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CREATE CHANGE

### **Real-time Clinical Analytics & Decision Support**

Jodie Austin, BPharm, PGDipClinPharm, PhD candidate Dr. Benjamin Sly, MBBS FRACP, PhD candidate Queensland Digital Health Grand Round Series







# Welcome to Country

I would like to acknowledge Aboriginal and Torres Strait Islander peoples as the Traditional Owners and Custodians of this country on which we meet and recognise their connection to land, wind, water and community. We pay our respect to them, their cultures and to elders both past and present.

I would also like to pay my respects and acknowledge the traditional owners and custodians from where each of us are calling.

# Funding

# The work presented has been funded via the Digital Health CRC

# Key Discussion Points:

- 1. Digital health transformation, CDSS & real/near real-time clinical analytics
- 2. Literature review and conceptual framework development
- 3. Opioid dashboard development
- 4. CDSS for in hospital diabetes management
- 5. Development and deployment diabetes dashboard
- 6. Future directions for CDSS for in hospital diabetes management

2017	2018 2019 2020 2021 2022 2023	2024 2025 2026 2027	2028 2029 2030 2031 2032				
	HORIZON 1	HORIZON 2	HORIZON 3				
	BUILDING DIGITAL FOUNDATIONS: BETTER CARE FOR INDIVIDUAL PATIENTS	TRANSFORMING PATIENT CARE: BETTER CARE FOR GROUPS OF PATIENTS	REIMAGINING OUR FUTURE: NEW AND INNOVATIVE MODELS OF CARE				
PEOPLE	Our workforce builds digital literacy	Intelligent use of data	Innovative workforce				
PROCESS	Integrating information and technology	Transparency to increase efficiency	Digital innovation allows new models of care				
INFORMATION	Collecting and collating	Live streaming analytics	Predictive and prescriptive analytics available				
TECHNOLOGY	Broadens workflows to improve care	Establish links between data and analytics	Integrate innovative technology in the digital platform				
		CULTURAL READINESS					
		TECHNICAL EXCELLENCE					
		DIGITAL CLINICAL GOVERNANCE					
		SINGLE SOURCE OF TRUTH FOR DATA					
	11	IFORMATION GOVERNANCE AND TRANSPARENCY					
			ITIES				

# **Clinical Decision Support Systems**

- Defined by Kawamota et al. BMJ 2005 cited 2700 times
- Any electronic or non-electronic system designed to aid directly in clinical decision making, in which characteristics of individual patients are used to generate patient-specific assessments or recommendations that are then presented to clinicians for consideration

# Real-time/Near real-time clinical analytics

- Automated process clinically relevant information – support decision making from raw data
- Processing time in matter of seconds vs. minutes
- Descriptive / Predictive / Prescriptive

# What does the literature say?

- n = 9
- 4 key outcome measures:
  - clinical care outcomes (n=2)
  - clinical process outcomes (n=3)
  - algorithm sensitivity/specificity (n=2)
  - anecdotal evidence (n=2)



# **Conceptual framework**

### Horizon 1

(Digital workflows)

 Robust digital workflows to ensure consistent input of provider generated data Horizon 2 (Data and analytics products)

- Simple, succinct visual displays with ability to drill down for further detail
- Multi-level views
- Customisable views
- Clinically actionable items on display
- Regular refresh of data (e.g. every 5 minutes)
- Interactive check-boxes for positive user reinforcement
- Ease of access (within existing EMR framework)
- Process for maintaining data integrity
- Clinician input throughout development/implementation
- Appropriate end-user training

#### Horizon 3

(New models of care)

- Integration into clinical ward rounds
- Enhanced documentation and reporting processes
- Heightened situational awareness to inform patient throughput/ transfer
- Dedicated staff member to monitor real-time analytics tool
- Identify candidates for clinical research opportunities



# Opioid Dashboard Development

# <u>AIM:</u>

- high-level summary of clinical data
- frontline clinicians
- supporting and assessing the safety of opioid usage
- identify opportunities for improvement

