Metabolic Adverse Effects of Atypical Antipsychotic Drugs

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FRNZCGP, FAChAM
Rotorua GPCME 12 June 2011

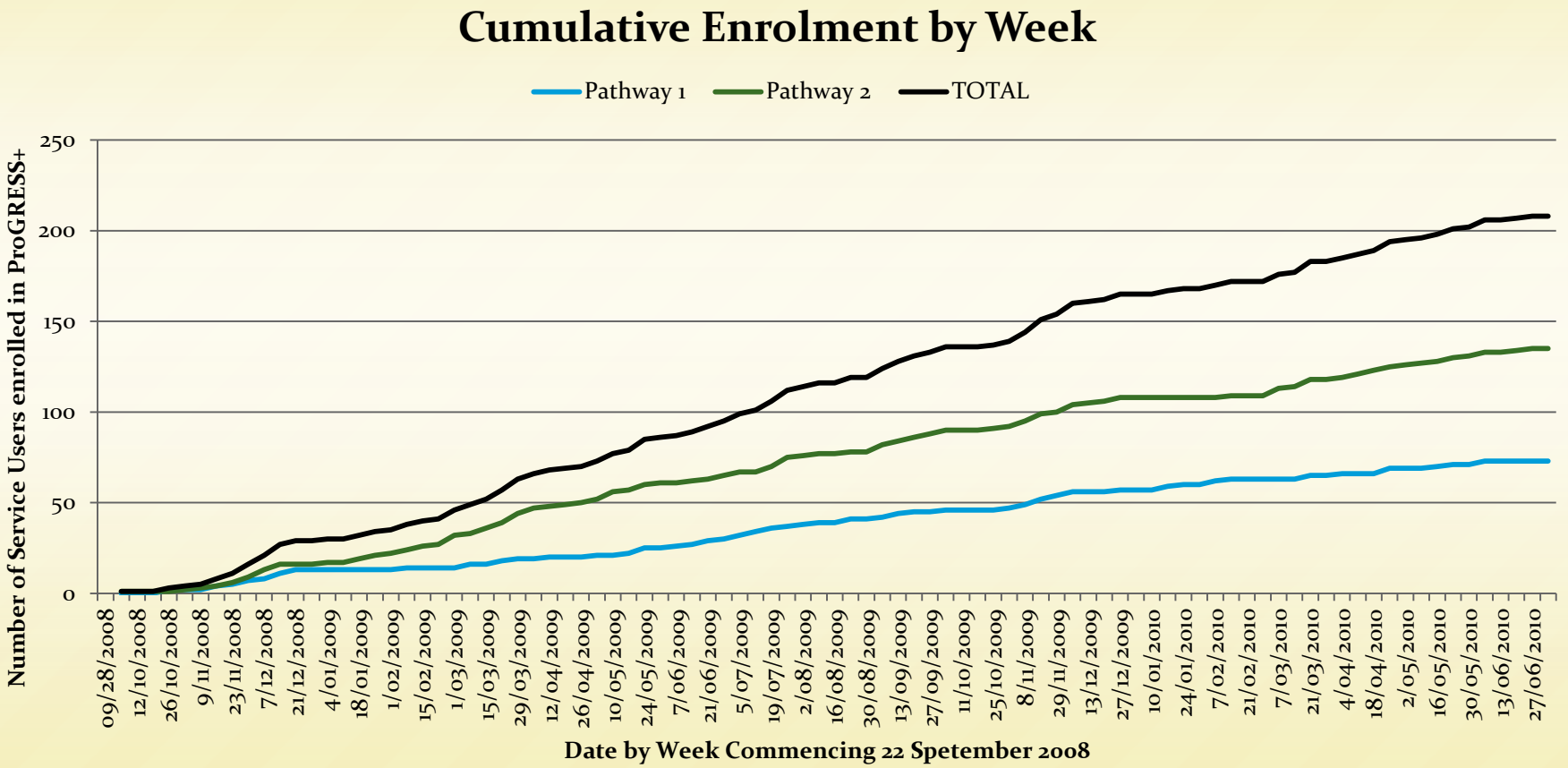
Summary: Metabolic monitoring those on Atypical Antipsychotics

	Baseline	Monthly	3-monthly	Annually
Weight / BMI	✓	✓		
Fasting glucose	✓	Those at risk for 3 months	Those at risk for 1 yr, once for others	✓
Lipids	✓		For 1 year	✓

From Best Practice, Issue 3

Progress+ Pilot Pathway utilization: Evidence

Enrolment to end of June 2010, Total = 208



208 SU

Pathway 1: 74

Pathway 2: 134

GPs' responses to 'I always complete metabolic screening with ProGRESS+ consumers'

	Number of GPs
Strongly Agree	0
Agree	3
Neither Agree or Disagree	2
Disagree	2
Strongly Disagree	0

[89 Procare GPs surveyed, 9 replied, & of those 7 replied to this question]

Uses of atypicals

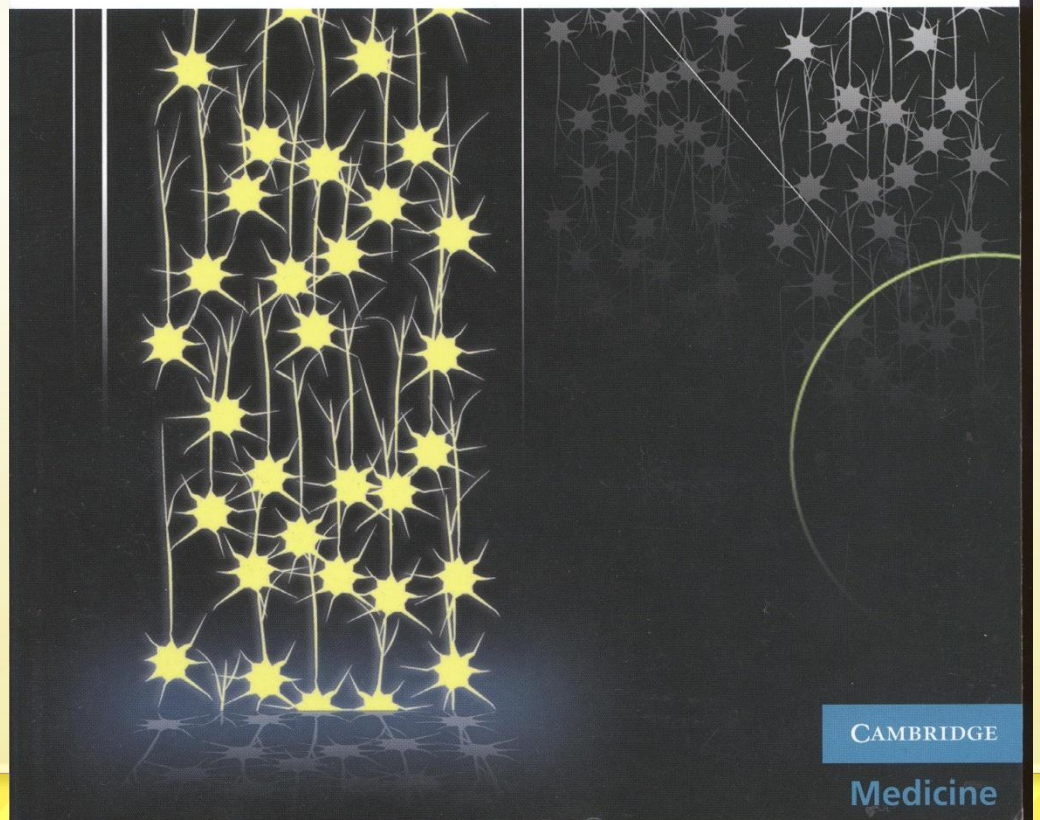
- Antipsychotics
- Mood stabilisers in all phases of bipolar
- 'Off-label' uses
  - Augmentation of antidepressants in treatment resistant depression
  - Anxiolytics in treatment resistant anxiety
  - Psychosis/behavioural disorders of dementias

Third Edition

Stahl's Essential Psychopharmacology

Neuroscientific Basis and Practical Applications

Stephen M. Stahl



CAMBRIDGE

Medicine

Typical, conventional, classic antipsychotics

- Chlorpromazine synthesized in 1950 as antihistamine, but observed to have antipsychotic effects
- Found to cause neurolepsis, ‘slowness or absence of motor movements’
- Properties of ‘psychomotor slowing, emotional quietening and affective indifference’
- Dopamine-2 antagonists


Dopamine Output - Untreated Schizophrenia
Mesolimbic Pathway
Mesocortical Pathway to DLPFC
Mesocortical Pathway to VMPFC
Nigrostriatal Pathway
Tuberoinfundibular Pathway
normal
HIGH
LOW
LOW
NORMAL
NORMAL
positive symptoms
cognitive symptoms
affective symptoms
(SIGH)
negative symptoms
(SIGH)
negative symptoms
Dopamine Output - After Pure D2 Antagonist
Mesolimbic Pathway
Mesocortical Pathway to DLPFC
Mesocortical Pathway to VMPFC
Nigrostriatal Pathway
Tuberoinfundibular Pathway
normal
NORMAL
LOW
LOW
LOW
LOW
reduced positive symptoms
cognitive symptoms
affective symptoms
parkinsonism
elevated prolactin
lack of pleasure or reward
(SIGH)
negative symptoms
(SIGH)
negative symptoms

Extra Pyramidal Symptoms

- Acute dystonic reactions: muscular spasms of neck – torticollis, eyes – oculogyric crisis, tongue, or jaw; more frequent in children
- Akathisia: restlessness
- Pseudoparkinsonism: drug-induced parkinsonism (muscular lead-pipe rigidity, bradykinesia/akinesia, resting tremor, and postural instability; more frequent in adults and the elderly)

[thank you Wikipedia]

Tardive Dyskinesia

- Involuntary, irregular muscle movements, usually in the face: chewing movements, tongue protrusions, grimacing
- Occurs when D2 receptors in nigrostriatal pathway are blocked long-term
- Sometimes irreversible
- About 5% chance of occurring each year the typical antipsychotic is taken
- Those without symptoms after some years may have protective genotypes

Muscarinic receptors

- CPZ blocks muscarinic receptors
  - Dry mouth
  - Blurred vision
  - Constipation
  - Cognitive blunting
  - Reversed with anticholinergics

Haloperidol lacks this property

Benefits of typicals

- Lower cost
- Lower cardiometabolic effects

- Keep in mind the risks stated earlier

Commonly used atypicals

- Risperidone [eg risperdal]
- Olanzapine [eg zyprexa]
- Quetiapine [eg seroquel, quetapel]
- Amisulpride [eg solian]
- Aripiprazole [eg abilify]
- Ziprasidone [eg zeldox]
- Clozapine [eg clopine, clozaril]

What makes an antipsychotic atypical?

- Low EPS risk
- May improve negative symptoms [blunted affect, poverty of speech, anhedonia, asociality, amotivation]
- Atypical has D2 antagonist plus serotonin 2A antagonistic properties

Atypical

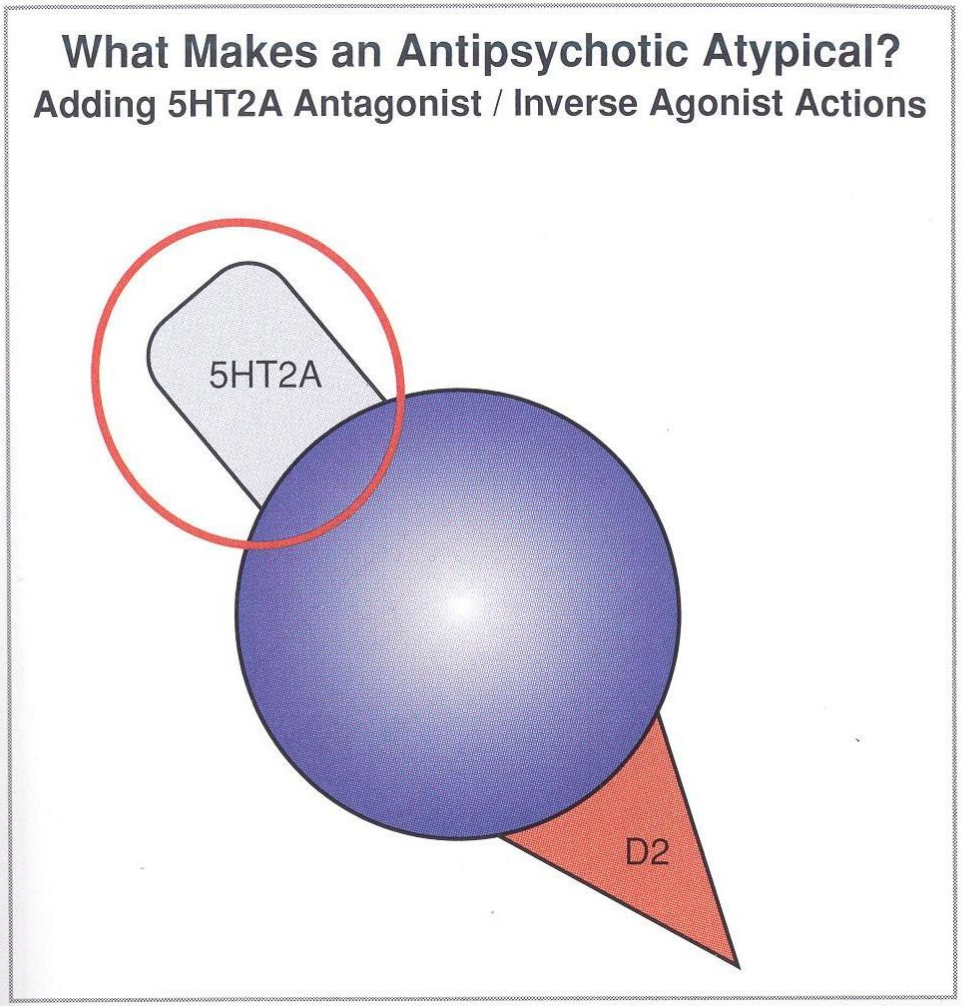


FIGURE 10-14 Serotonin-dopamine antagonist. The "atypicality" of atypical antipsychotics has often been attributed to the coupling of D2 antagonism with serotonin-2A antagonism. Shown here is an icon representing this dual pharmacological action.

