Scenario:
Traveller/ Malaria

Setting: ED
Clinical Focus: Returned Traveller/ Fever
Situational Factors:

Learning Objectives:
- Recognition of the Unwell Patient
- Performing a travel history
- Recognise/ Consider Malaria and assess for severity.

Stage/ Design/ Props/ Technical Setup

SimMan + Trolley. Gas and NPT

Briefing to Participants: Scene

20 year old presented to ED with a history of fever and sweats at night.

Presentation	Expected Response	Actors Notes
Nonspecific symptoms: chills, malaise, fatigue, sweating, headache, nausea and myalgias.	A-E assessment - Systems review and travel history	Returned from Chad (Africa) a month ago, symptoms started 3 weeks ago. Was out there doing voluntary work. Took prophylaxis at the start, but extended their stay and ran out.
Examination: ● RR18, Sats 98% (Air), Chest Clear, ● HR 115, BP 106/76, ● Alert ● T 40.1. ● BM 2.4 ● Slight jaundice	IV access, bloods (inc cultures and malaria screen). IVI, ABX + Sepsis Paperwork. Give dextrose Should consider Malaria as differential. Consider isolation as malaria not confirmed.	
Progress Improves: Remains alert, HR improves	Refer to medics/ IDU	
Progress Deteriorates: Increasingly drowsy, BM Falls	Critical Care/ Senior Input	Increasingly confused/ less responsive

Debrief	Clinical	CRM
	Travel History/ malaria	As identified in Sim

EMERGENCY DEPT ATTENDANCE RECORD

Printed Copy No. 1

University Hospitals Of LEICESTER NHS Trust
Leicester Royal Infirmary UHL Trust
LEICESTER

NHS Barcode:

PATIENT IDENTIFIER

Hospital No NHS No
Last Name Ben
Forename Halliday
Date Of Birth 25/12/1996 Age: 20
Sex M
Ethnic Category
Address

(Home)
(Work)
(Mobile)
Occ/School

Interpreter Required **No**
Language **HOME - OWN**

NEXT OF KIN/EMERGENCY CONTACT

Name Jeff Halliday
Relationship Father
Address

(Home)
(Work)
Emergency Contact

REGISTERED GP

Name Dr J. Dorian
Surgery Sacred Heart Medical Practice

TRIAGE

ED Arrival
Triage Assessment
Complaint
Triage Nurse
Nurse Assessment

Triage Category

CLINICAL ALERTS/ALLERGIES

Allergies

Clinical Alert

ATTENDANCE HISTORY

Date Discharge Diagnosis

16/7/2005 - Fracture Wrist

Sample No.: S1234567 Rack: Tube: 12:34:35
Patient ID: Ward: Dr.:
Name: Birth: Sex:
Comments: Inst.ID:XS-800i^65614

WBC	**7.62**	[10^9/L]	
RBC	2.08	[10^12/L]	
HGB	**132**	[g/L]	
HCT	0.184	[Ratio]	
MCV	88.0	[fL]	
MCH	29.8	[pg]	
MCHC	339	[g/L]	
PLT	**36**	[10^9/L]	
RDW-SD	42.4	[fL]	
RDW-CV	14.0	[%]	
PDW	11.3	[fL]	
MPV	10.5	[fL]	
P-LCR	27.7	[%]	
PCT	0.18	[%]	
NEUT	5.2	[10^9/L]	65.5
LYMPH	2.75	[10^9/L]	15.6 *
MONO	1.58	[10^9/L]	9.0 *
EO	0.04	[10^9/L]	0.2 *
BASO	0.03	[10^9/L]	0.2

