

# SSMJ

# South Sudan MEDICAL JOURNAL

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## **Guinea worm surveillance system evaluation in South Sudan**

**Clinical audit of malaria management**

**Health psychology and health care intervention**

**ICT in surgical training**

Can primary health care staff be trained in basic life-saving surgery? *A paper for discussion*

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**Cover photo:** *Showing young children using filters for drinking water (Source: Southern Sudan Guinea Worm Mid-year 2006 report. See article on page 72).*

# SSMJ South Sudan MEDICAL JOURNAL

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The South Sudan Medical Journal is a quarterly publication intended for Healthcare Professionals, both those working in the South Sudan and those in other parts of the world seeking information on health in South Sudan. The Journal is published in mid-February, May, August and November.

*Reviewers are listed on the website*

# Clinical attachment: a learning experience

A clinical attachment is an opportunity for doctors from South Sudan to experience the hospital and clinical practice in a setting different from their own. What they learn in the attachment will help them improve their medical practice on their return. I attended a clinical attachment in Oral and Maxillofacial Surgery at Poole Hospital, UK, in March 2012. This attachment involved attendance in diagnostic clinics, ward rounds and operations.

I learnt a lot of things during the attachment from the professional working environment and excellent doctor-patient relationships to the great way patients are handled through the system. All these help improve our patient care and South Sudan can emulate most, if not all, these practices.

Working in hospitals is not a one-man show, but require a team in order to deliver quality services. I saw good team spirit; each member of the team knew what to do, at what time and how, to complete the holistic care of the patient. This is essential if we want to provide good services at home.

A clinical attachment is an opportunity for doctors from South Sudan to experience the hospital and clinical practice in a setting different from their own.

Instilling the virtue of honesty in the workplace as well as strict time keeping is essential. In most instances in our hospitals, there is no discipline due to poor management skills in the various departments leading to poor performances and quality of services provided. I would highly endorse the implementation of a proper workable system to improve these qualities in medical staff and workers in the hospitals.

There are several draw backs to attachments, though. One is the heavy reliance on technology for diagnosis: the use of CT scans and sophisticated investigations. Because we do not have such high levels of investigative aids at our disposal, we still depend on our clinical skills and senses in examinations. Another disadvantage of attachments is the lack of hands-on application which is not allowed because of our observer status.

Despite the short comings, many of the things I learnt and saw during the one month clinical attachment are things that can be easily adopted in order to improve the work environment and give more time to the care of our patients. These were practical changes that will require little extra effort to realize. I recommend that such opportunities be granted to many of my colleagues so that change may come in our work places as we endeavour to deliver quality health services to the people of South Sudan.

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# Management of malaria at Juba Teaching Hospital: a clinical audit

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## Introduction

Worldwide there are 247 million cases of malaria annually and nearly a million deaths [1,2]. In South Sudan, especially during the rainy season, malaria is responsible for most admissions and is the leading cause of mortality in the Medical Department of Juba Teaching Hospital (JTH).

The World Health Organisation (WHO) and the Ministry of Health, South Sudan offers clear guidance on the diagnosis and treatment [2,3] Malaria is divided into:

1. **Uncomplicated** - which can be treated with artemisinin combination therapy (ACT) such as AS/AQ (artesunate plus amodiaquine)
2. **Complicated** - which includes the following features:
  - **Shock:** tachycardia (pulse >100/minute), hypotension (BP <100/60).
  - **Jaundice** with end organ dysfunction (i.e. shock and / or organ failure).
  - **Impaired level of consciousness/convulsion** (may indicate hypoglycaemia and / or cerebral malaria).
  - **Anaemia** (haemoglobin (Hb) <5g/dl).
  - Signs of **renal failure:** acidotic breathing, metabolic acidosis (bicarbonate <15mM/L), serum creatinine >265µM/L.
  - **Haemoglobinuria** (urine test positive for blood without red blood cells seen on microscopy).
  - **Spontaneous bleeding** (may indicate disseminated intravascular coagulation - DIC).
  - **Acute respiratory distress syndrome** (ARDS).
  - **Hyperparasitaemia** (>5% of red blood cells with parasites in endemic areas such as South Sudan)
  - **Hyper-pyrexia** (fever >40°C).
  - **Lactate** (>5mM/L).

The WHO guidelines recommend a variety of investigations and treatments for complicated malaria but

many of these are not available in JTH. The South Sudan Guidelines are based on the WHO ones but are modified for use in South Sudan.

We have used the following key in the text below.

- **Green:** Test or treatment available at JTH
- **Orange:** Test or treatment available in a private clinic but is expensive
- **Red:** Test or treatment not available

## General management of complicated malaria

- Assess vital signs: **temperature, pulse rate, blood pressure, respiratory rate, level of consciousness (Glasgow Coma Score/AVPU).**
- Assess for complications: see Table 1.
- Perform the following investigations: **blood film for malaria, glucose, full blood count, renal and liver function tests, coagulation screen, lactate, bicarbonate, blood gas analysis, blood cultures.**
- Start treatment: first line is **IV artesunate** (quinine if IV artesunate unavailable). Randomised controlled trials have shown a 34% relative mortality reduction when compared to quinine (WHO 2010)
- WHO advise switching all patients to oral artemisinin combination therapy (ACT) once improved, no matter what IV anti-malarial was given. The South Sudan Guidelines advise switching all patients on IV quinine to oral quinine. Whilst either option was advised, the authors preferred the use of oral ACTs as there were no studies in South Sudan documenting quinine resistance, the side effect profile was better on ACTs, the dosing regime was twice daily and rather than three times a day and the course duration was three days on ACT as opposed to 7 days on quinine (IV and oral combined). The two latter factors would therefore improve patient compliance and increase the likelihood of complete eradication of the malaria parasite.

The specific management of the complications of malaria, according to the WHO and South Sudan Treatment Guidelines, is listed in Table 1.

The aim of this clinical audit was to:

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1. Use the WHO and South Sudan Treatment guidelines as the "Audit Standard" and
2. Compare the management of malaria in the Medical Department against these guidelines
3. Recommend strategies for improving malaria care.

### Methodology

In July 2011, the case notes of 50 consecutive patients with malaria were analysed and the data in Table 2 were recorded as 'yes', 'no' or 'unknown' for each patient.

The answers to the questions were collected on a spreadsheet using an Apple Macintosh computer. Once collected, a variety of interventions were undertaken as follows:

1. Training of all (112) nurses in the detection and management of malaria and triage.
2. In association with the head of the Medical Department a malaria protocol was designed and displayed in the medical outpatients department (equivalent of a UK's Accident and Emergency Department).

**Table 1. Management of complicated malaria**

Complication Clinical features	Clinical features	Investigations/management
Cerebral malaria	Altered level of consciousness, convulsions.	Recovery position, maintain airway, nil by mouth. IV diazepam for convulsions and consider loading on phenytoin or phenobarbitone. Consider CT head and lumbar puncture. Other causes of coma e.g. hypoglycaemia, meningitis, must be considered. Serial assessments of level of consciousness using the GCS and / AVPU.
Hypoglycaemia (glucose <2.2mmol/l)	Altered level of consciousness, convulsions.	Blood glucose, 50ml 50% glucose.
Renal failure	Acidotic breathing, oliguria.	Metabolic acidosis (plasma bicarbonate <15mmol/l), creat >265umol/l. Exclude pre-renal causes. Carefully monitor fluid balance. Consider dialysis.
Shock	BP<100/60 and pulse >100.	Lactate >5mmol/l Fluid resuscitation: Fluid boluses with 0.9% normal saline or ringer lactate (unless in renal failure).
Evidence of severe intravascular haemolysis: •Severe anaemia (Hb<5g/dl) •Jaundice with end organ dysfunction. •Haemoglobinuria	Pallor, jaundice, "coca cola" coloured urine.	Hb, blood group, bilirubin. Transfuse if Hb <5g/dl or more than 5 and symptomatic.
DIC	Spontaneous bleeding.	Coagulation tests. Give fresh frozen plasma or whole blood if not available. Give vitamin K.
Acute respiratory distress syndrome (ARDS)	CXR signs and profound hypoxia.	Sit up, oxygen, furosemide and consider steroids, although there is very limited evidence of benefit.
Hyperpyrexia	Fever >40C.	Paracetamol if conscious. Tepid sponging if not able to take medications. Avoid nephrotoxic drugs such as diclofenac.
Super added septicaemia.		Use broad spectrum antibiotics if in any doubt.

