The Golden Mortar

Newsletter of the Southern Gauteng Branch of the Pharmaceutical Society of South Africa and associated Sectors

Edition 3/May 2018

Pharmacy in NHI—Towards Universal Health Coverage in South Africa (2018 Vol 1 No 1)

The NHI Pharmacy Stakeholders Consultative Forum that was formed a short while ago has released its first newsletter. The intention is to keep pharmacists informed on the work that is being done and which has been completed to date. This is an important informative document and consequently is being published in its entirety.

"An opportunity to reshape the future for the pharmacy profession"

The publication of the National Health Insurance (NHI) White Paper on 30 June 2017, combined with the acceptance of some 80 countries, including South Africa, of Universal Health Coverage (UHC) in 2012, presents the profession of pharmacy with both challenges and opportunities. Many professional associations and individual pharmacists, in various practice settings, took the opportunity to contribute to the White Paper through submissions at various stages of its development. Unfortunately, until September 2017, there was little done to use these submissions to provide one comprehensive narrative on the pharmacy profession's role in UHC through NHI for South Africa.

There is sufficient evidence in the White Paper to suggest that it is Government's intention to utilise all available professional resources to achieve UHC. More importantly, an explicit role for the pharmacist and pharmacy support personnel (PSP) can be found in various parts of the White Paper. This is particularly important in view of the expression in 2010 of the intention of Government to re-engineer the primary health care system.

At a meeting in May 2017 with the Director General of Health (DG), Ms Precious Matsoso, some tough questions were asked of the profession, which has created a window of opportunity to re-evaluate its position and bring the profession together to provide a way forward. What was apparent from the meeting was that the National Department of Health (NDoH) needs to engage with a unified profession with a common vision and purpose to address the many challenges that will present themselves along the way.

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Following the meeting with the DG, a joint task team was established, in order to formulate a plan and to map a way forward. It was clear to the team that the following is required:

1. An inclusive approach
2. A consultative process based on democratic principles
3. The use of the extensive expertise in pharmacy together with our available resources to map a programme of action
4. A patient-centric focus

Objectives

The intention is to allow pharmacy, as a profession, to create a comprehensive document outlining the various roles that pharmacy could play within the wider development of the NHI and its services. The document will further form the template on which various sectors of the profession can base their day-to-day activities. This will allow for standard setting and quality control to ensure that measurable outcomes from which we can build and improve services to achieve the vision of quality pharmaceutical care for all our citizens through UHC.

The Establishment of the NHI Pharmacy Stakeholders Consultative Forum (NHI Pharmacy Forum)

The NHI Pharmacy Forum was established in September 2017, to explore new models of care that can be delivered through, or by, pharmacy to provide a coherent narrative for the profession's roll in NHI. It is important to note that all interested pharmacies (or groups of pharmacies) and pharmacists (or groups of pharmacists) are welcome to become members of this Forum and to contribute their knowledge and views to the Forum's work.

Establishment of the NHI Steering Committee

The NHI Pharmacy Forum, at its first meeting (September 2017), established a NHI Steering Committee (the Steering Committee) with representatives from every sector of pharmacy to co-ordinate all the groups and to oversee the processes. In order to increase efficiency of the Steering Committee, a representative from every stakeholder group were invited to form the core committee.

Composition of the Steering Committee

The Steering Committee brought together expertise from across the pharmacy profession and key stakeholders, in the form of an advisory group of pharmacists and healthcare specialists.

The Steering Committee is able to co-opt experts onto the committee as required, to assist with the development of the pharmacy document. The group is only advisory in nature and not intended to be representative of different sectors or organisations. It comprises one representative, and if appropriate an alternate, of the following areas of pharmacy practice:

1. Pharmacy
   - 1.1. Manufacturing Pharmacy
     - 1.1.1. Local manufacturers
     - 1.1.2. Multi-national manufacturers
   - 1.2. Wholesale and Distribution
   - 1.3. Community Pharmacy
     - 1.3.1 Corporate Pharmacy*
     - 1.3.2. Courier Pharmacy
     - 1.3.3. Independent Pharmacy
   - 1.4. Institutional Pharmacy
     - 1.4.1 Private Institutional
   - 1.5. Information Technology
   - 1.6. Academia
   - 1.7. Pharmacist and Pharmacy Associations**
     - 1.7.1. APSSA
     - 1.7.2. BPIA
     - 1.7.3. ICPA
     - 1.7.4. PLASA

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1.7.5. PTG (SMASA, GBM, IPASA, PHARMISA)
1.7.6. PSSA
1.7.7. SAACP
1.7.8. SASOCP
1.7.9. SAAHIP
1.7.10. SAAPI

2. National Department of Health:
   2.1. Sector Wide Procurement
   2.2. Affordable Medicines
   2.3. Heads of Pharmaceutical Services representative

3. Regulatory bodies (by invitation):***
   3.1. SAPC
   3.2. SAHPRA
   3.3. CMS

It is important to note that each member must represent and articulate the views of his/her stakeholder community and provide feedback to his/her community as appropriate.

Accountability

The Steering Committee is accountable to the NHI Pharmacy Forum and members of this Forum are accountable to their respective constituency or sector. Final decisions about content and publication of the strategic document remain the responsibility of the NHI Pharmacy Forum, where decisions will be made by consensus. Day-to-day operational issues will be taken at the Steering Committee level.

Queries

Any queries regarding the NHI Pharmacy Forum and/or Steering Committee can be directed to the Secretariat at pharmacy.stakeholders@gmail.com

Communication

The Steering Community is excited to present this first brief and congratulates all the participating sectors in coming together in unity on this important project.

