HIV Nursing matters

A Magazine of the Southern African HIV Clinicians Society

Talking to children about their HIV status

Principles of HIV drug resistance for clinical management

Feeding an infant that is infected with HIV (Part 1)

September 2013 Volume 4 No. 3

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inside

SOUTHERN AFRICAN HIV CLINICIANS SOCIETY

HIV Nursing matters

focuses on ARV and TB Drug Resistance (Part 1)

on cover

Talking to children about their HIV status

Principles of HIV drug resistance for clinical management

Feeding an infant that is infected with HIV (Part 1)

guest editorial

By Professor Rene Phetlhu

Associate Professor & Head of Clinic Department in the School of Nursing, U.W.C., President of Tau Lambda at – Large chapter of STTI.

It is important to remember that our role as caregivers goes beyond physical care to include emotional and psychological wellbeing of our patients.

ARV resistance is a reality that has been reported in many research studies across the globe. A study done in Gabon showed that 58% of their sample with a mean of 17.7 months on ARV drug experience showed major mutations which induced resistance to mainly NRTIs (nucleoside analogue RT inhibitors) Vergne et al, 2002). In South Africa, the picture varied from 17% - 80% in different regions; however the reality is that many patients experience ARV drug resistance due to failure of a first HAART regimen. In order to avoid the rapid emergence of resistant viruses on a large scale, it will be important to ensure that the infrastructures and skills necessary to monitor ARV treatment are also rapidly developed.

Nurses play a significant role because they are the first to come into contact with the patients after they have started their ARVs. Hence continued surveillance of resistance patterns is warranted. Nurses need to be vigilant with regards to the patient's progress and report the detected abnormality such as poor weight gain, increase in the viral load and continued reduction of CD4 count cells. As nurses we can save many lives by taking up our advocacy role and ensuring that further steps in the care continuum are taken by clinicians before it is too late.

It is important to remember that our role as caregivers goes beyond physical care to include emotional and psychological wellbeing of our patients. Patients on ARVs are not only grappling with physical symptoms but have personal and societal dilemmas to deal with. Decades into this epidemic, stigma, TB co-infection and access to care is still a challenge. Therefore talking to patients about viral load which is the topic of one of the articles in this magazine could have a significant impact on their emotions. Most importantly, speaking the same language as nurses and in a simplified level for the patient will not only ensure their comprehension but will also strengthen their trust in our health system.

As we engage in this feature, the authors will stimulate debates on current topic like adherence intervention tools, managing TB in the new era of diagnostics and profiling of one of the historical hospital in our country, the Helen Joseph Hospital. As we embark on this informative journey, let us remember that we have an obligation to care for our patients in totality. That is what authentic nurses do. R

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Nurses play a significant role because they are the first to come into contact with the patients after they have started their ARVs

HIV Nursing matters

Message from the president

For more information contact
SA HIV Clinicians Society
Suite 233 Post Net Killarney
Private Bag X2600
Houghton
2041

www.sahivsoc.org

Message from the President
Dr Francesca Conradie
President Southern African
HIV Clinicians Society

We went through a training period and now are focussing on making sure that all those who fit into the priority groups are now getting them.

It is hard to believe that we are entering the final quarter of 2013. A lot has happened already this year but it is still a while before the end of it. In terms of HIV treatment care and support, we have some interesting developments at the beginning of the year- the introduction of the Fixed Dose Combination which antiretroviral therapy so easy to take. We went through a training period and now are focussing on making sure that all those who fit into the priority groups are now getting them. We can look back with pride at our programme- over 2 million South African on treatment.

But as with all new endeavours, there is an exciting time in the beginning but now we are in the hog slog period of getting as many HIV infected people in our region onto treatment as we can. It means getting the basics right- identifying HIV infected individuals, good adherence counselling in the beginning and adherence support for life associated with an uninterrupted drug supply. However, despite out best efforts resistance to antiretroviral therapy will occur. We have patients who have failed their first line therapy and had to change to second line. In the latest tender, the so- called third line drugs have been included. This means we have more and more medications to treat our patients but the newer drugs must be prescribed correctly. The only way to be able to decide on what a third line regimen should be is to do a resistance test. But there are guidelines on when and how to do this tests as well as how to interpret them. Our plan at the Society over the next while is to provide you with the tools to do this. I hope you enjoyed the case study book that was included in the last edition. And there will be more helpful points as time goes on.

And finally, before I go, remember that next year, we will be hosting our next conference in 2014. I know it seems a long way away but you need to be adding this to your diaries already. Save the date- 24-27th September 2014 ®

We can look back with pride at our programme- over 2 million South Africans on treatment

news

NURSING FOUNDATION OF SOUTH AFRICA

support • recognize • inspire

Leana R Uys

Rural work settings might make it difficult to access continuing education and since Continued Professional Development (CPD) is not yet compulsory, there is not a system of targeted affordable programmes nurses can access.

Introduction

Almost every person living in South Africa will experience the care of a nurse or midwife during their lifetime. And most people meet these nurses and midwives when they are feeling less than their best, and need help. So we all have an interest in ensuring that we have good nurses and midwives in the country.

South Africa has a primary health care system and a range of hospitals which is heavily dependent on large numbers of good nurses and midwives. A good nurse or midwife is a professional who is well prepared educationally, and practices competently according to professional and ethical standards. Nurses form the most visible part of the health system, since they are present everywhere – in the most rural clinics, in hospitals and even on the factory floor.

Nurses and midwives usually receive their education and then start working, often in challenging situations. They often work for many years with limited resources spent on their further development and on keeping their knowledge up-to-date. Rural work settings might make it difficult to access continuing education and since Continued Professional Development (CPD) is not yet compulsory, there is not a system of targeted affordable programmes nurses can access. They often also work in poorly resourced settings and with a workload that is much more than is healthy. Nursing and midwifery in South Africa is not for sissies!

The Nursing Foundation is a Trust Fund was therefore established to support nursing practice, education, and research in South Africa. Many nurse may remember the old "Nurses' Trust Fund" which used to support retired nurses. This new Foundation is also a registered Trust Fund, but aims at supporting practicing nurses and midwives.

The Nursing Foundation of SA

The objectives of the Nursing Foundation are to financially support the nursing profession in South Africa by means of supporting innovation in Higher Education Institutions offering nursing programmes, innovation in nursing services and research and national nursing organizations to improve quality and quantity of nursing education, practice and research. The Foundation does not support individuals for education or research, but supports all categories of nurses from all sectors of the health services in the country. Midwives are included in all the activities of the NF.

The Foundation is governed by a Board of Trustees consisting of three trustees both from within and from outside the profession. The trustees serve for a period of five years, and may be re-nominated. Currently the three trustees are Ms N Gcaba (Chair) who is partner and chair of Spoor $ Fisher Attorneys, a leading Intellectual Property attorney in Johannesburg, Professor R Thompson, Professor Emeritus of the University of Cape Town and Dr Sharon Vasuthevan, Director of Nursing at the Life Healthcare Group. The founder of the NF is Professor Leana Uys, Professor Emeritus of the University of KwaZulu-Natal.

The work of the Foundation

The Nursing Foundation receives donations and then uses the money to launch projects that will achieve the objectives of the Foundation. The Foundation is very interested in developing a new generation of nurse leaders who can innovate to solve the problems in the health system and in nursing.

"Many of the current nurses who are retiring or soon to retire have made an enormous contribution to nursing. But we need to make sure there is a next generation who can take up the challenges. We must also make sure that there is financial support for innovative initiatives in nursing" says the founder, Professor Leana Uys.

Currently the funded projects for which **individuals** may apply are:

- Sponsoring a nurse/midwife to attend the "Flourish 2013" conference in 9&10 September 2013. This is a conference in Pretoria, aimed to developing innovation. Sponsoring a nurse to attend such a conference aims at developing nurse leaders who can think "out of the box". The applications for this grant have already closed.
- Sponsoring a nurse/midwife to attend the "Inclusive Health Innovation Summit" in Cape Town January 2014. Again, this is a conference aimed at innovation and entrepreneurship and puts future nurse leaders in a multi-professional group to think about and plan for the future health system of the country. The closing date for this conference is end of September 2013.

The funded projects for which **nursing organizations and health care institutions** may apply are:

- Sponsoring a health care institution to implement a Healthy Work Environment project in 2014. It has become clear that a workplace that is healthy for its employees (including nurses) and their patients, should be characterized by skilled communication, true collaboration, effective decision-making, appropriate staffing, meaningful recognition and authentic leadership (AACN, 2011). To promote the development of such workplaces in South Africa, the NF foundation will make funds available for the winning health care institution to initiate a HWE plan. The applications close on the 30th September 2013 for implementation in 2014.
- Sponsoring a health care institution or national nursing professional organization to implement a project promoting professionalism and caring in so doing, fostering a culture of integrity and justice in 2014. This project plan may be submitted by either a professional nursing organization or by a health care institution and should also be submitted by the 30th September 2013.

All four grants are competitive and details and application forms can be found on the website www.nursingfoundation.co.za

The objectives of the Nursing Foundation are to financially support the nursing profession in South Africa by means of supporting innovation in Higher Education Institutions offering nursing programmes

The nurses and midwives of South Africa can support the work of the Nursing Foundation in a variety of ways. They can spread the news about the Foundation as widely as possible so that potential grantees may know what is available, they can assist nurses and midwives who do not have access to the web to get hold of the application forms and they can encourage individuals or groups to apply. The NF will also appreciate any donations from individual or groups.

Conclusion

The Trustees will in future endeavor to increase the income of the Foundation so that it can do more. But we need the profession to embrace and support the new organization and see it as a support and a partner in building nursing and midwifery in South Africa. R

Award winning rapid test device to deliver improved HIV testing in Africa

Australian healthcare company, Atomo Diagnostics, is bringing to market Atomo Rapid™ HIV, an innovative all in one rapid HIV test that significantly improves ease of use and the reliability of rapid HIV testing in the field.

Rapid testing is recognised as an increasingly important weapon in the fight to bring HIV/Aids under control in South Africa and other high disease burden countries. Whilst performance of most rapid HIV tests in the laboratory is very good, the use of complicated HIV test kits under real world conditions typically results in a significant reduction in the accuracy of HIV testing in the field.

A large South African study proved that the actual sensitivity of HIV test kits used outside of the laboratory was on average 93.5% and even with additional training and quality control improvement increased to only 95.1%. Across Africa, this potentially results in several hundred thousand people being misdiagnosed with HIV every year. Understandably, the effect of misdiagnosing a person who is HIV positive can

be devastating and invariably results in increased transmission. Consider the impact of the disease and stigma on families and relationships, loss of income and cost of treatment – all of which may have been avoided by using next generation testing device.

John Kelly, the CEO & Founder of Atomo Diagnostics says, "AtomoRapid™ was developed to provide a better way to perform rapid testing. Through collaborative commercialisation of this product, we are enabling both healthcare professionals and patients to trust the accuracy of their HIV test result."

AtomoRapid™ HIV can save lives by replacing the need to use a complicated test kit with inherent problems. This makes the AtomoRapid™ HIV test a lot simpler to perform and removes the need for manual steps requiring extensive skill and clinical training. In doing this AtomoRapid™ HIV removes the source of many errors common with current generation test kit based procedures.

To ensure superior performance, the AtomoRapid™ HIV product uses a proven HIV test strip that has been WHO Pre-qualified and sold in the market for many years. Atomo now delivers this test in the field as a next generation solution specifically designed to meets user's needs and reduce misdiagnosis.

"The Atomo team has been working hard towards making AtomoRapid™ HIV available to the market and the response we have received so far has been fantastic – we now look forward to collaborating with leading organisations to change the Rapid HIV testing landscape," says Kelly who presented during the 6th SA Aids Conference. AtomoRapid™ HIV will be available to customers in the coming months.

We ask for interested parties to make contact with us on the details below to register interest.

For more information on AtomoRapid™ HIV please contact:
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Rest of World +61 (0)2 9089 7604
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www.atomodiagnostics.com

For media enquiries please contact:
CLE Communications
Danielle or Camilla on 021 7626001
or Danielle@clecomms.co.za / Camilla@clecomms.co.za

About HIV in South Africa:
South Africa has the highest prevalence of HIV/Aids in the world, at over 10% of the population, 5.6 million people. Given this high prevalence both the public and private sector are making a concerted effort towards containing the epidemic. Key organisations such as the Southern African HIV Clinicians Society and the South African Business Coalition on Health & Aids are working hard to curb this epidemic and Atomo is working closely with them to achieve that.

About Atomo Diagnostics:
Atomo is an Australian based healthcare company with a focus on product development and usability. Atomo develops and commercialises next generation solutions that address unmet user needs in the diagnostic industry. ®

AtomoRapid™ HIV can save lives by replacing the need to use a complicated test kit with inherent problems.

12 Annual Nursing Unit Management Conference Report

By Nonhlanhla Motlokoa
Nurse Project Manager, Southern African HIV Clinicians Society, Johannesburg.

I was pleased that HAI included a financial service provider in their conference to give sound financial advice to delegates. It is unusual for a health conference to include financial education.

The 12th Annual Nursing Unit Management Conference was hosted by the Health Advance Institute (HAI) on the 29th and 30th of August 2013 at Sandton Convention Centre-Johannesburg. The conference was mainly attended by Nurse Managers from both private and government hospitals.

The Health Advance Institute (HAI) is a "health care management company geared to deliver high quality and cost effective medico-management solutions to the health care industry". Their website (http://www.hai.co.za/About_Health_Advance_Institute.php) states that they offer three core services to clients continuing professional development, consultancy, and employee wellness programmes.

The conference was attended by approximately 40-45 delegates from all over South Africa who manage staff in their respective place of employment. Topics covered were very informative and thought provoking. The presenter who impressed me most was an attorney from Webber Wentzel, Ms Lisa Swaine. Ms Swaine works as a defending lawyer for nurses who face charges related to their profession and duties. She gave practical examples from cases she's worked on, e.g. negligence, acting out of scope of practice. She emphasised the importance of record keeping and acting within one's scope of practice.

I hope most of us know that there are new nursing qualifications and nursing practice guidelines? These will be implemented by 2015 The goal of these changes is to increase the number of professional nurses in the country, as stated by The National Strategic Plan For Nurse Education, Training and Practice 2012/13-2016/17.Go to www.denosa.org.za to access the PDF file of this manual. Professor Sue Armstrong from Wits University elaborated more on this topic, explaining and ironing out all the confusion among delegates, the confusion was about the new category of nurses i.e. "staff nurse" replacing the nurse category of enrolled nurses. Currently enrolled nurses are known as staff nurses, and their training takes two years. In future the training will be for three years and they will be called staff nurses and no longer enrolled nurses. Delegates were divided into groups to discuss and present cases given by the professor in connection with the new qualifications; most of us had fun and the whole process was engaging and very participative.

Other managerial topics covered were discipline in the workplace, managing negativity in the work place, management of night shift nursing, antibiotic stewardship and employee financial wellness. I learned that it is very important to root out negativity in the work place because it affects the way people work and it brings down staff morale.

I was pleased that HAI included a financial service provider in their conference to give sound financial advice to delegates. It is unusual for a health conference to include financial education. According to Mr John Manyike from Old Mutual, 78% of disposable income goes to servicing debt and 4.2 million consumers have judgements or are listed on credit bureaus. Some nurses overcome debt by working non-stop without rest; for example, nurses may pick up extra shifts or work on their days off. The lack of adequate rest contributes to exhaustion and burnout. Further, one of the dangers of not taking sufficient time off is that one may become more prone to accidents or negligence on the job. Advice and tips on how to manage finance and avoid debt were given. Judging by the questions from the delegates one could see that more financial information is needed amongst nurses.

Overall I found the entire conference to be very informative and well planned; all of the speakers were of a high calibre. The food and venue also matched the high standard of the conference. Overall, it was time well spent. Ⓡ

According to Mr John Manyike from Old Mutual, 78% of disposable income goes to servicing debt and 4.2 million consumers have judgements or are listed on credit bureaus

TO TELL OR NOT TO TELL: TALKING TO CHILDREN ABOUT THEIR HIV STATUS

It is generally accepted that disclosure of HIV status has significant benefits including improved treatment adherence, better psychological adjustment, access to psychosocial support and the strengthening of relationships[16].

M. J Vujovic
Independent consultant and Clinical Psychologist, HIV and AIDS, Children's Sector
M. J Vujovic, BA Hons, MA Psych, PhD.

Some 460 000 children below the age of 15 years are living with the HIV in South Africa[1] An estimated 152 000 children are receiving antiretroviral treatment[2]. However research suggests that disclosure prevalence amongst children is generally low and that large numbers of adolescents do not know their HIV status.[3-9]

In South Africa where the majority of children living with the virus were infected through mother-to-child transmission, the parent or caregiver is the custodian of this information and disclosure generally rests with them[3]. However disclosure of a child's HIV status also frequently involves the support of the healthcare provider.

The healthcare provider may also be involved in a decision to disclose parental HIV infection to a child when parents turn to them to help smooth the way and facilitate psychological adjustment in the child. Given the success of South Africa's prevention of mother-to-child (PMTCT) programme disclosure by HIV positive parents to HIV negative children may need to receive more attention.[4]

The government's HIV counselling and testing campaign which encourages all South African's to know their status represents another context for disclosure where healthcare providers may be called upon to disclose a positive result to a young person who has undergone HIV counselling and testing either alone or with the support of an adult. In these circumstances, there is a valuable opportunity to guide and assist young people who were behaviourally infected.

Under South African law children of 12 years or below with sufficient maturity can consent independently to an HIV test and in these circumstances it will be the responsibility of the healthcare provider to counsel the individual, including disclosing their status, in a manner that is non-judgemental and sensitive to his or her needs. Where a child is under 12 years and deemed not capable of giving consent, disclosure generally involves the parent or caregiver[5].

