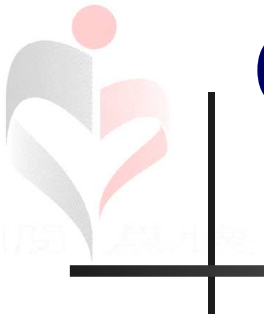


Myths and Truths of Clinical Information System in Intensive Care



Dr. Chan, King-chung Kenny
AC, ICU, PYNEH



Intensive Care

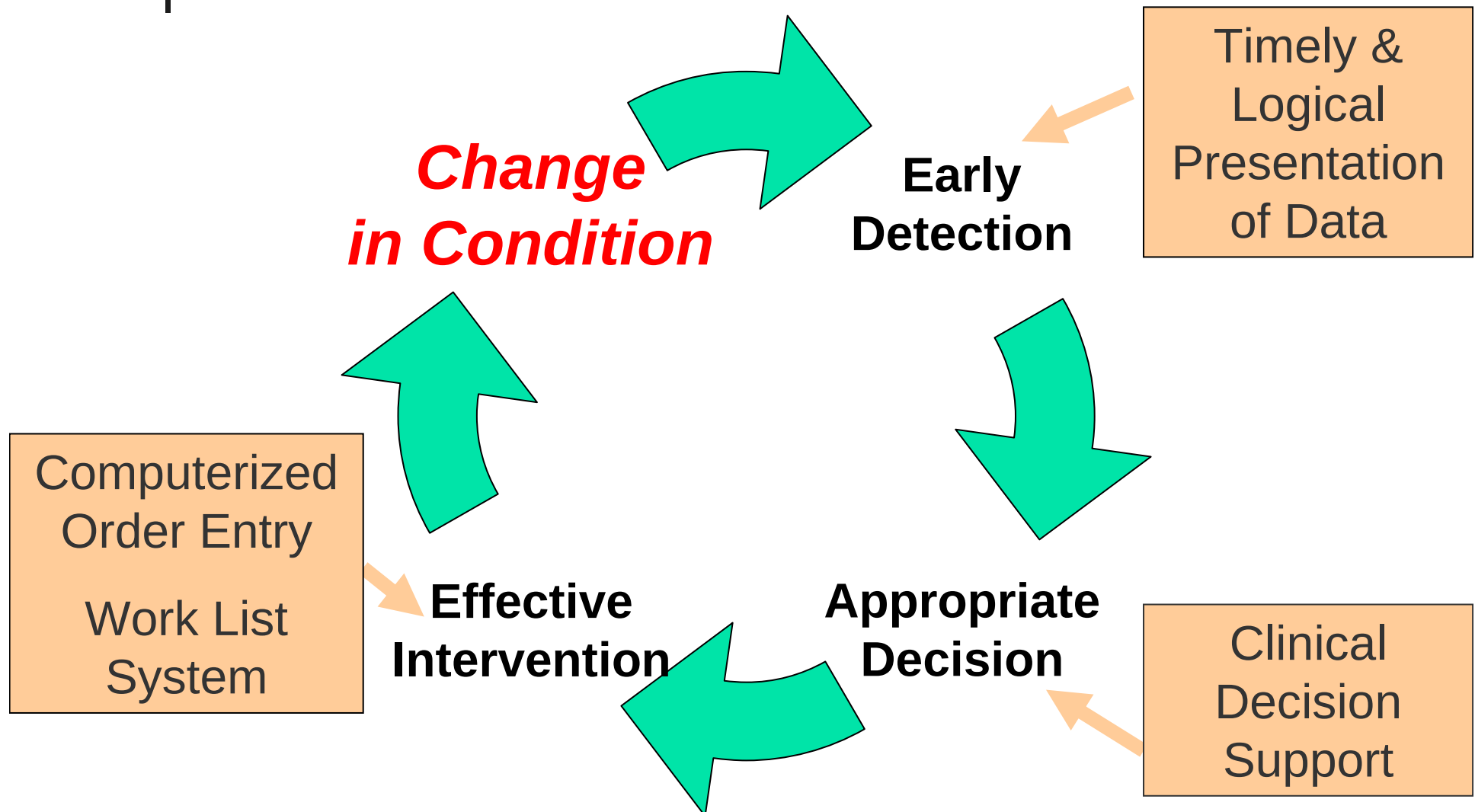
- **High Risk** environment
- Integration of many diagnostic information
- Titration of physiology
 - Life-Support Devices
 - Medication