Actions required

☐ Normal
☐ Abnormal but no immediate danger

☐ Significantly abnormal results –
patient in imminent danger

document STAT actions taken

NPT samples processed by

NPT results

VBG

Roche

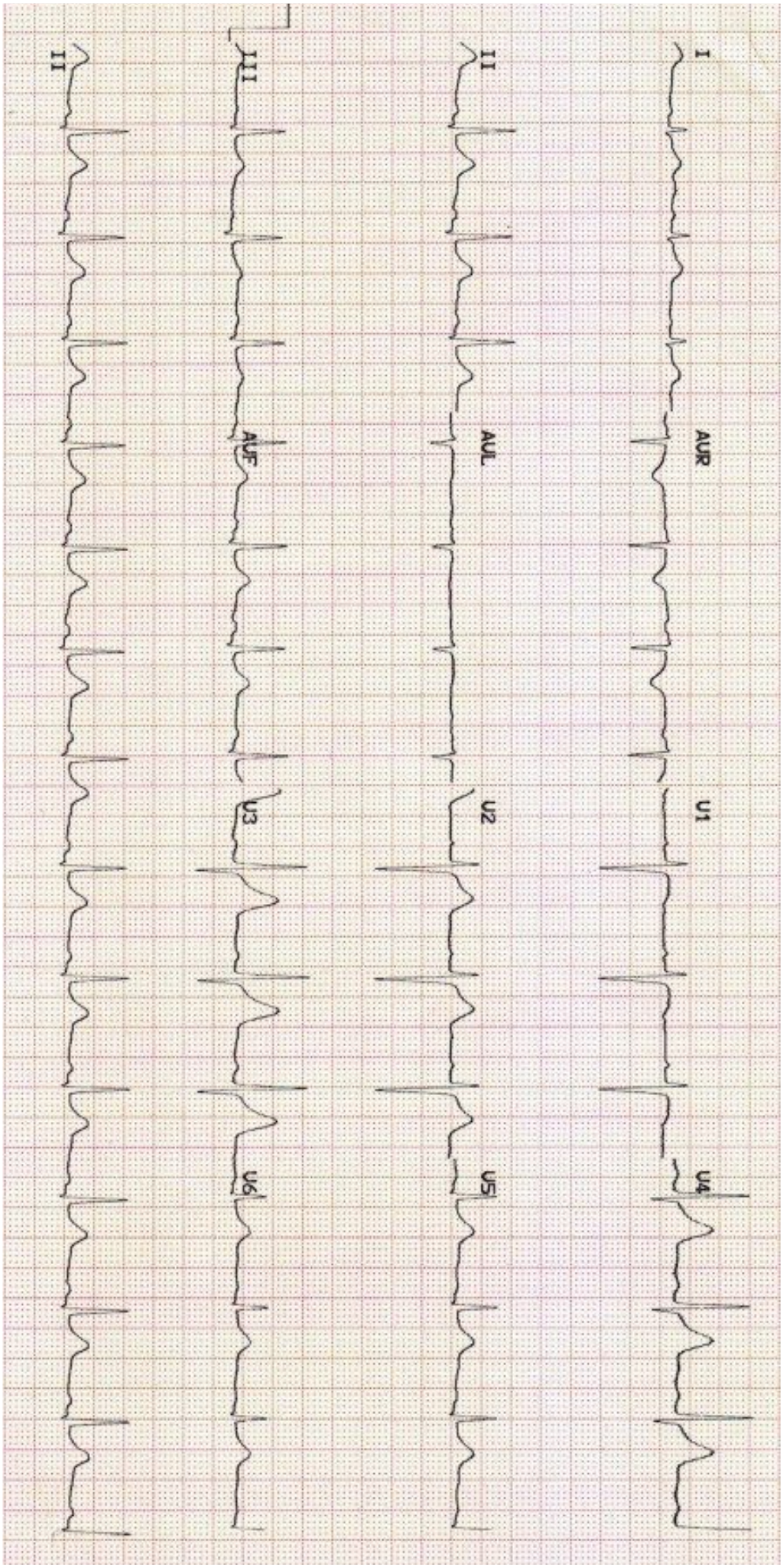
Measurement report

Serial number : 19241
Instrument ID : A&E 1
Operator ID : blood

St. Elsewhere Emergency Dept

Pat. ID	S1234567			
Last name	Man			
First name	Sim			
Blood type	Venous			
FiO_2	0.21			
pH	**7.34**	(-)	[7.350 -	7.450]
PCO_2	**6.5**	kPa	[4.27 -	6.40]
PO_2	**9.5**	kPa (--)	[11.07 -	14.40]
BE	**-7.7**	mmol/L		
$cHCO_3^-$	**17.2**	mmol/L		
Na^+	**137**	mmol/L	[136.0 -	145.0]
K^+	**3.9**	mmol/L	[3.50 -	5.10]
Ca^{2+}	**1.5**	mmol/L	[1.150 -	1.330]
Cl^-	**106**	mmol/L	[98.0 -	107.0]
Glu	**2.4**	mmol/L	[3.5 -	5.3]
Lac	**2.3**	mmol/L	[0.4 -	0.8]
Urea	**5.6**	mmol/L	[2.5 -	6.4]
AG	**17**	mmol/L		
Osm	**282**	mOsm/kg		
Hct	**45**	% (--)	[36.0 -	53.0]
Hct(c)	**45**	%		
tHb	**132**	g/L	[115.0 -	178.0]
SO_2	**76**	%	[94.0 -	98.0]
COHb	**0.5**	%	[0.0 -	3.0]
MetHb	**1.4**	%	[0.0 -	1.5]
HHb	**2.5**	%	[0.0 -	2.9]
O_2Hb	**15**	%	[94.0 -	98.0]
Bili	Out of range (-)		[51 -	850]

Scenario: *"Ben Halliday"*



University Hospitals of Leicester NHS
NHS Trust

Treatment Guidelines of falciparum and non-falciparum malaria in adults

APPROVED BY:	Policy and Guidelines Committee
TRUST REFERENCE:	B7/2009
AWP REF:	AWP 69
Date (approved):	AWP March 2008
Written	July 2002
MOST RECENT REVIEW:	April 2014
NEXT REVIEW:	April 2017
REVIEWED BY:	Dr Navin Venkatraman & Dr David Bell
ORGINATOR (Author):	Dr N. Venkatraman & Dr David Bell (2007), Iain Stephenson
RATIFIED BY:	AWP

MALARIA TREATMENT IN ADULTS

Introduction

Malaria should be considered in any unwell or febrile person who has visited an endemic area (tropics and most subtropical areas of Africa, Asia, Americas, and Oceania; detailed map at http://cdc-malaria.ncsa.uiuc.edu/). Most cases of severe malaria present within 3 months of return, but may present later. Malaria is a medical emergency with about 1500-2000 cases in the UK per year and overall mortality of ~1%. Delay in recognition and treatment is shown to increase mortality and complications.