Importantly, the law states that children who are sufficiently mature to consent to testing, are entitled to exercise their right to confidentiality.[6] In other words they can decide who they want to tell. In the context of HIV counselling and testing for example, young people who test independently are generally encouraged but never pressurised to disclose to a person they trust. However when they are ready they may need help disclosing to family members, a sexual partner or a peer.

Regardless of the circumstances, disclosure can be difficult and often poses challenges for healthcare providers who feel unsure about the correct approach to adopt and worried about whether or not they have the skills necessary to support the disclosure process.[7]

The World Health Organisation's guideline for disclosure counselling of children up to 12 years of age recommends that disclosure is viewed as a process rather than as a one-off event and states that it requires a developmental orientation. The guideline proposes that cognitively and emotionally mature children of school going age should know their HIV status, whilst younger children should be given information about their health incrementally.[8] Nevertheless studies show that when the time comes there is often difficulty in moving from a simple idea, for example talking about 'being sick', to using and explaining the term 'HIV'.[9]

A developmental approach to disclosure suggests the need for a solid understanding of the stages that characterise development and how these shape the way in which the causes and treatment of illness are understood.[10-12]

This knowledge helps those working with children and adolescents to explain different aspects of illness in a way that is meaningful for the child. For example, a pre-school child will know what it means to be sick, but is unlikely to appreciate the cause and effect nature of illness. Information is best kept simple and initially it is better to talk about 'germs' (partial disclosure) rather than HIV (full disclosure) and add more detailed and complex information as the child gets older.

Brainstorming different approaches to disclosure with parents or caregivers can be useful since they will know what interests the child and can also assist the healthcare worker in determining the child's level of cognitive and emotional maturity. Creative approaches are often called for. Children respond well to drawing, playing games or interacting with dolls or puppets that can be introduced to facilitate conversations about health, medication and so forth.[11]

Conversations with caregivers about status disclosure should start as early as possible – in infancy - in preparation for full disclosure in the future. Since there is often extreme anxiety about disclosure, healthcare providers addressing this issue at any stage of the child's development will need to devote time to working through the obstacles that commonly get in the way of the disclosure process. These include feelings of guilt, insufficient knowledge and information, a wish to protect the child, unresolved issues such as loss, and fear that the child might disclose indiscriminately to others.[13-14] Such concerns may need to be addressed over several sessions with the understanding that there are likely to be fluctuations between uncertainty and certainty about the need to disclose.

A model that has considerable relevance to healthcare proposes that patients tend to shift between various stages before they are finally ready to change their behaviour [15]. Pre-contemplation (not being ready to change), contemplation (thinking about change),

and preparation (readiness to change) are stages leading up to the point of action (change is made). In the context of disclosure the model indicates that it is best to meet the caregiver at his or her level of readiness rather than intervening inappropriately.

There are numerous ways in which assistance can be provided, for example by helping in the development of a disclosure plan that outlines how much information will be given, who will give it, and when and where the discussion will take place. The healthcare provider may also suggest a role play where caregivers can practice starting the conversation, dealing with possible outcomes and anticipating and responding to requests for information.

Caregivers also often benefit from referral to a support group where disclosure issues can be discussed and worked through. In these groups men and women who have successfully disclosed to their children are often introduced as role models who provide encouragement and build confidence in others.

It is generally accepted that disclosure of HIV status has significant benefits including improved treatment adherence, better psychological adjustment, access to psychosocial support and the strengthening of relationships[16]. However it is also beneficial for caregivers who often experience secrecy as a burden and describe a sense of relief when they are finally able to speak freely. Similarly many children suspect

Steps Towards Status Disclosure	What Helps	What Hinders
Younger Child		
Talk to caregiver/ parent about disclosure early on; provide information; introduce idea of partial disclosure	Caregiver is given time to prepare	Caregiver may only consider when a problem arises
Devote time to addressing any worries or concerns the parent or caregiver might have	A supportive relationship is built between healthcare provider and parent/ caregiver	Possible obstacles to future disclosure not resolved
Assess child's level of emotional and cognitive maturity	Approach tailored to child's level of understanding	Child's level of understanding not taken into account; process delayed
Help caregiver/parent to draw up an age-appropriate disclosure plan relevant to child and his/her needs	Parent /caregiver is empowered to start disclosure process	Parent/caregiver delays due to fear etc
Support parent/ caregiver to provide age-appropriate explanations of illness e.g. germs in the blood	Parent-child relationship strengthened	Caregiver/parent gives child inaccurate or unclear information
Use clinic visits to reinforce age appropriate messages	Opportunity to build child's knowledge/ skills of caregiver/parent.	Child is excluded from conversations
School Age Child		
Revisit initial plan; talk about more detailed information tailored to child's level of understanding e.g. name the germ as a virus	Parent /caregiver empowered to take next step	Caregiver avoids child's questions; leads to suspicion, confusion or anxiety
Identify approaches that would be best for child e.g. drawing, painting and initiate with caregiver	Child participation is fostered	Child not given chance to talk about concerns; may obtain inaccurate information from others
Use clinic visits to reinforce messages and answer any questions	Opportunity to build child's knowledge and skills of caregiver/parent	Child may not see reason for taking medication/missing school to visit clinic
Assess caregiver and child readiness for full disclosure	Meet caregiver and child at level of readiness	Child may be ready; suspicion of diagnosis may cause emotional problems
Draw up plan, who, when, where and how	Acknowledge parent as authority on best approach	Child may guess or find out accidentally from others
Agree post disclosure support plan	Child accesses psychosocial support; develops important skills e.g. coping.	Child cannot access support groups etc; lacks skills and knowledge
Full disclosure of status e.g. virus named as HIV; how medication works; possible to live healthy life	Open and honest communication, build parent-child partnership to maintain health	Disclosure delayed: parent-child relationship eroded; adjustment complicated by adolescent concerns.

Source: MJ Vujovic (2013)

their diagnosis but are left to grapple with private fears and anxieties until such time as they are told 'officially'. Contrary to the concern of caregivers studies show that although there may be a negative response initially, there are positive long-term benefits. Delaying disclosure until adolescence, particularly when this has involved some form of deception, seems likely to increase negative emotions and make adjustment more difficult [17].

Adolescence is a challenging time characterised by extensive change. It is during this period that young people start to form romantic relationships and to explore their sexuality. An adolescent who knows his or her status can make more responsible choices for example adhering to treatment and engaging in safer sexual practices to protect his or her health and avoid passing on the infection. However disclosure to others (onward disclosure) brings with it the risk of rejection or breaches of confidentiality. Helping adolescents to manage this is important and may involve encouraging the young person to think through their decision, including possible outcomes[18].

The effects of stigma are widely felt and psychosocial interventions that build skills such as problem solving and decision making are a necessary component of post-disclosure support.

In a clinic context where it is not always possible for patients to see the same healthcare provider at every visit, it is important to keep track of the disclosure process.[19] Use of symbols in the patient file, for instance a quarter, half and full moon to reflect progress towards disclosure serve as a reminder of the on-going need for conversation, ensure that questions are not repeated and help to assist with monitoring and evaluation of the process.

Since the challenges of disclosure can be compounded by uncertainty about policy and guidelines, it is useful to be familiar with the Children's Act, No 38, 2005 and related policy documents. Healthcare providers can also draw on local resources such as the legal, ethical and counselling guidelines related to HIV testing for children and adolescents [6] and will soon be able to refer to the National Disclosure Guideline for Children and Adolescents which is currently in the pipeline. R

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Conversations with caregivers about status disclosure should start as early as possible – in infancy - in preparation for full disclosure in the future.

Talking to Patients about VIRAL LOAD

V A Duminy
District Manager, Institute for Youth Development South Africa (IYDSA)

A good relationship with the client allows the freedom for him to come to the healthcare worker to discuss drug toxicity and social factors affecting adherence to treatment as early intervention may allow re-suppression of the virus [1] and prevent resistance.

A person diagnosed with a chronic illness should be educated in a way that s/he can comprehend, on an on-going basis so that s/he is able to make wise personal choices regarding her/his health. This enables individuals to live fuller, healthier lives, enabling them to contribute to family, community and economic progress of her/his country.

In South Africa in 2003, emphasis was placed on the importance of the CD4 cell count, which determined when a client was eligible to initiate antiretroviral therapy (ART). It would take many months, or even years, of monitoring the CD4 count before it dropped sufficiently for a person to be able to start ART according to the then national guidelines. Monitoring the CD4 prior to and after initiating ART allowed the importance of the CD4 count to overshadow the significance of the viral load. This needed to change.

This is a practical account of how to educate clients on the importance of viral load from a nurse who has comprehensively cared for people living with HIV in rural and peri-urban areas of the Eastern Cape for nine years.

Pragmatic Perspective on Viral Load

Understanding viral load (VL) and the importance of viral suppression enables clients to become the master of the virus in her/his body rather than the virus being the master of her/his body.
When blood is taken to measure viral load, the number of virus particles or 'copies' in one millilitre (mL) of blood is counted. The report sent back from the lab indicates the number of copies per mL. In a citrus growing area, a hands-on demonstration is used to educate clients, many with little formal education, to understand VL and its significance.

In the clinic, I present the client with a bag of oranges, also known as a pocket or ingxowa yama orenji (isiXhosa). During the harvest season, oranges themselves are used for the demonstration; otherwise orange plastic balls are used to represent the fruit. I also use a box with a pillow placed in it as well as a spray bottle filled with water for the educational session. I ask every client to actively participate in order to understand the dynamics of HIV in the human body.

I explain that a fruit packer packs a bag or pocket of oranges. With the oranges all loose on the table, I ask the client to pack the oranges (or orange balls) into

With the oranges in the bag, I ask the client to place them one-by-one into a separate box which has a pillow in it to represent 'cold storage' for oranges or a place in the body where the virus sleeps and does not continue to damage the CD4 cells.

the bag. When the bag is full, I ask the client to count how many oranges fit into the bag. I explain to the client that the bag is like the one drop or mL of blood and that the oranges in the bag are like the virus particles in the blood. The number of oranges in the bag is equivalent to the number of copies of the virus in one drop of blood.

I go on to explain that when a person first gets HIV, the virus (orange) multiplies or grows very quickly in the blood (orange bag) and the bag becomes very full. A person does not know that s/he has the virus in his/her blood and body fluids. A person may feel as if s/he is getting a cold for a few days. Because the person is not sick and does not know s/he has the virus, s/he can transmit HIV to a partner without knowing it. This is why it is important to use condoms: the virus can be passed on during unprotected sexual intercourse. Safe sex, be faithful or no sex remains the trusted motto whether you are HIV positive or negative.

The orange bag will be very full (there will be a lot of virus in the blood) before a person begins taking ARVs. The virus is like a bad orange which kills the soldiers (CD4 T-Lymphocytes) in the blood. The soldiers are part of the army of the body – the immune system – which goes to war fighting the enemy (germs) which enter into the body. The number of soldiers (CD4's) drop so there are few soldiers to fight against infections. The infections then quickly grow and a person can easily become sick with diseases such as tuberculosis (TB), pneumonia, skin conditions, diarrhoea, and thrush. Often times a person feels weak and tired.

The community that I serve understands the process of citrus farming and that fruit can stay in cold storage for an extended period of time; and that once the fruit is taken out of cold storage, it goes back to its original state or is 'alive'. The analogy of cold storage with regards to HIV is that the virus is still present in the body, integrated in

the DNA of the host; however it is not damaging the immune cells and cannot be found in the blood.

As the oranges are taken out of the bag and placed in the box for 'cold storage', I tell the patient that the viral load in the blood is going down. The bag of oranges slowly empties, demonstrating to the client that the viral load drops to undetectable, or 'becomes suppressed', when all of the oranges representing the virus particles go into the box to sleep. I then spray the balls in the box with the fine spray of water – representing the ARVs – as demonstration while describing that ARVs are like the chemical sprayer which sprays the fruit to kill the insects and diseases which affect the fruit. I tell the client that taking her/his pill(s) at night (when s/he is prescribed the national regimen of tenofovir, emitricitabine, and efavirenz or TDF/FTC/EFV) is like spraying the oranges in cold storage, keeping them asleep.

I then ask the client to place two oranges back into the bag. This illustrates that a virus is entering in the blood, perhaps due to poor adherence to ART, missing a few doses. While the fruit (virus) stays asleep while there is spray (ARV's) covering the oranges (adherence to medication and lifestyle), if the spray is not routinely done on a daily basis, the virus will come back into the blood. I

With knowledge and understanding, the client is empowered to be in control of the virus and her/his own health.

remind the patient that the VL test only measures how much virus there is in the blood and that it does not measure how much virus there is in seminal fluid, cerebrospinal fluid or body tissues.

I take time to re-emphasize with my client that when a person is taking ARV's (while the fruit is in cold storage getting sprayed daily), the virus cannot kill the soldiers or damage the body. Rather, the soldiers get stronger and multiply, creating a larger army – more white blood cells to strengthen the immune system. CD4 cells are made in the spleen, lymph nodes, and thymus gland, which are part of the lymph or infection-fighting system[2] . The army gets stronger and the body is able to fight infections and a person taking ART feels stronger and fresher.

I encourage all clients to know the names of their medication, the strength of the tablets and when they take the tablets. For clients on TDF/FTC/EFV, I inform them that they will drink their tablets every day for the rest of their lives to keep the oranges in cold storage and out of the bag. I let patients know that any struggles they have in taking medication is our struggle together, and that we will find ways together – as the nurse and the client – to overcome them.

All clients must know the names, doses, and common side effects of all of the medications they take, and they are asked to bring their pills with them at every visit.

This support is important for adherence and trusting relationship with a client with chronic disease. If the client has very good adherence with a suppressed viral load, different ways to reward and encourage him while it remains so should be forthcoming e.g. with being given two months treatment at a time, sending a sms congratulating him on being responsible taking the treatment, providing seeds which will assist food security and healthy diet. Sponsorship can be sought to support such efforts. A good relationship with the client allows the freedom for him to come to the healthcare worker to discuss drug toxicity and social factors affecting adherence to treatment as early intervention may allow re-suppression of the virus[3] and prevent resistance.

Maintaining a suppressed Viral Load

I educate each client that the longer s/he can keep the oranges asleep in the box in cold storage, the less chance there is for the oranges to become resistant to the spray and go mouldy. In the case that the sprays stop working, there are other sprays - ARVs - to take if the VL is greater than 1000 copies per ml in spite of a good adherence record.[4] These are not as easy to use as the first spray due to the side effects, for example lopinavir/ritonavir may cause vomiting, diarrhoea, abdominal pain , raised lipids (cholesterol and triglycerides), and drug-induced diabetes,[5] but they are effective and can keep a person healthy.

After the client starts ARVs, the nurse needs to take bloods to check the VL at 6 months, 12 months and then every year to make sure the treatment is working. If the oranges stop sleeping and start floating in the blood again – move from the box into the bag or pocket – then the person living with HIV will start getting sick again, meaning that disease progression occurs.

Conclusion.

Being inventive, 'thinking outside of the box', and using items familiar to your clients will greatly enhance your ability to educate your clients and support them in their long term adherence to HIV treatment and care. To utilize physical objects for demonstration allows the client to use the senses of sight, touch, smell, speech and hearing in the learning process. Client may retain and understand more through this type of educational interaction than merely providing a verbal description of a specific intervention. Asking questions through the educational session allows the healthcare worker to assess whether the client understands the point being made, such as the effect of HIV on the body. This takes time, patience, and understanding; however in the long term the effort ensures treatment success for the client on ART and lessens clinic workload because fewer clinic visits and clinical interventions are necessary. With knowledge and understanding, the client is empowered to be in control of the virus and her/his own health. R

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Supporting adherence to antiretroviral treatment: a facility approach to reduce the risk of treatment failure

Karien Conradie, Vivian Cox, Lynne Wilkinson
Medecins Sans Frontieres, Khayelitsha, Cape Town, South Africa
K Conradie, MBChB
V Cox, MD, ID Specialist
L Wilkinson, BA; LL.B

Group sessions or adherence support groups for high risk groups are very rarely utilised, despite being more feasible, given limited resources.

Introduction

The rapid scale up of antiretroviral treatment (ART) coverage in South Africa has improved access to treatment for HIV positive patients significantly. However, expanding treatment programmes are now facing increases in the number of patients failing treatment.[1] For optimal clinical outcomes, adherence to ART should be greater than 95% (1-2 missed doses per month); when adherence falls below 80% (more than 6 missed doses per month), detectable viral loads begin to appear.[2] Prolonged periods of replicating virus in the presence of suboptimal levels of ART in the bloodstream allow the virus to develop mutations that lead to resistance to the different classes of ART.

Poor adherence can vary from occasional missed doses to chronic, longer term treatment interruptions.

Summary of Ubuntu patients remaining in care

ART Regimen	Adults in Care	Percentage with viral load >400 copies/mL
1	6237 (90%)	8%
2	708 (10%)	16%
3	4	0%
Total	6949	9%

Adherence can also reflect the quality of the relationship between the patient and the healthcare provider. Good adherence is essential in minimising the emergence of drug resistance and subsequent treatment failure. Routine viral load monitoring is available in South Africa, which should be used to improve the detection of patients with an elevated viral load who are at risk of treatment failure.

