



# **Clozapine monitoring: Raising Levels – A quality improvement process in the Henry Bennett Centre, Waikato Hospital**

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# Objectives

- To minimise clozapine related risks of blood dyscrasias and cardiomyopathy in forensic mental health patients by :
  - i. Increasing the level of awareness and understanding amongst staff on clozapine related risks and blood sampling.
  - ii. To provide a comprehensive clozapine supply and monitoring system for all staff and the clients with all the relevant resources.

# METHODOLOGY

- A pre intervention audit on level of awareness and understanding on clozapine treatment
- Intervention strategy
- Post intervention audit
- Rollout to all mental health wards and to community

# Tool

- Questionnaire developed with CASU
- Participants included prescribers and nurses

pre intervention audit sample 50

post intervention audit sample 25

# Outcome of the pre-intervention audit

- There is a dire need to educate and increase the awareness and understanding of the drug clozapine and its monitoring processes

# Interventions

The intervention strategies involved:

- Creation of a patient specific clozapine folder
- Education sessions on the utilization of this folder.
- Regular discussions with nurses
- Fortnightly in-service – Clozapine updates series.
- Accreditation into the nurses portfolio

# Intervention strategies....

- A personal copy of Clozapine updates booklet for every regtd. nurse in the forensics.
- An integrated assessment tool to determine proficiency on clozapine and the monitoring processes.
- Assessment outcome to be included in their portfolio

# Patient specific clozapine folder



# Patient specific clozapine folder



# Patient specific clozapine folder

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1	CLOZAPINE DRUG monograph ( <i>Blue</i> )	
2	Clozapine Blood Concentrations and serum level measurements	
3	Clozapine Significant Side Effects and Management <i>Orange</i>	
4	Clozapine Interactions <i>Red</i>	
5	Clozapine - Discontinuing / recommencing therapy	
6	Clozapine Patient information leaflet ( <i>leaflet</i> )DHB	
7	Clozapine Consent form ( <i>use Novartis Form</i> )	
8	Clozapine Novartis lab investigation form( <i>use Novartis Form</i> )	
9	Clozapine physical and labs monitoring from ( <i>will use Lilly standard Forms</i> )	
10	Checklist for initiating Clozapine treatment	
	A Steps before commencing Clozapine	
	B Steps on during Clozapine initiation treatment	
	C Clozapine maintenance treatment	
	D Blood monitoring guidelines	
	E Interrupted treatment	
11	CARM form for adverse event monitoring ( <i>I will send you this</i> )	
12	Reference charts and guides ( <i>Use Novartis Charts</i> )	
13	Medication Chart ( <i>pl insert a blank Med chart</i> )	
14	Physical Monitoring forms	
15	Laboratory results ( <i>from Clinical Viewer</i> )	

# Clozapine Patient folder

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### Checklist for initiating Clozapine treat

#### A Steps before commencing Clozapine

- 11 Has the patient been well informed about behind the decisions to initiate clozapine by Has the clinical benefits and potential risks clearly highlighted
- 12 Has the patient and caregivers been clearly highlighted
- 13 Has the patient and caregivers been clearly highlighted
- 14 Has the patient and caregivers been clearly highlighted
- 15 Has the patient and caregivers been clearly highlighted

#### B. Steps on during clozapine initiation treatment

Item	Checklist	Yes	No
111	In circumstances where complete withdrawal of existing conventional antipsychotic treatment is not practicable, is a cross-tapering regimen in place with the current antipsychotic while clozapine is slowly built up to an adequate dose		
112	Is the dose titration appropriate and according to guidelines and the titration chart		
113	Is the rate of dose increase guided by the level of patient tolerance and the co-existence of any other physical conditions		
114	Is an adequate level of monitoring and supervision provided. This includes daily monitoring of BP, pulse and temperature.		
115	Is the patient's physical conditions closely monitored for at least the first 2 weeks of treatment		
116	Are there close monitoring and observation for adverse reactions, particularly risk of seizures, increases in doses over 600mg/day		
117	Is Weekly FBC (white blood count and differential) being performed for the first 18 week of treatment?		
118	Has Liver function tests (LFT's) been performed one month following initiation of treatment and 6 monthly thereafter unless there are clinical indications for more frequent liver function testing.		
119	Is the Temperature, blood pressure and pulse being measured and recorded at least once daily during the first two weeks of treatment. (Monitoring of physical signs might need to be performed more frequently or for longer than two weeks if any abnormalities are detected during the treatment process.		
120	Has an ECG been performed if the clinical condition indicates.		
121	<b>Haematological monitoring:</b> The frequency of FBC monitoring may be reduced to 4 weekly intervals if no abnormalities are detected after the initial 18 week period. Is the four weekly monitoring in place as long as clozapine treatment continues. More frequent monitoring however is required, e.g. weekly or fortnightly whenever blood tests indicate borderline results.		
122	Has Blood sugar levels been performed 6 monthly or more frequently if clinically indicated (fasting preferable).		

### Daily Bowel Chart

Day	Thur	Fri	Sat	Sun
Wed				
Thur				
Fri				
Sat				
Sun				
Mon				
Tue				
Wed				
Thur				
Fri				
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Sun				