Safe & Effective Care in ICU





IT at Point of Care

- Community-wide system (EHR)
 - Discharge summary / Allergy
- Hospital-wide system (EPR)
 - Lab / Radiology / ADT / Drug
- Department-specific system (CIS)
 - Physiology monitors / Equipments
 - Treatment orders / protocols
- Personal system (PDA)
 - E-Book / Medical calculator





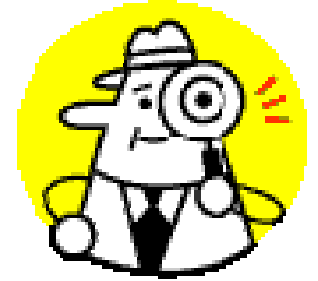
Myth #1



- The hospital should and will provide me all the information systems necessary for my job. Just wait for the coming upgrade.



Myth #1



- The hospital should and will provide me all the information systems necessary for my job. Just wait for the coming upgrade.

Truth #1

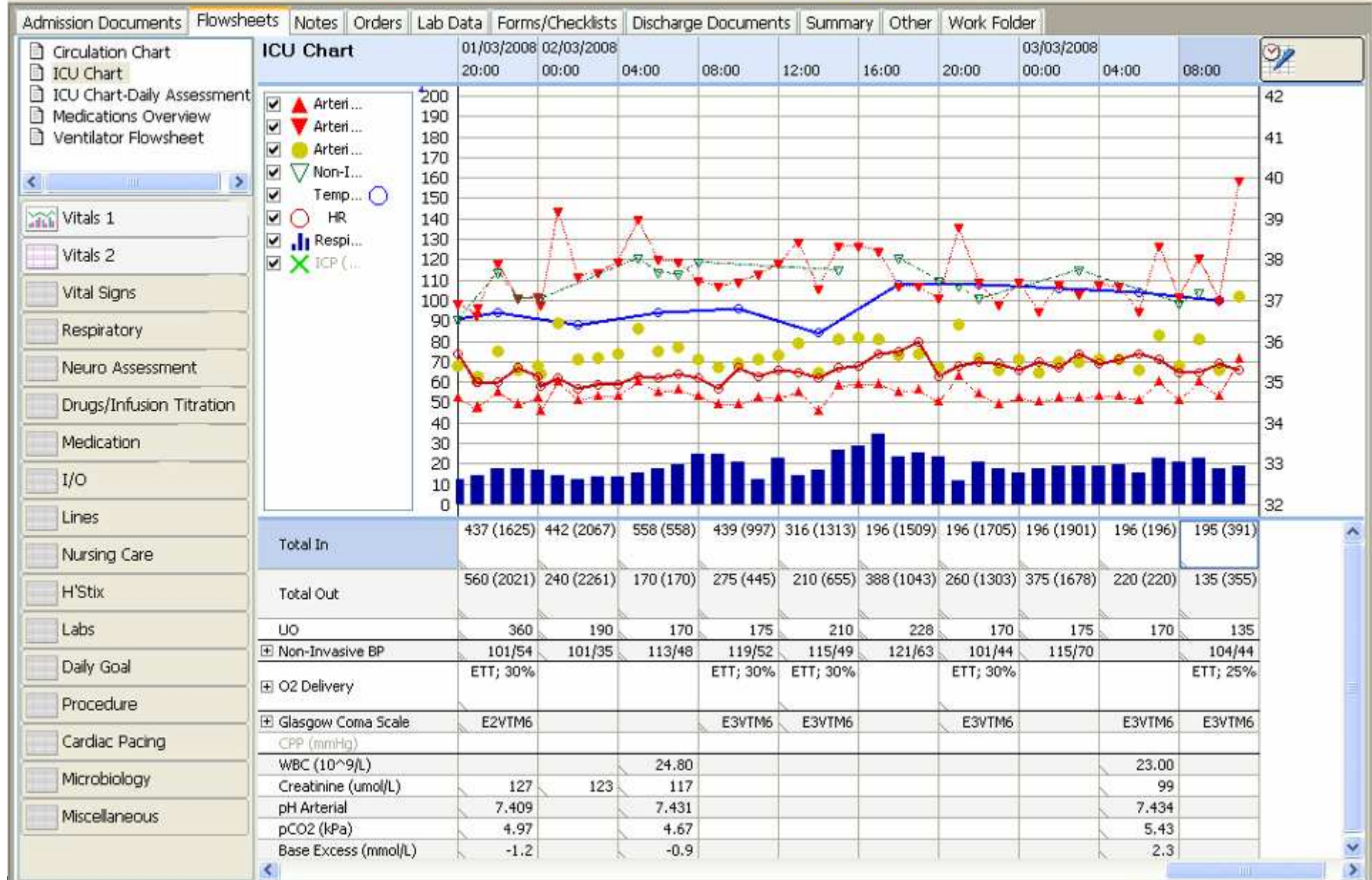
- The hospital should provide me **access** to the relevant information systems, and I may not need to wait.



