

MONITORING IN DENGUE

CLINICAL PRACTICE GUIDELINES

MOH/P/PAK/302.15(GU)

MANAGEMENT OF DENGUE INFECTION IN ADULTS (THIRD EDITION)



MINISTRY OF HEALTH MALAYSIA



ACADEMY OF MEDICINE MALAYSIA



Principles of Monitoring

- Setting: outpatient, inpatient
- Aspects: markers of severe dengue, warning signs
- Management: Fluid therapy



Issues

- Recognition
 - is it dengue?
 - critical phase – entry & exit?
 - picking up severe dengue
- Management
 - Fluid therapy

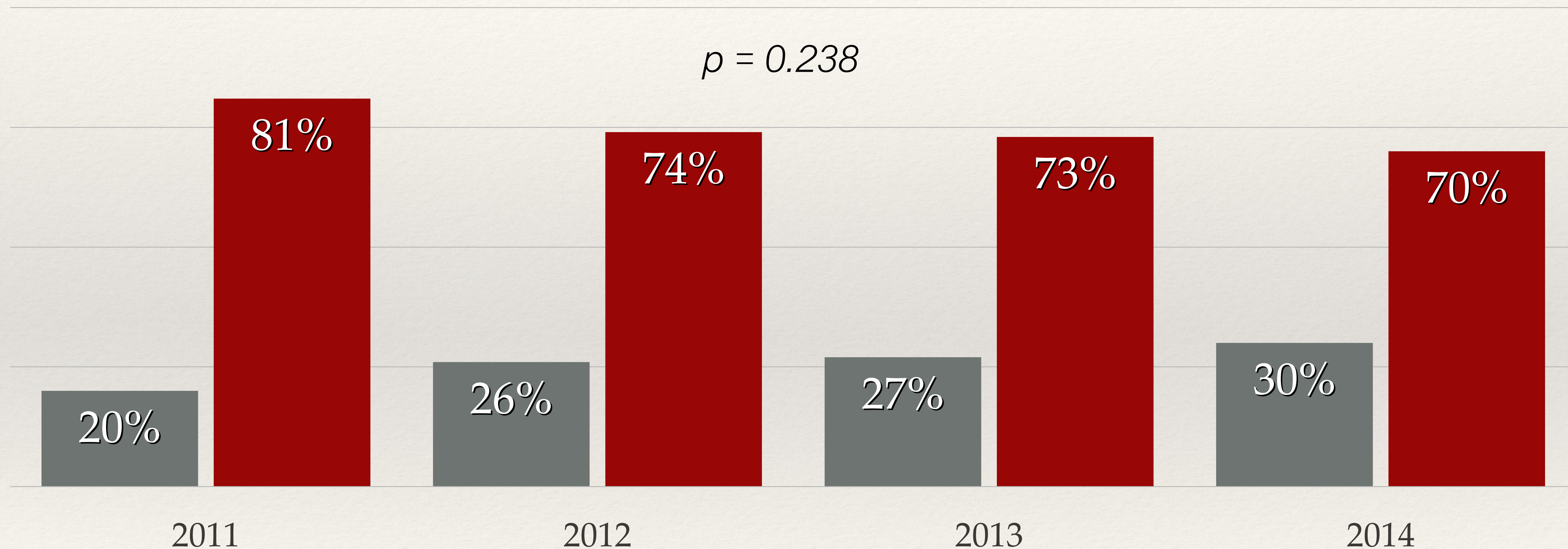
DIAGNOSIS ON THE FIRST Encounter

(Analysis of Death Cases)

