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Pulmonary tuberculosis case detection in South Sudan

Rheumatoid arthritis: diagnosis and treatment

Pericardial effusion

Volunteer physician's experience

The research nurse

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Cover photo: *Delivering water in Juba (credit Sharon Bennett).*

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Reviewers are listed on the website

Creating the environment for a healthy South Sudan

**Jay Bagaria and
Chris Lewis**

Department for
International
Development

South Sudan's health statistics stand out for all the wrong reasons. A woman is more likely to die in childbirth¹ than to complete primary education²; only 44% of the population lives within walking distance of a functional clinic³ and there are serious shortages of health workers.

Positive change requires political will, sustainable financing and strong policies and partnerships - experience from other post-conflict countries shows us that change is possible.

Political will and leadership at all levels of government is critical to improving public health. Both Sierra Leone and Liberia are good examples of high-level political leadership driving improvements in health care. In Sierra Leone, President Koroma identified maternal mortality as a key priority in 2009 and introduced free health care for pregnant and breastfeeding women, and for children under five years of age^{4,5}.

Sustainable financing is essential for transitioning a health system from humanitarian support to development. Government funding and long-term development assistance needs to rise appropriately to avoid a gap as humanitarian funding falls⁶.

Funding is only effective when under the guidance of strong policies and plans. All six of the World Health Organisation's building blocks must be addressed as they provide the foundation for delivering health services⁷. For example, the Liberian government developed its interim National Health Plan by working with donors to shape the transition from humanitarian response to one of sustainable development under their leadership⁸.

Political will
and leadership at all
levels of government
is critical to improving
public health.

Success in Sierra Leone and Liberia was underpinned by strong partnerships between the Government, donors, UN agencies and NGOs. In both cases, the Government increased its own financial commitments, while also presenting compelling reasons for donors to increase their funding.

UK aid and other development partners are working to help support South Sudan's government in delivering its Health Sector Development Plan. We are learning from experiences in other post-conflict countries, in particular that of the pooled fund in Liberia, in order to help the Government of South Sudan build its health system.

1. 2,054 women dying for every 100,000 live births, Southern Sudan Household Health Survey 2006
2. Primary school completion rate 1.9%, Gender Parity Index 0.85, Southern Sudan Household Health Survey 2006
3. Health Sector Development Plan 2012-16, Ministry of Health, Republic of South Sudan
4. [http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(11\)60559-X/fulltext](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(11)60559-X/fulltext)
5. <http://www.who.int/bulletin/volumes/88/7/09-071068/en/index.html>
6. Canavan A, Vergeer P, Bornemisza O, 2008 Post-conflict health sectors: the myth and reality of transitional funding gaps.
7. WHO Health Systems Building Blocks <http://www.who.int/healthsystems/topics/en/>
8. Hughes J, Glassman A, Gwenigale W. 2012 Innovative Financing in Early Recovery: The Liberia Health Sector Pool Fund

**The Editorial Board is pleased to welcome a new member - Prof John Adwok,
Consultant Surgeon.**

Pulmonary tuberculosis case detection in South Sudan

David L. Lukudu^a, MBChB, DTM&H, MSc (TMIH)

Abstract

Background: The National Tuberculosis (TB) Control Programme in South Sudan was created in 2006, and non-governmental organizations (NGOs) are its main implementers. Pulmonary tuberculosis (PTB) is a major public health threat. Available literature describes case finding as very low, but treatment success as high. This study was conducted to establish the true picture of case detection and to suggest ways to improve on case finding.

Methods: Recent trends in routine TB case notification as well as case detection and treatment outcome rates were analysed. Approaches and methods utilized in PTB case finding by the involved NGOs were examined. Opinions on how best to improve on case detection were generated.

Results: There was an increase in the trend of notification from 2002 to 2009, but the sputum smear-positive proportion was stable for the same period. The case detection rates were very low, all below 50% of expected for the given years; treatment success rates were high and stable, at an average of 80%; the defaulter rate was on the increase, especially after 2006. The NGOs seemed to be using the recommended approaches and methods to find and diagnose PTB. There was variation in opinions on how to improve on case detection in the region, with overlap in some instances.

Conclusions: PTB case detection has been very low in South Sudan over the last decade; however, the DOTS treatment success rate is high. The high treatment success rate could mean that if more PTB cases could be found in the communities, more are likely to be treated successfully.

Introduction

Tuberculosis (TB) is a chronic inflammatory lung disease caused by *Mycobacterium tuberculosis*. Sick people with the TB germs (or bacilli) transmit the germs into the air during coughing, sneezing, talking, or spitting. Inhaling a small number of the bacilli leads to infection [1]. When a person with active pulmonary TB disease does not receive treatment, that person will infect on average between 10 and 15 people in a year.

TB is a major cause of morbidity and mortality in South Sudan. An estimated 18,500 people develop TB and 5,300 die annually [2]. In 2007, the National TB/Leprosy/Buruli Ulcer Control Programme (NLTBCP) reported 4,738 cases of TB, with 2513 of these being new sputum smear positive TB [2]. With an estimated population of 8 million in the same year, the burden of smear positive cases is estimated to be 13,130 cases annually, whereas for all forms of TB (including sputum smear negative and pulmonary cases) it is roughly 29,640 [3].

While increase in incidence of TB in sub-Saharan Africa is associated with HIV infection, in South Sudan factors that play a big role in the spread of TB include low income, meager resources, civil unrest, and displacement of populations [4].

The study was conducted to establish the true picture of case detection and suggest ways to improve case finding.

Method

Using data from the national tuberculosis control programme, I analysed recent trends in routine TB case notification as well as case detection and treatment outcome rates. Using a questionnaire, I examined approaches and methods used in PTB case detection by the NGOs, the main implementers, and I asked the NGOs how to improve case detection.

Results

Case notification

I found an increase in the trend of notification from 2002 to 2009 (Table 1 and Figure 1) but the proportion of new sputum smear-positive was stable for the same time period, fluctuating between 40% and 55% from 2002 to 2009 (Table 2). The case detection rates were very low, all below 50% of expected for the given years (Figure 2); treatment success rates were high and stable, at an average of 80% (Figure 2). The defaulter rate was increasing, especially after 2006.

PTB diagnosis and case finding by organization

Out of 12 organizations that are involved in TB control in South Sudan, only 7 participated in the study. These were: Arkangelo Ali Association, Malteser International, Diocese of Wau/Don Bosco Missionary Sisters, Medair,

^a Team Leader, Healthcare Projects - Real Medicine Foundation, Juba, South Sudan

Table 1. TB case notification from 2002 to 2009

	2002	2003	2004	2005	2006	2007	2008	2009
New SM+	752	838	979	1656	2105	2513	1783	2023
New SM-	225	358	484	877	1311	1318	781	1211
P (ND or NA)	0	0	0	0	0	240	278	433
New EP	283	338	721	1278	1127	907	872	1023
Relapse	78	95	73	199	164	150	132	138
TAF	11	14	12	46	65	22	30	24
TAD	22	28	22	50	72	82	71	72
Others	0	0	0	0	0	5	220	104
Total	1371	1671	2291	4106	4844	5237	4167	5028

Merlin, Norwegian Peoples' Aid and Ministry of Health (Government of South Sudan) – TB Control Programme, Juba Teaching Hospital. I found that PTB diagnosis and case finding by the organizations were generally as recommended by the TB control programme.

Interview data synthesis

These 7 organizations had experiences that ranged from 5 to over 25 years, and their representatives were all senior staff members (i.e. coordinators, team leaders, project managers), who were well-versed with their respective programmes, including activities and difficulties related to TB control in South Sudan.

Although the practical realities and challenges on the ground vary from area to area, to improve PTB case detection the general collective recommendations of the implementing NGOs were:

1. Increase laboratory outreach
2. Increase human resources
3. Strengthen community participation
4. Ensure that all primary health care centres and units are fully operational and well supported through logistics and capacity building
5. Standardize reporting format between government structures and NGOs
6. Create information sharing between implementing partners
7. Carry out regular stakeholders meetings
8. Increase health education/ awareness
9. Improve referrals from the communities
10. Integrate TB programmes into all primary health care facilities
11. Improve supplies (laboratory and other logistics).

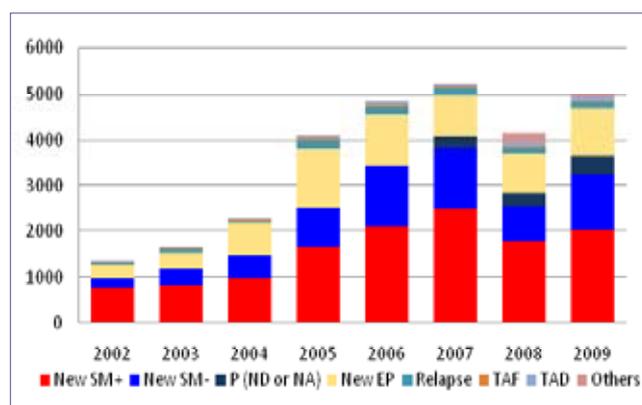


Figure 1. TB case notification in South Sudan from 2002 to 2009.

Source: NTLBCP.

Discussion

Notifications

Between 2002 and 2009 there was a general increase in the trend of TB case notification, especially for the categories new sputum smear-positive, new sputum smear-negative, and new extra-pulmonary TB. The notifications for the remaining categories were generally low and far below 500 and stable, except for 'pulmonary with sputum smear microscopy not done or unavailable'. This could mean that suddenly from 2006 to 2009 there was a gradual increase in the number of pulmonary cases being started on TB treatment without the recommended sputum smear microscopy being done.

Therefore, although there was a rise in the trend, still far less than expected TB cases were reported to the WHO in the referred time period, reflecting far fewer cases detected in the communities.

