

The background features a large, faint watermark of the Queen Mary Hospital logo, which consists of a stylized figure holding a staff with a snake coiled around it, all enclosed within a circular border.

**An Interdisciplinary Team Model to Enhance
Early Administration of Empirical Antibiotics
for Patients with Neutropenic Infection in
QMH AED**

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Queen Mary Hospital
7th May 2014 HA Convention**



Empirical Antibiotics for Neutropenic Infection

- Neutropenic patients with infection is a medical emergency and can deteriorate rapidly
- It requires immediate evaluation and administration of empiric broad-spectrum antibiotics
- Rapid identification of these patients in AED can enhance prompt management



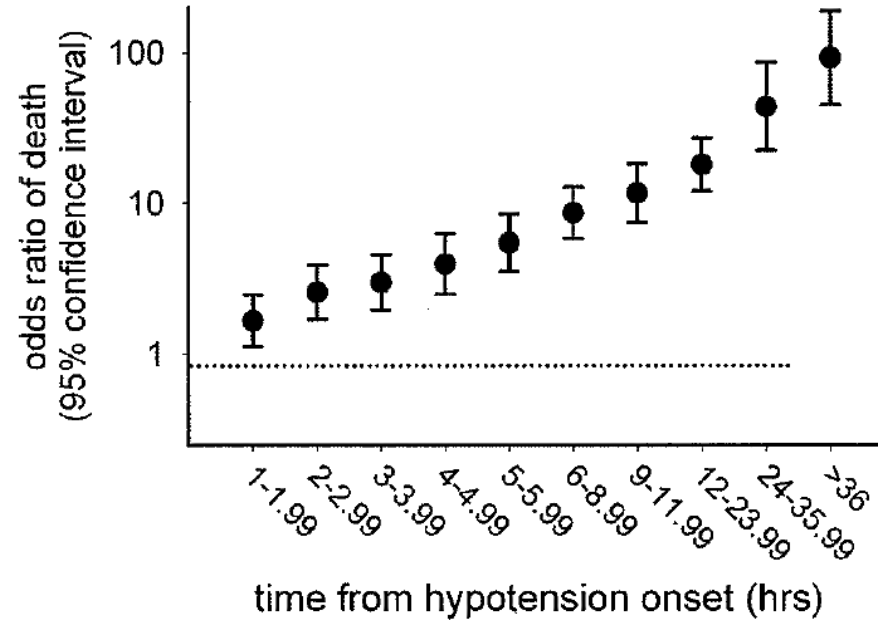
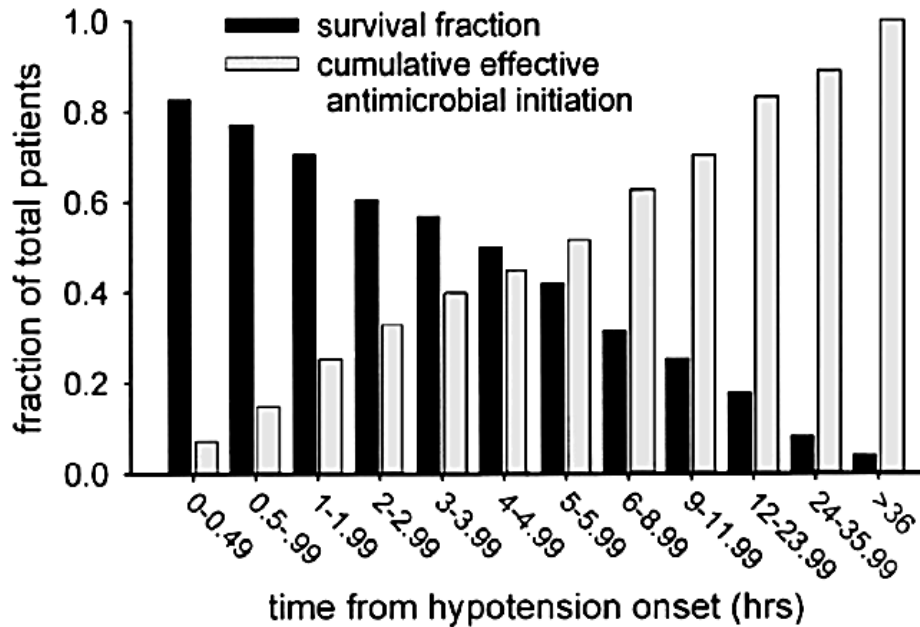


An 1-hour cutoff of triage-to-antibiotics time appeared to correlate with survival of patients presenting to AED

