Optimizing Dermatological Medication Management in a Student-Run Free Clinic

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Introduction

Background

The Agape Dermatology Clinic is a free clinic affiliated with a prominent academic center that delivers essential dermatological healthcare services and medications to local underserved populations. Many of the patients served at the clinic are undocumented Hispanic individuals facing financial instability.

Local Problem

One of the significant challenges faced is the lack of a standardized medication inventory management system, resulting in increased pharmaceutical waste. Developing an inventory tracking system is crucial to enhance medication management, facilitating easy access for physicians to available medicines. This is of utmost importance as it enables patients to fully leverage the clinic's medical resources.

Aim

The aim of the project is to optimize medication management by implementing a pharmaceutical inventory tracker at the clinic from February 2023 to September 2023.

Scope

The scope spans from the moment medications arrive at the Agape Dermatology Clinic to their eventual distribution or disposal. The introduction of this tracking system is instrumental in enhancing medication pharmacy organization, ultimately leading to a reduction in medication waste.

Methods

Quality Improvement (QI) methodology through affinity and Ishikawa diagrams helped identify the root cause of limited medication utilization and the resulting increase in pharmaceutical waste at the clinic.
An electronic medical record review from February 2023 to September 2023 identified the name and number of medications dispensed to patients. This data analysis enabled us to distinguish between medications frequently utilized at the clinic and those with limited use.

To streamline medication tracking within our pharmacy, a semi-automated Microsoft Excel database was developed. This database includes essential information such as medication names, expiration dates, supply numbers, lot numbers, internal locations, and donor information. The database comprises three user input-based sheets, all interconnected with a master medication list. These interconnected sheets are further enhanced through PIVOT tables and summarized in a visual dashboard for convenient end user digest and search functionality. Our end user digest provides a real-time registry of current medications, complete with quantities and their respective locations, along with an up-to-date graphical representation of medication distribution trends. Edit functionality is limited to clinic managers

The medications at the clinic were systematically tracked, allowing the physicians, residents, and student managers to identify the medications available for patients at any given time.

Quality Improvement Tools

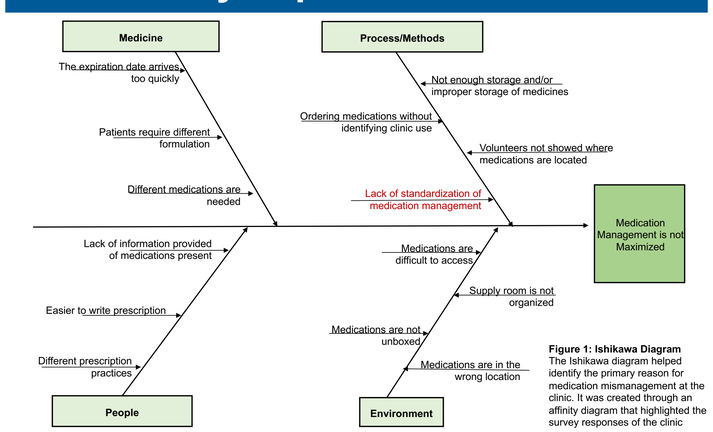


Figure 1: Ishikawa Diagram
The Ishikawa diagram helped identify the primary reason for medication mismanagement at the clinic. It was created through an affinity diagram that highlighted the survey responses of the clinic managers.

Figure 2: PDSA Cycle
The diagram illustrates the PDSA cycle from February 2023 to September 2023