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Annexure A

Abbreviations for pharmacist or pharmacy organisations

APSSA	Academy of Pharmaceutical Sciences of South Africa
BPIA	Black Pharmaceutical Industry Association
CMS	Council of Medical Schemes
GBM	Generic and Biosimilar Medicines
ICPA	Independent Community Pharmacy Association
IPASA	Innovative Pharmaceutical Association South Africa
PHARMISA	Pharmaceuticals Made In South Africa
PLASA	Pharmaceutical Logistics Association of South Africa
PSSA	Pharmaceutical Society of South Africa
PTG	Pharmaceutical Task Group
SAACP	South African Association of Community Pharmacists
SAAHIP	South African Association of Hospital and Institutional Pharmacists
SAAPI	South African Association of Pharmacists in Industry
SAPC	South African Pharmacy Council
SAHPRA	South African Health Products Regulatory Authority
SASOCP	South African Society of Clinical Pharmacy
SMASA	Self-Medication Manufacturers Association of South Africa

*A pharmacy or group of pharmacies listed on the JSE
**List of abbreviations in Annexure A
***List of abbreviations in Annexure A

Common Nutrition Problems in Infants

Left: Frans Landman who acted as MC at the session and to the Right is Dr. Nicoletta Hay, Paediatrician

The first Clinical CPD session for 2018 was arranged by the Southern Gauteng Branch of the PSSA for 17 April. The topic was "Common Nutrition Problems in Infants" presented by Dr Nicoletta Hay, a Paediatrician in private practice in Sandton. There were just short of 50 pharmacists who attended the session, which was found to be very interesting judging from the number of questions asked before the close of the session. Frans Landman acted as MC. In closing the session he thanked Dr Hay for her informative presentation, he also thanked Nestlé South Africa for their sponsorship of the session.

SOUTH AFRICAN ASSOCIATION OF COMMUNITY PHARMACISTS
(SAACP)

SUID-AFRIKAANSE VERENIGING VAN GEMEENSKAPSAPTEKERS
(SAVGA)

P O Box 95123 Grant Park, 2051, South Africa
Community Pharmacy House,
60 Fanny Avenue, Norwood, Johannesburg 2192

Posbus 95123, Grant Park, 2051, Suid Afrika
Community Pharmacy House
Fannylaan 60, Norwood, Johannesburg

E-mail : ella@saacp.co.za
Tel : +27 (11) 728-6668
Fax: 086 274 0852

(Representing the Community Pharmacy Sector of the PSSA)

24 April 2018
B62/4/18

AN UPDATE ON HIV MANAGEMENT- THE ROLE OF THE PHARMACIST

Sector Workshop to be held in the Auditorium, 52 Glenhove Road,
Melrose Estate, Johannesburg – Tuesday, 5 June 2018

A G E N D A

Registration and Refreshments: 19:30 - 20:00

Introduction, Welcome and Thanks to our Speakers and Sponsors Mylan (Pty) Ltd and Healthcare Waste Services:

20:00 – 20:10: **Tshifhiwa Rabali, Chairman, SAACP SG Branch & SAACP National President**

Speaker:

20:10 – 20:40: **Dr Martin McKay, General Practitioner, Specializing in HIV Management**

Questions and answers: **20:40 – ± 21:00**

21:00 – 21:15: **Demonstration of Temperature Alert Machine by Mr Pieter Lombard, PicC Electronics (SMS Alert)**

Questions and answers: **21:15 - ± 21:30**

Closure and Thanks:

Mr Tshifhiwa Rabali, Chairman, SAACP SG Branch

Kindly RSVP: Ella at ella@saacp.co.za or 011 728-6668

Viral infections in children: Are you looking at the full picture?

Lynda Steyn, BPharm
Amayeza Information Services

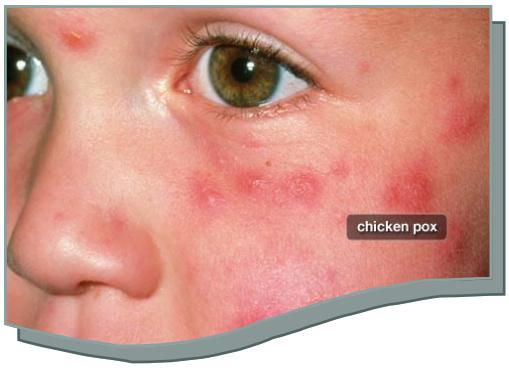
Children are highly susceptible to circulating viral infections and, during winter, not only is there the additional cold and influenza virus circulation, but the viruses causing measles, mumps and rubella also become more prominent. Pharmacists are often asked to dispense medications to relieve the associated symptoms of these viral infections. Most of these viral infections are self-limiting and symptoms improve over time even without treatment. However, symptomatic treatment usually makes the child feel more comfortable. The choice of treatment for symptoms such as pain and fever is usually either paracetamol or ibuprofen.

Aspirin is not to be a consideration for children and adolescents under the age of 16 years due to the risk of Reye's syndrome.

Reye's syndrome is a paediatric condition characterised by a "metabolic non-inflammatory encephalopathy and fatty degeneration of the liver." Although this disease is rare, it is potentially life-threatening. The use of aspirin in children with viral illnesses, such as varicella, upper respiratory tract infections, influenza and gastroenteritis, has been associated with Reye's syndrome. Children with Reye's syndrome usually present with vomiting and an altered level of consciousness. Since the use of salicylates in children is no longer recommended, there has been a dramatic decrease in the number of children diagnosed with Reye's syndrome.

Ibuprofen – caution in children with chickenpox

If a child has varicella (chickenpox), or is suspected of having varicella virus, ibuprofen (or any nonsteroidal anti-inflammatory), is not recommended, due to the increased risk of necrotizing soft-tissue infections (Necrotising Fasciitis) and possible secondary skin infections caused by invasive streptococci. In this instance, paracetamol should be offered to relieve pain or fever associated with the illness.