Cutoffs	Number	Mortality, %	Difference, %	Adjusted			Probability of Death
				OR	95% CI	<i>p</i>	
→ ≤1 hr	41	19.5	13.7	0.30	0.11–0.83	.02	.13 vs. .29
>1 hr	220	33.2					
≤2 hrs	124	28.2	5.4	0.54	0.29–1.03	.06	.22 vs. .31
>2 hrs	137	33.6					
≤3 hrs	172	27.9	9.2	0.53	0.27–1.01	.05	.23 vs. .34
>3 hrs	89	37.1					
≤4 hrs	200	28.5	10.8	0.62	0.31–1.24	.18	.25 vs. .34
>4 hrs	61	39.3					
≤5 hrs	218	30.7	1.8	0.82	0.37–1.79	.62	.27 vs. .29
>5 hrs	43	32.6					

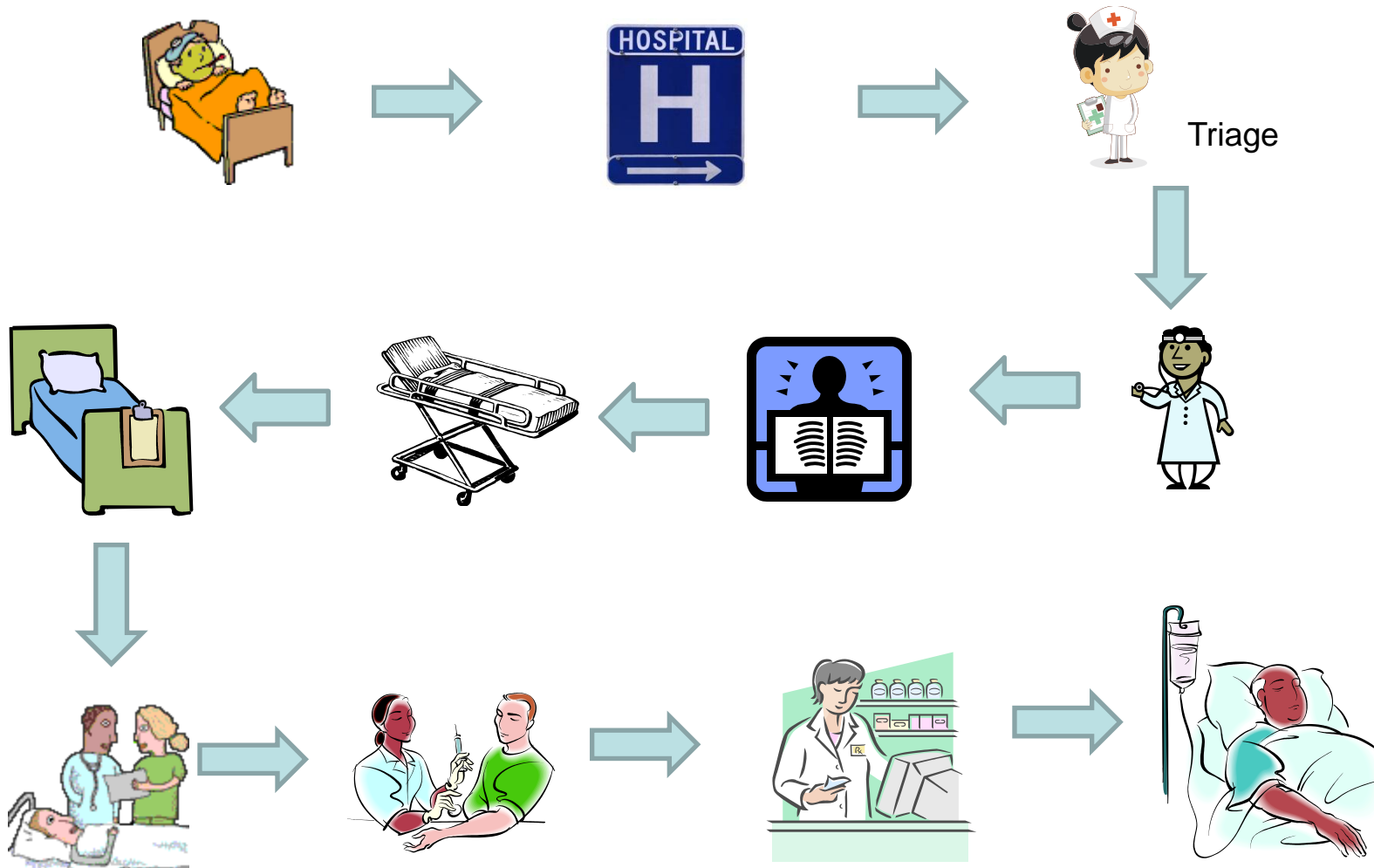


Delays of antibiotics administration from the onset of hypotension are associated with inferior survival





