

Preventive Health through Clinical Data Exchange using HL7

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What is “Innovation in Preventive Health”?

Preventive health is an essential component of healthcare, and innovation in this field can improve the overall health outcomes of individuals and populations. Some areas of innovation in preventive health include:

1. Digital health tools
2. Genetic testing
3. Precision medicine
4. Telemedicine
5. Behavioral interventions
6.

What are some examples of digital health tools?

There are many digital health tools available that can help individuals to track their health metrics, monitor their physical activity, and provide personalized recommendation for preventive care. Here are some example :

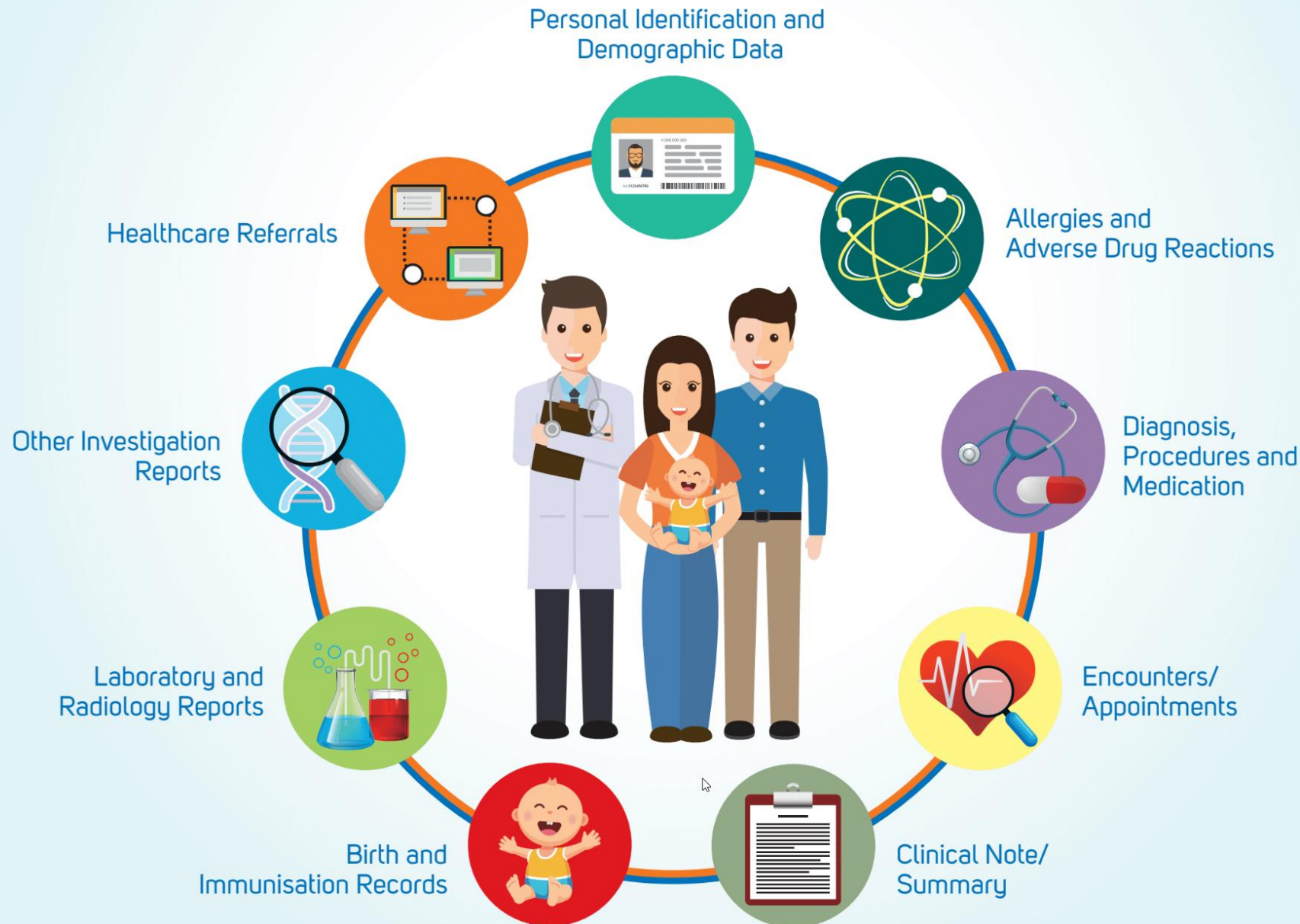
1. Health apps
2. Wearable sensors
3. Telehealth platform
4. Personalized health coaches
5. Electronic health records

