

# OUTCOMES EVALUATION ON MEDICATION INTEGRATION SERVICE PROVIDED BY COMMUNITY PHARMACISTS IN TAIWAN

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## Backgrounds/Purpose

- In 2015, Taiwan FDA provided a research Funding to develop and implement a new service in community pharmacies, called “Medication Integration Service.” With patient’s consent, pharmacist can go up to PharmaCloud to retrieve the patient’s past three months medication profile, then organize his “current medication file” and conduct check and balance. The drug therapy problems (DTPs) identified, pharmacist will contact physician and tried to change drug therapy (cognitive service), or educate patient on proper use of medications (adherence counseling).
- To evaluate the value of providing medication integration service by pharmacists in Taiwan.

## Methods

A computerized documentation system was developed by the Taiwan Pharmacist Association to record every service provided. The pharmacist would use AABCC coding to record DTPs identified (AA code), given recommendation (BB) and follow up the drug therapy changes by physician (CC). For adherence counseling service, pharmacist would use five open-ended questions to ask about medication taking knowledge and behavior at home for major medications the patient is taking, proper use will be educated. Taiwan FDA provides research funding to pay pharmacists NT\$300 per service provided.

## Results

Total of 208 pharmacists participated in the project, and total of 2,587 patients received medication integration service. Among them, pharmacists found 723 DTPs from physicians. In average, NT\$ 162 drug expenditure was saved by resolving one DTP identified. Total of 2,473 patients received adherence counseling service, and 15,007 medications were consulted. Around 36.2% of the drugs patients do not know what the drug is for, 43.7% took the drug with wrong time or wrong dosage, 10.1% use the wrong way of taking the drug, 89.4% do not know the side effects, and 67.2% need more necessary drug information.

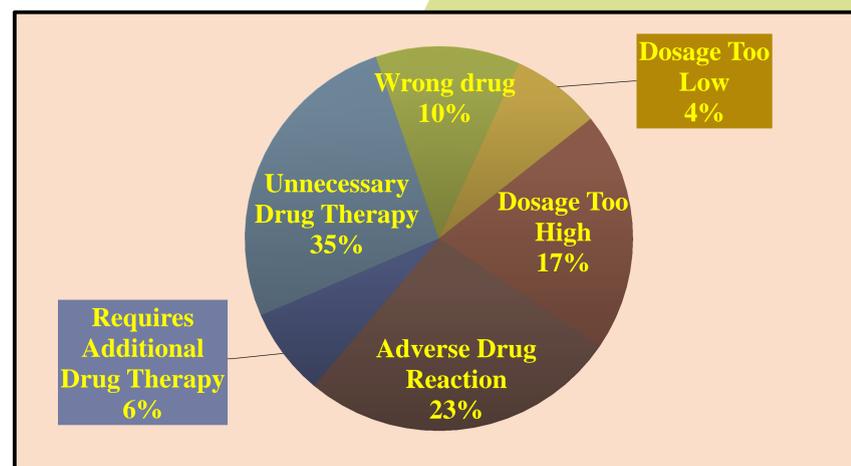


Figure 1. Categories of drug therapy problems (DTPs) identified by pharmacists

Table 2. Physician Response rates and Acceptance rates

Categories of DTPs	Amount of BB code	Response rates <sup>a</sup>	Acceptance rates <sup>b</sup>
Requires Additional Drug Therapy	50	73.5%	59.2%
Unnecessary Drug Therapy	260	71.9%	50.8%
Wrong drug	78	73.0%	60.3%
Dosage too low	34	82.4%	38.2%
Dosage too high	128	78.9%	38.3%
Adverse effect	173	66.5%	43.4%
Total	723	72.3%	50.6%

<sup>a</sup> Response rates=(Amount of CC code ÷ Amount of BB code)\*100%

<sup>b</sup> Acceptance rates=(Amount of CC code which represents physicians accept pharmacists recommendations ÷ Amount of BB code)\*100%

Table 3. Cost-benefit ratio (in NT\$) of providing Cognitive service

		Drug expenditure <sup>a</sup>			
		Decrease	No change	Increase	Total
Amount of services		293	386	44	723
Drug expenditure changed by services	Mean±S.D.	-434.0 ±644.3	-	214.3 ±284.2	-162.9 ±474.7
	MAX/min	-2/-4,726	-	3/1,259	1,259/ -4,726
	Sum	-127,174	-	9,427	-117,747
Remuneration for services		-	-	-	216,900
Remuneration : Drug expenditure saved		-	-	-	1 : 0.54