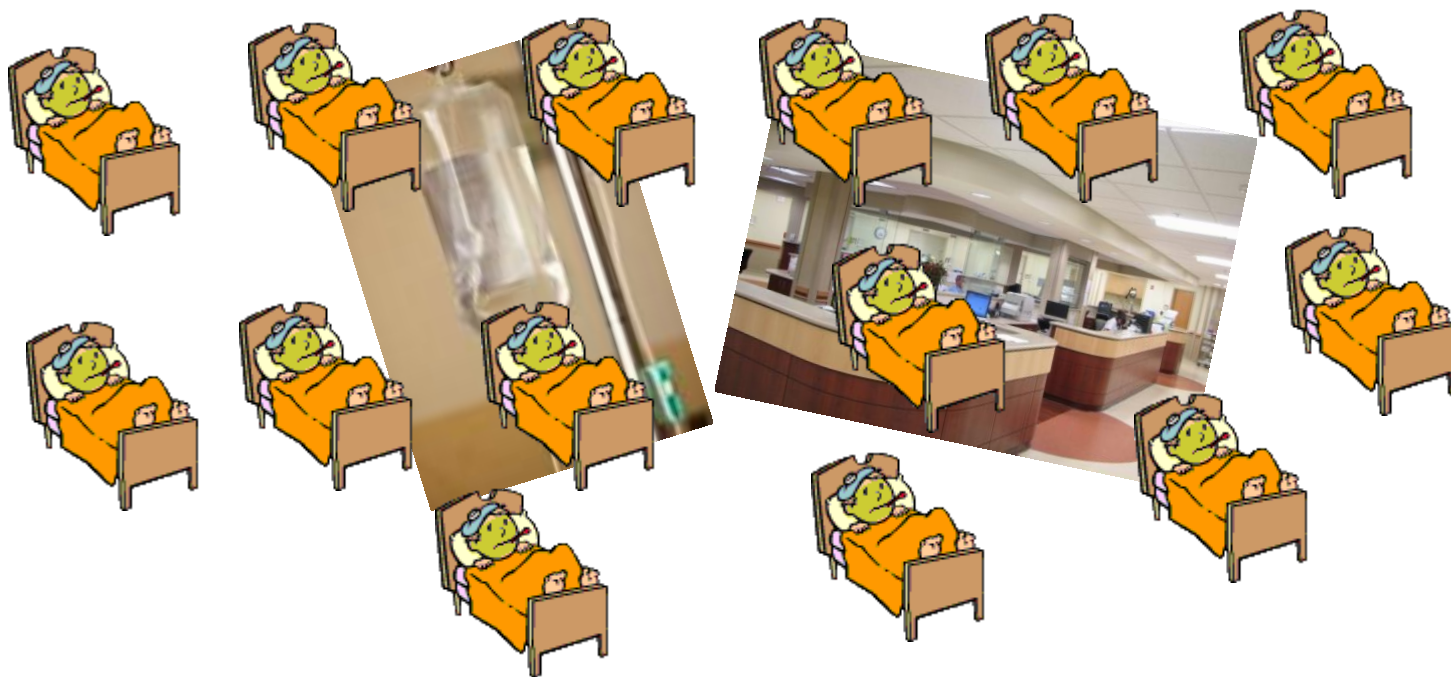
Old practice



Empirical Antibiotics Administration for Neutropenic Infection

Target :-

Prompt and Timely Administration of First dose of Antibiotics in AED for patients with neutropenic infection (within 1 hour)





Strategies

1. Evidence Based Medicine (Get the evidence)
2. Starts small; focus on Hematology patients first
3. Through interdisciplinary Team Collaboration
4. Engagement of frontline colleagues and patients
5. Independent Audit by CND case manager
6. Regular Communication & Critical reviews of the Program





Evidence Based Medicine

For patients with sepsis, the standard care is to administer antibiotics within 1 hour of A&E arrival.