Looking at the proportions of new sputum smear-positive cases (Table 2); these have been stable between 2002 and 2009 in the range 40% to 55%. Thus, although there is a general increase observed in the trend of the notification from 2002 to 2009, the proportions of sputum smear-positive cases compared to other categories

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Table 2. Proportion of new sputum smear positive cases from 2002

	2002	2003	2004	2005	2006	2007	2008	2009
New SM+	742	838	979	1656	2105	2513	1783	2023
Total cases	1371	1671	2291	4106	4844	5237	4167	5028
New SM+ proportion	0.55	0.5	0.43	0.4	0.43	0.48	0.43	0.4

Table 3. Diagnostic Criteria for PTSD

	2002	2003	2004	2005	2006	2007	2008
SR	80.6	81.2	83	85.1	79.6	79	78
FR	4.9	3.3	3.3	1.6	1.7	1	1
DFR	7.1	3.9	3.8	4.2	4.7	11	12
DR	4.5	2.7	2.7	3.3	6.3	5	5
TOR	0.7	0.1	0	0.7	0	3	3

have been fluctuating between 40 and 55% for the same time period. Thus the increase in trend of notification could only be related to change in notification behaviour, meaning: more and more sputum smear-positive cases are being reported to the WHO and not that there is an upsurge of sputum smear-positive cases.

Calculations

As the exact burden of TB in South Sudan remains unknown, based on WHO estimates (with an estimated population of 13 million in 2007):

- the incidence of PTB (new smear positive/100, 000 population per year) is 101
- the incidence of all new TB cases (all new TB cases/100, 000 population/year) is 228
- the prevalence of TB (all TB cases/100, 000 population per year) is 456 and
- the mortality (deaths/100, 000 population/year) is 56 [5].

It follows from the above estimates (particularly the total population) as well as the definition of notification rate, if we look at Table 1 and carry out some calculations, the notification rates of PTB per 100,000 population are:

11 for 2002 (i.e. $1371 \times 100,000/13,000,000$)
 13 for 2003
 18 for 2004
 32 for 2005
 37 for 2006
 40 for 2007
 32 for 2008
 39 for 2009.

The figures range from 11 to 39 per 100,000 population per year and none is even 50% of expected incidence of 101 per 100, 000 population per year.

Therefore, although there was a rise in the trend of TB case notification in the country between 2002 and 2008, still far less than expected TB cases were reported to the WHO in the referred time period, reflecting far fewer cases detected.

However, the figure of 101 per 100,000 and the population of 13 million are just estimates; so, maybe the incidence of PTB in the country is exaggerated. The latest census conducted in the Sudan was in 2008. Although rejected by the then Government of Southern Sudan (when it was still part of the Sudan) for political reasons, the population figure for the region was found to be about 8,260 490. From this "more accurate" population figure, we can compute a new and "better" PTB incidence, which is roughly 64 cases per 100,000 population per year.

It follows then that, if we do some calculations as previously, the notification rates of PTB per 100,000 population for South Sudan change to the following figures:

9 for 2002
 10 for 2003
 12 for 2004
 20 for 2005
 25 for 2006
 30 for 2007
 22 for 2008
 24 for 2009.

Again, the assumption is that the total population is

constant at 8, 260, 490, from 2002 to 2009. Even so the new figures are still below 50% of the expected incidence of 64 per 100,000 population per year.

Sex

Males dominate the list of smear-positive cases for almost all age groups, with the exception of the 5 to 14 year age group. On the one hand, this could mean that males have more access to health facilities and therefore diagnosis, which could be related to occupation (e.g. the army) in the context of a post-conflict region. On the other hand, social stigma associated with diagnosis of PTB and dedication to household responsibilities could explain why fewer smear positive cases are detected in females.

As South Sudan is largely rural, perhaps more health education and more outreach activities will enable more women of different ages to be reached in their communities and therefore more cases of TB could be detected amongst females.

State

New sputum smear-positive cases reported for Central Equatoria and Northern Bahr-el-Ghazel states were more than double those for each of the other eight states. Also, there were many more sputum smear-negative cases notified for Central Equatoria. We could attribute these higher figures to the fact that these are states with major towns or cities; not only do we expect larger populations in these urban settings, but also we expect more healthcare facilities, easier access to these facilities, and better diagnosis in terms of personnel and laboratories. Also a higher HIV prevalence could explain the figures, including higher sputum smear-negative for Central Equatoria; since this is the state that borders Uganda, a country with a higher HIV prevalence than South Sudan.

Trend of treatment success rate

The high DOTS treatment success rate (Figure 2) is consistent with the earlier findings cited from the USAID website. This could mean that if more TB cases in the communities could be found, more are likely to be treated successfully.

A rising defaulter rate should be a cause for concern (Table 3) as non-drug compliance is one factor that contributes to drug resistant TB; two cases were already reported in Kajo Keji in Central Equatoria in 2005 [3]. Reasons for a rising defaulter rate should therefore be addressed.

Implementing organizations and TB case detection

Each of the 7 participating organizations had been represented by a senior staff member and all these organizations have experiences in South Sudan ranging from 5 to more than 25 years.

Doctors, clinical officers, nurses and community health

workers are involved in the diagnosis of PTB in these organizations, with doctors dominating, implying that the likelihood of cases being missed is low.

Overall, the methods used by the 7 organizations to diagnose PTB include clinical findings (signs and symptoms) and sputum smear microscopy, with X-ray as an addition in some cases where the facility is available. This is in line with the recommendation from the policy and guideline document for TB control in the region [3]. Five of the 7 organizations find cases both passively and actively, which is a positive finding; with two limited to passive detection. Passive case finding involves detecting cases from symptomatic clients attending facilities, whereas active case finding involves looking for, diagnosing, treating and following-up cases in the community.

In summary, the organizations in the study are well-experienced and are utilizing the recommended approach to detect TB cases.

Conclusion

As mentioned already, there was a general increase in the trend of TB case notification in South Sudan between 2002 and 2009, but PTB case detection has been very low over the same time period. The increase in case notification could be related to development of better recording and reporting systems. As far as TB treatment outcome is concerned, the DOTS treatment success rate is high, with the implementing partners all treating and following up TB cases in the facility. The high treatment success rate could mean that if more PTB cases could be found in the communities, more are likely to be treated successfully. The prevalence of PTB would thus reduce and so would related mortality, and TB as a public health threat would be contained. However, defaulting is an issue that should be taken into consideration, because of the risk of drug resistant tuberculosis.

Study Limitations

1. Only 7 out of 12 organizations involved in TB control in South Sudan participated in the study.
2. It would have been more inclusive to involve all the 46 TB treatment centres in the region, no matter how many may be under one organization, as the realities and the challenges vary from one location to the other.
3. Communication was difficult with some of the intended respondents as they were based in remote locations.
4. Time was a limiting factor, as the study time frame was roughly 6 weeks with actual data collection done in just under two weeks.
5. Focus was on adult PTB patients only, as it is

MAIN ARTICLES

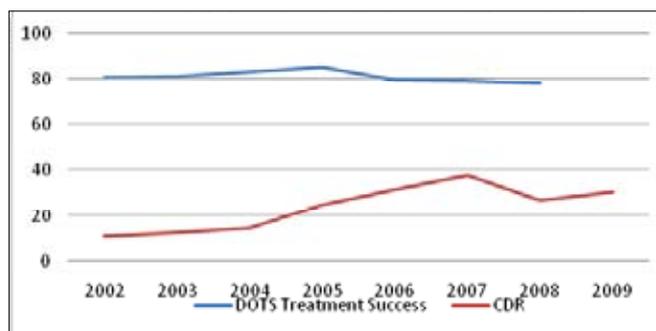


Figure 2. Trends of treatment success rate and case detection rate in South Sudan from 2002 to 2009

easier to diagnose PTB in this age group than in children.

- Data were not collected directly from the organizations but from the National TB/Leprosy/Buruli Ulcer Control Programme, the recipient of quarterly reports from all organizations involved in TB control in the region.

Author's note

This qualitative and quantitative study was carried out in 2010 and submitted in part fulfillment of the requirements for the degree of Master of Science in Tropical Medicine and International Health, at the London School of Hygiene and Tropical Medicine (LSHTM); University of London. Approvals for the study were granted by the LSHTM Ethics Committee and the Department of Research and Planning at the Ministry of Health, South Sudan. Special thanks to Drs Joseph Lasu and Joseph Lou of the National TB Control Programme, the NGO representatives in the study, as well as my supervisor, Professor Peter Godfrey-Faussett.

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A QUIZ FOR OUR READERS

Based on articles in the August 2012 issue of the South Sudan Medical Journal. For each of the following 5 questions only one answer is correct. How many can you answer correctly? [Answers are on page 94]

A. In complicated malaria an impaired level of consciousness may indicate:

1. Hyperglycaemia
2. Hypoglycaemia
3. No need to observe carefully
4. Haemoglobin of 7g/dl

B. Which one of the following statements is true for the management of malaria:

1. Trials have shown that quinine is still more effective than artesunate.
2. If coma occurs in malaria the possibility of meningitis must be considered.
3. Diclofenac is useful in hyperpyrexia of malaria.
4. Observations are the responsibility of the doctors only.

C. Which one of the following is true?

1. Cardiovascular risk factors are not high in urbanised African populations.
2. If a patient trusts his / her doctor the outcome of care is improved.
3. Cancer deaths each year in Africa are about 200,000.
4. About 10% of cancer deaths are preventable in Africa.

D. Which one of the following statements is true?

1. Only 20% of patients with haemorrhagic stroke in Africa have a history of hypertension.
2. The reduction in salt intake has no part in the management of hypertension in Africa.
3. Reducing alcohol consumption helps in the control of hypertension.
4. Obesity is a problem only in Western countries.

