Shifting to a systematic multi-step production workflow to increase compounding capacity, minimize risk of errors, reduce processing time, and maximize utilization of integrated technological resources in the Chemotherapy Preparation Unit (CTPU).

Using multiple PDSA cycles, the following changes have been done:

- A comprehensive educational and practical training was conducted, proceeded by staff rotation with the newly trained team. Every three weeks a new pharmacist trained and assigned to CTPU.
- Raw materials stores were rearranged for better accessibility and diminishing unnecessary staff movement.
- Carrying out of new two steps; a staging step as the first independent double-check before the start of compounding, and for assembly of raw materials and supplies required for compounding. In addition to a verification step as the second independent double-check upon compounding, using bar-code scanners, touchscreens and cross-checking with the chemotherapy order to assure the quality and integrity of the finished product.
- Production workload were restructured over three parallel line of manual stations and one automated preparation unit.
- Pharmacy Information System (PIS) screens were customized to give a first and second audio-visual alarms after 30 and 45 minutes of transcription time respectively.
- Chemotherapy sessions appointment system were established to assess the daily chemotherapy compounding needs by CTPU in advance with an incremental increase of production capacity to reach 100~120 patients/day or 180~200 preparations/day.

KCCC is the only oncology hospital in Kuwait. CTPU was unable to meet the increased number of orders; causing delivery delay and more patients’ waiting time. Moreover; work and more waste due to defective and faulty processes of current workflow; resulting in frequent incident reports of wrong final products dispatched.

- Number of preparations compounded by CTPU was increase by 8%, where more than 43% of preparations were validated to release between 15 & 30 minutes, and approximately 88% of preparations were delivered in less than 45 minutes.
- Number of preparation by automation was increased by 82%. Furthermore, all production incidences has been completely eliminated after full implementation of final verification and validation step.

The new workflow has increase the workload capacity with less production errors and zero incident reports. Patient experience was improved by comparable preparation time to other international Pharmacy Workload Unit and average time required per patient visit.

- Improve the “Staging Step” by PIS visual identification of products, raw materials, supplies and needs for preparation.
- Full integration between Hospital Information System (HIS), PIS and Computerized physician order entry (CPOE) to facilitate the “Transcription and Preparation Step”.
- Combine PIS pooled data in order to plan ahead for a “Pre-Preparation/Batch Preparation”.
- Equip CTPU with new two manual preparation units to increase the production capacity especially during peak hours’, hence shorter average production time.