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A Methods Engineering Study of the
Physical Examination Process of the
Fort Bonifacio General Hospital

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Executive Summary

This study aims to verify the seven-day time standard for completing a Physical Examination (PE) of the Fort Bonifacio General Hospital. Time study through the distribution of log sheets to the different clinics, sections and departments concerned with the PE were conducted to determine the time standard. The 2004 data were also looked at to determine which parts of the PE probably caused delays. The actual PE lasts between 4 hours and 40 minutes to 7 hours and 25 minutes. The documentation of the results of the PE lasts between 1.3440 and 1.8221 days. The signing of the PE compilation to make it official lasts between 7.6552 and 8.8063 days. The time study revealed that the signing of the PE compilation causes most of the present delays. The analyses of the 2004 data revealed also that examinees not returning immediately to finish their PE, the late submission of the results of the PE to the PE processing section, and, again, the signing of the PE compilation by the Medical/Dental board caused delays. The group recommended that all Physical Examinations done to the examinee should be finished in one working day. The group also recommended ways to ensure that the results of the PE be submitted to the PE Processing section one day after the PE. The group suggested ways to decrease the signing of the PE compilation to just one day after all results of the PE were submitted to the PE Processing section. With the recommendations of the group, the FBGH can decrease the time of PE to three or four days.

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1. Introduction

1.1. Rationale of the Study

Physical fitness is very necessary when people are serving in the military. The demands of defending the country are strenuous to military personnel's physical and mental health.

The Fort Bonifacio General Hospital (FBGH) – Out-Patient Service provides physical examinations (PE) to determine the health of Philippine Army (PA) personnel.

Those who are required to take their PE in the Hospital are enlisted personnel (EP) who belong to units within Metro Manila. Though they may have their base units in Metro Manila, they can be assigned anywhere in the country where their services are required by the government. EP are required to take a physical examination before a renewal of their contracts (Reenlistment), which happens every three years. Failure of an EP to undertake a physical examination, and consequently failure to renew his or her contract results to his or her dismissal from the PA. Though they may be assigned in areas of the country where there are PA hospitals, these hospitals do not have the complete facilities to perform the PE required by the PA. Also, since most EP who belong to units within Metro Manila have families in Metro Manila, they prefer to take their PE in a PA hospital in Metro Manila so that they can briefly visit their families.

Officers must take their PE every year on the month of their birth anniversaries. Officers who want to undergo training for promotion must also take their PEs (OCC). Retirees are required to undergo physical examinations for the computation of their pension (Retirement). Civilians applying in the PA are required to take their PE (CSC/WAC) in FBGH wherever they may be from. The PA requires them to undertake their PE in a Metro Manila PA hospital since the documents, aside from the PE, are processed in Metro Manila anyway.

The PA chose to conduct its own PE rather than outsourcing it to private hospitals because their PE is tailored for military service, which has stricter requirements than employment in private institutions.

Those who had delays in their physical examination pinpointed several departments of the Hospital that caused the delays. Delays should be minimized because presently the PA lacks employees. It cannot hire more employees because of budget constraints and of lack of qualified applicants. Whenever a PA employee goes out for a PE, his or her work is consequently delayed as well. For every day of processing of every soldier's PE means that that soldier is absent from his/her post where he/she is needed by the country.

1.2. Objectives

The purpose of this study is to apply the various engineering methods and techniques for the improvement of the hospital's PE operation processes. The management of FBGH proposes that the group

- (1) determine if the seven-working day standard time is a realistic time for finishing a physical examination; if it is not, determine a realistic standard time for finishing a physical examination,
- (2) identify the causes of most of the delays and the reasons for those delays,
- (3) suggest any improvements to accelerate the time to finish physical examinations.

The findings of the group will be used in a presentation to the Commanding General (CG) of the Philippine Army Support Command (ASCOM).

1.3. Methodology

Visits to FBGH were done once in December 2004, once in January and ten times in February, 2005. In December, Colonel Magday, the Civil Military Operations officer of the ASCOM, was interviewed. The Commanding Officer (CO) of the FBGH directly reports to her. In the interview, the group explained to her the goals of the productivity study. The group also found out that her office had a directive from the CG ASCOM to also conduct a similar study. The group offered to conduct the study for her. She agreed, and gave us specific objectives (see section 1.2) for the study.

In January, documentation of the system were done (see section 2). The group was oriented by Colonel Natividad, the Executive Officer of the FBGH. The group was oriented with the profile and organizational structure of the FBGH. The group was also introduced to Major Anastacio, the head of the PE section. Major Anastacio toured the group around the Hospital. He introduced the group to the different clinics and/or sections involved in the PE. He also gave the group a copy of the Armed Forces of the Philippines (AFP) Regulation Guidelines (RG) 165-362, which contains the minimum guidelines followed by the whole AFP in conducting PEs. The group interviewed the different sections concerned with the PE to determine their systems and procedures in conducting their part in the PE. Initial tools and work environment analyses were also done on this visit.

In February, the group started the quantitative analysis of the PE system. A three-year accomplishment report was obtained by the group. To forecast the number of PEs the hospital will conduct in 2005, the total PEs conducted for the past three years were simply linearly regressed (Figure 3-1). The Pareto principle¹ was also applied to determine which groups of physical examinees would most accurately reflect the present system of the FBGH PE. Samples of records of the determined groups of examinees from the Pareto chart were looked at. The samples were chosen randomly. There were eight folders of the groups of physical examinees chosen. A set of random numbers were produced using the random function of a spreadsheet and multiplied by 9. The whole number part dictated which of the 8 folders a sample would come. A similar process had been followed to determine which sample in a folder was chosen. The dates that the examinee finished a part of the PE in each of the record of the sample were noted using the form in Figure 1-1. The numbers of days for each applicant to finish the PE, for FBGH to finish the documentation, and for the Signatories to sign the documents were determined. The group determined the 95% confidence intervals for the accomplishment of the PE by the examinee, the documentation by the FBGH, and the signing of the documents by the Signatories.

¹ Twenty percent of the ranked items account for eighty percent or more of the total activity [1]

Folder	Record	Name	Releasing of checklist	Psychometric	Psychology	Psychiatry	Dental	Refraction	EENT	Radiology	ECG	Laboratory	Immunization	General Physical	Neuropsychiatric evaluation	X-Ray reading	ECG reading	Urine analysis	Preparation of Form 63-A	Signatures	
1																					
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					

Figure 1-1 Form for gathering information from the folders

Time studies were also conducted for four days. The group distributed log sheets (Figure 1-2) to the different clinics, sections and departments concerned with the PE. The group gave them instructions to take note of the time each physical examinee arrived in, and the time each physical examinee left their clinics, sections or departments. After four days, the accomplished sheets were collected and the results were subjected to a Runs Test² to verify that the times were not tampered. The times spent in each section were averaged. The standard deviations of the times spent in each section were determined. The group determined the 95% confidence interval for the times spent in each section. The group requested that the clerk take note of the dates when the PE section received the signed Form 63-A from the CO, the clearances from the NP, Radiology, ECG and Laboratory.

Section: _____		Date: _____	
Instructions: Please write the names of all the people you have serviced today FOR PHYSICAL EXAMINATION ONLY. Thank you.			
Name	Time IN	Time OUT	
<i>Example:</i> JOSEPH RAY GONZALES BRILLANTES	8:00AM	8:10AM	
1.			
2.			
3.			

Figure 1-2 Distributed log sheets

1.4. Scope and Limitations

This study focused on the PE process in the FBGH. Information presented here is limited by the details disclosed by the company either through the documents given or through interviews conducted by the group.

² The Runs Tests is a useful technique for testing that the observations have indeed been drawn at random (without bias) [2].

Visits to FBGH were not as exhaustive as the group wanted. Mostly responsibilities in other academic courses prevented the group to do so.

Though the group performed initial tools and work environment analyses, suggestions for the improvement of the tools and work environment were limited. Presently, the procurement of ergonomically designed workstations for the clinics, sections and departments are not the priority of the PA. With the PA under intense scrutiny because of the controversies it was recently involved in, the management felt that it was not the proper opportunity to spend money for ergonomically designed tools and workstations, when most of their tools and workstations, though not very ergonomic, would be sufficient enough to sustain their productivity. The group also observed that though there were tasks that were repetitive, they did not cause undue strain to the employees who were performing them.

This study used only the following purposes of the Physical Examination for its analysis, as revealed by the Pareto chart (see Figure Appendix-1):

- Retirement
- Reenlistment
- Officer Candidate Course (OCC)
- Candidate Soldier Course (CSC)/Women Auxiliary Course (WAC)

The year 2004 was chosen because of the obtained annual accomplishment reports from 2002 to 2004, the year 2004 is most reflective of the current trends.

The group preferred to just distribute log sheets rather than to perform the stop-watch method of time study. There were 19 different clinics, sections, departments and offices concerned with the PE. It was simply not possible, given the time and the number of group members, to perform stop-watch time studies for each clinic, section, department and office. The group also assumed that those who accomplished the log sheets given to them were honest. Dishonesty would eventually be penalized by the results of the study. If they lengthen the time for performing the tasks concerned with the PE so that the standard time would be longer than it should be, the FBGH would eventually not meet its forecasted number of PE for 2005. If they shorten the time for performing the tasks concerned with PE so that they would seem productive than they really were, the standard time would be too fast for them to perform. Because of these underlying assumptions, though the results of Runs Test

(see Table Appendix-1) suggested that some sections tampered the data they reported, the data from them was still used.

The group was not able to conduct time studies for the Preparation of the PE documentation and the General Physical. The group was not able to locate the doctors in charge for the General Physical for the specific days. The data in the General Physical were obtained through interviews from different doctors. There was a misunderstanding in the instructions given to the clerk preparing the documentation of the PE. She did not note the amount of time it takes for her to collate the different attachments and to type the Form 63-A.

All the signatories were treated as one. They cannot be treated individually because only the CO has past records of when he signed the Form 63-A. Though time studies can be performed for each of the signatories, the rate of obtaining results was too few and too slow.

