Project Title

"Slaying the "Vampire" in the case of "The Missing Outpatient Laboratory Specimens"

Organisation(s) Involved

Tan Tock Seng Hospital

Project Category

Process Improvement, Productivity, Quality Improvement

Keywords

Tan Tock Seng Hospital, Process Improvement, Quality Improvement, Productivity, , Lean Methodology, Go-and-See , Value Stream Mapping, Root Cause Analysis, Missing Laboratory Specimens, Standardized Workflow, Standardized Training, Reporting Near Misses, Pneumatic System Monitoring, Laboratory Medicine, Medical Centre (MEC), Facilities Engineering, Kaizen Office

Name and Email of Project Contact Person(s)

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ENTRY FORM FOR
CLINICAL SERVICE IMPROVEMENT CATEGORY

A clinical improvement project that was successfully completed in any of the specialized (technical) areas of hospital management, such as Nursing, Laboratory, Radiology or in specialty clinics such as Eye center, Kidney center, etc. The project should show measurable results of having improved the service in such areas as reduction in medication errors, reduced waiting times, prevention of service defects, or faster results with little or no capital outlay.

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INSTRUCTIONS

a. Please fill out all the sections below and abide strictly by the word count. Words exceeding the maximum word count will be cut off automatically/truncated.
b. IMPORTANT: It is necessary that the CEO certifies that all information you provide is true and correct by signing the form indicated in the last page.
c. By submitting an entry, you agree that HMA will share relevant aspects of the Entry submitted on the HMA or related Resource Center website.

Background Information

Project Title	"Slaying the "Vampire" in the case of "The Missing Outpatient Laboratory Specimens"
Date Project Started	2nd April 2012

Enhancements made (for projects that did not start operations between January 2012 to May 2013)

NIL

Key staff involved in the project

1. Name	Ho Juan San (Sponsor)
Department/Function	Operations (Medicine), Director and Leader of the Quality Service Management Taskforce Outpatient Workgroup
2. Name	Goh Mia Siang
Department/Function	Operations, Deputy Director
3. Name	Chris Heng
Department/Function	Operations (Surgery), Assistant Director
4. Name	Ho Wai Ling (Facilitator)
Department/Function	Senior Manager, Kaizen Office
5. Name	Lynette Ong (Facilitator)

Department/Function	Manager, Kaizen Office
6. Name	Samuel Tiang
Department/Function	Department of Laboratory Medicine, Manager
7. Name	Tan Siew Peng
Department/Function	Clinic 5A, Clinic Manager
8. Name	Neo Chee Hoon
Department/Function	Outpatient Management Unit, Professional Development Manager
Name	Bavani Deyvi
Department/Function	Clinic 2A, Clinic Manager
Name	Ong Lea Lee
Department/Function	Clinic B1B, Clinic Manger
Name	Wu Shuping
Department/Function	Senior Staff Nurse, Clinic 5A
Name	Mary Cheong
Department/Function	Assistant Manager, Operations (Surgery)
Name	Agnes Tan
Department/Function	Clinic B1B, Senior Staff Nurse
Name	Yeoh Kai Tze
Department/Function	Office of Clinical Governance, Assistant Manager
Name	Carol Ng
Department/Function	Clinical Immunology Laboratory, Principal Medical Technologist
Name	Md Nashir Bin Kadola
Department/Function	Facilities Management, Principal Engineer

PLEASE ANSWER THE FOLLOWING QUESTIONS USING THE MAXIMUM WORD ALLOCATIONS INDICATED

1. Please give some background to the project or program including how it originated. Give details of what clinical improvements were achieved and how the project improved quality of care as a result of these improvements. **MAX 350 WORDS.**

1.1 Origination of Project

There were 20 cases of lab specimens reported missing from Mar–Dec 2011 which resulted in:

1. Delayed diagnosis
2. Increased anxiety & inconvenience to patients (when a second specimen had to be taken)
4. Potential source of litigation

