

PDU[™] Pharmacy - Alex Plaza, Johannesburg

Questions, answers and facts

1. What is a PDU[™] and why has it been introduced?

- A Pharmacy Dispensing Unit[™] (PDU[™]) is an ATM simulated South African innovation which was developed for accurate dispensing, counselling and collection of medication. The PDU provides an innovative and unconventional alternative for the delivery of pharmaceutical services to public sector patients. The technology was developed with the aim of addressing some of the challenges compromising medicine access in the resource constrained public healthcare environment.

2. What are its features?

A PDU[™] comprises integrated layers of various technology, which includes:

- An interactive, information touch screen and a user-friendly interface which allows for two-way Skype-like audio-visual interaction
- Barcode ID scanning to initiate dispensing
- Patient PIN code authentication and activation
- Cloud-based dispensing software and electronic dispensing record
- Bar-code linked product database and product identification capability
- Versatile product printer-labeller
- Customised, temperature controlled compact medicine unit and
- A robotic arm for accurate and swift picking of medicines.

3. What are the benefits?

- Sites located at central and accessible community-based shopping centers and close to transport routes.
- The convenience of extended pharmacy operating hours, including weekends and public holidays – averaging 80 hours/month compared to surrounding primary healthcare clinics.
- PDU[™] pharmacies have a 24 hour operating capability.
- Short waiting times associated with efficient, robotic medicine dispensing. Average dispensing time – 3 minutes.
- Fewer chronic medicine collection clinic visits for patients due to the multi-month (e.g. 2-month supply) dispensing process.
- Personal, face-to-face interaction, communication and counselling with the patient.
- Authenticated and verified access to medicine.
- Secure storage and easy retrieval of patient demographic and dispensing information / data.
- Remote, professional facilitation of dispensing of medicines and counselling – helping to overcome barriers to medicine adherences e.g. language, literacy and education
- Automated application of personalised medicine labels.
- Direct dispensing of medicines, immediate collection by patient and attention to patient concerns or information requirements at the point of care.



- Enhanced communication through prescription collection reminder SMS, dispensing confirmation receipts with next collection dates, other health promotions communication per SMS supported by a toll free tele-pharmacy care line.
- Early identification of late collections and prompt follow up calls and tracing activities.
- Stock usage reports for accurate stock management and ordering.

4. How long does it take to service patients at an Alex PDU™?

- A dispensing episode at a PDU™ takes an average of three minutes including counselling.
- The shortest dispense since initiation of operations has been 1 minute 20 seconds and the longest dispense has been six minutes.
- Factors affecting medicine dispensing and collection time include:
 - ✓ Number of months' supply or repeats to be dispensed
 - ✓ Number of items on a prescription repeat cycle
 - ✓ Patient need for health information and counselling
 - ✓ Use of pharmacist's professional discretion to extend interaction for provision of further pharmaceutical care.

5. How long has the Right ePharmacy project been underway?

- The idea to develop this pharmacy automation innovation were laid as far back as 2010, five years prior to the initiation of the first pharmacy automation pilot with the Gauteng Provincial Health department in 2015.

6. Who are the partners and organisations that have made this possible and what are their roles?

- The pilot implementation and operation of this breakthrough technology in Gauteng has been made possible through Right to Care (RTC) key collaborations and strategic partnerships with national and international stakeholders such as the Gauteng Provincial Health Department, RTC, USAID, GIZ who are implementing on behalf of the German Government and Mach4. All invested and have interest in the success of this pilot in proving the hypotheses upon which the technology was developed.

How does it work?

7. Referral process

- A patient on chronic medication who has been identified as clinically stable and demonstrating responsible health behaviour at any of the surrounding referral clinics can be given the option of collecting their chronic prescription from a convenient PDU™ pharmacy.
- The clinic issues the patient with the first medicine repeat of medicine and provides a date for next collection of medicine from the PDU™
- The patient's prescription is verified and loaded onto the electronic dispensing software by a pharmacist in preparation for dispensing from the PDU™

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8. First PDU[™] visit

- On the patient's first visit to a PDU[™] pharmacy, personal details are verified and linked to a pharmacy card which is issued at registration
- The patient assigns a PIN number to the card to authenticate medicine access at the PDU[™]
- PDU[™] orientation is provided by onsite PDU[™] staff

The medicine is dispensed in a simple 5-step process as follows:

1. Scan barcoded ID book, ID cards or pharmacy card and enter PIN
2. Talk to a pharmacist
3. Select prescription
4. Collect medication
5. Take receipt

9. Subsequent PDU[™] visits

- An SMS reminder is sent two days prior to the next collection date
- At the next collection, the patient can proceed straight to an available PDU[™] machine and follow the 5-step dispensing and collection process. The patient can collect their prescriptions from the PDU[™] until the repeats on the prescriptions run out. Patients are then notified to return to their referral clinic for a follow up clinical visit and issuing of a new repeat prescription and the first supply of medicine as the process and cycle repeats.