Necrotising Fasciitis (NF) is a rare deep infection of the soft tissue most commonly caused by group A ß-haemolytic streptococcus. While many cases of NF have been associated with trauma to the skin in patients with comorbid factors, such as diabetes or alcoholism, there have also been studies possibly linking the use of nonsteroidal anti-inflammatories (NSAIDs) during varicella infections with the development of severe cutaneous complications. Due to this increased potential risk, the use of ibuprofen in the symptomatic treatment of varicella infections is not recommended.

While some viral infections are difficult to prevent, infections caused by several of the common viruses circulating in children can be prevented through vaccination. Vaccines are available for common childhood viral infections such as measles, mumps, rubella and varicella. Parents should be encouraged to make sure that their children's vaccinations are up to date.

In addition to routine childhood vaccines above, the influenza (flu) vaccine is recommended annually for children from 6 months of age. All children are susceptible to complications from flu, especially children under the age of 5 years or with chronic conditions, such as asthma, diabetes or neurological disorders. Children and adolescents under 18 years of age receiving chronic aspirin therapy are also advised to have an annual flu vaccine.

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The following table illustrates the dose of flu vaccine recommended according to age group:

Age	Dose
6 months through 2 years	0.25ml* (half an adult dose)
3 years through 8 years	0.5ml* (adult dose)
9 years of age and older	0.5ml

Adapted from Healthcare Workers Handbook 2015

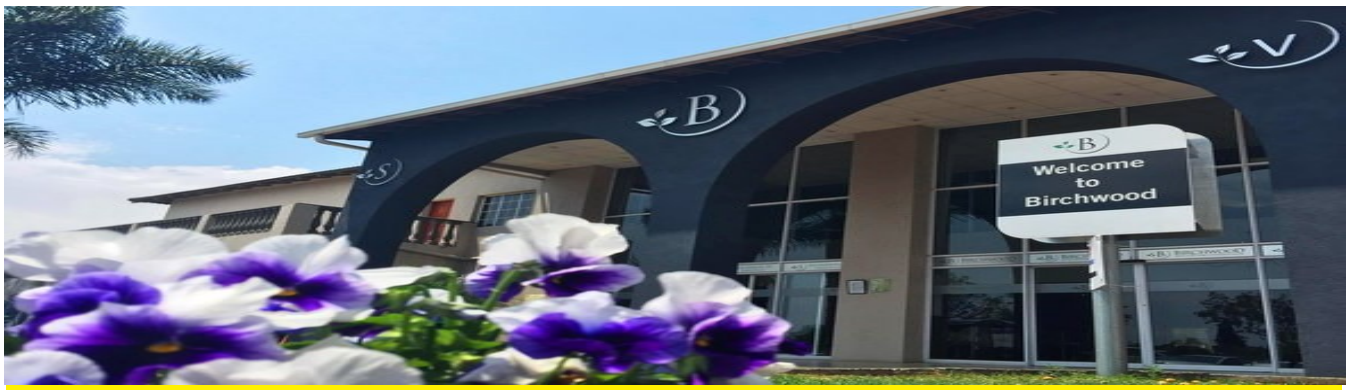
(NICD)
*Children under 9 year of age will require 2 doses of flu vaccine separated by 4 weeks if receiving flu vaccine for the first time. Thereafter, they will need one 0.5 ml dose of flu vaccine annually. Children 9 years of age and older receiving a flu vaccine for the first time only need to receive one dose of flu vaccine annually.

Parents should be made aware that:

- The flu vaccine takes approximately 2 weeks in order to develop protective antibodies to the flu viruses. The child may still get flu in the 2 weeks after vaccinating before the antibodies have had time to develop.
- The flu vaccine only prevents certain strains of flu present in the vaccine available for that flu season. Other strains of flu may be circulating to which the child may still be susceptible.
- The flu vaccine available in South Africa is inactive and cannot cause flu.
- It is never too late in the flu season to vaccinate. The flu season often extends beyond the winter months.

Viral infections in childhood are often inevitable and can often only be treated symptomatically. Choice of either paracetamol or ibuprofen should be made on an individual basis, taking into account the individual child and the presenting symptoms. Preventing viral infections where possible through vaccination not only protects the child, but also prevents the spread of these illnesses to other children (and adults) for whom vaccination is not possible (due to age factors or illness).

References available on request.



Save the date

22-24 June 2018

Birchwood Hotel & OR Tambo Conference Centre, Boksburg, JHB

By now, everyone working in the pharmaceutical environment in South Africa should be informed about the changes heading our way and can no longer afford to miss a conference where the future of our profession will be the main topic of discussion...

PSSA

CONFERENCE 2018

FAILURE TO PREPARE IS PREPARING TO FAIL

Go to https://www.psa.org.za/NewsEvents/Conference for information on the PSSA Conference.

Internship in Crisis

Stephanie de Rapper
Lecturer in Pharmacy Practice

Department of Pharmacy
Faculty of Health Sciences, Wits University

An internship period is a period of learning in which a student or trainee works in an organization, sometimes without pay, in order to gain work experience. In the South African Pharmacy setting, a year of internship is a requirement for qualification. This year of training is structured to provide the pre-qualified pharmacist with experience in order harness the skills required to provide optimal pharmaceutical care. The internship year is structured according to legislative requirements governed by the South African Pharmacy Council (SAPC) and includes students having to meet certain standards before they can be deemed competent enough to enter into community service. These standards include the submission of eight Continued Professional Development competency standards (CPDs) and the completion of a written exam based on pharmaceutical calculations and theory. Students shadow a registered tutor, who is a practicing pharmacist within the sector the student is registered for internship, in order to gain the skills of a pharmacist and to prepare for the SAPC requirements of internship. The tutor is expected, according to SAPC requirements, to assist the student in developing the skills required of a South African practicing pharmacist and to submit biannual reports on student progress.