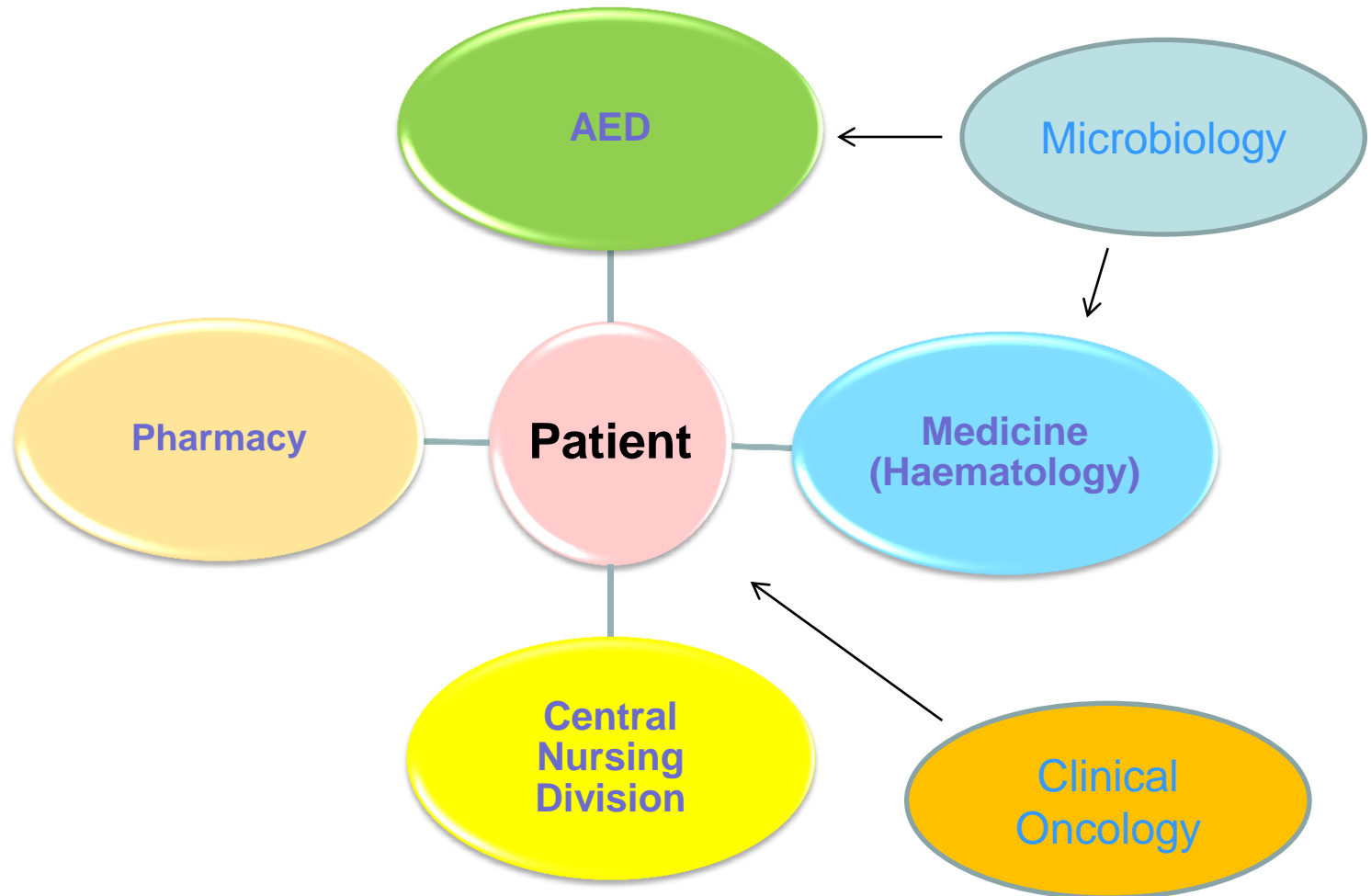
ACI 2010, Northern Ireland Network 2010, Fry et al 2012

Guidelines to offer consistency and up-to-date safe practice

NHS Guidelines 2012, Wingard 2014




Interdisciplinary Team Collaboration





AED



 Queen Mary Hospital	Affix Patient Gum Label
Empirical Antibiotics treatment in AED for Patients with Neutropenic Infection	
Triaged at :- _____	Seen at :- _____
Admission to : _____	
Aim :- Door-to-Antibiotics time < 1 hour	
Drug / Food Allergy: <input type="checkbox"/> Not known <input type="checkbox"/> No <input type="checkbox"/> Yes _____	
Principal Diagnosis *: <input type="checkbox"/> Leukaemia <input type="checkbox"/> Lymphoma (*Hodgkin's / non-Hodgkin's) <input type="checkbox"/> Myelodysplastic Syndrome <input type="checkbox"/> Severe aplastic anaemia <input type="checkbox"/> Post-haemopoietic stem cell transplantation (* autologous / allogeneic) <input type="checkbox"/> Myeloma <input type="checkbox"/> Others _____	
Last Chemotherapy _____ given on _____	
Haemopoietic Stem Cell Transplant (HSCT) on _____	
AED <pre> graph TD Start([Haematology Patients* :- Fever: (Either at home by patient OR at AED) :- Temperature ≥38.3°C (101°F) or :- Hx of Fever ≥38.3°C (101°F) within last 24 hours]) -- No --> End([Managed as per AED protocol]) Start -- Yes --> Triage[Triage: Category 1 or 2 as per patient's condition] Triage --> Med[1. Collection of Medication from Pharmacy 2. Check a. CXR b. CBF c. L/RET d. PT/APTT e. Peripheral blood culture] Med --> Antib[Start IV Antibiotics* :- • 1st choice-meropenem; • If allergic to Penicillin -Levofloxacin; • Amikacin for patients with poor condition - No need to wait for WBC count - In exceptional cases, Antibiotics can be started without/before septic workup] Antib --> Admit[Admit to Medical Admission ward. Inform receiving ward] Admit --> Ward[Medical Admission Ward] Ward --> Assess([Assessed by On-call doctor within 1 hour - Central line blood culture if not taken in AED]) </pre>	
* Please tick the appropriate box * Delete as appropriate	