2. The Present System

2.1. Company Profile

Name	Fort Bonifacio General Hospital (FBGH)
Owner	Philippine Army (PA)
Nature of business	General hospital
Contact person	Colonel Reynaldo Irineo DV Lipat, MC (GSC) PA Commanding Officer (CO) Army Support Command (ASCOM), PA Fort Bonifacio 1201 Makati +63 812 7431 extension 4600
Customers	Military personnel, their dependents (if married, spouse and children; if single, parents who are 60 years old or older), retired military personnel, and authorized civilians of the Philippine Army
Service lines	Operates a 250-bed capacity, Department of Health (DOH) licensed/authorized hospital Operates a departmentalized major clinical services [internal medicine, surgery, Obstetric-gynecology (OB-gyne) and Pediatrics] Provides services in other specialties [general medicine, Cardiology, Gastroenterology, infectious diseases, general surgery, Orthopedic, Urology, Ophthalmology, Neuropsychiatric (NP) services, Anesthesia, physical rehabilitation and intensive care] Provides ambulatory services (out-patient care, physical examinations, family planning, emergency room and immunization services) Provides ancillary services [pharmacy, X-ray, laboratory and Electrocardiogram (ECG)] Conducts preventive medicine activities Conducts in-service training to medical, nursing and other para-medical personnel Conducts civic action program as part of the Civil Military Operations and as directed by the higher headquarters
Manpower	326 Administration service: 92 Officers: 9 Enlisted personnel: 53 Civilian employees: 30 Clinical service: 108 Officers: 23 Enlisted personnel: 14 Civilian employees: 71 Nursing service: 126 Offices: 36

Enlisted personnel: 36
Civilian employees: 64

Location and Facilities Layout



Figure 2-1 Location of FBGH

FBGH is located centrally in Fort Bonifacio, Makati. It is housed in a five-story building, which has two wings and a center portion. It has two passenger elevators and a freight elevator. The ground and the second floors are connected by a ramp. It has six wards, and each ward has about nine to twelve rooms. These rooms are either shared or private. Each ward room has its own comfort room. Private rooms each have a television, a table, a bed, a cabinet, a night table and an air conditioner. Shared rooms each have four to six beds, each with a night table. Shared rooms have two wall fans.

The Hospital has three ambulances, a jeep, and two vans. One ambulance is always parked in front of the emergency room, while all vehicles are parked in the basement parking lot.

In the basement, the food services, supply storage and the maintenance section of the building can be found.

The Physical Examination (PE), Refraction, NP, Minor surgery, ECG, Medicine, Treatment, Pediatrics, Dental, Eye-Ear-Nose-Throat (EENT) clinics and/or sections are found in the ground floor. The operations and administration offices, the emergency room, the information, the chapel, the pharmacy, the gift shop, and the newspaper stand are all on the ground floor (Figure Appendix-2).

Found in the second floor are the Radiology/X-ray, the laboratory services, the operation room and the Ob-gyne (Figure Appendix-3).

The multipurpose hall, the Surgical and the Male Medicine 1 Wards are found on the third floor. The Dependents and the Orthopedic Wards are found on the fourth floor. The library, the Officers and Male Medicine 2 Wards are found on the fifth floor.

Historical background

A summary of the significant events in the history of FBGH is summarized in the table below. The Management column in the Table 2-1 traces the transfers of supervision of the FBGH among the HPA, the ASCOM, and the FBGH, when the Hospital was considered autonomous.

Table 2-1 Summary of Significant Events in the FBGH History

Date	Event	Management
December 5, 1958	The Army Station Hospital McKinley started as a fifty-bed capacity hospital on 5 Dec 1959.	HPA
November 16, 1960	It doubled its capacity to 100 beds, only after almost a year it was established.	HPA
February 16, 1964	It was renamed to Army Station Hospital, Fort Andres Bonifacio.	HPA
August 1, 1977	It was designated as the Army General Hospital.	ASCOM
June 11, 1986	It was renamed to Fort Bonifacio General Hospital, its current name.	HPA
January 1, 1988	It grew to an 800-bed capacity hospital.	HPA
March 10, 1988	It temporarily transferred from its Lawton Avenue compound to the MRF Dental School when a large part of Fort Bonifacio was sold to private companies to be converted to a commercial area (The Fort Global City).	ASCOM

June 16, 1999	It transferred to its new building (see Figure 2-1). The new building is smaller than that of the 800-bed capacity Lawton Avenue compound, thus it was reduced to its current bed capacity.	FBGH
September 15, 2000	HPA assigned the management of FBGH to ASCOM	ASCOM

Mission

The Hospital is tasked to deliver comprehensive quality health care services to all personnel, dependents, retired military personnel and authorized civilians of the Philippine Army.

Vision

The Hospitals aims to be the premiere Army Hospital capable of providing the health needs and demands of the Philippine Army personnel and their dependents.

2.2. Organizational Structure

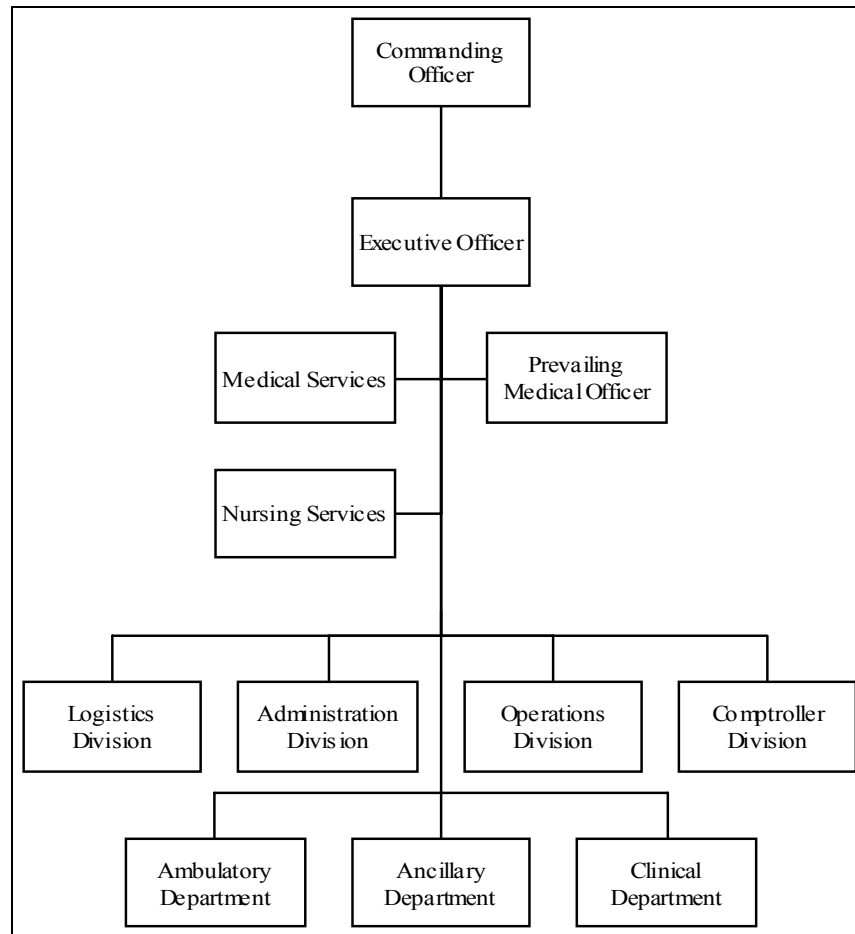


Figure 2-2 Organization Chart of Fort Bonifacio General Hospital

The Commanding Officer drafts, evaluates together with the Army Support Command, and revises hospital policy. The Executive Officer implements those policies assisted by the Prevailing Medical Officer, the Medical Services and the Nursing Services. The table below summarizes the responsibilities of each department or division under the Executive Officer.

Table 2-2 Summary of Responsibilities for each Department or Division under the Executive Officer

Division/Department	Responsibilities
Administration Division	administration and personnel, records, housekeeping, security, and the library
Comptroller Division	accounting and finances, budget, and Medicare
Operations Division	planning and programs, training and education, and Civil Military Operations
Logistics Division	supplies, procurement, food services, transportation, and facilities maintenance

Ambulatory Department	out-patient services, family planning program, emergency room, physical examinations and immunization
Ancillary Department	clinical laboratory services, Radiology, Ultrasonography, Pharmacy and Electrocardiography
Clinical Department	Internal Medical (General Medicine, Cardiology, Gastroenterology, Infectious Diseases, Hematology, Urology, Ophthalmology and Neurology), Surgical (General Surgery, Orthopedics, Anesthesiology), Ob-Gyne, Pediatric, NP, Intensive Care, Physical Rehabilitation and Dental services