The South African national ART guidelines require patients with an elevated viral load greater than 1000 copies/mL to undergo an 'intense adherence assessment.'[3] The structure and content of this counselling varies across sites, due to a lack of clear guidelines to direct the clinician, or counsellor. Often the counselling focuses on repeated treatment literacy, concentrating on the importance of good adherence, rather than a structured problem solving approach for common causes of poor adherence (lack of disclosure, misconceptions of ART, alcohol abuse, migration, among others). Group sessions or adherence support groups for high risk groups are very rarely utilised, despite being more feasible, given limited resources. Lastly, clinicians often struggle with the decision to switch patients to a second line regimen, with the knowledge that adherence difficulties need to be attended to prior to initiating a more complex and costly regimen.
In February 2012, Medecins Sans Frontieres (MSF) partnered with Western Cape Government Health to pilot a 'risk of treatment failure' intervention at a large community health centre ART clinic. Ubuntu Clinic provides ART to close to 7 000 adult patients, of whom approximately 10% are currently receiving second-line treatment.

The Risk of Treatment Failure Intervention

The purpose of the Risk of Treatment Failure (ROTF) pilot is to provide structured adherence support for patients with high viral loads; prolong the duration of viral load suppression on first- or second-line ART; ensure timely and successful regimen changes; decrease the development of treatment resistance and limit the need for third line ART. The ROTF programme consists of four components:

1. a flagging system to identify patients with viral loads greater than 400 copies/mL
2. counsellor led adherence support groups
3. combined clinical and adherence support consultations by a nurse authorised to initiate and manage ART (NIMART), using structured steps to improve adherence to ART
4. access to ART Adherence Clubs[4, 5] for patients that complete the ROTF programme and return to an undetectable viral load.

The programme has been implemented as part of routine clinic services using a provincial staff team of nurses, counsellors, and reception staff; all members of the team have been trained and mentored on the programme, and competency assessments are completed at the end of mentorship. The following is a brief description of the model:

1) Flagging patients with detectable viral loads

As patients arrive at the reception area, a simple system has been implemented to ensure that patients whose most recent viral load measurement is greater than 400 copies/mL have their folders flagged and separated. The flagging system involves reception staff checking the most recent viral load result (either manually or through the clinic's electronic medical record system) and placing a red sticker

Nurses' quotes

'I now feel very confident and skilled to manage patients with high viral loads.'

'I no longer feel frustrated not knowing what to say and do with patients with high viral loads; I can see them with a smile.'

'You build a relationship with your patient, which helps your patient to trust you and talk freely. Only then can you get to the bottom of the adherence issue.'

on patient folders with elevated viral loads. If a patient returns to having an undetectable viral load after the programme, a green sticker is placed to cover the red one.

2) Adherence support groups

All patients with one or more elevated viral loads (those folders flagged with red stickers) are requested to attend the 'high viral load' adherence support group session which takes place daily at the facility prior to their clinical consultation. A trained counsellor facilitates the discussion around understanding ART adherence and the flexibilities allowed, rectifying myths and mis conceptions, and sharing barriers to adherence. The counsellor also reviews basic education about viral load and the correlation between poor adherence and a detectable viral load. Grouping patients, who are all experiencing a high viral load, promotes openness and honesty. It furthermore gives patients a chance to motivate and support each other. Counsellors, who undergo a basic mentoring programme, follow a structured predetermined session plan to facilitate such support groups.

3) Integrated clinical/ adherence support consultation

Following the support group, each patient with a consecutive high viral load receives an individual consultation with a nurse. The consultation includes two components: 1) structured adherence support and 2) clinical management of the patient. Clinical management includes viral load monitoring and, if necessary, preparing patients to switch to second line ART, both according to national guidelines.[3] The adherence support component is made up of four sessions that occur monthly until the viral load is retaken and the result communicated to the patient.

The sessions consist of practical standardised steps to simplify adherence and problem solve with the patient around common adherence barriers, all in a non-judgemental way. The nurse is required to discuss:

- a medication schedule to fit into the routine of the patient's daily life, al lowing flexibility where appropriate;
- where and how to keep extra/emergency doses on hand;
- a simple reminder strategy;
- a plan for taking ART when using substances or suffering from depression;
- a back up plan for getting to clinic appointments and a plan for holidays and out of town trips.

The nurse also normalises making mistakes with adherence and motivates the patient to try again. The nurse and the patient determine an adherence plan together during the 10 minute consultation. A simple one page adherence session plan is placed in the patient's folder to keep a record of the patient's four adherence sessions.

These combined consultations are run by nurses and supported by doctors. Nurses undergo a short training and mentoring programme to be able to manage these patients comprehensively. Mentorship on the ROTF intervention increases NIMART certified nurses' confidence to manage and support patients at risk of treatment failure.

Lessons learnt

- Routine viral load monitoring, identifying patients with high viral loads, and addressing adherence promptly, are essential components of the ART programme in South Africa.
- Supporting and managing patients with detectable viral loads requires a team approach involving all clinic staff at a facility – doctors, nurses, counsellors, reception staff, and pharmacists.
- The adherence counselling component of such support cannot be the work of lay counsellors alone.
- Training and mentorship on the ROTF programme equips NIMART certified nurses to confidently and competently manage patients with high viral loads.
- Combining adherence and clinical management during nurse consultations increases the number of appropriate switches from first- to second-line ART ensuring adherence support.
- The ROTF programme is a feasible intervention to implement in all existing ART clinics.
- Providing access to ART Clubs for patients who have previously struggled with adherence (often due

to the cost and time associated with returning to facilities regularly), supports continued adherence by ensuring quick easy access to ART supply and peer support going forward.

- This programme supports patients through a difficult period in their treatment journey and empowers patients to take control of their own treatment. Introducing flexibility into patients' understanding of adherence ensures long term adherence.
- National guidelines for structured adherence support are urgently needed. R

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The South African national ART guidelines require patients with an elevated viral load greater than 1000 copies/mL to undergo an 'intense adherence assessment.'[3]

Principles of HIV drug resistance for clinical management in South Africa

Katharine Stott[1*] (MBChB, MSc, DTM&H), Janet Michel[1] (RN, BA Cur, MPH), Tulio de Oliveira[1] (BSc (Hon), PhD)
Affiliation: Africa Centre for Health and Population Studies, University of KwaZulu-Natal, South Africa.
* Corresponding Author: Katharine Stott (email: kstott@africacentre.ac.za)

Many barriers to viral load testing in South Africa are due to Health System challenges which are a combination of financial, logistical and human resource issues [4]

Introduction

The rapid scale-up of antiretroviral therapy (ART) during the past decade has led to dramatic reductions in HIV-related morbidity and mortality. Efforts are now focused on maintaining virological suppression of patients on first line ART, detecting treatment failure and switching to second-line regimens where necessary.

A major threat to sustaining the positive impacts of ART is the increasing issue of drug resistance. Drug resistance

may be primary (transmitted), whereby a person is infected by a strain of HIV that is not fully susceptible to antiretroviral medications (ARVs), or secondary (acquired), whereby a person develops resistance to ARVs over time. In South Africa, the level of primary resistance has been below 5% for the last decade[1] and so this article will focus on the more pressing problem of secondary resistance.

In southern Africa, routine viral-load monitoring is recommended to identify treatment failure but it is often not done with sufficient frequency, nor reacted to appropriately. There can be a reluctance to switch patients to second-line therapy, in spite of clear guidelines. This is in part because of a lack of certainty regarding the reason for treatment failure – whether it is due to poor patient adherence, the development of drug resistance, or a combination of these issues. Nonetheless, patients who continue taking a failing ART regimen are at risk of developing resistance to those medications. This article reviews the South African guidelines for viral load monitoring and regimen switch and introduces basic concepts of drug resistance for nurses and health care workers. The information presented here is useful to practitioners throughout southern Africa as most HIV epidemics in the region are dominated by the same HIV subtype (HIV-1 subtype C), and drug resistance develops by similar mechanisms.

Guidelines on VL monitoring

The goal of ART is to keep the viral load as low as possible for as long as possible[2]. HIV viral load tests are reported as the number of HIV copies in a milliliter (copies/ml) of blood. If the viral load measurement is above detection (> 50 copies/ml), this indicates that HIV is reproducing as evidenced by its presence in the blood, and that disease will likely progress faster than if the viral load is not detectable. Consistent suppression of viral load levels is associated with reduced morbidity and mortality and a lower probability of sexual transmission of HIV[3].

The South African national ART program provides viral load monitoring free of charge to patients on ART. Two viral loads are measured in the first year of treatment, at 6 and 12 months, and the test is repeated every 12 months thereafter. In response to a detectable viral load, adherence should be carefully assessed and the test repeated, as described in table 1.

Barriers to correct viral load monitoring

Many barriers to viral load testing in South Africa are due to Health System challenges which are a combination of financial, logistical and human resource issues[4]. Viral load is a costly and complex test. The price for viral load testing is about 4 to 5 times that of CD4 testing. Currently available viral load platforms are laboratory-based and require significant infrastructure compared with CD4 point-of-care technologies[5]. Currently available viral load technologies require delicate instruments, a reliable cold chain and a secure electricity supply – luxuries which are not available in many areas of Southern Africa. Physical and human resources at laboratory and clinic level further impede efficient processing and reporting of results[4]. There is evidence that continued ART scale up may exacerbate the health system crisis in South Africa[6].These various factors present obstacles to consistent and timely viral load monitoring. However, as the most sensitive indicator of treatment success or failure, viral load monitoring is a vital component of care for patients taking ART.

Why viral load monitoring is important: resistance to antiretroviral drugs

Treatment of HIV-infected people with antiretroviral treatment (ART) is very effective. It works by preventing HIV from making copies of itself, allowing cells of the immune system to survive and fight infections. These effects are reflected in a falling viral load and a rising CD4 count. If a person is taking ART and the viral load is still detectable in the blood, this indicates that the virus is still making copies of itself despite presence of the antiretroviral drugs. HIV has a very high rate of replication, coupled with a lack of quality control checks when this replication occurs. That is, HIV that is not controlled by antiretroviral medications (ARVs) produces billions of copies of itself every day, and none of these copies are double-checked to ensure that they are the same as the original. Under these conditions, the structural make-up of the virus is altered, and this is known as the development of 'mutations'. Some of these mutations do not impact how well the virus responds to ARVs; however some make the virus less susceptible (or more resistant) to one or more antiretroviral drugs. In general, resistance to a specific ARV

Table 1: South African National Guidelines 2010, 3:19

Viral load (VL)	Action to be taken
<400 copies/ml	Routine adherence support 6 monthly viral load monitoring and then at 12 months annually
400-1000 copies/ml	Assess adherence carefully Repeat viral load after 6 months
>1000 copies/ml	Intensive adherence assessment and counseling Repeat viral load in 3 months; check hepatitis B status if not done already. If <1000, return to routine 6 monthly monitoring If >1000 and adherence issues addressed, switch to second line therapy

only occurs if that ARV is present in the patient. This is why adherence to ART is essential – adequate levels of the drugs must be present to ensure that the virus does not get a chance to replicate. Drug resistance is strongly predictive of virological failure after highly-active ART[7]. Moreover, resistance to drugs in first-line ART regimens increases the probability of virological failure to subsequent regimens [8,9].

Virological failure and switching patients to second line ART

The South African National Department of Health (NDoH) defines virologic failure as VL>1000 copies on two occasions, despite intensive adherence counseling. In many southern African countries, viral load monitoring is not available and in these circumstances, immunological (fall of CD4 count to baseline, or 50% fall from peak value on treatment, or persistent CD4 level below 100 cells/mm^3) or clinical (new or recurrent World Health Organization stage 4 condition) criteria are used to detect treatment failure[10].

Recommended second line regimens are based on the likelihood that patients with treatment failure will have developed resistance to their first-line ARVs. In the case of the Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTIs), a patient who is resistant to efavirenz (EFV) is likely to be resistant to nevirapine (NVP), and vice-versa. For this reason, second-line regimens contain Protease Inhibitors (PIs) rather than NNRTIs. Empirical treatment switches should be made as follows:

- Patients failing on a d4T or AZT based first line regimen – switch to TDF+3TC/FTC+LPV/r
- Patients failing on a TDF based first-line regimen – switch to AZT+3TC/FTC+LPV/r

First-line drug resistance and treatment switch is explained in more detail later in this article. Patients failing any second-line regimen require specialist referral[11]

Patient-specific risk factors for the development of virological failure and HIV drug resistance

Virologic outcomes improve with increased levels of adherence to first-line (NNRTI-based) ART[12] . Factors that impact patient adherence are often complex, and a number of factors have been linked to poor adherence in Sub-Saharan Africa [13–15].

- Disease and treatment factors such as experiencing side effects, and the maintenance of adherence even when a person feels well
- Social factors such as having disclosed to a trusted family member or friend and having social support
- Individual factors such as alcohol use, being away from home, fear of stigma, preferential use of traditional medicines, non-acceptance of one's own HIV positive status
- Health care characteristics such as provider/ patient relationship, waiting times, access to health care facility
- Additional issues affect children and adolescents taking ART, where the importance of full disclosure of HIV status by caregivers, as well as strong parental relationships are associated with good adherence.

Aside from adherence issues, drugs may be poorly absorbed in the gastrointestinal tract, for example due to chronic vomiting or diarrhea or protein-losing enteropathy.

Drug-drug interactions are also a common issue affecting patients on ART, and these can lead to drug toxicity, poorer adherence, or decreased efficacy of either the ARVs or the coadministered medication[16]. Potential interactions are commonly presented when a patient is started on treatment for tuberculosis: rifampicin reduces the concentration of PIs and, to a lesser extent, NNRTIs. In addition, patients taking TB drugs as well as ARVs are exposed to increased risk of toxicity such as liver damage and peripheral neuropathy[17]. Prescribing errors are a further concern, and particular care must be taken with children, for whom drug doses must be calculated at each visit to ensure accuracy.

Nomenclature of resistance mutations

HIV RNA is a code for the proteins that the virus requires in order to function. RNA is made up of a sequence of codons. Each group of three codons makes an amino acid. Amino acids are the basic units that make up proteins and it is at the amino-acid level that resistance mutations are described. Because ARVs target certain HIV proteins, mutations in these proteins mean that the drugs no longer work, or work less effectively. This is drug resistance. When a mutation occurs, it is described according to the position of the affected amino acid.

The intended amino acid is named before the position, and the amino acid resulting from the mutation is named after. For example, M184V is a one of the most common drug resistance mutations. It happens in the reverse transcriptase (RT) protein and it is associated with lamivudine (3TC) resistance. In this mutation, 'M' refers to the 'wild-type' amino acid, methionine; 184 means that the affected amino acid is at position 184 in the genetic code of HIV's RT protein ; and 'V' refers to the amino acid resulting from the mutation in the RNA, valine. Because the amino acid at this position has been altered,

Treatment of HIV-infected people with antiretroviral treatment (ART) is very effective. It works by preventing HIV from making copies of itself, allowing cells of the immune system to survive and fight infections

the protein produced is different to that which was intended, and the virus is now resistant to lamivudine.

Even more worrying is the fact that these mutations can cause resistance to more than one ARV. In the example of the lamivudine mutation M184V, this single amino acid switch alone makes HIV resistant to lamivudine and emtricitabine, as well as potentially resistant to abacavir and didanosine[18].

Resistance to first-line therapy: NRTI and NNRTI resistance

RT is a type of protein known as an enzyme. It is essential for HIV to make new copies of itself. Nucleoside Reverse Transcriptase Inhibitors (NRTIs) and Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTIs) are designed to prevent reverse transcriptase from performing this function. These are the ARVs used in first line therapy in South Africa. Mutations that make HIV resistant to these classes of drugs are summarized in table 2. Particularly concerning are Thymidine Analogue Mutations (TAMs), which are a group of mutations that can cause resistance to all of the NRTIs.

Resistance to second-line therapy: PI resistance

Protease is another enzyme that is needed for the virus to become infectious. Protease Inhibitors (PIs) block protease so that HIV cannot infect a new cell. One mutation is usually not enough to make HIV resistant to PIs but if there are a multiple mutations, these drugs will become less effective than they should be[19]. Unlike with the NRTIs and NNRTIs, PI mutations do not tend to affect the entire family of drugs, so even if a person is resistant to one PI they may still be susceptible to another PI. Resistance to second-line therapy is not simple to manage; for this reason South African guidelines suggest that once a patient is resistance to PIs, he or she should see a specialist physician.

Table 2. Introduction on HIV-1 drug resistance mutations to first line ART in South Africa and its effects on other ARVs (adapted from the HIV & TB Drug Resistance Clinical Cases Book. Russouw, Lessells & de Oliveira, ISNB 978-1-920014-91-9)

Mutation	Selected by	Effects on other ARV
K103N, V108M, Y181C	EFV, NVP	- The presence of one of more mutations result in loss of susceptibility to EFV and NVP - These drug resistance mutations are commonly transmitted from mother to child due to sdNVP
M184V	3TC, FTC	- Loss of susceptibility to 3TC, FTC - Increased susceptibility to AZT, d4T, TDF
'TAMs': M41L, D67N, K70R, L210W T215Y or F, K219Q or E	AZT, d4T	- Decreased susceptibility to all NRTIs based on number of TAMs - Three or more TAMs are usually related to high-level resistance
Q151M, T69ins	AZT/ddI, ddI/d4T	- Resistance to all NRTIs - T69ins: TDF resistance
K65R	TDF, ABC, ddI	- Variable decrease in susceptibility to TDF, ABC, ddI (and 3TC, FTC) - Increased susceptibility to AZT
L74V	ABC, ddI	- Decreased susceptibility to ABC, ddI - Increased susceptibility to AZT, TDF

HIV drug resistance in South Africa

A number of studies have described the patterns of HIV drug resistance in patients failing first-line therapy in South Africa. Patients with virological failure on ART who have demonstrable resistance mutations have been shown to range between 73 and 88 percent [20-25] The most common mutations found are the M184V mutation, already described, and mutations that present resistance to the non-nucleoside reverse transcriptase inhibitors (NNRTIs) – namely efavirenz and nevirapine. This is clearly a huge concern with respect to our first-line treatment options here in South Africa. Patients who continue their first-line treatment despite raised viral loads are likely to accumulate numerous drug-resistant mutations as time progresses [23,25,26]. A recent study in rural KwaZulu-Natal identified that 1 in 6 patients failing first line ARVs developed high-level resistance that compromises second line therapy [27]. This was due to patients failing treatment for an average of 27 months (i.e. 27 months with detectable viral load) without being switched to second line. These findings highlight the need to detect and react to raised viral loads as soon as they occur.