10. Behind the scenes

- The robotic technology behind the PDU[™] receives a patient or remote pharmacist instruction via the cloud based electronic dispensing software.
- Barcode product identification directs the robot on which medicine type, strength, quantity and pack size to select for the patient.
- Once selected, the medicine is automatically labelled with the patient's personal information and sent to the medicine collection box at the front of the PDU[™] for the patient to collect.
- A prescription receipt is printed with the prescription number, items dispensed, date and time of dispense as well as the next collection date.

11. What do pharmacists working with this technology think?

- The pharmacy professionals working with PDU[™] technology appreciate the improved efficiency and the capacity the technology creates for extended professional interaction.
- Benefits such as accurate medicine picking, automated labelling, improved stock control, product tracing and easily retrievable data are significant value-adds to the profession.

12. How does the South African Pharmacy Council view pharmacy automation?

- The South African Pharmacy Council (SAPC) support of the use of innovation projects to improve and scale access to quality pharmaceutical services. SAPC is regulating the use of PDUs[™] by publishing additional minimum standards for community or institutional pharmacies operating Remote Automated Dispensing Units (RADUs).



- The SAPC have made amendments to sections of the Pharmacy Act 53 of 1974 and pharmacy practice guidelines for the registration and operation of RADUs (PDUs™) and other automation to evaluate innovation projects in the public sector.

13. Where else are PDUs™ being deployed? When will they be ready for patients?

- Several peri-urban communities in Gauteng were selected as appropriate locations for piloting the efficiency and demonstrating the benefits of this novelty in last mile medicine dispensing.
- The flagship PDU™ site is situated in Alexandra township, followed by two sites in Soweto and another in Diepsloot which will become operational in Q2 2018.

14. Who are the Right to Care spokespeople to talk about the PDU™?

Name	Job Title
Prof Ian Sanne	CEO of Right to Care
Fanie Hendriksz	Managing Director of Right ePharmacy
Rufaro Ngulube	Technical specialist: Pharmaceutical Services, Right ePharmacy
Andre Van Biljon	Chief Technology Officer, Right ePharmacy
Dr Belinda Strydom	Pharmacy programme manager: Right e-Pharmacy
Dr Shabir Banoo	Chief Technical Specialist for Pharmaceutical Programmes, Right to Care

15. How much does it cost?

- Referral to a PDU™ site and the use of this service is free to selected patients collecting their chronic medication from surrounding primary healthcare clinics.
- The cost of setting up a single standalone PDU™ is around R2m. The technology offers far reaching sustainable benefits due to its scalability. The cost of PDU operation decreases with increased use or patient uptake.

16. Is pharmacy automation destroying jobs?

- There is real shortage of pharmacy staff in the South African primary healthcare sector. This technology will help pharmacists to focus on the pharmaceutical care of the patient which includes counselling appropriate and safe use of medicine, side-effect aversion, lifestyle modification and disease prevention.
- PDUs™ and pharmacy automation create jobs and offer the pharmacy professional additional and diversified career opportunities in a new niche market – tele-pharmacy.

17. Is Right ePharmacy shifting queues from hospitals to PDU™ sites?

- No. The first few months of operation have demonstrated reduced waiting times, no queues and increased patient convenience due to extended pharmacy operating hours and the location of the PDU™ sites at convenient locations within communities.
- The PDU operation allows for 24/7 dispensing capability.

18. Privacy

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- We comply with all the requirements of the Pharmacy Council pertaining to privacy in medicine dispensing and patient counselling. Each PDU™ has a privacy screen that protects the privacy of patients and onsite operational staff also ensure privacy and protection of confidentiality.

19. Patient safety

- The bar-code product identification and location capability of the back-end robotic technology increases medicine picking accuracy, increasing patient safety through the reduction of dispensing errors.
- Continuous pharmacist oversight and counselling also improves clinical safety of patients in relation to medicine use.
- Additional security measures are in place during and after operating hours.

20. Medicine stock safety

- For physical security, all our sites have security personnel, camera surveillance and controlled access
- Access to medicine via the PDU™ is secured using a bar-coded ID book, ID card or barcoded pharmacy card with a PIN number.

21. Additional benefits

- PDU™ technology can be extended to address other challenges in medicine access e.g. acute medicine dispensing and dispensing for other targeted disease prevention and treatment programmes.
- It can help to rapidly and sustainably reform the quality and efficiency of medicine dispensing in the public sector primary healthcare setting in South Africa.
- Professional counselling provided via the PDU™ and tele-pharmacy service is offered in all 11 official languages, so the patient can be assisted in their language of choice.
- The cloud based software enables remote dispensing facilitation, helping to overcome some of the barriers to adherence such as language, education, and literacy levels.

Photographs are available here:

<https://drive.google.com/open?id=1qsOh9Bj3q246PWsJboPvUkylaNi5fAAh>

Video – raw footage available on request: <https://youtu.be/Xlh3YHvMj2A>

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