



A Novel System To Digitalise The Process of Chemotherapy Ordering and Treatment Records



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Background

- IPMOE has been launched for more than one decade in HA hospitals
- Challenges to develop IPMOE chemotherapy module:
 - complexity of multi-agent regimens
 - frequent needs for dose and time adjustments to address for the change in patients' condition
- Paper-based MARs are still widely used for chemotherapy centres, and treatment records were filed as folders

| | | | | | | | |
|---|--|---|--|--|--|----------------------|--|
| SHOSPITAL AUTHORITY PRINCESS MARGARET HOSPITAL | | (Please affix gum label if available) Name: _____ Sex/Age: _____ | | | | | |
| CHEMOTHERAPY PRESCRIPTION SHEET (HAEMATOLOGY) | | I D No: _____ | | Ward/Bed: _____ | | | |
| | | HN: _____ | | Dept: _____ | | | |
| (<input type="checkbox"/> Please <input checked="" type="checkbox"/> where appropriate) | | | | | | | |
| ALL HALL-S (Standard Induction, age<50) (Page 1 of 2) | | | | | | | |
| Cycle: _____ | | Diagnosis: _____ | | Prescription Date: _____ | | Starting Date: _____ | |
| <input type="checkbox"/> G6PD def <input type="checkbox"/> HBsAg: <input type="checkbox"/> +ve <input type="checkbox"/> -ve <input type="checkbox"/> anti-HBc: <input type="checkbox"/> +ve <input type="checkbox"/> -ve <input type="checkbox"/> HBV DNA <input type="checkbox"/> +ve <input type="checkbox"/> -ve Ht _____ cm Wt _____ kg SA _____ m ² | | | | | | | |
| Known Drug Allergies: _____ | | | | | | | |
| Doctor Sign: _____ | Day 2 | Day 9 | Day 16 | Day 23 | Day 30 | For Pharm. Use | |
| Code: _____ | Date: _____ | Date: _____ | Date: _____ | Date: _____ | Date: _____ | | |
| Name: _____ | | | | | | | |
| Antiemetic & Others: | | | | | | | |
| Granisetron 1mg IV daily before chemotherapy | Given by _____ Check by _____ Time _____ | Given by _____ Check by _____ Time _____ | Given by _____ Check by _____ Time _____ | Given by _____ Check by _____ Time _____ | Given by _____ Check by _____ Time _____ | | |
| Chemo Regimen: | | | | | | | |
| Daunorubicin _____ mg (25mg/m ²) in 100ml NS IV over 1hr daily on D2, 9, 16 & 23 | Given by _____ Check by _____ Time _____ | Given by _____ Check by _____ Time _____ | Given by _____ Check by _____ Time _____ | Given by _____ Check by _____ Time _____ | | | |
| Vincristine 2mg in 100ml NS IV over 1hr daily on D2, 9, 16, 23 & 30 | Given by _____ Check by _____ Time _____ | Given by _____ Check by _____ Time _____ | Given by _____ Check by _____ Time _____ | Given by _____ Check by _____ Time _____ | Given by _____ Check by _____ Time _____ | | |
| Dexamethasone _____ mg (3mg/m ² /dose, max. 5mg/dose) PO BD on D1 to D28 (then taper over the next 7 days) | Refer to IPMOE | | | | | | |
| Mercaptopurine _____ mg (60mg/m ²) PO nocte on D29 of induction to D28 of consolidation | | | | | Refer to IPMOE | | |

Chemotherapy Prescription Sheet (Haematology)


Sample of chemo MAR

Workflow In The Past

1. Prescription by doctor in clinic
2. Chemo chart sent to day ward

In clinic

1. Fax MAR to pharmacy
2. Collect invoice from pharmacy if involve SFI items



Pre-chemo day

Chemo day

Day ward:
Fax updated MAR
(with gum label) &
payment receipt to
pharmacy

Communication
between day
ward and
pharmacy

Pharmacy: After vetting, inform day ward to collect chemo

Copy MAR and file after administration

Fax

Phone

[illegible]