EXAMPLE of Benefit

DOPAMINE inhibits prolactin release

SEROTONIN stimulates prolactin release

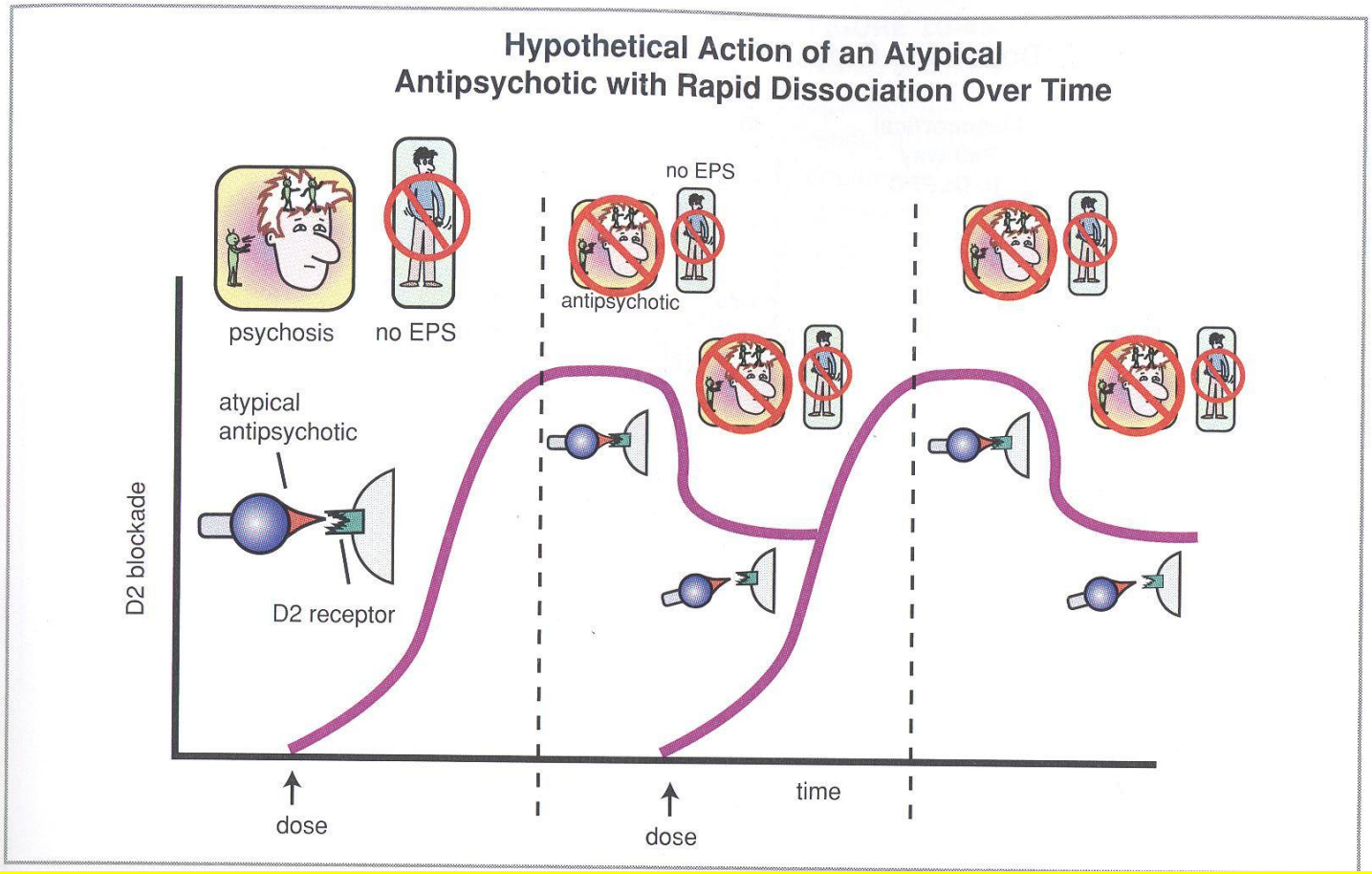
ATYPICAL blocks stimulation and inhibition of prolactin

Positive symptoms

- May be reduced by the '3-neuron circuit'

'when 5HT2A antagonists block the serotonergic excitation of cortical pyramidal cells, their glutamate release is reduced, and this lowers the hyperactive drive on the mesolimbic dopamine pathway downstream, thus reducing hallucinations and other positive symptoms.'

- Serotonin antagonism increases dopamine in some brain areas.



Hit and Run Theory

Dopamine partial agonists

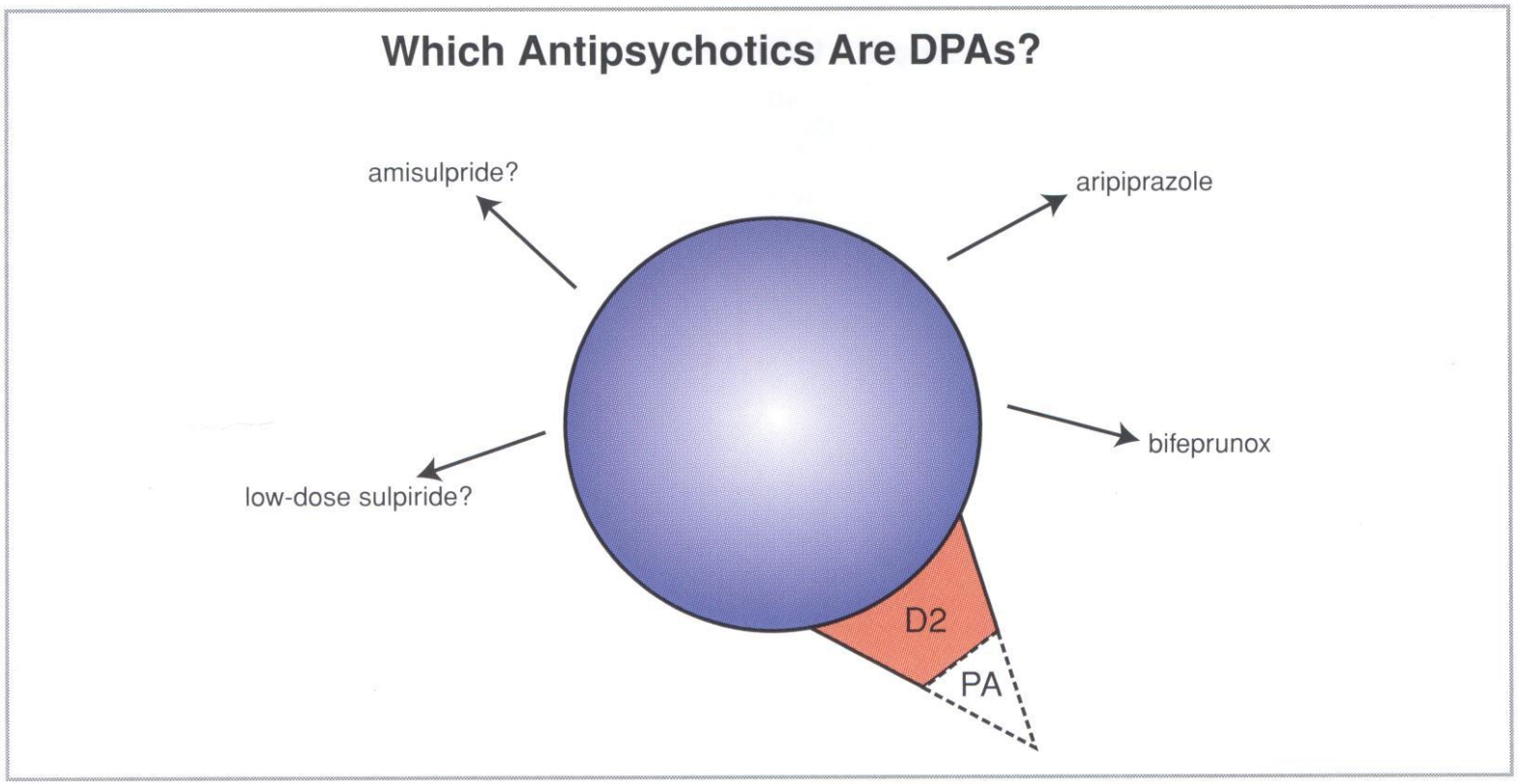
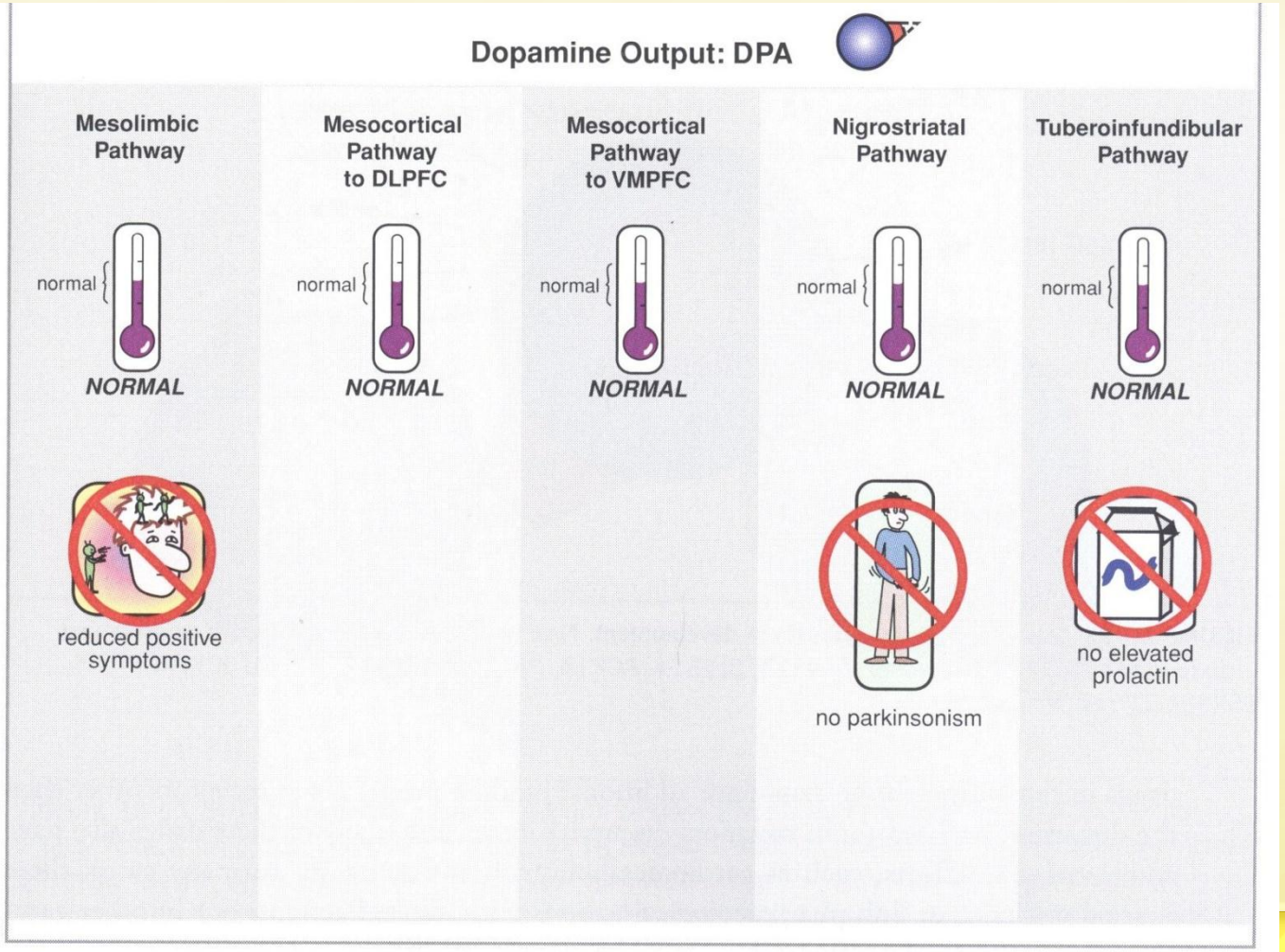
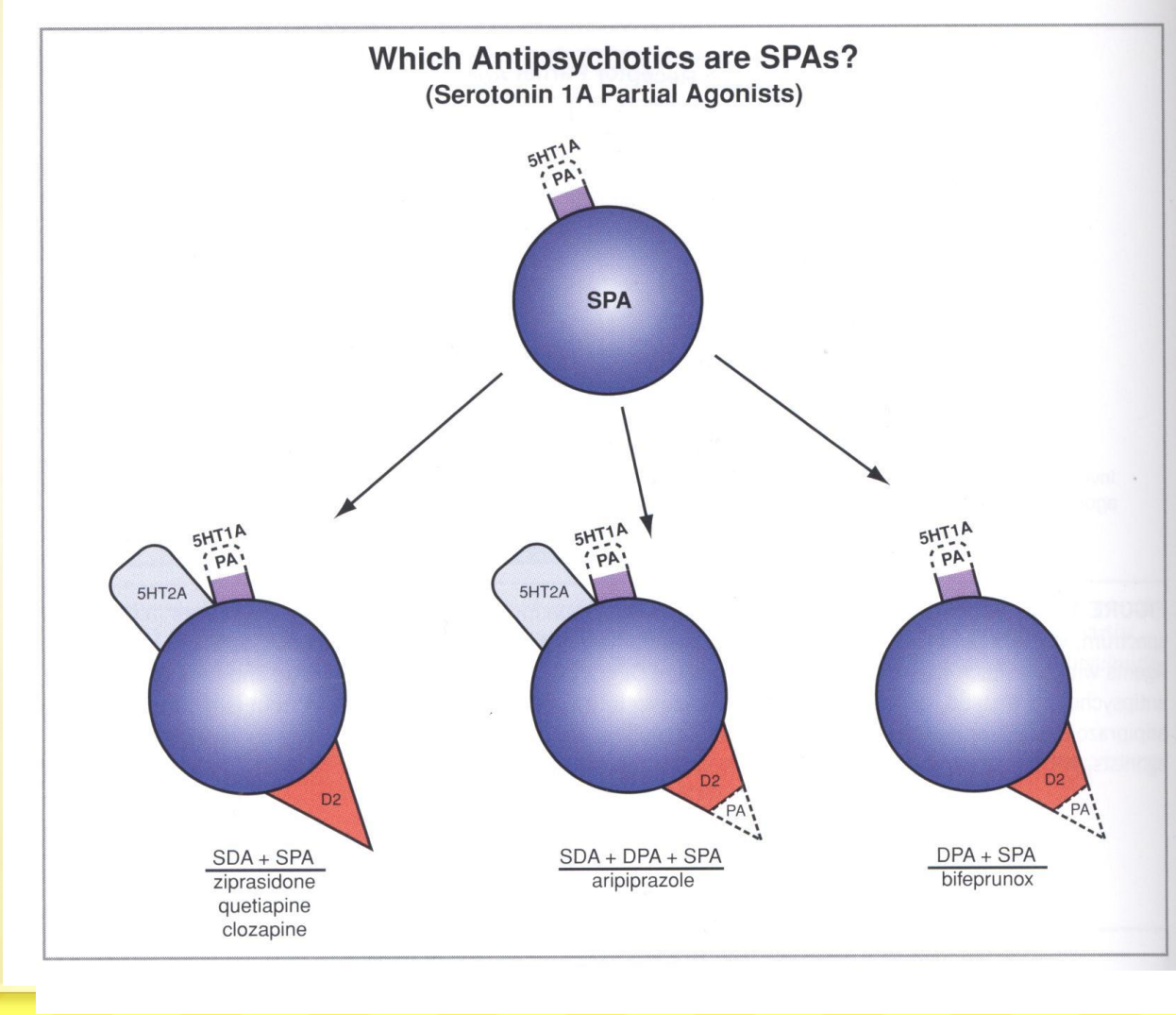


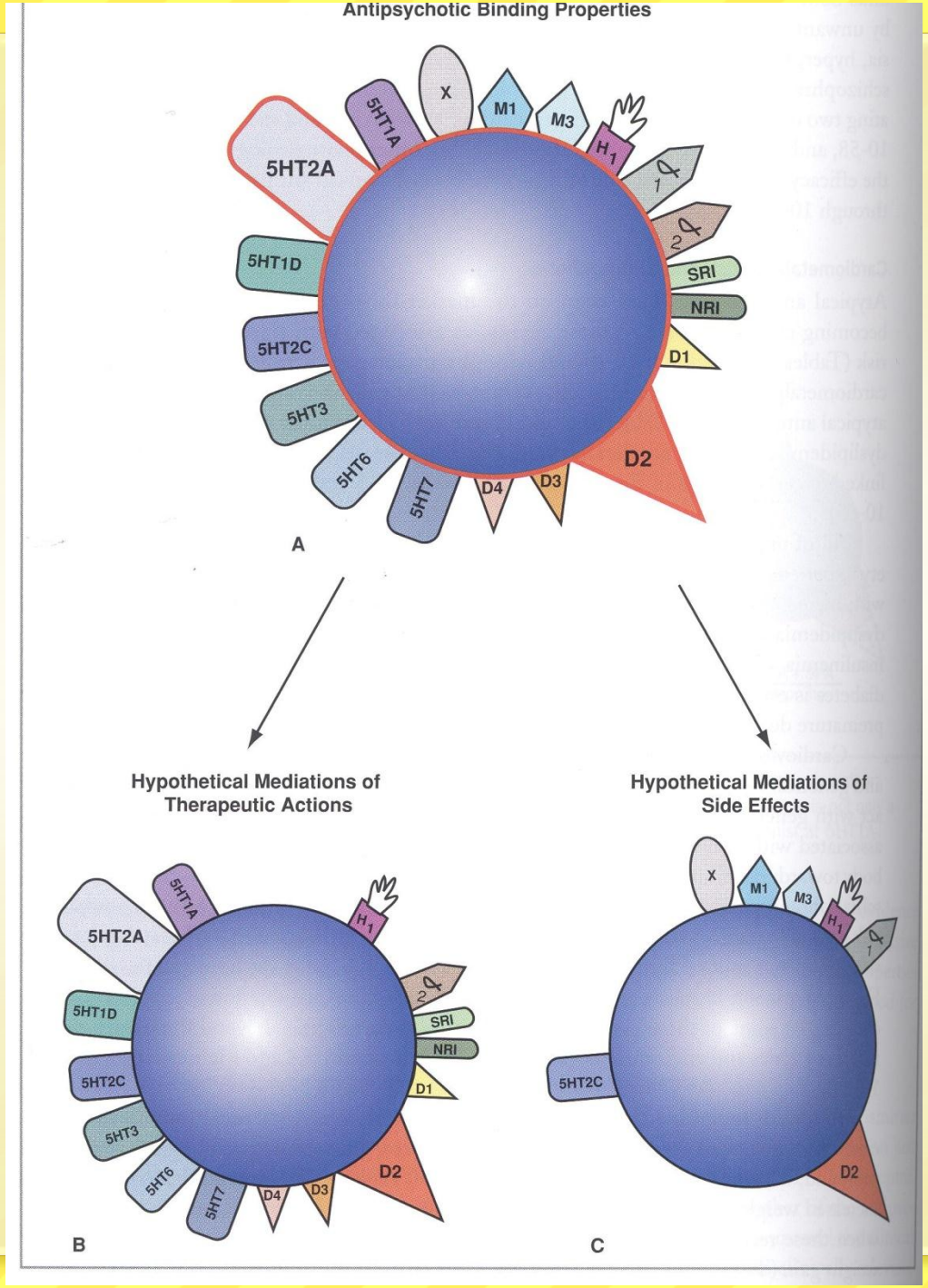
FIGURE 10-52 Dopamine partial agonists on the market. Which antipsychotics are DPAs? Dopamine partial agonists that are currently available or soon to be available include aripiprazole, bifeprunox, possibly amisulpride, and perhaps sulpiride when used at low doses.