## MAIN ARTICLES

**Table 2. Data recorded for each patient**

Audit Standard
Age, Sex, Residence
<b>1. Recorded vital signs:</b>
Pulse
Blood pressure
Respiratory rate
Temperature
Level of consciousness (GCS/AVPU)
<b>2. Assessment for complicated malaria:</b>
Shock (pulse>100 and/or BP<100/60)
Renal failure (RR>20 or oliguria)
Haemoglobinuria
Cerebral malaria/hypoglycaemia (coma, confusion, fits)
Pallor
Jaundice
<b>3. Investigations requested</b>
Blood film for malaria (BFFM)
Random blood sugar (RBS)
Haemoglobin concentration (Hb)
<b>4. Treatment given</b>
Quinine IV on admission
Dextrose IV with quinine
Artemether IM on arrival
Artesunate IV on arrival
Reduced level of consciousness, or seizures was 50% dextrose given?
Shock: were boluses of ringer lactate or normal saline given?
Fever: was paracetamol or tepid sponging administered?
Fever: was diclofenac administered?
Vomiting: was an anti-emetic given?
Dyspepsia: was an anti-dyspeptic given?
Was the patient switched to an oral ACT once improved?
Was the patient switched to oral quinine once improved?
Pulmonary oedema: was furosemide and oxygen given?
If evidence of bacterial infection, was an appropriate antibiotic given?
Severe anaemia (Hb <5): was the patient transfused?
Convulsions: was diazepam administered?

3. Bedside teaching of all doctors in the Emergency Medical Ward (EMW) on malaria.

4. Departmental professional standards were discussed and clarified with the agreement of the Head of the Department. The responsibilities at all levels aimed at creating team work and job satisfaction and hence improved patient care.

5. A new system for note-keeping was created, where doctors would write using the SOAP acronym:

S - subjective or what the patients said;

O - objective or what was found on examination;

A - assessment or the diagnosis;

P - plan or what investigations and medications should be done.

Once this was accomplished, a re-audit of forty patients took place in December 2011.

### Results

The results are summarised in Figures 1-4 and Table 3. More details are in full report of the audit which will be uploaded on the SSMJ website.

Table 3 compares the management of all the patients in the July and December audits. The quality of case notes in the July audit was poor making it difficult to know if an action had been done or omitted. Vital signs and assessment for complications of malaria were not consistently recorded.

In the December audit, ninety eight percent of patients were assessed for jaundice and pallor and 7.5% of these had pallor. Half of these had a haemoglobin check and no patients needed a blood transfusion for a Hb <5g/dl. The December audit also demonstrated improvements in the patients' symptomatic management. Pyrexia was predominantly controlled with paracetamol and tepid sponging.

In Figure 4, not all of the items are indicated for every case: e.g. not every patient with malaria is shocked or vomits. In this case the management for shock or vomiting is not needed. When collecting the data, the notes were examined to see if an item of management was clinically indicated. The following rules were applied:

1. Yes - management clinically indicated and given

2. No - management clinically indicated and not given

Not applicable (NA) - not clinically indicated as condition not present.

So Figure 4 shows a percentage breakdown of the management items where clinically indicated and the NA group was removed.

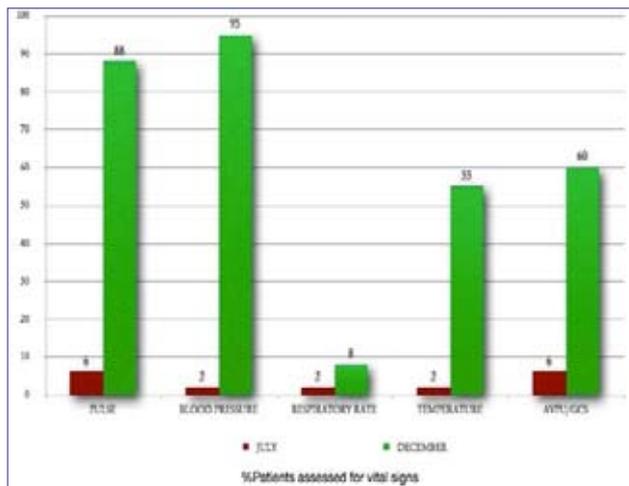


Figure 1. Percentage of patients in July and December with vital signs recorded (pulse, blood pressure, respiratory rate, temperature, and level of consciousness).

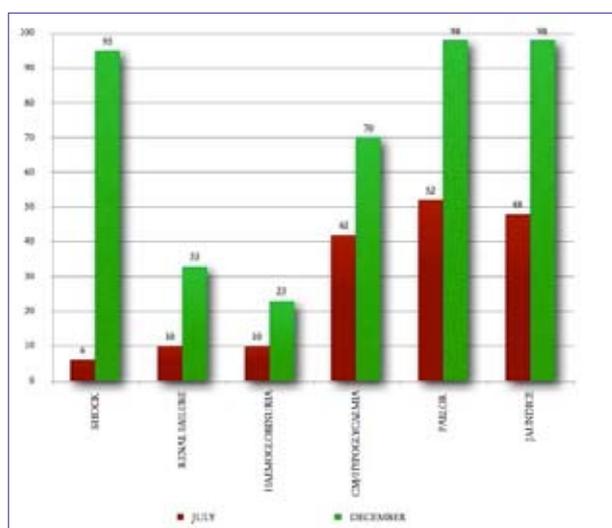


Figure 2. Percentage of patients assessed for complications of malaria in July and December. CM- cerebral malaria.

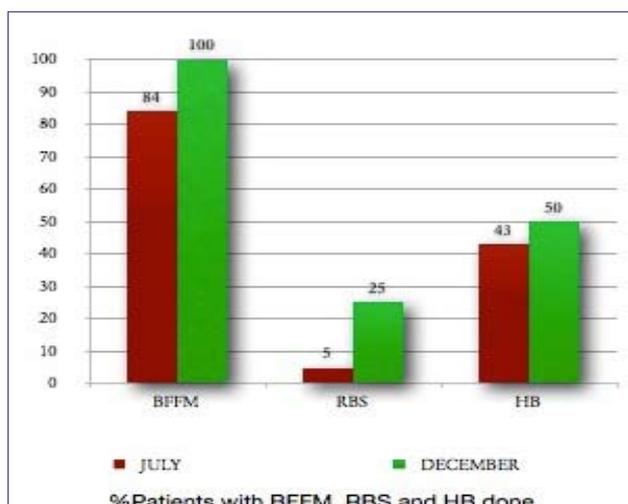


Figure 3. Percentage of patients in July and December 2011 for whom blood tests were clinically indicated.

## Discussion

The audit clearly demonstrates an improvement in the care of patients with malaria since July 2011.

There were no additional financial costs to implement this higher standard. A restructuring of the Department reduced delays in management to a minimum. The key changes were:

1. Bringing small quantities of medicine from the Pharmacy and stores into a drugs and equipment cupboard on the ward which the nurses regularly checked.
2. Introducing a rule that all patients admitted to the ward were re-clerked.
3. Teaching doctors about good clinical note-keeping.

However, compared to the WHO and South Sudan Treatment Guidelines, areas that continue to require attention are:

1. Vital signs. There was a failure to document a respiratory rate, an exact temperature, and a level of consciousness in many cases
2. Assessing patients for renal complications. All this requires is an assessment for oliguria (urine output <500ml/day) and haemoglobinuria ('coca cola' coloured urine)
3. Appropriate ordering of tests such as RBS and Hb where indicated.
4. Giving 50% dextrose to patients with altered conscious level.

## Conclusions

The Audit has led to a positive change in the management of malaria at Juba teaching Hospital, though areas of concern still remain such as failure to:

- Document a respiratory rate, an exact temperature, and a level of consciousness in many cases
- Assess for renal complications.
- Appropriately order tests such as RBS and Hb where indicated.
- Give 50% dextrose to all patients with altered conscious level.