Testing for resistance

There are two types of resistance tests; phenotypic testing and genotypic testing. The former is relatively simple to interpret and can assess the interactions between different mutations. Genotypic testing uses polymerase chain reaction (PCR) technology to find the changes in HIV's genetic sequences that we have discussed. A genotypic

Table 3: Example of an HIV-1 genotypic resistance test report.

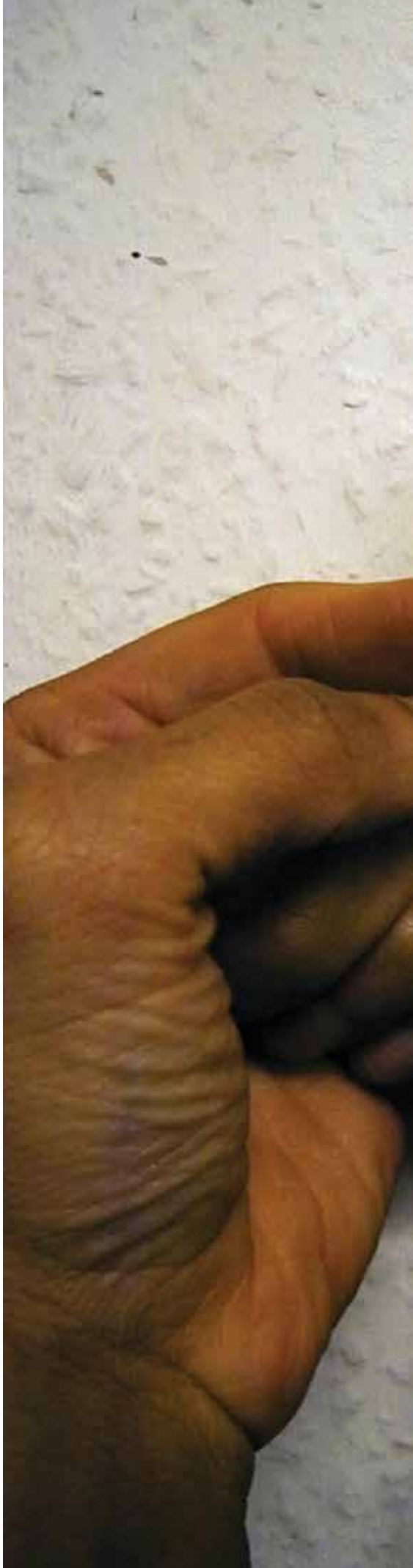
Drug	Mutations	Description	Level	GSS
Zidovudine	41L 65R 184V	Susceptible	1	1.0
Didanosine	41L 65R 74I 184V	High-level resistance	5	0.0
Lamivudine	41L 65R 184V	High-level resistance	5	0.0
Stavudine	41L 65R 184V	Low-level resistance	3	0.5
Abacavir	41L 65R 74I 115F 184V	High-level resistance	5	0.0
Emtricitabine	41L 65R 184V	High-level resistance	5	0.0
Tenofovir	41L 65R 115F 184V	Intermediate resistance	4	0.5
Nevirapine	106M 190A	High-level resistance	5	0.0
Delavirdine	106M	High-level resistance	5	0.0
Efavirenz	106M 190A	High-level resistance	5	0.0
Etravirine	106M 190A	Low-level resistance	3	0.5
saquinavir/r		Susceptible	1	1.0
indinavir/r		Susceptible	1	1.0
Nelfinavir		Susceptible	1	1.0
fosamprenavir/r		Susceptible	1	1.0
lopinavir/r		Susceptible	1	1.0
atazanavir/r		Susceptible	1	1.0
tipranavir/r		Susceptible	1	1.0
darunavir/r		Susceptible	1	1.0

resistance report will describe all of the resistance mutations and their impact on the level of resistance to each drug from 1 (no resistance) to 5 (complete resistance), as well as the genotypic sensitivity score (GSS): either 0 (drug has no activity), 0.5 (drug has partial activity), or 1 (drug has full activity). The perfect regimen has a GSS score of 3, meaning that all drugs are fully active (Table 3).

The first-line regimen of the patient described in table 3 was TDF/3TC/EFV. This regimen has a cumulative GSS of 0.5, because only TDF is partially active. The standard second-line regimen for this patient, as per South African guidelines, should be AZT/3TC/LPV/r, which has a less-than-perfect cumulative GSS of 2.0. However, given that this patient has the M184V mutation (described in table 2), he/she should do well on the standard second-line treatment as this mutation increases susceptibility to AZT. HIV-1 genotypic resistance testing is very useful both in terms of clinical management of patients, and as a research tool. In the clinical management of patients it allows clinicians to see whether the drugs the patient is taking are active against that patient's HIV, and whether different drugs may be more appropriate.

In addition, given that there is currently no accepted questionnaire-based adherence assessment tool[28], resistance testing can serve as a useful proxy indicator for adherence, as follows:

- High viral load and resistance to patient's drugs shown on test result: Patient may or may not be taking their drugs properly at the present time, but because they have resistance they will not be able to suppress their viral load with their current regimen.
- High viral load and NO resistance shown on test result: either...
  a) Patient has resistance but the level of resistance is too low for the test to detect (less than



20%). This could happen if the patient was not taking their drugs at all around the time of the test, but had been taking them previously and so developed resistance. In this scenario, re-initiation of the same regimen may not work as the resistant HIV will re-emerge once adherence to the same drugs improves. This is why we sometimes re peat the resistance test after 6 months if the viral load is still high despite intensive adher ence support and if the patient reports good adherence. Alternatively...

b) Patient is not taking the drugs at all and genuinely has no resistance. If this is the case, the same regimen should work for this patient if he or she is able to adhere correctly. Patients failing antiretroviral therapy in the absence of drug resistance are particularly difficult to manage and often have serious adherence problems. They are in great danger of disease progression with the development of AIDS and require intensive adherence support and care.

Conclusion

Drug resistance testing is not currently available in the public sector in most provinces of South Africa. However, with the recent publication of guidelines by the SA HIV Clinicians Society, it is hoped that drug resistance testing will become more widely available in the near future. In the meanwhile, attention must be focused on frequent, proactive monitoring for treatment failure. Research is underway to design simple, inexpensive viral load tests (e.g. finger prick) and it is hoped that they will be available throughout southern Africa and beyond in the near future[29]. Patients with treatment failure should be supported with intensified adherence support, in conjunction with

the correct application of criteria for regimen switching. This will reduce the amount of time that patients spend on failing regimens and limit the development of complex resistance patterns, encouraging a durable treatment response. R

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IDENTIFICATION OF DRUG-RESISTANT TB

WHAT IS DRUG-RESISTANT TB (DR-TB)?

- DR-TB is any strain of MTB that is resistant to one or more anti-tuberculosis drugs
- DR-TB is *always a laboratory diagnosis*
  - Clinical failure to respond to TB treatment does not mean that the strain is DR-TB
- INH and RIF susceptibility is initially performed
  - if resistance to INH or RIF detected; further DST is performed

WHEN SHOULD DRUG SUSCEPTIBILITY TESTING BE DONE?

- If Xpert MTB/RIF results show the following: MTB detected and rifampicin resistant or rifampicin indeterminate
- Repeat episode of TB
- Known DR-TB contact
- TB acquired in institutions
- Smear positive TB after intensive phase of TB treatment

WHICH DIAGNOSTIC TESTS CAN DETECT DRUG RESISTANCE AND WHAT IS THE MECHANISM OF THESE TESTS?

Diagnostic Modality	Explanation	Additional Tests Required
Xpert™ MTB/RIF	Detects resistance to RIF on sputum (smear positive or smear negative) by detecting mutations in the *rpo*B gene	RIF-resistant TB may be mono-resistant or MDR-TB. Request culture and DST. (See algorithm on adjacent page)
MTBDR*plus* Line Probe Assay (LPA)	Detects resistance to RIF (*rpo*B mutations) and INH (*kat*G and *inh*A mutations) on smear positive sputum, or MTB cultures	If RIF and/or INH resistant, request DST to RIF, INH and remaining first and second-line drugs
MTBDRs Line Probe Assay (LPA)	Detects resistance to fluoroquinolones and aminoglycosides on smear positive sputum, or MTB cultures, to exclude XDR or pre XDR-TB	Refer to specialist centre for further management if resistance is detected
Culture and phenotypic DST	• Gold standard for the detection of drug resistance • Requires solid media or automated liquid media technology	• Contamination may occur • Use this result to guide patient management

IDENTIFICATION OF DRUG-RESISTANT TB...CONTINUED

HOW SHOULD A PATIENT WITH THE FOLLOWING XPERT MTB/RIF RESULTS BE MANAGED?

Result: MTB complex detected / rifampicin resistant

If patient does not return within 48 hrs call and/or send TB tracer

- Counsel patient that he/she might have DR-TB but that a confirmatory test must be done
- Request a second sputum specimen for microscopy, culture and phenotypic DST
  - To confirm RIF resistance
  - To determine susceptibility to other drugs
- Start MDR-TB treatment
- Register and notify the patient
- Screen contacts for TB symptoms and investigate if symptomatic

Obtain result of phenotypic DST

If result shows resistance to RIF and susceptibility to isoniazid:
- Diagnosis is rifampicin mono-resistant TB
- Continue MDR-TB treatment and add isoniazid (see page 52)

If RIF and INH resistance detected:
- Diagnosis confirmed as MDR-TB
- Continue MDR-TB treatment (see page 53-56)

If result indicates RIF and INH susceptibility:
- Diagnosis is fully sensitive TB
- Stop MDR-TB treatment
- Start patient on regimen 1

If INH resistant and RIF susceptible
- Diagnosis is isoniazid mono-resistance
- Treat with regimen 1 (see page 52)

Toll-Free National HIV & TB Health Care Worker Hotline

Are you a doctor, nurse or pharmacist?

Do you need clinical assistance with the treatment of your HIV or TB patients?

Contact the TOLL-FREE National HIV & TB Health Care Worker Hotline

NATIONAL HIV & TB HEALTH CARE WORKER HOTLINE
0800 212 506

0800 212 506 / 021 406 6782

Alternatively send an SMS or "Please Call Me" to 071 840 1572

www.hivhotline.uct.ac.za

The Medicines Information Centre (MIC) situated within the Division of Clinical Pharmacology, Department of Medicine at the University of Cape Town is the largest and only clinically-based medicine information centre in South Africa.

In collaboration with the Foundation for Professional Development and USAID/PEPFAR, the MIC provides a toll-free national HIV & TB hotline to all health care workers in South Africa for patient treatment related enquiries.

What questions can you ask?

The toll-free national HIV & TB health care worker hotline provides information on queries relating to:

- HIV testing
- Post exposure prophylaxis: health care workers and sexual assault victims
- Management of HIV in pregnancy, and prevention of mother-to-child transmission
- Antiretroviral Therapy
  - When to initiate
  - Treatment selection
  - Recommendations for laboratory and clinical monitoring
  - How to interpret and respond to laboratory results
  - Management of adverse events
- Drug interactions
- Treatment and prophylaxis of opportunistic infections
- Drug availability
- Adherence support
- Management of tuberculosis and its problems

When is this free service available?

The hotline operates from Mondays to Fridays 8.30am – 4.30pm.

Who answers the questions?

The centre is staffed by specially-trained drug information pharmacists who share 50 years of drug information experience between them. They have direct access to:

- The latest information databases and reference sources
- The clinical expertise of consultants at the University of Cape Town's Faculty of Health Sciences, Groote Schuur Hospital and the Red Cross War Memorial Children's Hospital

MIC MEDICINES INFORMATION CENTRE

USAID FROM THE AMERICAN PEOPLE

FPD

Call us - we will gladly assist you! This service is free.

This service is brought to you as a result of the generous support of the American people through USAID/PEPFAR

MONO- AND POLY-RESISTANT TB

HOW IS RESISTANCE TO TB DRUGS CLASSIFIED?

Mono-resistant TB	Resistance to a single anti-TB drug
Poly-resistant TB	Resistance to two or more first-line drugs but not including both INH and RIF
Multi-drug resistant TB	Resistance to both INH and RIF
Rifampicin-resistant TB	Resistance to Rifampicin and any other drugs except INH

WHAT TYPES OF RESISTANCE ARE THERE?

RESISTANCE CAN BE DIVIDED INTO 2 MAIN TYPES:	
New Patients (previously called 'primary resistance')	Previously Treated Patients (previously called 'acquired resistance')
This is resistance in patients with no history of previous TB treatment or patients who have received TB treatment for less than one month previously	Resistance in these patients refers to resistance in cultures from patients with one or more previous TB treatment episodes, of more than one month each

WHY IS IT IMPORTANT FOR US TO KNOW ABOUT MONO- AND POLY-RESISTANT TB?

- Mono-and poly-resistant TB may be a step on the way to development of MDR-TB
  - It is very important to manage these patients correctly
- MDR-TB may develop when persons with mono-resistant TB are not receiving a sufficient number and dosage of drugs to which the strain is susceptible

HOW IS MONO- AND POLY-RESISTANT TB TREATED?

- Treatment is complex and expert opinion should be always be sought
- Treatment is individualised according to:
  - drug susceptibility patterns of resistance (whether INH or RIF resistance is present)
  - TB treatment history
  - potential for development of resistance to other drugs

HOW IS MONO- AND POLY-RESISTANT TB MONITORED?

- TB microscopy and TB culture monthly during intensive phase AND continuation phase
- Repeat DST if unsatisfactory clinical progress after 3-4 months of treatment

HOW ARE MONO- AND POLY-RESISTANT PATIENTS RECORDED?

- All mono-and poly-drug resistant patients should be recorded in the DR-TB register (NOT the drug-sensitive register)
- Patients that are mono-drug resistant to rifampicin must be recorded as MDR-TB "not confirmed"

MONO- AND POLY-RESISTANT TB....CONTINUED

ALGORITHM FOR THE OUTPATIENT MANAGEMENT OF MONO- AND POLY-RESISTANT TB*

RIF or INH resistance confirmed by line probe assay

1. Counsel patient regarding the implications of drug-resistant TB
2. Start patient on TB treatment regimen according to the table on the following page
3. Notify the patient to authorities
4. Request laboratory to do phenotypic (culture) drug susceptibility testing to first and second-line TB drugs
5. Send a further sputum specimen for microscopy, culture and DST
6. Offer an HIV test and initiate ART and cotrimoxazole if infected

Review the patient culture, and DST results 4 weeks after TB treatment initiation

1. Review laboratory DST results and confirm susceptibility results
2. Adapt TB treatment according to table on the following page
3. Send a sputum specimen for microscopy, culture and DST
4. If no clinical improvement, refer for specialist opinion
5. Manage HIV infection if present

Review the patient and all culture, and DST results every 4 weeks until treatment completion

1. Manage drug adverse effects
2. Manage HIV infection if present
3. Repeat sputum culture and DST at every visit to ensure the date of sputum conversion is known

*** PATIENTS MUST BE REFERRED TO A HIGHER LEVEL OF CARE OR EXPERT OPINION SOUGHT AT ANY POINT IF DEEMED NECESSARY**

MONO- AND POLY-RESISTANT TB....CONTINUED

SUGGESTED REGIMENS AND DURATION OF TREATMENT FOR MONO-AND POLY-RESISTANT TB[1]

Drug Resistance Pattern	Suggested Regimen	Minimum Duration of Treatment (months)	Comments
H	• RHZE for the full duration of treatment • In practice it is easier to use fixed drug combinations	• 6 - 9 months based on symptomatic response to treatment, weight gain and sputum culture combinations • A minimum of 6 months treatment after culture conversion is adequate	• Monitor the patient monthly with the following: ○ sputum smear microscopy and culture monthly throughout treatment ○ monthly clinical assessment required • Refer to MDR-TB expert if patient is not responding well to treatment
R (± any other 1st line drug other than INH)	• Standardized MDR-TB regimen plus INH	• 18 months treatment after culture conversion required	• These patients will need confirmation of diagnosis if diagnosed through GXP; however, LPA is a confirmatory diagnosis
Poly-resistant TB cases			• Refer to MDR-TB expert for regimen design based on resistance pattern and history of anti-TB drug use

[1]Management of drug-resistant Tuberculosis. Policy Guidelines. Updated January 2013

MDR-TB DIAGNOSIS AND MANAGEMENT

MDR-TB		XDR-TB	
Stands For	Definition	Stands For	Definition
Multi-Drug Resistant	• Resistance to at least INH and rifampicin WITH OR WITHOUT resistance to other drugs	Extensively Drug Resistant	• Resistance to INH and rifampicin AND • resistance to any of the fluoroquinolones AND • any second-line injectable e.g. kanamycin, amikacin or capreomycin

HOW DOES ONE ACQUIRE MDR-TB?

- Acquired infection with resistant bacteria
- Development in patient whose TB is not adequately treated

HOW IS MDR-TB DIAGNOSED?

MDR-TB is a laboratory diagnosis. It may be diagnosed by:

- LPA which shows resistance to INH and RIF
- Xpert MTB/RIF only detects RIF resistance, diagnosis of MDR-TB must be confirmed by culture and DST. MDR-TB treatment must be started in the interim

IT IS VERY IMPORTANT TO ENSURE THAT THE ORGANISM IDENTIFICATION IS MTB AND NOT ANOTHER SPECIES (NTM)

WHAT IS THE DIFFERENCE BETWEEN RESISTANCE IN A NEW AND A PREVIOUSLY TREATED/RETREATMENT PATIENT?