■ Dengue

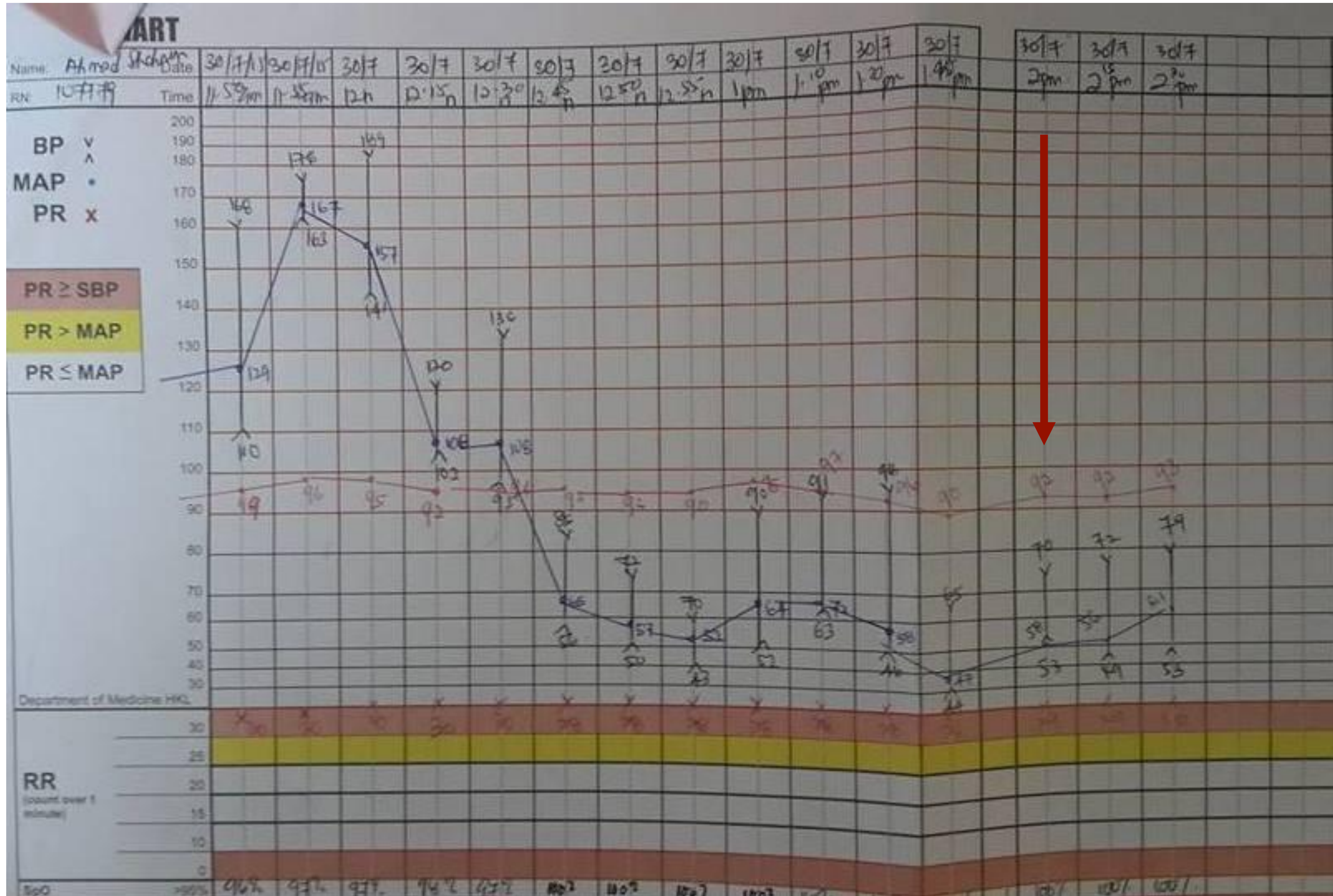
■ Non-dengue

