

Pre-handling

- Data cleaning was done to handle missing or outliers.
- Daily Dose = (Quantity * Strength) / Days of supply

Overlapped prescriptions – did patient use them all together?

- In the actual data, there are prescriptions overlapped with each other.
- It might overestimate the total dosage if we assume the overlapped prescriptions are used concurrently.
- We explored the data and sought input from clinical experts to make assumptions how patients used these prescriptions.

We categorized the possible scenarios below and made decisions respectively

Step 1: Same medication, same daily dose

Scenario 1.1: Same prescription date

- If same days of supply - remove duplicate
 - E.g., Rx1: 60mg/day for 30 days (filled date is Jan 01, 2020), Rx2: 60mg/day for 30 days (filled date is Jan 01, 2020). Only Rx1 will be kept.
- If different days of supply – keep the claims with the longest days of supply
 - E.g., Rx1: 60mg/day for 30 days (filled date is Jan 01, 2020), Rx2: 60mg/day for 60 days (filled date is Jan 01, 2020). Only Rx2 will be kept.

*The above scenarios are mainly to deal with duplicate observations we sometimes see in claims

Scenario 1.2: Different prescription date

- We assume that the prescription was refilled early for later use and push out the date of the later RX

Step 2: Different medications or same medications but different daily dose

Scenario 2.1: Same prescription date

- Business rule will depend on the total daily dose (summing up all Rx’s):
 - If the total daily dose > maximum allowed daily dose
 - We assume that the Rx’s are given with the direction they should be used sequentially (e.g., according to the tapering schedule).
 - We push out the one with the lower daily dose - the rationale is that in the context of steroid tapering, the goal is to slowly decrease a steroid dosage over time
 - If daily dose is the same and we have oral and injections/IV then we push out the oral one
 - If the total daily dose <= maximum allowed daily dose
 - We assume the two prescriptions were prescribed to be taken together to create a higher dose. No action is needed.

Scenario 2.2: Different prescription dates

- We assume this is a change in treatment or a change in dose
 - Discard the remaining dose for the earlier one

Once the steps applied, we summed up the dosage during the 90-day period as patient’s total dose for the downstream analysis.



Background / Goal

- Real-world data provides valuable information for outcomes research. However, the data can be messy and there is no source document to verify or correct the data points.
- This poster illustrates how the real-world data can be cleaned and handled.
- The objective of the analyses was to measure total steroid dose for each patient over a 90-day period.

Summary table

Same medication AND same daily dose	Same prescription date	Same days of supply	Daily dose sum exceeds max allowed daily dose?	Action
Yes	Yes	Yes	-	De-dupe
Yes	Yes	No	-	Keep the longer one
Yes	No	-	-	Push out the later Rx ²
No ¹	Yes	-	Yes	Push out Rx with lower dose
No ¹	Yes	-	No	No action
No ¹	No	-	-	Discard the remaining dose for the earlier Rx

1 Different medication and/or different daily dose. Same ingredient but different route (i.e. injection vs. oral) are considered as different medications

2 After pushing out, if it exceeds the 90-day follow up period, the part won’t be counted

Discussion

- We can see how messy the real-world data is and how complicated to come up with comprehensive business rules to cover all possible scenarios.
- These exploration/decisions need to be done before making the comparison between treatment groups.
- This takes cross-functional collaborations – programmers, scientists, and clinical experts – we were able to communicate efficiently and stay on the same page, even we all have very different expertise and background.
- It will never be perfect, but we need to make sure the business rules are clinically making sense.

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