- Briefing and **engaging** AED doctors and nurses
- Creation of **Alert Cards** to facilitate AED nursing staff in triage
- Training of **Phlebotomy team** for blood taking including blood C/ST
- Assigning supporting staff for immediate collection of medication from pharmacy
- Designing clear-cut flow-chart, documentation and treatment protocol





Queen Mary Hospital

Affix Patient Gum Label

Empirical Antibiotics treatment in AED for Patients with Neutropenic Infection

Triaged at :- _____ Seen at :- _____ Admission to : _____

Aim :- Door-to-Antibiotics time < 1 hour

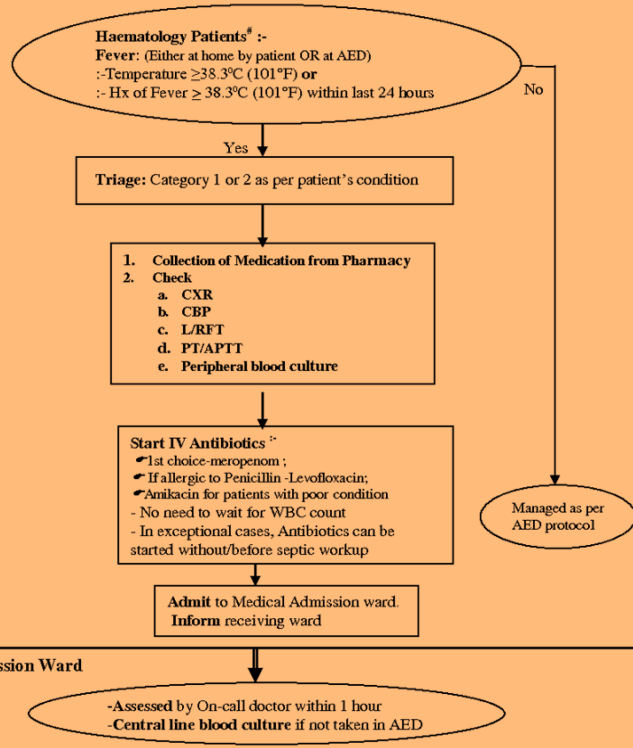
Drug / Food Allergy: Not known No Yes _____

Principal Diagnosis #: Leukaemia Lymphoma (*Hodgkin's / non-Hodgkin's) Myelodysplastic Syndrome
 Severe aplastic anaemia Post-haemopoietic stem cell transplantation (* autologous / allogeneic)
 Myeloma others _____

Last Chemotherapy _____ given on _____

Haemopoietic Stem Cell Transplant (HSCT) on _____

AED



Please tick the appropriate box * Delete as appropriate

Form with columns: Date & Time, Management Orders, Doctor Sign. & No., Date & Time, Management Orders, Nurse Sign. & No. Includes checkboxes for BP, Temp, CXR, CBP, R/LFT, PT/APTT, IV Meropenem, etc.

Please tick the appropriate box * Delete as appropriate





Department of Medicine




- Education of staff
- Education of patients & carers on S/S of infection and presentation of alert cards in AED; and need for early treatment
- Distribution of alert card to eligible patients
- Demonstration and workshops for AED colleagues





Pharmacy



 瑪麗醫院 Queen Mary Hospital 醫生處方 Prescription		<i>To affix patient's gum label here</i>
Drug Allergy (This section MUST be completed before prescribing any medication): <input type="checkbox"/> No Known Drug Allergy <input type="checkbox"/> Allergic to:		Pharmacy Use PHS Specialty: MHAE Pat Cat: A
ULTRA URGENT This Manual Prescription for antibiotic supply only.		
R	PLEASE SELECT THE APPROPRIATE DRUG ITEM .	
<input type="checkbox"/>	IV Meropenem 1g STAT. Reconstitute with 20ml WFL Slow IV Injection over 5 min.	
<input type="checkbox"/>	[For patient allergic to Penicillin] IV Levofloxacin 500mg STAT. Infuse over 1 hour	
<input type="checkbox"/>	IV Amikacin 500mg STAT. Into 500ml NS infuse over 1 hour	
Doctor's Signature: _____		For Pharmacy Use Only
Doctor's Name & code: _____		Filled by Checked by Issued by
Date: _____		_____
For enquiry about the prescription, please kindly contact A&E at 2255 3007.		

