

## 24x7 Non-Stop Operation @ Outpatient Emergency Pharmacy

### High Accuracy, High Efficiency, First in the World\*

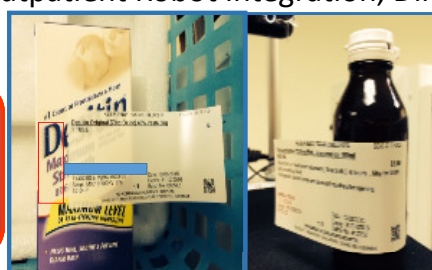
\*Bottle Dispensing, Inpatient-Outpatient Robot Integration, Direct Labeling, Unique Transparent Flag Label

#### Introduction

The **complete integrated robotic solution implemented** at the KKH Children's Emergency and O&G (24-hour) Clinic incorporates coordinated dispensing workflow with automated packing, assembly and barcoding of outpatient medications for improved stocking, labelling and inventory management.

Medications orders are interfaced to the robots and assembled using conveyor system and RFID tracking. **High accuracy for patient safety, High efficiency for short turnaround time** with the latest technology, **first in the world implementation** for Bottle Dispensing, Inpatient-Outpatient Robot Integration, Direct Labeling and Unique Transparent Flag Label.

**World 1<sup>st</sup> Direct Labeling and Unique Transparent Flag Label**

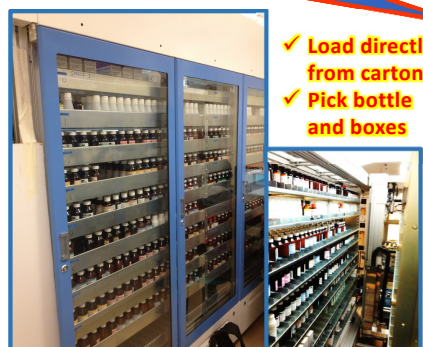


#### Methodology

**Aims in our mind...**

**Patient Safety:** Low human dependency for verification, guiding technology, alert, automated real-time checking.

**High Efficiency:** Low manpower dependency, optimum speed, real-time intervention and automated processes.



✓ Load directly from carton  
✓ Pick bottle and boxes



✓ Visibility of key information on original packaging  
✓ Durable when refrigerated

**World 1<sup>st</sup> Inpatient & Outpatient Pharmacy Robot-Robot Integration**

**Inpatient Robotic**

**Outpatient Robotic**



**Approach in our implementation...**

**Teamwork** with collaboration amongst KKH, IHiS, Getech, NCS, A\*STAR and Singapore Polytechnic.

**Gantt chart for project schedule** to achieve the implementation on time.

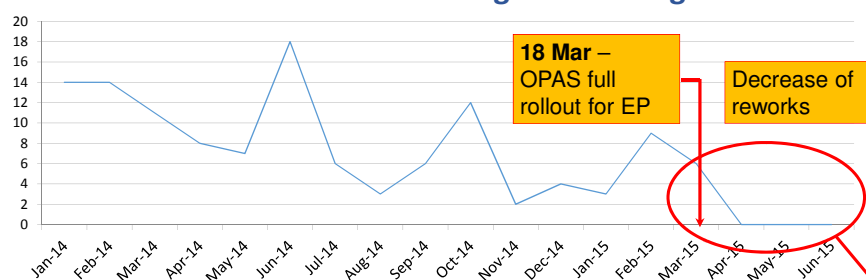
**Flowchart, Ishikawa diagram** for the root cause analysis.

**Efficiency and accuracy** via On-Site Development & Testing for real-time correction and fine-tuning, dedicated team for regular discussion and brainstorm.

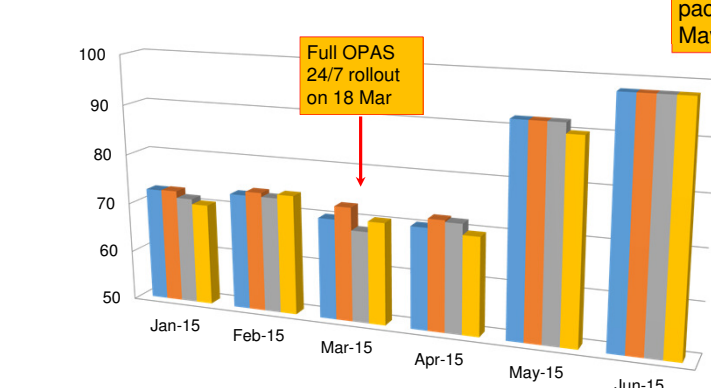
**Phase and staged rollout** to achieve seamless experience and low impact to the operation.

#### Results and Feedback

##### Reduction in Near Miss for Picking and Packing



##### Increased Patient Satisfaction



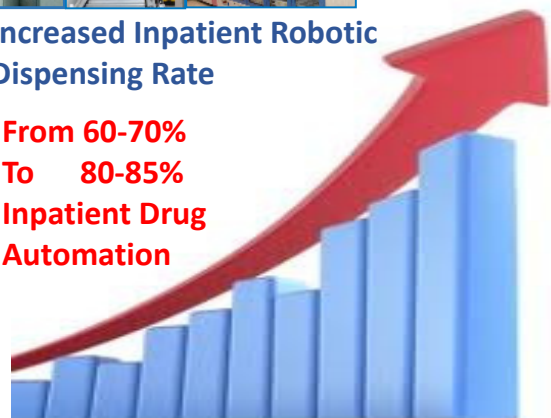
- Display professional knowledge and skills
- Explains and updates on care and treatment
- Shows Care and Concern
- Deliver prompt and friendly service

*Unsolicited feedback from an EP patient (friend of OP Pharmacist)*



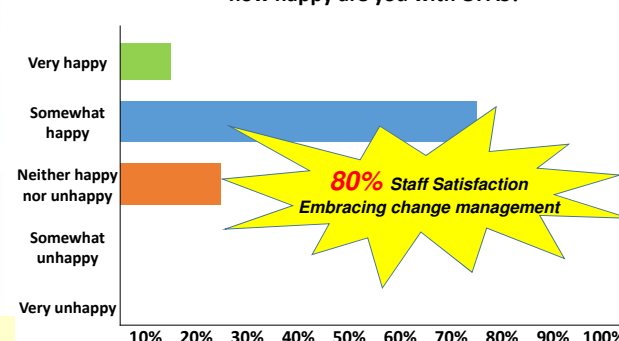
##### Increased Inpatient Robotic Dispensing Rate

**From 60-70% To 80-85% Inpatient Drug Automation**



##### Increased Staff Satisfaction

Overall, compared to pre-OPAS automation, how happy are you with OPAS?



**80% Staff Satisfaction Embracing change management**

#### Conclusion

The project successfully met the objectives set and reaped the benefits of high accuracy for patient safety and high efficiency for operations improvement. It has :

- Achieved automation** of at least **90%** of drugs packing
- Achieved efficiency** and **increase productivity** by **reducing manpower** by at least **3 Pharmacy staffs** enabling re-deployment to value-added activities. These staffs can then spend more time with patients on patient medication counseling, and medication reviews and patient education.
- Increased patient safety** by preventing actual ADEs; and **reduced Near Misses** to **zero** after implementation
- Improved patient satisfaction "Excellent" rating** by 20% from 70% to **90%**
- Improved stock inventory** and tracking