Goldilocks zone – not too hot, not too cold



Serotonin 1A partial agonists




Antipsychotic Binding Properties
X
M1
M3
H1
α1
α2
SRI
NRI
D1
D2
D3
D4
5HT7
5HT6
5HT3
5HT2C
5HT1D
5HT2A
5HT1A
A
Hypothetical Mediations of Therapeutic Actions
Hypothetical Mediations of Side Effects
B
C

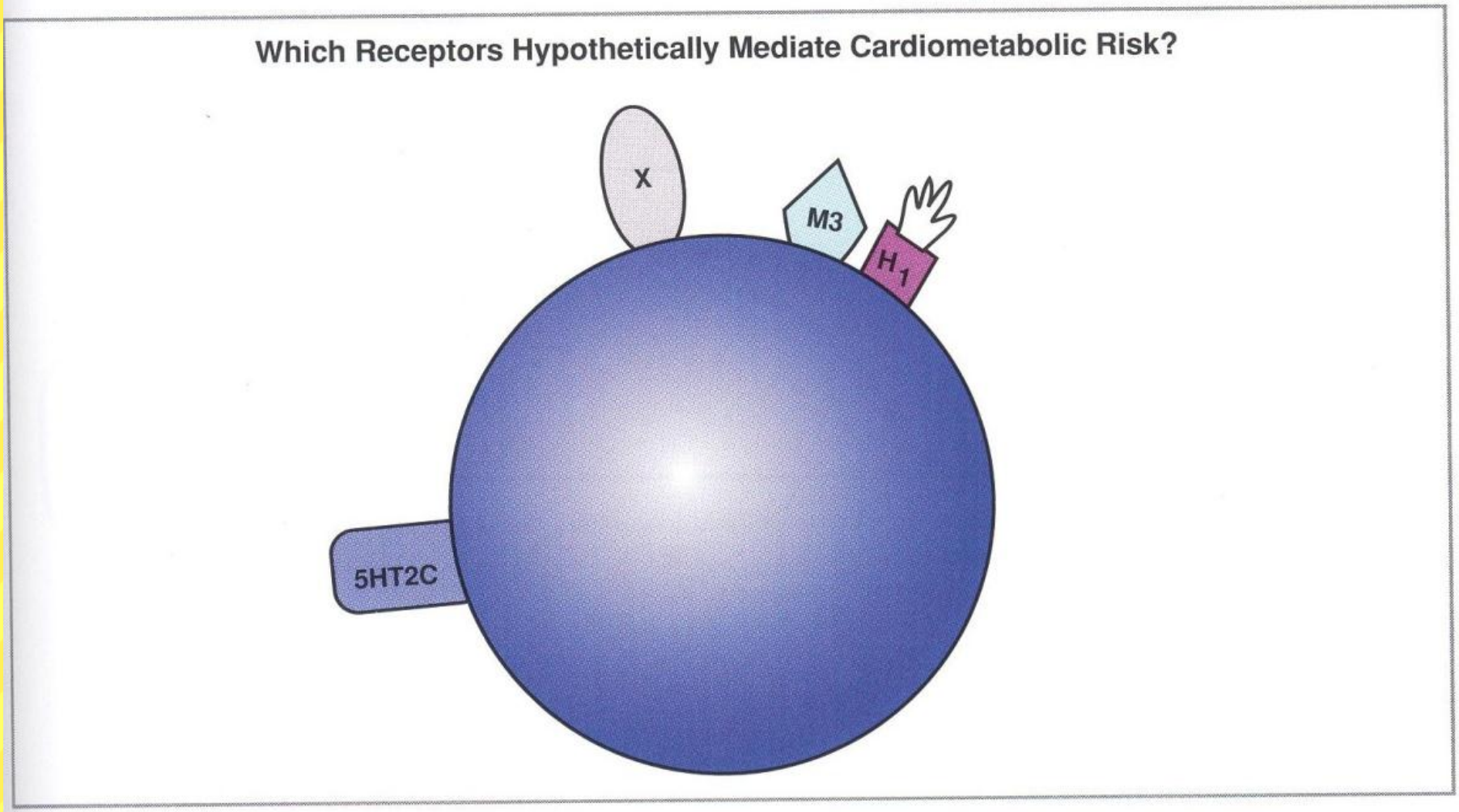


FIGURE 10-58 Receptors mediating cardiometabolic risk. Which receptors hypothetically mediate cardiometabolic risk? Serotonin-2C, muscarinic-3, and histamine-1 receptors as well as receptors yet to be identified (signified here as receptor X), are all hypothetically linked to cardiometabolic risk. In particular, antagonism of serotonin-2C and histamine-1 receptors is associated with weight gain, while antagonism at muscarinic-3 receptors can impair insulin regulation. An unknown receptor X may be involved in the rapid production of insulin resistance and may also rapidly cause elevated fasting plasma triglyceride levels in some patients who experience increased cardiometabolic risk on certain atypical antipsychotics.

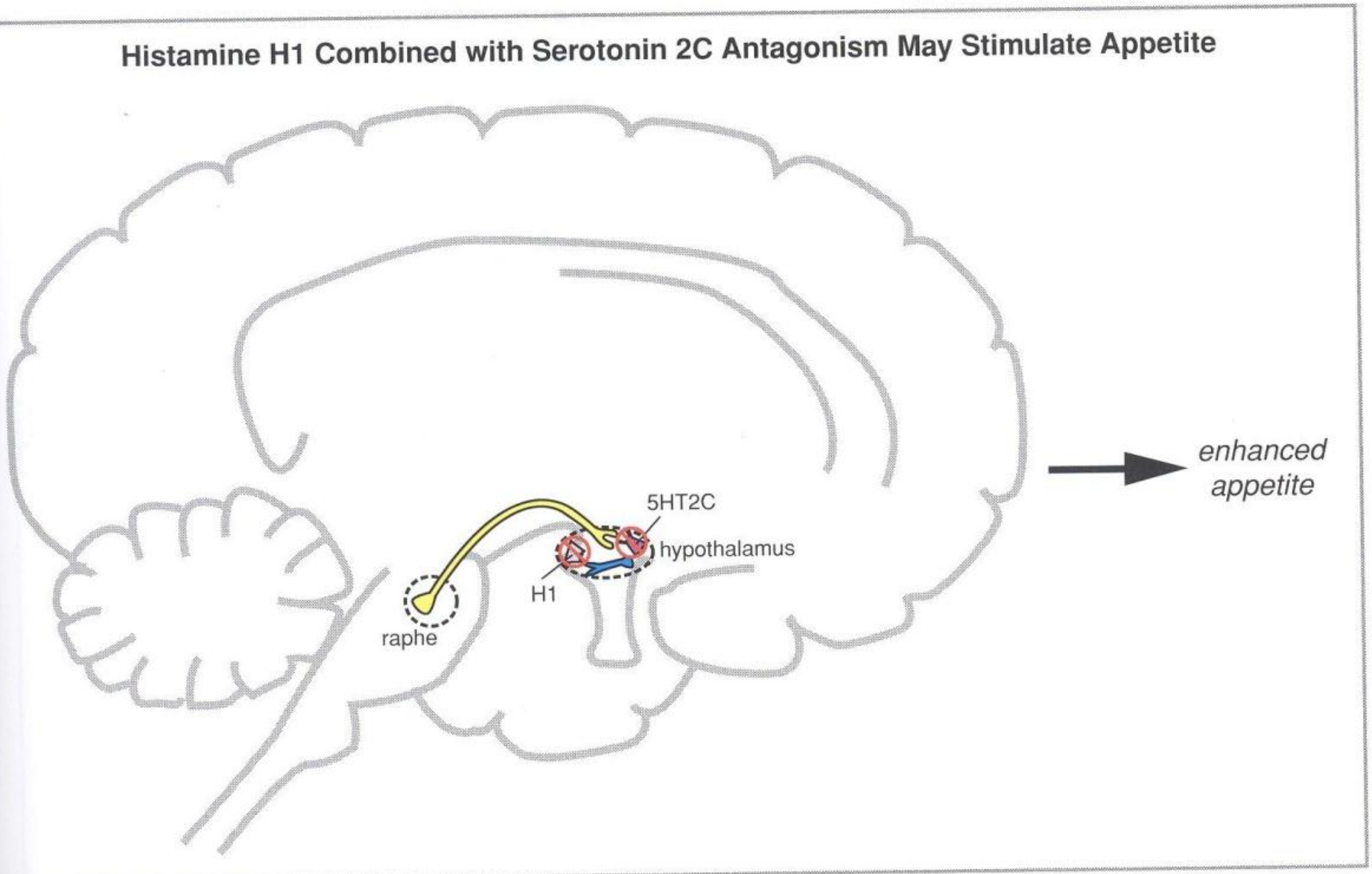
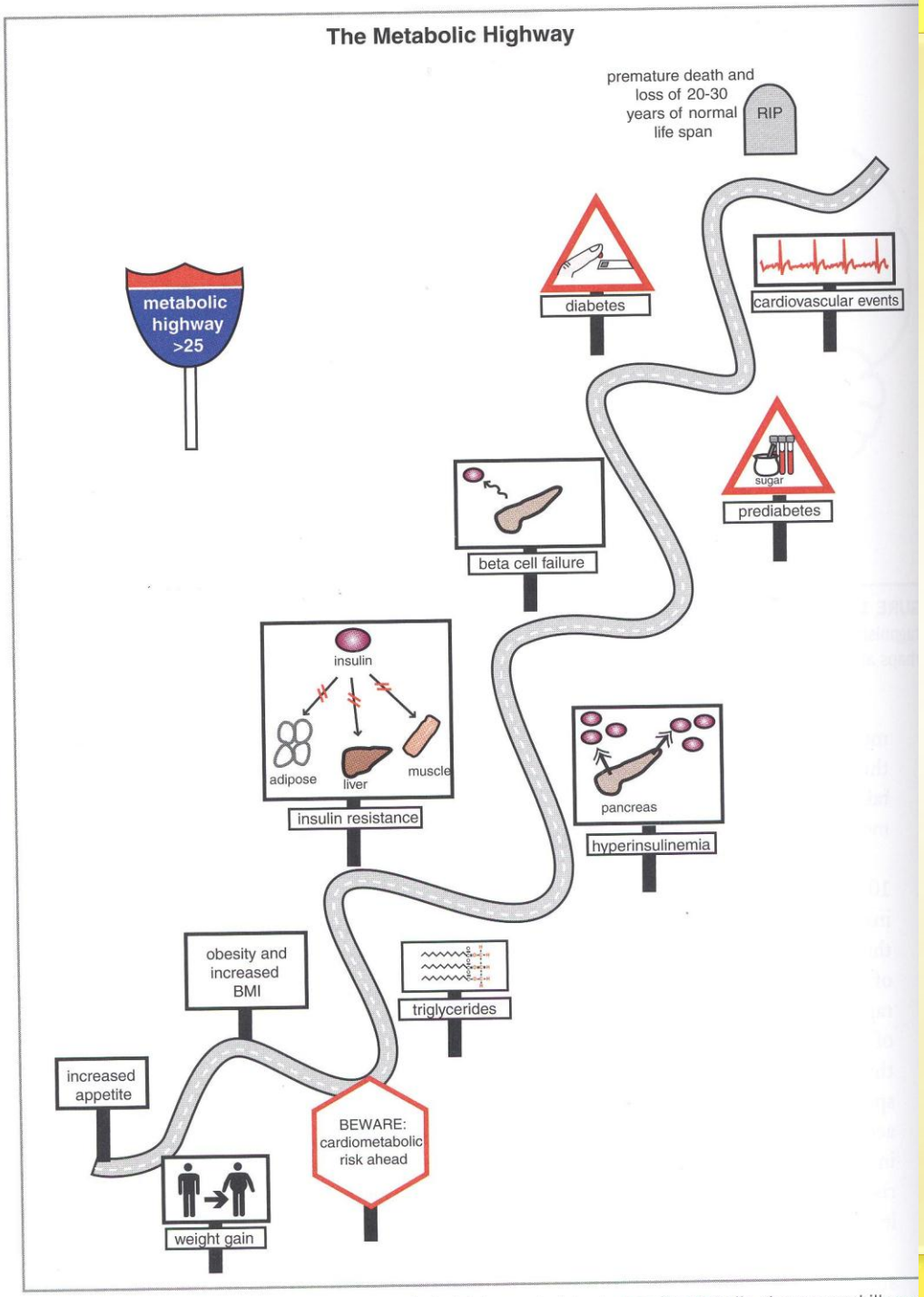
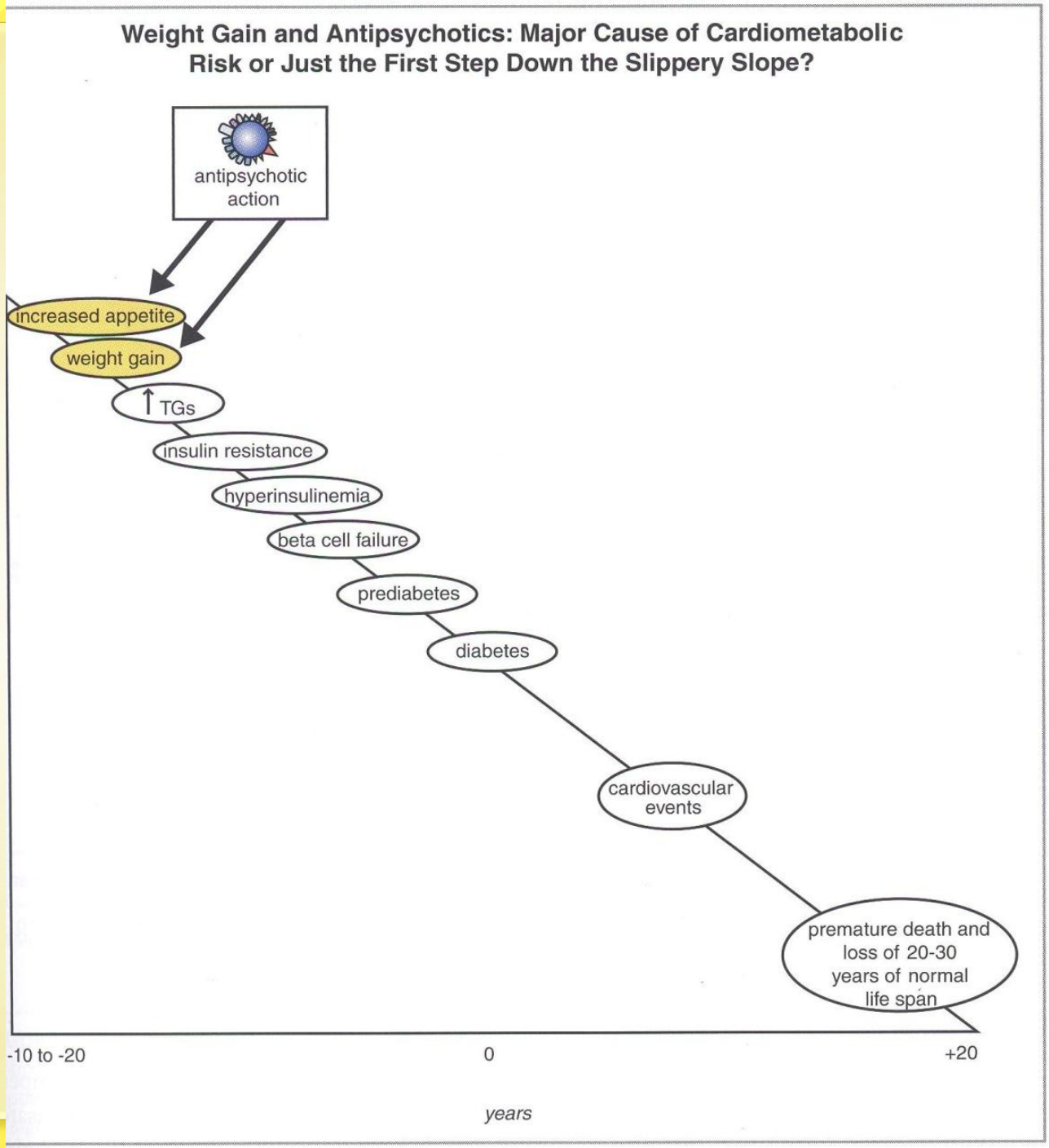
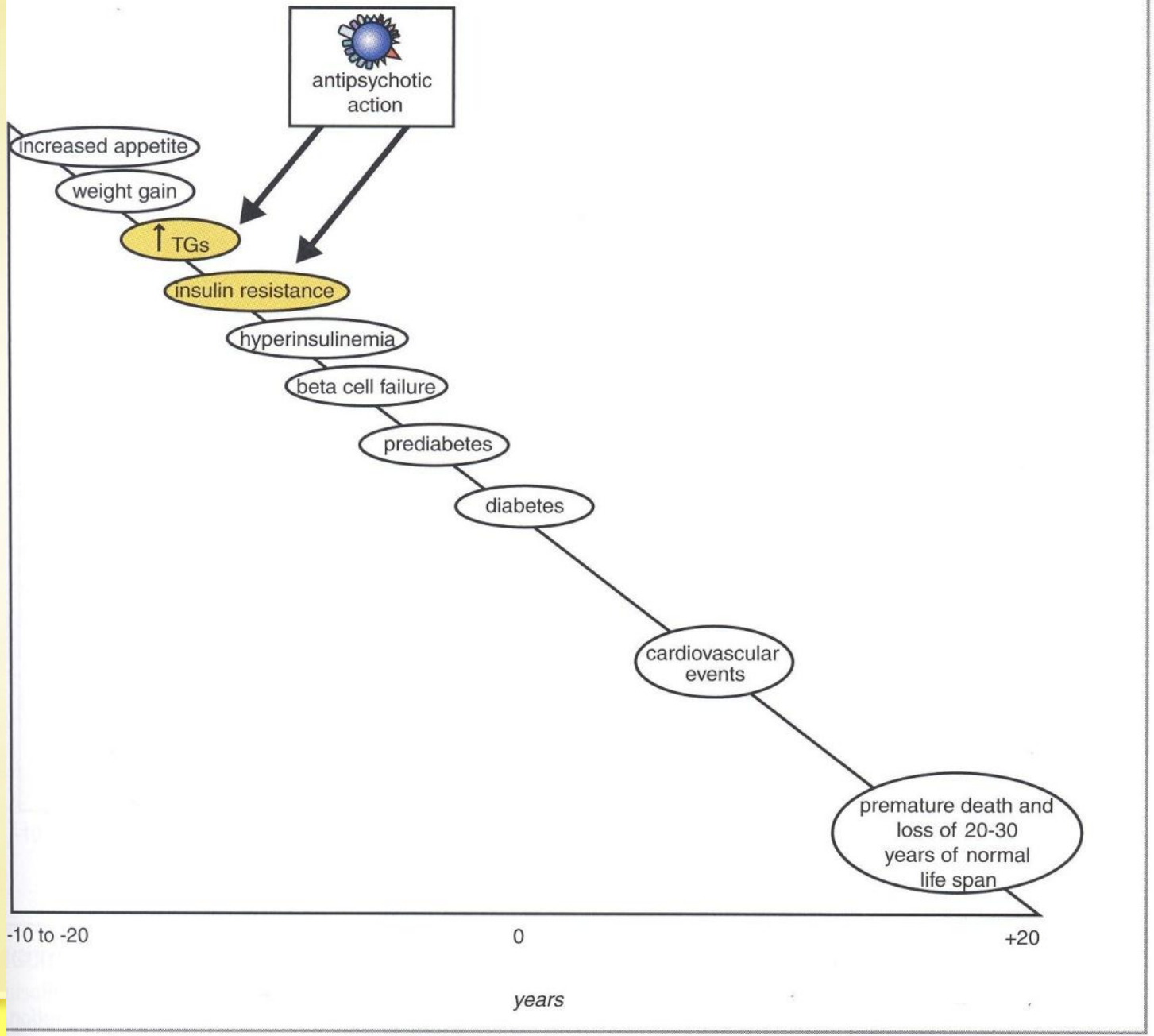