2.3. Production System Framework

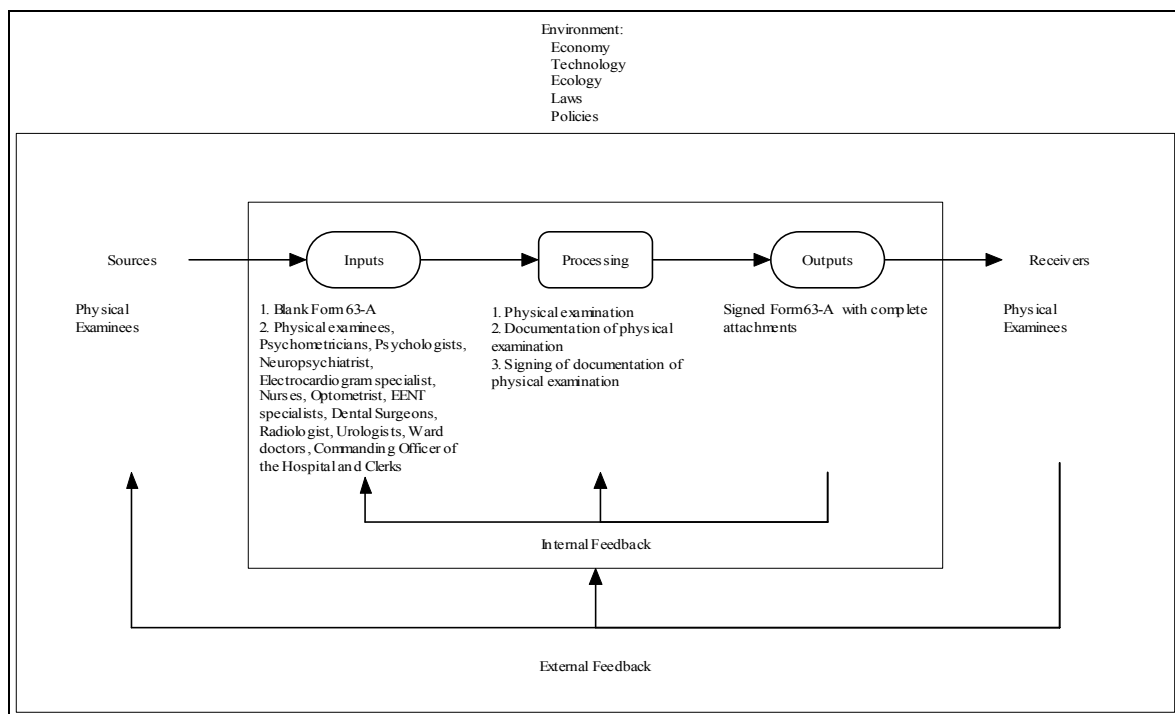


Figure 2-3 Production System Framework for PE

The PE is a service system. The sources for this system are the physical examinees. The physical examinees, the blank Form 63-A and NP, Dental, Radiology, Laboratory and ECG clearances, and the Psychometricians, Psychologists, Neuropsychiatrist, Electrocardiogram specialist, Nurses, Optometrist, EENT specialists, Dental Surgeons, Radiologist, Urologists, Ward doctors, CO of the Hospital and clerks are the inputs of the system to render the service. The system processes the sources by conducting the different tests that comprises the PE, by documenting the results of the different tests, and by signing the documents to support

their authenticity. Though the PE is a service system, those who undergo the PE consider the documentation as the output rather than the actual service. Thus, the PE is not complete until the signed Form 63-A, with the NP, the Radiology, the Dental, the ECG and the Laboratory clearances as attachments, are compiled and ready for release to the Physical Examinee.

2.4. PE Processing Time

The FBGH management determined that a PE should be finished in seven working days. This standard time was determined by summing the estimated times of the different tests that comprises a PE. Those estimated times were established through the hospital staff's experiences. However, there were extreme instances that an examination was finished in one working day, and that an examination lasted for more than a month.

2.5. Work Design

All clinics, sections, departments and offices are well illuminated with general directed-indirected lighting, though there is no supplementary lighting. Luminaires have no baffles and/or diffusers, and are placed away from the field of vision, as most of these are found in the ceiling. Work surfaces are perpendicular to luminaries, are not glossy, and are not matted. Screen filters are not available for computer screens.

The workers are well within the thermal comfort zone. The employees are also properly clothed for the equivalent wind chill temperature. All air-conditioning units have thermostats inside the room. Radiation shields are placed in the Radiology, where it is most needed. The air is not dehumidified.

Ventilation levels are acceptable. Fans are provided where necessary. Noise levels are well below 90 dBA, outside and inside of the rooms. The employees are not exposed to vibrations.

2.6. Systems and Procedures

Before a physical examination, the examinee is required to present a request form from his/her unit or office. The request form must contain the applicant's information and the purpose of the physical examination. It must be approved by the administration of the Fort Bonifacio General Hospital. The different purposes for a physical examination are the following:

- Retirement
- Reenlistment
- Promotion
- Annual Physical Examination (APE)/Expired Term of Annual Duty (ETAD)
- Call to Active Duty (CAD)
- Commissionship
- Ex-O 79 (Security of Tenure)
- OCC
- CSC/WAC
- POTC
- Schooling
- Airport Police
- Terminal Leave

2.6.1. Registration at PE section

Upon submission of the request form, the examinee must register at the physical examination section.

2.6.2. Filling up of forms

The examinee must fill up the physical examination form or the mimeographed copy of the Form 63-A (Figure Appendix-4a and Appendix-4b), the clinical laboratory request (Figure Appendix-5) and the X-ray request (Figure Appendix-6) forms. The examinee must also have each medical officer or personnel-in-charge sign his/her Checklist Guide for Physical

Examination (Figure Appendix-7) after he/she has finished a step. The examinee may proceed to the Psychometrics, the ECG, the Immunization, the Refraction, the Dental, the Radiology, the Laboratory (if it is not later than 11:30AM) or the General Physical (Figure Appendix-8). Before he/she can be interviewed by a Psychologist, he/she must have finished the IQ and personality exams given by the Psychometricians. He/She must have been interviewed by a Psychologist before he/she can be interviewed by the Neuropsychiatrist. He/She must have been to the Refraction section before proceeding to the EENT section.

2.6.3. Psychometrician

Various written exams are given to the examinee. The IQ test is given first followed by the personality tests. The exams given differ depending on the purpose of the physical examination (i.e. exams for CSC differ from exams for OCC).

The exams are given in the morning. IQ tests have time pressure and are given from 8 to 10 in the morning. IQ tests are given in the morning because this is when the mind of the examinee is clearest in a day. The personality tests are given afterwards without time limit. All exams can be accomplished in a day except when the applicant chooses to delay the accomplishment of his/her personality tests.

In cases where there are many examinees, exams are given by groups. There is no limitation in the number of examinees except when there is lack of exam materials.

The psychometrician follows these steps:

- 2.6.3.1. Get the request form (approved by the CO)
- 2.6.3.2. Ask for the exam requirements (pen, pencil, folder, etc.)
- 2.6.3.3. Log-in the applicant
- 2.6.3.4. Ask applicant to sit down
- 2.6.3.5. Give exam instructions
- 2.6.3.6. Administer the exams

2.6.3.7. Applicant returns the exam materials

For unfinished exams:

2.6.3.8. Instruct the applicant to return the following day to continue the exam

For finished exams:

2.6.3.8. Instruct the applicant to return the following day for an interview with a Psychologist

2.6.3.9. Check papers

2.6.3.10. Endorse examinee to a psychologist

After the exams are checked, the exams are forwarded to the psychologists for initial interpretations.

2.6.4. Psychologist

The hospital has five psychologists who interpret the results of the exams and do the initial interviews. The number of examinees who have taken the exams is divided among the psychologists.

The interviews start at 8:30 to 9 AM and ends until the psychologist have accomplished all the examinees assigned to him/her. Additional exams, especially personality tests, can be given to an examinee depending on the judgment of the psychologist.

The following happens step-by-step during the interview with a psychologist:

2.6.4.1. Examinee asks NP personnel if he/she was endorsed for initial interview by a psychologist

2.6.4.2. NP personnel verifies if examinee was endorsed

2.6.4.3. Psychologist performs an interview to determine the personality of the examinee.

2.6.4.4. After the interview, NP personnel collect interview results from the psychologist

2.6.4.5. The NP personnel advises the examinee for final interview schedule

2.6.5. Neuropsychiatrist

The examinee is checked for emotional stability, personality and Neuropsychiatric history and disorders. The examinee must be not diagnosed with Transient situational, reaction psychoneurotic, psychophysiological system reaction, or psychosomatic disorders. The steps that the neuropsychiatrist follows are:

2.6.5.1. Read the psychological protocol¹ of the applicant.

2.6.5.2. Perform the Neurological examination.

2.6.5.3. Perform the Psychiatric evaluation through an interview.

2.6.5.4. Write the final recommendation, if granted clearance or otherwise.

2.6.6. Dental

All examinees go through the dental check-up. After the dental check-up, the examinees are given the following classifications:

- 1 to 3: Dental treatment needed (1 - major treatment and 3 – minor treatment)
- 4: Passed

Any dental problems found in examinees must be treated by an outside dentist. The examinee must then repeat the step after having his dental problems treated.

2.6.7. EENT (Refraction Room)

¹ The Psychological protocol contains the results of the IQ test and the personality exam, and the psychologist's assessment.

The examinee is checked for visual acuity and organic defects of the eyes and lids. The examinee must have a minimum vision of 20/200 in each eye correctible to 20/30 in one eye and 20/100 in the second eye correctible to 20/20 with glasses. The steps that the optometrician follows are:

- 2.6.7.1. Record name of examinee, and the purpose of the examination.
- 2.6.7.2. Perform an eye examination.
- 2.6.7.3. Perform visual acuity for distance and near (naked eye and with glasses).
- 2.6.7.4. Perform the color vision test for colorblindness.
- 2.6.7.5. Diagnose.
- 2.6.7.6. Correct and write a prescription.
- 2.6.7.7. Indicate findings in PE Form 63-A, and sign.

2.6.8. EENT

The condition of the examinee's eyes, ears, nose, and throat are checked. Basically, there are three types of examinations:

- Transillumination – includes a Snellen chart, used for testing the examinee's vision. He/She will be rated as having myopia, hyperopia, astigmatism, or a normal vision. The findings for this test will not be a basis for failing or passing the examinee.
- Autoscope – includes physical observation of the ears and tests for deafness. A tuning fork is used. If the examinee is proved to be deaf or having hearing disorders, he fails the exam.
- Oral Pharyngeal – the nose and throat are checked by physical observation. For the throat, a tongue depressor is used.

2.6.9. X-Ray Section

The chest is being X-rayed to check the condition of the lungs, heart, and spine. The results of the X-ray will be later examined by the radiologist. The radiologist then rates the examinee an "OK" or "not OK". The examinee

is checked for signs of tuberculosis and other complications. If a complication is found, the examinee fails the test. If the examinee's heart is enlarged, he fails the test. Only examinees with normal heart size are given an "OK". Examinees without scoliosis or spinal cord defects are given an "OK". Results and findings of the X-Ray are not disclosed to the examinee. The radiology section follows these steps:

- 2.6.9.1. Check the X-Ray request form and record relevant information in the log book.
- 2.5.9.2. Type the film marker to distinguish ownership of the X-Ray.
- 2.5.9.3. Perform the X-Ray.
- 2.6.9.4. Develop the film.
- 2.6.9.5. Radiologist interprets the film (this is usually done 8:30-9:30AM).
- 2.6.9.6. Forward results of only those that are "OK" to the PE Section (this is usually done 1:30PM).

