.36%	96.05%	95.98%	95.64%	95.29%	92.08%	96.90%	95.29%	96.37%	96.43%	96.22%	96.61%	97.70%
Medicine	94.68%	95.59%	95.00%	92.48%	92.53%	88.74%	91.27%	91.39%	92.70%	91.73%	92.40%	91.86%	92.06%

# Supporting material - Insulin profile chart adapted from Think Glucose



## Typical Insulin Profiles



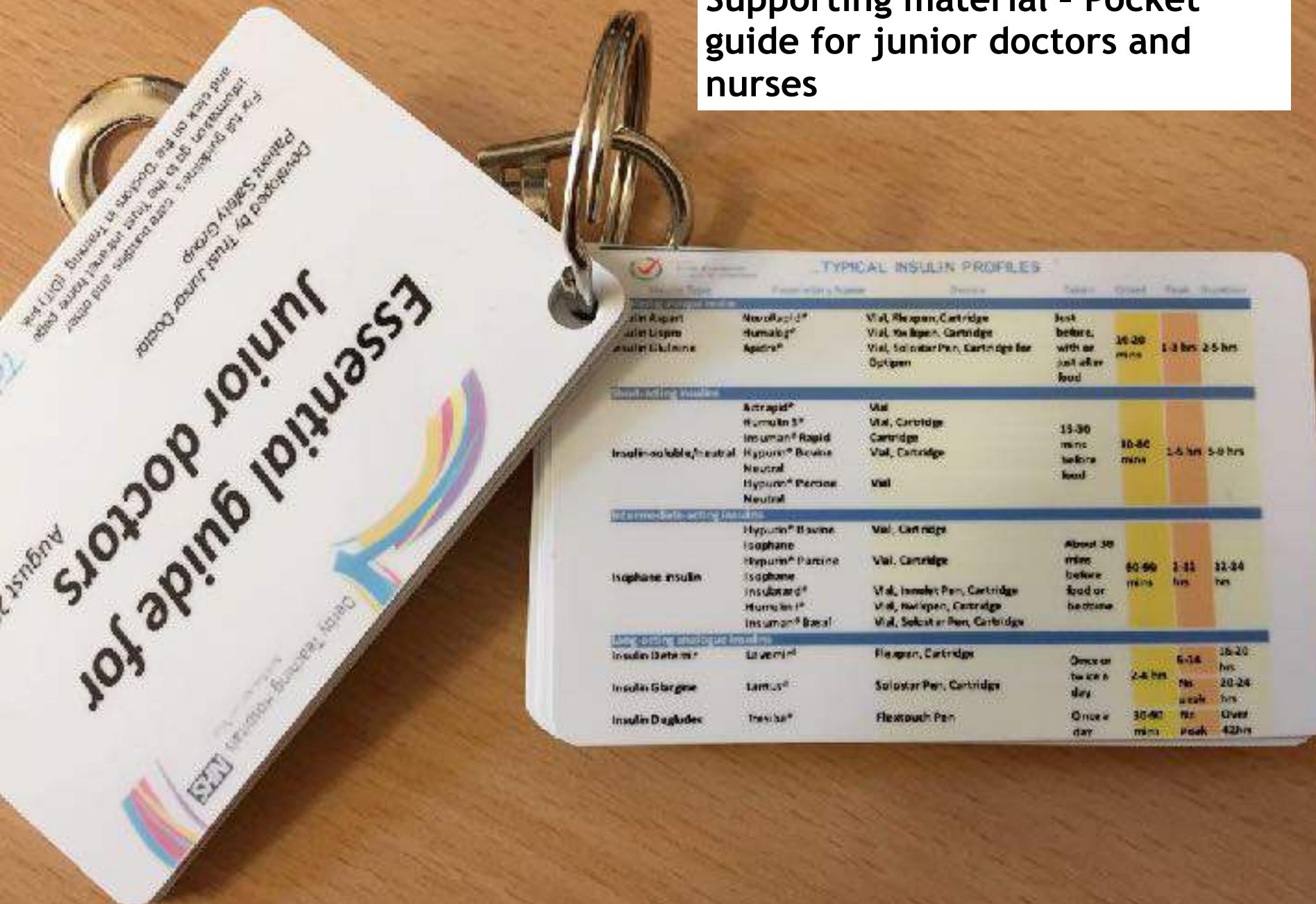
Insulin Type	Proprietary Name - use when prescribing	Manufacturer	Device	Taken	Dose	Peak	Duration	Typical activity profile
<b>Short-acting analogues insulin</b>								
Insulin Aspart	NovoRapid®	NovoNordisk	Vial, Flexipen, cartridge	Just before, with or just after food	10-20 mins	1-2 hrs	2-5 hrs	
Insulin Lispro	Humalog®	Lilly	Vial, Kwikpen, cartridge					
Insulin Glulisine	Apidra®	Sanofi-Aventis	Vial, Easidose pen, cartridge (v. Optisyringe)					
<b>Short-acting insulin</b>								
Insulin - soluble insulin	Aeropat®	NovoNordisk	Vial					
	Humulin S®	Lilly	Vial, cartridge					
	Humins® Rapid	Sanofi-Aventis	Cartridge	15-30 mins before food	35-60 mins	1-2 hrs	6-8 hrs	
	Humins® Bovine Neutral	Weekendt	Vial, cartridge					
	Humins® Porcine Neutral	Weekendt	Vial					
<b>Intermediate-acting insulin</b>								
Biphasic insulin	Humins® Bovine Neutral	Weekendt	Vial, cartridge					
	Humins® Porcine Neutral	Weekendt	Vial, cartridge					
	Humins®	NovoNordisk	Vial, Insulin pen, cartridge	About 30 mins before food or bedtime	70-90 mins	2-12 hrs	12-24 hrs	
	Humins® Basic	Sanofi-Aventis	Vial, Easidose pen, cartridge					
<b>Long-acting analogues insulin</b>								
Insulin Detemir	Lantus®	NovoNordisk	Flexipen, cartridge		2-4 hrs	3-4 hrs	12-20 hrs	
Insulin Glargin	Lantus®	Sanofi-Aventis	Insulin pen, cartridge	Once or twice a day	2-4 hrs	No peak	20-48 hrs	
Insulin Degludec	Tresiba®	NovoNordisk	Flexidash Pen	Once a day	35-90 mins	No peak	Over 42 hours	
<b>Mixed Insulins - Uptodate</b>								
Biphasic insulin aspart (analogue)	NovoMix® 30	NovoNordisk	Flexipen, cartridge	Just before, with or just after food	10-20 mins	1-4 hrs	Up to 24 hrs	
Biphasic insulin Lispro (analogue)	Humalog® Mix 25 Humalog® Mix 50	Lilly	Kwikpen, cartridge					