E. Which one of the following statements is true?

1. A hypodense area on a brain CT-scan may suggest a cerebral infarct.
2. Guinea worm disease is uncommon in South Sudan.
3. Boiling drinking water has no effect on acquiring guinea worm disease.
4. Iron supplements are useful in the treatment of diarrhoea.

Rheumatoid arthritis: diagnosis and treatment with a particular emphasis on South Sudan

Charles Radis^a D.O.

Rheumatoid arthritis (RA) is a chronic, systemic, autoimmune inflammatory disorder targeting diarthrodial synovial lined joints, usually in a symmetric distribution. The lungs, pericardium of the heart, skin, and eyes may be affected in up to twenty percent of patients. If uncontrolled, RA leads to joint destruction, disability, and a significantly shortened life span.

In developing countries where medical resources are limited, recognition and aggressive management of patients with rheumatoid arthritis may lag behind the treatment of infectious diseases associated with high mortality such as malaria, tuberculosis, HIV, and cholera. However, the burden of progressive pain and disability from the arthritis and its effect on the individual and family unit is considerable. Since specialists in rheumatologic care are rare in developing countries, the focus of this review is to improve the ability of general clinicians to diagnose early rheumatoid arthritis, and to initiate treatment within the limitations of available therapeutic options. A typical case is presented to illustrate key diagnostic features of the disease and management decisions.

A 23 year old female presented to clinic with a three months' history of pain, stiffness, and swelling of the proximal interphalangeal (PIP) joints, wrists, and knees. The symptoms began six months after the birth of her



Figure 1. Early RA affecting the MCP PIP joints (credit C. Radis)

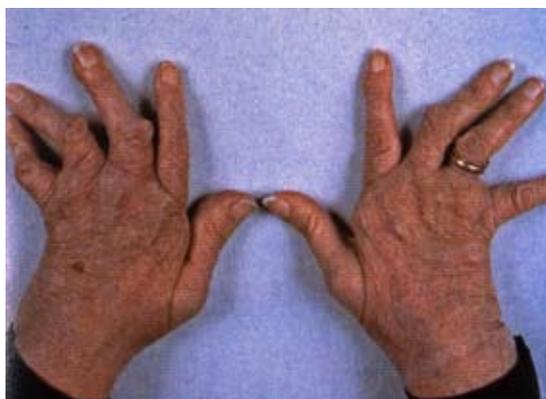


Figure 2. Progressive RA deformities (credit C. Radis)

third child. She was breastfeeding and having difficulty lifting her baby, washing clothes, and cooking. Morning stiffness is present for 2 hours and is accompanied by considerable fatigue. She denied a recent cough, change in bowel habits, weight loss, or fever. A maternal grandmother became crippled at an early age and was bed-bound for the last four years of her life.

On examination, she walks with a slight limp. There is swelling and subtle erythema appreciated in the second, third, fourth, and fifth MCP joints of both hands, and diffuse fusiform swelling in the PIP joints along with tenderness and swelling in both wrists and knees. At the right elbow is a freely movable nodule measuring approximately one centimeter. Her physical exam is otherwise unremarkable.

Epidemiology of rheumatoid arthritis

RA affects women more frequently than men by a ratio of 3:1. Although patients may present in childhood or at an advanced age, the peak incidence is in the child-bearing years. The disease has a world-wide prevalence of 0.8% but there is controversy regarding the incidence of RA in Africa. Some studies suggest that it occurs in only 0.1% of rural Africans, but rigorous epidemiologic studies have not been performed in most regions of Africa. A review of 406 cases at the Mulago Hospital in Uganda in 1980 suggested that RA was not infrequent and it was often severe [1]. A link to urban living may exist, as a study in Soweto, South Africa, showed a prevalence of RA among blacks similar to white Europeans [2].

The triggering event for rheumatoid arthritis is unknown. Many patients with RA have other family members affected by the disease, suggesting a genetic

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predisposition. HLA testing has linked an increased risk for developing RA to the HLA-DR4 region, with the highest risk associated with the HLA-DR01 allele. Since a minority of patients who are HLA-DR4 positive develop the disease, it is postulated that an additional environmental factor(s) may trigger the disease. Known risk factors currently include smoking with a relative risk reported as high as 8.8 [3] in a genetically predisposed individual, and chronic periodontal disease [4].

Extra-articular manifestations of rheumatoid arthritis

Rheumatoid arthritis is a systemic disease in that although synovial lined joints are a major target (see Figures 1 and 2), other organ systems are frequently affected. In general, patients with extra-articular disease have more severe and long-standing RA, but in some patients extra-articular disease may occur early and may be organ threatening. Sjogren's syndrome, with manifestations of dry eyes and dry mouth may affect up to 50% of RA patients over a lifetime. Patients may also present with episcleritis or scleritis (including corneal melt). Diagnosing RA eye involvement and initiating proper treatment may require ophthalmologic consultation.

Rheumatoid nodules affect up to 20% of RA patients. Nodules are most commonly palpable along the ulnar aspect of the elbow and forearm but may also occur at the Achilles tendons or in the hands. They are usually asymptomatic and may recur if surgically excised. Rheumatoid nodules may occasionally involve the lung parenchyma (see Figure 3). Differentiating rheumatoid nodules in the lung from malignancy or infection may require biopsy. The lung pleura and the pericardium may also be targeted by RA. Pleural effusions and pericardial effusions are not uncommon and may require thoracentesis or pericardiocentesis to differentiate from other causes of pleuropericarditis. Interstitial lung disease attributable to RA is usually mild and may be asymptomatic, but aggressive immunotherapy may be necessary in patients with progressive disease. Vasculitis secondary to RA is a feared complication of the disease. Small vessel leukocytoclastic vasculitis involving the skin is often present (see Figure 4). RA vasculitis may trigger mononeuritis multiplex, sensory neuropathy, and the gastrointestinal tract with bowel ischaemia and perforation.

Diagnosis

Despite improvements in laboratory assessment, rheumatoid arthritis continues to be a clinical diagnosis. The 2010 American College of Rheumatology (ACR)/European League Against Rheumatism (EULAR) criteria for the diagnosis of rheumatoid is summarized in Box 1.

Although a clinical diagnosis of rheumatoid arthritis may occasionally be made in patients who have a EULAR score less than 6, the clinical criteria emphasize well known aspects of typical RA patients: small and large joint synovitis of greater than six weeks duration. Differentiating the acute infectious polyarthritis seen in rubella, parvovirus, hepatitis B, and C, and Chikungunya from RA is usually possible by the presence of rash, fever, or the presence of myalgias. In addition, viral polyarthritis usually reaches a peak in several days and gradually resolves while patients with early RA usually add joints over time with increasing stiffness and swelling.

Other forms of chronic inflammatory arthritis must be differentiated from RA. Patients with psoriatic arthritis may present with symmetric small and large joint synovitis but careful skin exam usually demonstrates patches of psoriasis, nail pitting or onycholysis. Patients with systemic lupus erythematosus (SLE) may also present with polyarthritis but often have oral or nasal ulcers, photosensitive rash, pleurisy, or pericarditis. HIV

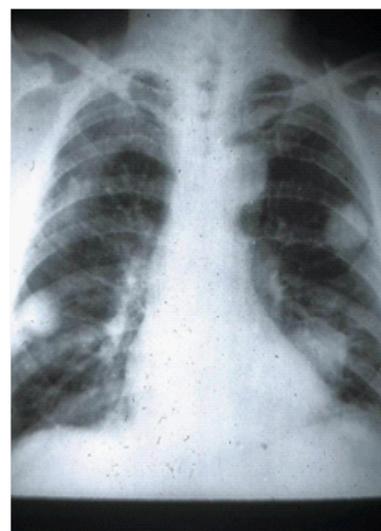


Figure 3. RA rheumatoid nodules

Box 1. Eular Classification criteria for RA

(score-based algorithm: add score of categories A–D; a score of $\geq 6/10$ is needed for classification of a patient as having definite RA)

A. Joint involvement

- 1 large joint: 0
- 2-10 large joints: 1
- 1-3 small joints (with or without involvement of large joints): 2
- 4-10 small joints (with or without involvement of large joints): 3
- >10 joints (at least 1 small joint): 5

B. Serology (at least 1 test result is needed for classification)

- Negative rheumatoid factor (RF) and negative ACPA: 0
- Low-positive RF or low-positive ACPA: 2
- High-positive RF or high-positive ACPA: 3

C. Acute-phase reactants (at least 1 test result is needed for classification)

- Normal C-reactive protein (CRP) and normal ESR: 0
- Abnormal CRP or abnormal ESR: 1

D. Duration of symptoms

- <6 weeks: 0
- ≥ 6 weeks: 1

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may trigger inflammatory arthritis. HIV patients may have significant cervical lymphadenopathy, splenomegaly and a wasting syndrome. If there are risk factors for HIV (multiple sexual partners or IV drug use) in a patient with polyarthritis, testing for HIV is recommended.

Rheumatoid factors are antibodies directed against the Fc portion of native IgG. In early RA, only 50% of patients have a positive rheumatoid factor, while in late disease, about 80% of patients have detectable rheumatoid factors. Rheumatoid factors are often present in other disorders including sub-acute bacterial endocarditis, tuberculosis, sarcoidosis, chronic hepatitis B and C, and HIV disease. Thus, rheumatoid factors have relatively low sensitivity and specificity for the diagnosis of RA. High titre rheumatoid factors however, are much more frequently seen in RA than in other disorders and may predict severe disease.