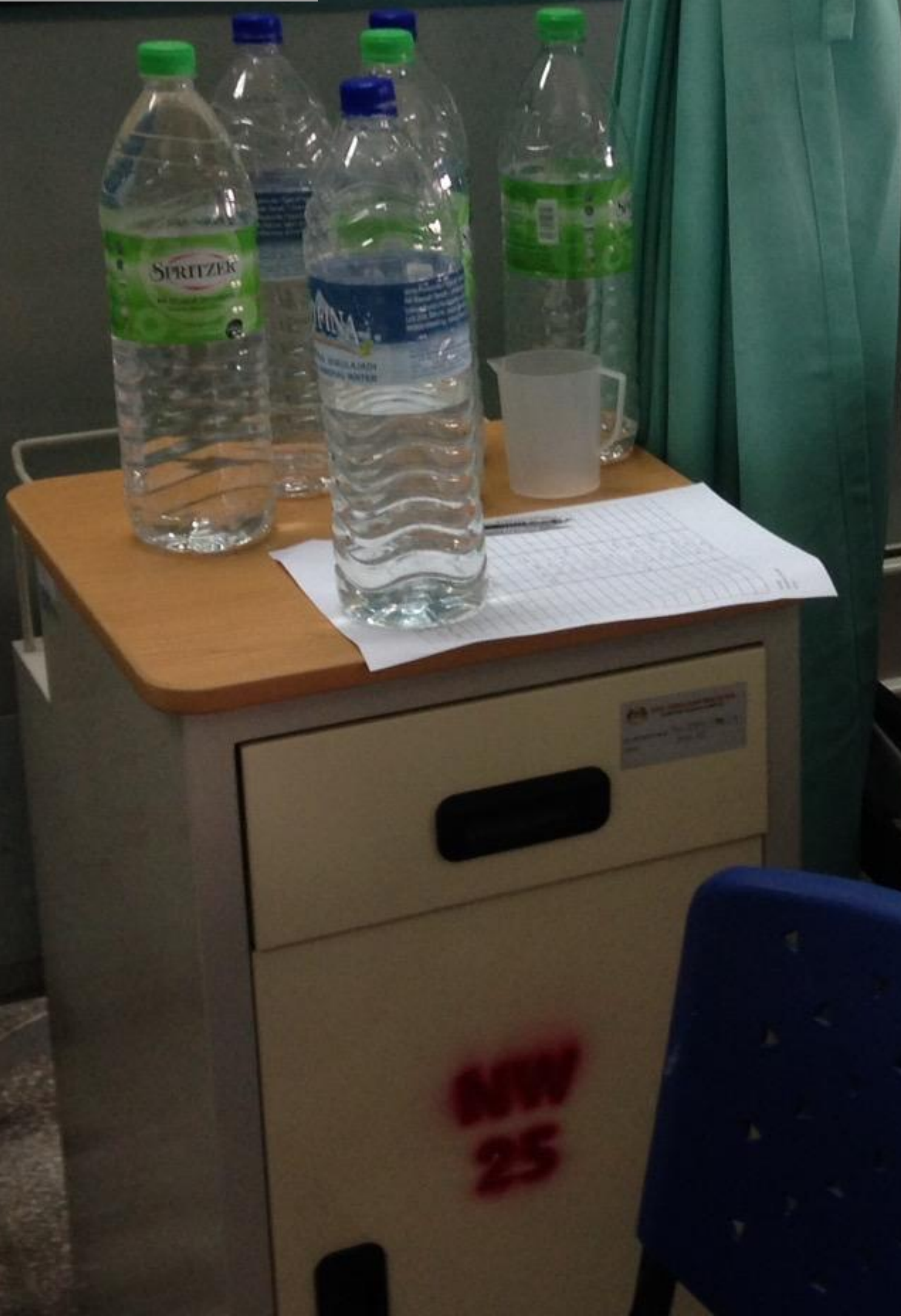
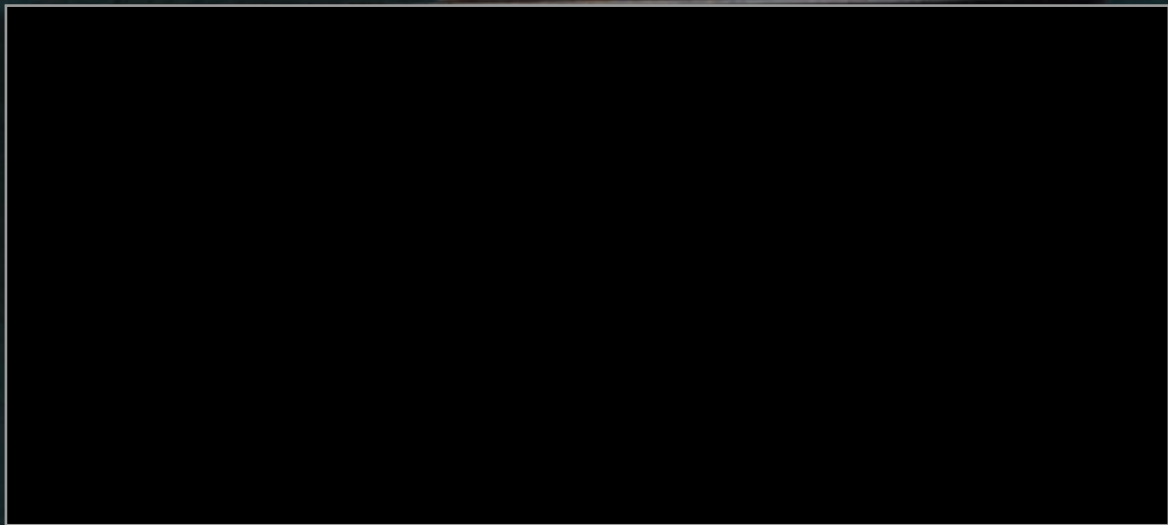
$p = 0.238$



