Development of a Microsoft Excel-based Calculator to Determine Out-Of-Pocket Chemotherapy Charges

Afidah A Manaf, Lee Chun Chuan
Joyce Siew Foon Yee, Pearl Ng Zi Rong,
Lita Chew Sui Tjien,
Pharmacy Department,
National Cancer Centre Singapore

Background

In August 2021, the Ministry of Health (MOH) Singapore introduced significant changes to Medishield life (MSHL) and Medisave (MSV) claims for outpatient chemotherapy treatments. These changes, implemented from September 1, 2022, marked a departure from fixed monthly claim limits to a more nuanced system based on individual drugs and their clinical indications (CI), as outlined in the MOH Cancer Drug List (CDL).

Recognizing the complexity introduced by these changes, our pharmacist team at the National Cancer Centre Singapore (NCCS) identified the need for a robust and comprehensive tool to streamline the calculation of out-of-pocket chemotherapy charges for patients.

Aim

To develop a frugal innovation tool that assists healthcare providers in accurately estimating the out-of-pocket costs for chemotherapy charges with the new claims limit changes.

Methodology (PDSA)

Plan: Core team formation, scope definition, identify opportunity, set specific objectives.
Do: Small-scale testing of proposed changes, test feasibility.
Study: Feedback and consensus gathering from stakeholders and adjustments made.
Act: Scaling of the calculator to calculate the out-of-pocket expenses for all chemotherapy protocols in the electronic prescribing system.

Results

- Excel-based calculator for 839 chemo regimes were created and used by multiple disciplinary staff from clinic operations, medical social worker, pharmacy and medical team to provide financial counseling and treatment planning to patients.
- From September 2022 till date, the calculator was used by staff for at least 6242 patients at NCCS, with constant update for new CDL listing & price changes.
- Better patient and staff experience dealing with cost estimation.
- Estimated cost savings of at least $50,000 when compared with external vendor proposed solution.

Key Features

Estimation of doses and indications based on chosen chemo regime, diagram 1:
Based on height, weight, kidney function and chosen regime, the tool will compute individual drug doses, supportive medications and 'best guess' clinical indications to provide accurate subsidy and OOP charges.

Diagram 1: Main excel calculator layout.

Multiple computation sheet for different needs, diagram 2:
Besides main calculator to compute for single patient, other interfaces allow computation to drug vial size and overview of multiple protocols for treatment planning.

Diagram 2: Consolidated estimations.