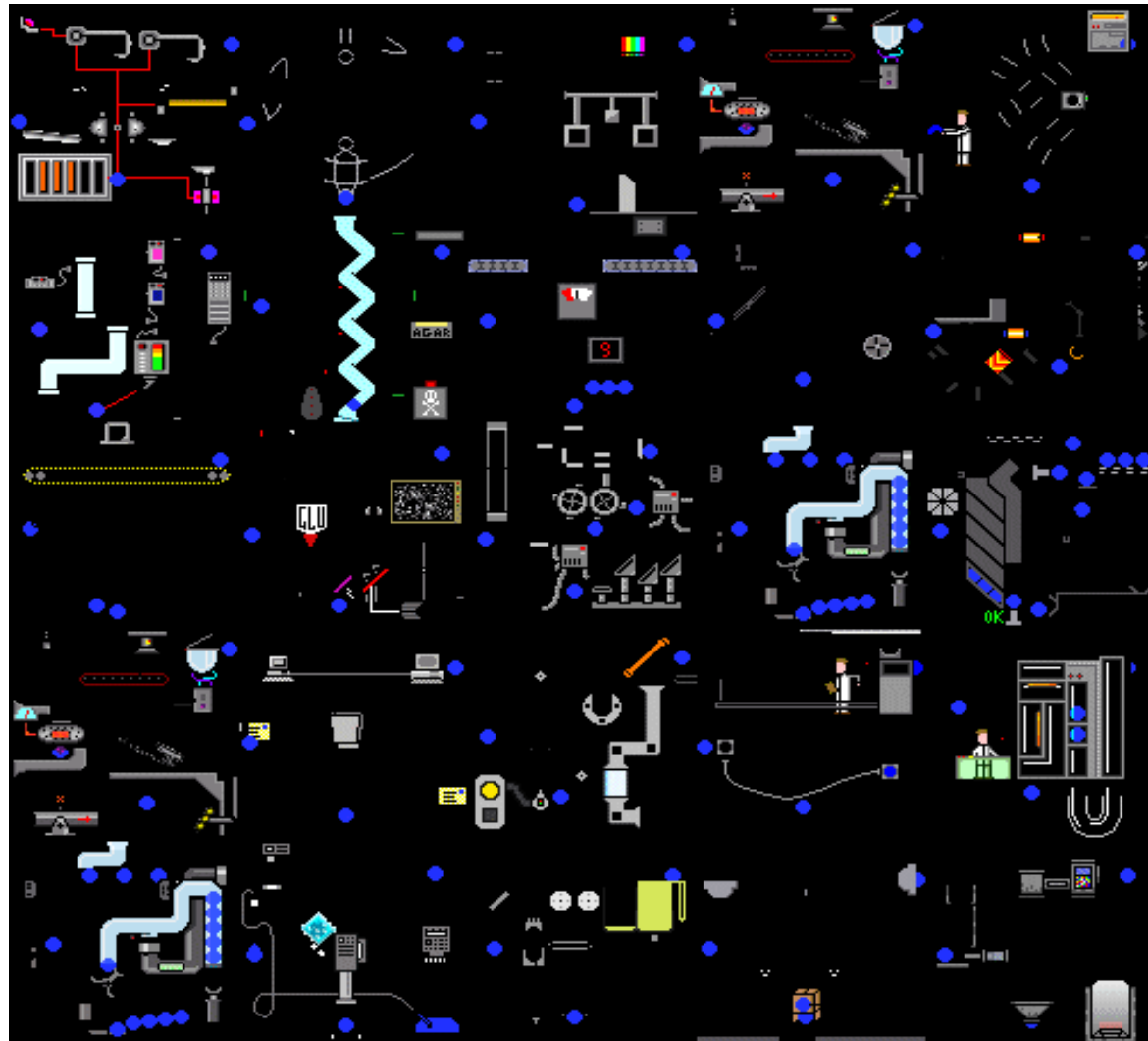
# Patient specific clozapine folder



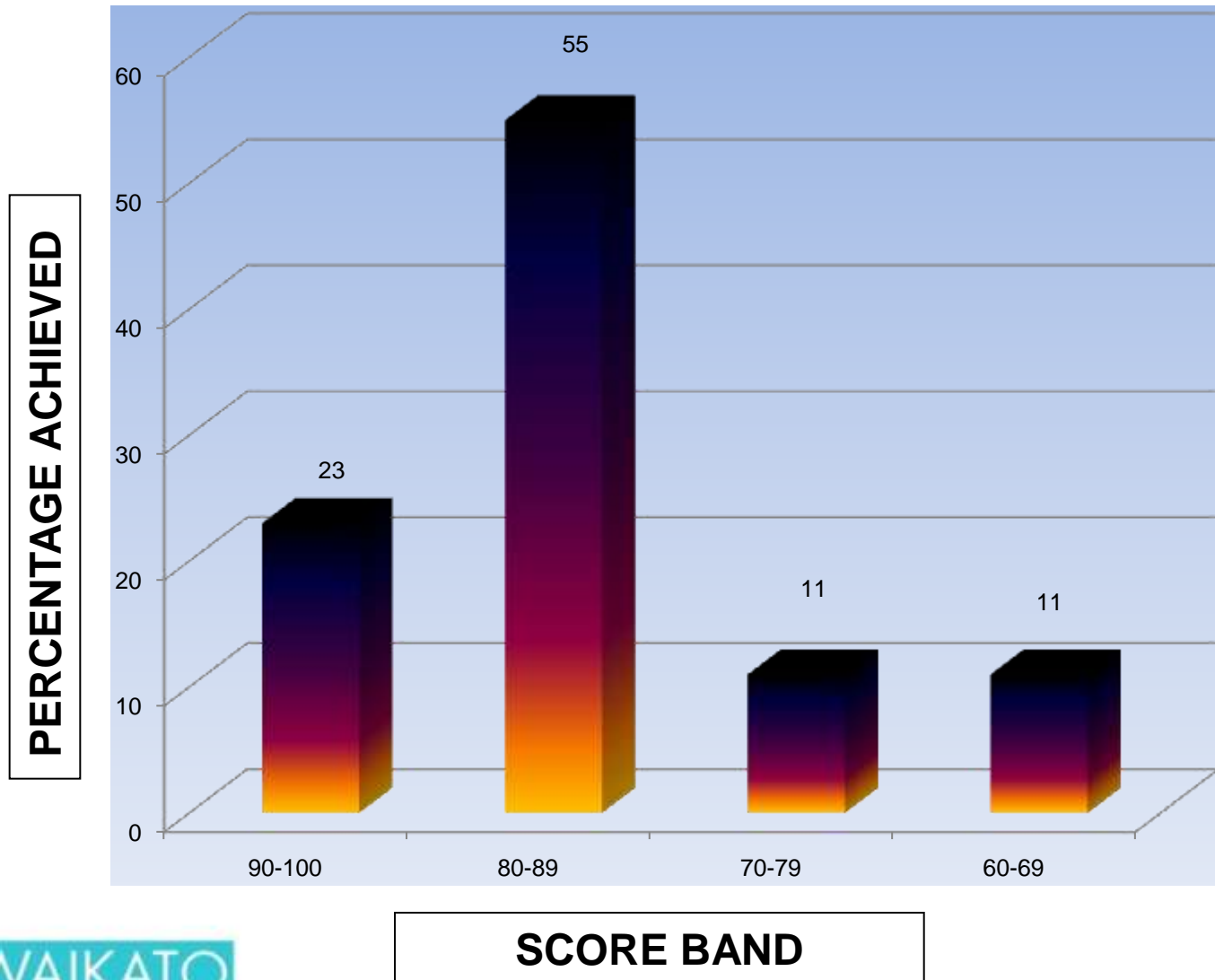
# Clozapine training module booklet



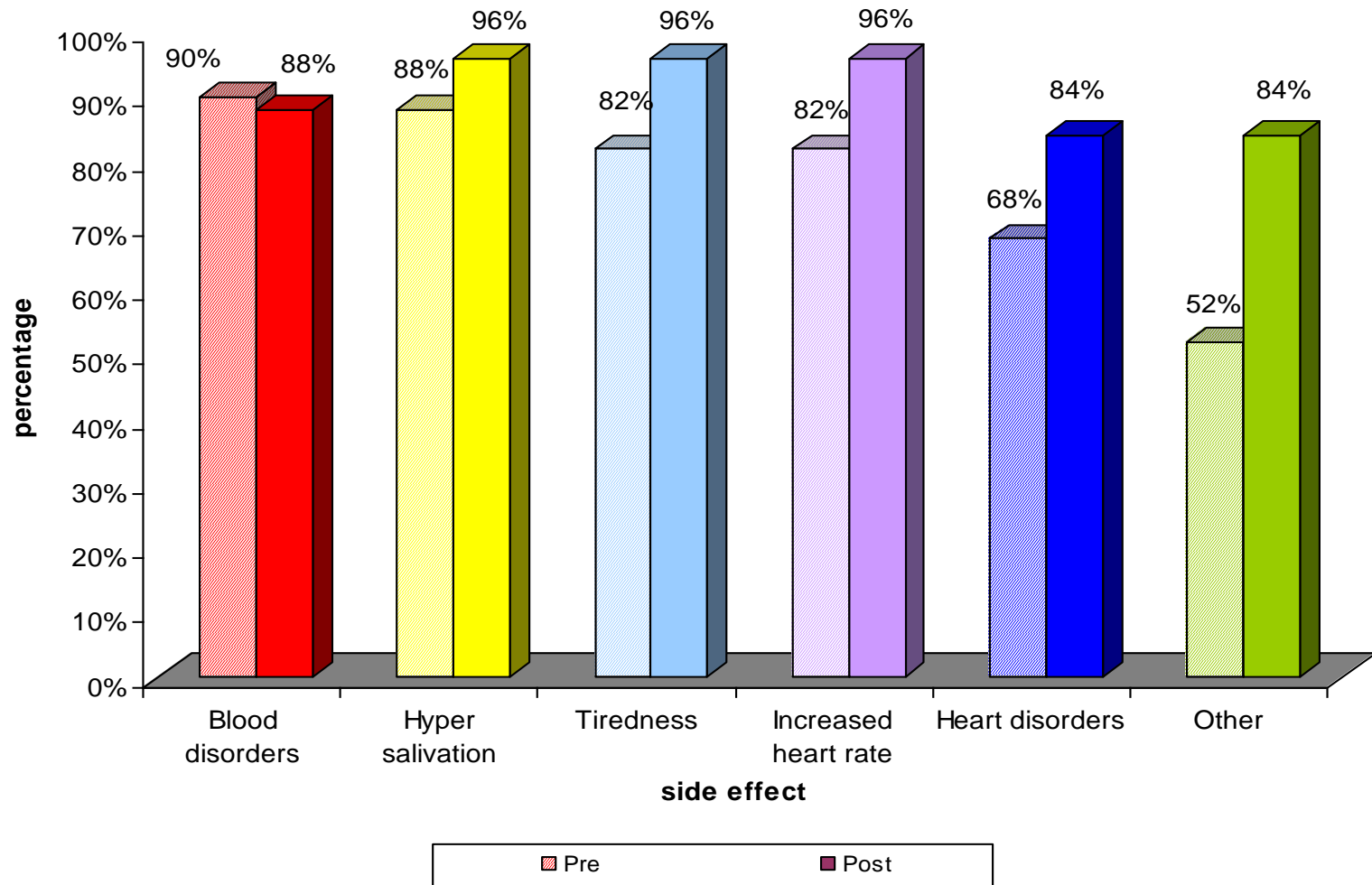