Electronic Health Record Sharing System (eHRSS)





- Single patient controlled record across all healthcare sectors
- Hong Kong interoperability standards with levels of compliance
- Focus on privacy and ease of adoption
- Seen as a tool of healthcare policy, not an IT project


Data Shared on eHRSS



Electronic Health Record




ClinicalAdministrationEmergency AccessStandardsInformation








UPPPNURSE011 UPPPNURSE011  (Logout)

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HKIC No. : Q000999(3) DOB : 14-Feb-1976 Age : 39 years Sex : M [Details ▶](#)

Allergy & ADRSelect PatientClose Record



AllLocalNon-LocalHelp



▼ Clinical Note & Summary
Clinical Note & Summary


► Encounter / Appointment

▼ Problem & Procedure
Problem / Diagnosis
Procedure

▼ Medication
Prescribing History
Dispensing History

▼ Laboratory Record
Chemical Pathology
Microbiology & Virology
Toxicology

▼ Radiology Record
General Radiology
Ultrasonography
Computed Tomography









Laboratory Record

Date ViewDocument ViewLaboratory: AllPeriod: AllDefault View

Date	Profile Description	Institution
02-Apr-2013	CA,GGT,LFT,RFT	QEH
02-Apr-2013	CBP/DC	QEH
02-Apr-2013	CEA	QEH

Laboratory Cumulative Result(s)

Last 1 yearPage 1 of 3

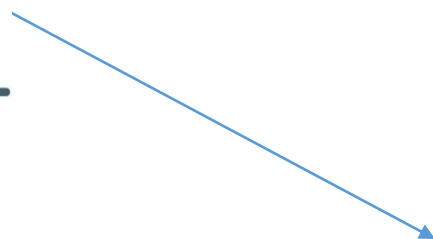
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PDF Report						
Sodium, Serum or Plasma	142	140	139	137	139	138
Potassium, Serum or Plasma	3.5	3.5	3.6	3.6	4	3.7
Urea, Serum or Plasma	2.0 L ↓	2.6 L ↓	2.5 L ↓	2.4 L ↓	2.3 L ↓	3.7
Creatinine, Serum or Plasma	43 L ↓	52 L ↓	56 L ↓	65	68	73
Protein, Serum or Plasma	64 L ↓	69	74	71	73	77
Albumin, Serum or Plasma	29 L ↓	33 L ↓	35	30 L ↓	30 L ↓	33 L ↓
Globulin, Serum, Calculated	35	36	39 H ↑	41 H ↑	43 H ↑	44 H ↑
Bilirubin, Serum or Plasma	3 L ↓	5 L ↓	6	6	6	6
Alkaline phosphatase, Serum or Plasma	95	105 H ↑	111 H ↑	111 H ↑	100 H ↑	116 H ↑
Alanine aminotransferase, Serum or Plasma	7 L ↓	6 L ↓	8 L ↓	12 L ↓	11 L ↓	13

Five Guiding Principles of eHR Sharing System

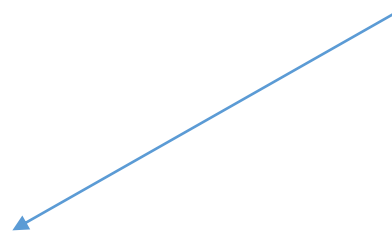
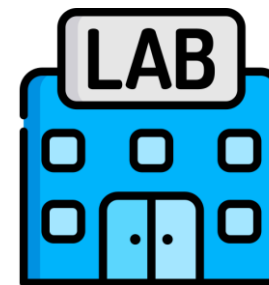
1. eHR development should be government-led and should leverage HA's systems and know-how.
2. Data privacy and system security of the eHR sharing system should be accorded paramount importance and given legal protection.
3. Participation in eHR sharing should be compelling but not compulsory for both patients and healthcare providers.
4. eHR sharing system should be based on open, pre-defined and common technical standards and operational protocols.
5. Development of eHR sharing system should be based on a building block approach, involving partnership with the private sector.