# **TWO VIEWS:**

- Pre-surgery view
- Inpatient view

# **Pre-surgery view**



# **Inpatient View**



× 17 GCUH C 6E GATO 68 27/05/2021 08:33 쯔 1 4/6/2021 12:09 0 介 Yes М 29 × 16 No GCUH B LGN GESS 7/06/2021 02:22 1 7/6/2021 04:07 6 🚽 Л M 83 2 28/5/2021 13:51 × 21 GCUH B 4S GCARD 24/05/2021 10:44 5 个 J 0 Yes X GCUH C 2W GSSSU F 22 2/06/2021 14:59 丒 1 2/6/2021 15:38 6 个 6 个 16 No 57 X 16 GCUH C 2W GSSSU 5/06/2021 11:54 2 7/6/2021 06:15 3 🤟 No 0 GCUH D 2 GSAU F 59 × 20 No 7/06/2021 08:08 1 7/6/2021 08:42 0 GCUH B 4S GCARD M 68 6/06/2021 11:06 6/6/2021 16:48 × 0 🕹 16 J 0 No GCUH C 4W GVSNS F 70 26/05/2021 12:37 × 19 쯔 1 28/5/2021 11:58 1 0 0 Yes X X F 80 2 0 🤟 18 个 No GCUH B 4N GCCU 5/06/2021 20:19 5/6/2021 22:04 0 ÷ 0 F 58 16 GCUH C 1E GHOP 6/06/2021 09:51 2 6/6/2021 10:35 0 No . . \_ 010010004 40 40 0000004-04-00 47

# Inpatient View

Order Catalog

buprenorphine oxycodone-naloxone

morphine

morphine tRAMadol

10:57

Nume

route Sublingual

Oral Oral

Oral

indicator (do not us

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Order Catalog • bupreno 06-02

Subcutaneou

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+		¢				MRN: Current Ward: G	DOB: 03 CUH C 4W GVSN	/10/1952   AG S   Registratio	E: 68   Sex: I on Date: 27/5	M /2021 07:26					Las	it 24 Hrs	$\supset$
L							0	oioid Order	Details								
		Order Catalog	route	Start Date	Stop Date	order_status	clinical_display_lin	2									
		buprenorphine	Sublingual	2/8/2021 11:00		ordered	0.2-0.4 mg, Tablet,	disintegrating, S	ublingual, 8 hou	urly, start: 02/06	/21 11:00:00 AE	ST, PRN for pa	ain, Indication: -				1
		oxycodone-naloxone morphine	oral Oral	6/6/2021 11:40 27/5/2021 15:54	31/05/2021 12	:09 discontinued	1 tab(s), Tablet, mo 10 mg, Tablet, Oral prior 24 hours usag	dified release, C , 4 hourly, start: 3 ge, Indication: -	oral, TWICE a d 27/05/21 15:54:	ay, start: 06/06/ :00 AEST, PRN	21 11:40:00 AES for pain, 10-30n	ST, Indication: p ng, q4h, PRN S	oain S <2 If required	l at discharge pr	ovide not more	that 3days x	
		morphine	Subcutaneous	6/6/2021 18:51		ordered	2.5 mg, Solution, in	jectable, Subcut	taneous, 5 hour	ly, start: 06/06/2	1 18:51:00 AES	T, PRN for pair	n, Indication: -				
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	6/6/2021 11:40		ordered	1 tab(s), Table	t, modified re	lease, Oral, TW	VICE a day, start	06/06/21 11	:40:00 AES	T, Indication	1: pain						
	27/5/2021 15:54	31/05/2021 12:09	discontinued	10 mg, Tablet, prior 24 hours	Oral, 4 hours usage, Indica	y, start: 27/05/2 ation: -	1 15:54:00 AES	T, PRN for pa	ain, 10-30m	g, q4h, PRN	ISS <2 If re	quired at di	ischarge pro	ovide not mo	re that 3day	s x	
s	6/6/2021 18:51		ordered	2.5 mg, Solution	on, injectable,	, Subcutaneous	s, 5 hourly, start:	06/06/21 18	:51:00 AES1	T, PRN for p	ain, Indicati	on: -					٢.
	27/5/2021 15-54		ordered	50 mg. Cancu	la Oral EOU	R times a day	ctart: 27/05/21 1	5-54-00 4ES	T PRN for r	nain 50.100	lma aßh Pi	PN Sedatio	n coora (</th <th>Casco on di</th> <th>charge For</th> <th></th> <th></th>	Casco on di	charge For		
				Opioi	d Meds A	dministratio	on Event										
rphine	• morphine	oxycodone	<ul> <li>oxycodor</li> </ul>	ne-naloxone	• tRAM	adol											
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ie 10 ilt 10	:57 AM .00			10.49 PM	23:07 PM 00 Ev	ent Time	TAM 10:20 AM	11:29 AM	11:49 AM	13:43 PM	10:02 PM	10:04 PM	20:29 PM	22:14 PM	05:36 AM	07:29 AM	
nit mo	In Score, FAS by						Nausea	a. Pruritis.	Sedation	Scores ar	d Bowel N	Aovement	ts by Clini	cal Event	Date		
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r 5