## Recommendations

1. A mortality study to assess the impact of the restructure on malaria related deaths.
2. A study to assess quinine and artemisinin resistance in South Sudan. This would allow doctors to improve anti-malarial therapy for their patients.

## MAIN ARTICLES

3. Appropriation of IV artesunate as a priority.
4. Allocation of more nurses to the Emergency Medical Ward which is one of the busiest wards. An increase in the nursing staff from twenty to thirty would enable a significant improvement in the recording of vital signs.
5. Improvement of laboratory services to include analysis of cerebrospinal fluid and estimation of serum electrolytes, bicarbonate and (ideally) lactate and renal function (i.e. serial creatinine assays).
6. A re-audit when the above has been accomplished.

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### Acknowledgements

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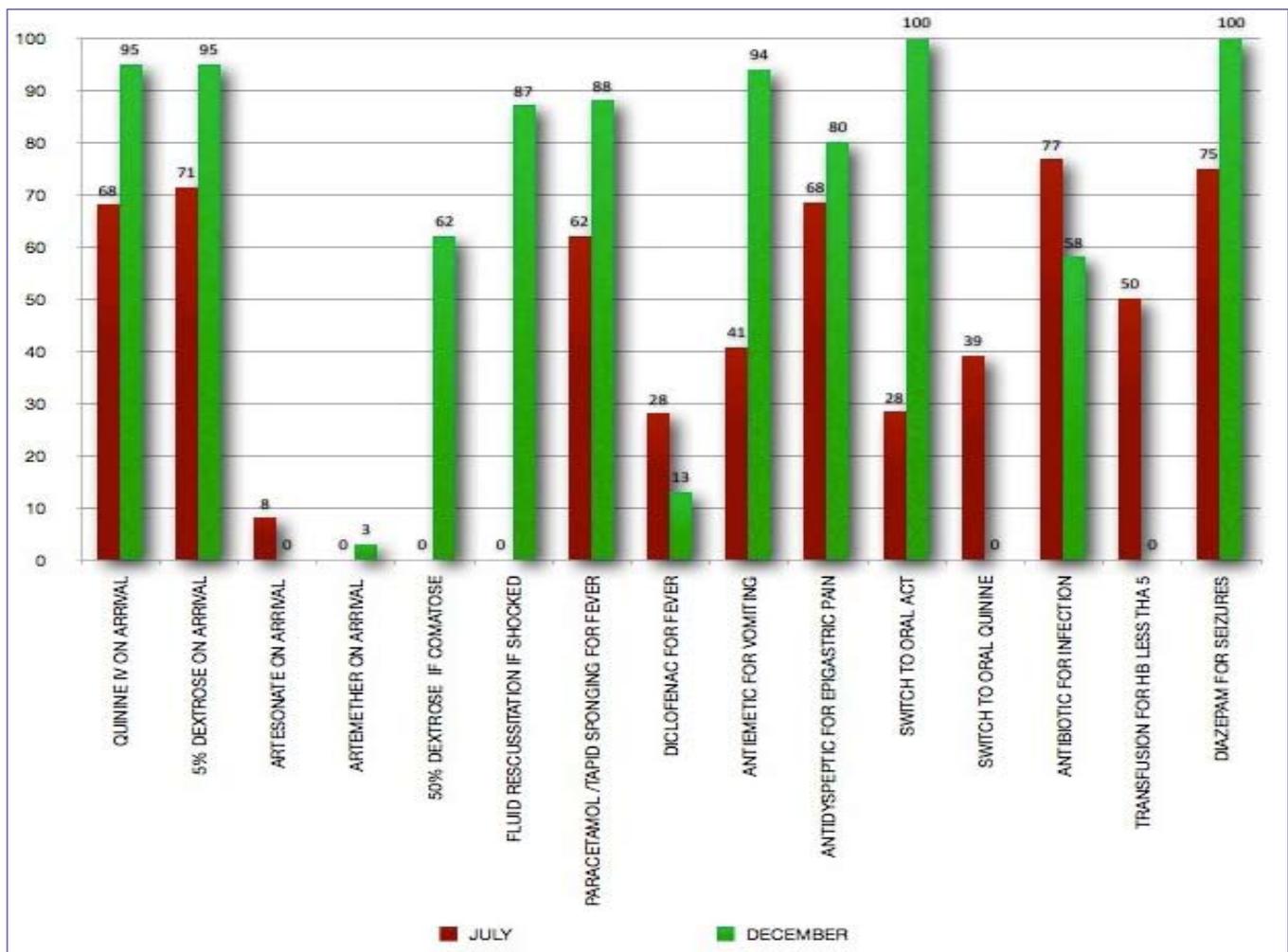


Figure 4. Percentage breakdown of the specific items of management in July and December.

**Table 3. Management of all patients in the July and December audits**

Management	Percent of audited patients receiving:	
	July n= 50	December n= 40
Patients who received quinine	68	95
Patients who received resuscitation fluids	0	87
Patients who received 50% dextrose if comatose	0a	50
Patients switched to an oral artemisinin combination therapy (ACT) on improvement	28b	100
Patients given diazepam for convulsions	75	100
Patients given an anti-emetic for vomiting	48	94
Patients given an antidyspeptic if indicated	68	80
Patients given diclofenac for fever	28c	13

Notes:

- This was extremely worrying given the large number of presentations with impaired consciousness and shock.
- Most were switched to oral quinine.
- Malaria can cause acute kidney injury and any non-steroidal anti-inflammatory drug should be avoided as this may compound the problem.

**How to do an audit (4,5)**

A clinical audit cycle has a number of phases:

1. Identification of clinical issue of concern: such as the diagnosis and management of patients with malaria.
2. Setting of audit standards against which to compare current practice: Use published guidelines such as the WHO or national guidelines. Agree a target to which standards of practice must conform, such as 80% of all patients with malaria must have vital signs estimated. A performance below this standard is deemed to have failed this particular Audit standard.
3. Determining the percentage of met and unmet audit standards to indicate the performance of the team or department being audited.
4. Displaying the data in tabular form and/or graphs for ease of reading comparing the audit data with the standards used in the Audit.
5. Drawing conclusions from the data collected, commenting on the data.
6. Learning from the results and make appropriate recommendation to change practice, make recommendations to implement the changes using tutorials or protocols depending on local practice. This should be reinforced with planned staff training.
7. Identifying a person to see through the recommended changes.
8. Re-auditing after an agreed period, such as six months, to determine any improvements in practice.

**Nodding Syndrome—South Sudan.** The first reference in this article from the Journal of the American Medical Association (May 16, 2012—Vol 307, No. 19 p2021; MMWR. 2012;61:52-54 ) is from the South Sudan Medical Journal! Please let us know if you find other items on Nodding Disease so we can publish an occasional summary update on this difficult and intriguing disease.

# Health psychology and health care interventions in sub-Saharan African countries

John Adwok<sup>a</sup> MBBS, MMED (Surg.), FRCS (Edin.), PhD and Patricia Wolskee<sup>b</sup> PsyD

## Introduction

Health psychology is a specialty within the discipline of psychology concerned with individual behaviours and lifestyles affecting physical health. The discipline strives to “enhance health, prevent and treat disease, identify risk factors, improve the health care system, and improve public opinion regarding health issues” (1. p. 16).

Health psychology evolved by incorporating the goals of behavioural health which promotes improving health and preventing diseases in healthy people—away from the traditional diagnosis and treatment of disease. Such an approach is well suited to resource poor countries in sub-Saharan Africa where preventable degenerative as well as infective diseases are on the rise. The **biomedical model** considers disease to be a result of a disease-causing organism and defines health as ‘absence of disease’. The **biopsychosocial model** is the holistic approach to medicine that considers social, psychological, physiological, biological and even spiritual aspects of a person’s health. It views health as a positive condition. Health psychology could play a significant role in alleviating existing and emergent health care issues in sub-Saharan African countries.

The migration of large numbers of rural Africans to the urban areas in recent decades in search of a ‘better’ life has been associated with life style and dietary changes. This has resulted in new or rarely experienced health care issues in their rural communities and tribal groups (2, 3). The need to consider political, economic, cultural, and social dimensions of health beyond the traditional individual model has been a driving force behind the transformation of health psychology (4). Including community development and social change as health promotion strategies in health psychology provides

the right tools to tackle life style related diseases of the urbanized African.