# Outcome of Intervention



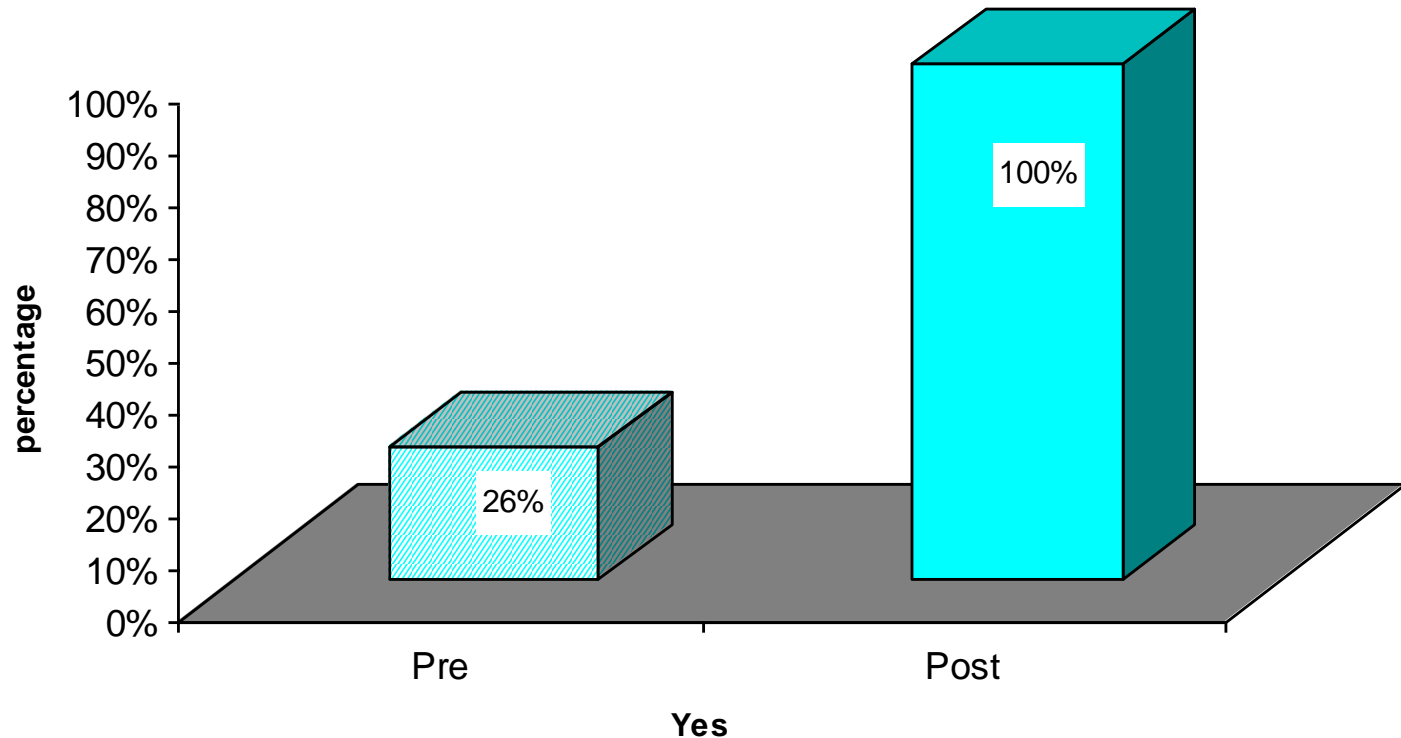
# Nurses assessment score



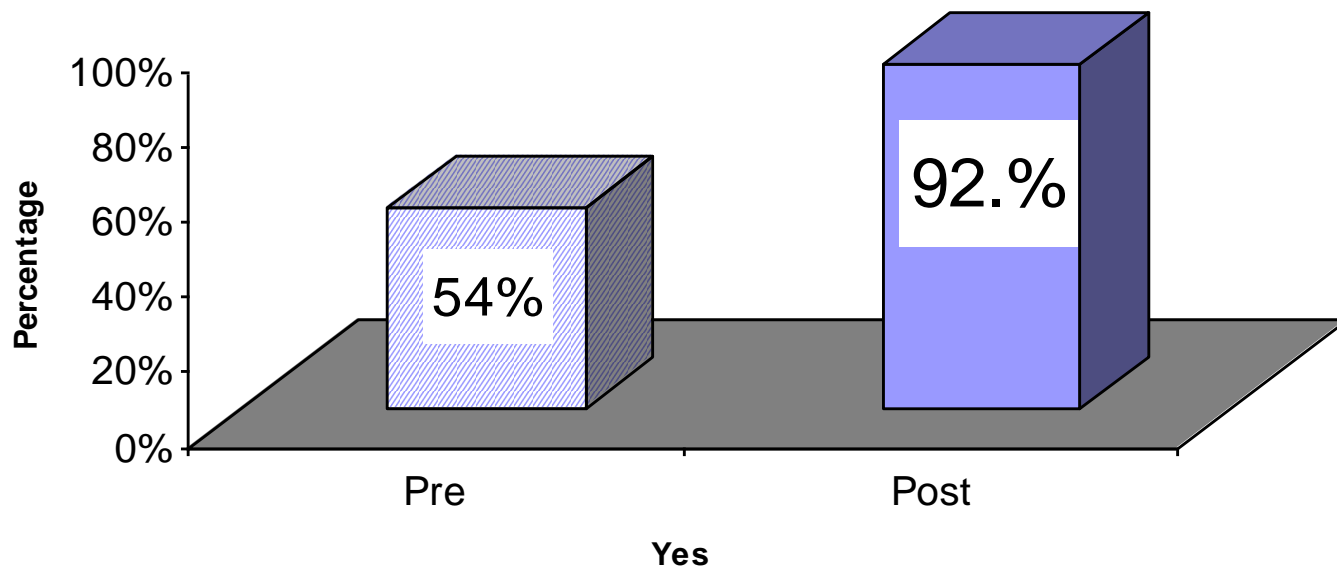
# Awareness on significant side effects