

The more  
difficult  
cases

GOING BACK TO  
BASICS



# Case 1

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MR SU

Mr Su

65 year old Chinese gentleman, retired carpenter

T2D diagnosed 15 years ago

Was on **Humalog Mix 50**® - 22U mane, 26U midi

Ceased 3 months ago - now on **Bydureon**®  
**Humalog Mix 50**® restarted 2 months ago

Last HbA1c 1 month ago 6.7% on **Humalog Mix**® - 24U mane, 24U midi

Admits to getting hungry at night and eating fruits to settle hunger

Erratic SMBG, no diary kept

Diet all over the place unsure re what to eat anymore

## Other co-morbidities



Dyslipidaemia



IHD – stents 2017



Hypertension



Right nephrectomy 2015 –  
multiple stones

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Amlodipine 5mg Tablet	1 Tablet Daily
Aspirin 100mg Capsule	1 Capsule Daily
Crestor 5mg Tablet	1 Tablet Daily
Irbesartan 300mg Tablet	1 Tablet Daily
Noten 50mg Tablet	1 Tablet Daily
Trajenta® (linagliptin) 5mg Tablet	1 Tablet Daily
Xigduo XR® (Dapagliflozin/Metformin) 5mg;1000mg	1 Tablet Twice a day
Bydureon®	2mg weekly
Humalog Mix 30/70®	24 units bd

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Current meds



# Findings

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Weight 70kg

Height 175 cm

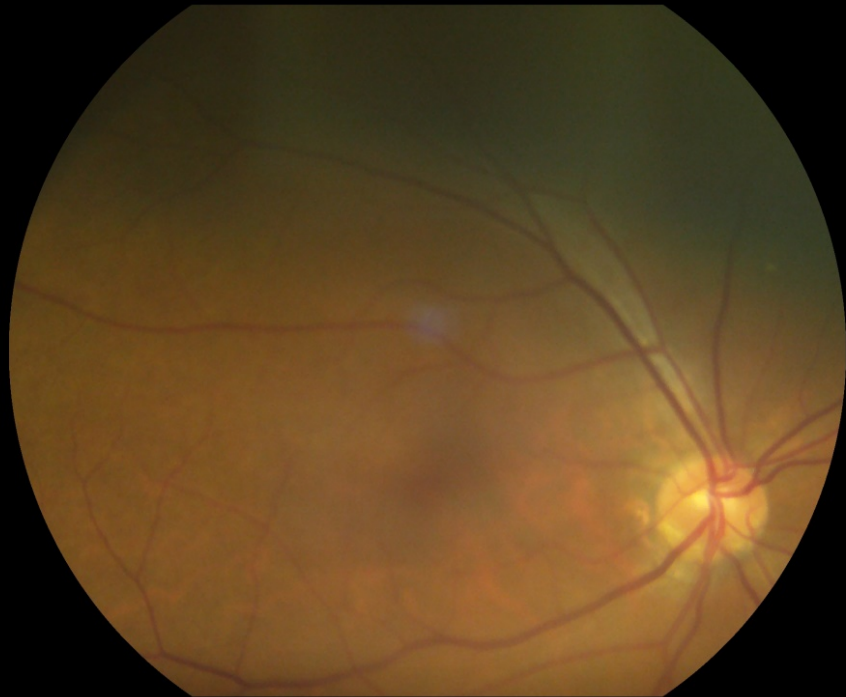
BMI 23 kg/m<sup>2</sup>

BP 123/72 mmHg

Feet normal

ABI normal

Retina see next



<u>Glucose</u>					<b>Current Result</b>	Units	Reference
Date	09/08/16	06/06/17	19/09/17	07/05/18	<b>23/08/18</b>		
Time	09:20	08:45	08:40				
Lab ID	245299584	287049440	287854174	278419916	293663221		
F Gluc Plasma	*11.7			*6.9	*6.3	mmol/L	(3.6-6.0)
F Gluc Serum		*6.9	*6.8			mmol/L	(3.6-6.0)

<u>HbA1c</u>					<b>Current Result</b>	Units	Reference
Date	09/08/16	06/06/17	19/09/17	07/05/18	<b>23/08/18</b>		
Time	09:20	08:45	08:40				
Lab ID	245299584	287049440	287854174	278419916	293663221		
HbA1c (IFCC)	*108	*54	*52	*45	*49	mmol/mol	(20-38)
HbA1c	*12.0	*7.0	*6.9	*6.3	*6.7	%	(4.0-5.6)

# Glycaemic control

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# Options?



