

# Searching for Success Factors in Deprescribing Proposals from Community Pharmacists

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Nihon Chouzai Koiwa-Minamiguchi Pharmacy

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## Research Article

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# Abstract

## Background

Polypharmacy is one of the most critical issues worldwide, especially in elderly people. In Japan, fees to support deprescription were established in 2018 which are calculated as the community pharmacists propose deprescribing in patients prescribed 6 or more medications regularly by submitting documents to the prescribing doctor, who may withdraw 2 or more medications. However, these are hardly calculated though many deprescribing proposals submitted.

## Objective

The objective in this study, success factors in deprescribing proposals from the community pharmacists to prescribing doctors were searched for.

## Methods

Tracing reports submitted from Aug 2017 to Mar 2020 were investigated retrospectively and factors that influenced the success of deprescribing were searched for.

## Results

One hundred and twenty-three tracing reports (67 reports of successful deprescribing and 56 reports of failure, success rate was 54.5%) were submitted to the prescribing doctors. Deprescribing proposals with existing unused medications or an assessment of possible adverse events significantly increased the deprescribing success rate. Whether the pharmacist experienced face-to-face communication with the prescribing doctors was not significant.

## Conclusion

Tracing reports with deprescribing proposals submitted by the community pharmacists may resolve polypharmacy. Mentioning unused medications or possible adverse events could increase the deprescribing success rate.

# Introduction

Polypharmacy is one of the most critical issues worldwide, especially for elderly people. Elderly people prescribed 5 or more medications have a significantly increased fall risk and those prescribed 6 or more medications have a significantly increased risk of adverse events.<sup>1-3</sup> Furthermore, some reports have suggested that polypharmacy can be defined as not only the number of medications used but also the use of medications that are not required or cause adverse events, regardless of the number.<sup>4</sup>

Polypharmacy also regarding newly diagnosed dementia<sup>6</sup> and cognitive decline.<sup>7</sup> Pharmacists can play an important role for polypharmacy. For example, hospital pharmacists review inappropriate

medications<sup>8-10</sup> and community pharmacists screen inappropriate medications and consult prescribing doctors.<sup>8</sup>

In Japan, community pharmacists are required to communicate with the other healthcare professionals, such as medical doctors, nurses, and nursing care managers.<sup>11</sup> The Ministry of Health, Labour and Welfare recommends that healthcare professionals communicate with each other. Medical service fees are charged for some kinds of that communication. In 2012, fees for avoid medications overlapping or drug interaction were established, which are calculated by the community pharmacists as they aware medications overlapping, drug interaction or unused medications and report to the prescribed doctors, thus change prescription. In 2014, fees to submit information regarding taking medications were established, which are calculated by the community pharmacists as they provide information to patients or healthcare professionals. In 2014, fees for supporting taking medications for outpatients were also established, which are calculated as the community pharmacists aware unused medications and perform one-dose packing, home pharmaceutical care or so. In 2016, fees for family pharmacists were established, which are calculated as the family pharmacist who was selected and consented by patients give the patients a drug administration guidance. Furthermore, fees to support deprescription were established in 2018, which are calculated by the community pharmacists as they submit deprescribing proposal documents to prescribing doctors in patients prescribed 6 or more oral medications for 4 weeks and as a result of the proposal withdraw 2 or more medications in 4 weeks. Although fees to submit information regarding taking medication were calculated 30,567 times during the 2018 fiscal year, fees to support deprescription calculated only 189 times.<sup>12</sup> Fees to submit information regarding taking medication can be calculated not only send tracing reports to the prescribed doctors but also consulting via telephone, letter, face-to-face or so to, the patients or healthcare professionals. The proportion of submitting tracing reports in calculating fees to submit information regarding taking medication is not disclosed so that how many tracing reports submitted to the prescribed doctors in Japan is unclear. In addition, tracing reports can be included not only deprescription proposals but also mentioning unused medications, potential adverse event, adherence of patients, the medications which prescribed the other medical institutions, over-the-counter medications or so. For the cases of Nihon Chouzai Koiwa-Minamiguchi Pharmacy, 637 tracing reports submitted to the prescribed doctors, 149 of 637 reports included deprescribing proposals and obtained consent to submit the report from Aug 2017 to Mar 2020. Thus, fees to support deprescription were calculated only 16 times. Fees to support deprescription calculating succeeded per tracing reports included deprescribing proposal was 10.7%. It seems that deprescribing proposals via documents submitted from community pharmacists to prescribing doctors are rarely successful. What kind of factors influence for success rate of deprescribing proposals are still unknown. Thus, in this study, the factors that influence the success rate of deprescribing proposal via documents submitted by the community pharmacists to prescribing doctors were investigated. Reveal success factors for deprescribing proposals may help increase its success rate and resolve polypharmacy.