Hospital-wide vs. Department-specific

- Hospital-wide
 - Generic / Multifunction
 - Used in various clinical areas
- Department-specific
 - Specific for clinical need
 - ICU / OT / OBS / RT
 - Integration with equipments/
IT systems





Philips CareVue Chart - [ICU_B10 - B10-21 -] | Gender: Male | Age: | HK | Adm. Date: 17/02/2008 18:00

File Edit View Patient/Chart Document Tools Window Help | Kenny King Chung Chan

B10-21 -

Admission Documents | Flowsheets | Notes | Orders | Lab Data | Forms/Checklists | Discharge Documents | Summary | Other | Work Folder

Lab Flowsheet

	28/02/2008 00:00	29/02/2008 00:00	01/03/2008 00:00	02/03/2008 00:00	03/03/2008 00:00	04/03/2008 00:00	05/03/2008 00:00	06/03/2008 00:00	07/03/2008 00:00	08/03/2008 00:00	09/03/2008 00:00
HGB (g/dL)	8.4	8.4	8.2	8.1	8.8	7.6	7.2	7.3	7.1	8.8	6.8
HCT (L/L)	0.26	0.25	0.25	0.24	0.26	0.23	0.21	0.22	0.22	0.27	0.2
MCV (fL)	86.6	87	87.5	86.6	85.1	86	86.5	87.1	86.8	86.6	86.2
MCH (pg)	28.2	28.8	28.7	29.4	29.3	28.6	29.1	28.6	28.8	28.3	29.3
MCHC (g/dL)	32.5	33.1	32.7	33.9	34.3	33.2	33.6	32.8	33.1	32.7	34
WBC (10 ⁹ /L)	15.60	15.70	19.40	23.80	24.60	22.70	15.10	12.50	12.70	11.80	11.60
Neutrophils (x10 ⁹ /L)	12.7	12.6	16.4	21.1	23	20.5	12.6	10.1	9.8	9.1	8.7
Lymphocytes (x10 ⁹ /L)	1.5	1.8	1.8	1.6	0.9	1.3	1.6	1.4	1.8	1.8	1.9
Monocyte (x10 ⁹ /L)	1.1	1	0.9	0.7	0.6	0.3	0.6	0.5	0.8	0.6	0.7
Eosinophil (x10 ⁹ /L)	0.2	0.2	0.2	0.4	0.1	0.6	0.4	0.4	0.3	0.3	0.4
Basophil (10 ⁹ /L)	0.1	0.1	0.1	0	0	0	0	0	0	0	0
Platelets (10 ⁹ /L)	472	446	461	431	401	326	290	317	351	345	408
PT (sec)	10.3				12.6						
INR	1.1				1.3						
APTT (sec)	35.1				39						
ABO BLOOD GROUP											
pH Arterial	7.464	7.453	7.449	7.477	7.459	7.453	7.439	7.436	7.43	7.461	7.472
pCO2 (kPa)	5.32	5.96	5.53	4.36	4.42	4.34	4.66	5.04	5.08	4.92	4.79
pO2 (kPa)	17.5	12.72	17.62	13.8	14.65	19.43	10.74	16.49	13.34	14.01	15.15
Bicarbonate (mmol/L)	28	30.6	28.1	23.6	23	22.3	23.2	24.9	24.7	25.7	25.7
Base Excess (mmol/L)	4	5.8	3.7	0.9	-0.1	-0.8	-0.4	0.9	0.6	2.1	2.4