Clinical guidance

Take travel history
History of fever in most cases; other symptoms are nonspecific and may include malaise, rigors, drowsiness, headache, diarrhoea and cramps.
Admit to sideroom, preferably on IDU. All cases of falciparum malaria should be admitted.
EDTA (FBC) blood to Haematology for malaria film +/- rapid diagnostics; repeat up to 3 times at daily intervals if initially negative; stop any antimalarial prophylaxis.
Blood cultures in all unwell travellers
Other investigations to consider: FBC and differential count, clotting, Group & Save, U&E, LFT, Bone, CRP, glucose, G6PD (EDTA bottle), urine dipstick, stool MC&S, CXR, Hepatitis/HIV serology
Do not give empirical therapy
Assess severity In a patient with malaria and no other obvious cause of symptoms, the presence of one or more of the following clinical or laboratory features indicates severe malaria:

Clinical features:
- impaired consciousness or unrousable coma
- prostration, i.e. generalized weakness so that the patient is unable to walk or sit up without assistance
- multiple convulsions – more than two episodes in 24 h
- deep breathing, respiratory distress (acidotic breathing)
- circulatory collapse or shock (SBP < 70 mm Hg in adults)
- clinical jaundice plus evidence of other vital organ dysfunction
- abnormal spontaneous bleeding

Laboratory and other findings:
- hypoglycaemia (blood glucose < 2.2 mmol/l)
- metabolic acidosis (plasma bicarbonate < 15 mmol/l)
- severe normocytic anaemia (Hb < 7g/dl, packed cell volume < 15%)
- haemoglobinuria
- hyperparasitaemia (> 2% of red cells parasitised)
- hyperlactataemia (lactate > 5 mmol/l)
- acute kidney injury (serum creatinine > 265 μmol/l)
- pulmonary oedema (radiological)

Treatment of malaria

1 Severe malaria (usually falciparum)

START TREATMENT IMMEDIATELY

Artesunate is the drug of choice for treatment of severe malaria. However, if the drug is unavailable, commence treatment with IV Quinine until Artesunate is available. Artesunate is unlicensed, and its use should be discussed with the Infectious Diseases physician on call.