Previous anecdotal evidence indicated that the urbanized African was resistant to ‘western’ diseases. However, recent studies show that ‘western’ diseases are becoming rampant in African towns and cities - affecting mainly the middle class (2, 3). This development could lead to insurmountable health care issues if left uncontrolled. We argue that health psychology interventions could help to ameliorate the impact of these emerging health care issues. Most African immigrants to the cities are unaware of the risks of newly acquired ‘western’ habits like smoking cigarettes, excessive alcohol consumption, and high fat intake until it is too late. The wide range of health psychology interventions and the ability of health psychologists to work effectively in interdisciplinary settings makes them well suited to tackle emerging diseases in developing countries.

## Background

Previous claims that the African is resistant to ‘western’ degenerative diseases even when they migrate to urban areas are not supported by current research findings. According to Segal et al. (5), “Rapid urbanization is occurring in many regions of Africa leading to marked changes in lifestyle and diet, and a decrease in physical activity but increases in smoking and alcohol consumption, all features of populations in transition”(5. p731). The authors argue that despite some environmental factors that favour an increase in the incidence of ‘western’ degenerative diseases, the incidence remains low. Claims that the incidence of diseases like acute appendicitis in Africans is low because critical events in early infancy lay the foundation for a healthy gastrointestinal tract that withstands insults that may occur in later life have been disputed. By extension, the assumption that the so-called western diseases like hypertension and diabetes do not afflict the African to the same degree as the westerner is no longer tenable.

Cardiovascular disease risk factors are as high in urbanized Africans as in their western counterparts. Tibazarwa et al (2) examined the cardiovascular risk factor

Health  
psychology evolved by  
incorporating  
the goals of behavioural  
health which promotes  
improving health

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profile of volunteers in the predominantly black Soweto Township of South Africa in 2006-2007. "Screening comprised a combination of self-reported histories and clinical assessments that included calculation of body mass index, blood pressure and random blood glucose and total cholesterol levels" (2 p3). The data strongly suggested a high prevalence of related risk factors for heart disease in this population—considered to be in epidemiologic transition.

Adwok (3) studied a probability random sample of an urban civil service population in South Sudan and got similar findings. Other areas that could be studied with the help of health psychology interventions in the African setting include the patient doctor-relationship and adherence to medical recommendations.

Many patients, especially in developing countries, still depend on their doctors to make health care decisions on their behalf. However, an increasing number no longer receive health care passively but demand to participate in decisions concerning their treatment. In spite of the proven advantages of this trend, a careful balance between respecting patients' autonomy, and proactively guiding them to make the right decisions is necessary (6).

More and more information about health care is now available on the internet and through the media but this information is often flawed and misleading. So the doctor still needs to play an important role in guiding the patient towards the best health care choices. The health psychologist could fill the widening gap between the doctor and the patient and also improve adherence to medical recommendations.

Adherence to medical recommendations is not simply the ability and willingness of a person to follow recommended health practices. Hynes (as cited in 1 p78) defines adherence as: "The extent to which a person's behaviour—in terms of taking medications, following diets, or executing lifestyle changes—coincides with medical or health advice". The later definition broadens the concept of compliance beyond the simple act of taking medicines regularly to include maintaining healthy lifestyles - like healthy diets, exercise, avoidance of stress, and abstaining from smoking among other health promotion measures. Therefore, adherence is a much broader concept when used in this context, encompassing more health seeking activities than simple compliance. Health psychologists have the skills and training to disseminate this concept in

communities and achieve better health outcomes.

Many factors determine adherence to medical advice and include the all-important relationship between the doctor and the patient. Moore et al. (7 p422) state that "in addition to its impact on patient comfort and satisfaction, doctor-patient rapport can also affect patient health behaviours, most notably treatment adherence". Patients follow the instructions of doctors they trust. The ability of the doctor to listen attentively, make eye contact, and allow the patient to tell their stories with little interruption promotes trust. Yet, few doctors could spare the time to listen to a rambling octogenarian or even to give clear instructions. The balance sheet of the health care organization might depend on how many patients its doctors can see in a given time period. Social and economic factors also play a big role in adherence to medical advice.

Although little research into treatment adherence has been done in African countries, social and economic factors are considered to affect adherence outcomes. Non-adherence to professional advice has been associated with medical and psychosocial complications of disease, compromised quality of life, and mismanagement of meager health care resources in African countries (8). Health centres in Africa - especially rural areas - are far apart, poorly equipped, and under-staffed. The sheer effort of walking miles to queue for hours, interact with hostile and overworked staff, and

the unlikelihood of actually filling a prescription due to chronic drug shortages, discourage many Africans from using the available health care services. The extensive use of traditional and alternative medicine in Africa, even in urban areas, is probably partly due to the lack of quality health care services and poor doctor and patient relationship.

Health psychology interventions could close the widening communication gap between the doctor and the patient and achieve better health care outcomes. Behavioural and lifestyle changes can be achieved when health care professionals interact effectively with their patients. The role of behaviour and lifestyle in the causation of cancer and hypertension has been studied extensively and can be used to illustrate how health psychology interventions could be applied to control these diseases.

## Health psychology interventions could close the widening communication gap between the doctor and the patient

## MAIN ARTICLES

### Behaviour and chronic illness

#### Cancer and behaviour

A number of risk factors for cancer have been identified and yet their interactions are still not yet clearly understood. Cancer is currently known to cause about 7 million deaths per year worldwide - more than malaria, tuberculosis, and HIV/AIDs combined (9). The cancer toll in Africa each year is estimated at 600,000 deaths and this is expected to increase significantly in the next 10 years. According to Brannon and Feist (1) most risk factors for cancer are a result of personal behaviour, notably diet and smoking. Others like environmental and hereditary factors exist and are beyond personal control. Populations in developing countries are more likely than their western counterparts to develop cancers in which infectious agents appear causal. The development of such cancers can be controlled through community interventions.

In Africa, up to a third of cancer deaths are considered potentially preventable. Vorobiof and Abratt (9) state that in the year 2002 there were more than half a million cancer deaths in sub-Saharan Africa, 40% of which can be explained by chronic infections and tobacco usage. Schottenfeld and Beebe-Dimmer (10 p38) estimate that "the proportion of cancer deaths attributable to infectious agents is about 20% - 25% in developing countries and 7% - 10% in more industrialized countries". For example, chronic infections with the sexually transmitted human papillomavirus increase the risk of uterine cervical cancer and chronic infection with the hepatitis virus increases the risk of hepatocellular cancer. Unfortunately, although highly effective vaccines against these infections have been discovered, they are generally unavailable to people in countries where they are needed most. Although preventive health programmes exist in developing countries, they remain inadequate and poorly funded. Awareness about cancer related infections could be created using health psychology interventions. The incidence and prevalence of Kaposi's sarcoma and non-Hodgkin's lymphoma could be reduced by sexual behaviours that discourage the dissemination of HIV/AIDs - the main risk factor.

Cancer is often not considered a priority in developing countries because of the wide range of other serious health problems(11). Nevertheless, if cancer prevention programmes like vaccination, safe sexual practices and antismoking measures are not implemented, many African countries will be overwhelmed by patients with cancer in

the foreseeable future.

Furthermore, both the developing and the industrialized worlds have their unique environmental and hereditary risk factors for cancer. Family history, ethnic background, and advancing age are considered cancer risks beyond the control of the individual behaviour. For example, a woman with a first degree relative who has breast cancer has a two-fold to three-fold chance of developing the condition (1). This explains why about two thirds of all women with breast cancer have a family history. Dark skinned people rarely develop malignant melanoma due to overexposure to ultraviolet sun rays because of the protective nature of sufficient melanin in the skin. Finally, advancing age increases the chances of developing cancer irrespective of behaviour patterns. Screening for common cancers like prostatic, colonic, gastric, and breast tumors in the elderly probably offer the only opportunities for cure in these cases.