In late 2017, the PSSA was approached by final year pharmacy students regarding a lack of placements for internship in 2018. Of the graduating class of 2017, 25-30% had not received an internship placement for 2018. This unprecedented lack of internship placements led the PSSA to conduct a survey on students and tutors to determine the cause. From the report generated, it was determined that of the students having applied for internship, each student had submitted 3.5 applications for consideration. The majority of applications were made to public institutions (29.2%), followed by private institutions (21.0%) and corporate pharmacies such as DisChem, MediRite, Pick 'n Pay and Clicks pharmacies (17.5%). When prompted to provide reasoning for lack of placement, students provided internal and external reasoning. Internal reasoning included, having applied too late or not at enough places, poor interview performance, lower than average academic records, conducting their undergraduate training at pharmacies that are not registered for internship, lack of work experience and not being able to start on 1 January with their internship due to outstanding supplementary examinations in January 2018. External reasons included, having applied for internship positions in provinces other than where they resided and that these positions were kept for students originating from the specific province, being non-South African residents, or budgetary constraints in government institutions.

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These reasons for lack of placement identified by Students surveyed mirror the responses received by Wits University students to whom an internal survey was submitted. Wits students interviewed stated in the majority that obtaining an internship was not an easy feat. Students suggested that pharmaceutical companies and private hospitals do not make it known that they offer internships. Other reasons for difficulty in obtaining an internship post included short period of acceptance for application with applications closing as early as April the year prior to internship. Students also stated that during interviews, they were be informed that if they had too much experience in one sector (i.e. retail) that they would not be suitable candidates for another (e.g. private or public institutional). The majority of Wits students interviewed had applied to industry, public and private institutional and corporate pharmacies. Of these students surveyed, only two had obtained their first-choice of application for internship. These suggested that the reasoning for this response was due to early application and above-average academic performance

In the report generated by the PSSA, pharmacists registered as internship tutors were surveyed to determine possible reasons for lack of internship posts. From the surveys received, 50.7% of pharmacists had previously mentored a pharmacist intern, with 30.8% of tutors having decided not to accept interns for 2018. When prompted for reasoning as to why tutors would not accept interns, the pharmacists surveyed indicated financial implications and expenditure incurred in employing a pharmacist intern as the primary reason, followed by the extensive time and effort required to train the intern during the internship year. Pharmacists surveyed stated that the costs associated with hiring an intern, including remuneration, pharmacy registration as a training site and tutor fees, were exceptional and did not equate to the benefit of hiring an intern. Interns during their internship period are considered to have the same scope of practice as that of a post-basic pharmacist assistant. The remuneration of an intern alone exceeds that of a post-basic pharmacist assistant and therefore pharmacies would prefer to hire an individual with retentive potential over an intern. Furthermore, the administrative time and effort afforded to training an intern was considered burdensome to registered tutors as they are expected to attend SAPC training events with their students, as well as help train the student on a day-to-day basis in preparation for CPD submissions and the intern exam. These tutor expectations are placed on these pharmacists in conjunction with their employment expectations.

Tutors assigned to Wits interns internally surveyed were invited to complete a series of interview questions aimed to determine the tutors reasoning for hiring the intern in 2018. Of the tutors interviewed, the majority stated that the institution in which they were employed had conducted interviews and had placed the students at their training site. These tutors were registered as such due to the expectation of their employer and were not driven by their individual willingness to assist interns. Private community pharmacists registered as interns provided more of a positive response with pharmacists stating their drive to assist interns and willingness to mentor. These pharmacists, however, did state that they are in the minority as often private community pharmacies are not financially capable of employing an intern due to their expected remuneration.

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Having identified the major hindrances to internship placements, could the period of internship be salvaged? The short answer is, yes, however, newer strategies need to be investigated in order to prevent the events of 2017 from reoccurring. These strategies affect the student, the tutor and Universities responsible for the volume of student output.

The student

The internship period is structured as a period of learning aimed to link theory to practice. The argument of remuneration, albeit a contested issue, should be the first obstacle of consideration in order to effect change associated to internship placements. Interns are students, individuals with a qualification but without potential for registration as qualified pharmacists until completion of this period of learning. Students assigned to internships should not be remunerated at levels exceeding their experience and qualification and as such should not earn more than a post-basic pharmacist assistant. Interns interviewed within the PSSA survey stated that on average, that they were willing to accept a minimum remuneration package of R15 591.84 (nett salary). Post-basic pharmacist assistants in South Africa earn on average between R10 000.00 and R12 000.00 (gross salary). This disparity in earning potential is exceptional and provides evidence as to why pharmacies are not financially capable of hiring interns over post-basic pharmacist assistants. Within the PSSA report, students suggested that a reduction in remuneration associated to internship posts would allow public institutions to assist more students based on the available budget. With the majority of students applying to institutions such as these for internship perhaps this could be the first point of deliberation. Another suggestion may be that students earn according to a teared system. For the first six months of internship, a period where the student is still being extensively trained and orientated, the student earns an equivalent of a post-basic pharmacist assistant. The following six month period will then allow the student to earn as they achieve. As students meet the milestones associated to internship, such as successful completion of CPD entries, the remuneration offered will increase accordingly.