2.6.10. ECG Section

This is where the examinee's heartbeat rate and blood pressure is checked and measured.

Electrodes are attached to specific parts of the examinee's body to monitor his heartbeat rate. An examinee will be disqualified if he is proved to have problems. (Terminologies used were not disclosed since they were very technical.) Nevertheless, the examinee will be rated as "OK" if no complications were found, and "not OK" if otherwise.

For the blood pressure test, if an examinee's blood pressure is not above either or both 140/90 (i.e. systole should be equal to or less than 140, and diastole should be equal to or less than 90) he/she will be rated as "OK". Otherwise, he/she fails the test.

2.6.11. Laboratory Section

Urinalysis is conducted to detect the following in the examinees urine:

- urine sugar to check for diabetes
- urine protein to check for kidney disease
- Urinary Tract Infection

A strip test is used to check those. A strip of paper is dipped into the urine and then the resulting color in the strip is compared to a standard. An examinee passes this test if all tests results are negative. If at least one test gave a positive result, the examinee fails. Results are released after 2:00 PM. The steps they follow are:

2.6.11.1. Check Laboratory request form of examinee, and write relevant information in the log book.

2.6.11.2. Issue bottle for urine sample.

2.6.11.3. Perform the strip test.

2.6.11.4. Indicate findings.

2.6.11.5. Forward results to the PE Section.

2.6.12. Immunization (Treatment)

The immunization differs depending on the applicant's purpose but all applicants are checked for the following:

- Bacille Calmette Guerin (BCG) for tuberculosis
- anti-measles
- anti-polio vaccine (APV)
- Diphtheria, Pertussis and Tetanus

CSC applicants are checked only of their current vaccination status while the rest of the applicants are provided with any vaccination they lack. For the CSC, they will be given an "OK" after they have been checked. For the other examinees, the vaccinations are provided.

2.6.13. General Physical

This is a thorough physical examination. The type of test is different for males and females. Females report to Obstetrics-gynecologists. There are different ward doctors assigned to perform the General Physical for each day. The examinee locates the doctor assigned for the day when he/she wants to take the General Physical.

Upon completion, the examinees submit the checklist at the PE Section, OPS.

PE Documentation

The PE clerks type the information written by the doctors in the mimeographed Form 63-A to the Form 63-A board. The PE clerks then collate the clearances from the NP, the Radiology, the Laboratory and the ECG, and attach them to the typewritten Form 63-A. They forward these documents to the members of the hospital's medical/dental board.

Signatories

The results will be deliberated by the hospital's medical/dental board consisting of six doctors: an internist, an EENT officer, a radiologist, a neuropsychiatrist, a dental surgeon and the CO of the hospital. Before the dental surgeon signs the Form 63-A, he/she attaches the dental record of the examinee. All the other five doctors must have signed the Form 63-A before the CO signs. The board will decide if the examinee passes the physical examination or not. An examinee will be ranked according to the following:

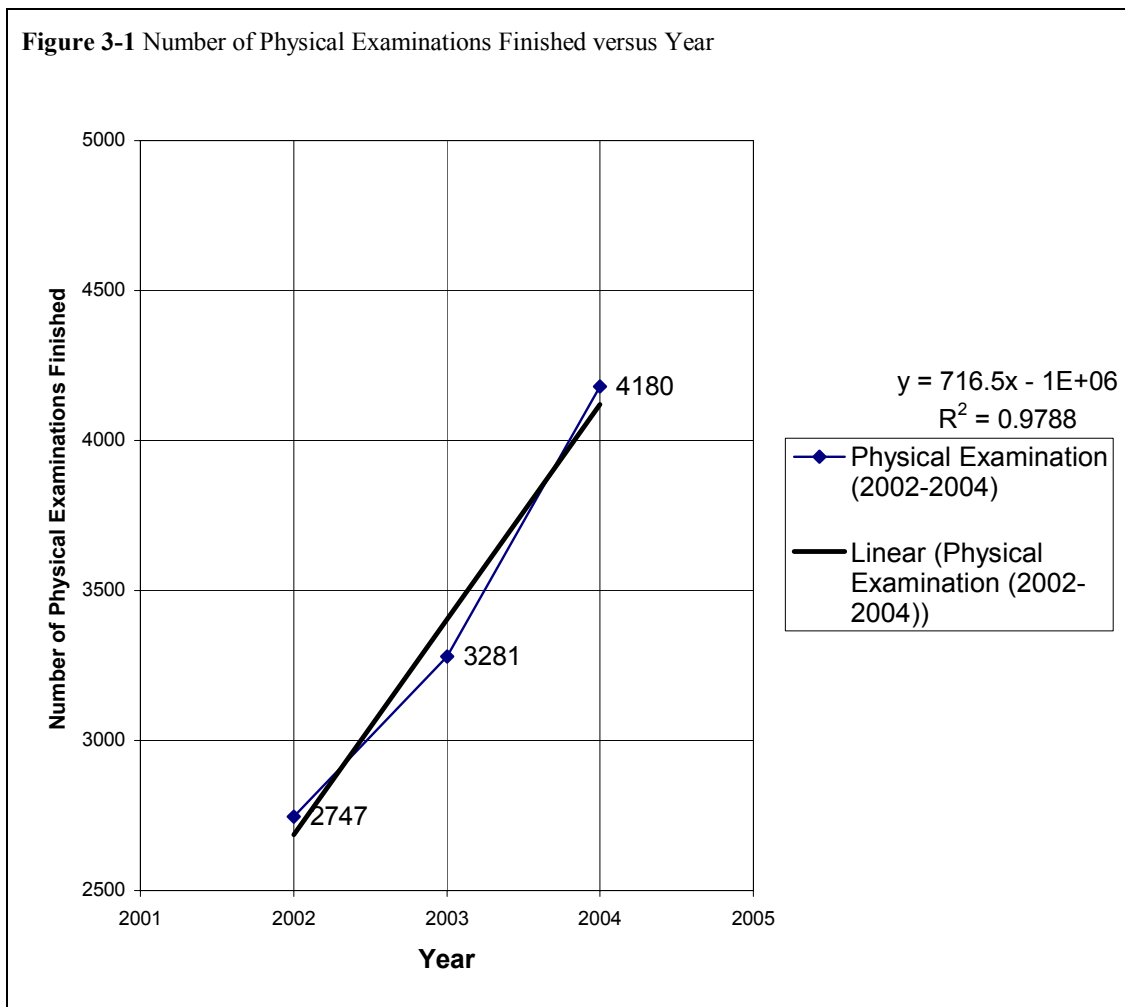
- P1: fit for combat
- P2: for garrison and office work
- P3: cannot serve in the Army, however, medical personnel are also given this rank

The examinee's Form 63A must be signed by the six doctors for it to be valid. Otherwise, he/she fails the physical exam.

3. Problem Identification

3.1. Statement of the problem

The year 2004 had approximately 249 working days. The Hospital currently has 7.5 hours (working hours are from 8:30 AM to 12:00 PM, and 1:30 PM to 5:00 PM) for each working day (from Monday to Friday). For the year 2004, the Hospital **finished 17 Physical Examinations every day**.



Simply linearly regressing Number of Physical Examinations Finished versus Year (Figure 3-1), the **forecasted number of Physical Examinations for the year 2005 is between 3743 and 5928**, with a 95% confidence level. The year 2005 has approximately 251 working days. To meet the forecast of Physical Examinations for the said year, the Hospital **should finish 15 to 24 Physical Examinations every day**.

Thus, the Hospital **should increase its efficiency by at least 41.18%**.

The group focused on quantifying the average number of days for a physical examination to be completed. Based on the 2004 data analyzed by the group (see Table Appendix-2), clearly the number of days to complete a PE exceeded the seven days established by the FBGH administration. **With a 95% confidence level, the FBGH finished a PE between 8.2315 and 10.0746 working days in the 2004.** The actual **Tests** (examinee going through the different sections/undergoing the different tests) can be **finished between 3.3240 and 3.5698**, the **Documentation** (submission of the NP, X-Ray, ECG and Laboratory clearances to the PE section, and preparation of the Form 63-A) of a PE **between 2.8763 and 3.4490**, while the **Signatories** (the medical/dental board authenticating the Form 63-A) **between 2.0312, 3.0558 working days.**

The results of the time studies (See Table Appendix-2) suggest that the actual physical examination can be finished between 3 hours 12 minutes (192.3891 minutes) and 5 hours 8 minutes (308.0760 minutes). These times are observed times only. Including allowances such as personal needs (5%), basic fatigue (4%), mental strain (17%), and monotony (17%) [1], and also the time the examinee spent walking from and to the different sections concerned with PE around the hospital (approximate distance traveled is 375.56 m at 80.466 m/min [2]), **the standard time to finish the actual PE is between 4 hours 40 minutes (279.7837 minutes) and 7 hours 25 minutes (445.2160 minutes).**

The PE documentation should take between 1.3440 and 1.8221 days. The processing of the clearances and the documentation are all independent of each other, and can be done simultaneously. Thus, only the longest minimum and maximum times were considered in setting up a standard time for the documentation of the PE.

The signing by all the members of the medical/dental board of the Form 63-A with the attached clearances takes between 7.6552 and 8.8063 days.

From direct observations, interviews and quantitative analyses, the group identified the different causes of the delay in completion of a physical examination (see Figure 3-1).