#### Hypertension and Life-style

Hypertension - considered to occur when the systolic blood pressure (BP) reaches or exceeds 140 mm Hg and the diastolic 90mm Hg - is the principal preventable risk factor for stroke. According to Mensah (12), an estimated 16 million first-time strokes and 5.8 million stroke deaths occurred in 2005 alone, accounting for 10% of deaths worldwide. Available compelling clinical trial and epidemiological evidence suggest that within 3-5 years of lowering BP by 10mm Hg, most of the increased risks of stroke are reversed (Lawes as cited in 12). In African countries, more than 90% of patients with hemorrhagic stroke and more than half with ischemic stroke had high BP and yet awareness of hypertension and its prevention, treatment, and control remains very low (12.). Studies in mainly urban regions of East Africa have shown rates of stroke mortality higher than those of England and Wales (Walker et al. as cited in 13). Enough epidemiological data now exist to inform public health action in Africa with a view of educating its people on life style changes and overcoming the unique challenges of this disease.

A number of behaviours are implicated in the development and management of hypertension. For example, there is good evidence that reducing salt intake reduces high blood pressure and that black people are more sensitive to this than white people (13). As most black Africans have negligible intakes of highly salted processed food, salt reduction strategies should be easy

Cancer is often not considered a priority in developing countries because of the wide range of other serious health problems

to implement with a good chance of success. However, the recent rapid urbanization and dietary changes of many Africans have resulted in obesity and stress related excessive alcohol consumption. A public health action to reduce blood pressure would be to return to the high fibre traditional African diet and encourage regular exercise and moderation in alcohol consumption. Yet, strategies that rely on education and threats of disastrous consequences for non-adherence are not often effective in changing people's behaviours. Behavioural strategies in health psychology focus more directly on changing the person's behaviours as they relate to compliance.

Cognitive-behavioural interventions in hypertension attempt to enhance patients' social support and improve their self-efficacy for adherence to healthy behaviour. For example, training patients to monitor their health-related behaviours and evaluate those behaviours against a predetermined criterion such as a lowered BP reading of 5mm Hg or loss of 2kg after a month of exercise. The use of positive self-enforcement for any progress towards meeting the criterion has also been found to be effective when using cognitive-behavioural interventions (1). Although educational methods may increase the patient's knowledge, behavioural approaches aimed at increasing patient involvement and encouraging an active ongoing relationship with the practitioner offer better chances of compliance with the BP reducing life-style change.

### Summary

In spite of rampant poverty and a heavy burden of infectious diseases, African populations continue to explode with many migrating to towns and cities. The resultant changes in behaviour and lifestyles are leading to a rapid increase in non-communicable diseases like diabetes and cardiovascular diseases in African urban areas.

Modern health care remains elusive for the average African as health care authorities grapple with inefficiency and budgetary constraints. African health care systems are already struggling to control infectious disease epidemics like HIV/AIDS, malaria, and tuberculosis. The adoption of the new health psychology strategies and interventions in promoting health will help reduce the burden of both communicable and non-communicable diseases. This approach would supplement the existing but inadequate public health and curative interventions in resource poor countries in Sub-Saharan Africa.

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# Assessing information and communication technology in surgical training, Sudan as example

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## Introduction

The Internet has enabled increasing numbers of healthcare professionals to access flexible, convenient and interactive forms of continuing medical education. The advantages of these computer-based technology tools are clear but they are expensive, may not be available and there is a lack of Information Technology (IT) skills. The objectives of this study were to:

- assess the knowledge and use of different educational modalities in surgical training among surgeons and trainees
- compare the classical methods of training against modern technology-assisted ones
- evaluate computer-IT literacy and competency
- identify obstacles to IT use in surgical education.

The rapid development of IT has dramatically influenced medical training and practice. These advances have had an enormous impact on the ways in which diseases are diagnosed and managed. Computer assisted training (CAT) has been introduced to medical education. It offers various interactive teaching programmes that facilitate the learning process(1,2).

Surgical training is built upon a strong foundation of didactic learning, reading, observation and performance under guidance and repetition. Surgical skills are not only required tasks for specialist surgeons but also for a wide range of health care practitioners. For example, students who need to learn the basic skills of taking blood samples, setting up I.V lines and closing wounds. General practitioners carry out many surgical procedures such as removing skin lesions and lipomas, circumcisions and herniorrhaphies. Nurses provide a range of hospital and community based surgical services (3).

Surgical skills cannot be achieved simply by observation. Practice, where the learner understands the aim of the skill, is needed (4). The challenge in training surgical skills

is to provide conditions for effective learning without putting patients at risk. Furthermore, ethical and medico-legal considerations mean that gaining surgical experience on real patients is unacceptable during the early stages of training. Other drawbacks are duty hour restriction, operating room time and cost.

Hence a radical transformation from the apprenticeship model to another training technique is needed (2,5,6). Consequently laboratories dedicated to teaching surgical skills have emerged. These laboratories were introduced with simple suturing models in the 1960's (7). Recently, advanced models that allow operative practice and simulate intra-operative complications have been introduced (8). In addition, a variety of other educational practices have evolved, such as case-conferences, grand rounds, bedside teaching and problem based learning (2, 9). Despite progress in surgical training, a number of economic and time factors have hindered the traditional training process by decreasing the amount of time and funding available for formal surgical teaching in hospitals (5). Recognizing these problems, the adoption of simulation and computer based training was suggested as a next step in surgical education.

Simulation refers to the act of mimicking a real object, event or process by assuming its appearance or outward qualities. Simulators are designed to reproduce some aspect of the working environment. This varies from replicating an aspect of a task (e.g. venous cannulation) through increasing levels of complexity to the recreation of an entire working environment such as the operating theatre. Also, simulators provide a safe and non-clinical environment designed to meet the educational needs of a learner. They encourage acquisition of skills through experience, as practicing can be repeated as often as necessary and learners have permission to fail so they can learn from their mistakes. Simulators can take many forms such as part task trainers (which are simulators used for only one purpose such as breast examination or cannulation), computer based systems, simulated patients and environments and integrated simulators.

Computer-based training (CBI) is different from textbooks or other delivery vehicles that incorporate

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multimedia content because it allows interaction with the user. The idea of Computer Assisted Instruction (CAI) became popular in the mid 1960's. It was found more effective in educational programmes compared to traditional techniques and later developed into an 'intelligent tutoring system' in the 1980's. Further advances in the 1990's created a powerful tool that allowed the design and use of complex multimedia programmes in medical and surgical education.

The first category consists of multimedia products that merely duplicate text-book information. These non-interactive systems add little value to the educational process. Other categories of more dynamic software include virtual patients, virtual reality, computer based simulation, self-study and online discussion groups. A virtual patient is defined as an interactive computer simulation of real-life clinical scenarios for the purpose of health care and medical training, education and assessment.

Virtual reality allows students to interact with three dimensional computerized data bases in real time using their natural senses and skills. These virtual reality simulators have been applied widely to minimal access surgical techniques using laparoscopy and microsurgery simulators. Web-Based Learning (WBL) covers all educational interventions that use the Internet or local Intranet. It is also called 'online learning', 'distributed learning' or 'Internet -based learning'. WBL uses an approach that is flexible, engaging and learner-centered. It also encourages collaboration and communication (staff-staff, staff-student and student-student). The three broad configurations in WBL are:

- tutorials
- online discussion groups and
- virtual patients.

Although clinical experience is the cornerstone of surgical education, the Internet and computer assisted technologies have provided an important tool for surgical education. All these educational modalities, ranging from simple simulators to complex computer assisted ones (such as virtual reality) are commonly used in developed countries. The Sudan, being a developing country with limited resources, does not have such technology available for medical training. Therefore the traditional methods of teaching are still used.

Surgical education depends mainly on lectures and seminars, while the training of surgical skills vary from one medical school to another, depending on the available teaching aids. Some schools have facilities known as 'skills laboratories' where simple simulators are available

such as manikins for I.V punctures and blood pressure measurement. But more complex tasks may not be at hand. Furthermore students, surgical trainees and staff may rely on the Internet. Surgical training in hospitals still depends mainly on observing seniors and later imitation of the skill by the junior practitioner. Therefore ethical and medico-legal considerations maybe jeopardized.

In this study we are trying to address these issues among a selected study group in Sudan.

## Methods

This was a prospective cross- sectional study at Soba University Hospital, one of Sudan's main training hospitals for surgeons and surgical trainees.