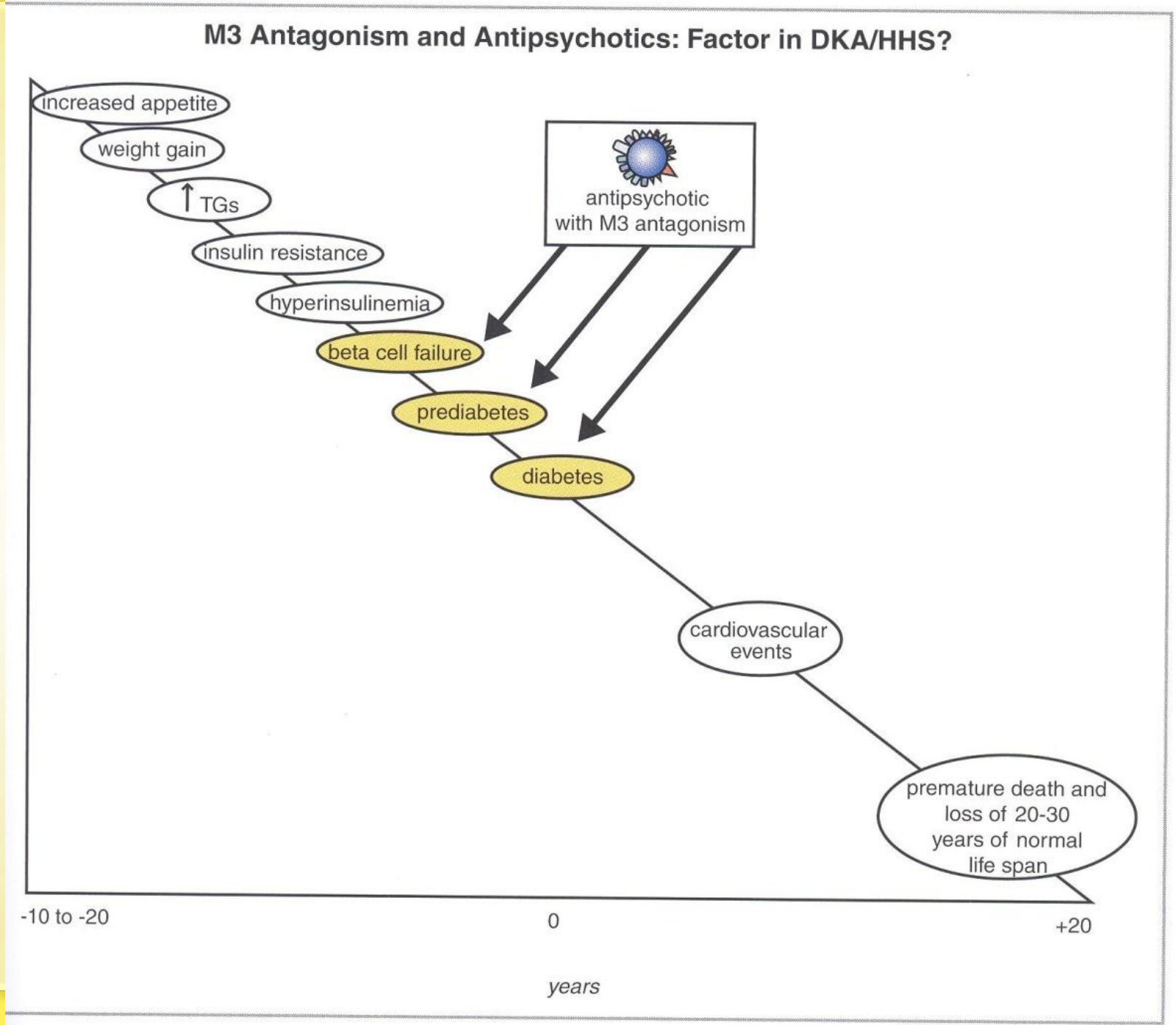
FIGURE 10-59 H1 combined with 5HT2C antagonism. Histamine 1 (H1) combined with serotonin-2C antagonism may stimulate appetite. Antagonism of serotonin-2C and/or H1 receptors can lead to weight gain, perhaps at least in part due to stimulation of appetite regulated by the hypothalamus.

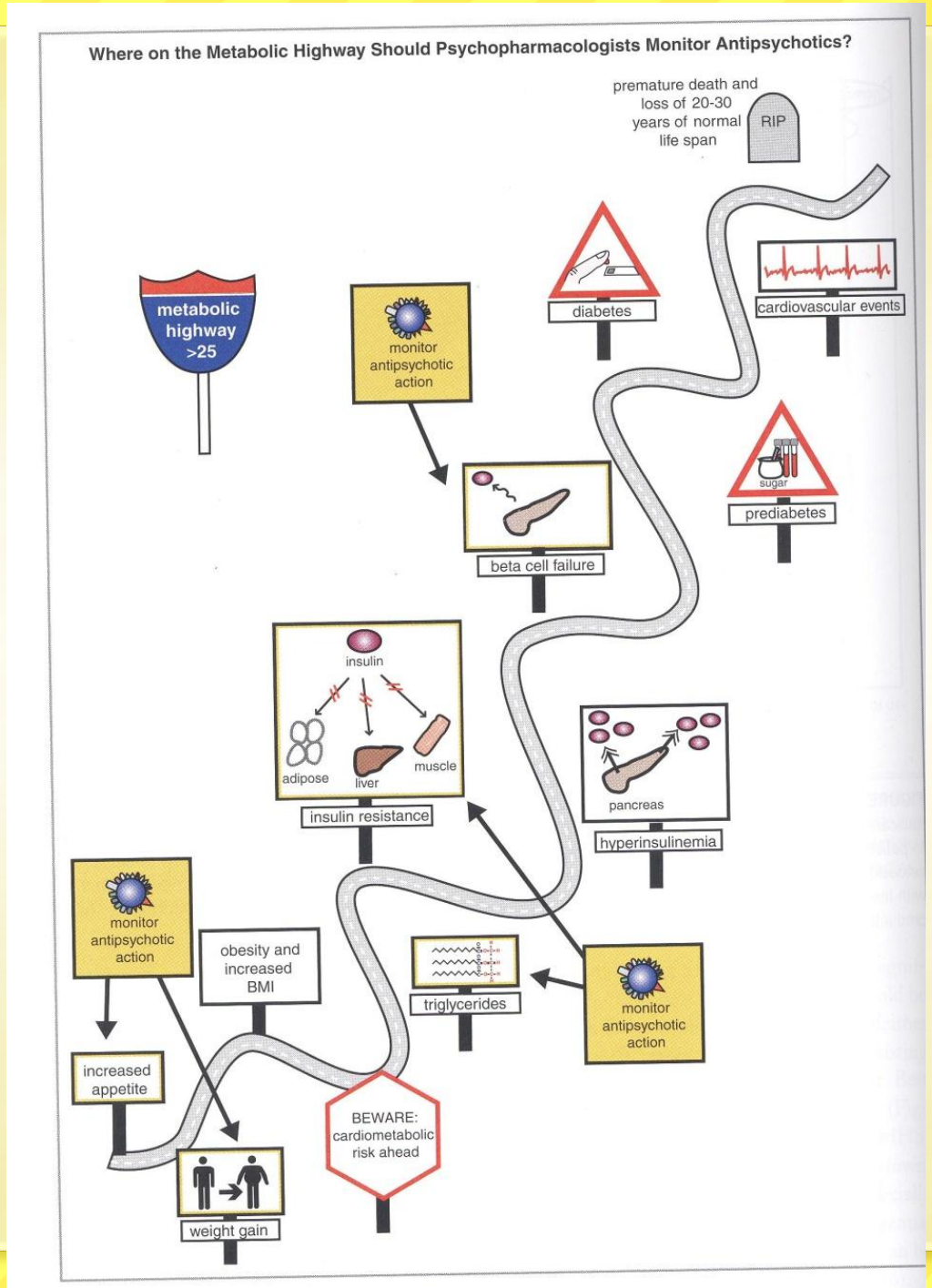

The Metabolic Highway
premature death and loss of 20-30 years of normal life span
RIP
metabolic highway >25
diabetes
cardiovascular events
sugar
prediabetes
beta cell failure
insulin
adipose
liver
muscle
insulin resistance
pancreas
hyperinsulinemia
obesity and increased BMI
triglycerides
increased appetite
BEWARE: cardiometabolic risk ahead
weight gain


Weight Gain and Antipsychotics: Major Cause of Cardiometabolic Risk or Just the First Step Down the Slippery Slope?
antipsychotic action
increased appetite
weight gain
↑ TGs
insulin resistance
hyperinsulinemia
beta cell failure
prediabetes
diabetes
cardiovascular events
premature death and loss of 20-30 years of normal life span
-10 to -20
0
+20
years

Fasting Triglycerides and Antipsychotics: Second Step Down the Slippery Slope?

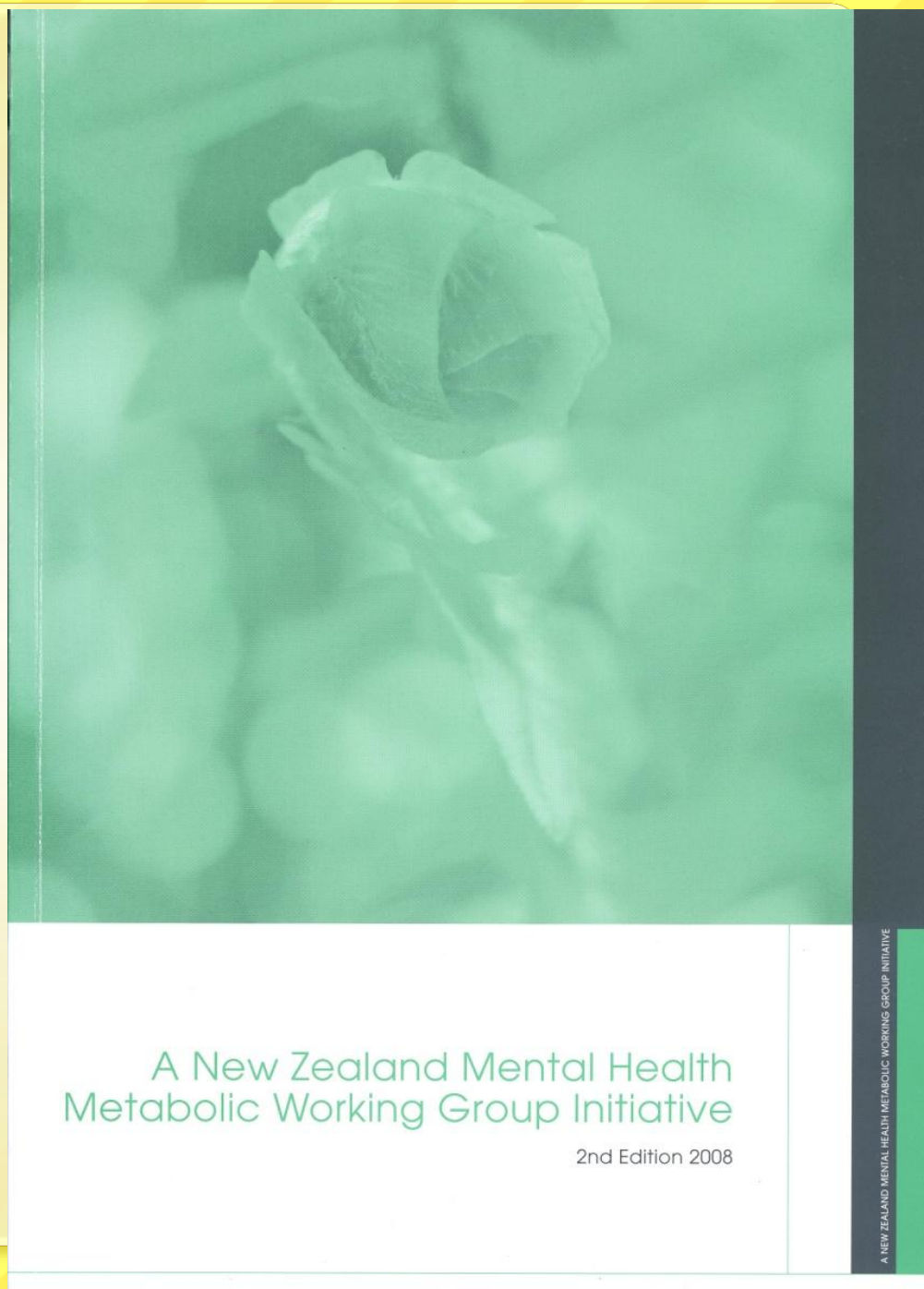



M3 Antagonism and Antipsychotics: Factor in DKA/HHS?
increased appetite
weight gain
↑ TGs
insulin resistance
hyperinsulinemia
beta cell failure
prediabetes
diabetes
cardiovascular events
premature death and loss of 20-30 years of normal life span
antipsychotic with M3 antagonism
-10 to -20
0
+20
years



DKA: diabetic ketoacidosis
HHS: hyperglycaemic hyperosmolar syndrome

Proudly sponsored by Janssen-Cilag 2nd edition 2008



Why screen?