The tutor

The aim of an internship is to ideally mould the graduate into a pharmacist of exceptional professional character and ability in order for the student to be a valuable member of the profession. The pharmacist registered as tutors are often overburdened and as a result lose sight of the privilege afforded to them as mentors. Pharmacist's assigned interns are in the unique position of being able to steer the profession through the nurturing and development of interns. The PSSA report suggested that the SAPC increase the number of interns legally allowed to be trained under an individual pharmacist. I feel this is not the best option as pharmacists are already so overburdened that increasing staff ratios may be detrimental to the intern. A suggestion on how to improve the quality of tutor to intern relationship may be for pharmacies to designate structured periods of interaction between them in order for valuable learning to commence. This period should be within the operating hours of the pharmacy with the tutor and intern offered a period of absence from the dispensary to address the learning needs or concerns of the intern.

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The need for tutors within practice is becoming a growing concern with more and more pharmacist becoming reluctant to take on this responsibility. A consideration may be to reward tutors for their assistance. Tutors are currently penalized for assisting students by having to pay for registration as tutors with the SAPC. Tutors are charged R 1,128.16 for registration while the pharmacy is levied R 2,889.05 for registration as a training site. An incentive for pharmacists and pharmacy owners may be to offer an incentive payment associated to the successful completion of internship by interns registered with their pharmacy. The remuneration may be entirely financial or a consideration may be to offer discount on annual registration fees with SAPC, such as 5% per successful intern. Another suggestion is to include the involvement of the South African government to offer tax rebates to companies willing to assist interns. Rebates are currently offered to graduates with STEM qualifications seeking internships in South Africa through the Exempted Micro Enterprise, "MindsInSync". Financial incentives may drive more pharmacists and pharmacies to assist students as a benefit will then exist for them to do so.

A suggestion received from the tutors interviewed, having mentored Wits graduates, was to formalize the period of internship within academic institutions. Some tutors felt that Universities could structure the internship year as a period of work based learning entirely dedicated to rotating students around varying institutions in pharmacy practice. Students would be mentored by both academics and pharmacist tutors. The academics could assist in guiding the student toward submission of CPDs and in preparing them for the intern exam, while the pharmacist tutor would offer the student practical experience based on this theory. This suggestion is not entirely practical as the student will then be expected to complete a 5-year degree with increases in costs associated to tuition. Universities, however, may be in a position to assist tutors and interns in order to reduce the number of student interns failing CPD submissions and the intern exam. The SAPC is making strides to improve on student understanding of these requirements for internship with the development of podcast tools and online resources. These resources will be available all year to guide the student, however, academics may be best suited to assist the SAPC in bringing these tools to fruition. These tools will then assist the tutor in order to provide effective guidance to the student and therefore may make the concept of tutoring less daunting.

Universities

The role of universities within the placement of interns was extensively discussed within the PSSA report with both pharmacy students and pharmacists suggesting that universities play a more active role in ensuring that their graduates can continue with their training. These suggestions included assisting the students in preparing to apply for internships as well as distributing advertisements to students. At the University of the Witwatersrand, such initiatives have been implemented through the development of INVEST. The Department of Pharmacy and Pharmacology at the University of the Witwatersrand has launched INVEST in 2017 as a Pharmacy Career Mentorship Program. The purpose of INVEST is to expose our B. Pharm students to various career options within the profession. Alumni and stakeholders are sourced by members of the INVEST staff and are approached

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to share career planning strategies with our students. INVEST lectures occur weekly with the goal to expose our students to the different sectors of the pharmacy profession. Within the INVEST lectures, students are also taught soft skills such as interview techniques and professionalism in these environments. Students are also taught by members of Human Resources on how to structure an attention-grabbing CV and how to actively apply for employment. Stakeholders are also approached to advertise internship placements with our third and fourth year undergraduates in these lecture slots. INVEST has received great reviews from stakeholders and students alike with the initiative set to gain momentum in years to come. Such initiatives should be encouraged in all institutions in order to get students thinking about internship early enough so that late applications and missed deadlines rarely occur.

Further to this, pharmacists suggested within the PSSA report that universities work together with the SAPC in preparing the profession on the number of interns expected the following year. The number of graduates is expected to increase each year with the higher demand expected with the implementation of the NHI. The role of pharmacists in the NHI calls for a greater number of graduates to fill the health need expected by the South African population. Although the number of graduates released in 2017 was not greater than those of 2016, the expectation is that this will not be the case in years to come. Pharmacies and pharmacists need to prepare for this in order to prevent the reoccurrence of the 2017 internship crisis.

Initiatives to encourage pharmacists to become active tutors and for pharmacies to be incentivised to encourage this among their staff is a crucial consideration in remedying the current state of pharmacy internship in South Africa. The suggestions provided in this report are made to provide stakeholders with food for thought and to encourage active deliberations among pharmacists, interns and regulatory bodies. The current state of internship is not one that cannot be rectified but will need willingness for engagement and constructive suggestions for improvement. These suggestions are encouraged by the PSSA with members invited to respond.

Pharmacy Month Theme for 2018

It has been a longstanding request by pharmacists to be informed well in advance of planned promotional periods such as Pharmacy Month so that they are able to undertake their own planning to fit in with the promotion. The good news is that The Golden Mortar has been informed well in advance of the Pharmacy Month theme for 2018, which is as follows:

The pharmacy month theme for 2018 is **"Use Medicines Wisely"** with five subthemes:

1. Know your medicine
2. Store your medicines correctly
3. Follow directions
4. Travel safely with your medicines
5. Talk to your pharmacist

The NDoH is currently in the process of designing the posters and pamphlets with the help of a graphic designer. Once the designs have been completed, the electronic versions will be uploaded to the PSSA website under News & Events.

Information in this regard will be communicated to PSSA members in the next PSSA Newsletter.

A closer look at tapeworms

Lynda Steyn, BPharm
Amayeza Info Services

Tapeworms can live as parasites in human intestines - adult tapeworms do not have a digestive tract and therefore absorb nutrients directly from the host's small intestine.