SaO2 (%)	98.8	97.5	98.7	98.1	98.3	99	96.3	98.6	97.7	98.1	98.4
Sodium (mmol/L)	154	155	156	155	157	156	155	158	158	158	157
Potassium (mmol/L)	4.7	4.3	4.1	4.2	4.9	3.7	3.8	4.3	4.5	4.4	4.5
Urea (mmol/L)	31.3	30.4	30.3	34.3	43.1	45.1	33.5	25.9	22.6	23.1	21.7
Creatinine (umol/L)	181	177	178	223	320	304	204	165	156	161	154
Total Protein (g/L)	76				80						
Albumin (g/L)	32				34						
Globulin (g/L)	44				46						
Bilirubin Total	6				15						
ALK Phos (U/L)	144				179						
ALT/SGPT (IU/L)	148				161						
Calcium (mmol/L)	2.55										

10/03/2008 15:08

Start Philips CareVue Chart ... EN 15:08

Description	Duration	Mon 25	Tue 26	Wed 27	Thu 28	Fri 29	Sat 1	Sun 2	Mon 3	Tue 4
Ampicillin 500 mg IV Q6H	4 days total									
10% CaGlucanate 10 ml IV STAT in...	2 days total									
Cefuroxime 750 mg IV Q12H	7 days total									
☒ D50										
Esomeprazole (Nexium) 40 mg IV Q2...	Day 10									
☐ Frusemide										
Frusemide (Lasix) 60 mg/60 ml St...	Day 6									
Frusemide 60 mg/60 ml Start 5 ml...	Day 1									
Metronidazole (Flagyl) 500 mg IV Q8H	8 days total									
Mida+Morp (1+1mg/ml) 1 ml/1 ml St...	Day 10									
Nor-adrenaline 4 mg/60 ml Start 2 m...	Day 10									
Timolol 0.5 % 1 drop Eye - Both BD...	Day 10									
Paracetamol (Panadol) 500 mg PR Q...	Day 9									
KCl 2 gm GT Once	3 days total									
Tazocin 4.5 gm IV Q8H	Day 3									
Vancomycin 750 mg IV STAT in. 200...	2 days total									

Legend

- Continuous Dose
- Pending Continuous Dose
- Dose Increase
- Dose Decrease
- Order Continues
- Scheduled Dose Given
- Scheduled Dose Held
- Scheduled Dose Missed
- Scheduled Dose Pending
- PRN Dose Given

Philips CareVue Chart - [ICU_D10 - D10-06 -] | Gender: Female | Age: 88 years | HKID: | Adm. Date: 22/02/2008 17:05]

File Edit View Patient/Chart Document Tools Window Help | Kenny King Chung Chan

D10-06 - ICU_D

Admission Documents | Flowsheets | Notes | Orders | Lab Data | Forms/Checklists | Discharge Documents | Summary | Other | Work Folder