- Individuals w schizophrenia have a 20% shorter life expectancy
- Due to greater vulnerability to
  - Type 2 diabetes
  - Obesity
  - Metabolic syndrome
  - Coronary heart disease
  - Hypertension
  - Emphysema

2nd generation antipsychotics contribute to

- Obesity
- Diabetes
- Dyslipidaemia
- Metabolic syndrome

- Being Maori or Polynesian further increases risk of metabolic abnormalities

However….

‘limited scientific evidence on the effectiveness of interventions to manage metabolic complications of antipsychotics’ p4

‘Although there are a number of reports that support the benefits of dietary advice and healthy living interventions, the use of medications remains controversial.’ p4, *A New Zealand Mental Health Metabolic Working Group Initiative*, 2008

General interventions

- Involve primary care
- Balance risk of adverse effects vs benefits of antipsychotics
- Monitor the patient
- Inform patient of risk/benefits
- Ask about constipation
- Advise:
  - Healthy eating
  - Exercise
  - Smoking cessation

Aggravation of metabolic problems

- Those already showing signs of metabolic syndrome
- Maori, Polynesian, Asian
- Sodium valproate
- Beta-blockers
- Negative symptoms of schizophrenia eg apathy, social withdrawal, limited insight

Metabolic trigger points

Metabolic Measures and Recommended Interventions

Measure	Trigger	Intervention
BMI	> 25	• Discuss risks with patient and family • Introduce local & individualised dietary and exercise programme with referral to dietician • Refer to patient's Primary Care Team
Waist circumference	Women > 88cm Men >102cm	
Weight	Weight gain of >7% & BMI >25	• Consult with patient and family • Consider switching to an atypical antipsychotic less likely to cause weight gain • Introduce local & individualised dietary and exercise programme with referral to dietician • Refer to patient's Primary Care Team
Blood Glucose	Impaired GTT or diabetes	• Consult with patient and family • Consider switching to an atypical antipsychotic less likely to cause abnormalities • Consider lower dose of antipsychotic • Introduce local & individualised dietary and exercise programme • Refer to Primary Care/ Specialist Team
Lipids	Triglycerides > 2mmol/L Total cholesterol (TC) : HDL-C > 4.5	• Consult with patient and family • Introduce local and individualised dietary and/or exercise programme • Refer to patient's Primary Care Team

Metabolic Risk

TABLE 10-2 Atypical antipsychotics and risk of weight gain: FDA and experts agree on three tiers of risk

Antipsychotic	Risk for Weight Gain
Clozapine	+++
Olanzapine	+++
Risperidone*	++
Quetiapine	++
Ziprasidone	+/−
Aripiprazole	+/−

*Risperidone's active metabolite paliperidone likely poses the same risk of weight gain as risperidone itself.
FDA, US Food and Drug Administration.

TABLE 10-3 Atypical antipsychotics and cardiometabolic risk: FDA and experts disagree on one versus three tiers of risk

	Cardiometabolic/Dyslipidemia/Diabetes Risk		
Antipsychotic	Expert consensus	CATIE	FDA
Clozapine	Definite risk	ND	Diabetes warning
Olanzapine	Definite risk	Definite risk	Diabetes warning
Risperidone*	Inconclusive	Intermediate	Diabetes warning
Quetiapine	Inconclusive	Definite risk	Diabetes warning
Ziprasidone	+/− limited data	Low-risk	Diabetes warning
Aripiprazole	+/− limited data	ND	Diabetes warning

*Risperidone's active metabolite paliperidone likely poses the same cardiometabolic risk as risperidone itself.
ND, not done (clozapine and aripiprazole not studied in early phases of this trial).
CATIE, Clinical Antipsychotic Trials of Intervention Effectiveness.
FDA, US Food and Drug Administration.

'Metabolically Friendly'

TABLE 10-4 Are there "metabolically friendly" atypical antipsychotics? Low-risk agents for weight gain and cardiometabolic illness

Antipsychotic	Cardiometabolic Risk
Ziprasidone	Low
Aripiprazole	Low
Amisulpride	Possibly low but not well studied
Bifeprunox	Possibly low, studies in progress

Generic	Brand
Ziprasidone	Zeldox
Aripiprazole	Abilify
Amisulpride	Solian

Summary Table of Monitoring Recommendations for Antipsychotic medication

Authors: Helen Dunn and Denise Tai, Mental Health Pharmacists, Capital & Coast DHB.
This table is adapted from the Atypical Antipsychotic Monitoring Guidelines, Chelsea & Westminster Hospital.
The monitoring recommendations below are intended as a guide only and should be tailored to the clinical need of the individual patient.

	Clozapine	Olanzapine	Risperidone	Quetiapine	Conventionals (Typicals), Aripiprazole (Arip), Ziprasidone (Zipras), Amisulpride (Amisul)
Weight, BMI, Girth	Baseline then as needed (monthly)	Baseline then as needed (monthly)	Baseline then as needed (monthly)	Baseline then as needed (monthly)	Baseline weight then as needed
Lipids	Baseline, then after three months then annually	Baseline then after three months then annually	Baseline then after three months then annually	Baseline then after three months then annually	Baseline then as necessary, at least annually
Blood Glucose (fasting)	Baseline, then: For high risk patients, monthly for 1st three months, then 3 monthly for rest of 1st year In other patients, repeat test after three months, then annually if no changes noted and no other risk factors.	Baseline, then: For high risk patients, monthly for 1st three months, then 3 monthly for rest of 1st year. In other patients, repeat test after three months, then annually if no changes noted and no other risk factors.	Baseline, then: For high risk patients, monthly for 1st three months, then 3 monthly for rest of 1st year In other patients, repeat test after three months, then annually if no changes noted and no other risk factors.	Baseline, then: For high risk patients, monthly for 1st three months, then 3 monthly for rest of 1st year. In other patients, repeat test after three months, then annually if no changes noted and no other risk factors.	Baseline, then: For high risk patients, monthly for 1st three months, then 3 monthly for rest of 1st year. In other patients, repeat test after three months, then annually if no changes noted and no other risk factors.
LFT's	Baseline then every 3 to 6 months for first year, then annually	Baseline then every 3 to 6 months for the first year, then annually	Baseline then every 3 to 6 months for the first year, then annually	Baseline then every 3 to 6 months for the first year, then annually	Baseline then every 3 to 6 months for the first year, then annually.

	Clozapine	Olanzapine	Risperidone	Quetiapine	Conventionals (Typicals), Aripiprazole (Arip), Ziprasidone (Zipras), Amisulpride (Amisul)
Cardiac	Be aware of myo-carditis in 1st 2 months of Tx & for cardiomypathy any time				
BP and Pulse	On initiation and during titration then annually.	On initiation and during titration, then annually	On initiation and during titration, then annually.	On initiation and during titration, then annually	On initiation and titration, then annually
Electrolytes & creatinine	Baseline then at least annually or more often if necessary	Baseline then at least annually or more often if necessary	Baseline then at least annually or more often if necessary	Baseline then at least annually or more often if necessary	Baseline then at least annually or more often if necessary (esp. Amisul. - renally cleared)
FBC	Baseline, then q1 week for 1st 18 weeks, then at least q4 weeks	Baseline then six monthly	Baseline then six monthly	Baseline then six monthly	Baseline then six monthly
TFT's				Baseline, then at six months, and six monthly in those with thyroid dysfunction	
Prolactin		Baseline then if symptoms occur	Baseline then if symptoms occur		Baseline then if symptoms occur (conventionals & amisulpride only).
EPS		Monitor for EPS and TD regularly	Monitor for EPS and TD regularly (every six months)		Monitor for EPS and TD regularly (every six months). Akathisia possible with Arip. & Zipras.
Other adverse effects	Monitor for constipation. Lunsers side effect questionaire	Monitor for constipation Lunsers side effect questionaire	Monitor for constipation Lunsers side effect questionaire	Monitor for constipation Lunsers side effect questionaire	Monitor for constipation Lunsers side effect questionaire

Liverpool University Neuroleptic Side Effect Rating Scale, 51 symptom questionnaire

MedTech-32 Kingsland Family Health Centre

File Edit Patient Module Patient Medications Report Tools Utilities Setup ManageMyHealth CAT Window Help

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t, Mt Eden 09 Mar 1966 44 yrs Male European/Pakeha 0.00 P

New Consultation

Main | More | Audit 00:04:02

HISTORY

EXAMINATION

GG

Details	P

Waiting Room

Provider:

Arrived	Appoint.	Wait

Patient Manager

Clinical Template | History | Appointments | Immunisation | Contacts | Patient Transactions | A/c Holder Account | Patient Tasks | Forms

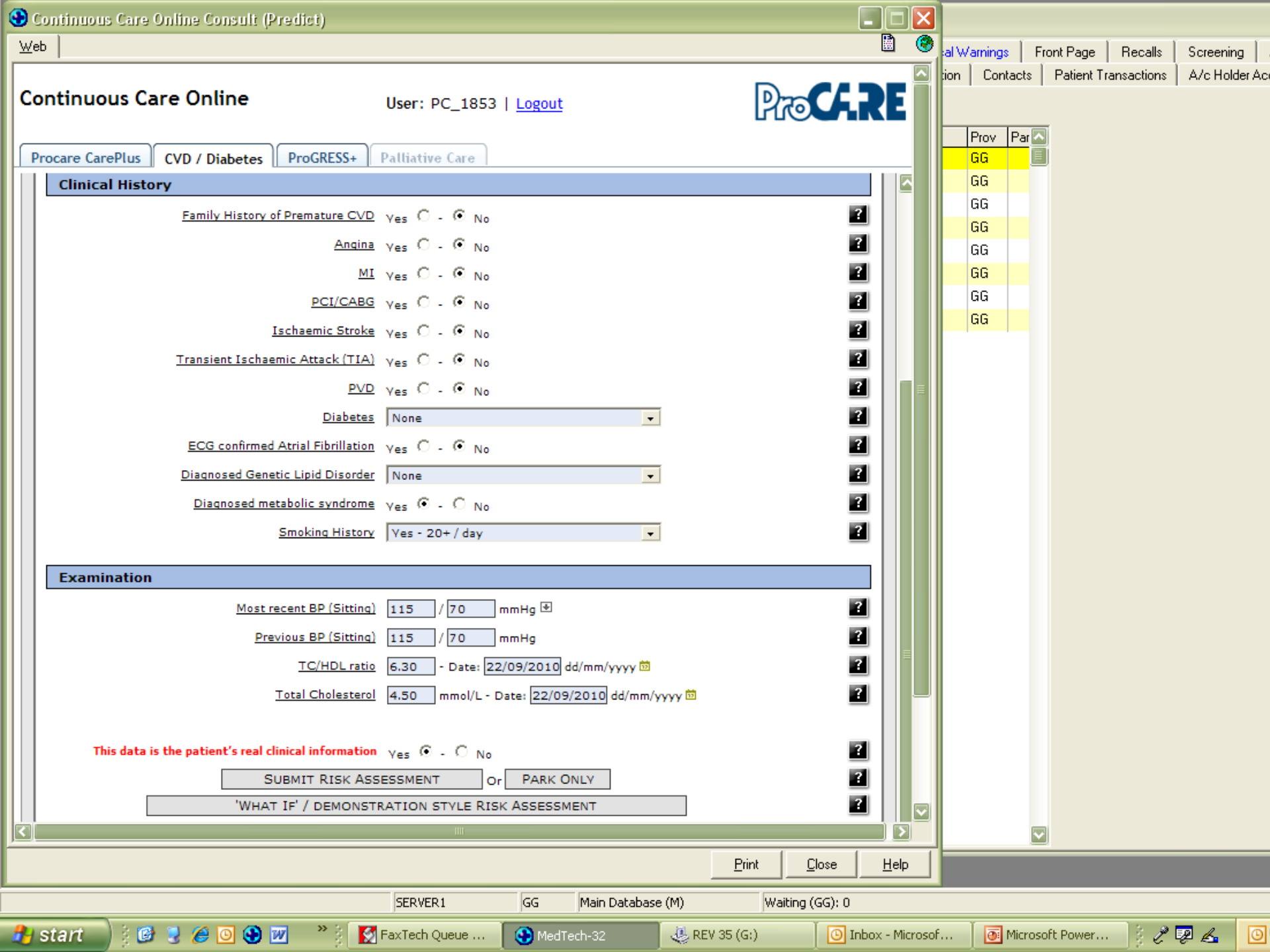
Daily Record | Medications | Classifications | Medical Warnings | Front Page | Recalls | Screening | Accidents | Out Box | Inbox

Rep	Date	Drug Name	Qty	Directions	Amount	Prov	SP
☐	27 Sep 2010	Sodium Valproate 500mg Enteric coated Ta	0	3 tabs, NOCTE	0.00	GG	
☐	27 Sep 2010	Risperidone 4mg Tab	0	1 tabs, NOCTE	0.00	GG	
☐	27 Sep 2010	Omeprazole 20mg Cap	0	1 caps, MANE	0.00	GG	
☐	27 Sep 2010	Atorvastatin Calcium 40mg Tab	0	1 tabs, NOCTE	0.00	GG	
☐	27 Sep 2010	Bupropion Hydrochloride 150mg Modified R	0	1 TWICE DAILY	0.00	GG	
☐	2 Aug 2010	Bupropion Hydrochloride 150mg Modified R	0	1 NOCTE FOR THREE NIGHT	0.00	GG	
☐	5 Jul 2010	Ibuprofen 200mg Tab (blister pack)	60	1-2 tabs, THREE TIMES DAIL	0.00	GG	
☐	23 Mar 2010	Paracetamol 500mg Tab	50	2 Q4H PRN FOR PAIN	85.10	GG	
☐	22 Dec 2009	Simvastatin 40mg Tab	0	1 tabs, NOCTE, following the f	0.00	GG	
☐	22 Dec 2009	Simvastatin 20mg Tab	0	1 tabs, NOCTE, in addition to	0.00	GG	
☐	8 Dec 2009	Nicotine 2mg Lozenges	0	6 boxes of 36, suck hourly prn	0.00	GG	