Mr. Ho Juan San, Director, Operations (Medicine) rallied a cross functional team with representatives from Medical Centre (MEC), Department of Laboratory Medicine (DLM) and Facilities Engineering to look into this issue using a systems approach. With the help of Kaizen, the team embarked on a 2-day Value Stream Mapping exercise and determined that there were some gaps in the whole process. They were identified as follows:

1. No consistency in specimen collection and dispatching process

2. No standard work and training checklist to audit competencies

3. Lack of structured training

1.2 Clinical Improvements

The team did an end to end process analysis and a review of past incidents in an attempt to determine the underlying reason associated with the missing specimens. Adopting the "Go-and-See" approach, the team embarked on an onsite study of the process flow from the point of collection and dispatch at the MEC, to DLM where specimens were sent for analysis.

To address the gaps, the team implemented a standardized workflow for both the incident reporting process and the workflow for the collection and dispatch of specimens. These improved workflows were then communicated via training sessions to the front-liners in July 2013
In addition, a pool of trainers, work instructions and a training video was created which ensured continuity and standardization of training for this new workflow.

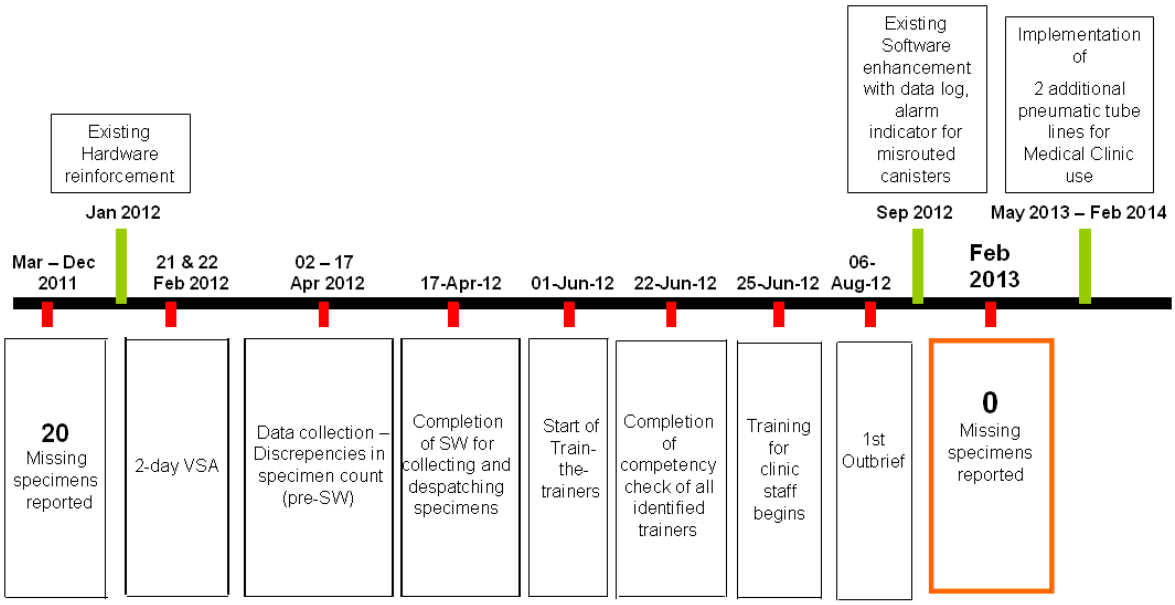
While the team continues to monitor the progress, their efforts have so far resulted in an impressive zero incidents of missing specimens as of March 2013.

This effectively translated to better outcomes for our patients as this improvement resulted in a reduction in the number of patients being

inconvenienced with a repeat specimen collection and a resultant delay in seeing the doctor.

Another benefit of this project was the resultant consistency in the delivery and training of staff in this area of work. It also encouraged reporting of near misses which allows the team to further refine the training and workflows.