Fever

- ❖ Aches & pains 94.3%
- ❖ Malaise 96.4%
- ❖ Nausea 57.2 %
- ❖ Injected throat 22.9%
- ❖ Cough 12.1%
- ❖ Vomiting 26.6%
- ❖ Diarrhoea 17.3%





19/8/15

FLUID BALANCE RECORD

Date Time	INTAKE (in ml.)						OUTPUT (in ml.)				
	ORAL		INTRAVENOUS		OTHER (Specify)		Time	Urine	Vomitus	Gastric Suction	Other (Specify)
	Type	Amount	Type	Amount	Type	Amount					
7am	H ₂ O	100cc	215 ml								
8am	Bihun+kopi	250cc	210 cc	210cc			8am	200cc			
9am	H ₂ O	200cc	100 ml 500 cc at 5pm	315cc			10am	200cc			
11am	Rt+H ₂ O	300cc					12pm	200cc			
12pm	H ₂ O	250cc					1pm	150cc			
2pm	Intake	1100cc	IVD	525cc	—	—	Output	750cc	—	—	BAO
3pm	H ₂ O	200	CF IVD N/S (210 cc)	210							
4pm	H ₂ O	200									
5pm	H ₂ O	200	MD N/S rush to bed	100							
6pm	Rt+H ₂ O	200									
7pm	H ₂ O	150									
8pm	Intake	1300	IVD	300	—	—	Output	1000	—	—	BAO
9pm	H ₂ O	300cc	CF IVD grate 2h	300cc			10pm	250cc			
10pm	H ₂ O	250cc					11pm	300cc			
11pm	H ₂ O	250cc					12pm	300cc			
12am	H ₂ O	250cc					3am	200cc			
1am	H ₂ O	300cc					5am	250cc			BAO
2am	H ₂ O	300cc									
3am	H ₂ O	300cc									
4am	Intake	1400cc	IVD	300cc			Output	1300cc			BAO
5am	Intake	3800cc	IVD	1125cc			Output	3050cc			BAO

CAPACITY: Coffee Cup=200 ml. Beaker=250 ml. Small Tumbler=115 ml. Large Tumbler=230 ml. Rice Bowl=400 ml. Carafe=800 ml. WJF000711 - PNMB..

FLUID BALANCE RECORD

Total Intake 4925 cc
Total output 3050 cc
Balance 1875 cc
(BAO)





*CFR*_{Pakistan} 2011 **1.28%**

WHO Regional Office for the Eastern Mediterranean Weekly
Epidemiological Monitor (2013) 6(37) 15 September 2013

State	Ranking CFR	Ranking Death	Ranking Cases	CFR (%)	Deaths	Cases
Selangor	11	1	1	0.14	77	54290
Kelantan	13	5	2	0.12	17	14456
Perak	6	4	3	0.28	21	7525
KL Putrajaya	5	3	4	0.29	21	7185
Johor	3	2	5	0.40	25	6323
Negeri Sembilan	8	7	6	0.26	10	3781
Penang	4	6	7	0.35	11	3141
Melaka	10	12	8	0.22	6	2770
Sarawak	9	11	9	0.23	6	2571
Pahang	7	10	10	0.28	6	2170
Terengganu	12	13	11	0.12	2	1688
Sabah	2	9	12	0.41	6	1456
Kedah	1	8	13	0.69	7	1014
Perlis	14	14	14	0.00	0	317

Whole 2014, by 4 Jan 2015

Vectorborne Diseases Sector, MOH MALAYSIA

State	Ranking CFR	Ranking Death	Ranking Cases	CFR (%)	Deaths	Cases
Selangor	12	1	1	0.22	96	43555
Johor	9	3	2	0.27	23	8578
Perak	7	4	3	0.32	22	6920
KL Putrajaya	4	2	4	0.50	25	5044
Penang	11	6	5	0.23	8	3453
Sabah	12	9	6	0.23	4	1752
Pahang	8	8	7	0.29	5	1730
Kelantan	10	9	8	0.26	4	1543
Negeri Sembilan	3	5	9	0.63	9	1437
Sarawak	14	11	10	0.14	2	1391
Melaka	5	7	11	0.44	6	1377
Terengganu	6	10	12	0.43	3	699
Kedah	1	6	13	1.32	8	606
Perlis	2	12	14	0.63	1	158