No acknowledgement of order receipt (unless by phone call)

Chemo order status of individual patient not known to the team

Chance of missing order

Wastage of paper and storage space

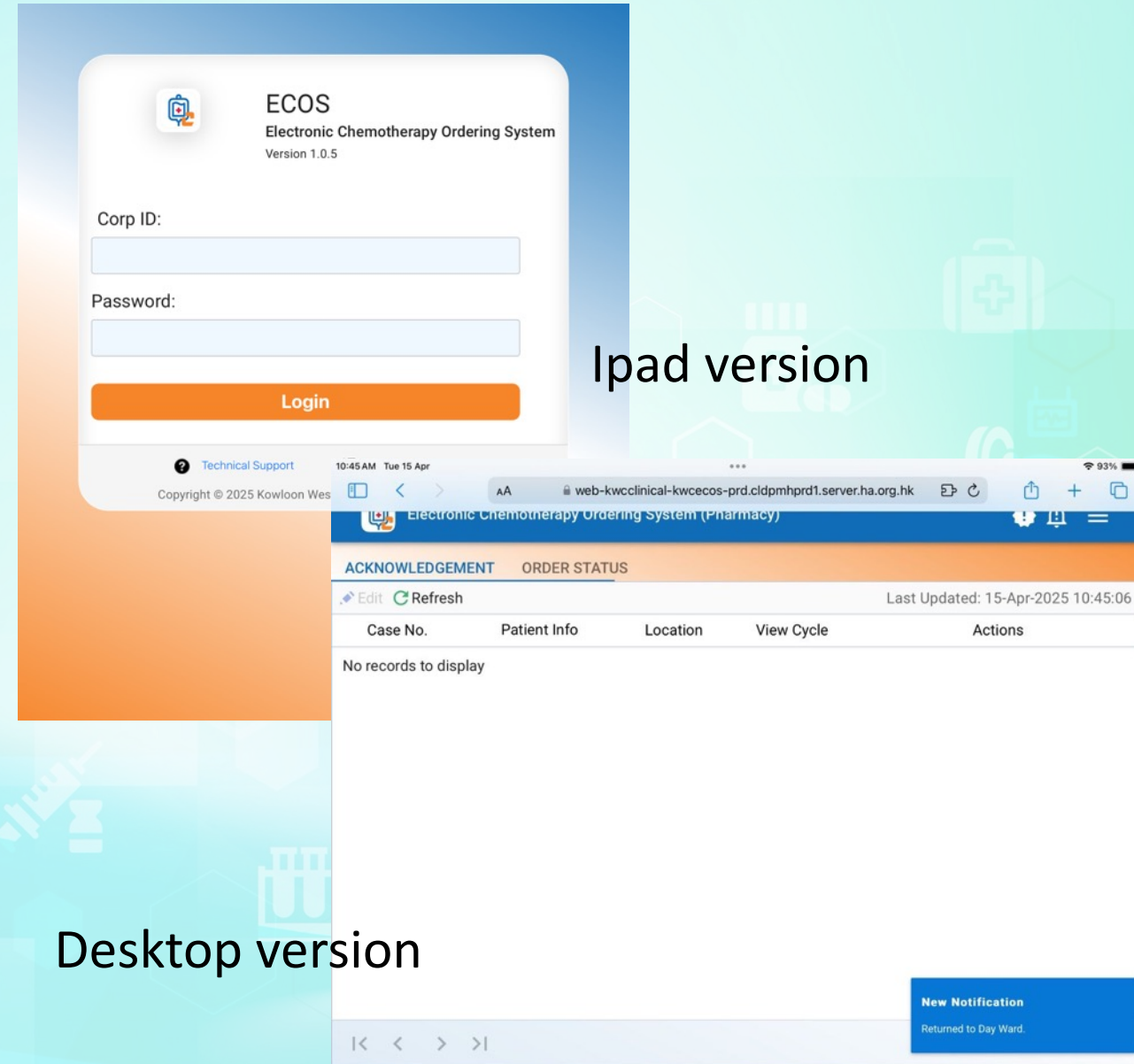
Always need to take hard copies to clinic