of Clozapine



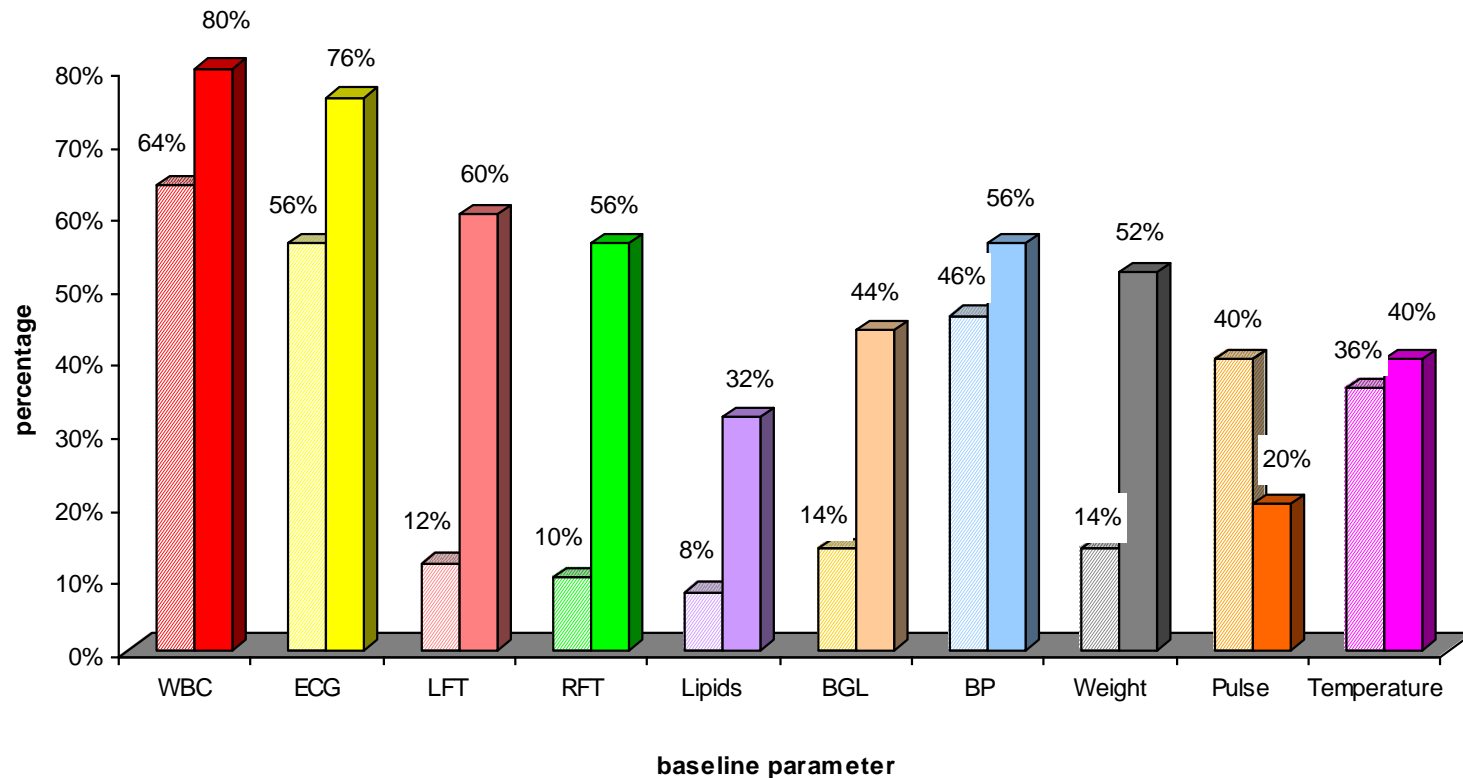
***Do you know which medicines that tend to suppress the bone marrow and Clozapine should not be prescribed with this drugs?***