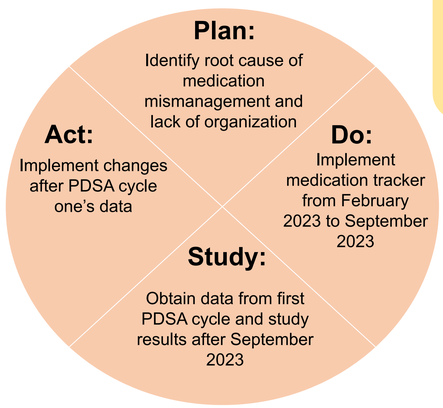
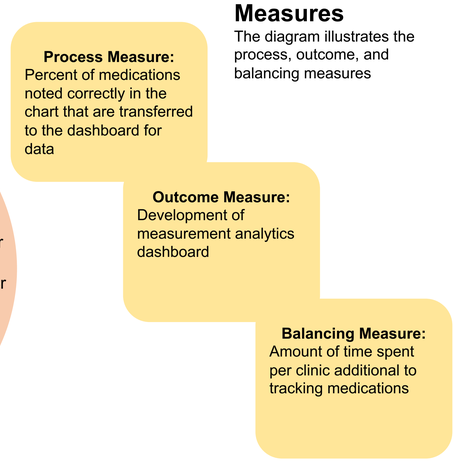


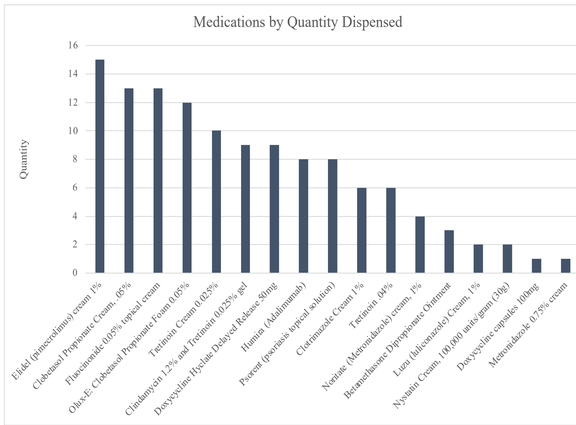
Figure 3: Measures
The diagram illustrates the process, outcome, and balancing measures



Results

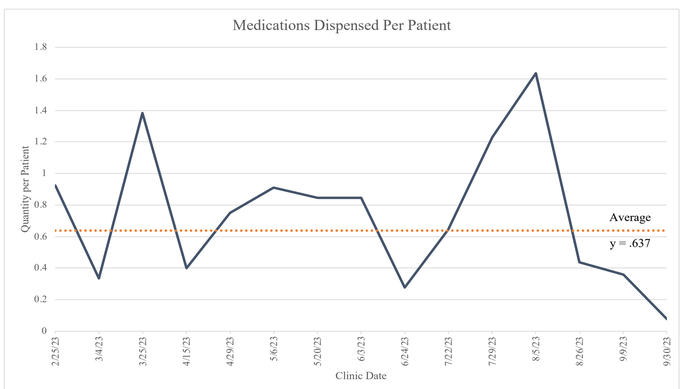
- Implementation of our dashboard began on 2/25/23. As of 9/30/23, our clinic saw 191 patients and dispensed 122 medications.
- The most dispensed sample at our clinic is Elidel (pimecrolimus) 1% 30g cream followed by Clobetasol Propionate .05% cream and Fluocinonide .05% topical cream. (Fig. 3)
- Over the analysis period we averaged .63 samples of medication per patient, but variability remained high from .07 medications/patient to 1.6 medications/patient on a given day. (Fig. 4)

Figure 4: Medications Dispensed from 2/25/23 to 9/30/23



Medication	Quantity	Percentage
Elidel (pimecrolimus) cream 1%	15	12%
Clobetasol Propionate Cream, .05%	13	11%
Fluocinonide 0.05% topical cream	13	11%
Olux-E: Clobetasol Propionate Foam 0.05%	12	10%
Tretinoin Cream 0.025%	10	8%
Clindamycin 1.2% and Tretinoin 0.025% gel	9	7%
Doxycycline Hyclate Delayed Release 50mg	9	7%
Humira (Adalimumab)	8	7%
Psorent (psoriasis topical solution)	8	7%
Clotrimazole Cream 1%	6	5%
Tretinoin .04%	6	5%
Noritate (metronidazole) cream, 1%	4	3%
Betamethasone Dipropionate Ointment	3	2%
Luzu (luliconazole) Cream, 1%	2	2%
Nystatin Cream, 100,000 units/gram (30g)	2	2%
Doxycycline capsules 100mg	1	1%
Metronidazole 0.75% cream	1	1%