Drug Allergy/Alert: No drug allergy or drug alert | Admit weight: • Height (cm): • BSA:

Scheduled, One time and STAT

03/03/2008 16:00	☐ Tazocin 4.5 gm IV Q8H ☐ Change bacterial filter Daily (4pm) ☐ Change disposable suction tubing* Q3Days (4pm) To change Vent tubing every 6 day if required ☐ Change feed tube strapping/clean nostrils* Daily (4pm) ☐ Change oral ETT position* Daily (4pm) ☐ Change Sterile Catheter* Q3Days (4pm) ☐ Mouth + lip care* QID ☐ Turn and back care* Q4H
20:00	☐ Mouth + lip care* QID ☐ Timolol 0.5 % 1 drop Eye - Both BD (8,8) ☐ Turn and back care* Q4H
04/03/2008 00:00	☐ Esomeprazole (Nexium) 40 mg IV Q24H ☐ Tazocin 4.5 gm IV Q8H ☐ Turn and back care* Q4H
04:00	☐ Turn and back care* Q4H
08:00	☐ Tazocin 4.5 gm IV Q8H ☐ Mouth + lip care* QID ☐ Timolol 0.5 % 1 drop Eye - Both BD (8,8) ☐ Turn and back care* Q4H
10:00	☐ Bed Bath+Foley Care* Daily (10am) ☐ NS dressing to Lt foot with Jelonet
12:00	☐ Mouth + lip care* QID ☐ Turn and back care* Q4H
Continuous	

03/03/2008 12:59



Electronic Patient Record



LOGON

User ID:

Password:

AHN ▼

Logon

Reset

Release Note v1.8

If your PC have problem in showing Chinese character, please click the following link to download the fonts:-

[Chinese Character - HA MingLiu](#)

[Microsoft Hong Kong Supplementary Character Set](#)

This site is best viewed at 1024 x 768 screen resolution with Microsoft Internet Explorer 6.0 or above

IMPORTANT NOTES

1. All patient information is strictly confidential
2. Staff may only use the ePR for authorised purpose
3. All access to ePR is logged
4. Please logoff immediately after use





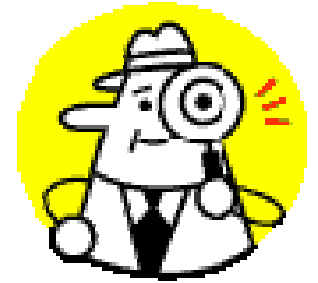
Myth #2



- Applying CIS will reduce the risk and improve the quality of care to patients.



Myth #2



- Applying CIS will reduce the risk and improve the quality of care to patients.

Truth #2

- Applying CIS will reduce some risks, but will create some new problems.
- The quality of care will probably be improve, but you better monitor.



Benefits from CIS



- Patient safety
 - Reduce error
- Quality of care
 - Care time
 - Remote access
- Clinical decision
 - Organization of data
 - Computer assisted
- Infection control
- Nursing resource
 - ↑ Recruitment
 - ↑ Retention
- Comprehensive info
 - Planning / budgeting
 - Audit / Research
 - Medico-legal



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Informing Choices. Rewarding Excellence.
Getting Health Care Right.

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Hospital Referral](#)[ICU Physician
Staffing](#)[National Quality
Forum-Endorsed
Safe Practices](#)[How the Leapfrog
survey data is
gathered](#)[Leapfrog Group
Position Statement
on Never Events](#)[Policy for multi-
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Computerized Physician Order Entry

The potential benefits for patients, payers and providers led national experts in health care quality and safety to recommend computerized physician order entry as one of Leapfrog's recommended practices. Recent research shows that if this Leapfrog practice was implemented in all urban hospitals in the U.S we could prevent as many as 907,600 serious medication errors each year. Studies have also shown that CPOE reduces length of stay; reduces repeat tests; reduces turnaround times for laboratory, pharmacy and radiology requests; as well as delivering cost savings.

For more information on Leapfrog's CPOE requirements see our [fact sheet](#).