Figure 1. Timeline of Project Journey



Word count: 335/ 350

2. Please describe how the project was beneficial from the patient's perspective and experience, and how it improved patient care, patient safety or service. Preferably please present quantifiable information such as "before and after" measurements if any. **MAX 200 WORDS.**

At the heart of Lean thinking and in keeping with the hospital's vision of creating a "Great Place to Learn, Work, Heal and being the Best", we embarked on a journey to provide safe, timely, and a high quality care to our patients and a conducive working environment for staff.

Due to the following implementation, incidents are reported and a standardized workflow was created to align practices at all clinics. There was a reduction in the number of errors which also meant a decrease in the number of re-work and repeat blood specimen collection taken from patients.

- **IRIS Incident Reporting**

  Before: Most users did not understand the reporting flow and the importance of reporting missing specimens' incident and near-misses.

  After: Upon implementation of a standard workflow and communication to front-liners to encourage reporting, the number of incidents reported increased to 130 for the period from Mar 12 to Feb 13 from 86 in the same period in the preceding year. This allows better data collection for trending purposes and further identification and improvements on the process.

- **Standard Work & Training for Collecting and Dispatching Specimens**

  Before: Varying workflow among clinics for specimen collection and dispatch.

  After: A standardized workflow was developed and all clinic staff were trained. Train-the-trainer sessions and competency checks were successfully implemented and completed.

Word count: 198 / 200

3. Please explain how the project reduced costs of or what other benefits were derived? Is it simple yet effective, something other departments can also adopt or adapt? Were appropriate analysis tools used or was it only a matter of throwing money at the problem? **MAX 200 WORDS.**

3.1 Benefits of Project

- This project translated to better outcomes for our patients as it resulted in a reduction in the number of patients being inconvenienced with a repeat specimen collection and a resultant delay in seeing the doctor which add 2 hours to the total turn around time of a patient.
- Patients do not need to undergo another painful procedure needlessly.
- It improved staff morale as they do not need to explain to patients on why there is a need to retake their specimen or how the specimens went missing.

- Created a better appreciation for all stakeholders of how their actions or inactions can have a down line impact on the whole process and ultimately affect patient care.

- It raised awareness of the need to ensure alignment in clinical practices and work flows to ensure good outcomes for patients.

- It uncovered gaps that if left unaddressed, could have resulted in a public relations debacle and/or potential litigation issues.

- Proactive monitoring of the pneumatic system by Facilities Engineering helped alert user departments of outages more promptly as opposed to discovering it at the end of the day.

3.2 Tools Used and Adoption

- The team used LEAN methodologies such as Root Cause Analysis, Value Stream Mapping and the "Go and See" approach in their journey to identify possible gaps in the process.

- They then introduced the concept of standard work to the process which immediately aligned practices and alleviated the recurrence of incidents.
- This project simply used LEAN methods to address a gap any monetary investments. Such tools can be easily adopted by other departments to address other process issues.

Word count: 200 / 200

4. Please explain how significant were the results or outcomes? Are these measurable? Are there testimonials, awards or other support to show impact on improvement of the department or unit's service? **MAX 150 WORDS.**

4.1 Results of Standard Work Implementation for Specimen Collection and Dispatch

- While the project objectives have been implemented, the team is still monitoring the outcomes.

- Thus far, the effectiveness of the standard work and training is evident given there has been zero incidents of missing specimens since the complete implementation in July 2012.

- This effectively translates to a <u>continuous</u> period of 8 months of zero incidents from July 2012 to February 2013.

Pre-SW Implementation		Post-SW Implementation
Mar to Dec 2011	**Jan to Jun 2012**	**July 2012 to Feb 2013**
20	5	0

4.2 Results of Incident Report Occurrences

- The increase in awareness of the importance of reporting incidents relating to specimen collection is evident from the increase shown post implementation.