# Key Challenges

- Surrogate markers
- Oral Morphine Equivalents (OME)
- Plotting pain/drug administrations together
- Data points missing from data lake
- Refresh delays
- Data integrity

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#### **AGP Report**

December 7, 2019 - December 20, 2019 (14 Days)

December 7, 2019 - December 20,	2019	14 Days			
% Time CGM is Active		97%			
Ranges And Targets For	Туре	1 or Type 2 Diabetes			
Glucose Ranges Target Range70-180mg/dL	Targets % Greater th	Targets % of Readings (Time/Day) Greater than 70%(16h 48min)			
Below 70 mg/dL	Less than 4% (57min)				
Below 54 mg/dL	Less than	n 1% (14min)			
Above 180 mg/dL	Less than	25% (6h 0min)			
Above 250 mg/dL	Less than	5% (1h 12min)			
Each 5% increase in time in range (70-180 mg	/dL) is clinically I	beneficial.			
Average Glucose		141 mg/dL			
Glucose Management Indicator (C	GMI)	6.7 %			
Glucose Variability		31.6%			
Defined as account coefficient of variation /8/	CVA: target <26	0/.			

#### AMBULATORY GLUCOSE PROFILE (AGP)

AGP is a summary of glucose values from the report period, with median (50%) and other percentiles shown as if occurring in a single day.



#### DAILY GLUCOSE PROFILES

Each daily profile represents a midnight to midnight period with the date displayed in the upper left corner.



Source: Battelino, Tadej, et al. "Clinical Targets for Continuous Glucose Monitoring Data Interpretation: Recommendations From the International Consensus on Time in Range." Diabetes Care, American Diabetes Association. 7 June 2019, https://doi.org/10.2337/dci19-0028.

### LibreView





100

80

12am

6am

#### Glucose

AVERAGE 141 mg/dL GLUCOSE % above target 19 % **77** % % in target % below target 4 %







12pm

6pm

12an

16

THE UNIVERSITY

:



# Clinical Decision Support Systems Diabetes -Inpatients

### **Order/prescription creation facilitators**

- Insulin order sets Limited
- Electronic Glycaemic Management Systems

### **Alerts/reminders**

• Medication order alerts – Diabetes Dashboard

### Protocol/pathway support

Hypoglycaemia management

### **Relevant data presentations**

• Data visibility solutions – Diabetes Dashboard

H		Duration: None	inne i la companya da comp	
	So 🕅 Component	Status	Details	^
	⊿ Medications			
	Suggested initial stat and supplemental rapid/short weight: Daily insulin <25 units or actual weight <50kg (See Daily insulin <25-49 units or actual weight 50.1-75kg Daily insulin 50-80 units or actual weight >100kg (H Daily insulin >80 units or actual weight >100kg (H	-acting insulin doses l nsitive) g (Moderate) kg (Resistant) ligh resistance)	based on patients previous total daily dose of insulin UK actual	
	incuire peucePADID (neucePADID Elember)	entence from the drop	p down list.	
Adult SUPPLEMENTAL INSUL	IN Pen Subcutaneous THREE times a day (with or after food). Indicat	tion: Diabetes (Sensiti	ve) - Daily total insulin use < 25 units or actual weight < 50kg	
SUPPLEMENTAL INSUL	IN. Pen. Subcutaneous, THREE times a day (with or after food), Indicat	tion: Diabetes (Moder	ate) - Daily total insulin 25-49 units or actual weight 50.1-75kg	
SUPPLEMENTAL INSUL	IN, Pen, Subcutaneous, THREE times a day (with or after food), Indicat	tion: Diabetes (Resista	nt) - Daily total insulin 50-80 units or actual weight 75.1-100kg	
SUPPLEMENTAL INSUL	IN, Pen, Subcutaneous, THREE times a day (with or after food), Indicat	tion: Diabetes (High re	esistance) - Daily total insulin >80 units or actual weight >100kg	
	CONCENTRATED Kwikpen)		Select an order sentence	