### U500 insulin (Humins R®)

This insulin is Unlicensed and is five times more concentrated than standard (U100) Insulin; it should be initiated by a diabetes consultant only. It is prescribed in **micro** and needs to be administered via a 0.3 or 0.5ml insulin syringe. (One **unit** on one of these syringes is equivalent to 5 units of insulin). All patients admitted on U500 insulin should be referred to the diabetes team via ICM.

**REFER TO DIABETES TEAM**  
Refer to diabetes inpatient nursing team via ICM.  
Telephone contactable times 0800 717 3441

# Supporting material - Pocket guide for junior doctors and nurses



# Supporting material - Pocket guide for junior doctors and nurses

TYPICAL INSULIN						
Insulin Type	Proprietary Name	Device	Taken	Onset	Peak	Duration
<u>Short-acting insulin</u>						
Insulin Aspart	NovoRapid®	Vial, Flexpen, Cartridge	Just before, with or just after food	10-20 mins	1-3 hrs	2-5 hrs
Insulin Lispro	Humalog®	Vial, Kwikpen, Cartridge				
Insulin Glulisine	Apidra®	Vial, Solostar Pen, Cartridge or Optipen				
<u>Short-acting insulins</u>						
Insulin-soluble/neutral	Actrapid® Humulin S® Insuman® Rapid Hypurin® Bovine Neutral Hypurin® Porcine Neutral	Vial Vial, Cartridge Cartridge Vial, Cartridge Vial	15-30 mins before food	30-60 mins	1-5 hrs	5-9 hrs
<u>Intermediate-acting insulins</u>						
Isophane insulin	Hypurin® Bovine Isophane Hypurin® Porcine Isophane Insulatard® Humulin I® Insuman® Basal	Vial, Cartridge Vial, Cartridge Vial, Innolet Pen, Cartridge Vial, Kwikpen, Cartridge Vial, Solostar Pen, Cartridge	About 30 mins before food or bedtime	60-90 mins	2-12 hrs	12-24 hrs
<u>Long-acting analogue insulins</u>						
Insulin Detemir	Levemir®	Flexpen, Cartridge	Once or twice a day	2-4 hrs	6-14 hrs	16-20 hrs
Insulin Glargine	Lantus®	Solostar Pen, Cartridge	Once a day		No peak	20-24 hrs
Insulin Degludec	Tresiba®	FlexTouch Pen	Once a day	30-90 mins	No peak	Over 42 hrs