- Since the improvement of the incident report workflow in Mar 2012, there was an increase in the reporting from 86 to 130

Pre-Project Implementation	Post-Project Implementation
Mar 11 to Feb 12	Mar 12 to Feb 13
86	130

- Furthermore, with this increase in awareness of missing/near misses reporting, discrepancies are identified quicker and the tracing is started by the relevant stakeholders in a prompt fashion. An estimated 45 minutes tracing time per specimen has been saved since implementation.

Word count: 146 / 150

5. Please give some background to the project team that originated, studied and developed the project or program. **MAX 200 WORDS.**

- The team comprised of the various stakeholders of the process with representatives from all working levels from Directors to Managers, clinical staff and laboratory technicians as well as Facilities Engineers and Lean facilitators.

- While the team comprised of people from varying backgrounds and levels, they were able to quickly synergize and work on a common goal of improving the delivery of care for our patients.

- They each brought to the table their expertise, knowledge and experience which enabled the team to implement a solution so quickly in the span of 7 months.

- Despite the fact that there was no research on the subject matter, nor were there any best practices to learn from, the team managed to implement an effective solution using Lean tool and methods.

Word count: 130 / 200

6. Please give any other information, including third party testimonial regarding your project which you think would help convince the judges that this project (or program) should win this category. **MAX 200 WORDS.**

"Going through this journey with fellow colleagues from various departments, I witnessed the energy and enthusiasm, and the synergistic achievements we attained through coming together and working as a team. There was one common objective and that was our patients. We needed to set our processes right so that we could get things done right the first time. This reduces re-work that will cause inconvenience to our patients and resources wasted. I believe this journey is a step towards the right direction in achieving Vision 2016 of making this hospital a great place for healing and a great place for working." – Samuel Tiang, Manager, Department of Laboratory Medicine

"It is the responsibility of the hospital to ensure that our patients' specimens are processed and results are available on a timely basis. Through this project, we identified potential gaps that could result in specimens being reported as missing. The team then deliberated on actions that we could take to plug the various gaps. Upon implementation of these concerted measures, missing specimens will be a thing of the past." – Md Nashir Kadola, Principal Engineer, Facilities Engineering.

Through an analytical and concerted approach, the multi-disciplinary teams broke frontiers and successfully redesigned the process.

Word count: 200 / 200

1. IRIS Reporting Workflow

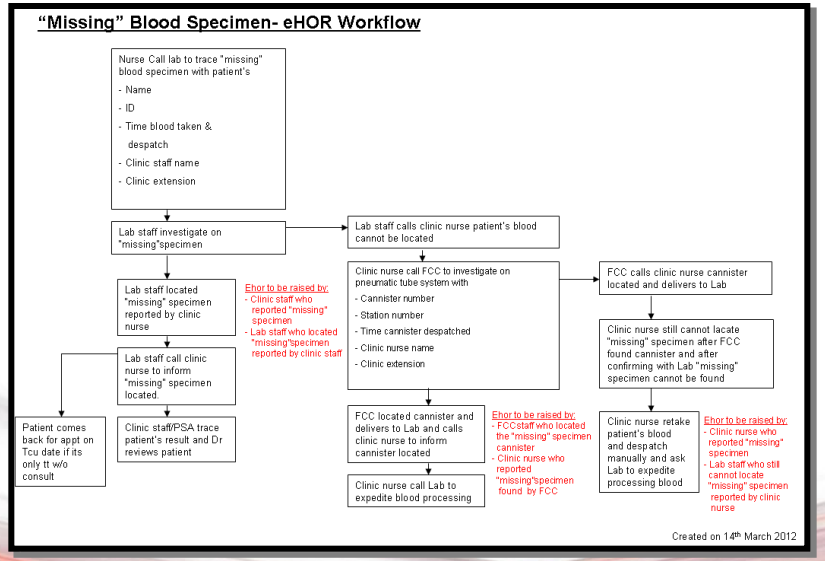
Problem: IRIS reporting is voluntary. Hence actual incidence of missing specimens/ near misses (the measureable indicator for this VSA) may not be accurate.