A newer laboratory test which measure antibodies against cyclic citrullinated peptide (ACPA) has much higher specificity in the diagnosis of RA (about 96% in Caucasians) and similar sensitivity (80%) compared to rheumatoid factor. A recently published study of black South Africans with early RA may point towards differences in ACPA specificity between African and European patients. In this study, ACPA was no more specific for the diagnosis of RA than traditional rheumatoid factors. Nearly a third of systemic lupus patients tested positive for ACPA. Based on this study, the authors suggest testing for ACPA antibodies only if a patient is RF negative [5].

Treatment of rheumatoid arthritis

Timely and aggressive treatment of early rheumatoid arthritis with disease modifying medications (DMARDs) may prevent or slow the progression of joint damage. Although anti-inflammatories (NSAIDs) such as ibuprofen, naproxyn sodium, diclofenac, and others, may help with pain and stiffness, they do not prevent joint damage. NSAIDs are frequently prescribed for joint pain and stiffness in rheumatoid arthritis, but clinicians need to be vigilant with clinical and laboratory monitoring to ensure these medications do not trigger renal or hepatic damage. Patients with congestive heart failure, diabetes mellitus, uncontrolled hypertension, or advanced age may be at particular risk for renal insufficiency. Heavy alcohol use and cigarette smoking increase the risk of



Figure 4. RA small vessel vasculitis

peptic ulcer disease or NSAID induced gastritis. Regular monitoring of serum creatinine and complete blood counts are recommended in patients at risk for NSAID side-effects.

Judicious use of corticosteroid injections and/or oral prednisone or methylprednisolone may reduce pain and improve function. Oral corticosteroids are often dramatically effective short-term but cumulatively have a host of side-effects including weight gain, fluid retention, glaucoma, diabetes mellitus, adrenal insufficiency, reduced bone density, and recurrent infections. Because these medications are relatively inexpensive and widely available, clinicians may find that benefits versus risks favour their use. At doses of 5 mg prednisone or 4 mg methylprednisolone

daily, risks may be minimized. Above these daily doses, long-term side-effects are inevitable and sometimes catastrophic. There is conflicting evidence as to whether low-dose oral corticosteroids prevent joint damage [6].

Most, if not all, RA patients should be prescribed a disease modifying medication. DMARDs do not cure RA, but when used singly or in combination, they may slow down or prevent joint destruction and offer patients the greatest hope of living a more comfortable and productive life. Current DMARDs include hydroxychloroquine, sulfasalazine, leflunomide, methotrexate, and an expanding family of medications termed biologic response modifiers. Biologic response modifiers block the function of key drivers of the immune system in rheumatoid arthritis. Infliximab, etanercept, and adalimumab are antibodies to tumor necrosis factor (TNF), while tocilizumab is an antibody directed against the receptor for the cytokine interleukin-6. An antibody against the CD20 antigen present on B cells is the target of Rituximab. This B cell depleting drug leads to decreased B cell help in the complex immune response which perpetuates rheumatoid arthritis.

The drawbacks to the routine use of biologic response modifiers in developing countries are considerable. The average cost for these medications is more than \$20,000 U.S. dollars yearly. The re-emergence of latent TB or the new development of TB and fungal diseases may be seen in patients prescribed TNF blockers, particularly in countries where the incidence of TB is high. Nevertheless, biologic response modifiers play a critical role in controlling RA in patients with severe disease unresponsive to traditional

DMARDs and in future years, these medications should be available to clinicians in South Sudan.

At a recent lecture at the Juba Teaching Hospital, this writer was made aware that DMARDs are not generally available in South Sudan. RA patients and their doctors must obtain these medications from outside countries. Thus, even with increasing recognition of the crippling effects of RA, this limits therapeutic options for patients. The traditional DMARDs such as Hydroxychloroquine, sulfasalazine, methotrexate, and leflunomide are the cornerstone of effective treatment in most RA patients. Hydroxychloroquine and sulfasalazine are inexpensive, generally well tolerated, and do not require extensive laboratory monitoring. Because of the risk of retinal toxicity with hydroxychloroquine, a baseline eye check is recommended by the American College of Ophthalmology with a second eye evaluation at five years and then yearly thereafter for patients who remain on the drug [7]. The effective dose of hydroxychloroquine is 400 mg/day and the drug may take 2-4 months to reach full effectiveness. Patients taking Hydroxychloroquine should not exceed a total daily dose of greater than 6.5 mg/kg/day. Sulfasalazine is another DMARD which is relatively inexpensive, well tolerated, and effective in many patients with RA. The usual dose is 2-3 grams daily in divided doses. A baseline Complete Blood Count (CBC) is recommended, with a repeat CBC at 3-6 month intervals due to the risk of leucopenia or thrombocytopenia.

Methotrexate is considered a cornerstone of therapy in most RA patients. It should be prescribed in early disease with monitoring of liver enzymes and complete blood counts. Patients with pre-existing liver disease or renal insufficiency should not be prescribed methotrexate. Baseline and monthly laboratory testing should be assessed until it is clear the medication is safe and well tolerated. If laboratory studies are stable, blood counts and liver enzymes can be reduced to every 3 months. Daily folic acid supplementation reduces the risk of side-effects with methotrexate and should routinely be prescribed for patients on long-term methotrexate. Leflunomide

is increasing used as an oral treatment for RA and may be used cautiously in combination with methotrexate or other DMARDs. Laboratory monitoring of leflunomide is similar to methotrexate. While methotrexate is relatively inexpensive, a prescription for leflunomide in the United States is several hundred dollars per month.

The clinical skills necessary to safely and effectively treat patients with rheumatoid arthritis require a familiarity with the costs and potential side-effects of each drug. However, the rewards are high for both the patient and clinician. Control of pain, preservation of function, and prevention of damage are possible for nearly all patients with RA.

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Guidelines for writing "Case Reports" for the South Sudan Medical Journal

These are now uploaded on the SSMJ website at <http://www.southsudanmedicaljournal.com/about-ssmj/guidelines-on-writing-case-reports.html>. Please use these to help you write up any interesting case you have seen so we can share it with other readers. Send case reports (and other items for SSMJ) to admin@southernssudanmedicaljournal.com

Pericardial effusion complicated by tamponade: a case report

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Introduction

Pericardial effusion is fluid in the space between the heart and the pericardial sac. There are many causes of pericardial effusion, with infection (viral and TB) as the most common. If fluid rapidly accumulates in the pericardial space, like in chest trauma, this fluid can compress the heart (cardiac tamponade) and cause circulatory failure. With slow accumulation of fluid, the pericardial sac will stretch to accommodate the fluid. However, if fluid continues to accumulate, tamponade will eventually occur. This is an emergency situation requiring aspiration of pericardial fluid (pericardiocentesis).

History and physical examination

A 40-year-old South Sudanese man was referred from a state hospital. He complained of fever, cough productive of mucoid sputum without haemoptysis and chest pain for four months. He also reported weight loss for two months and abdominal and lower limb swelling for one month. In addition he had fatigue, palpitations and exertional dyspnoea but denied orthopnoea.

He had no past history of medical or surgical conditions, no known tuberculosis contacts and had never been tested for HIV.

On physical examination he was wasted and sleepy but oriented and speaking in full sentences. Glasgow Coma Score 15/15. Pulse 102/minute and weak and thready. Respiratory rate 40/minute. Blood pressure 80/40. Pale but no jaundice. Pitting lower limb oedema up to the knees. Chest auscultation revealed crackles at both bases. The heart sounds were muffled but there were no added sounds, murmurs or friction rubs. The jugular venous pressure could not be determined. The abdomen was soft, distended with a fluid thrill and tender hepatosplenomegaly. Bowel sounds were normal.

Investigations

The patient brought a chest X-ray from the state hospital and this showed a massively enlarged cardiac silhouette and bilateral pulmonary infiltrates or oedema (Figure 1). An urgent bedside ultrasound showed a large pericardial

effusion of about 2 cm, right atrial collapse and right ventricular collapse in diastole (Figure 2).

HIV testing was negative. A further chest X-ray showed the same features as the one that was brought with the patient.

Treatment and progress

The physical examination suggested and cardiac ultrasound confirmed cardiac tamponade. An emergency pericardiocentesis was performed by a subxiphoid approach using ultrasound guidance. Only 75mL of serous (clear-yellow) fluid could be aspirated before the needle became blocked. However the blood pressure rose to 130/100 and the patient became haemodynamically stable. The pericardial fluid was smear positive for AFB so the patient was started on anti-TB therapy. Unfortunately, he passed away two days later. The precise cause of death is not known but may have been due to re-accumulation of pericardial fluid and cardiac tamponade.

Comment

The patient presented with cardiac tamponade, the most severe complication of TB pericarditis. The key to urgent treatment was the fact that the clinicians were aware of this possible diagnosis, which was confirmed with bedside cardiac ultrasonography. Emergency pericardiocentesis was possible using ultrasound to guide the insertion of



Figure 1. Chest X-ray demonstrating enlarged cardiac silhouette and bilateral pulmonary infiltrates or oedema (credit: Rae Wake. Permission obtained from patient)

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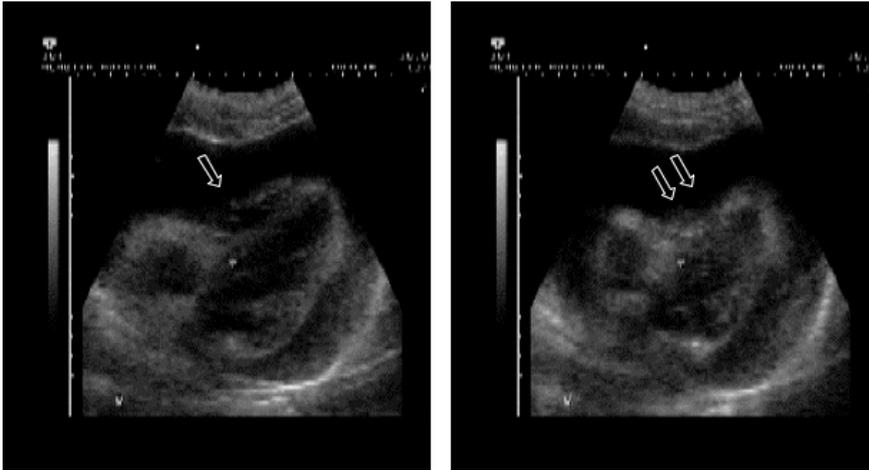


Figure 2. Cardiac ultrasound demonstrating large pericardial effusion and right ventricular collapse. Impaired filling of the right ventricle during diastole is visible (arrow) during inspiration. This even increases during expiration, when right ventricle almost collapses (2 arrows). (Courtesy Dr. Tom Heller, Munich)

the aspirating needle. Nevertheless, prognosis is poor once the condition has progressed to cardiac tamponade, and early diagnosis and treatment of TB pericarditis may prevent this potentially fatal complication.