## Aim Of This Study

In this study, we searched success factors in deprescribing proposals from the community pharmacists to the prescribed doctors.

## Ethics approval and consent to participate

This study was reviewed and approved by the research ethics committee of Nihon Chouzai Co., Ltd. (approval number: 2019-025, 26<sup>th</sup> Dec 2019), due to anonymized data on retrospective study, the research ethics committee of Nihon Chouzai Co., Ltd. has approved to obtain patient consent to submit tracing reports to the prescribed doctors instead of consent to participate. Methods were carried out in accordance with relevant guidelines (i.e. Ethical guidelines for epidemiological research<sup>12</sup>) and regulations.

## Methods

### Study design and participants

Study design: From Jul 2017 to Mar 2020, tracing reports submitted by pharmacists in Nihon Chouzai Koiwa-Minamiguchi Pharmacy were investigated retrospectively. As the study period started before fees for deprescribing were established in Apr 2018, fees to submit information regarding taking medication were established in 2014, tracing reports including deprescribing proposals were submitted to the prescribed doctors. For all reports, information on age; sex; number of oral medications prescribed; dosing frequency per day; presence or absence of potentially inappropriate prescriptions; having family pharmacist; one-dose packages; unused medications; possible adverse events; same-effect medications; and whether deprescription proposals succeeded or not, was collected.

Participants: Patients who were prescribed multiple medications by medical institutions, such as hospitals and clinics, and received their prescription at Nihon Chouzai Koiwa-Minamiguchi Pharmacy were included. All patients consented to the submission of the tracing reports, including the deprescribing proposal on oral medication, to prescribing doctors. Cases in which multiple reports were submitted to the prescribing doctor, a single report was included in the analysis. In this cases, deprescribing proposals succeeded reports earlier reports were preferentially included. Patients who did not visit the pharmacy after the submission of the tracing reports and those with tracing reports that included deprescribing proposals on external medications were excluded.

### Data collection

The data in this survey were collected from tracing reports submitted from Nihon Chouzai Koiwa-Minamiguchi Pharmacy to prescribing doctors. The reports submitted not only included cases who received their prescription at Nihon Chouzai Koiwa-Minamiguchi Pharmacy but also cases who received

their prescription at other pharmacies and checked their prescribed medications at Nihon Chouzai Koiwa-Minamiguchi Pharmacy using patient's medication record booklet.

Deprescription success was defined as not only a reduction in the number of prescribed oral medications but also a reduction in the amount of dose of the prescribed oral medications without a reduction in the number of prescribed oral medications. Potential inappropriate prescriptions were based on the "Guidelines for Medical Treatment and its Safety in the Elderly 2015," published by the Japan Geriatrics Society.<sup>3</sup> Family pharmacists defined as patients consented to have family pharmacist. Possible adverse events were defined as mentioned in tracing reports. Same-effect medications were based on a category of *Kon-nichi no Chiryō yaku 2020* published by Nankodo Co., Ltd.<sup>14</sup> Face-to-face communication was defined as whether the pharmacist who submitted the tracing report have experienced to meet the prescribing doctor.

## Statistical analysis

To identify the factors associated with success in the reduction of medication after the prescribing doctor received tracing reports from community pharmacists, univariate analyses were performed using a t-test for age, number of oral medications prescribed, and dosing frequency per day, whereas Fisher's exact test was used for sex and the presence or absence of potentially inappropriate prescriptions, family pharmacists, one-dose packages, unused medications, possible adverse events, and same-effect medications. Furthermore, a multivariate logistic regression analysis was performed using the patient attributes with a P value of less than 0.20 in the univariate analyses as covariates. In logistic regression analysis, a P-value, odds ratio and 95% confidential interval (95% CI) were calculated. A P-value of less than 0.05 indicated a factor that significantly influenced the success of deprescription from the tracing report submitted by community pharmacists. All analyses were performed using EZR software (version 1.50, Japan).<sup>15</sup>

## Results

From Jul 2017 to Mar 2020, 637 tracing reports were submitted from Nihon Chouzai Koiwa-Minamiguchi Pharmacy different medical institutions, such as included hospitals and clinics; 177 included deprescribing proposals. Patients consented to the submission of the reports to prescribing doctors in 149 of 177 cases. Cases in which multiple reports were submitted to the prescribing doctor, a single report was included in the analysis. Finally, 123 tracing reports that included deprescribing proposals were analyzed (Fig. 1). Deprescription succeeded in 67 cases and failed in 56 cases.