[CPOE Bibliography](#)[Copies of selected CPOE reports](#)

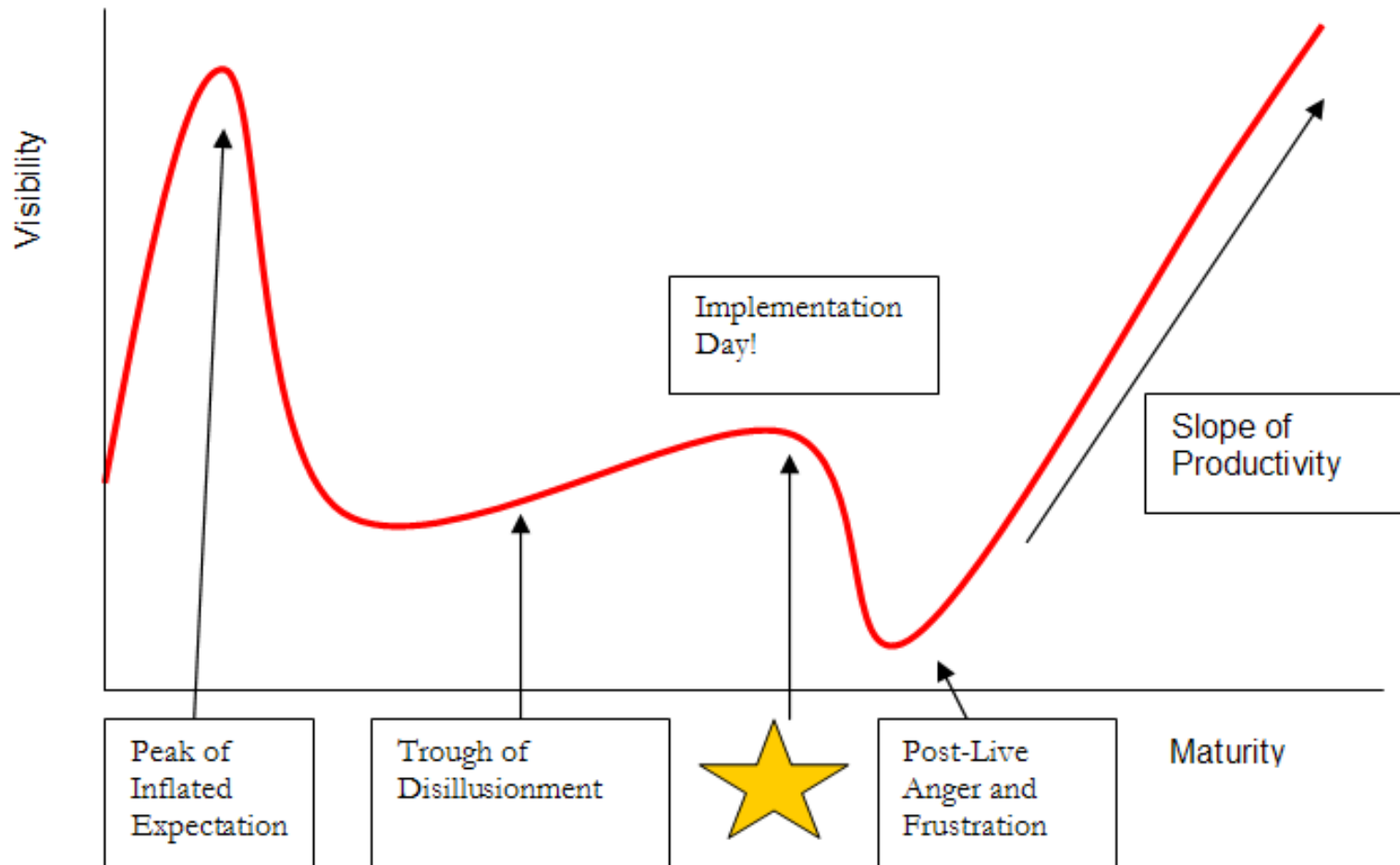


Unintended Consequence

1. More/new work
2. Unfavourable workflow
3. Never ending system demands
4. Problems related to paper persistence
5. Changes in communication patterns and practices
6. Generation of new kinds of errors
7. Unexpected changes in the power structure
8. Overdependence on the technology
9. Negative emotions