Ninety five doctors working in the Department of Surgery were selected by purposive sampling (where only doctors within different surgical teams were involved) using a self administered standard questionnaire which was developed through a literature search (e.g. Health Technology Assessment 2011; Vol. 15: No. 1) and focused discussion with the study group. The questionnaire was piloted in a sample of five participants.

## Results

Most of the doctors enrolled in this study were aged below 40 years and more than 50% were aged under 30 years. They are considered the 'cyber generation' which is expected to be familiar with the use of computers and Internet.

The study group mainly used computer aided education for preparing lectures and seminars (55.8%) and for searching for surgical literature reviews (43.2%). However knowledge about popular surgical websites was limited, with only 18.9% knowing a popular surgical website such as websurg.com. Online discussions, videos explaining operations, Personal Digital Assistants (PDAs) as well as using IT for assessment of students were all uncommon. Online discussions were used by only 13.7%.

Most of the study group used the Internet (89.5%) but only 67% regularly used computers for surgical education. Only 17.9% said they used it frequently (i.e. more than 3 times a week) and 42% said they used it for less than five hours each week. Reasons for not using the computer regularly were:

- difficult access.
- lack of time due to tight schedules.
- limited knowledge of websites.

Higher medical ranks benefited from and used different educational technology modalities more than others (as they were using it to review their practices, update their knowledge, and participate with other community

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practices around the globe as well as networking).

### Discussion and Conclusion

Educational technologies have the advantage of providing a safe, controlled environment that eliminates risk to patients and provides documentation of the learner's performance and allows repetition and practice.

This study showed that the majority of surgeons claimed competence in using computers. However many had gained their computer skills through self learning (46.3%). Only 21% had combined self learning with formal courses. This may have contributed to the users' restricted knowledge of computers and the Internet.

When the group was asked about teaching methods:

- 69% thought conventional methods, such as chalk and blackboard, were of moderate benefit and 10% thought they gave the maximum benefit.
- 48% thought computer aided lectures and seminars were of moderate benefit and 42% thought they gave maximum benefit.

Most of the group (82%) thought simulation was beneficial. About 60% had practiced on simulating programmes during their training and these were mostly consultants and registrars. Simulation is not widely available in the Sudan.

Therefore we concluded that lectures and seminars are better appreciated when aided with computer facilities such as video clip diagrams and pictures which draw attention and are visually attractive.

The majority of the doctors (98.9%) enrolled in the study suggested that IT should be introduced to the medical curriculum. This will require more investment in technology and computer assisted programmes. Obstacles cited against using technology were mainly limited time (52%) and difficult access due to limited availability of computers (34%) for the doctors.

To ensure maximum benefit we should consider reducing and systemizing the working hours for doctors

enrolled in rotation programmes so they have the time to update their knowledge. Moreover the provision of free courses in computer skills and other aspects of IT as well as easy access to the equipment would be greatly beneficial.

Last but not least, we recommend constructing a website for continuous professional development of surgeons in Sudan.

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## PAPER FOR DISCUSSION

# Can primary health care staff be trained in basic life-saving surgery?

Sunday Manoach Leet<sup>a</sup>, Abraham Kot Gai<sup>b</sup>, Andrew Adek<sup>c</sup> and Giuseppe Meo<sup>d</sup>

The following article by Leet *et al* advocates training rural PHC staff in basic emergency surgery in those areas of South Sudan where there is no access to secondary or tertiary level facilities (i.e. surgical task-shifting). Based on their experience, the authors describe and recommend the type of on-the-job training that they feel is most suitable for this level of staff.

Task-shifting at this time in South Sudan is a controversial topic and is not presently government policy. Please send us your views and tell us if you agree with the authors of this article. For example: Can rural middle level non-medical health staff be trained to safely carry out basic emergency surgical procedures? If so, what type of training is best? Should there be a recognized curriculum and accreditation? What further information would you like the authors to provide? Is your organisation training non-medical health staff in surgery (or other medical procedures)? If so, what are the results? Write to the editor at: [opikiza@yahoo.com](mailto:opikiza@yahoo.com)

## Introduction

Two billion people in low- and middle-income countries have no access to basic surgical care. Surgical conditions account for a significant proportion of the global health burden. Surgery is still not considered a public health priority even though surgical services may be as cost-effective as other well-accepted preventive procedures (1).

In South Sudan many patients arrive at Primary Health Care (PHC) Units or Centres requiring surgical treatment for obstetric, abdominal or other emergencies. Often safe surgical care cannot be provided locally because of untrained staff, poor equipment and limited supplies of drugs, and other essential items. In many places there are no secondary or a tertiary-level hospitals to which to refer the patient. "Secondary health care services are few and inaccessible to the majority of the population; they have inadequate facilities and suffer from severe shortage of qualified health care professionals" (2, 3).

It is well known in rural sub-Saharan Africa that, where there are no doctors, a wide range of surgical procedures (e.g. Caesarean section or repair of strangulated hernia) are performed by non-medical personnel often with inadequate training and little supervision (4).

Several international organizations such as the International Committee of the Red Cross, Médecins Sans Frontières and Christian Blind Mission have delegated

surgical skills to middle level health workers (5) as has been done for the management of HIV/AIDS. The Textbook of Primary Surgery (6) and the WHO Emergency and Essential Surgical Care (EESC) programme (7) are examples of efforts to promote life-saving surgical care in rural areas of low-income countries.

We believe that a few life-saving procedures can be safely performed by non-medical health staff. In this paper we draw on our experience in South Sudan (particularly at Adior Rural Hospital, Lakes State) to advocate the type of training best suited for training local rural para-medics in simple surgery.

The aim of this article, which is targeted at Ministries of Health, policy-makers and all levels of health professionals, is to:

- advocate policies aimed to broaden the range of those who can provide basic surgery and anesthesia in order to compensate for the severe shortage of qualified doctors which South Sudan is going to face for several years and
- promote a gentle, sympathetic and understanding method of training local non-medical health staff.

## Our experiences in South Sudan

In two reports 'Rural surgery in Southern Sudan' (8) and 'Primary surgery in rural areas of Southern Sudan' (9), we have analysed our 11-year experience of providing surgical care and training through mobile surgical missions in remote areas of South Sudan. During each mission, we provided PHC facilities with basic equipment and trained local non-medical health staff on-the-job. See Figure 1.

Teams of volunteer expatriate consultants (one surgeon, one anesthetist and one scrub nurse) carried

a Adior Rural Hospital Administrator, Min of Health of Lakes State  
 b Head Nurse Adior Rural Hospital, Min of Health of Lakes State  
 c CCM Adior Project Manager, Lakes State  
 d Member of CCM Executive Board, Turin, Italy and Consultant Surgeon in South Sudan

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Figure 1. Training on-the-job in surgery. (credit Comitato Collaborazione Medica)

out 51 surgical missions and operated on a total of 3,185 patients. In some of these the anesthesia and surgery were performed by local non-medical staff who had been trained partly during previous missions and partly by the War Wounded Referral Hospital (managed by the International Committee of the Red Cross in Lopidin, Kenya). See Figures 2 and 3.

The total mortality rate over the 51 missions was 0.72% (23/3185 patients). The majority of operations (77%) were elective procedures which probably explains the low mortality. Analysis of the cases through exact logistic regression did not indicate any significant statistical difference in mortality rates observed in patients operated on by the expatriate specialists and patients operated on by local personnel trained on-the-job (8, 9).

These results have been confirmed by our recent experience of training non-medical health staff in primary surgery at Adior Rural Hospital, Lakes State, under a project co-funded by Regione Toscana, Italy.

### Discussion

Our experience in South Sudan leads us to believe that even under-staffed and under-equipped first-referral facilities can provide minimum acceptable standards of surgical care provided selected non-medical health care staff is adequately trained. We have found that these workers can quickly learn the fundamental principles of surgery and anesthesia, and how to perform basic surgical techniques. **The essential precondition for the success is proper training on-the-job.**

**Servant leadership** means the teacher listens to each learner, and aims to 'get in touch with' and understand what the learner is communicating. The teacher makes a great effort to empathize with the learner, and to use a persuasive rather than authoritative manner – aiming for the group of learners to reach an agreed decision. This is especially important in remote facilities operating with poorly trained staff living under the adverse conditions that are still found in South Sudan.