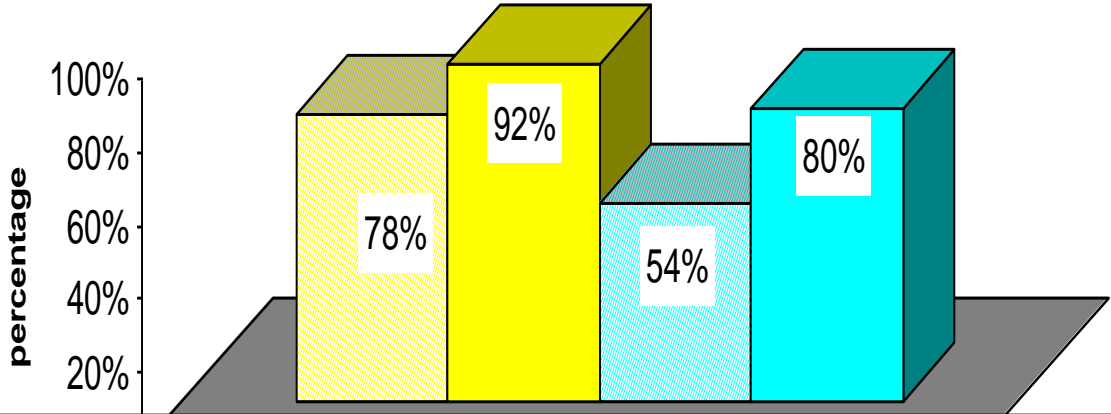
***Do you know who completes clozapine patient registration form and where it must be sent to prior to initiation of treatment?***



## Awareness of baseline parameters that have to be measured before clozapine initiation

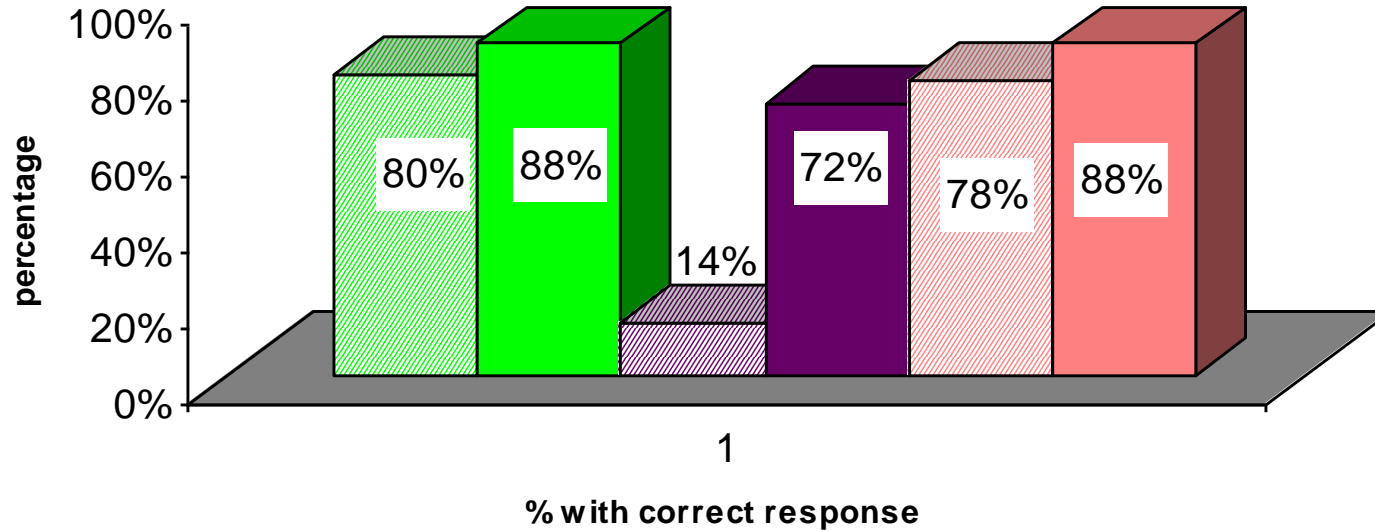


# Physical observations



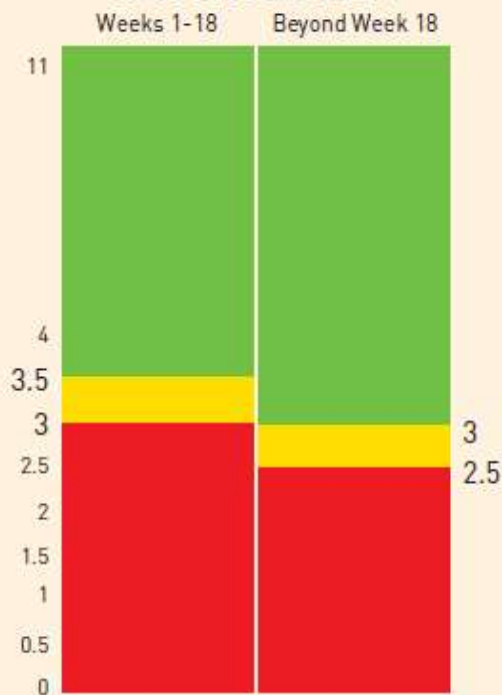
- Is daily monitoring of BP, pulse and temperature absolutely necessary PRE
- POST
- How long must the patient's physical conditions be closely monitored-PRE
- POST

# Blood monitoring



- 16 FBC monitoring may be reduced to 4 weekly intervals if no abnormalities are detected after the initial - week period -PRE
- 16 -POST
- 17 How often blood sugar levels be performed -PRE
- 17 -POST
- 18 Four weekly monitoring must remain in place for - years -PRE
- 18 -POST