	CONCENTRATED Kwikpen)	<ul> <li>Select an order sentence</li> </ul>
Hy	poglycaemia Management	
	😚 glucagon	1 mg, Injection, Intramuscular, As indicated, PRN hypogly. For SEVERE hypoglycaemia if IV access not available
	🥱 glucose (glucose 50% intravenous solution)	30 mL, Injection, IV, As indicated, PRN hypoglycaemia, Indication: for hypoglycaemia
⊿ Co	nsults/Referrals	
	All consults must be accompanied by a phonecall as per operation	current practice
	Consult to Dietetics	Routine T:N



# Clinical Decision Support Diabetes - Inpatients

	Glucometric	Patient Outcomes	Evidence Based Prescribing
Order sets	-/0/+	0/+	+
eGMS	+	+	+
Medication alerts			0/+
Hypoglycaemia			+
Data Visibility Solutions	+	0/+	+
	Key: - negative, 0 neutr	al, + positive outcomes	





Mathioudakis et al. Journal Diabetes Science and Technology. 2019



#### Orders

Active Signed & Held Home Meds Cosign VTE TPN SQ Insulin Post-Disch Orders \* Order History

Glucose Management 4					
'≩ Active Insulin Orders ≠					
SQ Insulin Decision Support					
SQ Insulin Decision Support Tool For routine SQ insulin management in adults. NOT intended for use in pregnant we Parenteral Nutrition (PN) orderset and use the JHH-BMC Adult Subcutaneous insul	omen or patients with Diabetic Ketoacidosis (DKA), Hyperglycemic Hyperosmolar Syndrome (HHS), In orderset to order any SQ insulin components.	Hyperkalemia, Cystic Fibrosis, or for pi	itients receiving parenteral nutrition (CPN or PPN). FOR PATIEN	TS AT JHH OR BMC: For patients on CPN or PPN, refer to IV regular insulin dosing instructions within the JHH-	BMC A
Indications for Insulin Therapy		Sten 1: User selects in	adication		
Aude highlightentik moore DM Netwy   Tige 2 Deterted NOT on Keelin at Nome   1/70948110	Teps 12 December 12 December 12 Post 101AL concentrations 1	Step 1. Oser sereets in			
<ul> <li>Weight-based estimation:</li> <li>Choose an appropriate unitKg/day estimation of the patient's total daily dose (TDC to SML diabetes type, and other factors. The estimate highlighted in green is bas stareoids, real function, home insulin dose) when selecting a weight-based total diabetes type.</li> </ul>	<ol> <li>of insulin. The doses shown below represent a range of insulin doses according Weight (kg): display on the patient's BMI and diabetes type. Consider other factors (e.g. ally dose (TDO).</li> </ol>	#3.000 BMI:	[27		
a. Malnourished, no history of DM, cognitive impairment, elderly, renal or liver dz.	, pancreatectomy	0.3 units/kgiday =	re units		
b. Lean (BMI 18.5 - 24.9) Type 2 DM, steroid-induced hyperglycemia, Type 1 DM		0.4 units/kgiday =	25 Units	Step 2: User reviews range of weight-based insulin TDD doses	
c. Overweight (BMI 25 - 30) Type 2 DM		0.5 units/kg/day -	sz units	(recommended dose per BMI in green)	
d. Obese (BMI > 30) Type 2 DM, or Type 2 DM receiving steroids		0.6 units/kg/day =	38 units	(recommended dose per biar in green)	
<ul> <li>Enter a different weight-based multiplier (e.g. 0.9, 1.2)</li> </ul>		unitsikgiday =	units		
Estimated TDD:		losule, inform	ation		
22				Step 3: User determines and manually enters TDD	
Nutrition Source: No entersityseethesi nutrition (Clear lipskie) Traing much the tensor of black that 5-50 years (Con	Stan 4: I lear salarts	nutritional source & sou	ocifies carb counting (if eating meals)		
Coes the patient dose nutritional visuals using insulance's ratio?	Step 4. Oser selects	nutritional source & spi	cones carb counting (in eacing means)		
Besal (50% TDD) 16 Nutritional (50% TDD) 1 1 1 1 1 1 1 1 1	el dose into BID dosing if > 70 units)	nended insulin doses	]		
Correctional aspart (Novolog) LOW dose scale, with meals and at bedtime "Millimatin dose taituations are invided to the rearrel number. Therefore, the recommended total da - These insulin recommendations are displayed in JHH-BMC Adult Subcutan - Varity the patient's active nutrition orders match the nutrition source select	In multin does here may not be exactly equal to your estimated TDD above. Clinical judgment should be used to make solutions linksuffin Order. Set - Focussed. edus linksuffin Order. Set - Focussed. and above. Caribolhydrate controllied dier recommended for patients eating meals.	allments in insulin doess based on tectors that inc	rease the mail for hypoglycemia or hyperphycemia.		
				1012/0015 Version 01	
See Restore 🗸 Close				1 Prestou	
== Enter Order Set					
Cown Order Sul Section /	Step 6: User opens insulin order set (recommended doses	from Step 5 above will o	arry forward to corresponding insulin o	rders)	