Continue the same and see 3 months



Stop Bydureon® and increase insulin dose



Change Humalog to Co-Formulation insulin



Change to basal insulin



Too hard – refer to endocrinologist or CDE

SMBG

MORE  
INFORMATION  
NEEDED

# SMBG on low carb diet

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	Self - monitored blood glucose (mmol/L)								Comments
	Breakfast		Lunch		Dinner		Before Bed	Overnight	
	Before	After	Before	After	Before	After			
Day 1	6.5	6.9							
Day 2			6.7	7.2			8.2		
Day 3	6.0	6.8							
Day 4					5.8	8.5	7.0		
Day 5	5.8	6.2							
Day 6			5.8	6.2					
Day 7					6.5	7.4	6.8		

Amlodipine 5mg Tablet	1 Tablet Daily
Aspirin 100mg Capsule	1 Capsule Daily
Crestor 5mg Tablet	1 Tablet Daily
Irbesartan 300mg Tablet	1 Tablet Daily
Noten 50mg Tablet	1 Tablet Daily
Trajenta (linagliptin) 5mg Tablet	1 Tablet Daily
Xigduo XR (Dapa/Met) 5mg;1000mg	1 Tablet Twice a day
<del>Bydureon</del>	<del>2mg weekly</del>
<del>Humalog Mix 30/70</del>	<del>24 units bd</del>

## Current meds

# Progress

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Date	06/12/18	28/02/19	15/05/19	26/08/19		
F Gluc Plasma	5.6			<b>H 6.7</b>	mmol/L	(3.6-6.0)
R Gluc Plasma		7.8	6.8		mmol/L	(3.6-7.8)
Cholesterol	<b>L 2.7</b>	<b>L 3.3</b>	<b>L 3.5</b>	<b>L 3.8</b>	mmol/L	(3.9-5.5)
Triglycerides	<b>H 2.1</b>	<b>H 1.9</b>	<b>H 1.9</b>	<b>H 2.0</b>	mmol/L	(0.5-1.7)
HDL Chol.	1.1	1.2	1.1	<b>1.4</b>	mmol/L	(0.8-1.5)
LDL Chol.	<b>L 0.6</b>	<b>L 1.2</b>	<b>L 1.5</b>	<b>L 1.5</b>	mmol/L	(1.7-3.5)
HbA1c	<b>H 6.6</b>	<b>H 7.2</b>	<b>H 7.4</b>	<b>H 7.2</b>	%	(4.0-5.6)
eGFR	69	67	71	<b>63</b>		
R U-Alb/Creat	<b>H 3.9</b>	1.3	2.0	<b>2.2</b>	mg/mmol	(<2.5)

BEFORE WE  
ESCALATE  
THERAPY...

**STOP RULE!**

# STOP RULE!



Adherence



Motivation



Patient education



Lifestyle issues



Drug interaction



Intercurrent infection



Secondary causes – pancreatic pathology



Have we excluded T1D

## Factors to consider

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Individualised glycaemic targets

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Cardiovascular benefits

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Renal benefits

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Glucose lowering potency

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Weight loss potential

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Hypoglycaemia risk

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Adherence

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Needle load

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Age

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Costs



# Managing weight



Dietitian referral



Low calorie diet



Very low calorie diet



Saxenda injections



Bariatric surgery

# Where to from here?



Lifestyle issues:

Carb intake  
Aerobic work  
Resistance work



Regular follow up



SMBG

post prandial  
HbA1c



Bydureon for pleiotropic effect



Insulin may be inevitable



# Case 2

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MRS GONZALEZ

## Case 2 – Mrs Gonzalez

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67 year old Chilean, retired teacher

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T2D for at least 20 years

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Initially on Metformin then Diamicron<sup>®</sup>  
then Janumet<sup>®</sup> 5 years ago

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Commenced on Humalog Mix 30/70<sup>®</sup> few  
years ago by local endocrinologist

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Sees endo once a year, minimal titration  
except “eat better, do more exercise”

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Fasting glucose 8.5-12 mmol/L HbA1c poor  
8.5%, no post prandial checks

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Diet lots of carbs, not much exercise except  
sometimes walks the dog

## Other co-morbidities

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Breast cancer 9 years ago – surgery, chemo, RRx. All good now

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Chronic active hepatitis B on Tenofovir

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Osteoporosis on Denosumab

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Dyslipidaemia

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Fatty liver – no cirrhosis

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Hypertension

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Dupuytren's contracture left hand