Figure 5: Trends in medications per patient by clinic day from 2/25/23 to 9/30/23



Conclusions

AGAPE Dermatology Medication Tracker

All Medications

Batch Number	Medication	Supply	Location
75541	Doxycycline Hyclate Delayed Release 50mg	5	Top 5.2
L106036	Clindamycin Phosphate and Tretinoin Gel 1.2%/0.025%	28	Top 5.3
CVPMC	Cera Ve Psoriasis Moisturizing Cream	7	Top 4.2
PX113A	PredniSONE Tablet, 5mg	9	Top 5.2
SDCH-1	Prudoxin (doxepin hydrochloride) cream, 5% 45g	10	Top 5.3
SDCH-2	Zonalon (doxepin hydrochloride) cream, 5% 45 g	15	Top 5.3
8134992	Elidel (pimecrolimus) cream 1%	6	Top 5.3
SDCH	Zonalon (doxepin hydrochloride) cream, 5% 30 g	5	Top 5.3
ACY21104	Acyclovir Tablets, 400mg	1	Top 5.2
CCD17	Clobetasol Propionate Cream, .05%	0	Top 5.2
CC017	Clobetasol Propionate Cream, .05%	1	Top 5.2
TF0266	Famciclovir Tablet, 500mg	2	Top 5.2
3471N211	Doxycycline Hyclate Delayed Release 50mg	8	Top 5.2
3109165	Tretinoin Cream 0.025% - AVITA	0	Top 5.3
RNCR-1	Olux-E: Clobetasol Propionate Foam 0.05%	15	Top 5.2
3109164	AVITA Tretinoin Cream	34	Top 5.3
22ED4X1	Opzelura (ruxolitinib) cream, 1.5%	3	Top 5.3
0190F124	Ammonium Lactate 12% Lotion	0	Top 5.2
L111016	Betamethasone Dipropionate Ointment	11	Top 5.2

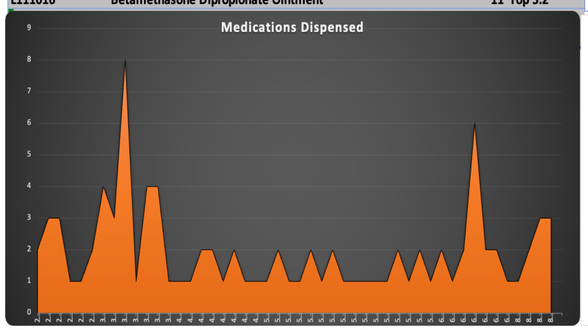


Figure 6: Medication End User Dashboard.
The data on the end user dashboard highlights what is available to clinic volunteers, residents, and attending physicians during clinic shifts. Each medication in the clinic is indexed upon delivery and organized in cabinet locations which are reflected in the dashboard. The end user dashboard will not include medications no longer carried by the clinic.

Our data suggest that medication management at a dermatology free clinic is vital due to the high medication load required to provide the best level of care.

The implementation of an automated database to track medications reduces medical waste and improves medication management.

An automated medication database also establishes transparency between free clinics and their pharmaceutical donors. By providing donors with accurate information on medication usage, clinics can foster a sense of trust and collaboration, ultimately improving patient care. The database enables donors to quantify the impact of their donations and recognize the significance of their support.

We recommend our method to other free clinics and non-profit organizations to optimize their service delivery and create better health outcomes for patients in the community.

Future initiatives should seek to understand variability in medication demand and meet supply challenges faced by clinics to provide cost effective solutions to prescription medications. In addition, improvements in medication tracking methods could be investigated.

References

1. Shah, Vraj. (2023). *Agape Dermatology Medication Tracker [Data Set]. https://365utsouthwestern-my.sharepoint.com/:x:/g/personal/vraj_shah_utsouthwestern_edu/EbLAonxvbr1BmRSRJc0OLl4BiYOSLjbAfw_7qEkJeFpzZQ*