MIMS INTEGRATED
Medicines information you can trust

SERVER1 GG Main Database (M) Waiting (GG): 0

start FaxTech Queue ... MedTech-32 REV 35 (G:) Inbox - Microsof... Microsoft Power... 4:43 p.m.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Web
Continuous Care Online
User: PC_1853 | Logout
ProCARE
Procare CarePlus
CVD / Diabetes
ProGRESS+
Palliative Care
Clinical History
Family History of Premature CVD Yes - No
Angina Yes - No
MI Yes - No
PCI/CABG Yes - No
Ischaemic Stroke Yes - No
Transient Ischaemic Attack (TIA) Yes - No
PVD Yes - No
Diabetes None
ECG confirmed Atrial Fibrillation Yes - No
Diagnosed Genetic Lipid Disorder None
Diagnosed metabolic syndrome Yes - No
Smoking History Yes - 20+ / day
Examination
Most recent BP (Sitting) 115 / 70 mmHg
Previous BP (Sitting) 115 / 70 mmHg
TC/HDL ratio 6.30 - Date: 22/09/2010 dd/mm/yyyy
Total Cholesterol 4.50 mmol/L - Date: 22/09/2010 dd/mm/yyyy
This data is the patient's real clinical information Yes - No
SUBMIT RISK ASSESSMENT Or PARK ONLY
'WHAT IF' / DEMONSTRATION STYLE RISK ASSESSMENT
Print
Close
Help
Warnings
Front Page
Recalls
Screening
Contacts
Patient Transactions
A/c Holder Ac
Prov
Par
GG
SERVER1
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Main Database (M)
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FaxTech Queue ...
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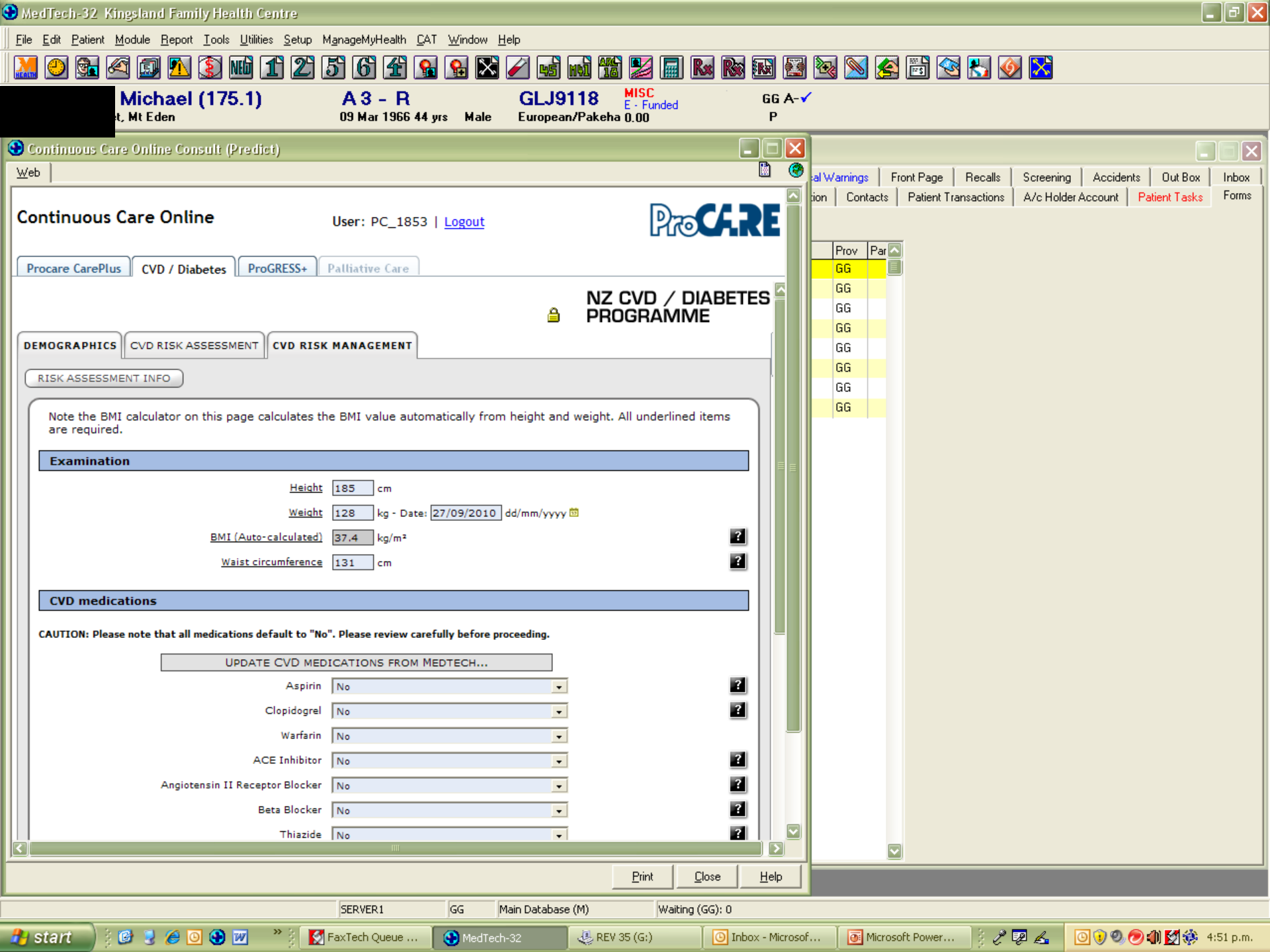
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Michael (175.1)
A 3 - R
09 Mar 1966 44 yrs Male
GLJ9118
MISC
E - Funded
European/Pakeha 0.00
GG A-✓
P
Continuous Care Online Consult (Predict)
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Continuous Care Online
User: PC_1853 | Logout
ProCARE
Procare CarePlus
CVD / Diabetes
ProGRESS+
Palliative Care
NZ CVD / DIABETES PROGRAMME
DEMOGRAPHICS
CVD RISK ASSESSMENT
CVD RISK MANAGEMENT
RISK ASSESSMENT INFO
Note the BMI calculator on this page calculates the BMI value automatically from height and weight. All underlined items are required.
Examination
Height 185 cm
Weight 128 kg - Date: 27/09/2010 dd/mm/yyyy
BMI (Auto-calculated) 37.4 kg/m²
Waist circumference 131 cm
CVD medications
CAUTION: Please note that all medications default to "No". Please review carefully before proceeding.
UPDATE CVD MEDICATIONS FROM MEDTECH...
Aspirin No
Clopidogrel No
Warfarin No
ACE Inhibitor No
Angiotensin II Receptor Blocker No
Beta Blocker No
Thiazide No
Print
Close
Help
Front Page
Recalls
Screening
Accidents
Out Box
Inbox
Contacts
Patient Transactions
A/c Holder Account
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REV 35 (G:)
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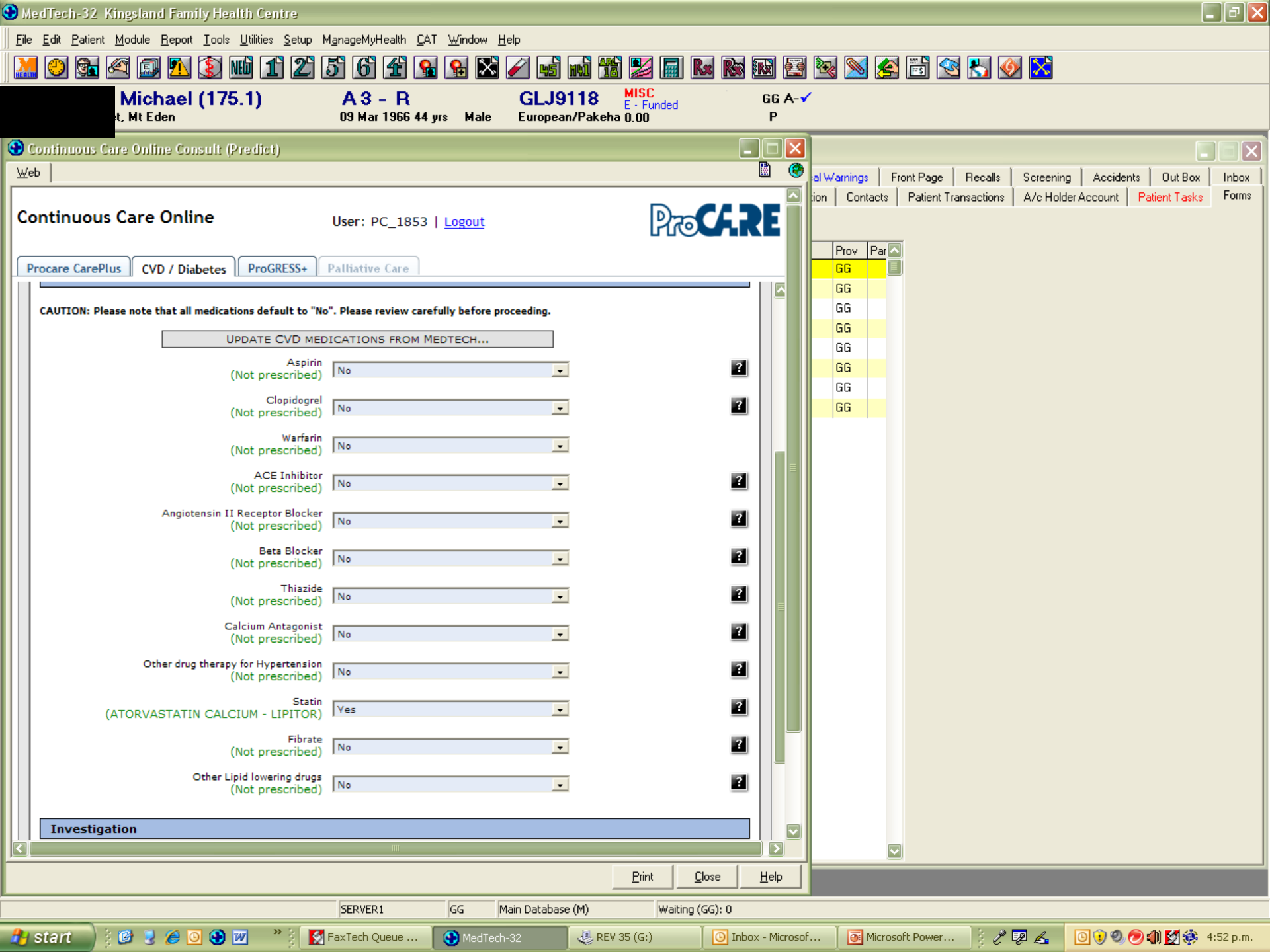
Microsoft Power...
4:51 p.m.


MedTech-32 Kingsland Family Health Centre
File Edit Patient Module Report Tools Utilities Setup ManageMyHealth CAT Window Help
Michael (175.1)
t, Mt Eden
A 3 - R
09 Mar 1966 44 yrs Male
GLJ9118
European/Pakeha 0.00
MISC
E - Funded
GG A-✓
P
Continuous Care Online Consult (Predict)
Web
Continuous Care Online
User: PC_1853 | Logout
ProCARE
Procare CarePlus
CVD / Diabetes
ProGRESS+
Palliative Care
CAUTION: Please note that all medications default to "No". Please review carefully before proceeding.
UPDATE CVD MEDICATIONS FROM MEDTECH...
Aspirin (Not prescribed) No
Clopidogrel (Not prescribed) No
Warfarin (Not prescribed) No
ACE Inhibitor (Not prescribed) No
Angiotensin II Receptor Blocker (Not prescribed) No
Beta Blocker (Not prescribed) No
Thiazide (Not prescribed) No
Calcium Antagonist (Not prescribed) No
Other drug therapy for Hypertension (Not prescribed) No
Statin (ATORVASTATIN CALCIUM - LIPITOR) Yes
Fibrate (Not prescribed) No
Other Lipid lowering drugs (Not prescribed) No
Investigation
Print
Close
Help
Front Page
Recalls
Screening
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MedTech-32 Kingsland Family Health Centre

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[redacted] Michael (175.1) A 3 - R GLJ9118 MISC E - Funded GG A-✓
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Procare CarePlus | CVD / Diabetes | ProGRESS+ | Palliative Care

Thiazide: No
Calcium Antagonist: No
Other drug therapy for Hypertension: No
Statin: Yes
Fibrate: No
Other Lipid lowering drugs: No

Investigation

Fasting glucose	5.90 mmol/L	Date: 27/09/2010	dd/mm/yyyy
LDL Cholesterol (fasting)	2.80 mmol/L	Date: 22/09/2010	dd/mm/yyyy
Triglyceride (fasting)	2.10 mmol/L	Date: 22/09/2010	dd/mm/yyyy
HDL Cholesterol	0.71 mmol/L	Date: 22/09/2010	dd/mm/yyyy

Lifestyle management

Smoke Quit Advice given today? Yes - No
Physically active? Yes - No
Green Prescription given Yes - No
Date of last dietary assessment dd/mm/yyyy
Date referral for dietary advice dd/mm/yyyy

This data is the patient's real clinical information Yes - No

RUN CVD MANAGEMENT Or PARK ONLY
'WHAT IF' / DEMONSTRATION CVD MANAGEMENT

PREDICT

Print Close Help

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ProCare

Procare CarePlus | CVD / Diabetes | ProGRESS+ | Palliative Care

NZ CVD / DIABETES PROGRAMME

DEMOGRAPHICS | CVD RISK ASSESSMENT | CVD RISK MANAGEMENT

menu

ACTIONS | RECOMMENDATIONS | PATIENT INFORMATION | RISK ASSESSMENT INFO

Risk Assessment:

This page was made specifically for **MICHAEL** [redacted]

Send | Print | Export to PDF

17-Oct-2010 16:53 hrs

Estimated risk of having a CVD eve

Estimated risk level: 5-year CV risk (fatal and non-fatal)	E (C
	1 interv (25% risk
11%	3 (2.8 pe

Based on the conservative estimate that each intervention: aspirin, blood pressure treatment (lowering systolic blood pressure by 10 mm Hg) or lipid modification (lowering LDL-C by 20%) reduces CV risk by about 25% over 5 years.

CVD risk has been moved up one risk category (5%), as cardiovascular risk may be underestimated in the Framingham risk equation; based on:

- metabolic syndrome

Your Heart Forecast

This tool shows the patient's CVD risk over time, as they age. It helps to show how a minor CVD risk can increase dramatically with age if no preventative action is taken.

Your Heart forecast *Currently in final testing

Cardiovascular Disease: Baseline Risk and Treatment Benefit

NO Diabetes

Print | Close | Help

Message from webpage

Reminder: you are able to claim for this CVD Management run ... you can do this when you close the CarePlus form

OK

al Warnings | Front Page | Recalls | Screening | Accidents | Out Box | Inbox

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[redacted] Michael (175.1)
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Web

Continuous Care Online User: PC_1853 | Logout

ProCARE

Procare CarePlus | CVD / Diabetes | ProGRESS+ | Palliative Care

PROGRAMME

DEMOGRAPHICS | CVD RISK ASSESSMENT | CVD RISK MANAGEMENT

ACTIONS | RECOMMENDATIONS | PATIENT INFORMATION | RISK ASSESSMENT INFO

Patient Information:

Send | Print | Export to PDF

This page was made specifically for **MICHAEL [redacted]**: 17-Oct-2010 16:53 hrs

CVD Risk

- Your risk of developing heart disease or blood vessel disease or having a stroke in the next 5 years is classified as moderate (10-15%). This means that for every 100 people like you, 10-15 will develop a problem in the next 5 years. The **good news** is there are lots of ways you can reduce this risk.
  [NHF booklet- reducing the risk of heart attack and stroke (www.nhf.org.nz)]
- Sometimes making changes can seem quite overwhelming - talk to your doctor or nurse about how you can get started. The benefits of tackling your risk factors start immediately and continue for as long as you maintain the change. Beneficial changes include lifestyle, diet, drug therapy and quitting smoking (if you are a smoker). The changes that will reduce **YOUR** risk are described on this page.