Pericarditis classically presents with shortness of breath and chest pain that is sharp, sudden, pleuritic and is relieved by sitting forward. A pericardial friction rub may be heard at the left sternal border but this disappears when fluid accumulates.

Cardiac tamponade occurs when fluid in the pericardial space accumulates faster than the pericardial sac can stretch and so causes high pressure compressing the heart and preventing the heart from expanding fully. For example, in cardiac trauma where blood fills the space quickly, as little as 100mL can cause tamponade. However, if the fluid accumulates more slowly as with TB pericarditis, the pericardial sac can expand to hold over one litre of fluid before critical compression arises [1].

The three classical signs of cardiac tamponade (also called Beck's triad) are **hypotension, jugular venous distention, and muffled heart sounds**. Hypotension results from decreased cardiac output, jugular-venous distention results from impaired venous return to the heart and, muffled heart sounds are due to pericardial fluid. There are other physical signs that may indicate cardiac tamponade. On inspiration the central venous pressure (jugular venous pressure) would normally fall but with tamponade this rises. Pulsus paradoxus is the finding of a fall in the systolic blood pressure of more than 10mmHg when the patient inspires [2].

The **chest Xray** of a patient with large pericardial effusion shows a large "boot-shaped" cardiac silhouette

but it can be difficult to tell if a large heart is due to dilated cardiomyopathy or pericardial effusion.

Ultrasound easily detects a large pericardial effusion: the fluid appears anechoic or black around the heart. The right atrium and right ventricle appear collapsed with dilation of the inferior vena cava [2].

In this case, the underlying cause of the pericardial effusion was rapidly established by the positive AFB smear test. However the other differential diagnoses would have included those in Table 1.

Tuberculous (TB) pericarditis

Epidemiology

Tuberculous pericarditis, caused by *Mycobacterium tuberculosis*, is found in approximately 1% of all autopsied cases of TB and in 1% to 2% of instances of pulmonary TB. It is the most common cause of pericarditis in Africa [3]. In one series from the Western Cape Province of South Africa, tuberculous pericarditis accounted for 69.5% (162 of 233) of cases referred for diagnostic pericardiocentesis [4]. By contrast, tuberculous pericarditis accounts for only 4% of cases in developed countries [3]. The incidence of tuberculous pericarditis in sub-Saharan Africa is increasing as a result of the human immunodeficiency virus (HIV) epidemic, and this trend is likely to appear in other parts of the world [5,6].

Recent studies of patients with TB pericarditis in sub-Saharan Africa found the overall mortality rate in the range of 17-27%. Risk of death was higher in patients with HIV infection, older age, and co-existing pulmonary tuberculosis [7,8].

Diagnosis

Pericardial fluid has a poor yield of about 2% (range 0-42% reported) of acid fast bacilli (AFB) on smear examination but TB culture is positive in 38-56% [8]. We were therefore fortunate to find AFB on a smear from our patient. A raised lymphocyte count, adenosine deaminase, protein and lactate dehydrogenase levels in the pericardial fluid are useful indicators of TB [9].

An adequate clinical assessment as described for our patient is always important but even more so in the absence of reliable laboratory tests. Evaluation for pulmonary TB (chest Xray and sputum AFB) and HIV may help guide your clinical diagnosis.

Patients from TB endemic areas who present with

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Table 1. Causes of pericarditis or pericardial effusion [1]

Infection- viral, TB, bacterial, fungal, HIV
Malignancy <ul style="list-style-type: none"> • Primary • Metastatic
Post-cardiac injury syndrome (after trauma or cardiothoracic surgery)
Acute myocardial infarction (acute, delayed)
Metabolic-uremia, hypothyroidism
Collagen vascular diseases- rheumatoid arthritis, lupus erythematosus
Radiation
Idiopathic

pericarditis must be regarded with a high index of suspicion. In the absence of an alternative diagnosis, patients should be started on empirical anti-tuberculosis treatment irrespective of test results [5].

Treatment

Patients diagnosed with TB pericarditis should be promptly started on anti-TB therapy using the standard 4-drug regimen. Pericardiocentesis is a life-saving procedure for patients with cardiac tamponade and as in our patient only a small volume of aspirate (75 ml) may have a dramatically beneficial effect.

It is generally recommended that patients with TB pericarditis are also prescribed steroids, although there are only a few clinical trials to support this recommendation [3]. The dose recommended is 60mg prednisolone daily for adults and 1mg/kg/day for children with gradual withdrawal after 2-3 weeks [10,11]. There is less evidence available to support steroid use in HIV positive patients, but one small study in Zimbabwe found mortality benefit with use of prednisolone [12].

Learning points

- Pericarditis typically presents with shortness of breath and pleuritic chest pain that gets better when leaning forward.
- A large or rapidly expanding pericardial effusion can lead to cardiac tamponade. This is a life-threatening condition and requires emergency pericardiocentesis.
- Close monitoring, especially during the hours after pericardial aspiration, looking for rising pulse and respiratory rate and falling blood pressure is needed as fluid may reaccumulate and cardiac tamponade recur.
- In sub-Saharan Africa, TB pericarditis is the most common cause of pericardial effusion and cardiac tamponade.

- Recommended treatment for TB pericarditis includes standard 4 drug anti-TB therapy for a six months' course, as well as prednisolone daily for at least 2-3 weeks.

Acknowledgement

We thank the CEO of JTH and Dr Elijah in whose Medical Department we carried out this case study - with the verbal permission of the patient

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A report and sequelae of a specialist volunteer physician

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Introduction

In 2006 volunteers were required for a USAID sponsored project under the Academy of Educational Development (AED). The aim was to transfer skills that would contribute to the reconstruction of Southern Sudan. I was privileged to take an assignment from 6 September to 21 October 2006. In a private voluntary capacity I returned for a month in 2010 and 2012, again to transfer skills, and so help in the reconstruction of the health sector. I worked in Juba Teaching Hospital (JTH), the Juba Medical Complex and for local television and radio.

Results of 2006 assignment

1. Training trainees

It was unfortunate that during my visit in 2006 the Trainee Clinical Officers or Medical Assistants were on leave. There were no House Officers or Medical Officers attached to the Department of Medicine. Hence there was a missed teaching opportunity.

2. Clinical services

I did daily ward rounds in the Emergency Ward and alternated daily ward rounds with a colleague from the International Committee of Red Cross (ICRC) in the Medical Ward 4. My host, the Head of the Department, did ward rounds in the First Class and Professor Woodruff amenity wards, ran weekly Medical Out-Patient Clinics and performed ultrasonography and echocardiography.

• **Workload:** According to Medical Insurance Relative Value Schedules¹ General Physician should spend not less than 45 minutes on seeing a new patient, and 15 minutes on subsequent follow-up in an outpatient clinic setting, In Private Practice where this schedule applies only Specialists see in-patients. If seen by a non-Specialist a different tariff applies. As most of the JTH patients

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¹ Relative Value Schedule. This is one aspect of a concept of value for money agreed between Health Services Financiers (Medical Aid Societies) and Private Practitioners in South African Sub-region where a Physician by the nature of his/her job spends more time on consultation (at least 40 to 45 minutes) or else he/she gets paid General Practitioner's fee.

Table 1. Summary of a 4-week work load according to the Medical Insurance Relative Value Schedules

Total working days in four weeks	23 days
Average number of patients seen in emergency ward	32 a day, working 24 hours/day non-stop
Average number of patients seen in ward 4	20 a day, working 5 hours/day non-stop
Total average number of patients seen (32+20)	52 a day, working 29 hours/day non-stop

Table 2. Summary of discharges

Ward	Discharges	Deaths (%)
Emergency ward	210	4 (1.9%)
Ward 4	336	5(1.4%)
Total	546	9 (1.6%)
Early readmission	2	1 (50%)

were rarely seen again due to logistic reasons, detailed consultations are needed to formulate a comprehensive management plan. On the basis of these Schedules the workload was overwhelming (as shown in Table 1) and there would have been no time for training although this can be carried out opportunistically on ward rounds, in the clinic and during the weekly grand rounds. Also assuming a labour regulation of no more than a 40 to 45-hour week, an average of only eight minutes would be available per patient. Hence a critical mass of clinicians is needed to share out the large work load.

• **Discharges and deaths:** Despite the workload and inadequate paramedical support there were very few readmissions and overall mortality was low (Table 2) - perhaps because patients did not return to the hospital or sought treatment elsewhere.