### White Cell Count x 10<sup>9</sup>/L

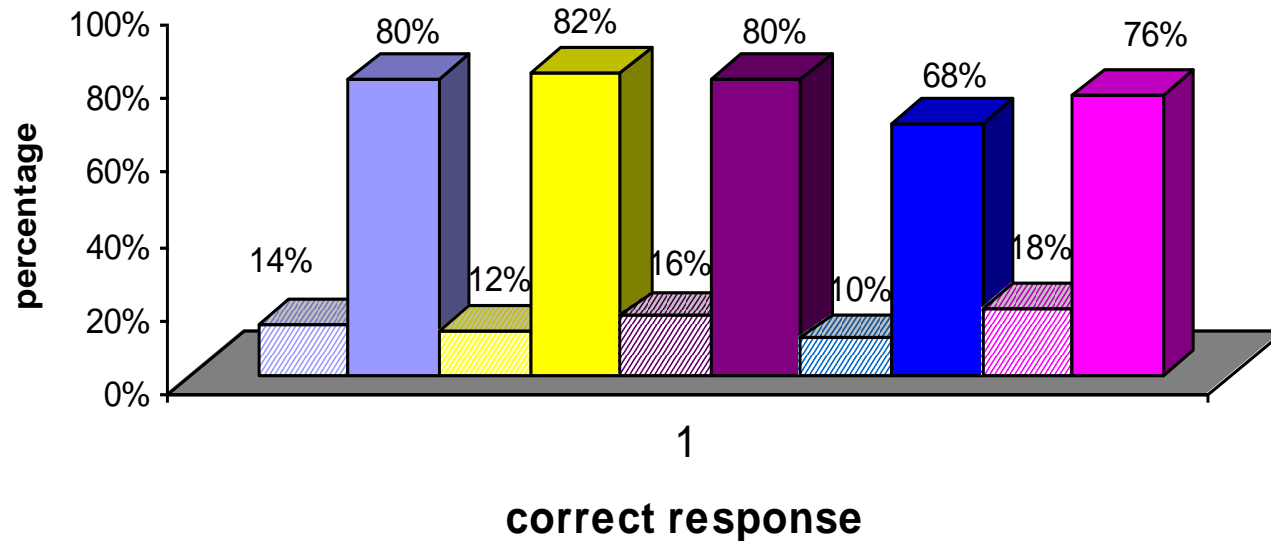


### Neutrophils x 10<sup>9</sup>/L



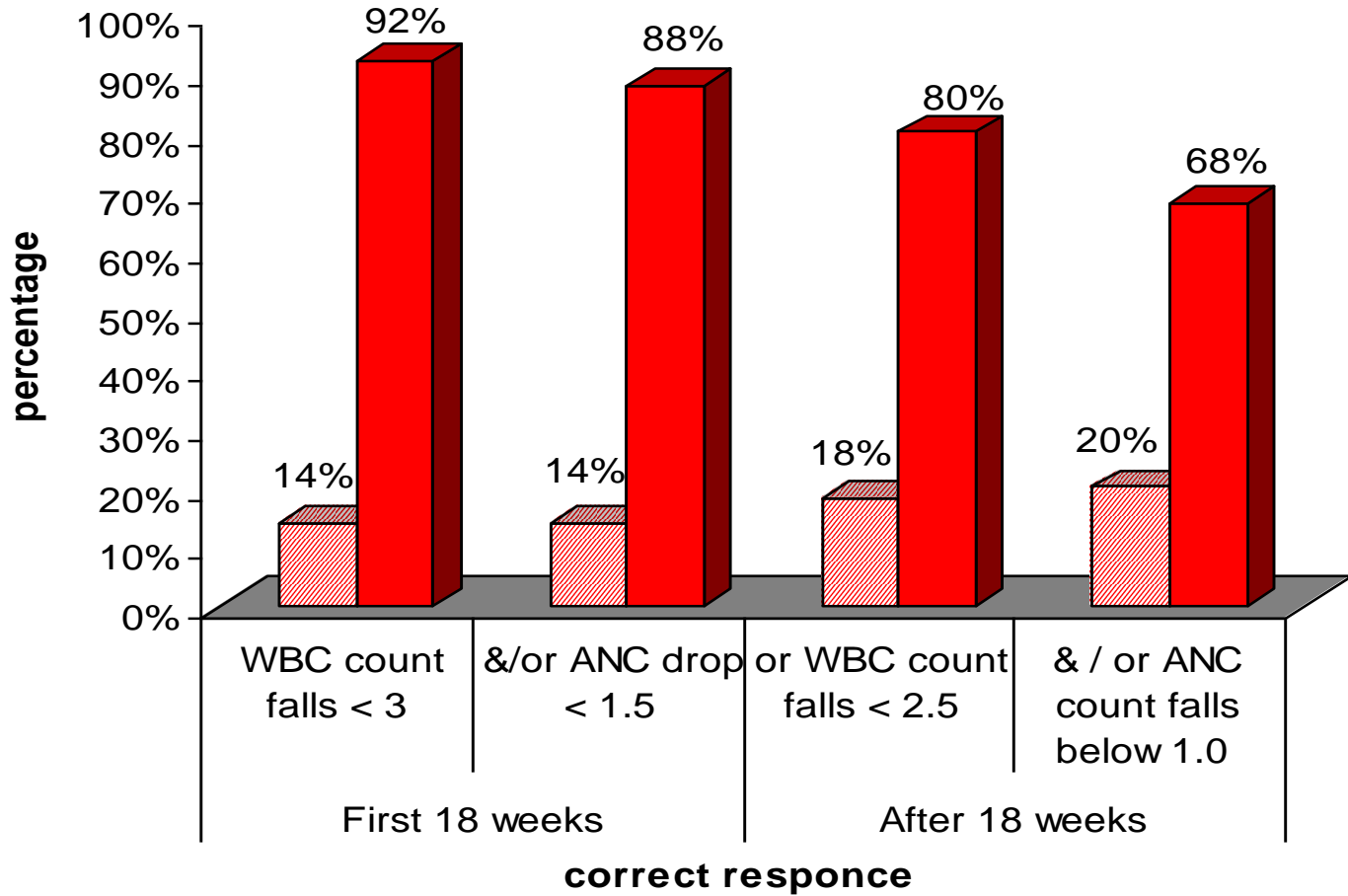
- Continue Clozaril<sup>®</sup> treatment. White cell counts and Neutrophil counts are required weekly for the first 18 weeks and then every 4 weeks thereafter.
- Continue Clozaril<sup>®</sup> treatment, sample blood twice weekly until counts stabilise or increase.
- Immediately stop Clozaril<sup>®</sup> treatment, sample blood daily until haematological abnormality is resolved, monitor for infection. Do not re-expose the patient. Contact the prescriber, the prescriber should contact a haematologist to discuss the management of the patient. If neutrophil count <1.0 x 10<sup>9</sup>/L the patient is usually hospitalised.