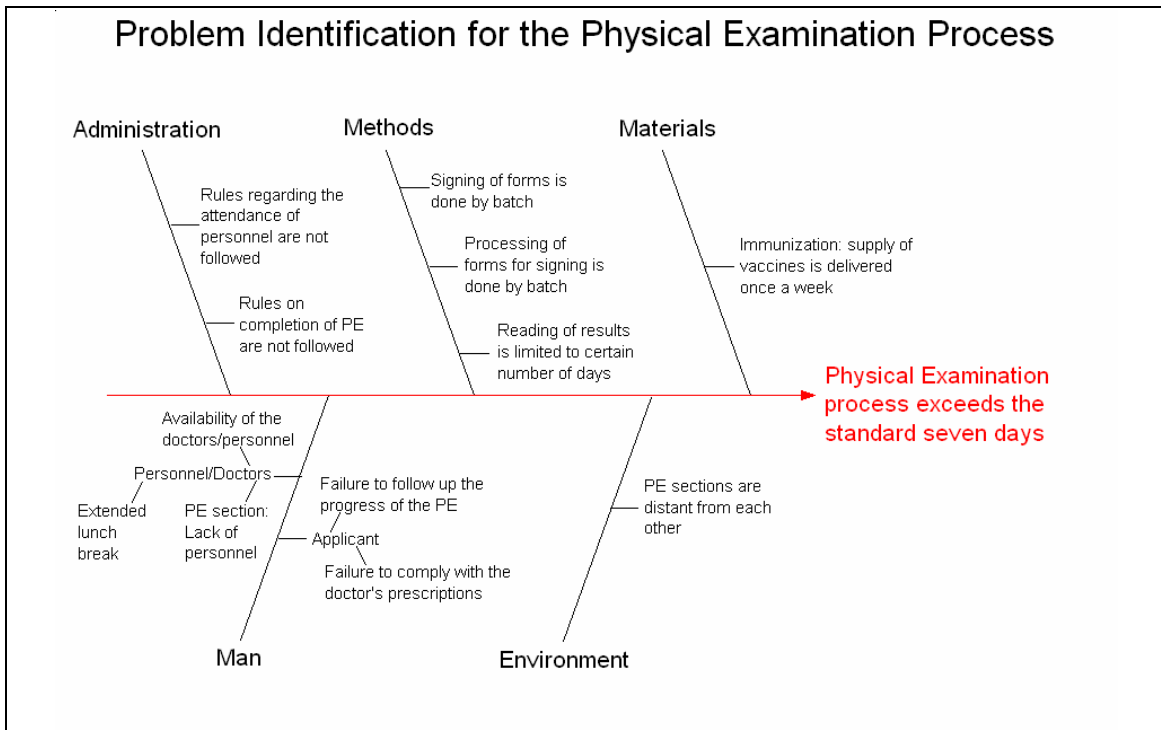


Figure 3-2 Fishbone Diagram for the different causes of the delay of the PE

3.1.1. Man

Employees

During the hospital visits done by the group, most of the sections were already closed by 11:30 AM and resumed operation only by 1:30 PM.

Doctors and personnel were not always available, especially in the afternoon.

In the PE section, there are only two personnel in charge of the processing of the results, preparation of each applicant's Form 63-A and distribution of the forms to the members of the medical/dental board for signing. Moreover, the PE section personnel are also the ones following up the applicants who failed to return to the hospital to accomplish their physical examination.

Applicants

In cases where not all examinations are accomplished within a day, some of the applicants failed to return immediately for the continuation of the physical examination. There were also cases where examinations were accomplished but there were findings, and the applicant fails to comply with the doctor's prescriptions. **The number of delayed days caused by applicants not returning immediately is between 6.8890 and 11.3483 days** [see Table Appendix-2].

3.1.2. Materials

The Immunization section encountered problems regarding their supply of vaccines to be given to the physical examinees. They receive their supply of vaccines only once a week. There were cases wherein their supply of vaccines ran out while there were still examinees in need of vaccination. When this happens, the examinees would just have to go back when the vaccines were available.

3.1.3. Methods

Reading of results for the ECG section is done every Tuesday, Thursday, and Saturday. Only one doctor is assigned to read the results, since he is the only one certified to do the task. Results of examinations conducted on Mondays, Wednesdays, and Fridays were on hold until the following day for them to be read and interpreted. Results obtained on Tuesdays and Thursdays are brought immediately to the doctor for them to be interpreted. The limited days for reading the results and the availability of the doctor are factors for the examiners' papers not to be processed quickly.

The processing of results or the writing of final remarks on the Form 63-A for the Dental section was done by batches. After all the dental records have been compiled and completed, then they would write the final results. Afterwards, the files are forwarded to the PE section.

In the PE section, the processing of Form 63-A, and the distribution of these forms to the signatories were also done by batches. At the end of the

day, the processed forms were compiled in the PE section and then distributed to the members of the medical/dental board for approval/signing. The forms are approved/signed by the signatories individually, and not as a group.

Processing by batches becomes a problem when those who were supposed to process them are absent. For every day a clearance to be attached to the Form 63-A is delayed, the whole documentation process is lengthened a day.

Though the members of the medical/dental board can sign after the Form 63-A documentation is finished, they cannot sign simultaneously because they sign in the same Form 63-A. If a member of the medical/dental board delayed signing the Form 63-A, the signing of the rest of the medical/dental board members are also delayed.

3.1.4. Environment

Physical examination rooms are distant from each other. The Psychometrician, Psychology, Neuro-Psychiatry, EENT (Refraction), EENT, Dental, Immunization, and ECG sections are located on the first floor. The Radiology and Laboratory sections are located in the second floor and are quite distant from each other. The general physical for the males is located in the third floor, and for the females is located in the first floor but it is far-off from the other eight sections.

3.1.5. Administration

Rules regarding the attendance especially on lunch breaks and tardiness are not being followed. Moreover, there were cases that the deadlines for the completion of the PE exam are not met.

3.2. Core and Secondary Problems

Through the Stream Diagnostic Chart, the group decided to group the identified causes of the main problem into two categories, core problems or the main causes of the main problem, and secondary problems or the causes that have little effect on the main problem.

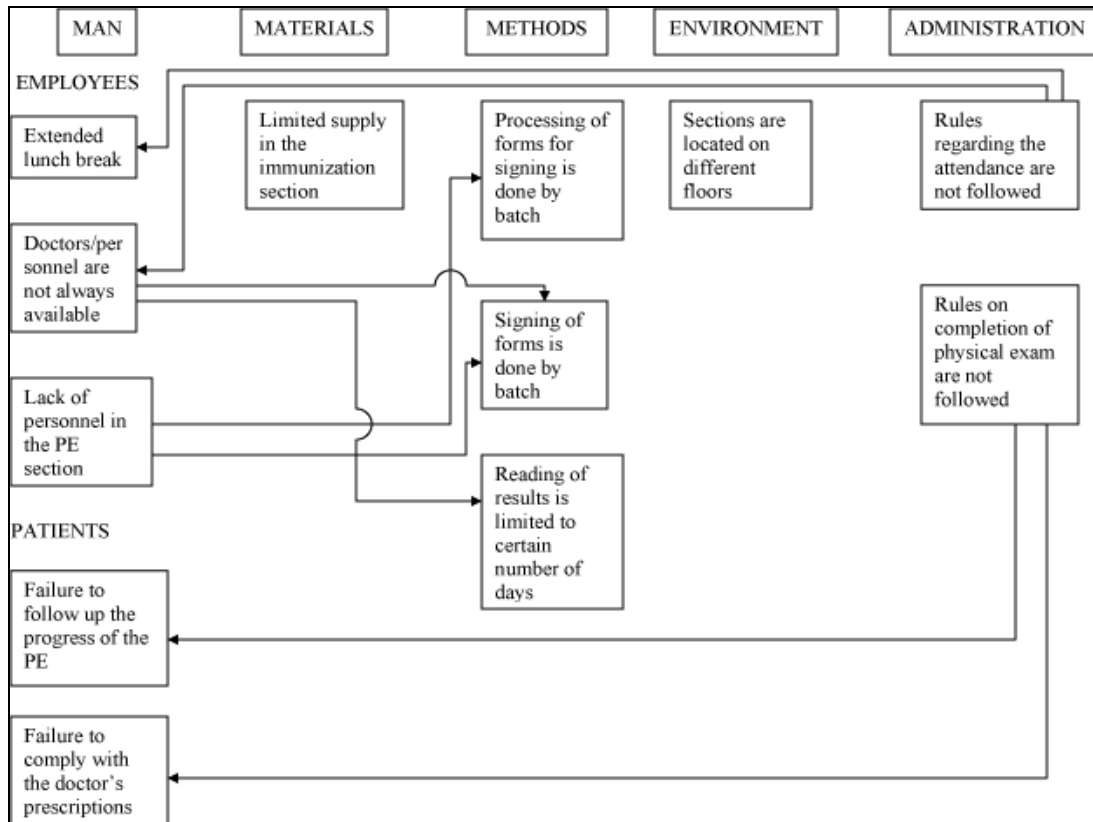


Figure 3-3 Stream Diagnostic Chart

3.2.1. Core Problems

In the stream diagnostic chart, the problems that are relatively the source of most of the arrows are the problems regarding the attendance of the doctors/personnel, the lack of personnel in the PE section and the rules that are being followed. These problems are the main contributors to the delay in the physical examination process.

3.2.2. Secondary Problems

Having identified the core problems, the group categorized all the remaining problems as secondary problems. Secondary problems are either those that will eventually be solved once the core problems are solved or those that are beyond the FBGH Administration's jurisdiction or are too costly for the administration to resolve. Problems regarding the extended lunch break, signing and processing of forms, interpretation of results and the faults of the applicants are problems that can be resolved once the core problems are properly dealt with. The problem on the supply in the immunization section is beyond the FBGH administration's control. The Department of Health, which is the supplier of vaccinations to the FBGH, determines the number of vaccinations the FBGH receives based on FBGH's bed-capacity, regardless of demand. The problem on the distances between the sections involved in the PE will be costly for the hospital to resolve.