## Diabetes Dashboard / Clinical Prioritisation View Development

	MEDICATION MANAGEMENT CYCLE STEPS
WHY (GOAL)	Optimise ordering, minimise dysglycaemia & insulin on
WHEN (WORK FLOW)	Ordering & Monitoring
WHO (PERSON)	Clinicians: Nursing / Pharmacy / Clinicians
CDS FIVE RIGHTS	Condition specific drug, disease, pathology
HOW (FORMAT)	Relevant data presentation & alerts
WHERE (CHANNEL)	Internet – Power BI platform

#### Consultation

- Stakeholders
- Subject matter experts

#### Development

- Business rules

#### Endorsement

- Data definitions

### Demonstration

- Use groups
- Governing bodies



		In	pat	ient Diabete	s Dashboard						C	linica	al <b>Excellence</b> ( <sub>Que</sub>	Queensl ensland H	and <sub>ealth</sub>
		A	g dmissi	Clinical Filte Missing ins No Ons (#) Yes	rs ulin order <6 hours	Hypoglyo	caemia pas	t 48 hours	Poo	or glyca No Yes	aemic day past 48 hours	Cur	rent Ward		~
URN	Patient name	Age	Patient location	Insulin administered in last 24 hours	Insulin prescribed not yet given		Missing insulin order <6 hours	BGC past 24 hours	Hypoglycaemia in past 48 hours	Recen t poor day	Non insulin diabetes medications	HBA1 C	HBA1C At	eGFR Value	eGFR Valid DT
		82	MBH G0 ORTHG 0 R8 R8A	07/04/21 10:30 insulin Mixtard 30/70 44 unit(s) 07/04/21 18:19 insulin Mixtard 30/70 34 unit(s)			08/04/21 06:00	13.6 @ 07:37 14.7 @ 10:24 11.5 @ 17:14 10.7 @ 18:19	3.9 @ 08/04/21 01:20	~	07/04/21 08:12 gliCLAZide 60 mg Tablet, modified release 60 mg 07/04/21 08:12 metformin 500 mg Tablet, modified release 500 mg 07/04/21 14:59 metformin 500 mg Tablet, modified release 500 mg 07/04/21 19:32 metformin 500 mg Tablet, medified release 500 mg	9.1	26/03/2021 9:00:00 AM	68	7/04/2021 1:27:56 PM
		73	MBH F 2 MED 22 A	07/04/21 08:31 insulin novoRAPID Pen 2 unit(s) 07/04/21 11:53 insulin novoRAPID Pen 4 unit(s)	08/04/21 07:00 Insulin Supplemental 08/04/21 12:00 Insulin Supplemental 08/04/21 17:00 Insulin Supplemental			10.8 @ 08:31 15.4 @ 11:51 12.2 @		~				86	7/04/2021 9:56:27 AM
		74	MBH G 1 GSU 19 A	O7/04/21.37:27 Insulin novor(APID Pan 4				1/:1/ 14.8 @ 08:10 13.3 @ 09:13 13.7 @ 11:36 12.3 @ 14:39 11.2 @ 16:10 11.2 @ 17:16 12.2 @		-	07/04/21 08:38 metformin 500 mg Tablet, modified release 500 mg 07/04/21 09:35 gliCLAZide 60 mg Tablet, modified release 120 mg			52	7/04/2021 4:06:36 PM
		55	MBH F 1 CCU 6 B					19:09 9.6 @ 09:25 8.4 @ 13:32 7.9 @ 15:54 11.1 @ 18:00		~				84	7/04/2021 6:43:31 AM
		62	MBH F 2 MED 18 A					7.7 @ 08:37 9.6 @ 11:29 10.9 @ 17:47 8.7 @ 20:12	3.1 @ 06/04/21 08:25	-				>90	3/04/2021 10:05:08 AM
		49	MBH F 2 MED 09 B	07/04/21 08:39 insulin Fiasp 6 unit(s) 07/04/21 11:56 insulin Fiasp 4 unit(s) 07/04/21 17:53 insulin Fiasp 10 unit(s) 07/04/21 21:58 insulin Levemir 30 unit(s)	08/04/21 07:00 Insulin Supplemental 08/04/21 12:00 Insulin Supplemental 08/04/21 17:00 Insulin Supplemental			14.1 @ 07:39 18.6 @ 11:13 16.7 @ 13:38		-		9.3	18/09/2020 12:40:00 PM	>90	7/04/2021 2:57:24 PM
		90	MBH G 2 MIXG2 07					8.8 @ 07:30 12.5 @ 12:01 10.4 @		-	07/04/21 08:59 gliCLAZide 30 mg Tablet, modified release 30 mg	7.2	1/12/2020 9:10:00 AM	29	6/04/2021 1:30:49 PM