In the univariate analysis, the P-values of the number of administrations, sex, potential inappropriate prescriptions, family pharmacists, unused medications, possible adverse events, and same-effect medications were less than 0.2; therefore, these endpoints were analyzed using multivariate logistic regression analysis (Table 1).

Table 1  
Univariate analysis was performed for each endpoint

	<b>Deprescribing succeeded (n = 67)</b>	<b>Deprescribing unsucceeded (n = 56)</b>	<b>P-value of univariate analysis</b>
Average age	76.0	76.2	0.96
Average number of oral medications prescribed	8.2	7.8	0.26
Average dosing frequency per day	3.6	3.3	0.16
Sex (% of male, femal)	(64.2, 35.8)	(48.2, 51.8)	0.10
% of potentially inappropriate medications	64.2	42.9	0.020
% of family pharmacists	70.1	53.6	0.064
% of one-dose packages	32.8	26.8	0.56
% of unused medications	61.2	37.5	0.011
% of possible adverse events	73.1	44.6	0.0017
% of same-effect medications	64.2	42.9	0.020
% who experienced face-to-face communication	23.9	33.9	0.221
Age, number of oral medications prescribed, and dosing frequency per day were tested by t-test. Sex and presence or absence of potentially inappropriate medications, family pharmacist, one-dose packages, residual medications, adverse events, and same-effect medications were tested by Fisher's exact test. Factors with a P-value of less than 0.20 in the univariate analyses were used in multivariate logistic regression analysis.			

In the logistic regression analysis, the presence of unused medications and possible adverse events significantly increased the deprescribing success rate (Table 2, Fig. 2).

Table 2  
Results of logistic regression analysis

	Odds ratio	95% CI		P-value of logistic regression analysis
Family pharmacists	1.16	0.488	2.78	0.733
Unused medications	3.61	1.52	8.62	0.00377**
Sex (male)	0.481	0.203	1.14	0.0956
Potentially inappropriate medications	1.95	0.799	4.78	0.142
Same effective medications	1.92	0.839	4.42	0.122
Possible adverse events	2.59	1	6.66	0.0489*
Dosing frequency per day	0.839	0.604	1.17	0.295
Result of logistic regression analysis. * indicate P-value < 0.05, ** indicate P-value < 0.01. 95% CI indicate 95% confidence interval.				

## Discussion

Tracing reports that included deprescribing proposals, submitted by the pharmacists who worked at Nihon Chouzai Koiwa-Minamiguchi Pharmacy to the prescribing doctors, were investigated to search for the factors of success in deprescribing proposals. In this study, 67 of 123 proposals (54.5%) resulted in successful deprescription. Nevertheless, fees to support deprescription were calculated only 16 times from Apr 2018 to Mar 2019. The reason of this gap is different definition between deprescribing success in this study and calculation requirements of fees to support deprescription. Definition of deprescribing success is as not only a reduction in the number of prescribed oral medications but also a reduction in the amount of dose of the prescribed oral medications without a reduction in the number of prescribed oral medications. Thus, calculation requirements of fees to support deprescription is community pharmacists submit deprescribing proposal documents to the prescribing doctors for patients with prescribed 6 or more oral medications for 4 weeks and as a result of the proposal withdraw 2 or more medications in 4 weeks. The calculation requirements of fees to support deprescription is stricter than definition of deprescribing success in this study. The result of this study suggested that tracing reports submitted by community pharmacists help deprescribing. Previous studies suggested intervention for deprescribing reduce the number of prescribing medications.<sup>16,17</sup> However, the success factors in deprescribing have been still unknown and the factors firstly revealed in this study.

The mention of existing unused medications and possible adverse events on tracing reports significantly increased the success rate of the deprescribing proposals. It reported cost of unused medications spend 650 billion Japanese yen per year<sup>18</sup>. Existing unused medication is considerable that result of

nonadherence. Nonadherence caused by difficulty of taking medication due to cognitive impairments, low level of education,<sup>19</sup> or patients takes some kinds of medications on-demand.<sup>20,21</sup> When pharmacists find unused medications, they can propose to the prescribed doctor reducing days of prescription.