QMHP/MP/1006

- Distinctive colored requisition form labeled 'ultra-urgent' to facilitate identification by pharmacy colleague
- AED supporting staff to collect medication in person



CND - Case Manager

Version 12/13

Empirical Antibiotics for Neutropenic infection patient in AED Variance Form

CP No: _____

A&E No: _____

Age: _____ Sex: Female Male

Affix Patient Gum Label

Drug / Food Allergy: Not known No Yes _____

AED attendance on : ___/___/____ (dd/mm/yyyy) at ___:___ (hour/min)

Triaged as *Category 1/ 2:- Yes No

Temperature :- Fever: $\geq 38.3^{\circ}\text{C}$ (101°F) by *patient / at AED)
 History of Fever $\geq 38.3^{\circ}\text{C}$ (101°F) within last 24 hours

Principal Diagnosis : Leukaemia Lymphoma (*Hodgkin's / non-Hodgkin's)
 Myelodysplastic Syndrome Myeloma Severe aplastic anaemia
 Post-haemopoietic stem cell transplantation (* autologous / allogeneic)

Other Diagnosis _____

Last Chemotherapy _____ given on ___/___/____ (dd/mm/yyyy)

Haemopoietic Stem Cell Transplant on ___/___/____ (dd/mm/yyyy)

Investigations:
 CXR; CBP; R/LFT; PT/APTT; peripheral blood culture

Medication :
Sent for collection at : ___/___/____ (dd/mm/yyyy) at ___:___ (hour/min)
Collected at : ___/___/____ (dd/mm/yyyy) at ___:___ (hour/min)
Administerd at : ___/___/____ (dd/mm/yyyy) at ___:___ (hour/min)
Type given :- Meropenem Levofloxacin Amikacin Other _____

Inform On-call Medical Ward at ___/___/____ (dd/mm/yyyy) at ___:___ (hour/min)

Admission to Medical Admission ward: Yes to ___ ward on ___/___/____ (dd/mm/yyyy)
at ___:___ (hour/min)
 No : reason _____

Assessed by On-call doctor on : ___/___/____ (dd/mm/yyyy) at ___:___ (hour/min)

Investigations: Central line blood culture; Others _____

Door to Antibiotic Time :- _____ (mins)

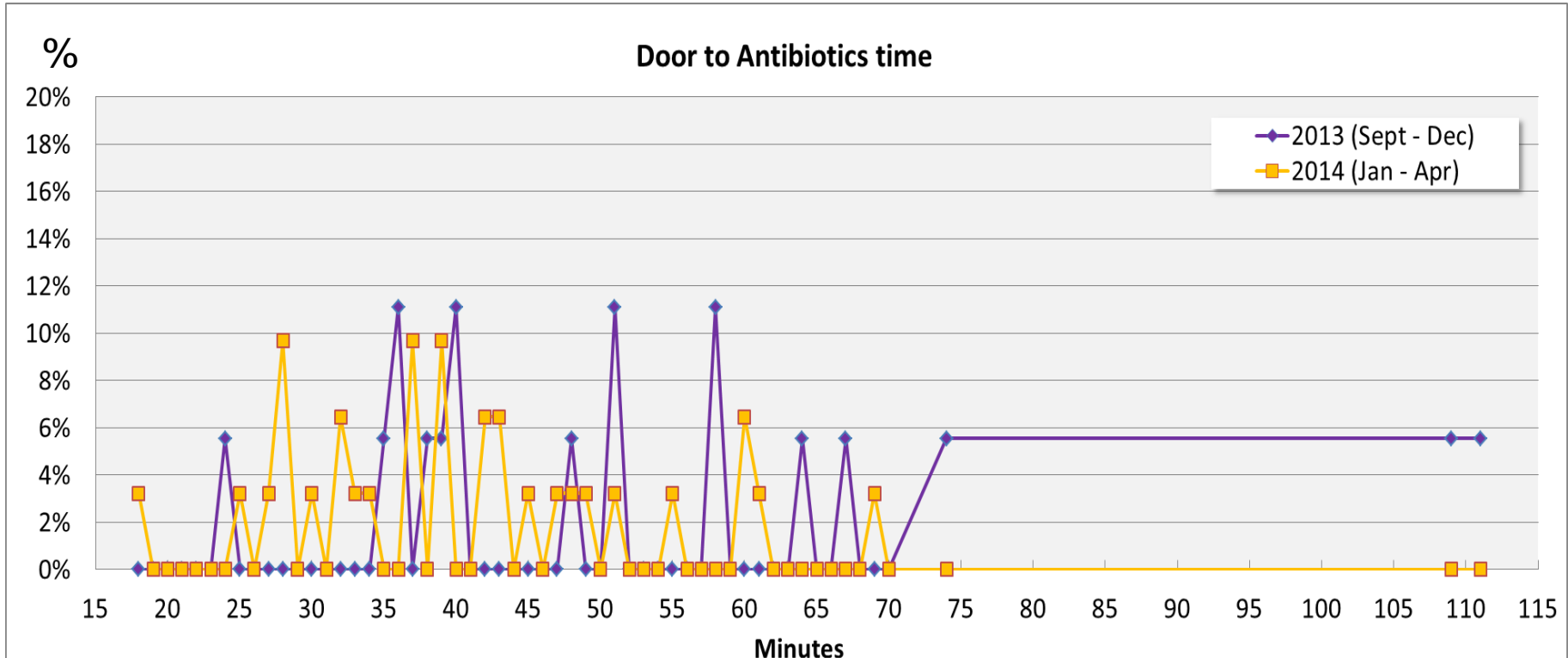
- Review & develop SOP & Care Maps
- Root cause analysis of variances (↑ Door to antibiotic time)
- Monitor patient delivery logistic (the AED → Pharmacy ward → Drug administration → admission)
- Case manager : data acquisition, analysis & variance