Artesunate

IV bolus of 2.4mg/kg at 0 hours, 12 hours, 24hours and once daily thereafter, until parasites are cleared, or the patient is able to take oral medication

Follow with a full course of Artemisinin based combination therapy (ACT) with Artemether-Lumefantrine as above

Quinine

Loading dose quinine: 20mg/kg (max 1.4g) by slow infusion over 4 hours

Notes: Omit loading dose if mefloquine or quinine taken in last 24 hours, and go straight to maintenance dose below
All quinine doses given by infusion in 250ml 5% glucose
Adverse effects include arrhythmias (monitor ECG), hypoglycaemia (monitor BM)

Followed 8 hours after the start of the loading dose by

Maintenance dose quinine: 10mg/kg (max 700mg) by slow infusion over 4 hours every 8 – 12 hours, until parasites are cleared, or the patient is able to take oral medication

Notes: Reduce maintenance dose to every 12 hours if hepatic or renal impairment, or if intravenous Quinine is needed for more than 48 hours

Once the patient can take oral therapy, convert to oral quinine followed by doxycycline, clindamycin, or sulfadoxine-pyrimethamine as for non severe falciparum malaria

1.1 Adjunctive management

- In the case of shock, after taking cultures, add Ceftriaxone 2g od to cover bacterial sepsis
- Avoid fluid overload, which can precipitate fatal pulmonary oedema
- Transfuse if Hb < 70g/l taking care not to overload
- Support clotting if bleeding, avoid drugs which may cause GI bleeding
- If severe complications (metabolic acidosis, oliguric renal failure, pulmonary oedema or adult respiratory distress) manage in ITU setting

2 Uncomplicated falciparum malaria

Artemether with lumefantrine (Riamet ®)

4 tablets immediately then further doses of 4 tablets given at 8, 24, 36, 48 and 60 hours

Notes: Take with milk or fatty food as this aids absorption.
Riamet should not be used in the first trimester of pregnancy without specialist advice.

OR

Quinine

Quinine base 600mg tid for 7 days or until parasites have cleared

followed with doxycycline 200mg od for 7 days **or** clindamycin 450mg tid for seven days **or** sulfadoxine 500mg/ pyrimethamine 75mg (Fansidar ®) 3 tablets stat

Notes: Do not give doxycycline in pregnancy or lactation
Clindamycin is safe and effective in pregnancy
Seek pharmacy advice on quinine base equivalent of available quinine salt preparation

OR

Atovaquone / Proguanil (Malarone ®)

4 tablets od for 3 days

Notes: Take with milk or a fatty meal to increase absorption
Do not use if the patient took Malarone prophylaxis.

Repeat blood film after 12-24 hours, then daily until parasites have cleared

3. Uncomplicated malaria due to infection with Plasmodium vivax, ovale, or malariae

Chloroquine

Chloroquine base 620mg orally (equivalent to 4 chloroquine phosphate 250mg tablets), then 310mg at 6-8 hours, then 310mg daily for 2 further doses, or to total dose 25mg/kg

Followed with Primaquine for 14 days, in the case of P vivax (30mg daily) or P ovale (15mg daily)

Notes: Rule out G6PD deficiency before prescribing Primaquine
In case of mild G6PD deficiency, Primaquine can be given weekly (45mg weekly for 8 weeks) unless haemolysis develops
In severe G6PD deficiency Primaquine is contraindicated
Primaquine is contraindicated in pregnancy

Routine admission is not required

Severe malaria is uncommon with these species

4. Malaria due to mixed infection, or when the species cannot be determined

Treat as for falciparum malaria with either Quinine, or Artemisinin based combinations followed with Primaquine if indicated

Quinine and ACTs are effective against P vivax and P ovale

USEFUL LINKS

WHO guidelines for management of severe malaria - 2013
Investigation and treatment of imported malaria in non-endemic countries.BMJ; 2013. (Via Open Athens)

Review Record			
Date	**Issue No.**	**Reviewed By**	**Description of change (if any)**
7.09	2	I Stephenson	No changes
7.11	3	I Stephenson	Improved description of chloroquine dosage
4.13	4	D.Bell	Addition of Artesunate and Artemether with lumefantrine (Riamet ®) as treatment option