RESISTANCE CAN BE DIVIDED INTO 2 MAIN TYPES:	
New Patients (previously called 'primary resistance')	Previously treated/Retreatment Patients (previously called 'acquired resistance')
This is resistance in patients with no history of previous TB treatment or patients who have received TB treatment for less than one month previously	Resistance in these patients refers to resistance in cultures from patients with one or more previous TB treatment episodes, of more than one month each

HOW DO WE TREAT CLOSE CONTACTS OF MDR-TB PATIENTS?

- Screen and test for MDR-TB if symptomatic
- If patients are found not to have TB, they should receive screening every six months
- Asymptomatic contacts may be managed in the same way as contacts of drug-sensitive TB patients
  - Please refer for specialist opinion if in doubt, especially in the case of children

NB: M/XDR-TB IS DIFFICULT TO TREAT, ALWAYS REFER IF ANY UNCERTAINTY

National Department of Health. 2013. Management of Drug-Resistant Tuberculosis Policy guidelines.

MDR-TB DIAGNOSIS AND MANAGEMENT....CONTINUED

HOW IS MDR-TB TREATED?

Treatment of MDR-TB: Adults and Children >8 years

- A standardised MDR-TB treatment regimen should be given 7 days a week
- In patients who were previously exposed to second-line anti-TB drugs for a month or more
  - the standardised regimen will be modified based on the history of drug usage and DST results

THE DURATION OF THE INTENSIVE PHASE WILL BE DETERMINED BY ADDING 4 MONTHS TO THE DATE OF TB CULTURE CONVERSION.

(DATE OF COLLECTION OF THE FIRST SPUTUM THAT TURNED TB CULTURE NEGATIVE)
IT HAS TO BE SIX MONTHS OR MORE

Intensive Phase: Treatment of MDR-TB: Adults and Children >8 years

Patients Weight	Drug	Dosage
<33 kg	Kanamycin	15-20 mg/kg
	Moxifloxacin	400 mg (children: 7.5 to 10 mg/kg)
	Ethionamide	15-20 mg/kg
	Terizidone	15-20 mg/kg
	Pyrazinamide	30-40 mg/kg
33-50 kg	Kanamycin	500-750 mg
	Moxifloxacin	400 mg
	Ethionamide	500 mg
	Terizidone	750 mg
	Pyrazinamide	1000-1750 mg
51-70 kg	Kanamycin	1000 mg
	Moxifloxacin	400 mg
	Ethionamide	750 mg
	Terizidone	750 mg
	Pyrazinamide	1750-2000 mg
>70 kg	Kanamycin	1000 mg
	Moxifloxacin	400 mg
	Ethionamide	750-1000 mg
	Terizidone	750-1000 mg
	Pyrazinamide	2000-2500 mg

MDR-TB DIAGNOSIS AND MANAGEMENT....CONTINUED

THE DURATION OF THE CONTINUATION PHASE WILL BE DETERMINED BY ADDING 18 MONTHS TO THE DATE OF TB CULTURE CONVERSION.

Continuation Phase: Standardised Regimen for Adults and Children 8 years and above		
Patients Weight	Drug	Dosage
<33 kg	Moxifloxacin	400 mg
	Ethionamide	15-20 mg/kg
	Terizidone	15-20 mg/kg
	Pyrazinamide	30-40 mg/kg
33-50 kg	Moxifloxacin	400 mg
	Ethionamide	500 mg
	Terizidone	750 mg
	Pyrazinamide	1000-1750 mg
51-70 kg	Moxifloxacin	400 mg
	Ethionamide	750 mg
	Terizidone	750 mg
	Pyrazinamide	1750-2000 mg
>70 kg	Moxifloxacin	400 mg
	Ethionamide	750-1000 mg
	Terizidone	750-1000 mg
	Pyrazinamide	2000-2500 mg

PLEASE NOTE:

- **Pyridoxine (Vit B6) 150 mg (maximum 200 mg) to be given daily to patients on terizidone**
- **Adults who may not tolerate moxifloxacin will be given levofloxacin at the following dosage:**
  - **750 mg for patients weighing below 51 kg, and 1000 mg for patients with a weight equal or above 51 kg**

MDR-TB DIAGNOSIS AND MANAGEMENT....CONTINUED

Standardised MDR-TB Treatment Regimen for Children Younger than 8 Years

Drug	Dosage
Amikacin	15 - 22.5 mg/kg
Levofloxacin	10-15mg/kg daily for children < 8 years
Ethionamide	15 - 20 mg/kg
Terizidone	15 - 20 mg/kg
Pyrazinamide	30 - 40 mg/kg

- NB: Ethambutol may be given at the dosage of 20 - 25 mg/kg
- High-dose INH 15-20mg/kg may be given if no katG mutation

HOW IS XDR-TB TREATED?

XDR-TB requires an individualised approach based on the previous history of drug use in a patient and the results of DST. Therefore, treatment of XDR-TB should always be initiated under guidance of the clinical management team and the review committees.

MONITORING OF MDR-TB PATIENTS ON TREATMENT

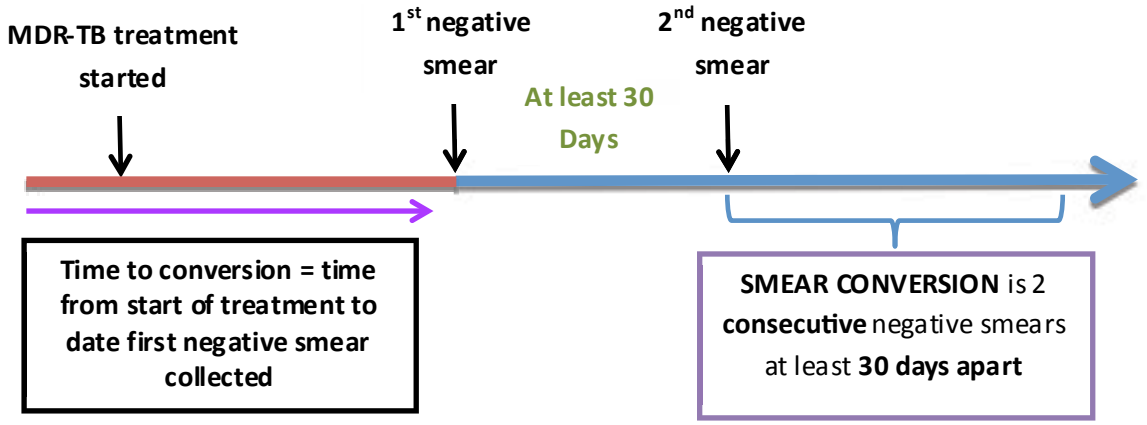
HOW OFTEN MUST MDR-TB PATIENTS BE REVIEWED?

- Intensive (injectable) phase → Weekly once clinically stable
- Continuation phase → Monthly

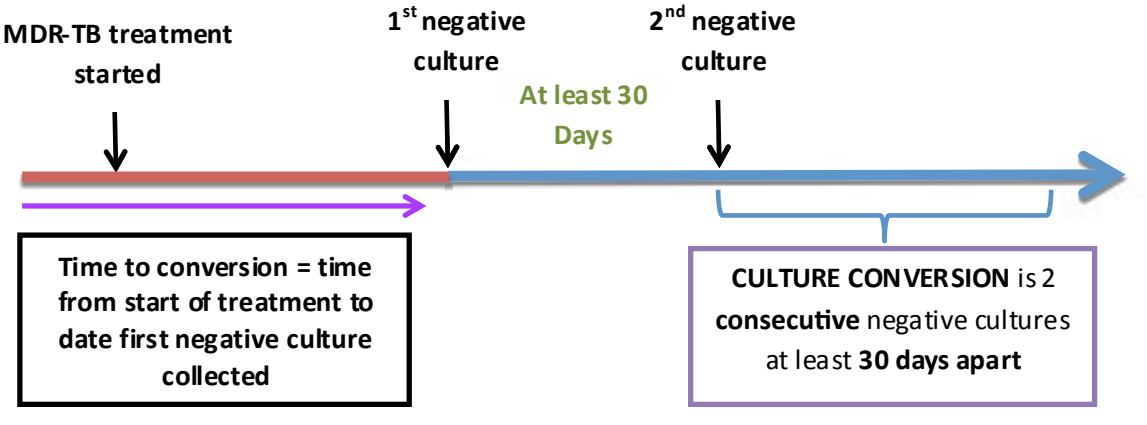
HOW OFTEN MUST SPUTUM BE SENT?

- One sputum specimen should be sent monthly for smear microscopy and culture (not DST)
- Only culture can determine if organisms are still viable (alive); culture is therefore required for monitoring progress

WHAT IS SMEAR CONVERSION?



WHAT IS CULTURE CONVERSION?



WHAT HAPPENS IF A PATIENT DOES NOT IMPROVE ON TREATMENT?

- Culture conversion may take a long time but if there is no clinical improvement after 4 months, the patient must be reassessed

ARE MDR-TB DRUGS SIDE EFFECTS DIFFICULT TO MANAGE?

- MDR-TB treatment may have many side effects and it may be difficult to know which drug is causing these. Side effects may occur at any time. Some side effects may be severe and patients should be referred if there is any doubt about treatment. Management of drug reactions is well described in the NDoH MDR-TB guidelines

MONITORING OF MDR-TB PATIENTS ON TREATMENT....CONTINUED

WHAT ARE THE MOST COMMON SIDE EFFECTS OF MDR-TB TREATMENT?

Adverse Effects	Offending Drug	Management
Skin Reactions	• Could be several agents	• Desensitisation, may reintroduce drugs within one or two weeks
GIT (Nausea, Vomiting & Diarrhoea)	• Pyrazinamide	• Take the medication with a non-fatty meal or before going to bed • Monitor, if no response, investigate for liver toxicity
Ototoxicity	• Injectable agents	• Audiometry prior to initiation • Repeat monthly or when indicated
Peripheral Neuropathy	• Cycloserine • Terizidone	• Pyridoxine or • amitriptyline
Electrolyte Wasting	• Capreomycin • Amikacin • Kanamycin	• Is reversible once the injectable is suspended • Supplement electrolytes as needed
Psychiatric Symptoms	• Cycloserine • Terizidone • Ethionamide • Quinolones especially in the elderly	• Pyridoxine
Nephrotoxicity	• Aminoglycosides • Capreomycin	• This adverse effect is occult (not obviously noted by taking the history of the patient or by physical examination) in onset and can be fatal
Impaired Vision	• Ethambutol	• Avoid in patients with impaired vision
Osteo-articular Pain	• Pyrazinamide	• Acetyl salicylic acid (Asprin) • Intermittent administration of Pyrazinamide
Hypothyroidism	• PAS • Ethionamide	• Monitor closely

Please consult the latest DR-TB guidelines for more in-depth guidance on managing adverse events

MUST THE PATIENT RECEIVE FOLLOW-UP AFTER BEING CURED?

- Yes
- Patients with MDR-TB must be followed up 6 monthly for at least 2 years after cure

WHAT PROCEDURES MUST BE DONE AT A FOLLOW-UP VISIT?

- Clinical examination
- Sputum collection for smear and culture

Management of drug-resistant Tuberculosis. Policy Guidelines. Updated January 2013 (for more indepth guidance on management of side effects)
Multi-drug resistant TB: A Policy framework on decentralised and deinstitutionalised management for South Africa

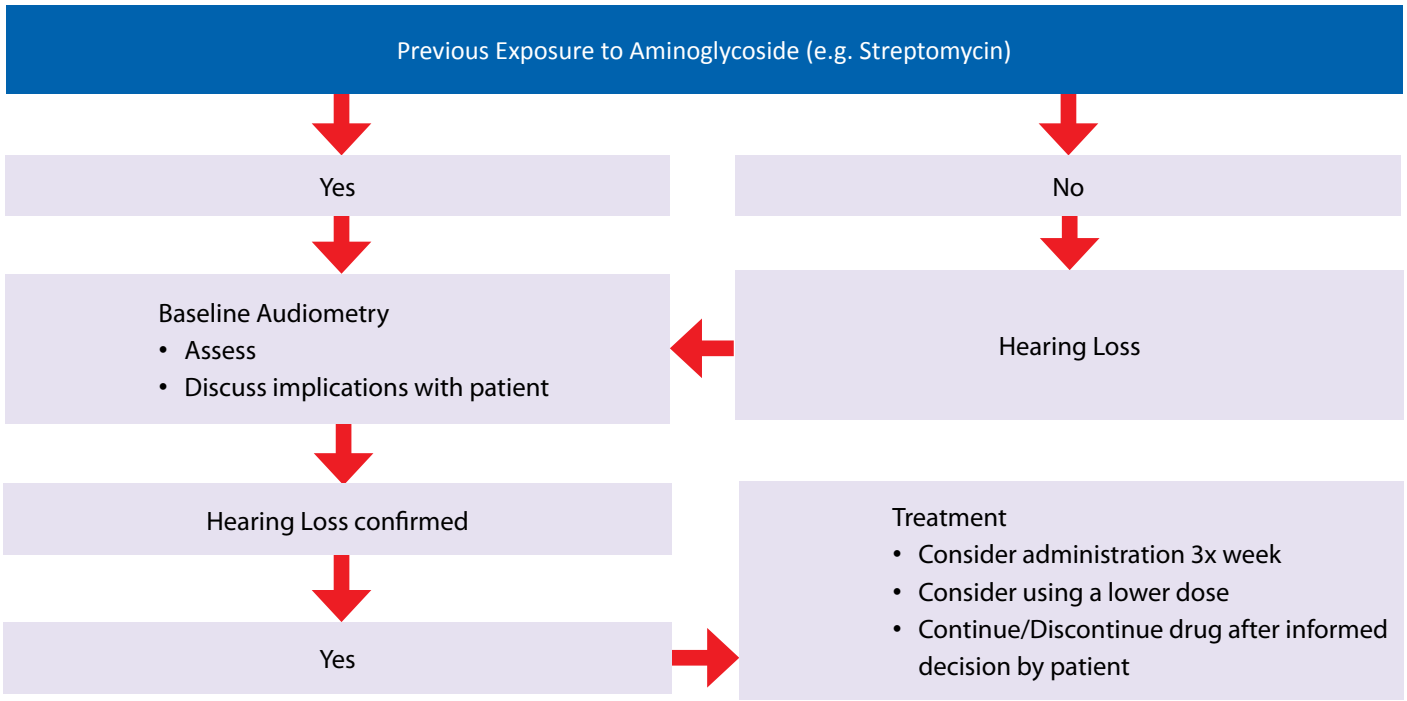
MONITORING OF MDR-TB PATIENTS ON TREATMENT....CONTINUED

HOW IS MDR-TB MONITORED AND EVALUATED?

Monitoring and Evaluation	Recommended Frequency
Evaluation by Doctor	• At baseline • Twice to three times per week for stable patients and daily for very sick patients until conversion • Every month or bi-monthly for outpatients in continuation phase
Evaluation by Nurse	• Daily
Sputum Smear and Cultures	• At baseline • Monthly
Weight	• At baseline and weekly during intensive phase • Monthly during continuation phase
Height	• At baseline in adults and children
Body Mass	• At baseline and then monthly
DST	• At baseline • For patients who remain culture positive at six months
CXR	• At baseline • Every six months (for children every 2 to 3 months in intensive phase) • At treatment completion • When requested by clinician
Serum Creatinine	• At baseline, then monthly during injectable phase
Serum Potassium	• Monthly during injectable phase
Thyroid Stimulating Hormone	• Every six months if receiving ethionamide and /or PAS • Monitor monthly for signs of hypothyroidism • In children every 2 months
Liver Serum Enzymes	• Periodic monitoring (every 1-3 months) ○ In patients receiving pyrazinamide for an extended period ○ For patients at risk of/with symptoms of hepatitis ○ In Children: if symptoms or every six months if on ART
HIV Screening	• At baseline, and repeat if clinically indicated
Pregnancy Test	• At baseline for women of child bearing age and repeat if indicated
Audiometry	• At baseline, monthly during injectable phase and 3 months after completion of the injectable therapy
Eye Test	• At baseline and when indicated
Lung CT-scan	• When indicated

MONITORING OF MDR-TB PATIENTS ON TREATMENT....CONTINUED

HOW IS HEARING LOSS MANAGED?



SAFETY OF SECOND-LINE DRUGS DURING PREGNANCY

Medication	Safety Class	Comments
Ethambutol	B	• Experience is gravid patients suggests safety
Pyrazinamide	C	• Use with caution. Most references suggest it is safe to use
Streptomycin Kanamycin Amikacin Capreomycin	D	• Documented toxicity to developing foetal ear • Risks and benefits must be carefully considered • Avoid use where possible
Fluoroquinolones	C	• Use with caution. • No teratogenic effects seen in humans when used for short periods of time (2-4 weeks) • Associated with permanent damage to cartilage in weight-bearing joints of immature animals • Experience with long-term use in gravid patients is limited, but given bactericidal activity, benefits may outweigh risks
Ethionamide Prothionamide	C	• Avoid use • Teratogenic effects observed in animal studies. • Significantly worsens nausea associated with pregnancy
Cycloserine Terizidone	C	• No significant experience in gravid patients: animal studies have not documented toxicity

A = Safety established using human studies	C = Uncertain safety, no human/animal studies show adverse effects
B = Presumed safety based on animal studies	D = Unsafe, risk may only be justified under clinical circumstances

(Adapted from: Partners in Health. The PIH Guide to Medical Management of Multidrug-resistant Tuberculosis. International Edition. PIH, USA: 2003)

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HIV/TB Case Studies

By Stacie C. Stender, MSN, MSc inf Dis, FNP
Africa Regional Technical Advisor, TB/HIV/ID
Jhpiego-an affiliate of Johns Hopkins University

Ntombi, a 2-year-old girl, is brought to the primary health clinic (PHC) by her aunt Bongi to see you. Ntombi has not been eating well and has been less playful than usual for the past week. Bongi is worried about a large lump in Ntombi's neck which does not seem to be going away. You enquire about the child's parents and learn that the mother died 1 week after Ntombi was born and the father's whereabouts are unknown.