Morale with CIS Implementation





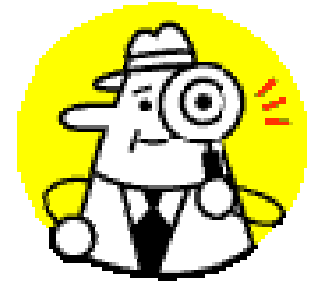
Myth #3



- Implementation of CIS is straight forward, I can just copy the successful model from another ICU.



Myth #3



- Implementation of CIS is straight forward, I can just copy the successful model from another ICU.

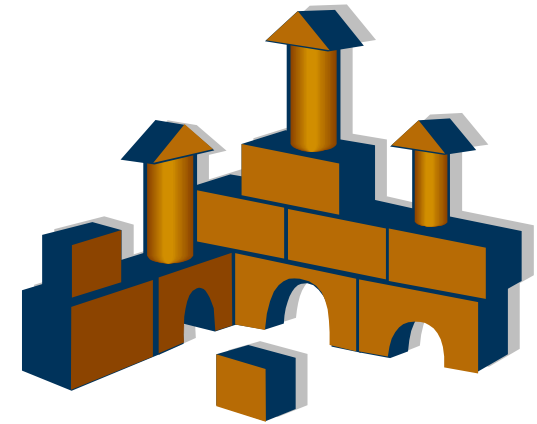
Truth #3

- As work processes are very different between ICUs, simple out-of-the-box solution with not work very well.



Components of CIS

- Charting / Case Notes / Images
 - Logical presentation of information
 - Clarity / Improved availability of information
- Order Entry System
 - Scheduling / Worklist
 - Dispensing
- Decision Support
 - Access to guidelines and references
 - Advisory based on clinical data





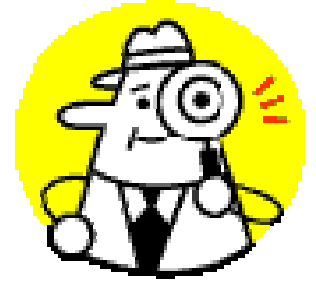
Myth #4



- Implementing CIS is difficult and is dangerous as it may fail.



Myth #4



- Implementing CIS is difficult and is dangerous as it may fail.

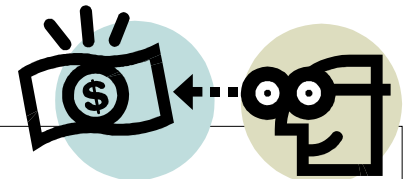
Truth #4

- Yes, driving a private car is dangerous if you don't know how to drive and allow it to crash.
- But, if you know how to drive, it can be a comfortable way to travel.