Lifestyle

- **Well done!** You are doing 30 minutes or more physical activity on most days of the week. Keep it up and if possible do a little more!
- No matter how long you have smoked or what age you are, if you quit smoking you will benefit straight away. For example, within one day of quitting smoking the risk of having a heart attack starts to drop. In 2 days your ability to smell and taste gets better. Between 2 weeks and 3 months your circulation and lung function will have improved. (Quitline phone number is 0800 778 778)
  [Nicotine gum (www.quit.org.nz)]
  [Nicotine patches (www.quit.org.nz)]
  [Smoking (www.quit.org.nz)]
  [Tackling your risk factors-smoking (www.nhf.org.nz)]
  [Tips for quitting smoking (www.quit.org.nz)]

Print | Close | Help

al Warnings | Front Page | Recalls | Screening | Accidents | Out Box | Inbox
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Web

Click link

Continuous C User: PC_1853 | Logout ProCARE

Procare CarePlus Palliative Care

CVD risk has bee p one risk category (5%), as cardiovascular risk may be underestimated in the Framingham risk equation; based o
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Your Heart Forecast
This tool shows the patient's CVD risk over time, as they age. It helps to show how a minor CVD risk can increase dramatically with age if no preventative action is taken.

YourHeart forecast *Currently in final testing

Cardiovascular Disease: Baseline Risk and Treatment Benefit

NO Diabetes
(With a 5% upward risk adjustment applied)

Nonsmoker	Smoker

Ratio of Total Cholesterol:HDL

The colour chart and calculated risks vary. Likely cause: patient age or BP fall between two colour chart groups.
Calculated risk value: 11% - Indicated risk range: (5-10%)

Risk Level
5 year CVD risk (non-fatal and fatal)

	>30%	**High**	15-20%		5-10%
Very High	25-30%	**Moderate**	10-15%	**Mild**	2.5-5%
	20-25%				<2.5%

Print Close Help

al Warnings | Front Page | Recalls | Screening | Accidents | Out Box | Inbox
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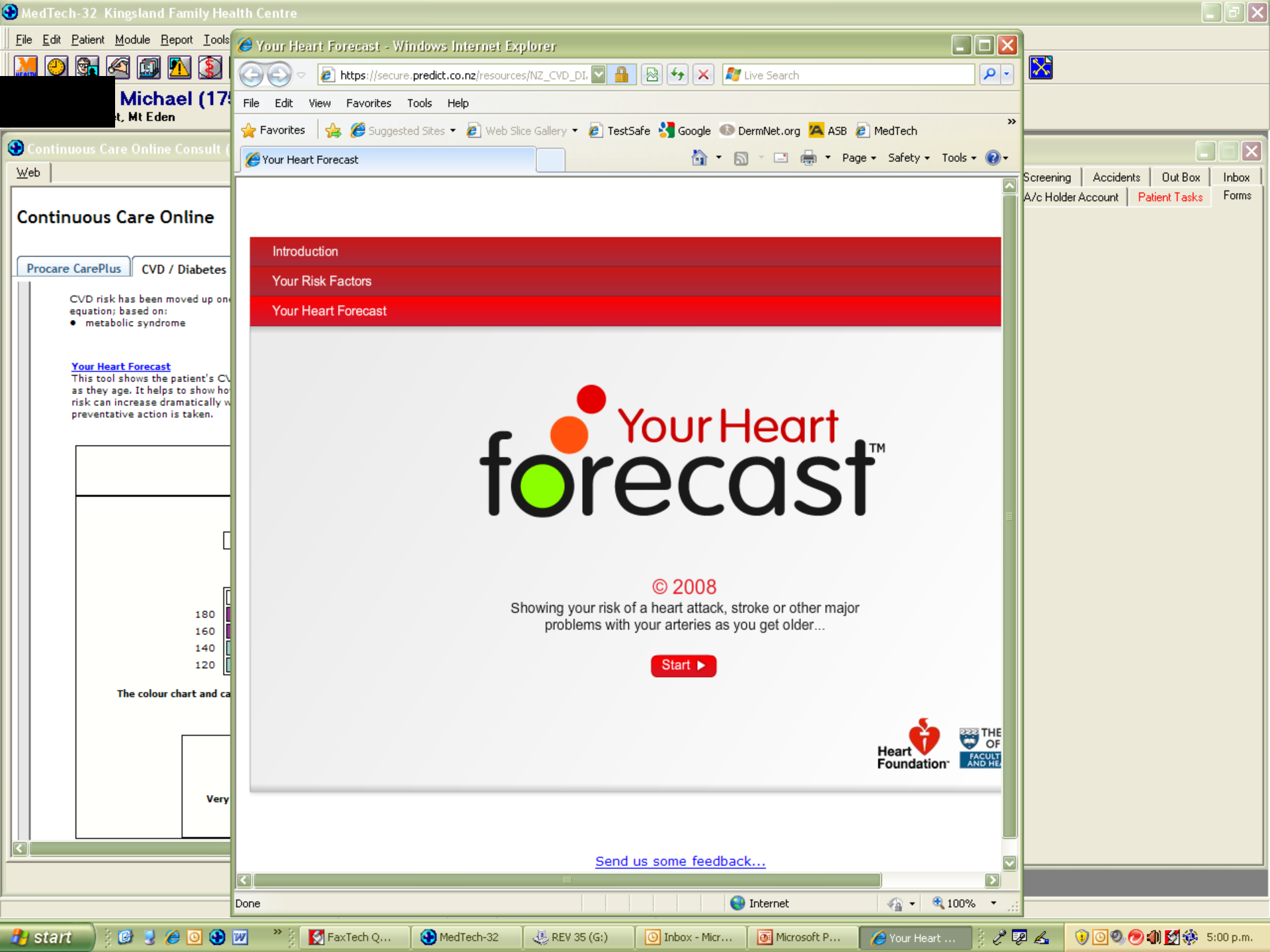
MedTech-32 Kingsland Family Health Centre
File Edit Patient Module Report Tools
Michael (175
t, Mt Eden
Continuous Care Online Consult (
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Continuous Care Online
Procare CarePlus
CVD / Diabetes
CVD risk has been moved up on
equation; based on:
metabolic syndrome
Your Heart Forecast
This tool shows the patient's CV
as they age. It helps to show ho
risk can increase dramatically w
preventative action is taken.
180
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Your Heart Forecast - Windows Internet Explorer
https://secure.predict.co.nz/resources/NZ_CVD_DI
Live Search
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Favorites
Suggested Sites
Web Slice Gallery
TestSafe
Google
DermNet.org
ASB
MedTech
Your Heart Forecast
Page
Safety
Tools
Introduction
Your Risk Factors
Your Heart Forecast
Your Heart forecast™
© 2008
Showing your risk of a heart attack, stroke or other major problems with your arteries as you get older...
Start
Heart Foundation
Send us some feedback...
Done
Internet
100%
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MedTech-32
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Your Heart ...
5:00 p.m.

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Continuous Care Online

Procare CarePlus | CVD / Diabetes

CVD risk has been moved up on
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Screening | Accidents | Out Box | Inbox
A/c Holder Account | Patient Tasks | Forms

Your Heart Forecast - Windows Internet Explorer

https://secure.predict.co.nz/resources/NZ_CVD_DI...

Live Search

File Edit View Favorites Tools Help

Favorites | Suggested Sites | Web Slice Gallery | TestSafe | Google | DermNet.org | ASB | MedTech

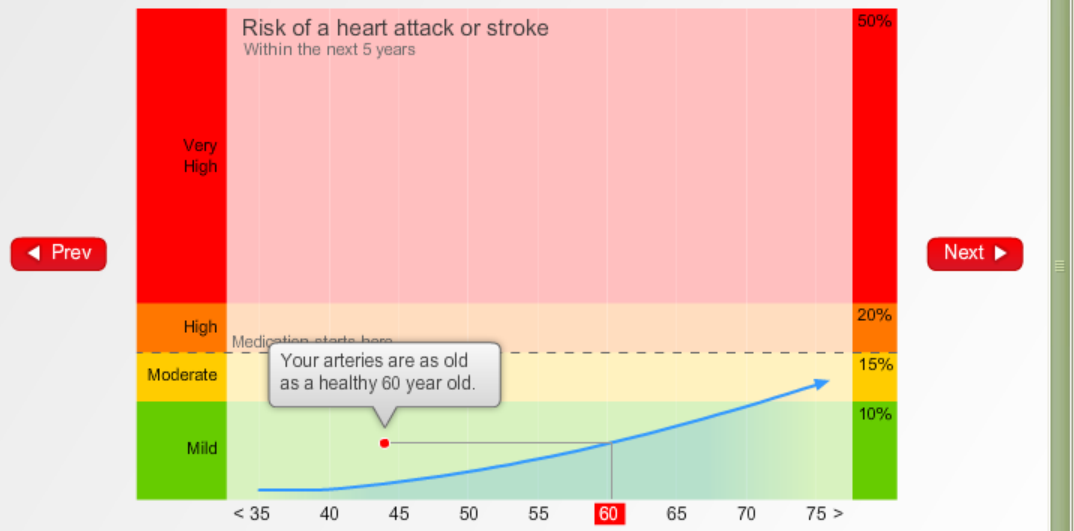
Your Heart Forecast

Page | Safety | Tools

Introduction

Your Risk Factors

Your Heart Forecast



- Your current risk right now
- Point where heart pills are recommended (15% risk)
- Your projected risk if no changes are made
- Your ideal risk zone (Based on Non-Smoker, TC/HDL ratio:4, BP: 120/80)

Heart Foundation

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Send us some feedback...

Double-click to change security settings

100%

start

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5:01 p.m.

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Michael (17
t, Mt Eden

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Continuous Care Online

Procare CarePlus | CVD / Diabetes

CVD risk has been moved up on
equation; based on:
- metabolic syndrome

Your Heart Forecast
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Screening | Accidents | Out Box | Inbox
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Your Heart Forecast - Windows Internet Explorer

https://secure.predict.co.nz/resources/NZ_CVD_DI...

Live Search

File Edit View Favorites Tools Help

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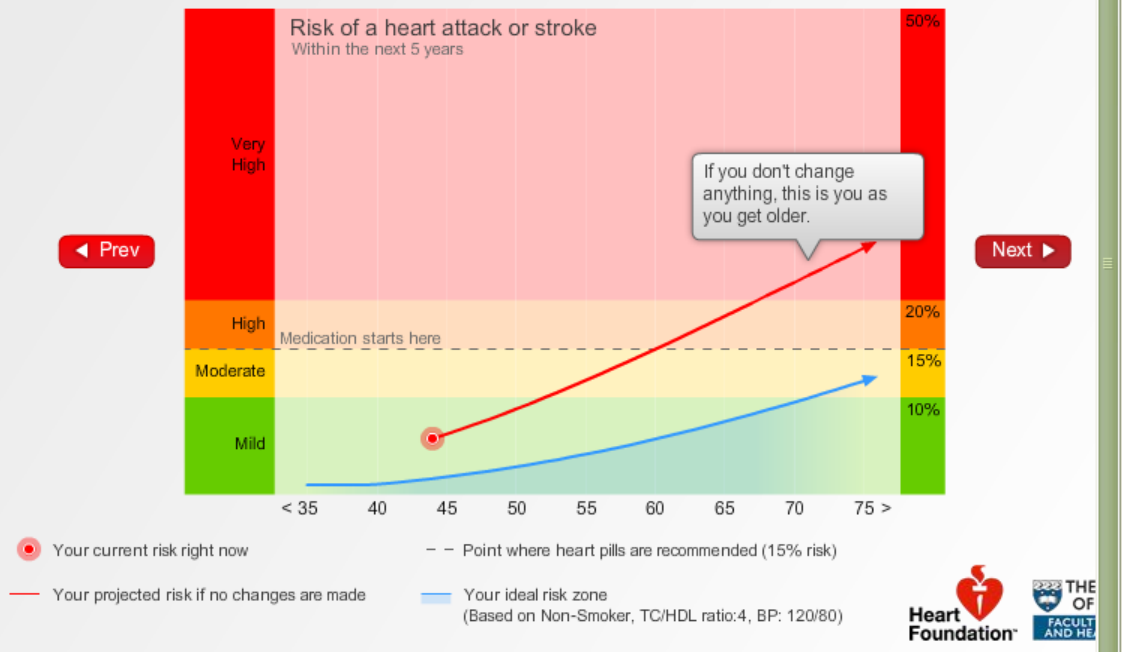
Your Heart Forecast

Page | Safety | Tools

Introduction

Your Risk Factors

Your Heart Forecast



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Internet | 100%

start | FaxTech Q... | MedTech-32 | REV 35 (G:) | Inbox - Micr... | Microsoft P... | Your Heart ... | 5:02 p.m.

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File Edit Patient Module Report Tools

Michael (17
t, Mt Eden

Continuous Care Online Consult (

Web

Continuous Care Online

Procare CarePlus | CVD / Diabetes

CVD risk has been moved up on
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Your Heart Forecast
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Screening | Accidents | Out Box | Inbox
A/c Holder Account | Patient Tasks | Forms

Your Heart Forecast - Windows Internet Explorer

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Live Search

File Edit View Favorites Tools Help

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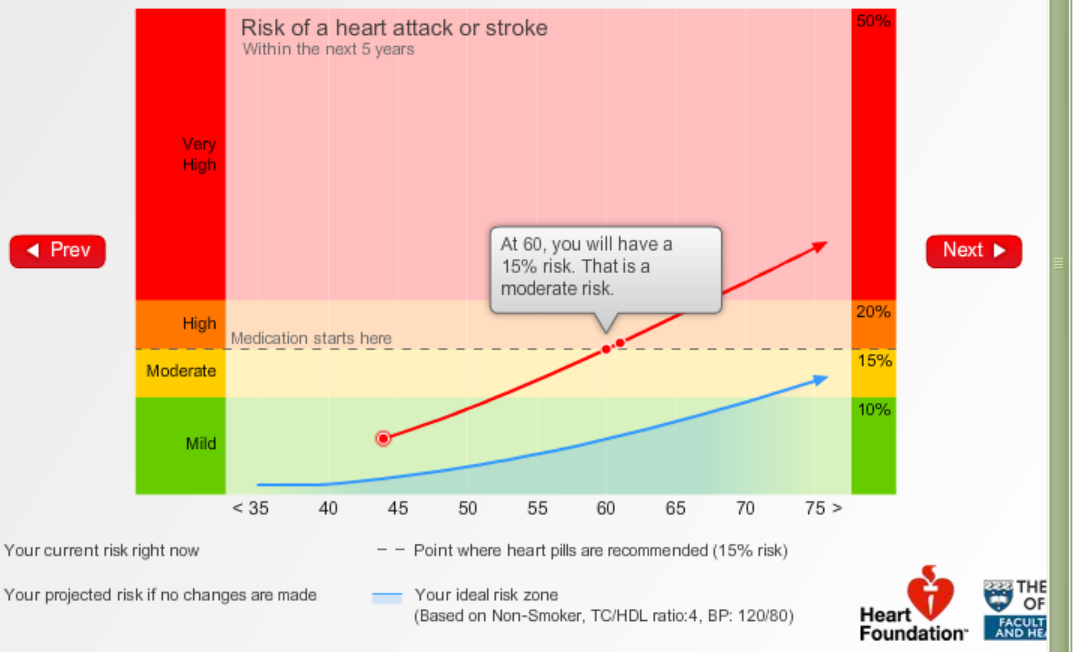
Your Heart Forecast

Page | Safety | Tools

Introduction

Your Risk Factors

Your Heart Forecast



◄ Prev

Next ►

Heart Foundation

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start | FaxTech Q... | MedTech-32 | REV 35 (G:) | Inbox - Micr... | Microsoft P... | Your Heart ... | 5:03 p.m.

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Your Heart Forecast

Page | Safety | Tools

tion Step 1

k Factors Step 2

art Forecast Step 3

Risk of a heart attack or stroke
Within the next 5 years

50%
20%
15%
10%

very High
High
rate
Mild

Medication starts here

< 35 40 45 50 55 60 65 70 75 >

What if..

See how changes in your lifestyle can influence your risk

If you quit smoking (for over 12 months):

If you lower your average Blood Pressure:
115 / 70 mmHg

If you lower your TC/HDL cholesterol ratio:
6.30

If you develop diabetes:

Prev Reset

our current risk right now

our projected risk if no changes are made

our 'What If' risk profile

Point where heart pills are recommended (15% risk)

Your ideal risk zone
(Based on Non-Smoker, TC/HDL ratio:4, BP: 120/80)

Heart Foundation

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5:04 p.m.