• **Clinical spectrum:** Malaria was the commonest indication for admission. Seventy seven percent (77%) of the cases were diagnosed on clinical grounds. The malaria slide positivity rate was 68.1%. The majority of the slide-positive cases did not have features of severe and complicated malaria. The mortality rate of slide-positive severe cases was 2 out of 5 (40%). The picture could have been different had data from the paediatric and antenatal wards been included. According to data available at the time HIV/AIDS was rare. Of great concern were the

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commonly encountered clinical features of liver cirrhosis and hepatocellular carcinoma. This may suggest a high prevalence of viral hepatitis B which may be complicated by these conditions. Severe anaemia was very common possibly due to a combination of factors such as parasitic infestations, malnutrition, various medical conditions and multiple pregnancies.

3. Continuing Medical Education

- **Attendance at a clinical talk:** Invitations were distributed to attend a talk on “Common Clinical Disorders in Juba Teaching Hospital - a Four Week Experience”. 14 people attended including the Medical Director. This was the first clinical meeting of its kind. I suggested establishing regular weekly or monthly lectures and an annual “Professor Woodruff Memorial Lecture” in memory of the late co-founder of the Medical School of Juba University.

- **Contribution to a book:** Prior to my assignment I had been one of the contributors of the book ‘Prevention and Treatment Guidelines for Primary Healthcare Centers and Hospitals in Southern Sudan’.

4. Constraints to my assignment

- **Lack of trainees:** The lack of potential trainees resulted in missed opportunities in an assignment that aimed at training trainees and transferring skills.

- **Lack of facilities:** There was lack of back up facilities such as adequate imaging and laboratory analytical capability.

- **Lack of certain essential drugs** hampered patient care.

- **Lack of interdepartmental coordination:** This particularly applied to the relationship between the public health programmes and hospital based clinical services.

- **Lack of educational fora:** There were no educational fora in the various departments or the hospital at large.

5. Forecast of future needs of a physician

- **Manageable workload:** I suggested a better structure for the deployment of the medical manpower in the hospital by building teams consisting of middle grade clinical support staff (clinical officers, house officers and registrar), registered nurses and specialists to ensure that there is a chain of command to delegate work and share responsibilities without leaving wards short of cover.

- **Allied healthcare professional support:** Adequate and appropriate laboratory and radiological support is essential for optimal clinical practice.

- **Research:** Research facilities and funds contribute to the development of physician’s skills and enquiring minds for younger clinicians. Basic research to determine local prevalence of communicable and other common clinical problems needs to be supported in order to plan the delivery of services at the Hospital.

- **Continuing Professional Development (CPD):** All clinicians working within a constantly evolving profession that requires life-long learning must engage in CPD. Professional development includes updating medical knowledge and skills as well as generic skills such as information technology, clinical audit and management.

Recommendations

1. **Training needs:** Tailor training needs to the local circumstances after carrying out a needs assessment.

2. **Coordination:** Make sure public health policies and principles of clinical medicine complement each other.

3. **Institution:** Improve all aspects of Juba Teaching Hospital so it reflects its name and the purpose of such a hospital.

Results of 2010 and 2012 visits

The opportunity for voluntary service diminished in Juba Teaching Hospital while locums at Juba Medical Complex and presentations on the media were readily available as shown in table 3.

Table 3. Summary of results of voluntary service in 2010 and 2012

Activities	Period	Outcome	Period	Outcome
Clinical services at JTH	2010	Ward rounds in Emergency Ward	2012	Did not materialise
Clinical teaching at JTH	2010	Did not materialise	2012	Did not materialise
CME/CPD at JTH	2010	One session. Excellent turn up	2012	Two sessions did not materialise
Television presentations (South Sudan)	2010	One session. Excellent	2012	One session. Good experience
Radio presentation (Bakhita Radio)	2010	Not planned	2012	One session. Excellent
Part time Juba Medical Complex	2010	Good experience	2012	Good experience

Discussion

One striking observation was the rapid rate of development taking place in South Sudan, especially in the health sector. The infrastructure and staffing of the health services appeared to have improved tremendously including the establishment of thriving private sectors. The opportunity for voluntary service in Juba Teaching Hospital which had received tremendous support in 2006 had waned, for reasons that were unclear.

My offer to speak to the media was welcomed and I was invited to act as a Locum Physician by the Juba Medical complex, an indication of possible lack of critical mass of trained specialists in the South Sudan.

Recommendations

1. Institute a comprehensive public health system to include provision of clean water, sewage and waste disposal
2. Incentivise doctors, nurses and clinical officers to engage in CPD.
3. Provide adequate accommodation for overseas volunteers who wish to offer their services free of charge to South Sudan
4. Form links with institutions in developed countries and better-off African countries to support the health system in South Sudan
5. Establish comprehensive primary health care programmes in rural areas to stem the tide of rural-to-urban migration, a trend which compounds health problems in South Sudan.

Conflict of interests. The 2006 service was sponsored by USAID facilitated by AED for a modest incentive. The locum at Juba Medical Complex was after JTH ward rounds in 2010 and in the evenings in 2012. In return I received 70% of the consultation fee.

CMAM FORUM:

Calling all nutrition workers in South Sudan – join the new ‘Forum for the Community-based Management of Acute Malnutrition (CMAM)’

The CMAM Forum at www.cmamforum.org is an information sharing site which aims to:

- bring together resources and initiatives (protocols, guidance, reports, research, training, advocacy materials etc.) related to the management of acute malnutrition into one ‘home’
- summarise current thinking on different technical issues relating to CMAM through the development of ‘Technical Briefs’ and Frequently Asked Questions.

The forum allows you to be in contact directly with others, to share resources, ask for advice, etc. So the forum is a great way to meet other nutritionists around the world and know who is doing what. At the time of writing the forum had over 450 members in >60 different countries – with 5 in South Sudan. It links to three websites from South Sudan - one is SSMJ and another is the Nutrition Cluster South Sudan Website at <https://sites.google.com/site/nutritionclustersouthsudan/>.

So if you are dealing with acute malnutrition this is an important resource. It is easy to become a member and then you can share relevant resources by emailing cmamforum@gmail.com.

Also remember this WHO nutrition site at <http://apps.who.int/nutrition/en/contains> much useful information and is often updated

ANSWERS TO QUIZ

- A.** Answer number 2 is correct. Hypoglycaemia is a serious complication which may be aggravated by the effects of quinine. It is easy to diagnose with a bedside “stix” test and is reversed with intravenous glucose. Complicated malaria is usually accompanied by a haemoglobin of less than 5g/dl.
- B.** Answer number 2 is correct. Meningitis remains a possibility in any patient with impaired consciousness. Artesunate intravenously may reduce mortality from malaria by about one third compared to quinine. Diclofenac may be nephrotoxic. ALL members of the medical team are responsible for the close observation of our patients.
- C.** Only answer number 2 is true. Urbanised Africans have equal cardiovascular risks compared with Western

populations. Cancer deaths in Africa are 600,000 each year and a third are preventable.

D. Only answer number 3 is true. 90% of patients with haemorrhagic stroke have hypertension. Reduction in salt intake plays an important part in the management of hypertension in Africa as it does everywhere. There is some evidence that Black Africans are more sensitive than white people to the effects of reducing salt in their diets. Obesity has increased in Africa especially in urban populations.

E. Only answer number 1 is true. 95% of the world’s cases of guinea worm infestation occur in South Sudan and Ghana. Boiling or filtering drinking water is important. Zinc supplements are helpful in the management of diarrhoea.

Compiled by David Tibbutt, SSMJ.

The role of the research nurse

Tania Norman^a

Although this article draws on the UK experience of the author and may not be of immediate application to South Sudan, the principles of Research Nursing can be adapted to developing countries. In time some South Sudanese nurses may want to be involved in research.

This article explains what research is and why it is so important to health care. It briefly discusses how to set up a trial and the role of the Research Nurse based on my own experience.

What is research?

Research is vital in health care to support current practice and to inform better approaches and improve patient outcomes. "It helps us to diagnose, treat, cure or prevent health problems"[1]. Research can take many forms, such as testing a new drug, looking at different interventions and testing a theory. Clifford & Gough [2] say that "while there are multiple definitions of research, they share common themes - the two most obvious being:

1. A search for knowledge - and that it does so
2. In a systematic and scientific fashion."

Most nurses apply a problem-solving approach to their practice - the knowledge they use is often a combination of tradition, ritual, experience and authority.

A clinical trial refers to studies that test the effectiveness of a clinical treatment [3]; these can be in relation to a drug or medical research. Often the participants are healthy or have a specific medical condition. The trials vary in size from a small pilot study in one locality to multiple sites internationally.

Setting up a trial is a lengthy process that requires input from many different people before it can reach the hospital or area where the research is to take place. These people include statisticians, sponsors and chief investigators. When the research question and the design of the study have been agreed, a protocol (the action plan of the study) is written. When feasibility and funding have been established, the protocol needs ethics approval and in some cases approval by government or other authorities.

Role of the Research Nurse

The role of the Research Nurse in setting up a trial varies from place to place. Preferably the nurse has at least two years of general nursing experience and a degree in nursing.

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The nurse usually works with the Principle Investigator (PI) who holds overall responsibility for running the trial.

The role includes screening and recruiting patients for the trial, gaining informed consent from the patient or carer if the patient lacks mental capacity (as defined by the Mental Capacity Act 2005 [4]), communicating with the coordinating centre, reporting adverse events, recording data and educating staff. These roles are conducted whilst adhering to the trial protocol and the 1996 International Conference on Harmonisation (ICH) and Good Clinical Practice (GCP) standards for research [5].

My own experience

I became a Research Nurse when, after working in the community for some years, I was looking for a new challenge. I am employed by the hospital but partly funded by the South East Stroke Research Network (SESARN). The network is one of ten which facilitate stroke research in UK.

I had not worked in research before and the first 6 weeks were a huge learning curve. I had to attend several courses which included a research course. I have spent time with another Research Nurse and regularly attend Network meetings. These meetings include education sessions and opportunities to share ideas with the other research staff. I have been very fortunate to work with a very supportive PI (Dr Eluzai Hakim) and Research Manager.