2015, by 22 Aug 2015

Vectorborne Diseases Sector, MOH MALAYSIA

DENGUE ASSESSMENT CHECKLIST

CRITERIA	RECOGNITION		Details
	Yes	No	
Fever	☐	☐	
Aches & pains	☐	☐	
Nausea and/or vomiting	☐	☐	
Rash	☐	☐	
Leucopenia	☐	☐	
Any Warning Signs	☐	☐	
Warning Signs		Yes	Details
Persistent vomiting/ diarrhoea (≥3x over last 24h)		☐	

PATIENT DETAILS

Name :

IC No / MRN :

WCC:	Temp:
Hb:	BP/MAP:
Hct:	HR:
Plt:	CRT:
	RR:

DENGUE ASSESSMENT CHECKLIST

Male >60: Hct >42					
Female all ages: Hct >40					
Other criteria for admission	Yes	Details			
Syncope	☐				
Diarrhoea	☐				
Social factor	☐				
Special group	Yes	Details			
Obese	☐				
Pregnant	☐				
Heart failure/ CKD/ CLD	☐				
DM	☐				
HPT	☐				
IHD	☐				
COPD	☐				
Age >65	☐				
ADMIT if ANY WARNING SIGNS present or presence of other criterion for admission. CONSIDER admission for patients in the special group even in the absence of warning signs.					
Instructions					
1. Please notify					

CRITICAL CARE REVIEW & FAST-TRACK					
Instructions					
1. Review features of severe dengue present. 2. Use colloid-incorporated regime early 3. Specify start and end time of regime					
Date & Time of:					
Fever onset:					
Critical phase onset:					
Phase:					
Febrile	☐	Critical	☐	Recovery	☐
DIAGNOSIS					
DENGUE FEVER WITHOUT WARNING SIGNS					☐
DENGUE FEVER WITH WARNING SIGNS					☐
SEVERE DENGUE					☐
Dr:					
Date:					

CRITERIA	RECOGNITION		Details
	Yes	No	
Fever	☐	☐	
Aches & pains	☐	☐	
Nausea and/or vomiting	☐	☐	
Rash	☐	☐	
Leucopenia	☐	☐	
Any Warning Signs	☐	☐	

PATIENT DETAILS	
Name :	
IC No / MRN :	
WCC:	Temp:
Hb:	BP/MAP:
Hct:	HR:
Plt:	CRT:
	RR:

Warning Signs	Yes	Details
Persistent vomiting/ diarrhoea (≥ 3 x over last 24h)	☐	
Any abdominal pain/ tenderness	☐	
Lethargy/ restlessness/ confusion	☐	
Tender hepatomegaly	☐	
Third space fluid accumulation	☐	
Spontaneous bleeding tendencies	☐	
Raised Hct with rapid drop in platelet	☐	(In the absence of baseline values)
Male ≤ 60 : Hct >46		
Male >60 : Hct >42		
Female all ages: Hct >40		

Other criteria for admission	Yes	Details
Syncope	☐	
Diarrhoea	☐	
Social factor	☐	
Special group	Yes	Details
Obese	☐	
Pregnant	☐	
Heart failure/ CKD/ CLD	☐	
DM	☐	
HPT	☐	
IHD	☐	
COPD	☐	
Age >65	☐	

ADMIT if ANY WARNING SIGNS present or presence of other criterion for admission.

CONSIDER admission for patients in the special group even in the absence of warning signs.

Instructions

1. Please notify

SEVERE DENGUE	Yes	Details
Hypotension SBP<90 or MAP<60 or SBP drop >40mmHg from known baseline	☐	
Shock index: HR > SBP or impaired perfusion	☐	
Third space fluid accumulation with respiratory distress	☐	
Disturbed conscious level	☐	
Any bleed GI/ non-mucosal and non-cutaneous/ supra-physiological	☐	
Specific organ dysfunction <i>(pls specify)</i>	☐	
CRITICAL CARE REVIEW & FAST-TRACK		
Instructions		
1. Review features of severe dengue present. 2. Use colloid-incorporated regime early 3. Specify start and end time of regime		

Date & Time of:			
Fever onset:			
Critical phase onset:			
Phase:			
Febrile	☐	Critical	☐
		Recovery	☐
DIAGNOSIS			
DENGUE FEVER WITHOUT WARNING SIGNS			☐
DENGUE FEVER WITH WARNING SIGNS			☐
SEVERE DENGUE			☐
Dr:			
Date:			