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Procare CarePlus | CVD / Diabetes

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A/c Holder Account | Patient Tasks | Forms
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Your Heart Forecast

Page | Safety | Tools

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Medication starts here

< 35 40 45 50 55 60 65 70 75 >

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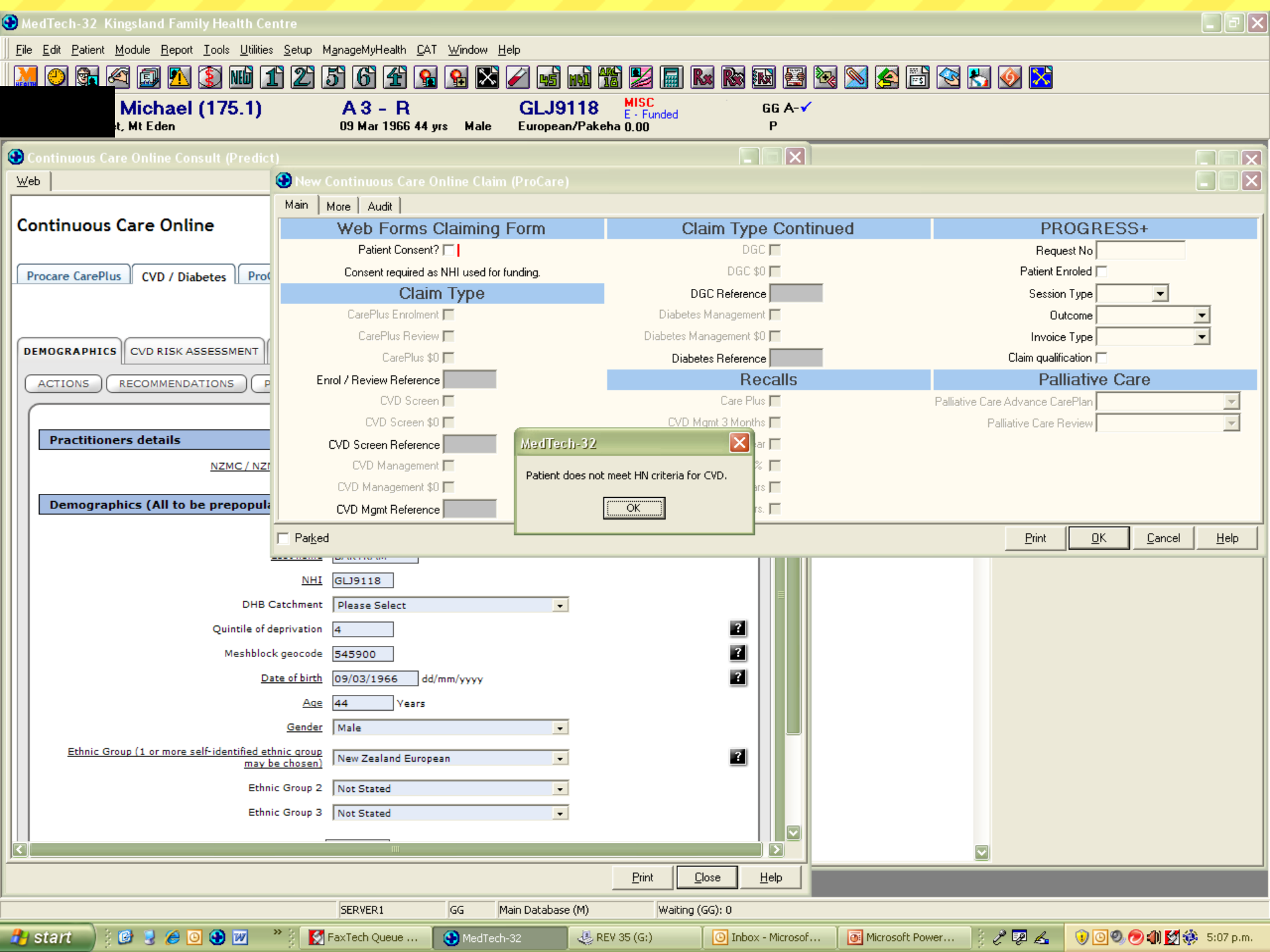
MedTech-32 Kingsland Family Health Centre
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Michael (175.1)
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09 Mar 1966 44 yrs Male
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Continuous Care Online Consult (Predict)
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CVD / Diabetes
DEMOGRAPHICS
CVD RISK ASSESSMENT
ACTIONS
RECOMMENDATIONS
Practitioners details
Demographics (All to be prepopul
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NHI GLJ9118
DHB Catchment Please Select
Quintile of deprivation 4
Meshblock geocode 545900
Date of birth 09/03/1966 dd/mm/yyyy
Age 44 Years
Gender Male
Ethnic Group (1 or more self-identified ethnic group may be chosen) New Zealand European
Ethnic Group 2 Not Stated
Ethnic Group 3 Not Stated
Print
Close
Help
New Continuous Care Online Claim (ProCare)
Main
More
Audit
Web Forms Claiming Form
Patient Consent?
Consent required as NHI used for funding.
Claim Type
CarePlus Enrolment
CarePlus Review
CarePlus $0
Enrol / Review Reference
CVD Screen
CVD Screen $0
CVD Screen Reference
CVD Management
CVD Management $0
CVD Mgmt Reference
Claim Type Continued
DGC
DGC $0
DGC Reference
Diabetes Management
Diabetes Management $0
Diabetes Reference
Recalls
Care Plus
CVD Mgmt 3 Months
PROGRESS+
Request No
Patient Enroled
Session Type
Outcome
Invoice Type
Claim qualification
Palliative Care
Palliative Care Advance CarePlan
Palliative Care Review
MedTech-32
Patient does not meet HN criteria for CVD.
OK
Parked
Print
OK
Cancel
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MedTech-32
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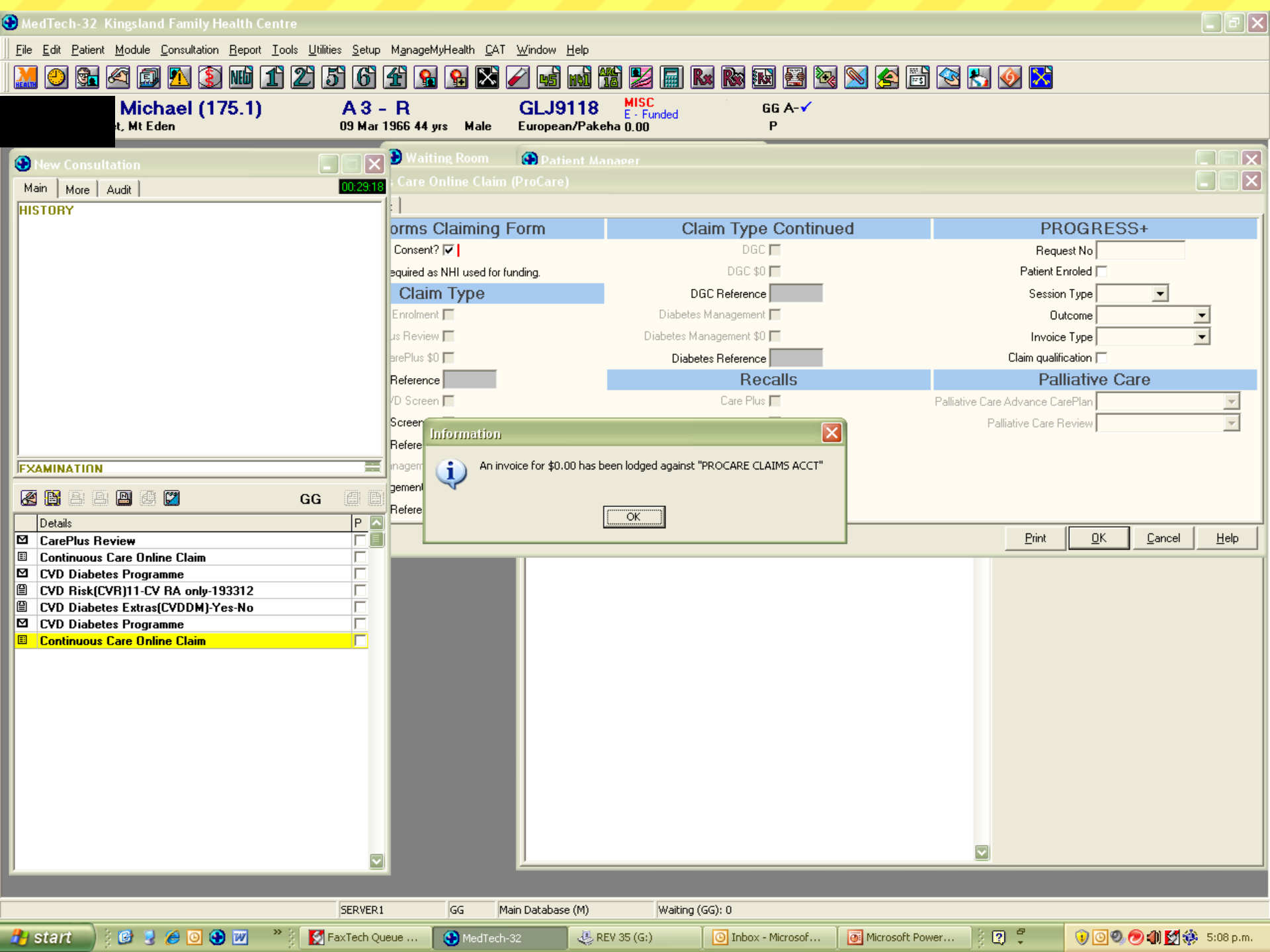
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File Edit Patient Module Consultation Report Tools Utilities Setup ManageMyHealth CAT Window Help
Michael (175.1)
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09 Mar 1966 44 yrs Male
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HISTORY
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CarePlus Review
Continuous Care Online Claim
CVD Diabetes Programme
CVD Risk(CVR)11-CV RA only-193312
CVD Diabetes Extras(CVDDM)-Yes-No
CVD Diabetes Programme
Continuous Care Online Claim
Waiting Room
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Care Online Claim (ProCare)
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VD Screen
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DGC $0
DGC Reference
Diabetes Management
Diabetes Management $0
Diabetes Reference
Recalls
Care Plus
PROGRESS+
Request No
Patient Enroled
Session Type
Outcome
Invoice Type
Claim qualification
Palliative Care
Palliative Care Advance CarePlan
Palliative Care Review
Information
An invoice for $0.00 has been lodged against "PROCARE CLAIMS ACCT"
OK
Print
OK
Cancel
Help
SERVER1
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Main Database (M)
Waiting (GG): 0
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FaxTech Queue ...
MedTech-32
REV 35 (G:)
Inbox - Microsof...
Microsoft Power...
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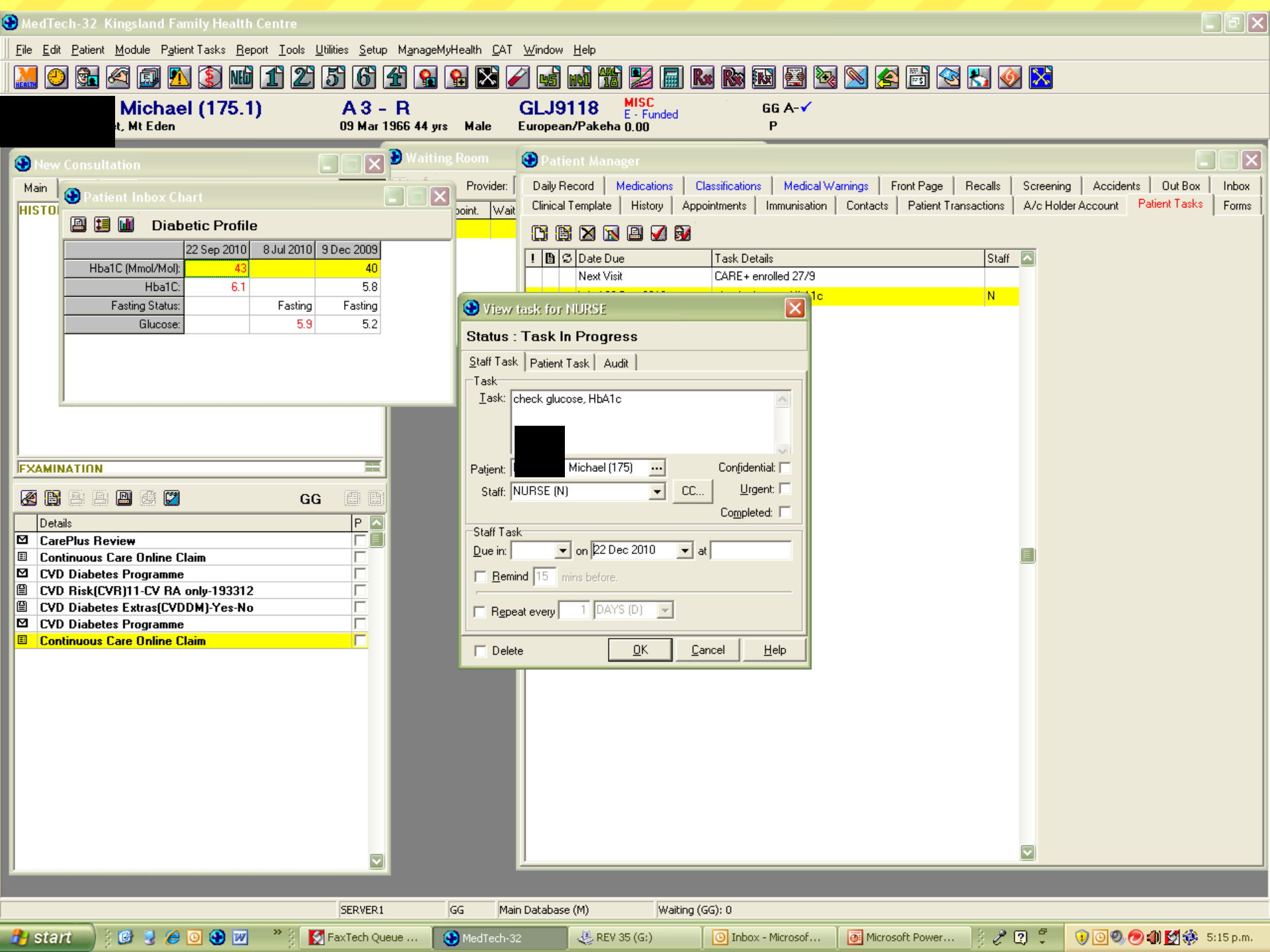
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Michael (175.1)
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E - Funded
European/Pakeha 0.00
GG A-✓
P
New Consultation
Main
Waiting Room
Provider:
Patient Manager
Daily Record Medications Classifications Medical Warnings Front Page Recalls Screening Accidents Out Box Inbox
Clinical Template History Appointments Immunisation Contacts Patient Transactions A/c Holder Account Patient Tasks Forms
Patient Inbox Chart
Diabetic Profile
22 Sep 2010 8 Jul 2010 9 Dec 2009
Hba1C (Mmol/Mol): 43 40
Hba1C: 6.1 5.8
Fasting Status: Fasting Fasting
Glucose: 5.9 5.2
Date Due Task Details Staff
Next Visit CARE+ enrolled 27/9
N
View task for NURSE
Status : Task In Progress
Staff Task Patient Task Audit
Task
Task: check glucose, HbA1c
Patient: Michael (175)
Staff: NURSE (N)
CC...
Confidential:
Urgent:
Completed:
Staff Task
Due in: on 22 Dec 2010 at
Remind 15 mins before.
Repeat every 1 DAYS (D)
Delete
OK Cancel Help
EXAMINATION
GG
Details P
CarePlus Review
Continuous Care Online Claim
CVD Diabetes Programme
CVD Risk(CVR)11-CV RA only-193312
CVD Diabetes Extras(CVDDM)-Yes-No
CVD Diabetes Programme
Continuous Care Online Claim
SERVER1 GG Main Database (M) Waiting (GG): 0
start
FaxTech Queue ...
MedTech-32
REV 35 (G:)
Inbox - Microsof...
Microsoft Power...
5:15 p.m.

Summary

Another 15 minute General Practice miracle !

Summary: Metabolic monitoring those on Atypical Antipsychotics

	Baseline	Monthly	3-monthly	Annually
Weight / BMI	✓	✓		
Fasting glucose	✓	Those at risk for 3 months	Those at risk for 1 yr, once for others	✓
Lipids	✓		For 1 year	✓

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