Data exchange for eHRSS

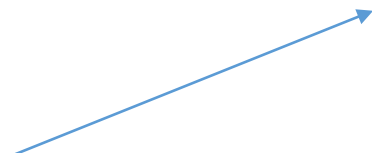
- Require common format for information exchange
- Need to provide the framework for event-driven message
 - e.g. sharing consent notification to HCP
- Capable to carry
 - Unstructured data (Free text / PDF)
 - Structured data (Fully codified data & values)



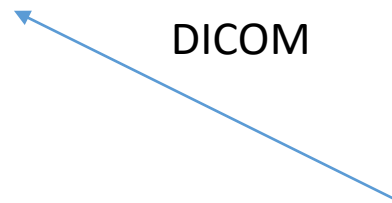
HL7 v2.5
HL7 CDA



HL7 v2.5
HL7 CDA



DICOM





**Technical Interface Specification
For
eHR Healthcare Information System**



**Technical Interface Specification
For
eHR Radiology Examination Record**

Version 1.4.0



**Technical Interface Specification
For
eHR Laboratory Result (General Result)
Record**

HONG KONG

**Technical Interface Specification
For
eHR Prescribing Record
And
eHR Dispensing Record**

Usage and Record Sharing

~ 2.556B records shared*

** Including radiological images in the pilots as part of eHRSS sharing*

➤ **42 HA hospitals**

➤ **11 PPP programs**

➤ **4 DH services**

➤ **1051 private clinics**

➤ **13 private hospitals**

➤ **24 NGOs**

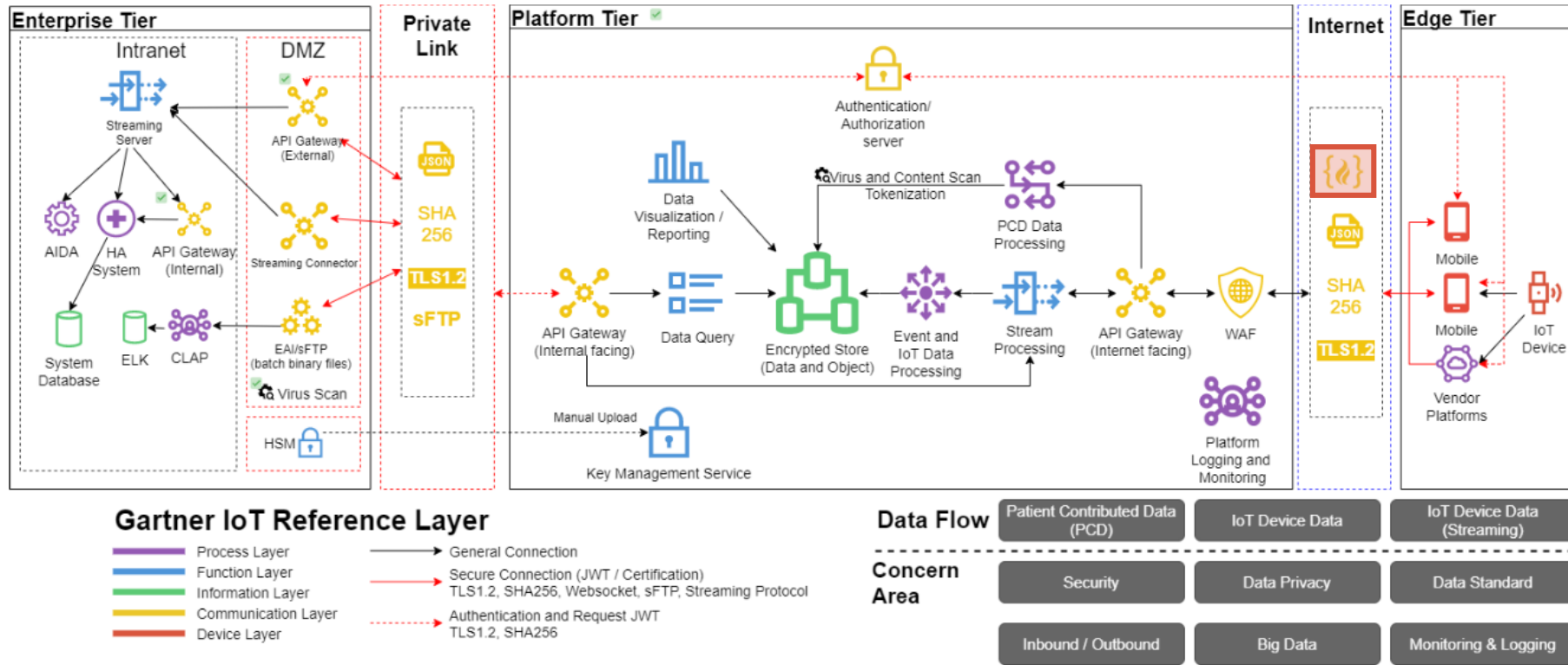
➤ **19 Radiology
groups / centres**

➤ **13 DHC**

Vital Sign Kit for isolation camp / AWE



Secure External Data (SED) Platform in HA



FHIR 

- Fast Healthcare Interoperability Resources
 - Next generation standards framework created by HL7



What's FHIR feature?