Objectives

- Electronic chemotherapy ordering system (ECOS) was developed as a KWC initiative project, by haematology unit, pharmacy and IT department of PMH in Mar 2023
- An interface to digitalise the chemo ordering process and record storage
- To evaluate the implementation of ECOS from Jan to Dec 2024





Features of ECOS

| PATIENT / CYCLE LIST | | | | | |
|---|----------------------------|------------------------------------|-------------------------------|------------|---------------------------|
| | Case No. / HKID MED 123 | Search / Refresh | + Add | Edit | Patient Info Patient A |
| Location | Chemo Date | Status | Download | Upload MAR | |
| ▼ Chemo Cycle Info: #01. Velcade-based treatment DaraVTD, Cycle 1 - 4 items | | | | | |
| | 22-Apr-2025 | New | MAR Invoice Receipt Upload | | |
| | 15-Apr-2025 | New | MAR Invoice Receipt Upload | | |
| | 08-Apr-2025 | Withheld(Con dition changed) | MAR Invoice Receipt Upload | | |
| | 01-Apr-2025 | Picked up | MAR Invoice Receipt Upload | | |
| ▼ Chemo Cycle Info: #02. Velcade-based treatment , Cycle 1 - 4 items | | | | | |
| | | | MAR Invoice Receipt Upload | | |

Patient specific profile

“+ Add” function to initiate a new chemo order

Review of past treatment record

- Past chemo cycle
- Past chemo MAR

Download invoice to patient issued by pharmacy

- 👍 Remote access of past chemo history
- 👍 Unconfined location to make chemo order (no need to stay near the fax machine)



Features of ECOS

Electronic Chemotherapy Ordering System (Day Ward)

ADMISSIONORDER STATUS

Refresh

| Patient Info | Location | View Cycle | Actions |
|--------------------------------------|----------|-----------------|---|
| Chan, Tai Man (陳大文) PID: A1234xxx | | <div>View</div> | <div>MAR</div> <div>Submit</div> <div>Receipt</div> <div>Print/Download</div> |
| Ng, Chi Man (吳至文) PID: B5678xxx | | <div>View</div> | <div>MAR</div> <div>Submit</div> <div>Receipt</div> <div>Print/Download</div> |
| Pang, Yan Sam (病人三) PID: C7890xxx | | | <div>Print/Download</div> |

MAR and receipt scanning replaced by iPad

Document: MAR

Patient: Chan, Tai Man (陳大文)