Give two additional social/family history questions would you ask Bongi about Ntombi's situation.

1) .....
2) .....

Give two additional clinical history questions you would ask Bongi about Ntombi

3) .....
4) .....

Bongi does not know the cause of Ntombi's mother's death and states that she has been caring for Ntombi since her sister's death. Ntombi lives with Bongi, her husband, their 4 children, and 3 of Bongi's brother's children are visiting for school holidays.

What 3 aspects of the physical exam will you perform on Ntombi at a minimum?

5) .....
6) .....
7) .....

Ntombi is lethargic but responsive during the exam. The physical exam reveals: axillary temperature 37.6 C; respiratory rate 44 breaths/min; heart rate 140 beats/min; weight 10.2 kg; white patches noted on Ntombi's tongue and soft palate; warm, tender, fixed, matted lymph node 2.5 cm in diameter above the left clavicle; no in drawing during breathing.

What investigation available at PHC level will assist with your assessment and plan for Ntombi?

8) .....

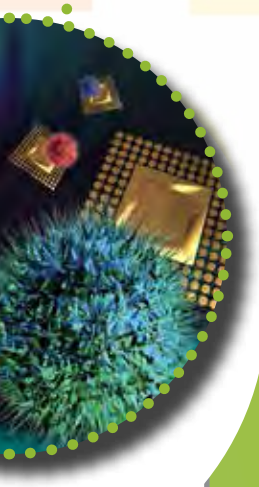
The rapid and confirmatory tests are positive. You decide to refer Ntombi to the hospital 35 km away. What clinical information makes you suspect tuberculosis?

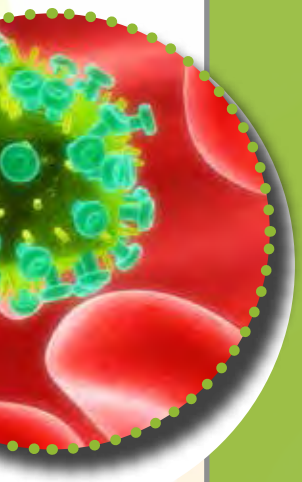
9) .....

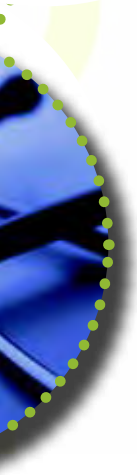
What further diagnostic(s) will assist with determining if Ntombi has tuberculosis once she is evaluated at the hospital?

10) .....

HIV/TB Case Studies







Answers

1-2)
- Cause of death of Ntombi's mother
- If Ntombi's mother's HIV status was known
- Who is the primary caregiver of the child?
- Who lives in the same household as the child? Is anyone in the household ill or been recently diagnosed with TB?

3-4
- Does Ntombi have other symptoms such as cough, fevers, sweating, etc.?
- When is the last time Ntombi was seen at the clinic? Is she often ill?
- Has Ntombi ever been tested for HIV?
- Is Ntombi up-to-date on her vaccinations?
- Review the Road to Health Booklet and asses Ntombi's growth
- Ask about development

5-7)
- Vital signs: temperature, respiratory rate, heart rate, weight (plot on child health card)
- Assess the head and neck, paying particular attention to the lump in the neck by inspection and palpation
- Assess the eyes, ears, nose, and mouth/throat for signs of inflammation, infection, etc.
- Respiratory assessment by and inspection, auscultation. Note how easy/difficult Ntombi's breathing is
- Feel for a big liver and a palpable spleen
- Asses for meningitis

8)
- HIV rapid test

9)
- Suspicious symptoms
- Physical assessment results – lymphadenopathy, oral candidiasis (immunosuppression), rapid breathing, fever, <-2 z score for weight, lethargy
- HIV status making Ntombi more susceptible to tuberculosis

10)
- Gastric aspirate
- Lymph node aspirate and analysis
- Chest X-ray
- PPD skin test

TO BE CONTINUED...

A third-line antiretroviral treatment clinic at Helen Joseph Hospital, Johannesburg

RH Berhanu, S Sheik, P Howell, I Jonker, SS Mashamaite
Themba Lethu HIV Clinic, Helen Joseph Hospital, Department of Medicine, University of Witwatersrand, Johannesburg South Africa
Dr RH Berhanu MD MD (US), Internal medicine (US), Dip TM&H (US), Dip HIV Man (SA) rberhanu@righttocare.org

Dr S Sheik MBChB, Dip HIV Man (SA)
Dr P Howell MBBCh, Dip HIV Man (SA)
Dr I Jonker MBBCh
Dr SS Mashamaite MBBCh, MPH, Dip HIV Man (SA)

The genotype test works best when the patient's viral load is more than 1000 copies/ml. Sometimes if the patient's viral load is lower than 1000 copies/ml the test will not be successful.

Introduction

Themba Lethu Clinic is an HIV management clinic situated at Helen Joseph Hospital in Johannesburg. The clinic is one of the largest of its kind and serves close to 11000 patients with HIV each year. It is jointly managed and funded by Helen Joseph Hospital and the non-governmental organization Right to Care.

The majority of our patients at Themba Lethu Clinic are on first line antiretroviral therapy (ART) with a non-nucleoside reverse transcriptase inhibitor (NNRTI) such as efavirenz or nevirapine and two nucleoside reverse transcriptase inhibitors (NRTI). Around 20 percent of patients are on second line therapy, which includes a protease inhibitor (PI) such lopinavir/ritonavir (aluvia) or atazanavir with ritonavir. Of these patients on second line therapy, about one quarter, or 600 patients, have a viral load greater than 400 copies/ml, i.e. are not suppressed on second line therapy (also referred to as "treatment failure"). Around 450 of these patients on second line have a viral load > 1000 copies/ml, which constitutes 4% of the total clinic population.

Most second line treatment failures are due to poor adherence; however, some people have developed resistance to antiretroviral drugs. In order to determine whether a patient is resistant to ART and to help decide what treatment to try next, a genotype test can be ordered. Resistance testing in the public sector is currently only available at referral and research centres. In the private sector the test is readily available.

Prior to 2012 patients failing second line therapy in our clinic would be sent for repeated counselling and viral load testing. Unfortunately the quality of counselling the patient received varied. Sometimes a clinician would refer for genotype testing, and the genotype test would demonstrate no resistance because the patient was not adherent at the time the test was done.

If resistance was identified, there was no specific procedure in place to motivate for third line drugs or to systematically assess a patient's adherence. Patients would see a different doctor at every visit which led to poor continuity and genotype test results being overlooked. All of this resulted in suboptimal management of patients failing 2nd line.

The third line clinic

In 2012 staff at Themba Lethu Clinic came up with a systematic approach to patients failing second line ART and started a "third line clinic".

Every week a list of patients that are failing second line is drawn up, and each file is reviewed by a doctor ahead of the visit. If intervention is warranted the patient's files are marked as 'third line patients' so that they may go for counselling on the day of their appointment and then to see one of the third line doctors.

It was decided that the cornerstone of approaching second line failure was an intensive adherence counselling session to elicit the reasons for treatment failure. This specialized session would be done by a more experienced counsellor or social worker and requires about half an hour to complete. A counselling form was drawn up to be used as a tool to guide the counselling session. (See website for copy of counselling form) The patient would be assessed in detail for their knowledge about ART, side effects from treatment, history of depression or psychiatric illness, conception planning, alcohol use, disclosure to family members and views on traditional medicines. Common misconceptions about ART are also addressed during this session such as 'If I drink alcohol I shouldn't take my ART' or 'If I miss the time of my medication I wait until the next day to take the dose'.

Many people have been subjected to harsh reprimands in the past due to their non-adherence and hesitate to be truthful. We've found that when a non-judgmental and gentle approach is taken most people do open up during the counselling session. One should explain that the purpose of the counselling is to find a solution together and not to punish or judge. It is also

important to establish trust between the counsellor and patient as he or she might be scared to share information of a sensitive or personal nature e.g. home circumstances/relationship issues. Some patients may need repeated counselling sessions before they open up. In some difficult situations it can be helpful to involve partners and other family members in the discussion with the patient's approval.
After the counselling session the patient would see an experienced clinician. The doctor would review the problems identified during the counselling session and attempt to address any side effects to treatment the patient was experiencing. The patient would return for repeat viral load testing after 3 months. We decided that patients should see the same clinician at every visit to help build a relationship of trust between doctor and patient. If the viral load was suppressed, the doctor would congratulate the patient and encourage them to maintain good adherence. If the repeat viral load was elevated, the doctor would review the barriers to good adherence again with the patient.

If the patient and doctor agree that adherence is good, and that re-infection or possible drug interactions are not an issue, then the patient would be referred for genotype testing. If, however, adherence still remains a problem; genotype testing is not done at this stage because it is felt that even if drug resistance is identified the patient is not a good candidate for expensive third line drugs.

Once the genotype result is available the doctor presents the patient at a twice monthly "third line meeting". Two senior consultants, the Themba Lethu doctors and nurses, trainee intern doctors, and the counselling staff are all present at this meeting. Each patient is discussed in detail and the genotype result, if available, is also discussed. A decision is made about whether or not to recommend treatment with third line drugs. Central to this decision is whether or not the patient has made a genuine attempt to improve their adherence.

Results

In the year that we have been running the third line clinic at Themba Lethu we have seen a total of 330 patients with viral loads greater than 1000 copies/ml. One third of the patients have suppressed after the intensive adherence counselling. This is very satisfying because many of these patients have had elevated viral loads for years. We have obtained 120 HIV genotype tests of which 40 have been unsuccessful (i.e. did not amplify). As a result of this process 33 patients have been placed on third line drugs.

Challenges

Some of the challenges that we experience at the third line clinic are discussed below:

- **Genotype tests that don't amplify**
  The genotype test works best when the patient's viral load is more than 1000 copies/ml. Sometimes if the patient's viral load is lower than 1000 copies/ml the test will not be successful.
- **Patients who continue to have treatment failure in the absence of resistance**
  In the majority of cases this is related ongoing difficulties with adherence and in order to successfully solve the adherence problem, the underlying reason must be found and addressed properly. It can sometimes be difficult to find these reasons and can take time to address. Some of them may include:
  - The patient may be forgetful due to an underlying neurological condition
  - Non-disclosure to family and colleagues leading to hiding of medication and limiting the patient's ability to take medication consistently
  - Alcohol and drug dependency
  - Family or partner pressure not to take ART or to use traditional medicines
  - Desire to conceive leading to re-infection
  - Severe side-effects, e.g. diarrhoea from Aluvia, resulting in medication avoidance.

However, some patients may still be non-adherent despite all possible causes being addressed. In these cases we continue with regular counselling, and possibly refer to a psychologist, until the patient is ready to be adherent.

- **Lack of alcohol abuse support and psychological treatment options in the community**
  We often see patients that may admit to drinking habitually due to relationship problems, financial stressors, or for other reasons they do not disclose. Many patients are in difficult circumstances that have developed into a vicious cycle of depression, poverty and feelings of hopelessness. The problem with excessive alcohol use is that patients will forget to take their ART when they are drinking, which leads to eventual failure of the drugs. In our clinic we refer patients for social worker counselling and intervention, we try to empower our patients to take back control of their health, and we are supportive if they have not managed to cut down on their drinking. Treatment of underlying depression is sometimes necessary. Illicit drug use in some patients challenges us in similar ways.

In 2012 staff at Themba Lethu Clinic came up with a systematic approach to patients failing second line ART and started a "third line clinic".

Unfortunately there are few places in the community to assist these patients successfully.

Take home messages

In most cases where a patient has a high viral loads on 2nd line ART, it is due to an adherence problem. Re-infections, drug interactions and resistance should also be kept in mind.

In those cases where adherence is good and the viral load remains high, drug resistance may be a possibility and a genotype test can be helpful in making that decision and in helping to decide on the next step.
High quality adherence counselling is the basis for treatment success: many of our patients referred to our clinic for the community have never undergone adherence counselling before despite many years of elevated viral loads. Assessing the causes of second line failure requires time and a non-judgmental approach. Busy clinics have to find a way to give these patients the time and attention they require.

Clinician's point of view working in the TLC third line clinic: Dr Sadiyya Sheik, medical officer Themba Lethu Third Line Clinic
It is rewarding to see patients that are able to achieve undetectable viral loads as a result of the interventions of the third line clinic. We are finally able to provide patients failing second-line therapy with an appropriate and highly successful management plan. I am proud of the clinic's achievements and feel privileged to be a part of it.

Clinician's point of view working in the TLC third line clinic: Dr Pauline Howell, medical officer Themba Lethu Third Line Clinic
I have come to get to know several patients very well because of the extra time spent with them during the third line clinic and have forged some good relationships. Working in the third line clinic has helped me gain a much better understanding of patients' struggles, and has made working at Themba Lethu a much more rewarding and personally fulfilling experience for me.

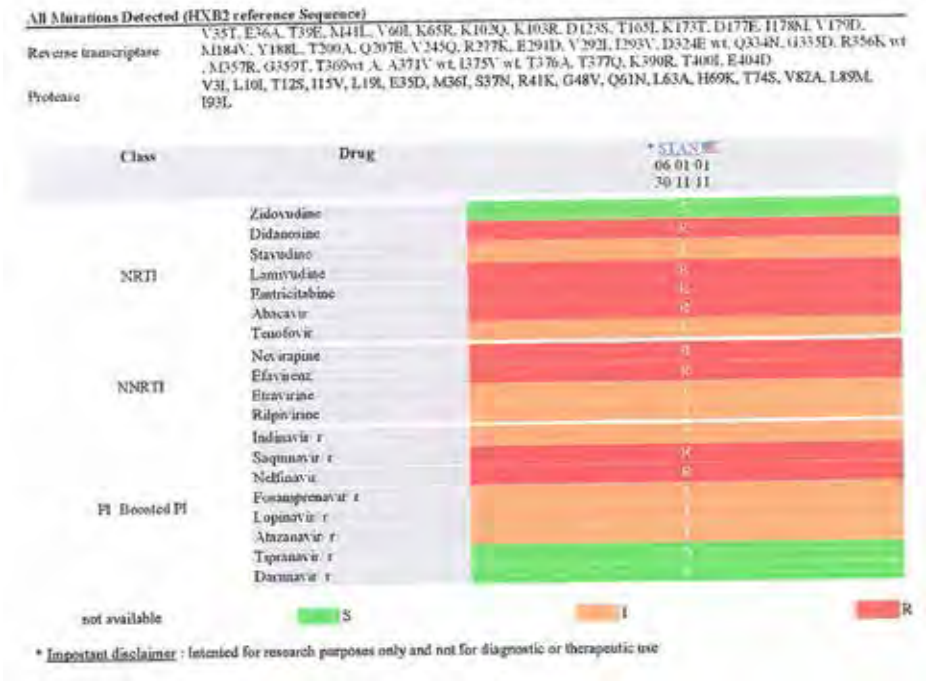
Case study:
Ms AH

ART History:
- **2003:** Private GP, Initiated d4T AND ddI
- **2006:** Moved ART to public sector, switched to d4T/3TC/efv
- **2009:** VL did not suppress, switched to AZT/ddI/Lopinavir/ritonavir VL remained elevated
- **2010:** Diagnosed with pulmonary TB, Lopinavir/ritonavir dose not adjusted
- **2011:** Switched to TDF/AZT/3TC/Lopinavir/ritonavir VL remained elevated
- **2012:** Referred to third line clinic, underwent intensive adherence counselling and HIV genotype testing (see result below)

Counselling Outcome:
During her counselling session she told us that she was very self-conscious about the facial lipodystrophy and the fact that people could tell by looking at her that she was taking ART. She admitted to periods of poor adherence due to frustrations with the lipodystrophy.

Genotype Result:
Her genotype test showed that she had intermediate resistance to tenofovir, lopinavir/ritonavir and complete resistance to stavudine, abacavir and efavirenz.