- Global standard with complete **self-extension** capability
- Message **readability** between clinical interface specialist and medical informaticists
 - Support to add human-readable narrative in the machine-readable message
- Modern web-based suite of **API** technology
 - Small-sized message : JSON / RESTful protocol
 - Efficient information exchange between systems and tablets/cell phones.
 - Meet the most common IT skillset

FHIR Observation Resource

- Vital Signs Profiles

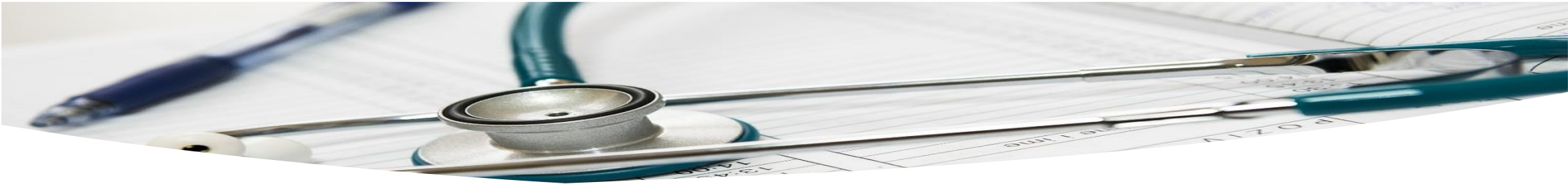
Structure			
Name	Flags	Card.	Type
Observation	1 N		DomainResource
<ul style="list-style-type: none"> identifier basedOn partOf status category code subject focus encounter effective[x] <ul style="list-style-type: none"> effectiveDateTime effectivePeriod effectiveTiming effectiveInstant issued performer value[x] <ul style="list-style-type: none"> valueQuantity 			
	Vital Signs Panel	85353-1	Vital signs, weight, height, and other vital signs listed in this panel may miss individual results; instead, it is used in the Arg...