CIS Systems in HK

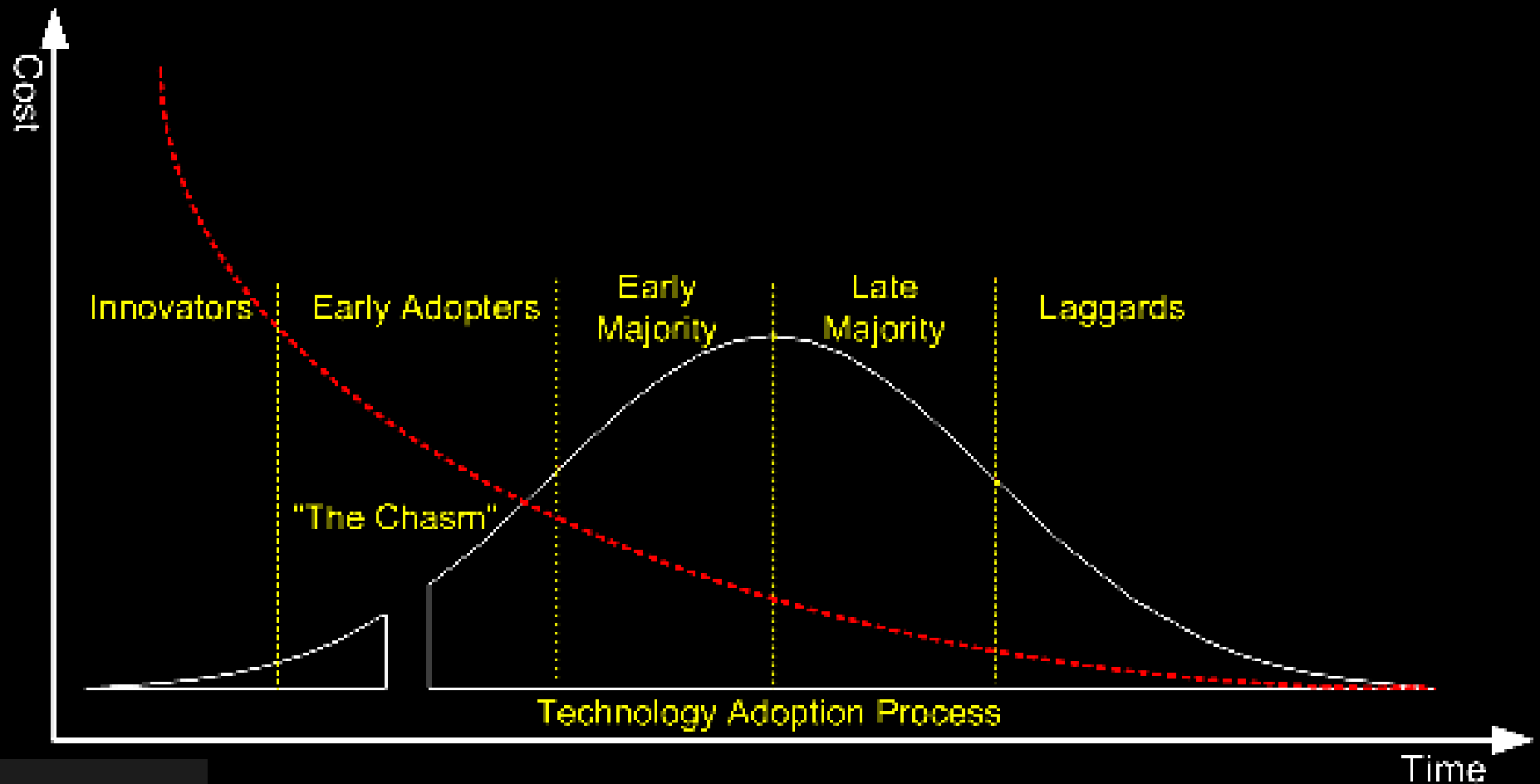
- Early successes
 - Painful work on interface with CMS
 - KWH AICU & QMH NICU
- A few more installed
 - Positive experiences
 - No major breakthrough
 - Loss of momentum
- New systems
 - PYNEH / UCH / PMH AICU
 - Second vendor
 - Integration of APACHE / Discharge Summary
- Other factors
 - Shortage of staff
 - **Lower price tag**





Adopting New Technology

Technology adoption curve vs Cost





Myth #5



- The more 'paperless' the ICU, the more successful is the CIS



Myth #5



- The more 'paperless' the ICU, the more successful is the CIS

Truth #5

- Paper is still best for its portability and compatibility with the 'conventional' world.





Myth #6



- CIS is just the business of ICU.



Myth #6



- CIS is just the business of ICU.

Truth #6

- A departmental CIS will never be successful without inter-departmental co-operation.



Summary

- Change in daily workflow
- Careful planning is required for its implementation
 - Internal
 - External
- Improvement in ICU service with CIS