There are several species of tapeworms that can cause infection in humans, for example:

- *Taenia saginata* (beef tapeworm),
- *Taenia solium* (pork tapeworm),
- *Taenia asiatica* (Asian tapeworm; acquired by eating contaminated pork in Asia),
- *Diphyllobothrium latum* (fish tapeworm) and

Did you know?
"The longest parasite in the world is the 40 meter whale tapeworm, *Polygonoporus* sp."

Dipylidium caninum usually infects domestic cats and dogs. However, in very rare instances, humans may become accidentally infected with *D. caninum* after swallowing a parasite-contaminated flea. The larval stage of the dog tapeworms, *Echinococcus granulosus* and *E. multilocuralis,* can cause hydatid disease in people.
T. solium is associated with major health problems. Therefore, this article will primarily focus on T. solium infections.

Epidemiology

T. solium can be found worldwide. However, the prevalence of *T. solium is higher* in poorer communities where humans live in close contact with pigs and eat undercooked pork. It is estimated that neurocysticercosis (cysts in the brain) causes 30% of all epilepsy cases in countries where the *T. solium* parasite is endemic.
According to the World Health Organization (WHO), "in 2015, the WHO Foodborne Disease Burden Epidemiology Reference Group identified *T. solium* as a leading cause of deaths from food-borne diseases, resulting in a considerable total of 2.8 million disability-adjusted life-years. The total number of people suffering from neurocysticercosis, including symptomatic and asymptomatic cases, is estimated to be between 2.56–8.30 million, based on the range of epilepsy prevalence data available."

What does a tapeworm look like?

Adult tapeworms (cestodes) are multi-segmented, flat hermaphroditic worms (with both male and female reproductive organs in a single worm). The entire worm could regenerate if the treatment does not eliminate the neck and scolex. The tapeworm has three distinct recognisable sections:

1. The scolex (head)
Attaches to intestinal mucosa and serves as an anchoring organ.

2. The neck
The unsegmented region, or neck, has a high regenerative capacity.

3. Proglottids
The rest of the worm consists of many segments, which are known as proglottids.
The distal segments can separate from the rest of the body; eggs or gravid proglottids are passed in the stool.

T. solium and *T. saginata* can be differentiated by morphologic characteristics of the proglottids, scolex and eggs. Figure 1 contains an illustration of the pork tapeworm and Table 1 highlights some of the differences between *T. solium* and *T. saginata*.

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***Table 1. Comparison between T. saginata* and *T. solium* tapeworms.**		
	*T. saginata (*beef tapeworm)	*T. solium* (pork tapeworm)
Scolex	Has four lateral suckers; Does not have hooks ("unarmed")	Has a well-developed rostellum (crown); Has four suckers; Has a double row of hooks ("armed")
Length of adult tapeworm (meters (m))	Usually ≤ 5m, but can reach up to 25 m	Range from 2 m to 7 m
Amount of proglottids per adult worm	1 000 to 2 000	1 000 (average)
Amount of eggs* per proglottid	Up to 100 000	About 50 000

*The eggs can survive in the environment for days to months.

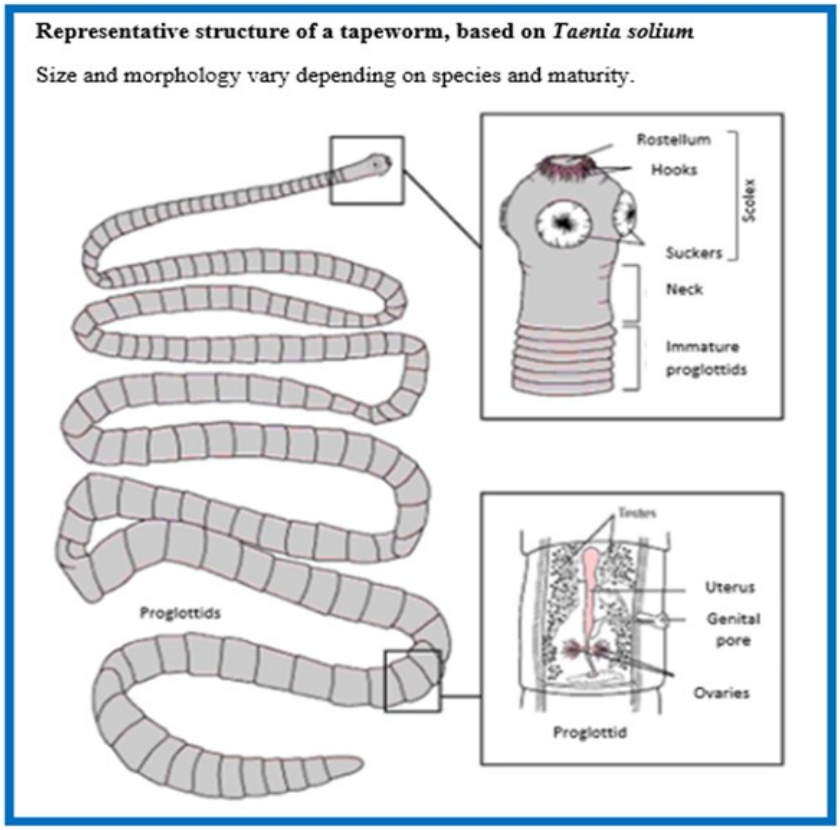

Figure 1. Representative structure of a tapeworm. Extract from the MSD Manual Professional Version (Known as the Merck Manual in the US and Canada and the MSD Manual in the rest of the world), edited by Robert Porter. Copyright (2018) by Merck Sharp & Dohme Corp., a subsidiary of Merck & Co, Inc, Kenilworth, NJ. Available at http://www.msdmanuals.com/professional. Accessed 20 March 2018.