Pharmacists understand not only the efficacy and mechanisms of absorption, distribution, metabolism, and excretion of medications but also the pathology and symptoms of diseases. Additionally, the community pharmacists listen to a patient's condition, worries, and lifestyle habits. Therefore, the community pharmacists can assess possible adverse events and inform prescribing doctors.<sup>22,23</sup> Interestingly, tracing reports submitted by the pharmacists who experienced face-to-face communication with the prescribing doctors did not significantly influence to the deprescribing success rate, although a previous study mentioned that face-to-face communication with doctors is important for deprescribing.<sup>24</sup> This difference may have occurred because the past study did not perform a quantitative evaluation, whereas the present study did. Nihon Chouzai Koiwa-Minamiguchi Pharmacy receiving prescriptions from more than 100 medical institutions. It is too difficult to take face-to-face communication with all prescribing doctors. Present study suggested the community pharmacists find unused medications or potential adverse event, and inform to the prescribed doctor resolve polypharmacy.

## **Study Limitation**

This study included a small sample and tracing reports written by pharmacists at only one pharmacy. Additionally, most tracing reports were written by one pharmacist. Furthermore, this study was retrospective. In the future, a prospective study with a large samples involving multiple pharmacies should be conducted.

## **Conclusion**

Pharmaceutical intervention by the community pharmacists using tracing reports helps to resolve polypharmacy. Specifically, deprescribing proposals with information regarding unused medications and possible adverse events increase the deprescribing success rate.

## **Declarations**

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## Data statement

All data generated or analysed during this study are included in this published article.

## Conflicts of interest

The author has no conflict of interests that are relevant to the content of this article.