Parameters for monitoring	Frequency of monitoring		
	Febrile phase	Critical phase	Reabsorption phase
Clinical Parameters			
General well being Appetite / oral intake Warning signs	Daily or more frequently towards late febrile phase	At least twice a day and more frequently as indicated	Daily or more frequently as indicated



Parameters for monitoring	Frequency of monitoring		
	Febrile phase	Critical phase	Reabsorption phase
Clinical Parameters			
Haemodynamic status ☐ <i>CCTVR</i> ☐ <i>BP</i> ☐ <i>Pulse pressure</i> Respiratory status ☐ <i>RR</i> ☐ <i>SpO₂</i> Neurological Status ☐ <i>conscious level</i> ☐ <i>restlessness</i> ☐ <i>seizures</i>	4-6 hourly depending on clinical status	2-4 hourly depending on clinical status In shock Every 15-30 minutes till stable then 1-2 hourly	4-6 hourly



Parameters for monitoring	Frequency of monitoring		
	Febrile phase	Critical phase	Reabsorption phase
Clinical Parameters			
Urine output	4 hourly	2-4 hourly	4-6 hourly
		In shock : hourly	



Parameters for monitoring	Frequency of monitoring		
	Febrile phase	Critical phase	Reabsorption phase
Laboratory Parameters			
* All investigations done at ED must be reviewed immediately upon ward admission			



Parameters for monitoring	Frequency of monitoring		
	Febrile phase	Critical phase	Reabsorption phase
Laboratory Parameters			
* All investigations done at ED must be reviewed immediately upon ward admission			
FBC	Daily or more frequently if indicated	4-12 hourly depending on clinical status In shock Repeated before and after each fluid resuscitation and as indicated	Daily