Our Result – Door to Antibiotic Time

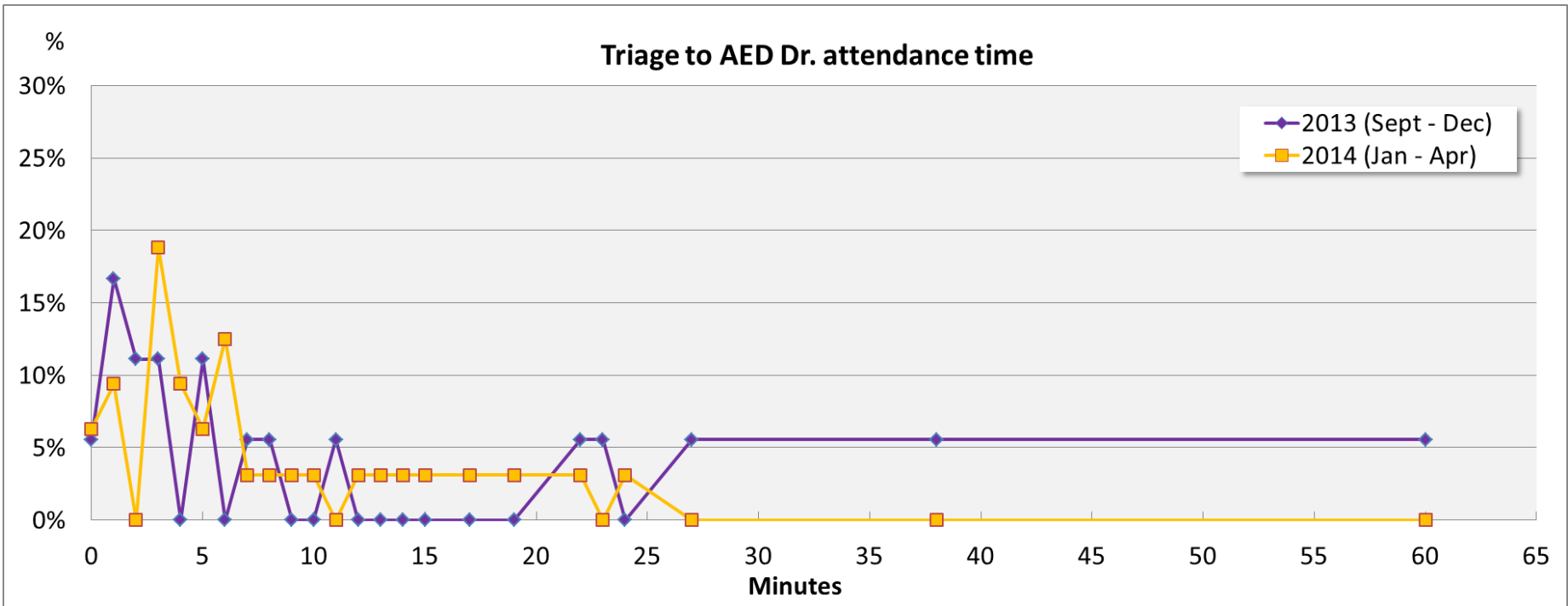
Period	No. of patients	Mean door to antibiotic time
September to December 2013	18	54.4 minutes
January to April 2014	31	40.6 minutes