4. Recommendations

The group recommends that the FBGH implements the standard time to finish the actual PE, which is between 4 hours 40 minutes (279.7837 minutes) and 7 hours 25 minutes (445.2160 minutes), and the standard time for documentation of the PE, which is between 1.3440 and 1.8221 days. It can also inform the examinees that the PE would only last for at most a day so that the examinees would insist upon the hospital staff that they be serviced. This would also discourage examinees to leave, and to return whenever they feel like it. The group suggests that the examinees report to the hospital by 8 AM, and follow this order so that they can maximize the day¹ [see Figure Appendix-10]:

Morning starting at 8AM

- a. Examinee registers at the PE Section
- b. Examinee fills up forms
- c. Psychometrician administers IQ and personality tests
- d. Optometrician checks visual acuity and organic defects of eyes and lids
- e. Cardiologist measures heartbeat rate (ECG) and blood pressure
- f. Treatment doctor/nurse administers vaccinations
- g. EENT doctor performs transillumination, autoscope and oral pharyngeal
- h. Dentist performs check-up
- i. Laboratory technician performs urine analysis
- j. Radiology technician X-Rays chest physical examination

Afternoon starting at 1PM:

- k. Ward doctor performs general
- l. Psychologist interprets results of IQ and personality exams
- m. Neuropsychiatrist administers neurological and psychiatric evaluations
- n. Examinee submits PE checklist guide to the PE section

The management should insist that all documents must be processed not more than a day after the examination. If the management implements the time standards, PEs would be completed faster, the PE section can accommodate an increased number of examinees, and it would not cost the hospital anything.

¹ This order was determined by using the Line Balancing function of the Design Tools 3.0 software.

The group suggests that the FBGH obtain a private first class or a corporal to become a mail clerk for the hospital whose primary responsibility is to collect the results of the PE from the different sections, clinics and departments. He/She can also distribute communication and mail to other departments in the FBGH. He/She is to make his/her rounds before lunch break and before the end of the working day. The sections, clinics and departments should also process the documentation of the PEs they conducted in the morning before lunch, and those that they conducted in the afternoon before the end of the day, just in time for mail clerk's collection rounds. Doing so, the hospital can avoid unnecessary delays in the submission of clearances attached to the Form 63-A compilation. The group believes that the additional salary expense is commensurate to the benefits of having a mail clerk.

The FBGH management should find ways to decrease the time for all the signatories to finish signing the compiled Form 63-A. Of all the different processes, the time standard computed for this is the longest, between 7.6552 and 8.8063 days. **The group recommends that medical/dental board hold daily meetings to sign the physical examinations that the PE was able to compile the previous day.** The distribution of the PE forms to each member of the board would not be necessary since it would only be delivered to the room where the board would meet. **The medical/dental board can have their daily meetings after the daily morning endorsement meetings** which most of them attend anyway. The benefit of doing so is that the normal time for signing would be reduced to a day while costing the hospital nothing.

Following the recommendations of the group, the hospital can finish a PE in three to four working days from the normal 8 to 10 working days.

The group also recommends that the FBGH strictly implements its rules on tardiness, and absences on doctors, nurses and other hospital staff. Furthermore, doctors, nurses and other hospital staff should stay in their clinics or at their posts while they are on duty, especially in the afternoons. They are also to reserve personal matters such as attending mass, playing sports and socializing during lunch breaks and after 5 PM. The group recommends that the FBGH increase working hours to 8 hours everyday. Doing so would increase service times and productivity, employee efficiency and effectiveness. It would not cost the hospital anything.

In order to assess the clinic/department/sections' work systematically, **the FBGH management could use some performance appraisal methods** such as graphic rating scales, multiple comparisons and group order ranking. The evaluation would help the administration to identify the weak points of the clinics, departments, and/or sections and then provide suggestions for improvement. Moreover, the FBGH administration could provide motivators to encourage clinics, departments, and/or sections to improve their jobs. Motivators could be in a form of autonomy and recognition programs such as clinic, department or section of the month awards, or other celebrations of the clinics', departments', or sections' achievements. The group believes that performance appraisal and motivators could lead to better performance. Though implementing such would cost the hospital something, it would only involve minimal expenses (i.e. the tokens to be given to the awardees). Performance appraisal would also require some time from the evaluator.

A comparison of the present versus the recommended system follows.

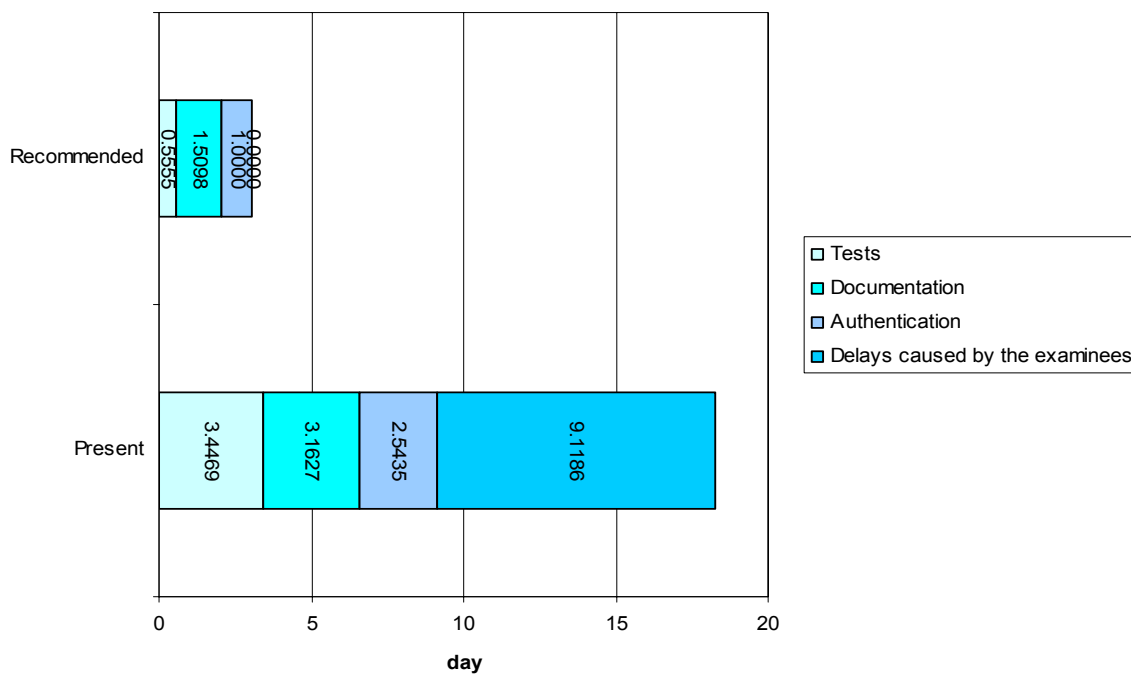


Figure 4-1 Comparison of days it takes to finish a PE (present vs. recommended)

Table 4-1 Comparison of the present system and the recommendations of the group

Present	Recommendations
Tests	
Takes between three and four days	Should take at most a day

Efficiency of 53.70% [see Figure Appendix-9]	Efficiency of 75.52% [see Figure Appendix-10]
<p>Order of tests is determined by the availability of the doctors/personnel administering the examinations; normally follows this order:</p> <ol style="list-style-type: none"> 1. Examinee registers at the PE Section 2. Examinee fills up of forms 3. Examinee's mental health is evaluated <ol style="list-style-type: none"> 3.1. Psychometrician administers IQ and personality tests (after the test, the applicant is told to return the next day; IQ & personality profile is prepared before the work day ends) 3.2. Psychologist interprets results of IQ and personality exams 3.3. Neuropsychiatrist administers neurological and psychiatric evaluations 4. Examinee's eyes, ears, nose and throat are examined <ol style="list-style-type: none"> 4.1. Optometrician checks visual acuity and organic defects of eyes and lids 4.2. EENT doctor performs transillumination, autoscope and oral pharyngeal 5. Radiology technician X-Rays chest 6. Cardiologist measures heartbeat rate (ECG) and blood pressure 7. Laboratory technician performs urine analysis 8. Treatment doctor/nurse administers vaccinations 9. Dentist performs check-up 10. Ward doctor performs general physical examination 11. Examinee submits PE checklist guide to the PE Section 	<p>Doctor/personnel administering the examinations should be available the whole day; examinations should follow this order to maximize the day:</p> <p>Should be done in the morning starting at 8AM:</p> <ol style="list-style-type: none"> 1. Examinee registers at the PE Section 2. Examinee fills up of forms 3.1. Psychometrician administers IQ and personality tests (after the test, request the applicant to return in the afternoon; prepare IQ & personality profile immediately after the examinee finishes; psychometrician has 2 hours and 12 minutes to prepare the profile before the examinee proceeds to the psychologist) 4.1. Optometrician checks visual acuity and organic defects of eyes and lids 6. Cardiologist measures heartbeat rate (ECG) and blood pressure 8. Treatment doctor/nurse administers vaccinations 4.2. EENT doctor performs transillumination, autoscope and oral pharyngeal 9. Dentist performs check-up 7. Laboratory technician performs urine analysis 5. Radiology technician X-Rays chest <p>Should be done in the afternoon starting at 1PM:</p> <ol style="list-style-type: none"> 10. Ward doctor performs general physical examination 3.2. Psychologist interprets results of IQ and personality exams 3.3. Neuropsychiatrist administers neurological and psychiatric evaluations 11. Examinee submits PE checklist guide to the PE Section
Documentation	
Takes between three and four days Reading of results is done only in the	Should take between one and two days Reading of results should be done twice

<p>morning</p> <p>Submission of clearances is done only once everyday and depends on the availability of a personnel from the section submitting</p>	<p>everyday, before lunch break and before the end of the work day</p> <p>Submission of clearances should be done twice everyday and should not depend on the availability of a personnel from the section submitting; Clearances should be collected by the mail clerk</p>
<p>Authentication by the medical/dental board (Signatories)</p>	
<p>Takes between two and three days</p> <p>Members of the medical/dental board signs the Forms 63-A sequentially; when a member is delayed in signing, those signing after him/her is also delayed</p>	<p>Should take at most a day</p> <p>Members of the medical/dental board should meet everyday after the endorsement meeting so that they can all sign the Forms 63-A at the same time</p>

5. Areas for further study

A stop-watch time study should be performed so that the data obtained would more accurately reflect the system. Since the lengthiest part of the PE process is the Signatories part, the group suggests each signatory to undergo a time study to determine which of the signatory causes delays to directly address the problem.

