# Prescription Language Examples

## General Structure of Input

The input is generally structured as:

```
<ACTION> <MEDICATION> <DOSING> <TIMING>
```

These must always occur in this order. The details of how these are broken down can be gleaned from examining the ANTLR4 grammar file.

## 1. Basic I

```
take aspirin 81 mg once daily FOR 60 days
```

- Action: `take`
- Medication: `aspirin`
- Dosing: `81 mg`
- Timing: `once daily FOR 10 days`

## 2. Basic II

```
take aspirin 81 mg twice daily FOR 60 days
```

- Action: `take`
- Medication: `aspirin`
- Dosing: `81 mg`
- Timing: `twice daily FOR 60 days`

## 3. Basic III

```
take aspirin 81 mg 3 times daily FOR 60 days
```

- Action: `take`
- Medication: `aspirin`
- Dosing: `81 mg`
- Timing: `3 times daily FOR 60 days`

## 4. Specific Time

This describes taking 81 mg of aspirin at 8AM and again at 8PM.

```
take aspirin 81 mg twice daily (8, 20) FOR 10 days
```

- Action: `take`
- Medication: `aspirin`
- Dosing: `81 mg`
- Timing: `twice daily (8, 20) FOR 10 days`

If a specific timing is not specified the doses are spread out even throughout a 24 hour period.

## 5. Specific Dose

This example shows how dosing can vary in time. Since no times are specified, the doses are spread out across the 24 hour period.

`take aspirin (81 mg, 100 mg) twice daily FOR 10 days`.

- Action: `take`
- Medication: `aspirin`
- Dosing: `(81 mg, 100 mg)`
- Timing: `twice daily FOR 10 days`

## 6. Specific Dose and Time

This shows how specific doses and times can be combined. At 8AM take 100 mg of aspirin, at 8PM take 200 mg of aspirin.

```
take aspirin (100 mg, 200 mg) twice daily (8, 20) FOR 10 days
```

- Action: `take`
- Medication: `aspirin`
- Dosing: `(81 mg, 100 mg)`
- Timing: `twice daily (8, 20) FOR 10 days`

## 7. Sequencing Several Instructions

Several instructions can be sequenced together using the `THEN` keyword.

```
take aspirin 81 mg twice daily FOR 10 days
    THEN take aspirin 100 mg for 20 days
```

- Action1: `take`
- Medication1: `aspirin`
- Dosing1: `81 mg`
- Timing1: `twice daily FOR 10 days`

- Action2: `take`

- Medication2: `aspirin`
- Dosing2: `100 mg`
- Timing2: `twice daily FOR 20 days`

## 8. Concurrent Instructions

***NOT IMPLEMENTED*** *This is my idea for an extensions of the language, but I left it out of scope for the thesis work. Might be interesting to mention though.*

We can specify actions to happen concurrently using the `AND` keyword.

```
take aspirin 81 mg twice daily FOR 10 days
    AND take penicillin 100 mg once daily FOR 7 days
```

## 9. Titrating Medications

Titrating is the act of changing dose of medication at a constant rate over time.

E.g. increase by 1 mg per day over 1 week. We can specify increasing or decreasing doses.

```
take aspirin TITRATE down FROM 100 mg TO 10 mg BY 10 mg per da
y
    once daily FOR 10 days
```

- Action1: `take`
- Medication1: `aspirin`
- Dosing1: `TITRATE down FROM 100 mg TO 10 mg BY 10 mg per day`
- Timing1: `once daily FOR 10 days`

This can be expressed more verbosely as:

```
take aspirin 100 mg once daily FOR 1 day
    THEN take aspirin 90 mg once daily FOR 1 day
    THEN take aspirin 80 mg once daily FOR 1 day
    ...
    THEN take aspirin 10 mg once daily FOR 1 day
```