# Supporting material - Pocket guide for junior doctors and nurses

## ACUTE HYPOGLYCAEMIA

*Hypoglycaemia - blood glucose <4mmol/l*

Conscious, oriented and able to swallow

Give fast acting oral carbohydrate

One of:  
Glucose tablets (4-5)  
Lucozade 100ml  
Fruit juice 200ml  
Cola/lemonade 100ml

Conscious and can swallow but confused and aggressive

If capable and cooperative give fast acting oral carbohydrate (see left)

If not capable or cooperative but able to swallow, give 2 tubes

Glucose Gel

If unable to take either, give IM glucagon

Unconscious or fitting and unable to take orally

Check ABC. Stop insulin, call for senior help  
Give 75ml 20% dextrose IV quickly.  
If no IV access, give IM glucagon and then obtain IV access

Check bedside blood glucose after 10-15 minutes- if still less than 4mmol/l repeat oral carbohydrate, GlucoseGel, or iv dextrose according to consciousness as above.  
Check again after 10-15 mins and repeat upto three times

When blood glucose above 4 mmol/l give 20g long acting carbohydrate;  
e.g. 2 biscuits or a slice of bread or 200-300 ml of milk (double amount if glucagon used)  
or give meal immediately if due

Review cause of hypo- consider referral and insulin dose reductions  
If NBM give 10% glucose infusion ( eg 100 ml/h)

# Supporting material - Pocket guide for junior doctors and nurses

## ACUTE HYPERGLYCAEMIA IN DIabetics

Look for causes – Consider intercurrent illness or missed oral hypoglycaemics

Patient clinically unwell  
Vomiting / NOT eating and  
drinking OR urinary ketones  $> ++$   
capillary ketones  $> 1.5 \text{ mmol/L}$

Check U/E, venous bicarbonate  
And lab glucose

Capillary ketones  $> 3 \text{ mmol/L}$   
or Urinary ketones  $> ++$  AND  
Bicarbonate  $< 15$  or pH  $< 7.35$

Yes

See DKA  
and DKA

No

Patient hypovolaemic  
BG  $> 30 \text{ mmol/L}$   
Urinary ketones -ve or capillary  
ketones  $< 1.5 \text{ mmol/L}$   
Serum osmolality  $> 30$

Yes

See hypovolaemic  
DKA

No

Consider IV metformin 500mg  
Inotropes if not responding  
Look for concurrent illness

Patient clinically well  
Eating and drinking, urinary ketones  
negative OR capillary ketones  $< 1.5$   
 $\text{mmol/L}$

BG  $> 25 \text{ mmol/L}$

No  
BG  $> 18 \text{ mmol/L}$  for  
24 hours or  $> 22$   
 $\text{mmol/L}$  for 48 hours?

Yes  
BG  $> 25 \text{ mmol/L}$

No  
BG  $> 18 \text{ mmol/L}$

Assess pre-meal  
HbA1c profile/review  
treatment regime.  
Check BG after 2  
start  $> 25$ ?

Yes

Review doses  
of oral agents  
or insulin

Yes  
BG well?

Yes

Consider IV glucose bolus if most recent BG  $> 25 \text{ mmol/L}$   
Insulin bolus if patient already in a ketoacidosis and you  
are going to give them more insulin. Use regular insulin  
using bolus if you prefer. If not, use Adm 10.  
Treat with more than 10% total daily insulin dose as a single  
bolus. If necessary insulin consider a half of total daily insulin  
bolus. BG  $> 30 \text{ mmol/L}$

**Supporting material - An initiative by one of the staff nurses in an oncology ward to improve ward assurance.**

**Evidence of impact on other staff members in the hospital**