A successful research nurse needs a PI who is keen and supportive, to be able to communicate well at all levels and to work both alone and as part of a team, and to be empathetic to the needs of both the patients and relatives.

References

1. SESARN (2012) "Induction and training file" St George's University of London.
2. Clifford C., Gough S. 1995 cited in Nolan M, Behi R. Research in Nursing, developing a conceptual approach. *British Journal of Nursing* (BJN), 4 (1): 47-50
3. Macnee, C. L. (2004) Understanding research Lippincott Williams & Wilkins.
4. The Mental Capacity Act (2005) Available at: http://www.direct.gov.uk/prod_consum_dg/groups/dg_digitalassets/@dg/@en/@disabled/documents/digitalasset/dg_186484.pdf (Accessed: 4th July 2012).
5. International Conference of Harmonisation of Technical Requirements for Registration of Pharmaceuticals for Human Use (1996) "Good clinical Practice" ICH Secretariat.

LETTERS TO THE EDITOR

Below is a response to the article 'Can primary health care staff be trained in basic life-saving surgery?' by Sunday Manoach Leet, Abraham Kot Gai, Andrew Adek and Giuseppe Meo published in SSMJ (vol 5 no3). Please send your comments to the Editor at opikiza@yahoo.com.

Dear Editor,

In response to the article "Can primary health care staff be trained in basic life-saving surgery?" published in the August 2012 edition of the South Sudan Medical Journal perhaps we could make the following observations.

There is little doubt that non-medically qualified personnel can be trained to undertake surgical procedures and where this training exists and there are suitably able people every effort should be made to utilise their skills. However, we have serious reservations about creating a surgical service which is based around non-medically qualified personnel for the following reasons:

1. There is a lot more to surgical care than just the operation and this requires wide-ranging knowledge of a number of subjects, including anatomy, physiology, pathology, therapeutics, the medical care of the surgical patient and the recognition and management of complications. All these form the basis of medical training. Practitioners without this training can only provide part of the care and in our opinion should be directly responsible to a doctor who is in overall charge of the patient.
2. It is recognised that there is a desperate need for immediate surgical care in South Sudan and a serious lack of healthcare professionals at all levels. It is however important to recognise that the "task-shifters" are only going to be fire fighters of the immediate problems. This does not address the issue of developing a structured health service for the medium and long term. We believe that a doctor led system has stood the test of time but it is for the Government of the Republic of South Sudan to determine policy on this matter and we should respect their views. We would be concerned at the development of a healthcare structure which was not part of the Ministry of Health Strategic Plan. Furthermore we should not proceed with developing healthcare professionals, possibly at variance with government policy, without clarity as to their precise lines of responsibility, range of practice, validation of training, registration and where they fit into the long term structure.
3. There is a substantial number (possibly as many as 200) of doctors of South Sudanese origin across North and South Sudan who have had basic medical training, have the basic knowledge and achieved a medical qualification but have had no opportunity for postgraduate training to enable them to work effectively at the District level. Surely it would be sensible to focus on developing this cadre of healthcare professional who would then be able to increase the medical staffing in the Primary Health Care Centres and County Hospitals, promote a comprehensive surgical service and would also be in a position to provide on the job training to non-medically qualified

assistants who would work under their supervision and in a supportive role.

In conclusion, we believe that the training of "task-shifters" without the concomitant training of doctors to supervise them could be a retrograde step and this could even impede health service development. Furthermore they should be an integral part of a structured health service in line with the medium/ longer term strategy of the Government of the Republic of South Sudan.

Tim Walsh, BSc, MS, FRCS

Eluzai Hakim, FRCP (Edin & Lond), DTM&H

Endorsed by **John Adwok**, Consultant Surgeon

One of the authors of the original article has sent the following reply to the letter above:

Dear Editor,

There is no doubt that all the points underlined by the colleagues are correct and wise. We fully agree with their opinions. The aim of the article was exactly to spark a debate on the issue and collect contributions on the applicability of the task shifting strategy in South Sudan. We believe that it is absolutely important to support the Government of South Sudan in the development of the health sector and, as an organization, Comitato Collaborazione Medica has always worked in this direction and aimed to fulfill the Ministry of Health requirements. However, we also believe that South Sudan could benefit a lot from the application of the experience of bordering countries where the strategy has been endorsed by their Ministries of Health and applied widely. The strategy is applicable to qualified staff, including medical doctors, and is based on specific training and on selected high impact interventions.

When we started our project of Primary Surgery in remote areas of South Sudan in 1991/92 the insufficiency of the health care system was dramatic. The lack of professionals was impressive too and in some areas there were no qualified professionals of any level. Wherever Comitato Collaborazione Medica had the opportunity, it employed and trained qualified health professionals.

In this regard, we take the opportunity to wish an even closer and broader collaboration with the Ministry of Health, evaluating opportunities of training, especially on life-saving interventions for ministry employees.

Giuseppe Meo

Comitato Collaborazione Medica, Consultant Surgeon

Resources

Maternal, neonatal and child health

The Healthy Newborn Network (HNN)

HNN (at <http://www.healthynewbornnetwork.org>) is a partnership of organizations and individual members committed to improving newborn health around the world. HNN connects advocates around the world and provides a platform for discussions and interactions on newborn and maternal health topics. It has a vast library of newborn health resources, featuring the latest in newborn health research, news, resources, events, articles, videos and success stories from around the world. See <http://www.healthynewbornnetwork.org/topics>. Join the network at the website.

Effect of using HIV and infant feeding counselling cards on the quality of counselling provided to HIV positive mothers: a cluster randomized controlled trial

The aim of this study was to determine the effect the World Health Organization HIV and infant feeding cards on the quality of counselling provided to HIV positive mothers in Zambia by health workers about safer infant feeding options. It was concluded that the addition of counselling cards to the counselling session for HIV positive mothers were a valuable aid to counselling and significantly improved the quality of the counselling session.

Ref: Effect of using HIV and infant feeding counselling cards on the quality of counselling provided to HIV positive mothers: a cluster randomized controlled trial. Katepa-Bwalya M, Kankasa C, Olusegun Babaniyi O, Siziya S. International Breastfeeding Journal. 2011, 6:13.

Caring for the newborn at home: A training course for community health workers

These training materials from WHO draw on experiences of training community health workers in caring for the newborn at home in several research studies, particularly the SEARCH study in India and the NEWHINTS study in Ghana. The materials provide guidance for community health workers to conduct home visits in the antenatal period and the first weeks after the baby is born. They promote that families seek care from a skilled health professional for antenatal care and care at birth and support families in adopting appropriate home care practices for the mother and baby, during pregnancy and after childbirth. The materials include a manual, facilitator's guide and counseling cards.

Download the document at

http://www.who.int/maternal_child_adolescent/documents/caring_for_newborn/en/index.html

Family Planning: A Global Handbook for Providers offers clinic-based healthcare professionals in developing countries the latest guidance on providing contraceptive methods. Updated in 2011, the book focuses on the family planning essentials that health workers need to provide quality care to their clients. The handbook includes the medical eligibility criteria for contraceptives, job aids (including a wall chart on methods), and many other useful resources. WHO considers this handbook one of the four cornerstones of family planning guidance. On the revised website at <http://www.fphandbook.org> users have new ways to navigate and explore this Handbook and its contents.

Malawi and childhood pneumonia care

A pilot Child Lung Health Programme (CHLP) in Malawi has demonstrated that delivering standardised case management for severe and very severe pneumonia in children younger than 5 years of age can reduce case fatalities by more than 55%.

The model involves training health-care staff in standard case management, ensuring adequate stocks and uninterrupted supply lines of drugs and laboratory materials, programme supervision and monitoring through consistent data collection and analysis, accountability and transparency, regular external evaluation, and government commitment. The success of the CHLP in Malawi demonstrated that standardised case management is possible in resource-poor settings using a simple clinical assessment strategy, antibiotics aimed at the common bacterial pathogens and effective management of hypoxia for the most severe cases. One of the important aspects of CHLP is that it incorporates Malawi's existing structure of health services, and is implemented by hospital personnel who were already working on the control of acute respiratory infections and the integrated management of childhood illnesses.

Ref: Mullins J. 2012. Malawi breathes new life into childhood pneumonia care. The Lancet, Volume 380, Issue 9843: 717, 25 August 2012

The State of the World's Children 2012, Children in an Urban World

This UNICEF report focuses attention on the needs of

children in urban areas. One billion children live in urban areas, a number that is growing rapidly. Disparities within cities reveal that many children lack access to schools, health care and sanitation, despite living alongside these services. See www.unicef.org/sowc2012

BMI and BMI-for-Age Look-Up Tables for Children and Adolescents 5–18 Years of Age and BMI Look-Up Tables for Non-Pregnant, Non-Lactating Adults ≥ 19 Years of Age (2012)

These tables are a quick reference for health care providers to use to help determine the nutritional status of children over 5 years of age; adolescents; and non-pregnant, non-lactating adults. Practice exercises are available to assist health care providers in using the tables. See <http://www.fantaproject.org/publications/BMI-charts.shtml>.

HIV/AIDS

Review of delivery of HIV and tuberculosis services in sub-Saharan Africa

This review identifies and synthesises published evidence for the effectiveness and cost-effectiveness of eight integrated strategies recommended by WHO that represent coordinated delivery of HIV and tuberculosis services. Evidence supports concurrent screening for tuberculosis and HIV, and provision of either co-trimoxazole during routine tuberculosis care or isoniazid during routine HIV care and at voluntary counselling and testing centres. Although integration of antiretroviral therapy into tuberculosis care has shown promise for improving health outcomes for patients, evidence is insufficient to make conclusive claims. Evidence is also insufficient on the accessibility of condoms at tuberculosis facilities, the benefits of risk reduction counselling in patients with tuberculosis, and the effectiveness of tuberculosis infection control in HIV health-care settings. The vertical response to the tuberculosis and HIV epidemics is ineffective and inefficient. Implications for policy makers and funders include further investments in implementing integrated tuberculosis and HIV programmes with known effectiveness, preferably in a way that strengthens health systems; evaluative research that identifies barriers to integration; and research on integrated strategies for which effectiveness, efficiency, and affordability are not well established.