Our Result – Triage to AED Doctor's attendance

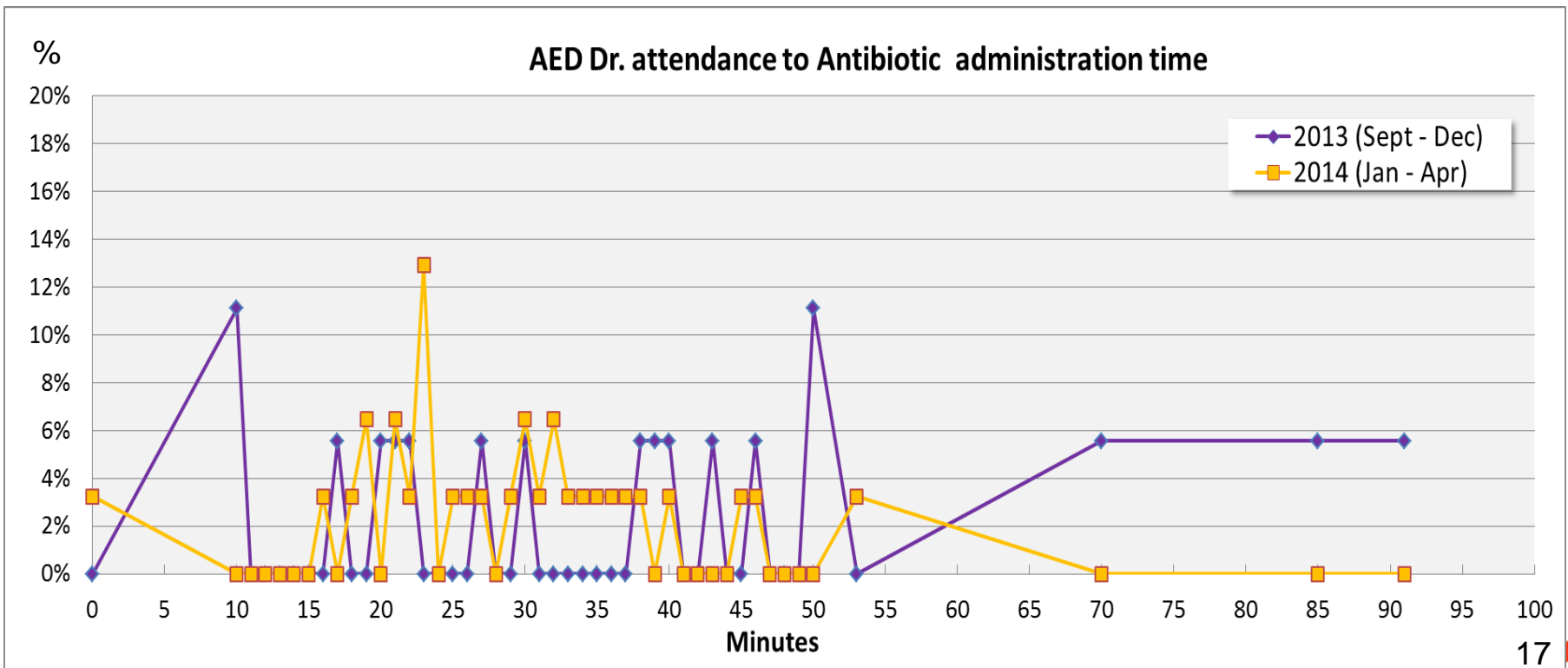
Period	No. of patients	Mean door to AED Doctor attendance time
September to December 2013	18	12.2 minutes
January to April 2014	31	7.4 minutes





Our Result -Doctor's attendance to Administration of Antibiotics

Period	No. of patients	Mean AED Dr. attendance to administration of antibiotic time
September to December 2013	18	39.4 minutes
January to April 2014	31	28.6 minutes





System Changes within different disciplines

AED	Before	After
Identification of patient	No robust system	An alert card (fast pass)
Workflow / care map	Not structured	Agreed protocol of care Standardized workflow
Medication administration	Not given	Administered within 1 hour in AED

Department of Medicine	Before	After
Assessment, investigations and administration of 1 st dose of antibiotics for potential neutropenic patients	After admission in ward	In AED

Pharmacy	Before	After
Dispensing of medication	Normal procedure	Fast track dispensing of medication with the designated colored form





Challenges encountered during

1. Buy in and engage frontline staff
2. Manipulate patients' central line for blood taking
3. Familiarize and optimize workflow logistics
4. Identify non-compliance





Conclusion

Key Drivers to survival of this Program:

- Well planned and Interdisciplinary Collaboration
- Staff engagement
- Independent case review
- Regular communication between stakeholders

Future Perspectives:

- Study the effect on patients' outcome
- Extension of the care path for non-hematological malignancy patients





Acknowledgment

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- *Ms. Tavia Cheng, DOM, Med, QMH*
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- *Ms. Ritchie Kwok, Cl. Pharmacist, QMH*
- *Ms. Sin-ting Wong, WM, Dept. of Clinical Oncology, QMH*
- *Ms. Alta Kan, WM, Dept. of Medicine, QMH*
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- *Colleagues of Dept. of Medicine, QMH,*
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THANK YOU!

Queen Mary Hospital

瑪麗醫院



Supplementary slide

Our Result – Door to Triage Time

Period	No. of patients	Mean door to triage time
September to December 2013	18	5.5 minutes
January to April 2014	31	4.6 minutes