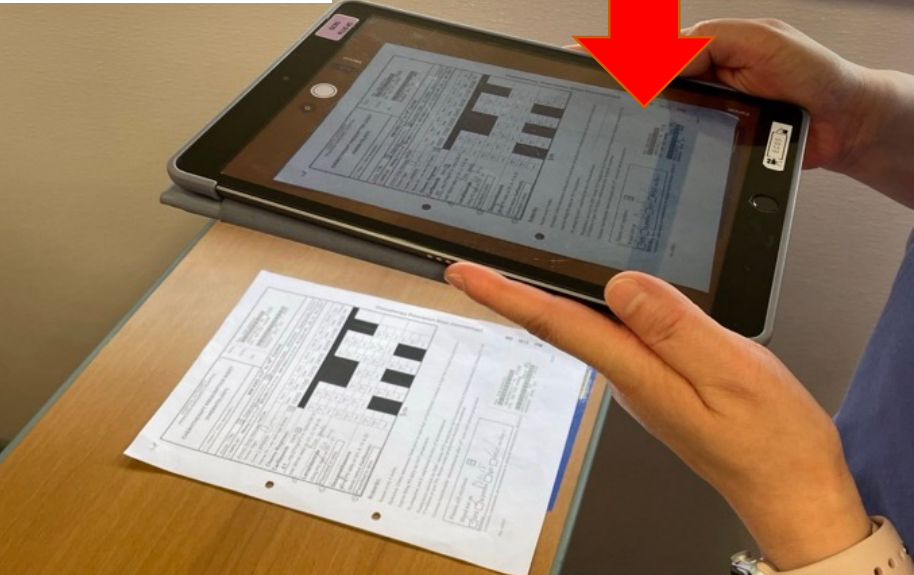
HKID: A1234xxx

Case No: MED 1816

Chemo Date: (MAR)

By: M W CHAN, PMH RN(Med&Geri)

Start Scanning



👍 Document scanning function of iPad to maintain the quality of images; Cf. distortion by fax machine



Features of ECOS

New Chemo Order Received

- 1. Chan, Tai Man (陳大文), A123XXX, Velcade based treatment (cycle 1)
- 2. Ng, Chi Man (吳至文), B567XXX, Azacitidine (Cycle No. 14)
- 3. Pang, Yan Sam (病人三), C7890XXX, R-CHOP (Cycle No. 2)

Info: MED 10

4-Apr-2025

View

Invoice

Print/Download

Acknowledged

| ADMISSION | | ORDER STATUS | | Last Upd |
|---------------------------------|----------|-------------------|------------------------------------|----------|
| Edit Refresh | | | | |
| Patient Info | Location | Status | Actions | |
| Chan, Tai Man (陳大文) A1234xxx | | Vetting | Picked Up MAR Print/Download | |
| Ng, Chi Man (吳至文) B5678xxx | | Acknowledged | Picked Up MAR Print/Download | |
| Pang, Yan Sam (病人三) | | Pending Admission | Picked Up MAR | |

Pharmacy interface –

New chemotherapy request will pop up in pharmacy for acknowledgement, and shown in the system

Day ward interface –

The status of each order is clearly shown
Notification pop up when ready for pick up

👍 No missing of order cf. fax MAR/ receipt in the past

👍 Every staff can log in to see the progress of a chemo order. Encourage teamwork!



Features of ECOS

Confirm

Are you sure to Release this treatment?

Chemo Date: 2025-04-15

Chan, Tai Man (陳大文)
PID: A123XXX

☐ No ☒ Yes

Request for order release and amendment

Details of MED 2311:

Patient Info
MED 2311 Chan, Tai Man (陳大文), A123XXX

Chemo Date
2025-04-15

Release Request for:

Reupload amended MAR

👍 Communication between day ward and pharmacy by ECOS to replace fax + call

👍 Enhanced traceability



Implementation of ECOS

- In the evaluation period (Jan to Dec 2024)
 - >4800 chemotherapy orders processed by ECOS
 - Document scanning failure on 2 days, fax used as contingency
 - No report of missing chemotherapy order
- Challenges in implementation and limitations of our evaluation
 - Time to adapt to and optimise the novel system
 - Efficiency not accessed, but expected to be enhanced with familiarity to the system



Limitations, future role and prospect of ECOS

- ECOS only digitalise the chemo ordering process but the steps are still manual
 - ?Scanning multiple MARs with OCR function to recognise patient’s identifiers
- Now we use PDF to prescribe and then print whilst IPMOE chemo module is still under development
- Extension to inpatients, other chemo site at KWC (PMH clinical oncology/ YCH haematology)

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| Check by | | Check by | | Check by | | Check by | | Check by | |
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| Time | | Time | | Time | | Time | | Time | |
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Current layout of chemo MAR is optimised for treatment planning

Chemotherapy Prescription Sheet (Haematology)



Acknowledgement

Haematology Unit, Dept of M&G, PMH
Medical Day Ward, Dept of M&G, PMH
Pharmacy, PMH
KWC IT Team