## WBC & ANC monitoring

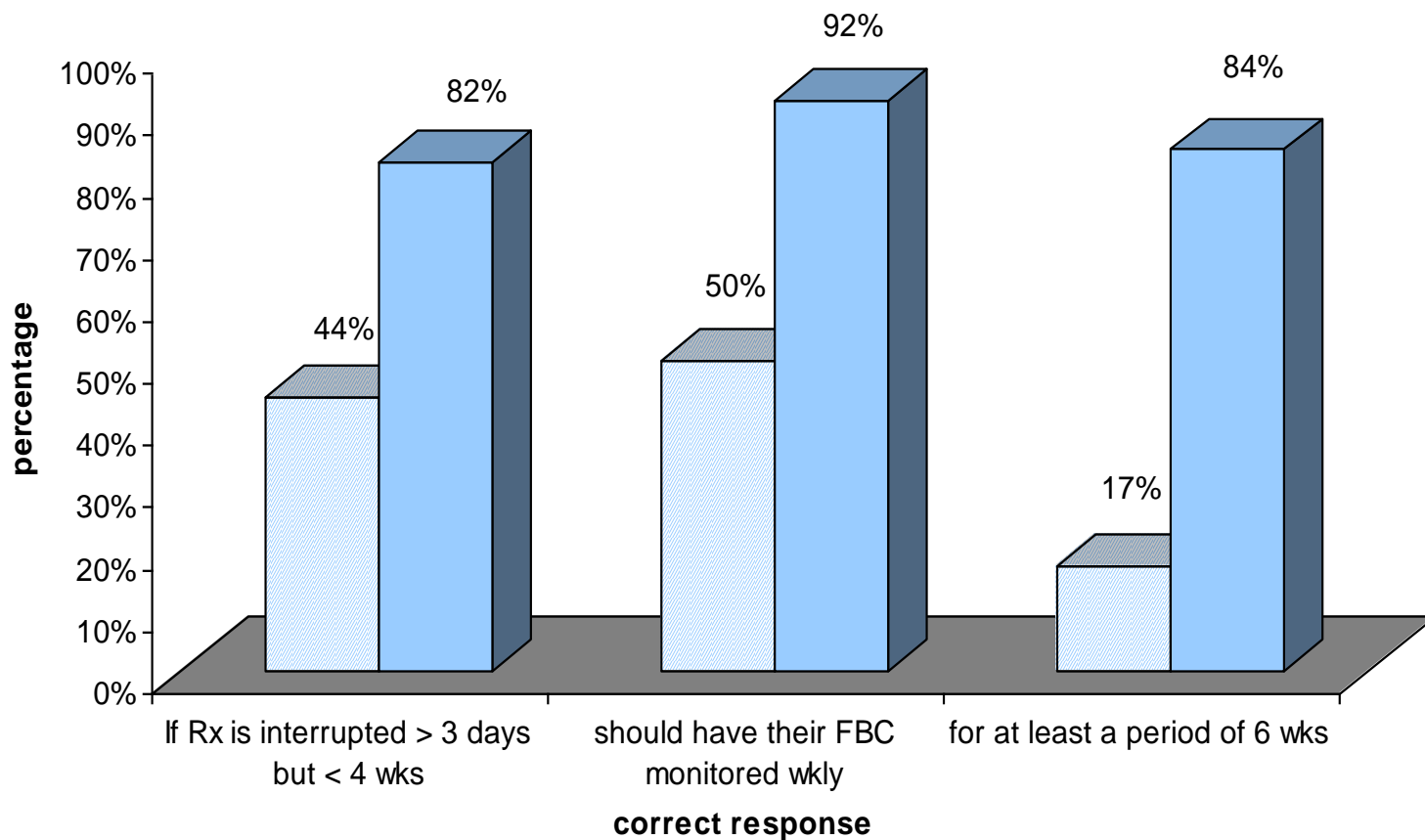


- ▨ 19a Twice weekly monitoring during the first 18 weeks done when WBC count falls <3.0-3.5 PRE
- 19a Post
- ▨ 19b Twice weekly monitoring during the first 18 weeks done during ANC count falls < 2.0-2.5 PRE
- 19b POST
- ▨ 20 Twice weekly monitoring following the first 18 weeks done when WBC count falls to between 2.5 -3 PRE
- 20 POST
- ▨ 21c Repeat FBC must be taken when the WBC count shows Cumulative drop
- 21c POST
- ▨ 21d Repeat FBC must be taken when the WBC count shows a drop of 3 or more within 3 weeks
- 21d POST

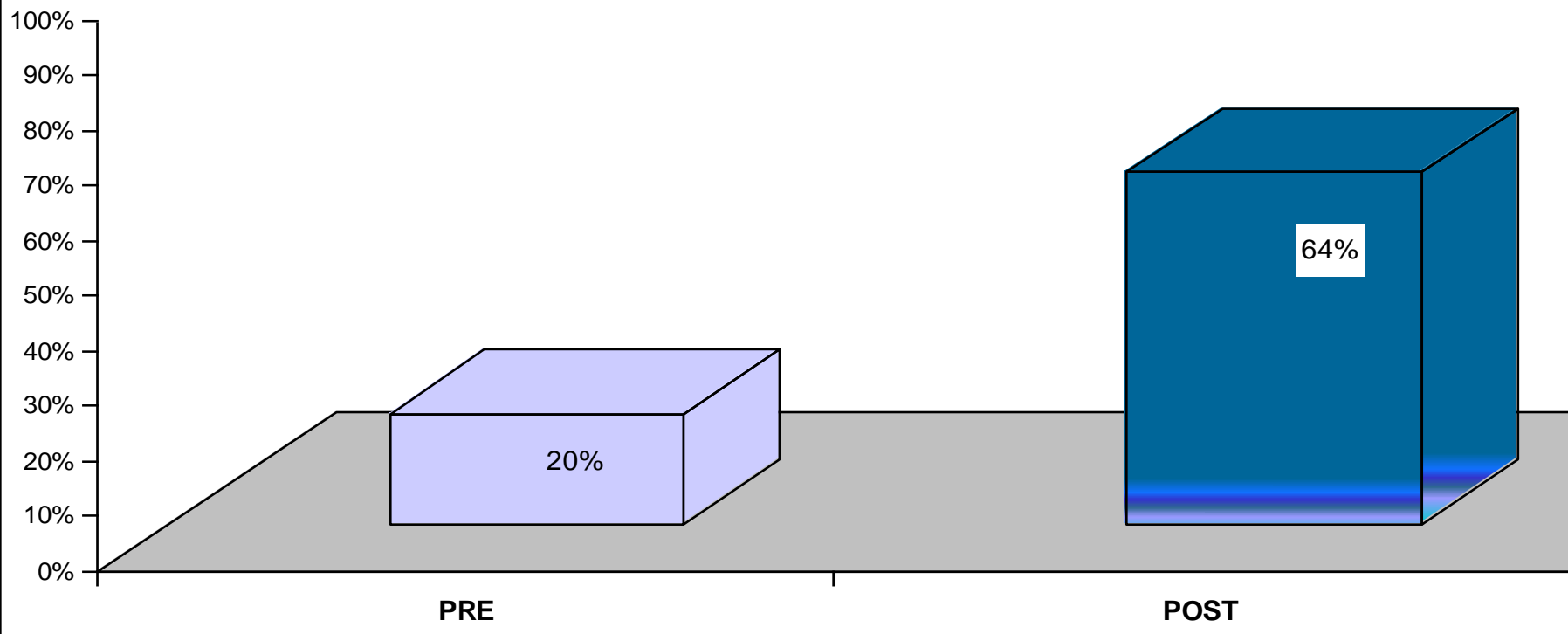
## Immediate clozapine discontinuation based on WBC/ ANC