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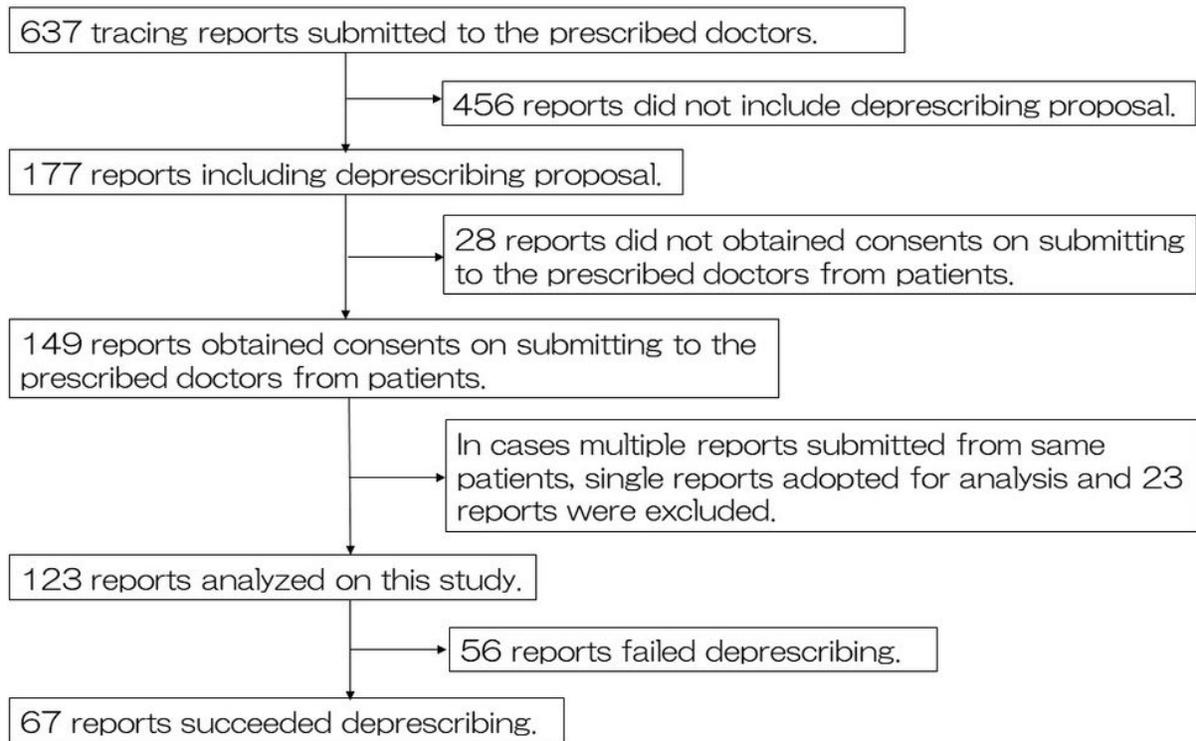
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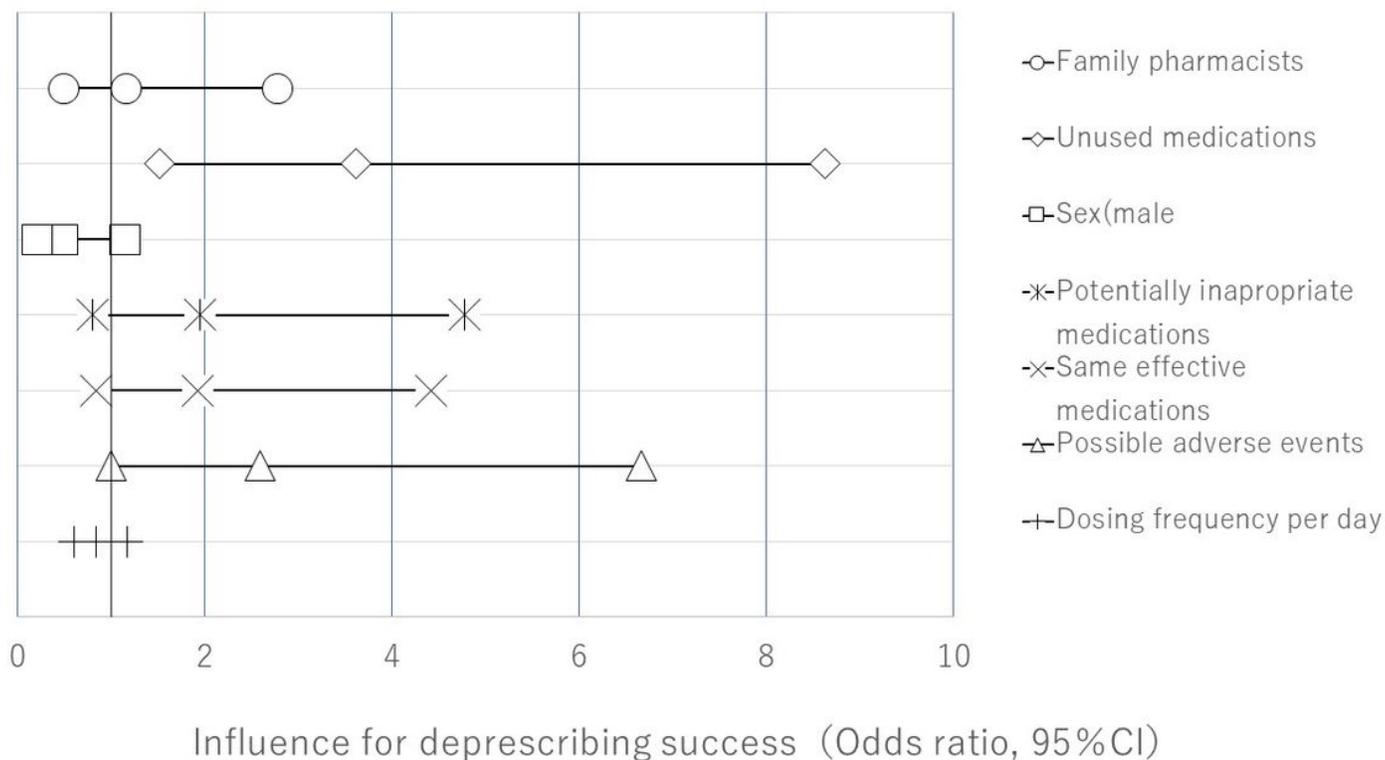
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## Figures



**Figure 1**

Criteria for selecting tracing reports This figure indicates criteria of choosing analyzed tracing reports. Of analyzed 123 tracing reports, 67 reports succeeded deprescribing and 56 reports failed.



**Figure 2**

Forest plot of logistic regression analysis The odds ratio was calculated and analyzed using EZR software (version 1.50, Japan). The symbols with line indicate the odds ratio with 95% confidence interval. The odds ratio of 1 suggests no difference in success rate of deprescribing proposal. An odds ratio > 1 indicates an increased success rate of deprescribing proposal whereas an odds ratio < 1 suggests a reduced success rate of deprescribing proposal.