<sup>a</sup> \$1USD= \$31NTD

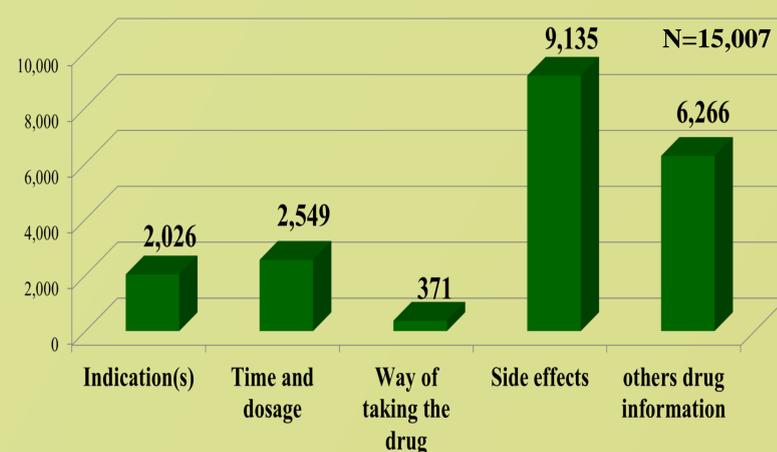


Figure 2. The number of educations conducted by pharmacist on 5 kinds of open-ended questions for each and every drugs patient is taking. Whatever patient’s response is wrong or do not know, pharmacist should educate the correct information to the patient.

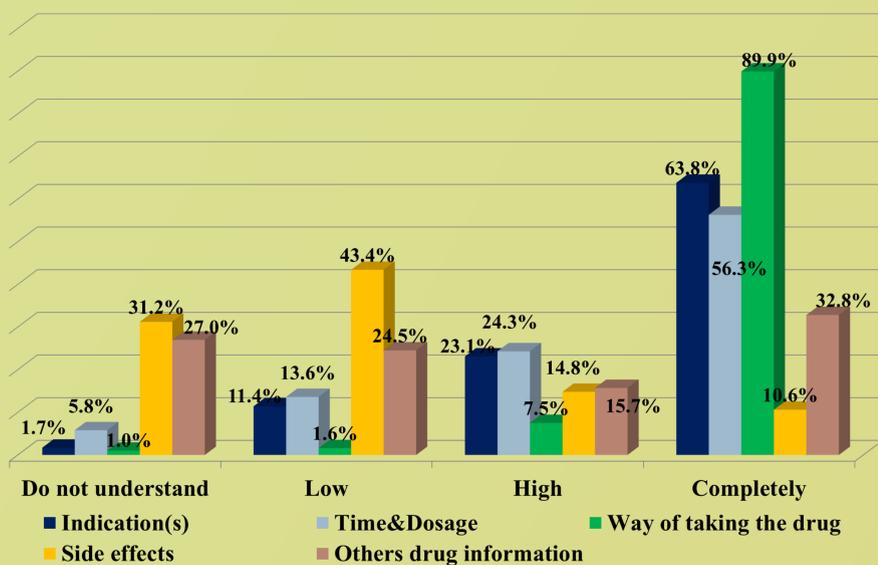


Figure 3. Distribution of patients on five classifications of drug adherence

Table 1. Demographic characteristics of the patients

Variable	Medication Integration Service	cognitive service	adherence counseling
Gender N(%)			
Male	1,295(50.0)	355(49.1)	1,234(49.9)
Female	1,292(50.0%)	368(50.9)	1,239(50.1)
total	2,587	723	2,473
Age (Mean±SD)	66.4±13.2	69.5±14.4	65.7±12.9
Age (years> 65 ) N(%)	1,416(54.7)	479(65.4)	1,338(54.1)
Consultation time			
<10 mins	-	-	52(2.1)
11~40 mins	-	-	1,727(69.8)
>40 mins	-	-	694(28.1)

## Conclusion

The “medication integration service” provided by pharmacists can indeed protect medication safety of the patients, and can also provide personalized educational contents to satisfy the patients’ needs.