## For patients who have been on Clozapine >18 weeks



# Are you honestly knowledgable about Clozapine monitoring? YES



# Discussion

- The intervention strategies did bring about a significant change in awareness and understanding of clozapine and the associated monitoring processes.
- The easy availability of resources and information improved the nurses knowledge base.

# Potential benefits and future implications

1. Minimise potential clozapine related risks of blood dyscrasias and cardiomyopathies in forensic mental health patients.
2. Early identification of potential issues and adverse effects.
3. Timely intervention.
4. Improved vigilance on clozapine treatment
5. Improved monitoring of metabolic syndrome parameters and side effects.
6. Improved monitoring of bowel output and constipation issues.

# Metabolic Monitoring

### METABOLIC RISK MONITOR

Yes  No  
 Date of last Examination: \_\_\_\_\_  
 Patient Details: \_\_\_\_\_  
 Antiepileptic Medication - Dose & Frequency:  
Clozapine 50mg twice a day PO  
Sodium Valproate 300mg BD  
 Relevant Concomitant Medication - Dose & Frequency:  
 \_\_\_\_\_

**GLUCOSE LEVELS**

Check all type 2 diabetes risk factors:  
 Diagnosis of insulin disease  Obesity (especially with central adiposity)  
 Family history of diabetes  Physical inactivity  
 European 40 years of age or older  Previous diagnosis of Impaired Glucose Tolerance (IGT)  
 Male, Asian, Middle Eastern or Pacific Island descent aged 30 years or older  History of gestational diabetes, or both of large baby  
 Hypertension

High Waist Circumference?  Yes  Moderate  No  
 Calculate waist circumference with a loose measure for weight gain and glucose tolerance?  Yes  No  
 NB: Obesity is the most important modifiable risk factor for diabetes.

Fasting Glucose (FPG)  IGT (Glucose Tolerance Test)  HbA1c (Average Glucose)  
 Random Glucose = 19.1 (3.7 - 5.7 mmol/L)

Date	Normal Glycaemia FPG < 5.6 mmol/L IGT < 7.8 mmol/L	Impaired Glucose Metabolism FPG 5.6-6.9 mmol/L IGT 7.8-11.0 mmol/L	Diabetes Mellitus FPG ≥ 7.0 mmol/L IGT ≥ 11.1 mmol/L
10/01/08	4.6		
13/11/08	5.1		
20/12/08	5.8		
05/02/09	4.5		
14/05/09	5.7		
16/08/09	5.8		
21/08/09	19.1		
20/02/09	5.3		
24/03/09	5.3		
25/03/10	5.2		
11/06/10	5.2		

PTG

### LIPID LEVELS

Check all cardiovascular disease (CVD) risk factors:  
 Family history of CVD  Physical inactivity  Impaired glucose tolerance/diabetes  Hypertension  
 Obesity  Smoking  Dyslipidaemia  Dysrhythmias

Date	LDL Cholesterol = 2.6 mmol/L*	Total Cholesterol = 5 mmol/L*	HDL Cholesterol = 1 mmol/L*	Triglycerides = 2.0 mmol/L*	Blood Pressure = 140/90
10/01/08	4.4	4.7	1.2	1.3	
13/11/08	4.4	4.4	1.4	1.4	
05/02/09	4.4	4.4	1.4	1.4	
14/05/09	4.4	4.4	1.4	1.4	
16/08/09	4.4	4.4	1.4	1.4	
21/08/09	4.4	4.4	1.4	1.4	
20/02/09	4.4	4.4	1.4	1.4	
24/03/09	4.4	4.4	1.4	1.4	
25/03/10	4.4	4.4	1.4	1.4	
11/06/10	4.4	4.4	1.4	1.4	

Normal Range

**WEIGHT LEVELS**

Check weight levels:  
 Baseline Weight: 97.5 kg  
 Height: \_\_\_\_\_  
 Date: 08/09/09

Check all risk factors for chronic obstructive pulmonary disease:  
 Family history of obesity  Hypertension  Diabetes  Dyslipidaemia  Smoking  Lung genetic factors

Date: \_\_\_\_\_  
 Weight measurements: \_\_\_\_\_  
 Body Mass Index (see BMI Chart opposite)

Date	Weight (kg)
10/01/08	97.5
13/11/08	97.5
05/02/09	97.5
14/05/09	97.5
16/08/09	97.5
21/08/09	97.5
20/02/09	97.5
24/03/09	97.5
25/03/10	97.5
11/06/10	96.5

# Conclusions

- The processes in place will be ongoing.
- This quality improvement processes will be extended to clozapine patients in other wards in the adult mental health service
- And into the community mental health services.

# Yoga for Mental Health

ASANAS WITH PROPS

## Asanas with Props

*The ancient yogis used logs of wood, stones, and ropes to help them practice asanas effectively. Extending this principle, Yogacharya Iyengar invented props which allow asanas to be held easily and for a longer duration, without strain.*



**YOGACHARYA IYENGAR IN SETUBANDEHA SARVANGASANA**

*This version of the posture requires considerable strength in the feet, shoulders, and back, requiring years of practice to achieve. It should not be attempted without supervision.*



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# Alternative Yoga



different means .....

.....similar outcome!!!



# The Mental Health Forensic facility





Q ?..... Thank Q