Intervention: Develop a workflow to encourage reporting.

Result: Workflow implemented. IRIS are increasing as near-misses are now reported. However the culture & philosophy of active voluntary reporting needs more time to be internalized.

eHOR workflow implemented

Month	Missing	Near-Miss*	Total
Jan-12	1	4	5
Feb-12	1	8	9
Mar-12	0	4	4
Apr-12	0	8	8
May-12	0	8	8
Jun-12	3	12	15



***Near-miss**

Specimens initially flagged as missing but later found (after investigation)

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Near Misses

Month	Mis sing	Near-Miss* (Other reasons)	Delay due to Pneumatic Tube	Rejection due to no sticky label	Specimen on request form and bottle do not match	Discarded by BTS staff	Delayed beyond use	Nature of specimen not specified	Mislabeled	No clinical information on form
Jan-12	1	4	2	Have to go into HOR to dig out the reasons for near-misses						
Feb-12	1	8	3							
Mar-12	0	4	2							
Apr-12	0	8	3							
May-12	0	8	4	2	1					
Jun-12	3	12	4		5	1	1	1		
Jul-12	0	4	1	1	2					
Aug-12	0	5	3					1		1
Sep-12	0	9		1	2			2	3	
Oct-12	0	7		1				4		1
Nov-12	0	11	3						1	2
Dec-12	0	5	1							2
Jan-13	0	7			4				2	2
Feb-13	0	6	1		1				4	

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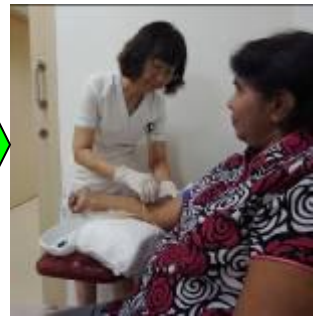
Overview of specimen taking