Symptoms

Intestinal worm infection

Intestinal infection with *T. solium* mainly occurs when people eat undercooked or raw contaminated pork, which contain cysts of tapeworm larvae (cycticerci). After ingestion, the cysticercus develops into an adult tapeworm; this takes about 2 months (Figure 2). The adult tapeworm then attaches to the small intestine and resides in the small intestine, where it can survive for years.

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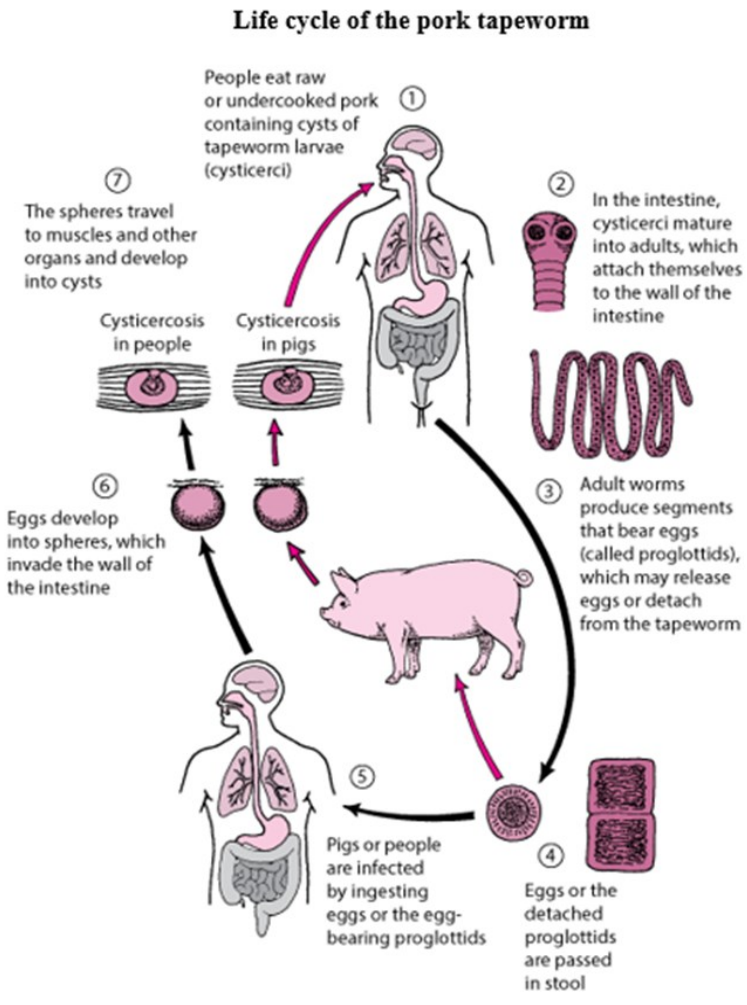
Most people typically do not have any symptoms and worms are often discovered incidentally, when they see part of the "ribbon-like" tapeworm in their stools, clothing or bedding. This is usually the most visual sign and main symptom. However, some people may experience symptoms such as diarrhoea or constipation, nausea, abdominal discomfort, loss of appetite or weight loss. The infected person may also sense the movement when a piece of the worm moves through the anus.

Patients with *T. saginata* taeniasis often experience more symptoms because the *T. saginata* tapeworm is larger in size compared to *T. solium or T. asiatica*.
Occasionally the migrating tapeworm segments may become lodged in the pancreatic ducts, appendix or the bile ducts and cause obstruction.

Cysticercosis
After ingestion of *T. solium* eggs, oncospheres (embryos) hatch in the small intestine, penetrate the intestinal wall and migrate to other areas in the body (including the brain, tissue under the skin, muscles and other organs such as the liver, lungs, spinal cord or eyes) where they form cysts (cysticerci) (Figure 2). This form of the disease in known as cysticercosis.

The incubation period prior to the appearance of clinical symptoms for cysticercosis is variable and some infected people may remain asymptomatic for many years.

Cysts in the brain (neurocysticercosis) can cause symptoms such as blindness, severe or chronic headache, confusion, epileptic seizures, hydrocephalus, meningitis or dementia. Signs and symptoms depend on the person's immune response, the number, size, stage, and location of the pathological changes, but can also be clinically asymptomatic. In rare cases, cysts can develop in the spinal cord and cause muscle weakness or paralysis or cysts may develop in the eye where they can lead to blindness.



Note:
Ingestion of infected pork causes taeniasis (adult tapeworm infestation) but not cysticercosis.
Ingestion of the eggs cause cysticercosis.

.../ *continued on page 17*

Figure 2. Life cycle of the pork tapeworm. Extract from the MSD Manual Consumer Version (Known as the Merck Manual in the US and Canada and the MSD Manual in the rest of the world), edited by Robert Porter. Copyright (2018) by Merck Sharp & Dohme Corp., a subsidiary of Merck & Co, Inc, Kenilworth, NJ. Available at http:// www.msdmanuals.com/consumer. Accessed 20 March 2018.

Prevention

Prevention is the first line of defence. People should be advised to:

- Wash their hands with soap and water:
  - ⇒ Before eating or handling food and
  - ⇒ After touching animals or using the toilet.
- Thoroughly cook pork, beef and fish to at least 63°C for 3 minutes or longer and ground meat should be cooked to at least 71°C.

Tapeworm eggs and larvae can also be killed by freezing meat and fish at ≤ -20°C for 7 days or by deep freezing at ≤ -35 °C for 12 to 24 hours. Drying and smoking of food does not kill the cysts.

Treatment

Antiparasitic drugs such as niclosamide or praziquantel are effective against *T. solium* and *T. saginata* intestinal infections (adult worms). Alternative treatments include albendazole or mebendazole.
Albendazole or praziquantel may be used to treat cysticercosis or neurocysticercosis. Destruction of the cysts may lead to an inflammatory response; patients with ocular cysticercosis or neurocysticercosis may therefore require supporting therapy with corticosteroids and/or anti-epileptic drugs, and possibly surgery.