	Respiratory Rate	9279-1	Respiratory Rate
	Heart rate	8867-4	Heart rate - To supplement an additional observation
	Oxygen saturation	2708-6	Oxygen saturation in Arterial oximetry which MAY be
	Body temperature	8310-5	Body temperature - To supplement observations.
	Body height	8302-2	Body height - To supplement typically used for infant
	Head circumference	9843-4	Head Occipital-frontal circumference
	Body weight	29463-7	Body weight - To supplement 8361-8 - Body position
	Body mass index	39156-5	Body mass index (BMI) [kg/m²]
	Blood pressure systolic and diastolic	85354-9	Blood pressure panel with Observation.valueQuantity supplement this vital sign 41904-4 - Blood pressure blood pressure device MA
	Systolic blood pressure	8480-6	Systolic blood pressure -
	Diastolic blood pressure	8462-4	Diastolic blood pressure

```

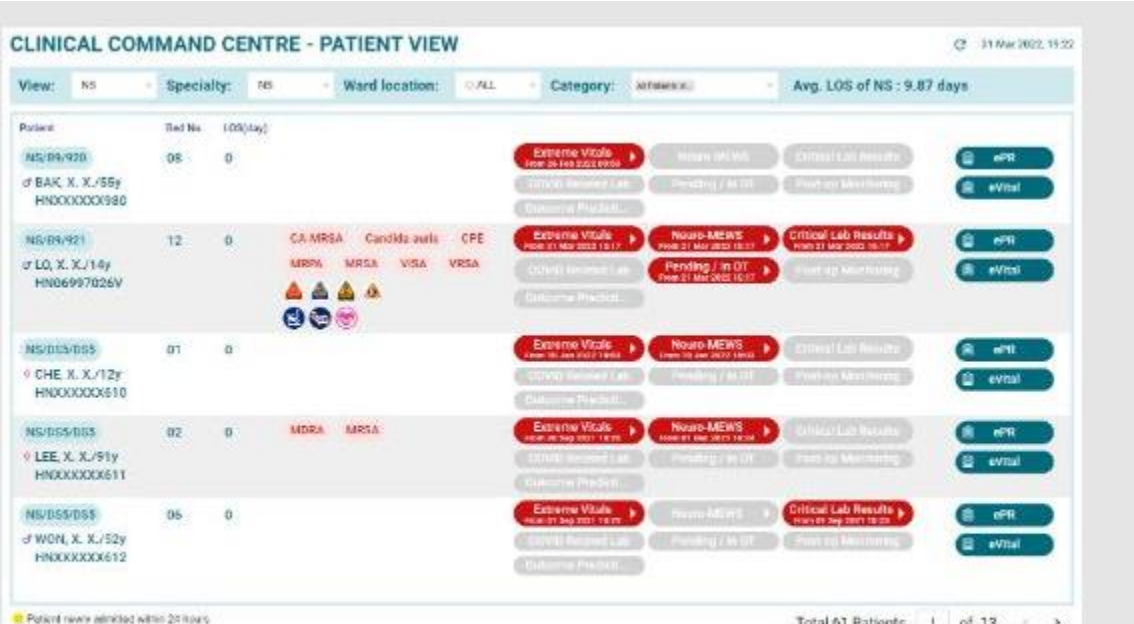
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    }
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      }