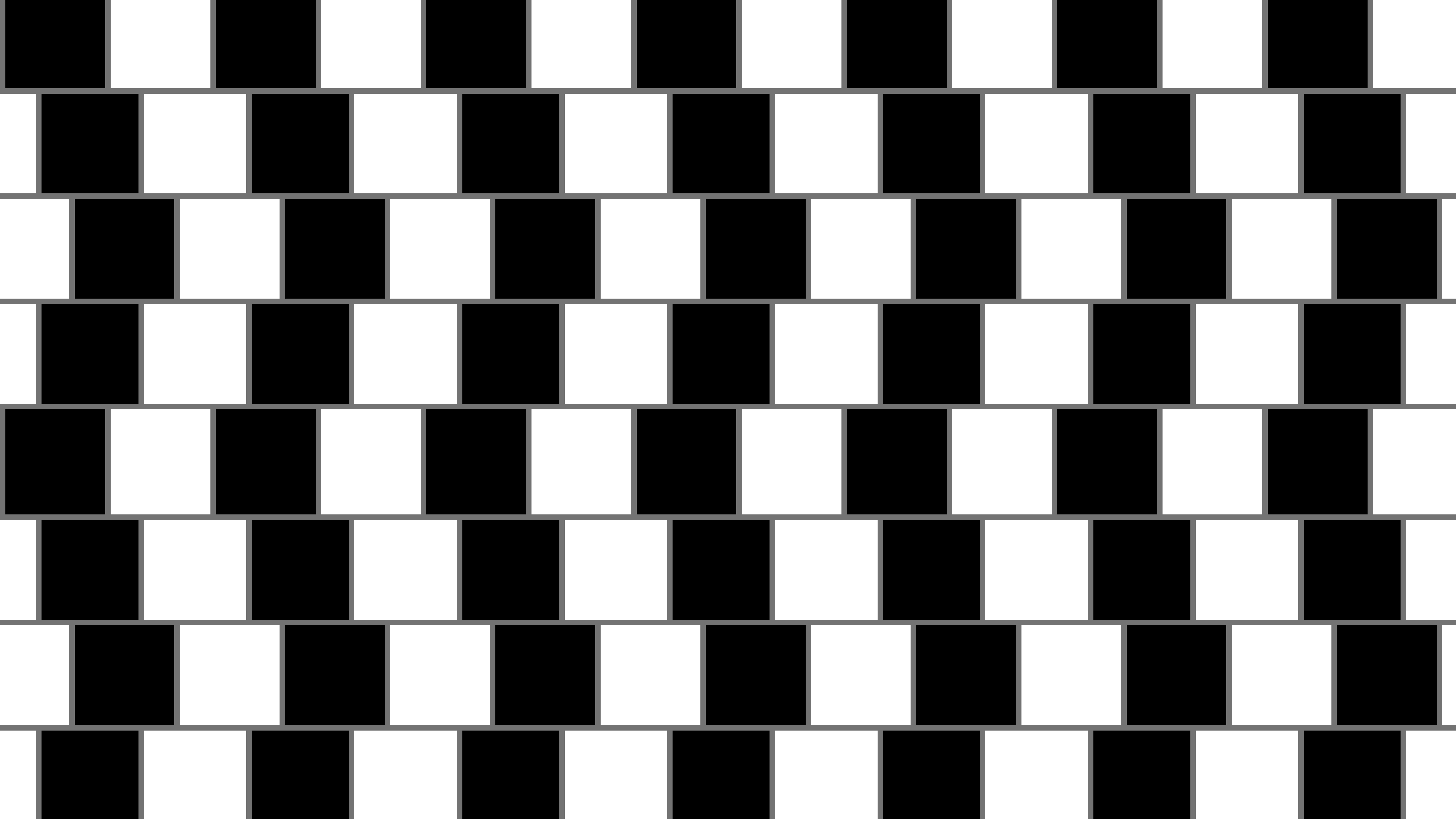


Parameters for monitoring	Frequency of monitoring		
	Febrile phase	Critical phase	Reabsorption phase
Laboratory Parameters			
* All investigations done at ED must be reviewed immediately upon ward admission			
BUSE/Creatinine LFT + AST RBS Creatine Kinase	As clinically indicated	At least daily or more frequently as indicated In shock Crucial to monitor ABG, lactate closely	As clinically indicated



Parameters for monitoring	Frequency of monitoring		
	Febrile phase	Critical phase	Reabsorption phase
Laboratory Parameters			
* All investigations done at ED must be reviewed immediately upon ward admission			
ABG, lactate Coagulation profile CRP Troponin or CKMB Fibrinogen, LDH, ferritin, triglyceride Echocardiogram Ultrasound	As clinically indicated	As clinically indicated	As clinically indicated

		PR	SBP	DBP	RR
14/04	1330	72	104	74	20
	1430	68	102	75	21
	1545	66	110	75	21
	1945	86	107	79	20
	2300	79	101	66	20
15/4	0415	86	102	68	26
	805	90	126	95	24
	1200	83	124	96	20
	1600	80	113	86	26
	1920	90	106	77	24
16/4	2200	90	106	82	20
	0400	88	104	72	20
	800	85	104	79	20
	1135	102	102	78	20
	1415	106	116	90	28