#### Pre-admissions

URN	Patient name	Age	Latest Known HBA1C	HBA1C Date	eGFR Value	eGFR Valid DT	Diabetes Problem	Latest medications	Pharmacist Pre-Adm Review	Scheduled surgeries
		82	5.1	11/03/2021 6:23:00 AM	65	27/04/2021 1:09:48 PM				29/04/21 12:50 Anaes Endo Procedure:
		68	5.6	20/04/2021 6:15:00 AM	>90	28/04/2021 12:35:53 PM	T2DM - Type 2 diabetes mellitus	metformin 1 g Tablet, modified release		29/04/21 14:05 Amputation of toe: SHORTT, NICHOLAS LE
		65			>90	5/03/2021 3:14:08 PM	Diabetes mellitus associated with pancreatic disease			29/04/21 11:50 Anaes Endo Procedure:
		53	7.2	27/04/2021 12:43:00 PM	>90	27/04/2021 3:01:12 PM	DM - Diabetes mellitus	insulin Toujeo		29/04/21 09:45 Lobectomy of liver: HODGKINSON, PETER
		57	7.4	17/02/2021 9:10:00 AM	6	21/04/2021 1:46:11 PM	Diabetes clinic	siTagiptin		29/04/21 08:10 Anaes Endo Procedure:
		32			W.	9/07/2020 4:31:40 PM		insulin novoMIX 30/70 insulin Toujeo linagiptin	22/4/21 8:00	29/04/21 13:00 Laparoscopic pentoneal dialysis cathetersa KANAGARAJAH, VIJAY ANANDHA MURUGESU SMO
		68			>90	13/04/2021 10:22:42 AM		insulin novoMIX 30/70		29/04/21 08:30 Transperineal needle biopsy of prostate: GA
		61			85	15/04/2021 11:47:21 AM		metformin 1 g Tablet, modified release	23/4/21 8:30	29/04/21 13:00 Phacoemulsification of cataract with intraoci
		61	6.5	15/03/2021 8:05:00 AM	39	27/04/2021 1:40:10 PM		insulin Actrapid + glucose 50% 25 g insulin novoMIX 30/70 insulin novoRAPID insulin novoRAPID Pen insulin subcutaneous dose check Adult linugliptin linugliptin linugliptin 5 mg Tablet		29/04/21 12:30 Cystoscopic removal of urelaric stent: WOO THOMAS SMO
		67			70	4/11/2020 1:09:29 PM		gliCLAZide 60 mg Tablet, modified release insulin Actrapid insulin Actrapid Cartridge		29/04/21 08:10 Anaes Endo Procedure:
		77			84	24/01/2021 1:19:16 PM	Diabetes mellitus type 2	metformin 1 g Tablet, modified release metformin 500 mg Tablet, modified release		29/04/21 08:30 Phacoemulsification of cataract with intrace implan: MCLINTOCK, CAMERON ANDREW SMD
		74	6.8	10/03/2021 7:50:00 AM	79	28/04/2021 8:58:09 AM	Type 2 diabetes meTitus	gliCLAZide 30 mg Tablet, modified release metformin 500 mg Tablet, modified release slTAGEIPTin 100 mg Tablet		29/04/21 13:10 Anaes Endo Procedure:
		76			36	28/04/2021 8:28:56 AM				29/04/21 13:10 Anaes Endo Procedure:
		81			>90	28/04/2021 9:45:18 AM		linagliptin linagliptin 5 mg Tablet metformin metformin 1 g Tablet		29/04/21 12:30 Anaes Endo Procedure:
		60			29	3/04/2020 1:12:07 PM	Type 2 diabetes mellitus	gliCLAZide		29/04/21 12:10 Anaes Endo Procedure:
		66	8.1	29/12/2020 10:00:00 AM	66	28/04/2021 7:41:45 AM	Diabetes mellitus type 2	insulin Optisulin metformin 500 mg Tablet siTagliptin 50 mg Tablet siTagliptin-metformin		28/04/21 16:30 Anaes Endo Procedure:
		64	5.3	31/03/2021 6:48:00 AM	59	28/04/2021 8:31:38 AM		Insulin novoRAPID Pan		29/04/21 08:50 insertion of tunnelled indwelling catheter wit KEIR, GREGORY JOHN SMO
		69			64	22/04/2021 7:40:19 AM		empagilfiozin		29/04/21 12:10 Anaes Endo Procedure:
		66			>90	30/03/2021 9-26-34 AM		dulagiufide insulin novoRAPID Pon insulin subcutaneous dose check Adult metformin metformin 500 mg Tablet, modified release		29/04/21 10:35 Rigid cystescopy: GALLAGHER, KYLIE AN 29/04/21 10:35 Cystoscopic removal of uneteric stent: GALL KYLIE ANN SMO 29/04/21 10:35 Lithobripsy using laser: GALLAGHER, KYLIE 29/04/21 10:35 Lithobripsy using laser: GALLAGHER, KYLIE 29/04/21 10:35 Cystoscopic replacement of uneteric stent: C KYLIE ANN SMO



# Deployment

### • Validation

- Data view (raw data)
- Dashboard (visual display)
- Local site specific

### Training

- Development of workflow documentation
- In person training of key stakeholders
- Training the trainers

### Governance structures

- Local access control
- Centralised point of contact discrepancies, enhancements
- Centralised process deployment at additional sites
- Regular review by overseeing governance group



# **Future Directions**

### **Order/prescription creation facilitators**

• Insulin order sets – S/C Insulin prescribing workflow, steroid hyperglycaemia guidelines

#### **Relevant data presentations**

• Data visibility solutions – Inpatient aggregated diabetes dashboard

### **Queensland Integrated Element Tracker (QUIET)**

- Statewide repository of endorsed data definitions and associated code for iEMR link
- Collation of cohorts
- Streamline development of digital products



# Thank you

• Questions?