    ],
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  ]
}

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HA Clinical Command Centre

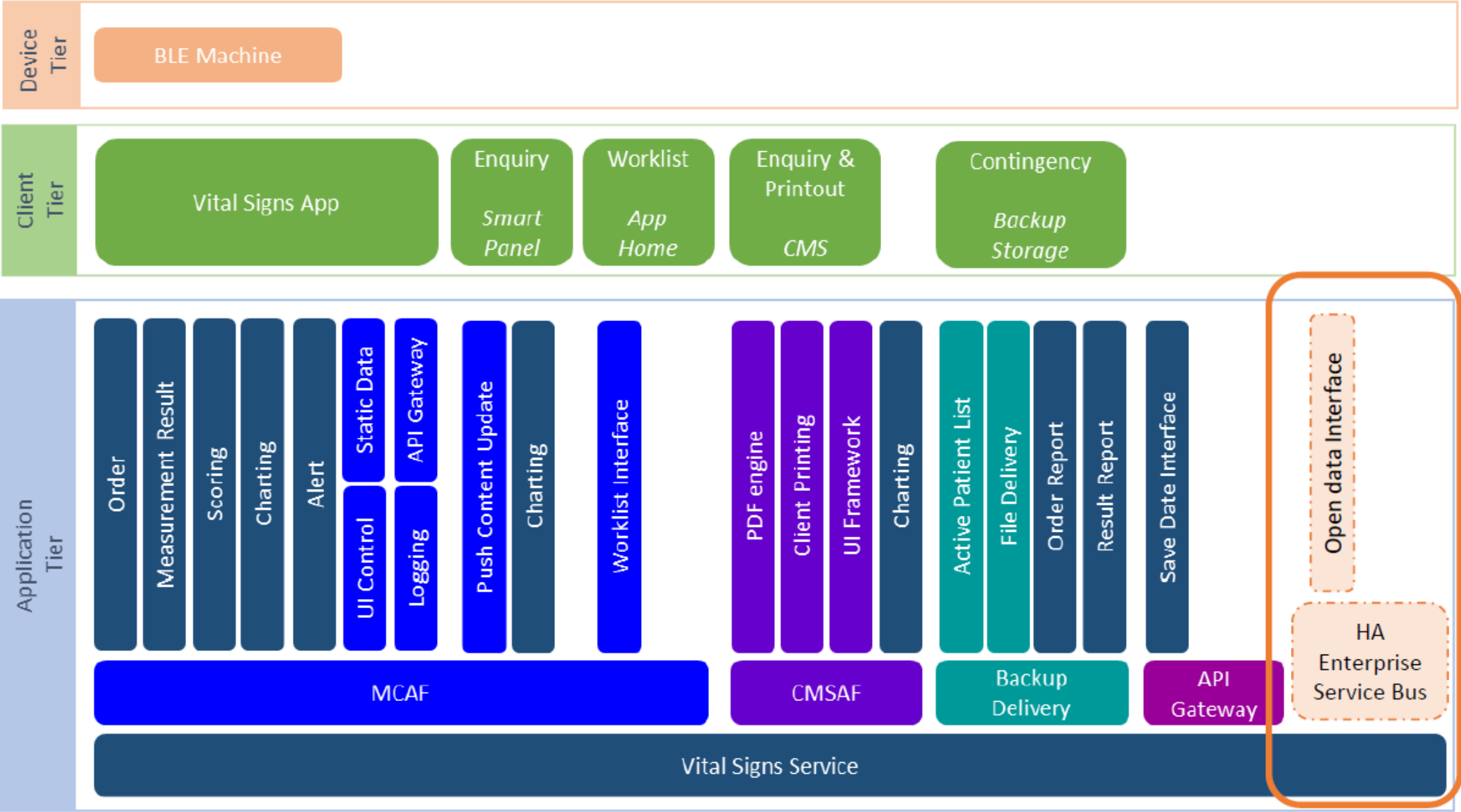


Clinical Command Centre - Ward View



Clinical Command Centre - Patient View

HA Vital Sign Architecture





Vital signs
Application

Measurement Transactions

Message Content

- HL7-FHIR
- IAMS



HA Enterprise Service Bus

Coming up: FHIR at eHRSS



Medication download

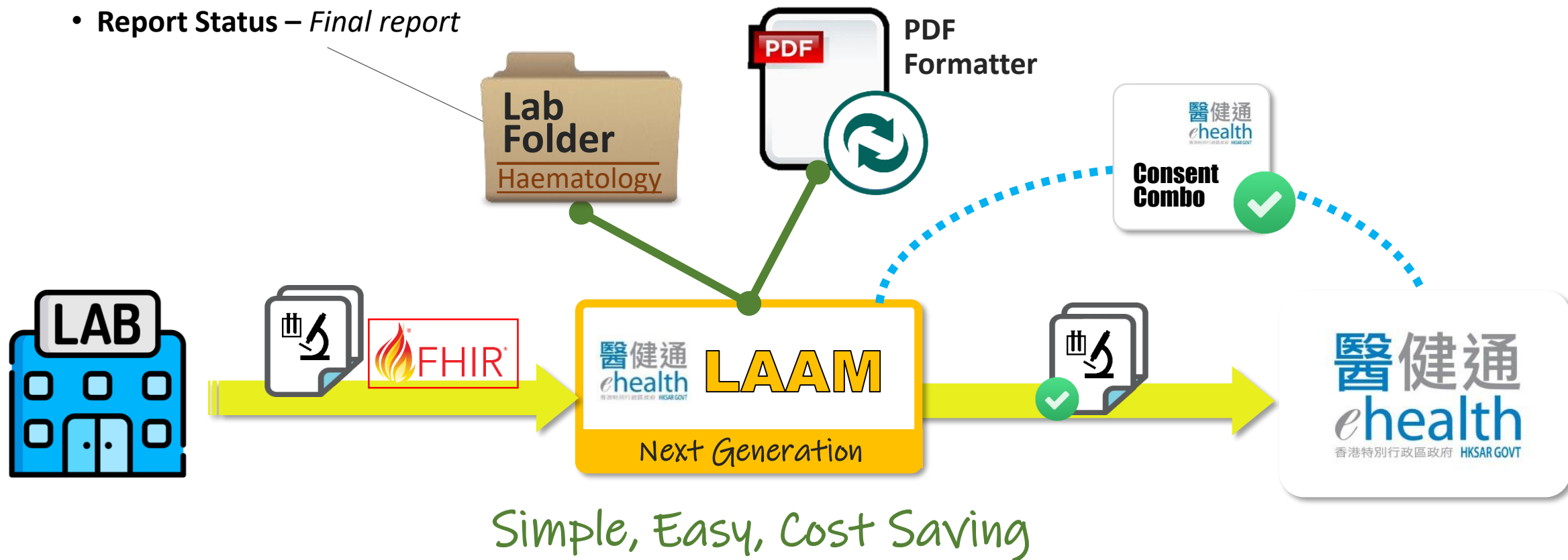
FHIR 🔥

藥物管理服務 Medication Management Service



Support Laboratory report sharing

- Lab Category – e.g. Haematology
- Report Status – Final report



Lab Records



Lab Records with consent



Local Adaptor - Adaptation Module

Roadmap of FHIR at EHRSS

- Upgrade existing HCP sharing interface to FHIR
- Enable two-way sharing on Public-private program to minimize duplicated input
- Adopt FHIR International Patient Summary (IPS) for cross-broader sharing

*Thank
You!*