Ref: Integrated delivery of HIV and tuberculosis services in sub-Saharan Africa: a systematic review. Uyei J, Coetzee D, Macinko J, Guttmacher S. *The Lancet Infectious Diseases* - Vol. 11, Issue 11, Pages 855-867.

Telling children about their HIV status

'Health care workers are often without the support of

definitive, evidence-based policies and guidelines on when, how, and under what conditions children should be informed about their own or their caregivers' HIV status', says a new guideline from WHO, published November 2011. See http://whqlibdoc.who.int/publications/2011/9789241502863_eng.pdf

Self-reported dietary intake and appetite predict early treatment outcome among low-BMI adults initiating HIV treatment in sub-Saharan Africa.

Low BMI is a major risk factor for early mortality among HIV-infected persons starting ART in sub-Saharan Africa and the common patient belief that antiretroviral medications produce distressing levels of hunger is a barrier to treatment adherence. The authors assessed relationships between appetite, dietary intake and treatment outcome 12 weeks after ART initiation among 142 Zambian HIV-infected adults with advanced malnutrition (BMI<16) and immunosuppression.. A 500 kJ/d higher energy intake at any time after ART initiation was associated with an approximate 16 % reduction in the hazard of but the relative contribution of carbohydrate, protein or fat to total energy was not a significant predictor of outcome. Appetite normalized gradually among survivors and hunger was rarely reported. It was concluded that poor early ART outcomes were strikingly high in a cohort of HIV-infected adults with advanced malnutrition, and mortality was predicted by lower dietary intake. Intervention trials to promote post-ART intake in this population may benefit survival and are warranted.

Ref: *Public Health Nutrition* 2012 Jun 13:1-10. [from ProNut-HIV 19 August 2012 www.pronutrition.org]

Non-communicable diseases

Diabetes and TB in Tanzania

Due to the association between diabetes and pulmonary tuberculosis (TB), diabetes may threaten the control of TB. In a prospective cohort study nested in a nutrition trial, the authors investigated the role of diabetes on changes in anthropometry, grip strength, and clinical parameters over a five months follow-up period. The concluded that TB patients initiating TB treatment with diabetes co-morbidity experience delayed recovery of body mass and haemoglobin, which are important for the functional recovery from disease.

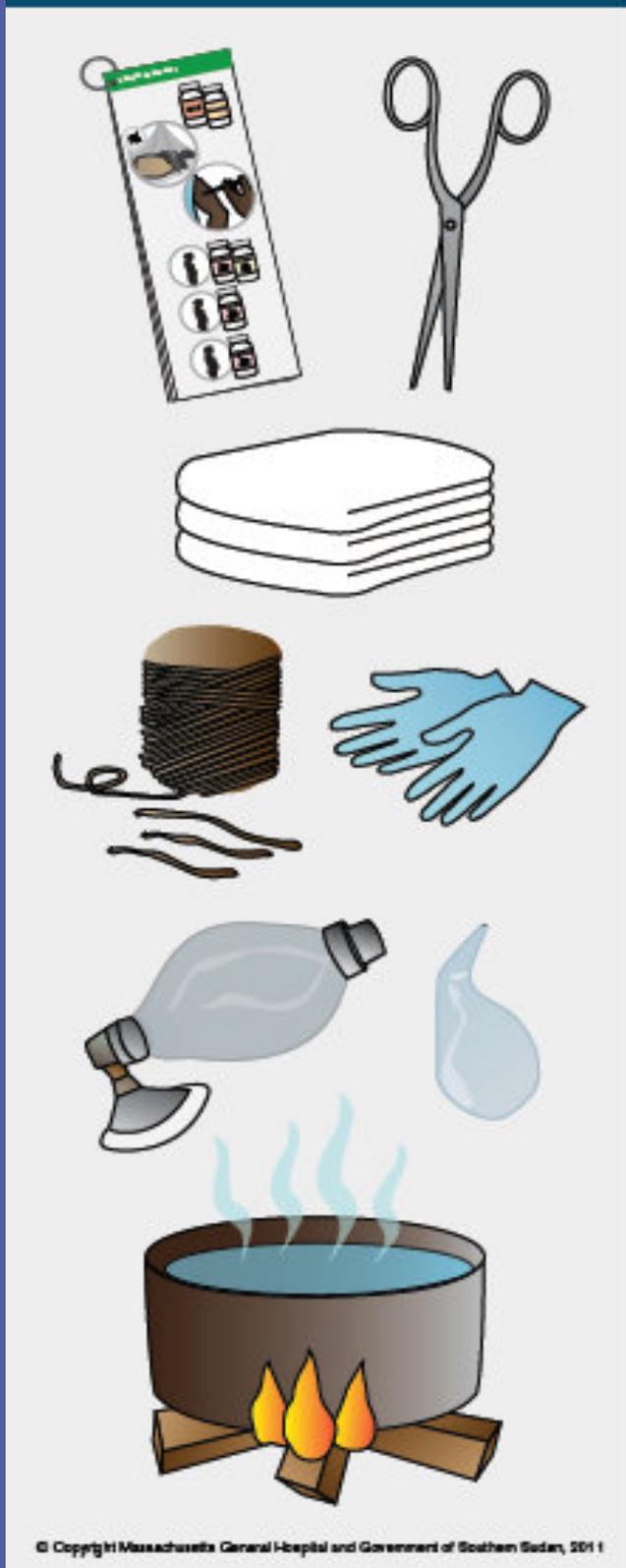
See: *BMC Infectious Diseases* 2012 Jul 27;12(1):165. The role of diabetes co-morbidity for tuberculosis treatment outcomes: a prospective cohort study from Mwanza, Tanzania. <http://www.biomedcentral.com/content/pdf/1471-2334-12-165.pdf>

[from pronut-HIV forum at www.healthnet.org].

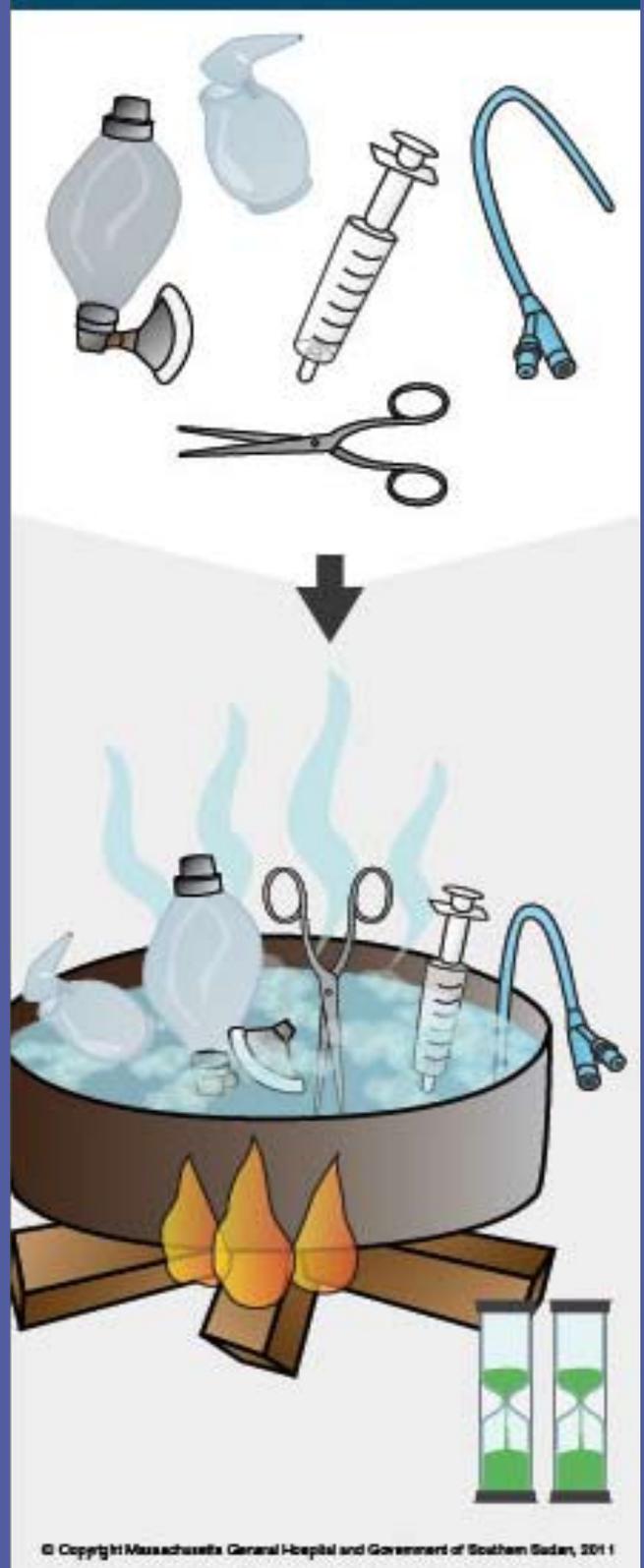
Examples of checklists for community-based frontline health workers in South Sudan

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 basic steps community-based providers can use to prepare for a safe delivery. For more information, please contact: Dr Thomas Burke, tfburke@partners.org.

PREPARING FOR DELIVERY



PREPARING FOR DELIVERY



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.