Test ordered by Dr

Pt called into Tx room
Verify patient ID

Click 'Collected' in iSMART

Label printed



Verify patient ID & draw blood

Verify patient ID with label & paste on tube

Record into logbook:
1) Bld draw time
2) Canister no.
3) Urgent blood

Canister despatched

Pneumatic tube interchange

Canister arrives at DLM

Contents are removed and brought to sorting table for checking in

Tubes received by Lab staff at sorting table

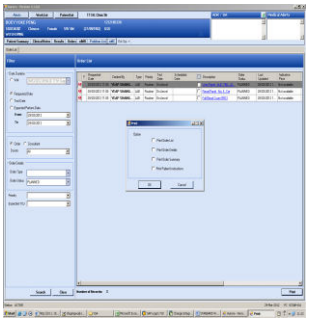
Canisters despatched back to origin

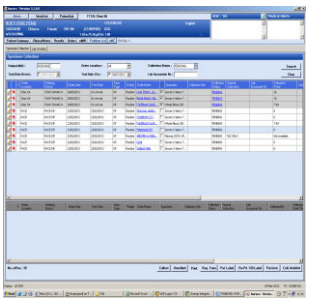
Tubes placed on conveyor for tests

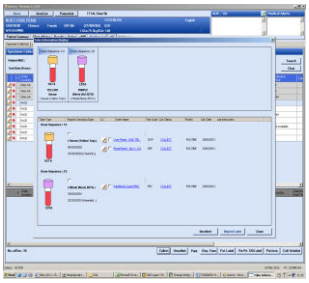
Results ready.
Dr views results

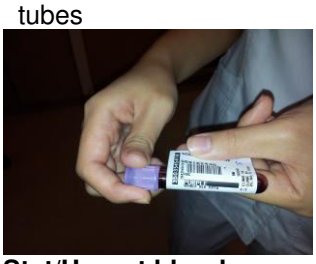
STANDARD WORK

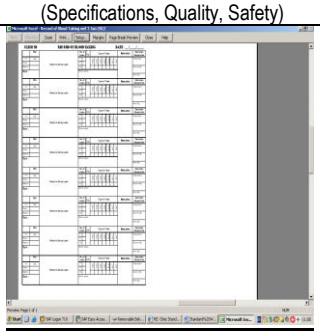
Operation:	**Collecting and Despatching Blood specimen**	SW No.: SW-MEC-CDB-001
Equipment; Parts; Tools; Materials	SATO printer and Computer with Aurora software	SW Rev: 0
Related Documents; Forms	Patients' appt card/ Queue Chit/Blood requesting form	Effective: 1 June 2012 DD/MM/YY

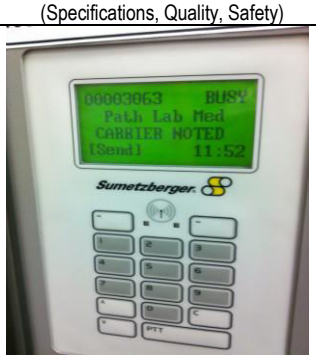
#	WORK SEQUENCE	STANDARD Time/ Duration (Specifications, Quality, Safety)
1	**Receiving patient**	- Press call Q button in EQMS system When patient come in to treatment room : - Make Eye Contact - Smile - Greet by surname based on the Q-chit. - Collect **Order Summary Form** from patient - To print if Order Summary Form is not available 
2	**Before blood taking**	- Identify patient by asking 2 identifiers (name and ID, birth date or address, etc.) - Explain procedure to patient - Scan barcode /Key in patient's IC into Aurora **Worklist** page (go to Worklist page & key in patient's ID. - Do a search by retrieving Dr's order)

#	WORK SEQUENCE	STANDARD Time/ Duration (Specifications, Quality, Safety)
		 - Verify test order in Aurora (still in Worklist page) against Order Summary Form - Click on blood test ordered - To inform patient if per test cost >$20 for Sub patient or >$40 for Non-Sub patient  - Click on the **patient's label** icon (still in Worklist page) to print out one patient label for recording - patient label printed (do not tear off from Sato printer)

#	WORK SEQUENCE	STANDARD Time/ Duration (Specifications, Quality, Safety)
		- tick and check the ordered test as per Order Summary Form - Click collect icon to print **SID label** - SID label printed - Tear patient label & SID labels **Note**: If you require to un-collect test and click collect for the correct test, ensure new SID label is printed and pasted over the old SID. Otherwise discard the old SID label. - Prepare blood tubes according to **Tube Information Display** and check against SID labels.  - Prepare requisites for venepuncture
3	**During Blood taking**	- Identify patient by asking 2 identifiers (name and ID, birth date or address, etc.) (If patient is handed-over to another nurse) - Proceed to draw blood **Note**: Problem encountered during blood taking :

#	WORK SEQUENCE	STANDARD Time/ Duration (Specifications, Quality, Safety)
		- add on test to insufficient blood drawn for fine vein **(refer to Standard Work on Add on Test to Insufficient Blood Specimen for Chemistry Test only: SW-MEC-CDB-002)**
4	**After Blood taking**	- Staff to ask patient's identity (2 identifiers) & check against the SID label before labeling the tubes  **Stat/Urgent blood** - put labeled tubes into pink biohazard bag **Routine blood test** - put labeled tubes into clear biohazard bag - Clear used requisites - Handwash / handrub - Document the followings in the recording template: - Paste correct patient's label - Time blood specimen collected - Type of test - Number of tubes - FC done - Red canister number - Staff signature - Time blood specimen Despatched - Despatch mode