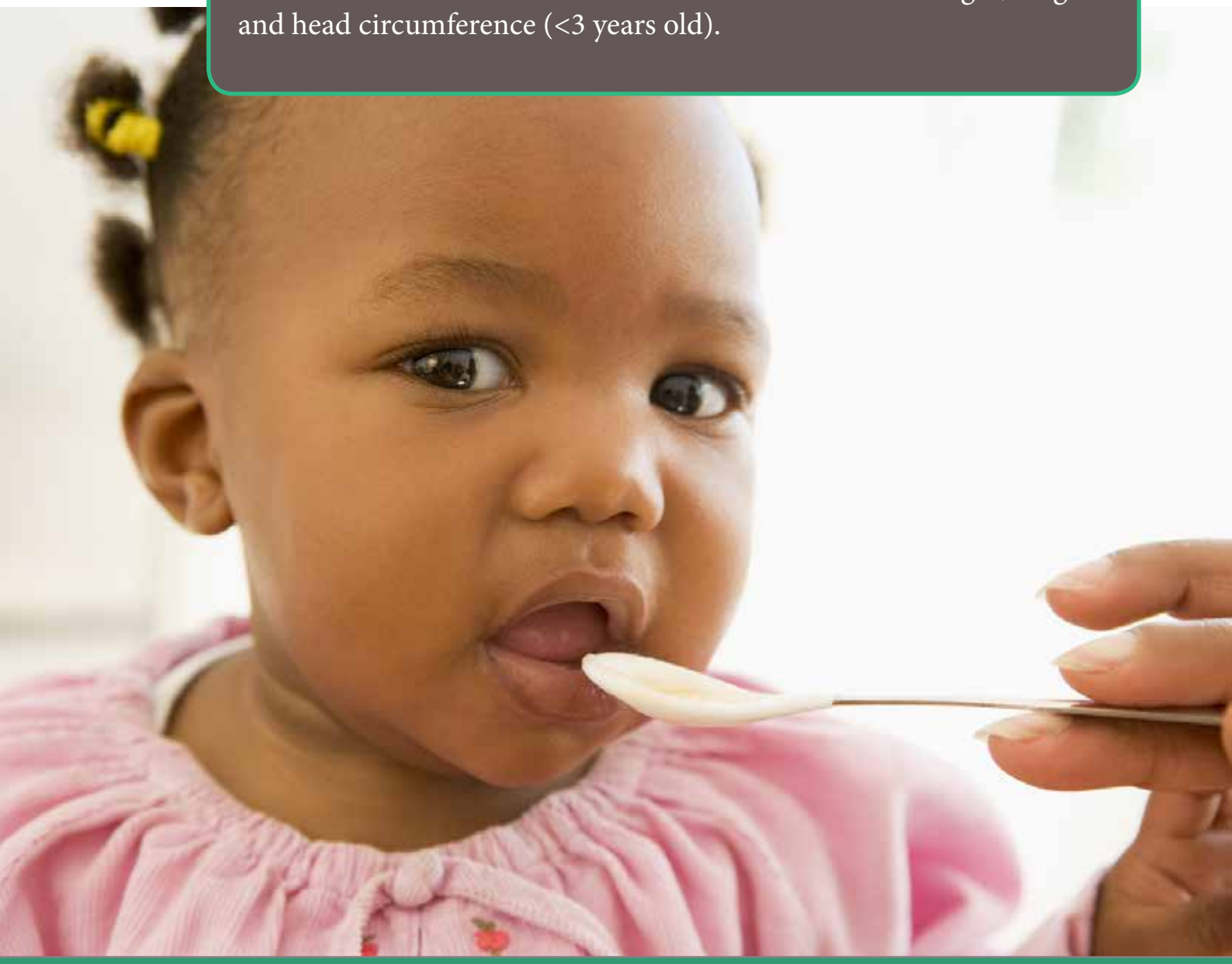
Third-line clinic intervention and outcome:
Her case was discussed at the Themba Lethu third line meeting and it was decided that if she was able to demonstrate good adherence she would be a candidate for third line drugs. Three months after her intensive adherence counselling session her viral load was repeated and improved from 25000 copies/ml to 600 copies/ml. Because she had demonstrated improved adherence and her genotype revealed resistance to the three main ARV drug classes she was placed on a regimen of raltegravir, lamivudine, darunavir and ritonavir. On repeat viral load testing three months after her regimen change her viral load was undetectable, for the first time in 10 years on ART. She has been referred to the Helen Joseph Hospital plastic surgery department for evaluation of her facial lipodystrophy. R



Feeding an infant that is infected with HIV (Part one)

by Carey Haupt RD (SA) Family Kitchen

Growth and nutritional status is a marker of HIV disease and response to ARV treatment. Thus all HIV infected infants need to have routine nutritional assessments. This includes measurement of weight, height and head circumference (<3 years old).



Introduction

There are certain issues that need to be considered in relation to infant and young child feeding in the context of HIV, with regard to their nutritional status. Therefore all infants should have their HIV exposure determined before birth as part of the Prevention of Mother to Child Transmission (PMTCT) program[1]. As per the SA guidelines on management of HIV infected children, all HIV exposed infants should have a polymerase chain reaction PCR HIV test at 6 weeks of age and a rapid test at 18 months. This includes infants that are breastfed. They require an additional test 6 weeks after stopping breastfeeding.

It is strongly recommended that breastfeeding should not be stopped in order to conduct any HIV diagnostic test, and this is supported by high quality evidence[1]. This is because if the infant is found to be HIV positive, the nutritional guidelines for HIV infected infants says to continue breastfeeding exclusively until the age of 6 months and then continued breastfeeding until 2 years and beyond. If a mother has stopped breastfeeding, she may be encouraged to re-lactate.

As a health care provider you should provide a mother of HIV infected infants with the following nutritional advice and support (all of the topics below are discussed in detail in the 18 hour Lactation management courses that are required for all health care staff to attend in order for a facility to become accredited as Baby Friendly:

1. Encourage the mother to continue to breastfeed.
2. If the mother has disclosed to her family, invite them to come into the clinic and discuss her breastfeeding the infant. Explore their beliefs and understanding about breastfeeding and HIV. Help them to support the mother.
3. If the mother has not disclosed, help her to find breastfeeding support from another source.
4. Explore and discuss the following topics with the mother depending on the age of the infant:

a. Latching and positioning of the infant at the breast.

i. Correct latching and positioning are key skills that the mother and infant need to learn in order to breastfeed successfully. There are many positions that mothers can breastfeed in- cradle hold, rugby hold, side lying, cross cradle hold or prone position[2].

b. Maintaining of breast milk supply.

i. Discuss common myths about drinks or supplements that increase milk supply.
ii. Explain how milk is made via hormones: Prolactin and Oxytocin [2].

c. Demand feeding.

i. Is uninterrupted and feeding when the infant indicates that he is thirsty. This is important in order to maintain milk supply.

d. Breast feeding in public.

i. Discuss how the mother feeds about breastfeeding in public and explore different options.

e. Explanation of exclusive breastfeeding and coping techniques.

i. Exclusive breastfeeding is breast milk only, no water, formula, solid foods or herbs except for medication or vitamins as prescribed by a doctor.

f. Expression of breast milk by hand and using a pump.

i. Both techniques can produce sufficient milk but the correct techniques need to be taught

g. Storage of expressed breast milk.

i. Breast milk can be stored at 15°C for 24 hours, 19-22°C for 10 hours, 25°C for 4 to 6 hours, in the refrigerator (0 to 4°C) for 8 days, in the freezer compartment inside a refrigerator for 2 weeks and in a self-contained freezer for 3-4 months.

h. Prevention of engorgement and mastitis.

i. If a mother is able to latch her baby correctly and if she feeds on demand she should be able to avoid engorgement or mastitis.

i. Treatment of engorgement and mastitis.

i. Explain what the symptoms of engorgement and mastitis are and how to treat them

j. Introduction of complimentary foods- when, and which foods.

k. Giving of the antiretroviral treatment to the infant.

As per the guidelines a mother of an HIV infected infant may choose to formula feed her infant. She also will need to have guidance and support as part of the infant's nutritional care. The health care worker needs to discuss the following with the mother:

1. How to correctly mix the formula.
2. Sterilization of all feeding and mixing equipment.
3. How much formula the infant should be receiving.
4. Safer formula feeding practices.
5. Stopping of formula at 1 year of age and replacement with full cream cow's milk.
6. Introduction of complimentary foods- when and which foods.
7. Giving of the antiretroviral treatment to the infant.

The nutritional recommendation for HIV infected infants is exclusive breastfeeding for 6 months and continued breastfeeding for 2 year or beyond.

Growth and nutritional status is a marker of HIV disease and response to ARV treatment. Thus all HIV infected infants need to have routine nutritional assessments. This includes measurement of weight, height and head circumference (<3 years old). These measurement need to be recorded in the child's Road to Health Booklet in addition to any facility based records. Z-scores are used to determine if a child is within the normal weight and height. Stunting, wasting and severe acute malnutrition can be determined using growth charts like the Road to Health Cards.

Once ART is started there is normally an improvement in growth. The growth pattern of the child should be communicated to the mother or care giver as this can be very rewarding and help with adherence with the treatment.
A child requires an extra 10% energy once they have acquired HIV and an additional 30% to 100% when symptomatic depending on their nutritional status. The additional 10 to 30% energy can be met with food. Nutritional supplements will be required for more malnourished or children who are not able to eat foods. Refer to a dietician if a child is in need of supplementation.

When the infant is about 5 months old, help the mother to prepare for giving complimentary food when the infant turns 6 months old. Encourage the mother to make her own complementary foods.

Here are some recipe ideas:
Make purees by cutting the vegetable/fruit into small pieces, steam until soft, and push the vegetable through a sieve or use a blender to puree. As your child tolerates, make the vegetable less smooth. Some fruit do not need to be cooked, such as avocado, banana or canned fruit. If you have a freezer, make more than you need and freeze the extra in an ice tray. Once the puree is frozen, store in the freezer for up to 1 month in a closed container. Use the puree as you need

Appropriate foods for complimentary feeding:

Different cultures use different foods, explore what foods that the mother has available and what she would like to give. Discuss the pros and cons of her choices. Use the list of foods below as a guide for appropriate complimentary foods.

Start with the staple foods. They should provide energy, some protein and vitamins. Examples include cereals (rice, wheat, maize, millet, quinoa) and roots (cassava, yam and potatoes).

Animal source foods are important as they provide high quality protein, haem iron, zinc and other vitamins. At six months of age infants need additional sources of haem iron. Examples include liver (chicken, beef, lamb), red meat, chicken, fish and eggs.

Vegetables should include green leafy and orange coloured vegetables as they provide vitamins A, C and folate. Examples include spinach, broccoli, chard, carrots, pumpkins, sweet potatoes.
Legumes are a cheaper source of protein and also provide energy, fibre, and iron (although it is not well absorbed). Examples include chickpeas, lentils, cowpeas, black-eyed peas, kidney beans, lima beans.

Oils and fats provide energy and essential fatty acids. Examples include cooking oil (canola and sunflower, margarine, butter or lard. Avocado pears can also be given as a fat substitute. Seeds have a high fat content and provide energy. These include groundnut paste or other nut pastes, and also soaked or germinated seeds such as pumpkin, sunflower, melon, sesame.

Milk products can be given in small amounts from 9 months. This can be added as milk to porridge or given as a piece of cheese. Animal milk should not however be given to replace breast milk or formula feed as it has incorrect protein and solute load for an infant. Milk products provide protein, energy and most nutrients. Examples include cheese, milk, yoghurt and curds.

it and make different combinations of foods for your frozen stock.

Here are some combination ideas that help babies to explore different tastes:

Potato and pumpkin

Potato and spinach

Carrot and broccoli

Carrot and spinach

Apple and avocado

Chicken, baby marrow and carrot
Fish, spinach and potato

Oats porridge with apple and cinnamon

Pumpkin and sweet corn
Peach and apricot

In order for the mother to increase the energy density of the purees, she can add nutrient dense foods like: peanut butter, egg, chicken liver, avocado, oil, margarine, soya mince or canned fish. To prevent food poisoning all animal products need to be cooked well, meaning that the egg yolk should be hard and that the meat is cooked so that it is no longer red or pink. R

Reference:

1. Department of Health Guidelines for the management of HIV in children. 2012 2nd edition.
2. Mohrbacher N, Stock J. The breastfeeding answer book, 3rd edition: La Leche League.

Once ART is started there is normally an improvement in growth. The growth pattern of the child should be communicated to the mother or care giver as this can be very rewarding and help with adherence with the treatment

Legal obligation to prevent stockouts

Sasha Stevenson, Attorney, SECTION27

The stock outs are also devastating to health care workers. Having to turn a patient away because no treatment is available goes against the core of a health care worker's job.

The stock outs of essential medicines and medical supplies across many parts of the country affect both patients and health care workers. Over the last year, these stock outs have become more and more common.

Background

The Eastern Cape has been particularly badly hit. In December last year, a team from the Treatment Action Campaign (TAC) and Médicines Sans Frontièrs (MSF) intervened at the Mthatha Depot where operations had all but come to a stop following floods, months of strikes, and years of systemic breakdown and suspected corruption. It was estimated at the time in a report entitled *Emergency Intervention at Mthatha Depot: The hidden cost of inaction*[1], that due to the stock outs of ARVs in the health care facilities served by the Mthatha Depot, at least 5 494 adults taking ARVs went for at least one day without their ARVs and at least 561 children went home without their treatment in the preceding months. Based on academically-accepted published data[2] on the impact of unplanned drug interruptions upon drug resistance, it was estimated that at least 714 patients may have developed some form of drug resistance as a result of this period of supply disruption. The consequences of medicines stock outs couldn't be starker. In June 2013, a follow up report was published[3] showing that while the situation had improved, medicines stock outs remained throughout much of the Eastern Cape.

Another province that is beset by stock outs and shortages is Gauteng. Months of stock outs of medicines including ARVs in facilities across the province finally culminated on 9 July 2013 in the intervention of the National Department of Health, which delivered Lamivudine to facilities. In many cases, patients had to be given two or three days of medication by health care workers who had to ration the medication available. This meant that patients had to return to facilities repeatedly, having to take leave from work or spending the little money they had on transport to the clinic.

The impact of stock outs

These stock outs are clearly devastating to patients. Many patients will default on their treatment (be it for HIV, TB or chronic illnesses) because they cannot afford to visit the clinic multiple times to collect treatment, cannot get leave, or lose faith that the treatment needed will be available. Defaulting on treatment can lead to a worsening condition and, in the case of some medication like ARVs, can lead to resistance, forcing people onto second line regimens which are more expensive and may have unpleasant side-effects, or third line regimens, which are only available in the South African public health care

sector to a limited extent. The stock outs are also devastating to health care workers. Having to turn a patient away because no treatment is available goes against the core of a health care worker's job. Deciding who does and who doesn't get treatment, and how much everyone can get, is equally unbearable.

Legal obligations to prevent stock outs
Given the serious adverse effects of stock outs on patients and health care workers alike, it is important to understand where the legal obligations to prevent stock outs lie and what those obligations involve.

Legal obligations regarding the prevention of stock outs fall into one of four key sources of legal rights and duties: the Constitution, legislation, regulations and policy.

Under the Constitution, everyone is entitled to access to health care services (which includes essential medicines) and there is an obligation on the state to ensure access to such services and also to ensure that where services (or medicines) are available, they remain available. The state is also constitutionally obliged to respect, protect, promote and fulfill the rights to life and to dignity and to ensure efficient use of resources to respond to people's needs.

Legal obligations regarding the prevention of stock outs fall into one of four key sources of legal rights and duties: the Constitution, legislation, regulations and policy.

The National Health Act 61 of 2003 places obligations on the Minister of Health and MECs and Heads of Department in each province. These role players are required to create policy (the Minister and MECs), implement that policy in the provinces (MECs), and to plan for the provision of services and facilities and the quality of such services and facilities (HoDs).

The Pharmacy Act and Rules govern both facility pharmacies and medicines depots. They place obligations on the Responsible Pharmacist at a pharmacy or depot to ensure that stock levels are adequate to maintain accessibility of medicines and that stock control systems are in place.

It is clear from these legal provisions that there are obligations on the Minister, MECs, Heads of Departments, Depot Responsible Pharmacists, and facility Responsible Pharmacists (who, in the case of clinics, often don't exist). These obligations are legally enforceable, meaning that the office holders can be sued in their official capacities if they fail to comply with their obligations. It is not always clear, however, where the problem in the supply of medicines to patients arises. In some places, the problem is with suppliers, in some it is with depots, and in some it is with the ordering system. This uncertainty, due to insufficient monitoring and evaluation, makes enforcing these kind of legal provisions difficult.

Stop Stockouts Project

It is because of the difficulty in establishing where the problem in the supply of medicines and the unacceptable consequences of medicines stock outs that a number of organisations have come together to form the Stop Stockouts Project ("SSP"). The SSP aims to monitor and report on drug stock outs across the country, follow up on selected stock outs to ensure that they are resolved, create "intelligence" by navigating the drug supply chain, and analyse collated data to assist the Department of Health and other policy makers in understanding the root causes of stock outs within the public health system.

The basis of the SSP is reporting from health care workers and patients. It is only through this reporting that stock outs can be identified and ended. The SSP will shortly publicise a phone number to which messages about stockouts can be sent but in the mean time, report stock outs in your facility to http://www.sahivsoc.org/stockouts.

Medicine stockouts are damaging patient care and make the work of health care workers unnecessarily difficult. They are also a violation of rights and a breach of obligations. The SSP seeks to assist the Department of Health in establishing the systemic causes of stock outs and remedying stock outs in facilities to prevent the rights violations that are occuring.

Play your part. Report stock outs in your facility. R

[1] Review published by MSF, Rural Health Advocacy Project, TAC and SECTION27 in January 2013.
[2] Katharina Kranzer and Nathan Ford. *Unstructured treatment interruption of antiretroviral therapy in clinical practice: a systematic review.* Tropical Medicine and International Health. Volume 16 no 10 pp 1297–1313 October 2011.
[3] *Mthatha Area Stock outs Update 1: The chronic crisis - Essential drug stock-outs risk unnecessary death and drug resistance in South Africa,* published by MSF, Rural Health Advocacy Project, TAC and SECTION27 in June 2013.

Test your knowledge Quiz

1. According to the South African law, at what age can a child consent independently to an HIV test?

2. When is the right time to start talking to care givers about status disclosure?

3. When taking blood for viral load, what is it that gets measured?

4. For optimal clinical outcomes, adherence to ART should be greater than 50%. True or False.

5. After how many missed doses per month does viral load becomes detectable?

6. When should a patient be switched to second line regimen?

7. Patients failing on a d4T or AZT based first line regimen-switch to TDF+ 3TC/FTC+LPV/r. True or False

8. How often a sputum specimen must be sent to the laboratory for a patient who's got MDR-TB.

9. Patients with MDR-TB must be followed up 6 monthly for at least 2years after cure? True or False.

10. In most cases when a patient has a high viral load on 2nd line ART, it is due to an adherence problem? True or False.