# Findings



Weight 60.5 kg



Height 159 cm



BMI 23.9 kg/m<sup>2</sup>



BP 139/73 mmHg



Feet normal



ABI normal



Retina – see next



## Current meds

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Atacand 8mg Tablet      1 Tablet Daily

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Crestor 10mg Tablet      1 Tablet evening

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**Janumet 50mg;1000mg      1 Tablet bd**  
**(Sitagliptin/Metformin)**

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Prolia 60mg/mL Injection      Injection 6 monthly

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**Humalog Mix 30/70      45 units bd**

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Viread 300mg Tablet      1 Tablet Daily



# Initial results

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Date Collected		18 Sep 18	19 Feb 19
Fasting glucose	mmol/L	<b>10.7</b>	<b>13.9</b>
Chol	mmol/L	<b>2.8</b>	<b>2.9</b>
Trig	mmol/L	<b>1.5</b>	<b>2.0</b>
HDL	mmol/L	<b>1.0</b>	<b>0.9</b>
LDL	mmol/L	<b>1.1</b>	<b>1.1</b>
HbA1c-NGSP (4.0-6.0) %		<b>8.2</b>	<b>8.5</b>
eGFR	mL/min/1.73m <sup>2</sup>	72	61
Alb/Crt (< 3.5)	mg/mmol	<b>4.7</b>	<b>6.2</b>

# Outstanding issues



Microalbuminuria



CKD Stage 2



Borderline hypertension



Dyslipidaemia



Suboptimal HbA1cc

# Glycaemic control - options



Reduce Humalog Mix



Change to basal insulin



Change to Ryzodeg



Change Janumet to QTERN (Dapa/Saxa)



Stop insulins and start SGLT2 inhibitor



All too hard – refer to endocrinologist/CDE

# SMBG on lowish carbs

## Humalog Mix 30/70 30U bd

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	Self - monitored blood glucose (mmol/L)								Comments
	Breakfast		Lunch		Dinner		Before Bed	Overnight	
	Before	After	Before	After	Before	After			
Day 1	4.5	5.9							
Day 2			5.7	6.2					
Day 3	4.0	5.8							
Day 4					4.8	5.5	3.5		
Day 5	4.8	6.2							
Day 6			4.8	5.2					
Day 7					4.5	6.4	5.8		

# SMBG on lowish carbs

## Humalog Mix 30/70 10U bd

	Self - monitored blood glucose (mmol/L)								Comments
	Breakfast		Lunch		Dinner		Before Bed	Overnight	
	Before	After	Before	After	Before	After			
Day 1	3.5	5.9							
Day 2			5.7	6.2					
Day 3	4.0	5.8							
Day 4					5.8	6.9	3.5		
Day 5	3.8	6.2							
Day 6			4.8	5.4					
Day 7					5.5	6.4	5.8		

Moving  
forward  
options

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Change to Ryzodeg at dinner time?

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Change to Toujeo at bed time?

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Change to insulin + byetta?

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Change to GLP1-RA?

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Change to DPP4i/SGLT2i combo?

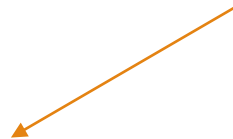
# Conversion from Mix 70 to basal

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Total daily insulin  
dose of mix  
insulin



70% of Total  
daily insulin dose  
given before bed  
time



Titrate insulin to  
morning fasting  
glucose then add  
prandial if  
needed

## Factors to consider

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Individualised glycaemic targets

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Cardiovascular benefits

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Renal benefits

---

Glucose lowering potency

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Weight loss potential

---

Hypoglycaemia risk

---

Adherence

---

Needle load

---

Age

---

Costs





# Case 3

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MRS LEE

Mrs Lee

95 year old Chinese lady

151 cm tall, 45 kg weight, BMI 19.7 kg/m<sup>2</sup>

T2D at least 10 years

Stable on Galvumet® (Vildagliptin) for years

Recently fell, fractured 2 ribs and admitted to hospital for pain relief

While in hospital, developed urosepsis and glucose control deteriorated

Discharged on 40 units Novomix 30/70® bd

Granddaughter rang on day of discharge asking for prescription

## Other co-morbidities



Atrial fibrillation



Severe lumbo-sacral  
spondylosis with spinal  
stenosis



Heart failure



Chronic kidney disease Stage 3  
A (eGFR ~50)

## Meds on discharge

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Aldactone 25mg Tablet 1/2 Daily

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Apixaban 2.5mg Tablet 1 Tablet Twice a day

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Lasix M 20mg Tablet 1 Tablet Daily

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Lyrica 25mg Capsule 1 Capsule Twice a day