There seems to be more idle time in the afternoon. It might interest the FBGH management to know how much of the idle time there really is in the afternoon. This can be determined through work sampling.

Methods engineering studies should be conducted periodically to constant check the FBGH PE's productivity. A methods engineering study may be done after every six months. The first six months to determine areas for improvement, and the second six months to determine if forecasts would be reached by the end of the year.

The clerks of the FBGH can easily be trained to gather data for internal methods engineering studies. The FBGH can hire statisticians or industrial engineers to interpret the data gathered by the clerks.

To ease the proceeding productivity studies, the clerks should include the time each Physical examinee spent in their clinic, sections and/or departments in their Checklist Guide for PE. The clerks should note the date and time when documents such as clearances and endorsements were received by their office.

Appendix

Table Appendix-1 Summary of the Runs Test of the accomplished log sheets

Runs Test of samples from . . .	Mean	Observed Number Of runs	Expected Number Of Runs	Observations Above Mean	Observations Below Mean	P	Conclusion that the sample may be . . .
Registration	8.6875	11	13	8	24	0.3324	Random
Psychometrics	114.2625	28	40.7750	43	37	0.0038	Not random
Psychology	31.1	6	5.2	3	7	0.5127	Random
Neuropsychiatry	19	15	13.5926	10	17	0.5525	Random
Refraction	14.4118	9	9.2353	10	7	0.9030	Random
EENT	2.4151	9	22.5094	15	38	0.0000	Not random
ECG	12.6964	20	29	28	28	0.0152	Not random
Immunization	1.8140	18	19.1395	13	30	0.6753	Random
Dental	2.6176	20	17.7647	15	19	0.4296	Random
Laboratory	4.3810	21	21.9524	20	22	0.7655	Random
Radiology	9.0094	28	50.3019	39	67	0.0000	Not random
Submission of Checklist	1.2800	12	13	10	15	0.6698	Random

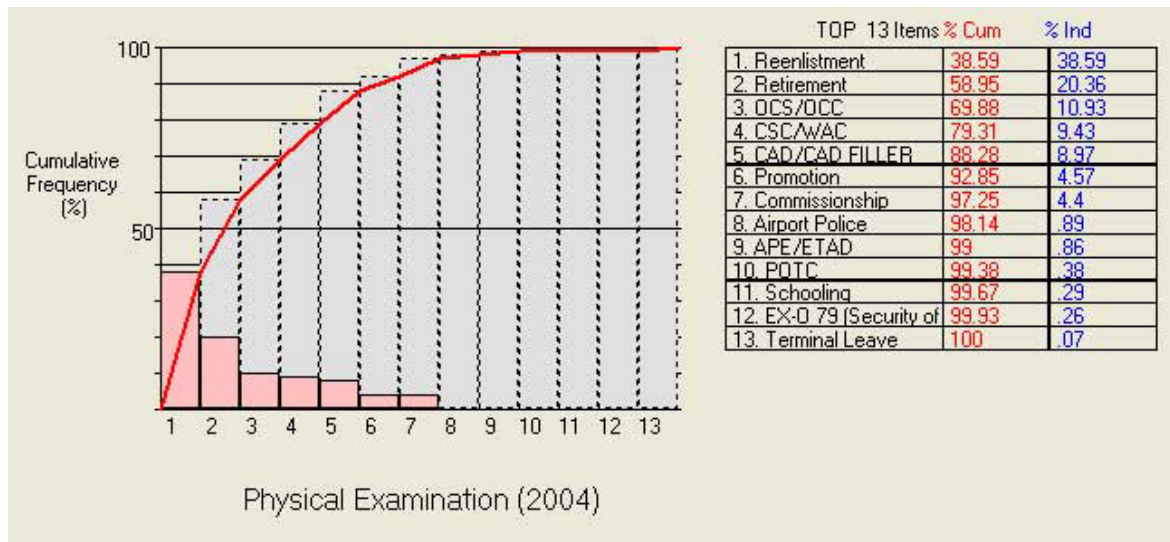


Figure Appendix-1 The Pareto Principle applied to the breakdown of the Physical Examination (2004)

Table Appendix-2 Summary of the analysis of the 2004 data

	Tests	Documentation	Signatories	Delays caused by the Examinee
unit of measurement	(day)	(day)	(day)	(day)
n	358	332	46	59
mean	3.4469	3.1627	2.5435	9.1186
std	1.1864	2.6618	1.7727	8.7377
confidence interval (CL=95%, e=0.01 mean)	(3.3240, 3.5698)	(2.8763, 3.4490)	(2.0312, 3.0558)	(6.8890, 11.3483)

Table Appendix-3 Results of the time studies

Tasks/Tests	Releasing of checklist	Psychometrics	Psychology	Psychiatry
Unit of measurement	(min)	(min)	(min)	(min)
n	29	76	6	26
mean	4.7586	111.0526	30.8333	19.5000
std	2.8866	38.4808	4.9160	8.3774
confidence interval (95%)	(3.6608, 5.8564)	(102.4011, 119.7042)	(25.6735, 35.9932)	(16.1156, 22.8844)

Tasks/Tests	Refraction	EENT	ECG	Immunization	Dental	Radiology
unit of measurement	(min)	(min)	(min)	(min)	(min)	(min)
n	16	51	53	43	32	106
mean	13.4375	2.1176	12.8491	1.8140	2.3125	9.0094
std	6.7623	1.2433	4.9590	1.4352	0.8958	6.7886
confidence interval (95%)	(9.8349, 17.0401)	(1.7764, 2.4589)	(11.5139, 14.1842)	(1.3850, 2.2429)	(2.0021, 2.6229)	(7.7171, 10.3018)

Tasks/Tests	Laboratory	General Physical	Submission of checklist
unit of measurement	(min)	(min)	(min)
n	40	4	24
mean	3.6750	37.5000	1.1250
std	2.3467	19.3649	1.0759
confidence interval (CL=95%)	(2.9477, 4.4023)	(6.6904, 68.3096)	(0.6706, 2.0751)

Documentation	Neuropsychiatric evaluation	ECG reading	X-Ray reading	Urine analysis	Preparation of Form 63-A
unit of measurement	(day)	(day)	(day)	(day)	(day)
n	51	76	99	74	
mean	1.5098	1.4737	0.9899	0.3649	
std	1.1379	0.5767	0.5248	0.4847	
confidence interval (CL=95%)	(1.1975, 1.8221)	(1.3440, 1.6034)	(0.8865, 1.0933)	(0.2544, 0.4753)	

Signatories	NP, Internist, EENT Officer, Radiologist, Dental Surgeon and CO
Unit of measurement	(day)
n	78
mean	8.2308
std	2.5933
confidence interval (CL=95%)	(7.6552, 8.8063)