### Traditional vs. on-the-job training

The 'on-the-job' training carried out in our missions proved to be both appropriate and effective. We believe that this was due the training being based on the theory of "Constructionism" (10) and to the connected principles of the 'servant leadership'.

Traditional teaching is based on the abstract principle of an 'outside authority'. Constructionist learning is based on the authority of the teacher and is inspired by a kind of leadership called 'servant leadership'.

### Why our training in South Sudan was successful

Three factors found in the culture of rural South Sudan contributed to the success of this training.

1. Our training centres on the learner and the community of learners. The role of the consultant surgeon is as a tutor and a facilitator (i.e. 'servant leadership'). What is also vital is to see the existing difficult situation in South Sudan within a vision of a better future. Among all our trainees there is the desire to build a new country, and this triggers a deep commitment to personal and professional growth within the organization and in the community.



Figure 2. "Any task which has to be repeated many times, even though it is comparatively intricate, should if possible be taught to an auxiliary" M. King in *Medical Care in Developing Countries*, Oxford Medical Publications. (credit Comitato Collaborazione Medica)

2. Learning is easier when the outcome is a 'tangible product' that can be examined and admired (10). The 'concreteness' of surgery helps to explain why local health workers, who are unaccustomed to theoretical learning because of their poor formal education, are able to quickly learn surgical skills.
3. The intense desire to have a social role in the community also helps to explain why our training, which increased social standing, was successful.

### Conclusion

On the basis of our experience, we believe that rural



Figure 3. Spinal anaesthesia is the commonest technique in rural surgery. (credit Comitato Collaborazione Medica)

primary health care units can be cost-effectively staffed, equipped and organized, and can acquire the capacity to provide satisfactory, basic, emergency surgical care. An essential prerequisite is on-the-job training of local non-medical health staff. We consider that the principles of 'servant leadership' are particularly appropriate to this historic moment of South Sudan.

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## CASE STUDY – LEFT ICA ANEURYSM

### Clinical History

Right hemiplegia and right facial weakness; smoked more than 20 cigarettes a day for several years.

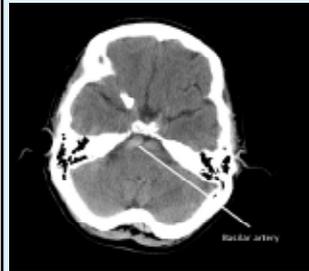


Figure 1.



Figure 2.

**Picture 1:** Non enhanced CT of the brain. This image features a fusiform dilatation of the basilar artery (BA).

**Picture 2:** Non enhanced CT of the brain. This picture shows a round slightly hyperdense extra-axial intracranial mass lesion abutting left internal carotid artery (ICA) and posterior vertebral artery (PCA) measuring about 9mm in maximum diameter. Additionally, there is a chronic left sided striatum infarct demonstrated.

### Radiological Report

A non enhanced CT of the brain has been acquired at patient admission (Pictures 1 and 2). There is no evidence of an intracranial haemorrhage or haematoma. There is also no evidence of midline shift or of signs of raised intracranial pressure. No recent ischaemic changes are identified. However, a hypodense secondary porencephalic defect area is noted involving the left sided striatum being in keeping with a chronic striatum infarct.

Additionally, there is evidence of two vascular changes. Firstly, the basilar artery appears to be dilated being suggestive of a fusiform aneurysm. And more importantly, there is evidence of a round, slightly hyperdense intracranial extra-axial mass lesion abutting left internal carotid artery and left posterior cerebral artery measuring about 9mm in maximum diameter in keeping with an internal carotid artery aneurysm (A1 segment).

A subsequent conventional angiogram confirms both vascular findings, and the left internal carotid artery aneurysm has been clipped successfully.

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## REPORT

# Evaluation of community-based surveillance for Guinea worm, South Sudan, 2006

M. Lado<sup>a</sup>, S. Mackoy<sup>b</sup>, B. Steve<sup>c</sup> and J. Rumunu<sup>b</sup>

## Abstract

**Background:** Guinea worm disease (dracunculiasis) is an ancient parasitic disease and is set to be the next disease eradicated from the world and the first to be overcome without a vaccine or treatment. South Sudan and Ghana account for more than 95% of global dracunculiasis. **Methods and Materials:** We used the Students field guide for surveillance evaluation to assess surveillance objectives, usefulness of the system, operation procedures, costs, and attributes of the South Sudan community-based surveillance system. **Results:** The guinea worm surveillance system has met its objectives; it is active, simple, flexible, sensitive, stable, and moderately acceptable. The data source is slightly biased; the system costs \$2,006,610 U.S. dollars a year to operate. **Conclusion:** Community-based surveillance for guinea worm is a good example of a surveillance system on which an integrated disease surveillance system can be based in countries with poor surveillance capacity. This makes its potential value to public health practice very high.

**Key words:** *Guinea worm, endemic-villages, community-based-surveillance, village volunteers, Integrated Disease surveillance, South Sudan*

*This report was cited in Southern Sudan Integrated Disease Surveillance and Response Assessment Report, 2007. A paper on the current situation, which takes into account the recommendations listed here, is being prepared by Samuel Makoy.*

## Background

Guinea worm disease (dracunculiasis) is targeted as the next disease to be eradicated from the world and the first to be overcome without a vaccine or other medical treatment [1]. It is currently endemic in nine countries, with South Sudan and Ghana accounting for more than 95% of global cases [2].

Guinea worm disease is contracted when stagnant water, contaminated with microscopic water fleas carrying infective larvae, is consumed. Inside a human's abdomen, guinea worm larvae mature and grow, some as long as 3 feet. After a year, the guinea worm slowly emerges through an agonizingly painful blister in the skin. Guinea worms can take up to two months to be completely removed, and even then, secondary infections may occur. Victims often immerse their limbs in water, seeking relief from the burning sensation caused by emerging guinea worms and thus re-contaminate drinking water [3].

The guinea worm disease cycle can be stopped by:

- preventing persons with an emerging guinea worm from entering sources of drinking water
- constructing boreholes or deep wells
- treating water with the chemical Abate larvicide
- filtering or boiling all drinking water. Filtering water

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b Ministry of Health, Government of South Sudan.

c Carter Center

is highly effective, especially when coupled with other strategies, such as health education (Figure 1).

## The guinea worm surveillance system in South Sudan

Guinea worm infection in South Sudan occurs throughout the year in endemic areas with contaminated water sources but infection is at a peak in April through October; all sexes and ages are at risk but the 14-45 year age group is most affected because of their greater mobility [4].



*Figure 1. Showing Filters for drinking water (Source: Southern Sudan Guinea Worm Mid-year 2006 report).*

The community-based surveillance programme in 2006 covers all the States in South Sudan with the exceptions of areas in Upper Nile, Jongeli and Eastern Equatoria. These are not covered due to:

- the vastness of areas and poor road communications,
- the shifting populations among the pastoralist communities
- the influxes of returnees into endemic communities or from the latter to non-endemic communities and
- insecurity [4].

The objectives of the guinea worm surveillance system are to:

- Estimate the magnitude of guinea worm disease in the population at risk, and
- Detect, monitor and contain the cases.

The aim of this evaluation of the community-based surveillance programme for guinea worm was to determine how the programme operates and what value it can provide to the Ministry of Health to help establish an integrated disease surveillance and response (IDSR) system.

### Methods and Materials

From June to August 2006, we reviewed records (of health education, filter distribution, cases, etc.) from 2005, and interviewed village volunteers, area supervisors, field officers, the State Coordinators, and the National Coordinator using the Surveillance Evaluation Student Guide [5] in selected endemic guinea worm areas. We assessed surveillance objectives, operation procedures, costs, and the usefulness and other attributes of the system. Excel 8.0 2005 data was collected from the Data Manager based in Loki, Kenya and analyzed using Epi Info 3.3.2.

Figure 2 shows the number of cases in each State, whereas Table 1 shows the most endemic counties in the ten States of South Sudan. We chose Eastern Equatoria State to represent a high endemic area and Central Equatoria State to represent a low endemic area [5]. Within Eastern Equatoria State, Kapoeta North county and Riwoto payam (high endemic) and in Central Equatoria State, Terekeka County and Tali payam (low endemic) were chosen. A case was defined as any individual exhibiting a skin lesion with emergence of a guinea worm [6].