Tree Structure for quick update, diagram 3:
Computation built from layers of presets. This allows faster turn around updates when there are significant changes in price or clinical indications.
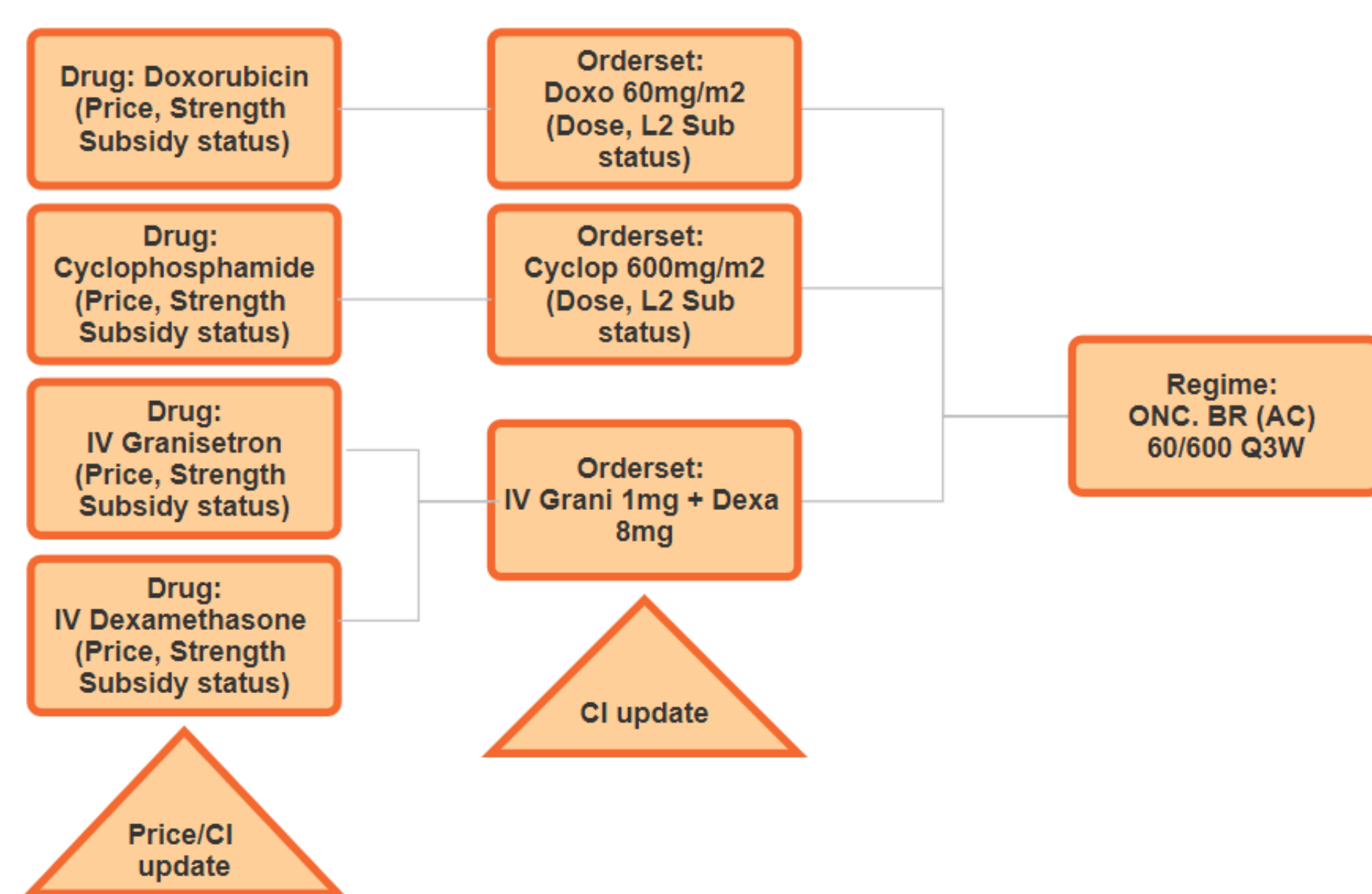

Diagram 3: Structure to generate cost estimations.

Auto adjustment of claim rules, diagram 4a & 4b:
Based on resident status, monthly per capita household income (PCHI), subsidy status, Pioneer/Merdeka generation, the tool will apply appropriate subsidy rules, price premium, pro-ration factor and co-payment scheme in final cost computation.

Diagram 4a: Sample case using drug strength worksheet.

Diagram 4b: Sample case using permanent resident.

Conclusions

This frugal innovation offers efficiency in developing simple, affordable, and practical solutions to a complicated calculation of out-of-pocket costs for chemotherapy charges post CDL implementation.

The Excel-based calculator for chemotherapy out-of-pocket costs serves as a crucial resource for healthcare professionals and patients to manage the financial aspects of cancer treatment. By accommodating dynamic claim limits and providing real-time updates, this tools ensures accurate and efficient financial counseling.

Future Plans

- Expand the tool's functionality to include out-of-pocket expense calculation for investigations, diagnostics and other types of treatments beyond chemotherapy, making it a comprehensive financial planning resource.
- Implements a feedback system to gather user input and continuously improve the tool based on real-world usage and suggestions.
- Create a web-based application for broad accessibility and cross-platform compatibility.