Get all the answers on the next page (Page 60)

FPD SCHOOL OF HEALTH SCIENCES

BUILDING A BETTER SOCIETY THROUGH EDUCATION AND DEVELOPMENT

Registered with the Department of Education as a Private Institution of Higher Education under the higher education act, 1997. Registration number: 2002/HE07/013.

DISTANCE PALLIATIVE CARE NURSING FOR PROFESSIONAL AND ENROLLED STAFF NURSES

INTRODUCTION

The WHO defines palliative care as "an approach that improves the quality of life of patients and their families facing problems associated with life-threatening illness, through the prevention and relief of suffering, the early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual."

Palliative care is an integral part of every nurse's role. This course equips the nurse with the particular skills and knowledge required to care for patients with non-curable and terminal illness and to support the patient's family members.

WHO SHOULD ENROLL?

All professional and enrolled nurses registered with the SANC who care for patients with life-threatening illness.

COURSE DESIGN

The course consists of 3 parts:

1. Day release learning based on methods suitable for adult learners.
2. Assessment component (examination, communication skills and portfolio).
3. 128 hours clinical work – done in a HPCA approved Hospice. These clinical hours must be completed in the learner's own time.

COURSE STRUCTURE

1. Describe the development of palliative care and its role within the health care system and apply legal, ethical and professional principles in the care of patients and families, with particular reference to death and dying.
2. Describe the management principles of pain and symptom control in advanced illness with particular reference to malignant disease, HIV and AIDS, progressive neurological disorders and end stage organ disease.
3. Be competent in the interpersonal communication skills required to establish rapport and facilitate the grieving process with patients, families and colleagues.
4. Demonstrate the ability to understand the developmental stages as applied to social, cultural and spiritual dimensions in the provision of palliative care based on respect for the uniqueness of the individual.

ASSESSMENT / CERTIFICATION

Formative and summative assessment methods are used to evaluate learning at both theoretical and practical levels. To qualify for the certificate of completion for this short course, participants should fully attend the workshops, successfully complete the assessment process and complete the clinical work.

CLOSING DATE FOR REGISTRATION: 24 January 2014

ORIENTATION DAYS	DATE
Block 1: Handbook and Modules 1	10 – 14 February 2014
Block 2: Module 2	7 – 11 April 2014
Block 3:Module 3 and Module 4	23 – 27 June 2014
Block 4: Revision and Assessment	18 – 22 August 2014
CASE STUDY	**DATES**
Completed and bound	22 August 2014
COMMUNICATION SKILLS	**DATES**
Role play assessment	21 August 2014
LEARNING ACTIVITIES	**DATES**
Module 1: Learning activities	31 March 2014
Module 2: Learning activities	13 June 2014
Module 3: Learning activities	11 August 2014
Module 4: Learning activities	11 August 2014
CLINICAL WORK	**DATES**
Completed and submitted	22 August 2014
Completed evidence of work to be handed in	22 August 2014
MOCK EXAM	21 August 2014
FINAL EXAMINATION	17 September 2014

COURSE FEE

R 6 740 (Inclusive of all VAT and taxes where applicable)

EDUCATIONAL GRANT

This course is partially sponsored through an educational grant from the HPCA

All interested participants may also apply for a grant from HPCA. For application forms contact:

LESHOKO KOMANE
Tel: 012 664 8538
Fax: 012 664 6175
Email: lesoko@hpca.co.za
nkosazana@hpca.co.za

Answers to the Quiz questions

1. *Under South African law children of 12 years or below with sufficient maturity can consent independently to an HIV test and in these circumstances it will be the responsibility of the healthcare provider to counsel the individual.* From this Article: **"TO TELL OR NOT TO TELL: TALKING TO CHILDREN ABOUT THEIR HIV STATUS"**
2. *Conversations with caregivers about status disclosure should start as early as possible – in infancy - in preparation for full disclosure in the future. .* From this Article **"TO TELL OR NOT TO TELL: TALKING TO CHILDREN ABOUT THEIR HIV STATUS"**
3. *When blood is taken to measure viral load, the number of virus particles or 'copies' in one millilitre (mL) of blood is counted. The report sent back from the lab indicates the number of copies per mL.* From this article: **"Talking to Patients about Viral Load"**
4. *For optimal clinical outcomes, adherence to ART should be greater than 95% (1-2 missed doses per month); when adherence falls below 80% (more than 6 missed doses per month), detectable viral loads begin to ap pear.*[2] **False** From this Article: **"adherence to antiretroviral treatment: a facility approach to reduce the risk of treatment failure".**
5. *.(More than 6 missed doses per month), detectable viral loads begin to appear.*[2] From this Article: **"adherence to antiretroviral treatment: a facility approach to reduce the risk of treatment failure".**
6. *If a viral load is >1000 and adherence issues addressed, switch to second line therapy* From this Article: **"Principles of HIV drug resistance for clinical management in South Africa".**
7. **True** *Patients failing on a d4T or AZT based first line regimen – switch to TDF+3TC/FTC+LPV/r,* From this Arti cle **"Principles of HIV drug resistance for clinical management in South Africa"**
8. *One sputum specimen should be sent monthly for smear microscopy and culture.*From this Article: **"Monitoring of MDR-TB Patients on Treatment"**
9. **True** *Patients with MDR-TB must be followed up 6 monthly for at least 2years after cure,* From this Article: **"Monitoring of MDR-TB Patients on Treatment"**
10. **True,** *In most cases where a patient has a high viral load on 2nd line ART, it is due to an adherence problem* From this Article: **"A third-line antiretroviral treatment clinic at Helen Joseph Hospital, Johannesburg"**

Second South African Nurses' Conference 2013

Brought to you by DENOSA

Theme:	It is Our Right to Care
Venue:	ICC Durban
Dates:	16 - 18 October 2013.
Cost:	R2 500
Early registration:	R2000 (closes 15 June 2013)
To register:	visit: www.sanursesconference.co.za and download registration form
For more info:	Tel: 012 343 2315 (Peggy) Email: sanursesconference@denosa.org.za

A conference for nurses, by nurses

FIDSSA 5

Changing Attitudes

10-12 October 2013

5th FIDSSA CONFERENCE
Champagne Sports Resort Drakensberg
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- Antibiotic stewardship
- HIV and TB
- Multi-resistant Gram negatives
- Insights from the microbiome
- Infectious Diseases in marginalised populations and mass gatherings
- Current vaccination challenges and controversies
- New therapeutics
- Frontiers in diagnostics
- Workshops and training

For further information contact the FIDSSA Conference Office
Tel: +27 (0)11 463 5085 Fax: +27 (0)11 463 3265
email: erna@soafrica.com, janice@soafrica.com

www.fidssa.co.za

NATIONAL HEALTH LABORATORY SERVICE

RESULTS HOTLINE

0860 RESULT 737858

This line is dedicated to providing results nationally for HIV Viral Load, HIV DNA PCR and CD4 to Doctors and Medical Practitioners, improving efficiency in implementing ARV Treatment to HIV infected people. This service is currently available to members of Health Professionals Council of the South Africa and the South African Nursing Council. The hotline is available during office hours from 8am to 5pm Monday to Friday.

Register to use the RESULT HOTLINE

Follow this simple Step-by-step registration process

Dial the HOTLINE number 0860 RESULT (737858)
Follow the voice prompts and select option 1 to register to use the hotline
A hotline registration form will be sent to you by fax or e-mail.
Complete the form and return it by fax or e-mail to the hotline to complete your registration process.
Once you are registered, you will be contacted with your unique number. This number is a security measure to ensure that the results are provided to an authorized user.

To use the hotline dial 0860 RESULT (737858)

Select option 2 to access laboratory results.

- You will be asked for your HPCSA or SANC number by the operator.
- You will be asked for your Unique Number.
- Please quote the CCMT ARV request form tracking number (bar coded) and confirm that the result requested is for the correct patient.

Should the results not be available when you call, you will be provided with a query reference number which must be used when you follow up at a later date to obtain the result.

Once you have a Reference number

Select option 3 to follow up on a reference number
Should the requested results not be available, a query reference number will be provided to you.
A hotline operator will call you within 48 hours of receiving the laboratory results.

Registering for this service from the NHLS, will assit in improving efficiency, providing improved patient care and streamlining clinic processes. Call now and register to access results for HIV Viral Load, HIV DNA PCR and CD4.

NDOH/SANAC Nerve Centre Hotlines

• Any HCT concerns from facility and district managers should be reported to the NDOH/SANAC

Nerve Centre Hotline and, specific emails for each province:

- **Western Cape:** 012-395 9081 sanacwesterncape@gmail.com
- **Northern Cape:** 012-395 9090 sanacnortherncape@gmail.com
- **Eastern Cape:** 012-395 9079 sanaceasterncape@gmail.com
- **KZN:** 012-395 9089 sanackzn@gmail.com
- **Free State:** 012-395 9079 sanacfreestate@gmail.com
- **Mpumalanga:** 012-395 9087 sanacmpumalanga@gmail.com
- **Gauteng:** 012-395 9078 sanacgauteng@gmail.com
- **Limpopo:** 012-395 9090 sanaclimpopo@gmail.com
- **North West:** 012-395 9088 sanacnorthwest@gmail.com

AIDS Helpline 0800 012 322

The National Toll free AIDS Helpline was initiated in 1991 by the then National Department of Health's (NDoH) "HIV/AIDS, STD's and TB Directorate". The objective of the Line is to provide a national, anonymous, confidential and accessible information, counselling and referral telephone service for those infected and affected by HIV and AIDS, in South Africa.

In 1992, LifeLine was requested by NDOH, to take over the management of the Line by rotating it between the thirty-two existing community-based LifeLine Centres, and manning it with volunteer counsellors. In 2000, in response to an increasing call rate, a centralised Counselling Centre was established in Braamfontein, Johannesburg, to house the AIDS Helpline

The AIDS Helpline a national toll-free, operates on a 24/7 basis and is utilized by people from all walks of life in urban and rural areas, in all eleven languages at no cost from a landline telephone.

Annually, the Line provides anonymous, confidential and accessible telephonic information, counselling and referrals to over 300 000 callers.

The AIDS Helpline plays a central role in providing a deeper preventative and more supportive service to those infected and affected by the disease, but also serving as an entry point in terms of accessing services from government, private sector and other NGOs/ CBOs

Cases presented to the range from testing, treatment, transmission, TB, Medical Male circumcision, etc.

The AIDS Helpline incorporates the Treatment line. The treatment support services were included to complement the services provided by lay counsellors on the line. The Treatment Line is manned by nurses who provide quality, accurate, and anonymous telephone information and/or education on antiretroviral, TB and STI treatment

Registered with the Department of Education as a Private Institution of Higher Education under the higher education act, 1997. Registration number: 2002/HE07/013.

DAY RELEASE PALLIATIVE CARE NURSING FOR PROFESSIONAL AND ENROLLED NURSES

INTRODUCTION

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4. Demonstrate the ability to understand the developmental stages as applied to social, cultural and spiritual dimensions in the provision of palliative care based on respect for the uniqueness of the individual

ASSESSMENT / CERTIFICATION

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CLOSING DATE FOR REGISTRATION: 24 January 2014

MODULE	DATE
Module 1	6, 13, 20, and 27 February 2014 6 March 2014
Module 2	13, 20 and 27 March 2014 3 and 10 April 2014 8, 15, 22 and 29 May 2014
Module 3	5, 12 and 19 June 2014
Module 4	10, 17, 24 and 31 July 2014 7, 14 and 21 August 2014
Revision & Assessment	28 August 2014 4 and 11 September 2014
Final Examination	17 September 2014

COURSE FEE

R 6 740 (Inclusive of all VAT and taxes where applicable)

EDUCATIONAL GRANT

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All interested participants may also apply for a grant from HPCA. For application forms contact:

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9th Public Health Association of South Africa (PHASA) conference and the inaugural conference of the African Federation of Public Health Associations (AFPHA)

Africa's Public Health Legacy - Beyond the MDGs

24 - 27 September 2013

The 9th Public Health Association of South Africa (PHASA) conference and the inaugural conference of the African Federation of Public Health Associations (AFPHA) will be held jointly in Cape Town at the International Convention Centre.

CONFERENCE DATES

24 September 2013	Student Assembly World Federation of Public Health Association's Workshop
25 September 2013	Skills-building Workshops
26-27 September 2013	Main Conference

CALL FOR ABSTRACTS *(Conference official language is English)*

PHASA & AFPHA are now calling for abstracts for the 2013 Conference. Authors should submit abstracts online by no later than **21 May 2013**.

Track 1: Leadership for a lasting legacy
Track 2: Social determinants of health
Track 3: Burden of disease, disability and population health
Track 4: Improving the performance of the health system
Track 5: Policy advocacy and Community action for public health
Track 6: Public Health Education, Teaching and Training

SPECIAL CONFERENCE FEATURES

- Abstract Mentorship Programme
- Satellite sessions
- Taking stock - Thinking futures – A moderated panel discussion
- Student assembly
- Saving our planet-climate change focus

REGISTRATION

Early registration:	5 March – 30 July 2013
Late registration:	1 August – 13 September 2013

EXHIBITION

Do not miss the opportunity to network with industry innovators. Get in touch to learn more about exhibition opportunities at this event.

For more information, please visit the website at www.phasaconference.org.za

CONTACT DETAILS

MRC EVENT MANAGEMENT OFFICE
TEL: +27 21 938 0237
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SAVE THE DATE

24 – 27 SEPTEMBER 2014

SOUTHERN AFRICAN HIV CLINICIANS SOCIETY

CONFERENCE

2014

24-27 SEPTEMBER AT CTICC

Southern African HIV Clinicians Society 2nd Biennial Conference

International Convention Centre, Cape Town, South Africa

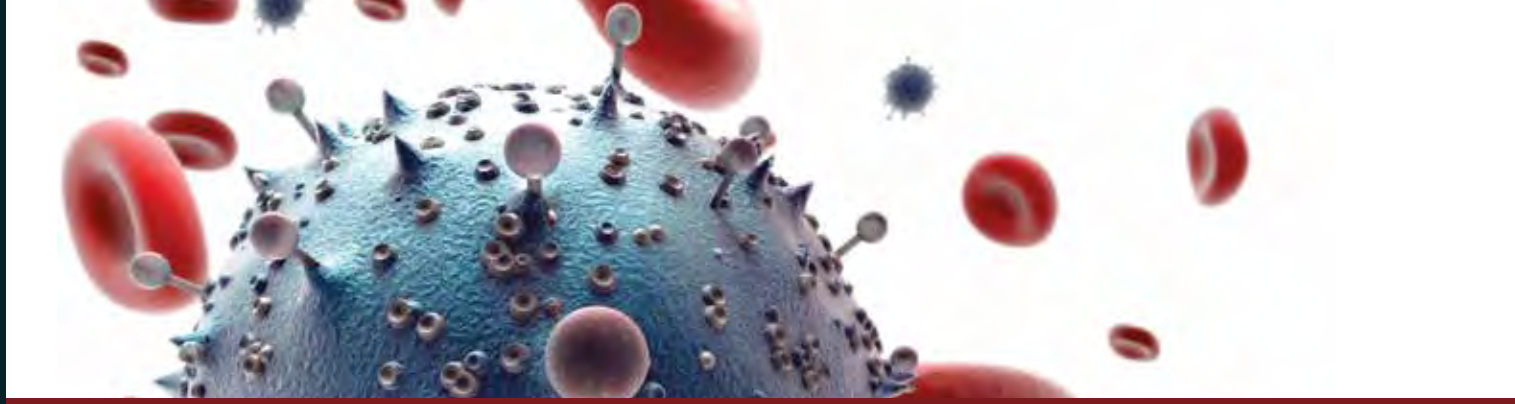
Following on from the success of our inaugural conference in 2012, our second SA HIV Clinicians Society Conference will be taking place from 24 – 27 September 2014 at the CTICC.

Focusing on clinical content, our conference is aimed at doctors, nurses and pharmacists, and will be fully CPD accredited.

Please diarise this event and keep an eye on our website: www.sahivsoc2014.co.za , for the latest updates.

We look forward to welcoming you in Cape Town.

Contact: Scatterlings Conference & Events
Tel +27 (0) 11 463 5085 Email: fiona@soafrica.com



UNITING NURSES IN HIV CLINICAL EXCELLENCE, BECOME A MEMBER.




Who are we?

We are a member-based Society that promotes quality, comprehensive, evidence-based HIV health care, by:

1. **LEADING • PIONEERING**
   We are a powerful, independent voice within Southern Africa with key representation from the most experienced and respected professionals working in the fight against HIV.

2. **CONNECTING • CONVENING • ENGAGING**
   Through our network of HIV practitioners, we provide a platform for engagement and facilitate learning, camaraderie and clinical consensus.

3. **ADVOCATING • INFLUENCING • SHAPING**
   With our wealth and depth of clinical expertise, we can help health care workers take their practice to a new level. We are constantly improving and expanding our knowledge, and advocating for clinical and scientific best practice.

Member Benefits

Join today and gain instant support from a credible organisation. The Society helps connect you with the best minds in HIV health care. Build your knowledge, advance your profession and make a difference by getting involved now!

- Free quarterly subscriptions to the *Southern African Journal of HIV Medicine*
- Free monthly subscription to the Society's e-newsletter, *Transcript*
- E-learning through CPD-accredited clinical case studies and on-line discussion group forums
- Free quarterly subscriptions to *HIV Nursing Matters*
- Weekly SMS clinical tips for nurse members
- Free CPD-accredited continuing education sessions
- Listing in the Society's online HIV provider referral network

SOCIETY CONTACT DETAILS:

Tel: +27 11 728 7365 • **Fax:** +27 11 728 1251
Email: sahivsoc@sahivsoc.org

Post: Suite 233, Private Bag X2600, PostNet, Killarney, Houghton, 2041

www.sahivsoc.org