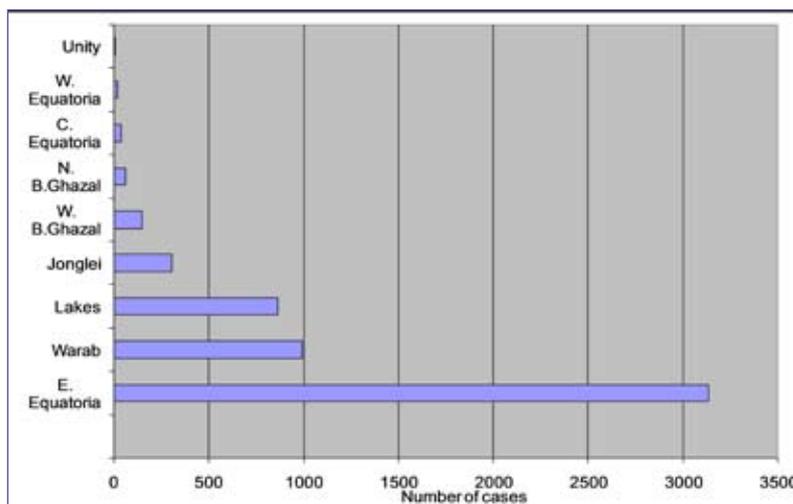


Figure 2. Endemic States in South Sudan in 2005

### Results

The objectives of the guinea worm surveillance are to:

- Estimate the magnitude of guinea worm disease in the population at risk, and
- Detect, monitor and contain the cases.

The system is headed by the Resident Technical Advisor, human resource and data managers, six technical advisors, the National Coordinator, eight State coordinators, 54 field supervisors, 290 area supervisors and 8,849 village volunteers in the 1,085 endemic villages out of 9,832 villages in the 9 States under active surveillance in South Sudan.

The system has to be simple because most of the village volunteers are illiterate and it is easier for them to use pictures (showing emergence of the guinea worm) to identify cases. These are confirmed by the area supervisor with the entry, editing and analysis done by the data manager. As this means that the case definition has been met, there is no need for special or laboratory confirmation.

The system is flexible, and has also been used for polio campaigns, and Onchocerciasis Volvulus and Trachoma programmes. It was recently used in Eastern Equatoria to control an acute watery diarrhea outbreak. It is also stable as it is funded by the Carter Center, WHO, CDC and UNICEF. The training given to the village volunteers and area supervisors is short (1-3 days).

We obtained data from 5,565 cases from 9,832 villages under active surveillance. We estimated surveillance sensitivity to be 100%, since the case definition is very specific, "any individual exhibiting guinea worm" and the same cases reported by the volunteers are the cases reported at national level. In addition:

- Volunteers are meant to record the population and other data of each village in the register. This had been done

Table 1. High endemic counties in South Sudan in 2005

	County	No of cases	% of total cases
1	Kapoeta North	2,605	46.8
2	Awerial	699	12.6
3	Gogrial West	481	8.6
4	Kapoeta East	398	7.2
5	Tonj North	235	4.2
6	Tonj East	197	3.5
7	Fangak	165	3
8	Wau	150	2.7
9	Kapoeta South	128	2.3
10	Pibor	121	2.2



## Resources

### The first 1,000 days

In the last few years, the issue of child malnutrition has garnered increased attention and has led to a growing body of evidence that investing in better nutrition during the 1,000 day window can save lives, improve health and drive long-term economic growth. New online tools on [www.thousanddays.org](http://www.thousanddays.org) include the Resources library and the interactive 1,000 Days map - "Mapping the Window of Opportunity." The map focuses on 16 key nutrition interventions, including those identified by The Lancet and the World Bank.

### A new injectable contraceptive

The Uniject device will provide women in the hardest-to-reach areas access to a popular and effective family planning method. The product prevents pregnancy for three months with a single sub-cutaneous injection using the pre-filled, auto-disable Uniject device. For more information see <http://www.path.org/projects/uniject-dmpa.php>. The device was announced at the July 2012 London Summit on Family Planning see <http://www.londonfamilyplanningsummit.co.uk>

### Child Health e-learning resources

These materials from the Paediatric Department, College of Medicine, Malawi can be freely downloaded from <http://www.medcol.mw/paediatrics/index.php?page=pages&pid=132>. Lectures are in powerpoint (PPT) or articulated (A) with voice over.

The topics covered are:

- Basic. For example [History taking in paediatrics](#) (PPT), [Communication skills](#) (PPT)
- Systems and conditions. For example [Common Cardiac disorders](#) (PPT), [Anaemia in children](#) (PPT),

[Causes of anaemia/Sickle Cell Disease and bleeding disorders in children](#) (A)

- Infectious diseases and immunology. For example [Malaria in children](#) (PPT), [Meningitis in children](#) (PPT), [Childhood TB](#) (PPT)
- Neonatology. For example [Neonatology](#) (PPT), [New Born Examination](#) (A)
- Nephrology. For example [Renal diseases in children](#) (PPT)
- Neurology. For example [Child hood seizures](#) (PPT)
- Nutrition. [Vitamin A deficiency in children](#) (A)
- Oncology. [Paediatric Oncology](#) (PPT)

[A Paediatric Handbook For Malawi](#) and other handbooks are also available on this site.

[Thanks to Dr Bernadette O'Hara for sending this item]

### Primary Mothercare and Population: Book review by Nancy MacKeith

"I really enjoyed this book as I felt Maurice King and I were sitting together as he took me through ideas, stories, information, pictures and even jokes! I am not convinced it works as a basic 'how-to' book - for example, the illustrations are small compared to the text and as I am a midwife I noticed that the section on breech delivery was about what obstetricians do rather than the newer information on how to manage it avoiding hands on the baby as much as possible. There are cultural issues, some minor like obscure stories and pictures but others may be more serious if the statements are considered inappropriate. I recommend this book to those who want to consider the bigger picture both practically and in terms of health planning."

Ref: Primary Mothercare and Population. 2012. King M, Mola G et al. 2012 For details on how to buy email [Sales@spiegl.co.uk](mailto:Sales@spiegl.co.uk) (by surface post ~£11 in UK; ~£12 outside UK).

### State of the World's Mothers

This 2012 report from Save the Children this year highlights the plight of 171 million children globally who suffer from poor nutrition in early life. It underscores the vital importance of breastfeeding and shows which countries are doing the best and the worst at providing nutrition during the critical window of the first 1,000 days of life. It recommends six key nutrition-related solutions: -iron folate supplements, breastfeeding, good complementary feeding, vitamin A supplements, zinc for diarrhoea and water/sanitation/hygiene - that have the greatest potential to save lives, and shows that these solutions are affordable, even in the world's poorest countries. Find the report at [www.savethechildren.org](http://www.savethechildren.org) [from K4Health 29May2012]

### Family planning in The Lancet

To coincide with the London Summit on Family Planning (see <http://www.londonfamilyplanningsummit.co.uk>), 'family planning' and 'maternal mortality' are the main topics of several articles in [The Lancet, Volume 380, Issue 9837, 14 July 2012 doi:10.1016/S0140-6736\(12\)61156-8](#). One article concludes that numbers of unwanted pregnancies and unmet contraceptive need are still high in many developing countries. It provides evidence that use of contraception is a substantial and effective primary prevention strategy to reduce maternal mortality in developing countries. For free access to many articles in The Lancet go to <http://www.thelancet.com/mylancet>

## Examples of checklists for community-based frontline health workers in South Sudan

Here are two of nine checklists from the Maternal, Newborn, and Child Survival (MNCS) Initiative, which was developed and is being implemented countrywide by Massachusetts General Hospital and the Ministry of Health. These two checklists illustrate the danger signs of pregnancy: prolonged rupture of membranes - and perhaps with fever, eclampsia, bleeding, and preeclampsia. For more information, please contact: Dr Thomas Burke, [tburke@partners.org](mailto:tburke@partners.org).

**DANGER SIGNS IN PREGNANCY**

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Every effort has been made to ensure that the information and the drug names and doses quoted in this Journal are correct. However readers are advised to check information and doses before making prescriptions. Unless otherwise stated the doses quoted are for adults.