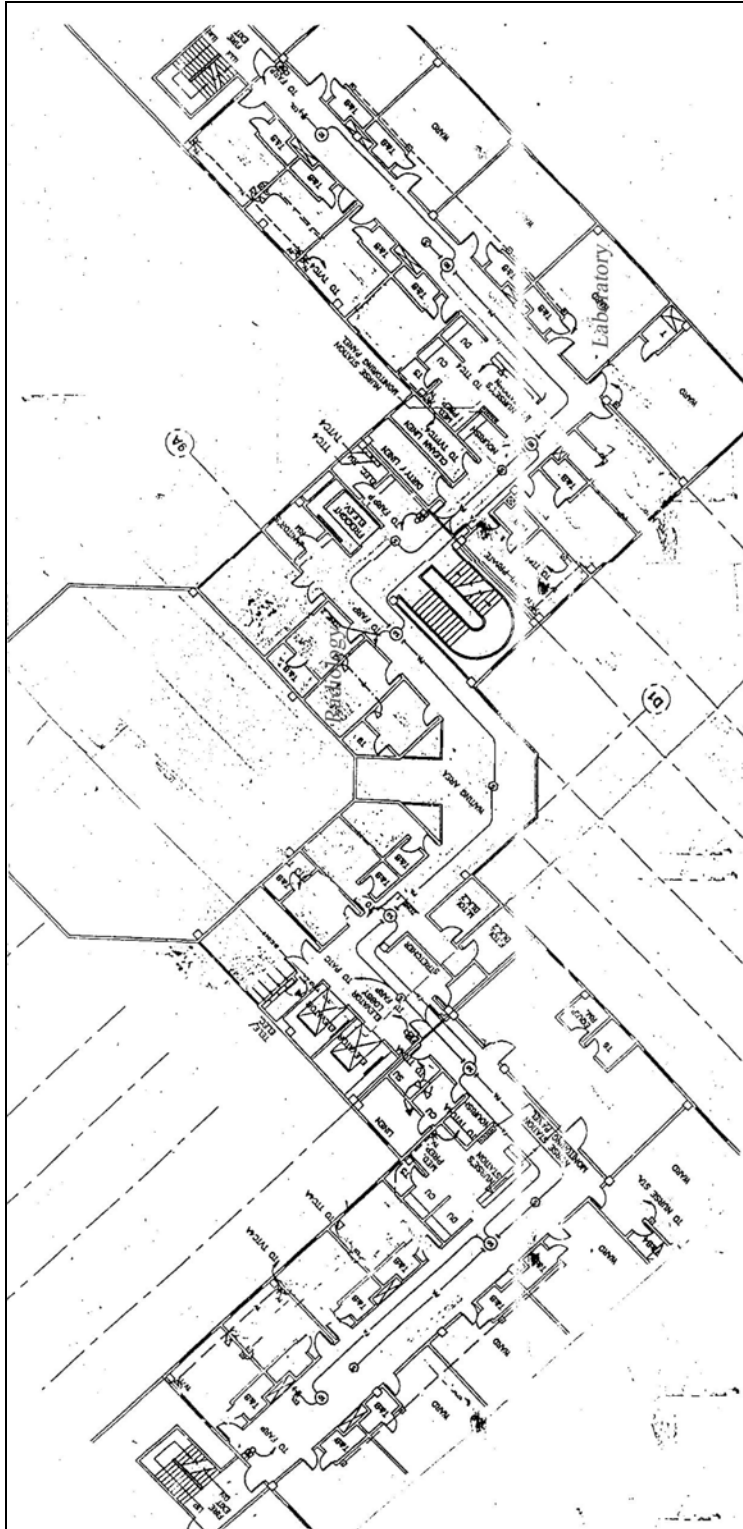


Figure Appendix-3 Second floor

MEASUREMENTS AND OTHER FINDINGS													
1. HEIGHT		62. WEIGHT		53. COLOR HAIR		54. COLOR EYES		55. BUILD SLIM () MEDIUM () HEAVY () OBESE ()		56. TEMP.			
57. BLOOD PRESSURE (mm at 1 foot level)						58. PULSE (4m at heart level)							
SIFTING	SYST.	RECUM.	SYST.	STANDING	SYST.	SITTING	AFTER EXERCISE	5 MIN. AFTER	REQUIR. BENT	AFTER STANDING			
59. DISTANT VISION				60. RE. REFRACTION				61. NEAR VISION					
RIGHT 20'	CORR. TO 20'			BY	S	CX	CORR. TO			BY			
LEFT 20'	CORR. TO 20'			BY	S	CX	CORR. TO			BY			
62. METROPHORIA (Specify distance)		ES	EX	R.H.	L.H.	PRISM DIV	PRISM	CONV	PC	PD			
63. ACCOMMODATION		64. COLOR VISION (Test used and score)				65. DEPTH PERCEPTION (Test used and score)		66. REFRACTION					
RIGHT	LEFT					UNCORRECTED		CORRECTED					
67. FIELD OF VISION		68. NIGHT VISION (Test used and score)				69. REF. LENS		70. BINOCULAR VISION					
71. HEARING		72. ALDIMEYER						73. PSYCHOLOGICAL AND PHYSIOLOGICAL (Test used and score)					
RIGHT HV	715 SV	715	250	500	1000	2000	3000	4000	5000	6000	7000		
LEFT HV	715 SV	715	250	512	1024	2048	3072	4096	5192	6384	7472		
74. NOTES (Circumstances) AND SIGNIFICANT OR INTERVAL HISTORY													
(Use circles to show defects or pluses, dots if necessary)													
74. SUMMARY OF DEFECTS AND DIAGNOSIS (List diagnoses with item numbers)													
75. RECOMMENDATIONS (FURTHER SPECIALIST EXAMINATIONS INDICATED BY SIGNIFY)								76. PHYSICAL PROFILE					
								P	I	L	H	E	S
77. EXAMINE <input type="checkbox"/> FIT FOR GENERAL MIL. SVC. <input type="checkbox"/> FIT OR LIMITED SVC. FOR U.S.S. <input type="checkbox"/> FIT FOR GEN. MIL. SVC. w/ WAIVER <input type="checkbox"/> UNFIT FOR GEN. MIL. SVC.								PHYSICAL SUFFIX					
78. IF NOT QUALIFIED LIST IRREGULARITY NO DEFECTS BY ITEM								R	F	D	O		
79. TYPED OR PRINTED NAME OF PHYSICIAN						SIGNATURE							
80. TYPED OR PRINTED NAME OF PHYSICIAN						SIGNATURE							
81. TYPED OR PRINTED NAME OF PHYSICIAN						SIGNATURE							
82. TYPED OR PRINTED NAME OF DENTIST OR PHYSICIAN (Indicate which)						SIGNATURE							
83. TYPED OR PRINTED NAME OF REVIEWING OFFICER OR APPROVING AUTHORITY										NUMBER OF ATTACHED SHEETS			

Figure Appendix-4b Back of Form 63-A

CLINICAL LABORATORY REQUEST

FBGH _____ (Date) _____

RANK / NAME: _____

UNIT / ADDRESS: _____

Figure Appendix-5 Clinical Laboratory Request Form

**HEADQUARTERS
FORT BONIFACIO GENERAL HOSPITAL, ASCOM, PA
"PHIC Accredited Health Care Provider"
Fort Andres Bonifacio, Marikina City**

Last Name	First Name	MI	Radiograph Nr
Rank	AFPSN	Br/Spec	Unit/Organization
Age	Height	Sex	Date
Examination Request		Requesting Medical Officer:	
Diagnosis Summary of Clinical Findings			
Radiograph Report			

Figure Appendix-6 X-Ray Request Form

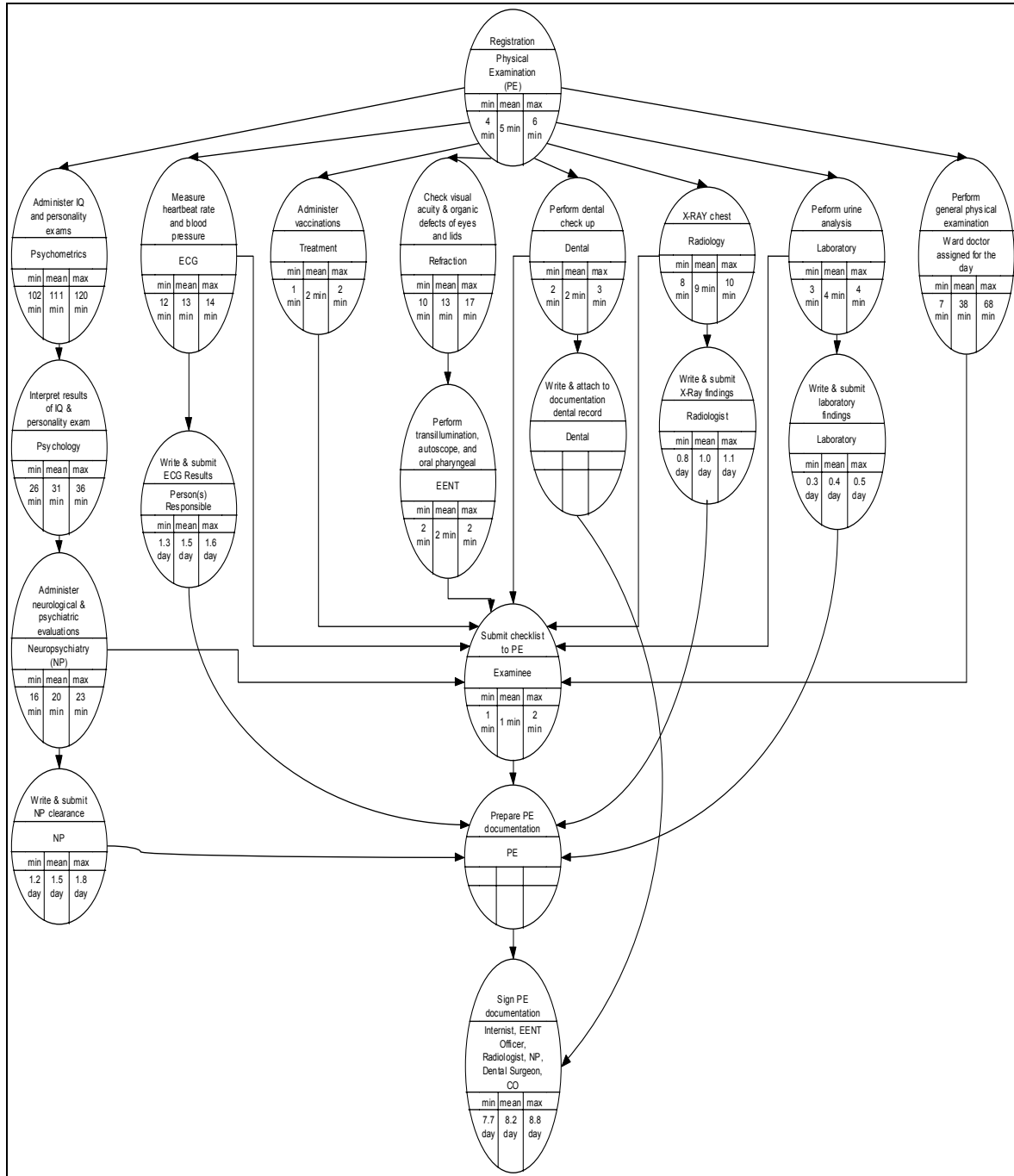


Figure Appendix-8 PERT Network of PE

Work Station No	Tasks Assigned	Task Time	Idle Time	% Idle	Number of Workers
1	1	6.90			
	2	161.03			
	5	19.48			
	6	3.07			
	7	18.63			
	8	2.63			
	9	3.35			
	11	5.33			
	Total Time: 220.42		4.58	2.04	
2	10	13.06			
	12	54.38			
	Total Time: 67.44		157.56	70.03	
3	3	44.71			
	4	28.28			
	13	1.63			
	Total Time: 74.62		150.38	66.83	1
Total Number of Workstations :			3		
Balanced Delay (%) :			46.30		

Figure Appendix-9 Present set-up solution from Design Tools 3.0

Work Station No	Tasks Assigned	Task Time	Idle Time	% Idle	Number of Workers	
1	1	6.90				
	2	161.03				
	5	19.48				
	6	3.07				
	7	18.63				
	8	2.63				
	9	3.35				
	10	13.06				
	11	5.33				

	Total Time:		233.48	6.52	2.72	
2	12	54.38				
	3	44.71				
	4	28.28				
	13	1.63				

Total Time:		129.00	111.00	46.25		

Total Number of Workstations :			2			
Balanced Delay (%) :			24.48			

Figure Appendix-10 Recommended solution of line balancing from Design Tools 3.0

References

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