#	WORK SEQUENCE	STANDARD Time/ Duration (Specifications, Quality, Safety)
		 **<u>Despatch by Pneumatic Tube</u>** - Put specimen in **Red** canister **<u>Stat/Urgent blood</u>** - Despatch red canister immediately **<u>Routine blood test</u>** - Send red canister as soon as possible, depending on your venepuncture workload **Follow Guide to Pneumatic Tube Directory key points :** - Ensure red canister lid is completely closed - Place the red canister in the pneumatic tube station appears on the screen - Check to ensure destination (Path Lab Med) and “Carrier Noted” message appears on the screen

#	WORK SEQUENCE	STANDARD Time/ Duration (Specifications, Quality, Safety)
		 **<u>Despatch by Hand</u>** - transport in secured carrier - Return the Queue chit to patient - Transfer Q no. and direct patient to wait outside Consultation room if patient has appt on the day or proceed to payment if no appt on that day - Handwash / handrub

Created by: Ong Meng Hang, Chris Heng, Samuel Tiang, Tham Mee Eng, Michelle Teo, Md Nashir, Neo Chee Hoon, Tan Siew Peng, Bavani Deyvi

Approved by:

Department: TTSH Operations Ext:

Validated with: SSN Agnes Tan, SSN Wu Shu Ping, SSN Celine Soong

Assessment Record for Practical Performance

Candidate's Name : _____ **Department:** _____

NRIC Number : _____

COMPETENCY UNIT: Collecting and Despatching Blood specimen							
CHECKLIST for Practical Performance							
Instructions to Assessor Place a tick in the: "C" Column for steps performed correctly "NYC" column for steps performed incorrectly							
	Date						
	Start time						
	End time						
Performance Criteria	**Assessment Criteria (Observation Checklist)**	**Assessment 1**			**Assessment 2**		
		Tick		**Evidence of 'C' and 'NYC' must be recorded**	**Tick**		**Evidence of 'C' and 'NYC' must be recorded**
		C	**NYC**		**C**	**NYC**	
Collecting and Despatching Blood specimen							
1. Receive patient	• Press Call Q button						
	• Greet Patient -Make Eye Contact -Smile -Greet by surname						
	• Collect **Order Summary Form** (Print if Order Summary Form is not available)						
2. Before blood taking	• Check patient's identity						
	• Explain procedure to patient						
	• Scan barcode /Key in patient's IC into **Aurora Worklist** page						
	• Verify test ordered						
	• FC if needed						

	• Print out one patient label for recording						
	• Click collect icon to print **SID label**						
	• Prepare blood tubes according to **Tube Information Display** and check against SID labels						
	• Prepare requisites for venepuncture						
3. During Blood taking	• Check patient's identity (If patient is handed-over to another nurse)						
	• Correct technique						
4. After Blood taking	• Check patient's identity (2 identifiers) against the SID label before labeling the tubes						
	• Put tubes in Biohazard bag – Put labeled tubes into pink biohazard bag for urgent blood – Put labeled tubes into clear biohazard bag for routine blood test						
	• Document in RECORD OF BLOOD TAKING form – Paste correct patient's label – Time blood specimen collected – Type of test – Number of tubes – FC done – Red canister number – Staff signature – Time blood specimen dispatched – Dispatch mode						
	• Put specimen in Red Canister						
	• Ensure red canister lid is completely closed						
	• Check to ensure destination (Path Lab Med) and "Carrier Noted" message appears on the screen						

	• Return the Queue chit to patient						
	• Transfer Q no. and direct patient accordingly						
	• Perform Handwash / Handrub						

Assessment 1
I certify that the trainee has/has not achieved all the competencies required in this unit.

Remarks:

Assessor Name _____ Date _____

Assessor Signature _____

Candidate Signature _____ Date _____

Assessment 2
I certify that the trainee has/has not achieved all the competencies required in this unit.

Remarks:

Assessor Name _____ Date _____

Assessor Signature _____

Candidate Signature _____ Date _____