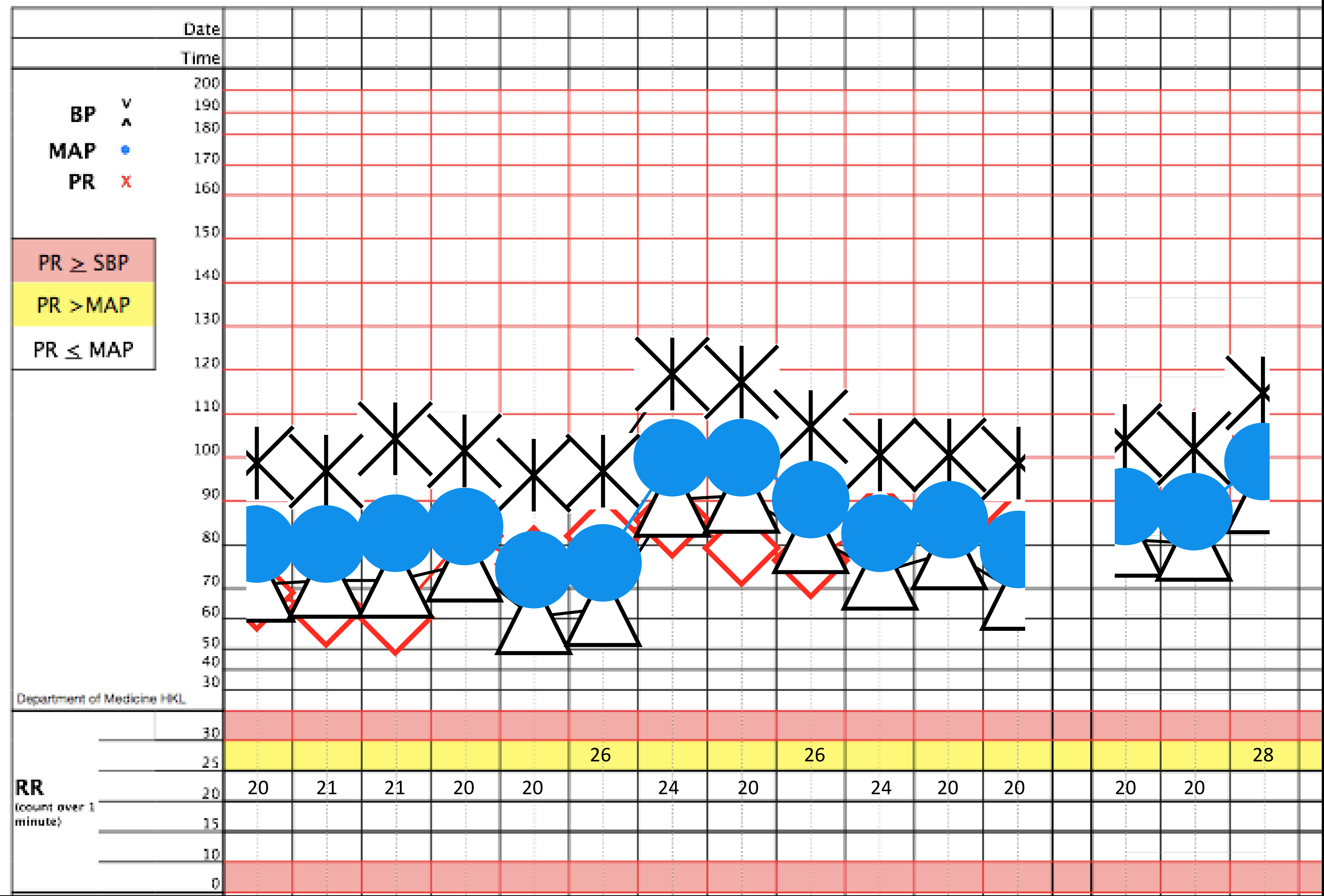


DENGUE CHART

NAME:

MRN:[illegible]

		PR	SBP	DBP	RR
14/04	1330	72	104	74	20
	1430	68	102	75	21
	1545	66	110	75	21
	1945	86	107	79	20
	2300	79	101	66	20
15/4	0415	86	102	68	26
	805	90	126	95	24
	1200	83	124	96	20
	1600	80	113	86	26
	1920	90	106	77	24
16/4	2200	90	106	82	20
	0400	88	104	72	20
	800	85	104	79	20
	1135	102	102	78	20
	1415	106	116	90	28



MRN:[illegible]

The image shows two hand-drawn graphs on grid paper. The top graph has a red line with points (1, 90), (2, 80), (3, 85), (4, 92) and a blue line with points (1, 70), (2, 72), (3, 73), (4, 74), (5, 75). The bottom graph has a red line with points (1, 40), (2, 30), (3, 38), (4, 39) and a blue line with points (1, 20), (2, 22), (3, 23), (4, 24), (5, 25).

[illegible]

The image shows two hand-drawn graphs on millimeter paper. The top graph has a y-axis labeled 'p' (relative vapor pressure) ranging from 0 to 100. The x-axis is labeled 'RH' (relative humidity) with values 70, 80, 90, 95, 98. The graph shows a red line with data points and blue vertical lines indicating saturation vapor pressure. The bottom graph has a y-axis labeled 'p' (relative vapor pressure) ranging from 0 to 100. The x-axis is labeled 'RH' (relative humidity) with values 70, 80, 90, 95, 98. The graph shows a red line with data points and blue vertical lines indicating saturation vapor pressure. The x-axis for both graphs is relative humidity (RH) in percent, ranging from 70% to 98%.

DENGUE CHART

NAME:

MRN:[illegible]

BP	V
	Λ
MAP	•
PR	x

SHOCK INDEX

$$PR \geq SBP$$

PR > MAP

$$PR \leq MAP$$

WT:

HT:



Date: _____

NS1

☐ IgG

☐ IgM

200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40

[illegible]

WCC	Baseline:												
HB	Baseline:												
HCT	Baseline:												
PLT	Baseline:												
HCO3	Baseline:												
LACT	Baseline:												



TAKE HOME MESSAGE

- Act
 - Do not act based on 1 parameter alone