Conclusion

According to the WHO "Neurocysticercosis is the most frequent preventable cause of epilepsy worldwide." Asymptomatic household pork tapeworm carriers are the most common source of infective eggs and they may place themselves as well as others at risk of developing cysticercosis. It is therefore important to treat those who are infected with adult tapeworms, especially those infected with *T. solium*.

Bibliography available on request

Anti-doping Seminar

A report by Frans Landman, FPS

On the 21st April 2018 the SAIDS (South African Institute for Drug – free Sport) held a collaborative University Anti-Doping Seminar at the Princehof campus of Pretoria University – shared amongst pharmacists, doctors, some health care professionals and members of the SA Pharmaceutical Students Federation (SAPSF).

The topic: "A healthy approach to the use of medicines by athletes. The Seminar objective was to provide delegates with an insight into Anti-Doping rules, issues and details, which affect the athletes and sportsmen and sportswomen. It also highlighted the role that pharmacists and doctors can play to assist and guide the athlete in this regard.

Mr Khalid Galant (SAIDS CEO) opened the seminar and explained the program layout and the aims of the seminar. He gave an overview of doping in sport in South Africa and emphasised the important role that the GP and pharmacist play in assisting the participating athlete to maintain a doping – free status. He emphasised that we are part of the international arena and every athlete participating competitively on a provincial, national and international level knows the rules; but competition and winning motives lead to some athletes eventually breaking the rules.
What he highlighted is that the GP and the pharmacist can be implicated in cases if they do not advise the athlete according to the rules and regulations; the onus is also on athletes to inform the healthcare professional that they are competing competitively.

Ms Wafeekah Begg, from the SAIDS legal team, shared some doping cases that they were involved with, and how the healthcare professionals were implicated.
The next speaker**, Mr David Bayever** enlightened us about the latest on marijuana in sport – "Banned or Permitted?"

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The important ones to take note of are:

- THC- Tetrahydrocannabinol (High psychoactive effect)
- CBD – Cannabidiol (Low psychoactive effect)
- CBN – Cannabidiol (Mild psychoactive effect)
- THCV-Tetrahydrocannabivarin (Medium psychoactive effect)
- THCA-Tetrahycannabinolic Acid (Nil psychoactive effect)
- CBC-Cannabichromene (Nil psychoactive effect)
- CBG-Cannabigerol (Nil Psychoactive effect)

Some of the Cannabinoids have anti-inflammatory, some have antiemetic, some have analgesic effects, and some increase the appetite. He also emphasised that the so-called "Dagga Oils" available "out there" are not tested to be containing the safe Cannabinoids; the chance of side effects is too risky. Cannabis and most of the Cannabinoids are still Schedule 7 drugs and not permitted to be used – the only one registered is the synthetic THC oral preparation Dronabinol, indicated as an anti-emetic in chemotherapy.

The following speaker, **Dr Katharina Grimm** – WADA (World Anti-Doping Association) and TUE (Therapeutic Use Exemptions) Expert Group Chairperson: SAIDS TUE Commission) explained the process in applying to have certain medicine use exempted. This process applies to certain medicines to be used by athletes – out of participation; she highlighted the TUEs apply to out-of-season use, and that with certain sports like Archery and Target Shooting a drug like a Beta-blocker will never be allowed to be used. She explained the steps in applying for a drug/medicine to comply with TUE rules.

The next speaker was **Dr Amanda Claasen-Smithers** (SAIDS Education and Research Manager) a Dietician by Profession, spoke of dietary supplements and the thin line between "safe and risky" sports supplements and products.

She named some products' actions as stimulants that are included in some supplements. DMBA(1,3-dimethylamylamine (DMAA), banned by the US FDA. She mentioned also Tribulus terrestris, colostrum, DHEA and Sibutramine, to be found in some products.
She also explained that many of the products have their own logo stating "GMP" compliant; this states that the company adheres to sanitation and good manufacturing practices, but the quality of ingredients and quantities have never been tested and proven! The other logos in question are "quality verified retailer", "informed choice .org trusted by sport" and "informed sport.com" – the athletes assume that they are safe and at low risk, but the products have not been tested for ingredients, and until we have a body like the FDA testing and proving products to be safe, they cannot be proven to be safe. There is a need for a board e.g. a Complimentary Medicines Board or body, which will be able to deal with such products.

The Seminar ended with a panel discussion on issues like the role of the healthcare professional in addressing the high tolerance among adolescents to steroid use and sports supplements. In the closing remarks the need for collaboration and co-operation amongst professional bodies SAIDS, SAACP, SAMA, etc and academia was identified and needs to continue.

Dr Amanda Claassen-Smithers, SAIDS Education & Research Manager, has invited any pharmacist who wants to participate in a short course that Wits will be hosting, to send their contact details to e-mail amanda@saids.org.za. There is also an App provided that can be downloaded to smart phones to assist with which products are safe in sport: just search for "Drug-free Sport"

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The Golden Mortar
P O Box 2467, Houghton, 2041
Tel: 011 442 3615, Fax: 011 442 3661
pssa@pssasg.co.za

Your SG Branch Chairman: Lynette Terblanche

Your PSSA Southern Gauteng Branch Sector representatives are:
Community Pharmacy: Tshifhiwa Rabali & Richard Barry
Hospital Pharmacy: Tabassum Chicktay & Rofhiwa Mulibana
Industrial: Hilton Stevens
Academy: Paul Danckwerts & Stephanie de Rapper

Contact them through the Branch Office: Tel: 011 442 3615

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