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Nebivolol 1.25mg Tablet 1 Tablet In the evening

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Ryzodeg 70/30 40U breakfast, 40U dinner

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Somac 40mg Tablet 1 Tablet Before bed

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Targin 5mg; 2.5mg 1 Tablet In the evening

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Trajenta (linagliptin) 5mg 1 Tablet Daily

# Pre hospital findings

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Date Collected :	19/12/2018	14/03/2018
Fasting Glucose :	11.3 *	
eGFR	54	53 mL/min/1.73 m <sup>2</sup>
Chol	3.4	4.2 mmol/L (<5.5)
Trig	1.6	2.6 * mmol/L (<2.0)
HDL	1.1	1.3 mmol/L (>0.9)
LDL	1.6	1.7 mmol/L (<3.5)
HbA1c	8.2%	7.8%

# Recent findings

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Date Collected : 23/09/2019 14/03/2018 Current

HbA1C : **10.2 \*** **7.8 \*** % ( $<6.1$ )

Date Collected : 23/09/2019 19/12/2018 14/03/2018

=====

Gluc

eGFR	: 35	54	53	mL/min/1.73 m <sup>2</sup>
Cholesterol	: 4.9	3.4	4.2	mmol/L
Triglyceride	: <b>4.7 *</b>	1.6	<b>2.6 *</b>	mmol/L
HDL Cholesterol	: 1.3	1.1	1.3	mmol/L
LDL Cholesterol	:	1.6	1.7	mmol/L

## What's next?



When should you see Mrs Lee?



What should the family be checking in the meantime?



Are you comfortable in managing Mrs Lee's insulin?

What's  
next?

MORE  
INFORMATION  
NEEDED



# SMBG

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SMART MONITORING, LESS PAIN

	Insulin Injections					Monitoring Blood Glucose							
	Type of Insulin	Units given				Breakfast		Lunch		Dinner		Before Supper or Bed	Over night
		Breakfast	Lunch	Dinner	Before Bed	Before	After	Before	After	Before	After		
3/6 Mon	<del>Novo</del> 30	10U 8:30AM		6U 5:30PM		6.5				7.3		13.3	-
Tues	NOVO 30	10U 8AM		6U 6PM		7.6				10.7		10.4	
Wed	NOVO 30	10U 8AM		6U 6PM		7.2				12.7		9.5	
Thu	NOVO 30	10U		6U		7.6				13.8			
Fri	NOVO 30	10U		6U		7.2				5.5		9.4	
Sat	NOVO 30	10U		6U		6.6				9.6		8.9	
Sun	NOVO 30	15U		6U		7.6				8.3		9.4	



Insulin Injections					Monitoring Blood Glucose								
	Type of Insulin	Units given				Breakfast		Lunch		Dinner		Before Supper or Bed	Over night
		Breakfast	Lunch	Dinner	Before Bed	Before	After	Before	After	Before	After		
Mon						9.3		Ⓟ		10.8			
Tues						9.6				12.4			
Wed						9.7				15.4		14.3	
Thu						9.5				15.4		13.7	
Fri						9.4				15.5			
Sat						12.5				12.8			
Sun						9.4				15.0			

## Glycaemic control - options



Stop insulin and go back to previous oral medications



Reduce Ryzodeg dose and monitor prebreakfast and predinner BSL



Change to basal bolus regimen



All too hard - refer to endocrinologist/CDE



# Factors to consider for Mrs Lee



Glucose targets – HbA1c, fasting, post prandial



**Hypoglycaemia risk**



**Hypoglycaemia recognition and management**



Carer issues



Renal function



Heart failure



Drug interactions

Difficult  
cases:  
In summary

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Insulin action is very predictable

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The second generation basal insulins can achieve glycaemic targets with less hypoglycaemia

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SMBG helps us with decision making

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FGM provide even more information to help us with decision making

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Close contact with the patients and their carers is vital

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Insulin therapy for T2D can be adequately managed by the GP team

## Factors to consider in management

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Glucose targets – fasting, post prandial, HbA1c

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Ongoing renal function

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Oral medications

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Hypoglycaemia management

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Drug interactions

---

Hypoglycaemia unawareness

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Dietary advice

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Carer issues



Lifestyle issues are as **important** in early as well as advanced diabetes



Diet

Carbohydrate intake



Regular exercises

Aerobic  
Resistance



Weight loss

Low calorie diet option

Bariatric surgery in appropriate patient

# Managing weight



Dietitian referral



Low calorie diet



Very low calorie diet



Saxenda injections



Bariatric surgery



Thank  
you

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