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CLINICAL TRAINING ON ELECTROCARDIOGRAMS for the MINISTRY OF HEALTH

**PALESTINIAN HEALTH SECTOR REFORM AND DEVELOPMENT
PROJECT**

SHORT-TERM TECHNICAL ASSISTANCE REPORT

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ACRONYMS

ACS	Acute Coronary Syndrome
AF	Atrial Fibrillation
APC	Atrial Premature Complexes
CABG	Coronary Artery Bypass Grafting
ECG	Electrocardiogram
DM	Diabetes Mellitus
GP	General Practitioner
IHD	Ischemic Heart Disease
MOH	Ministry of Health
NCD	Non-Communicable Disease
OJC	On-the-Job Coaching
PHC	Primary Healthcare
PUD	Peptic Ulcer Disease
RBBB	Right Bundle Branch Block
SOC	Standards of Care
SOW	Scope of Work
STTA	Short-Term Technical Assistance
USAID	United States Agency for International Development

ABSTRACT

Through the Palestinian Health Sector Reform and Development Project (the Project), the United States Agency for International Development (USAID) has procured and installed electrocardiogram (ECG) machines for the the Ministry of Health (MOH) to be allocated in major primary healthcare (PHC) clinics in the northern West Bank districts (Nablus, Jenin, Tubas), covering a wide geographic area.

The objective of this consultancy was to provide additional support in ECG clinical training related to equipment previously procured, further capitalizing on interventions already conducted. The consultant also provided on-the-job coaching (OJC) as per the Standards of Care (SOC) at clinics, specifically ECG service for patients with non-communicable diseases (NCDs).

The training targeted nurses and doctors, and addressed proper placement of ECG electrodes, use of the machines as well as interpreting ECG results. Training on the proper ECG utilization at the PHC level should aid in easing the burden on the MOH secondary healthcare level.

The main objectives of this consultancy can be summarized by the following:

- To enhance the capacity of General Practitioners (GPs) and nurses working at the PHC directorate level and in the Champion Communities to properly utilize ECG machines.
- To improve the ability of GPs working at the PHC level to interpret ECG results
- To link ECG utilization with the relevant parts of the SOC.

The methods used include:

- Hall lectures for GPs on ECG interpretation (see *Annex E1. ECG Agenda*).
- Site visits to assist GPs to identify and select patients who are in need of ECG (see *Annex E2. ECG Schedule*)
- On-site nursing coaching on how to use and properly maintain the ECG machines.

SUMMARY OF RECOMMENDATIONS

The following recommendations are for MOH medical directors in each district.

- Improve ECG filing and documentation system.
- Carry out site visits for follow-up.
- Carry out simple preventive maintenance of the ECG machine.
- Ensure that all ECG machines are being used and utilized to the maximum.

The following recommendations are for the NCD coordinators in each district.

- Ensure comprehension and implementation of the course content.
- Start ECG courses.
- Start formulating a plan to expand care services.
- Improve ECG knowledge and interpretation skills.
- Plan to start ECG Training of Trainers courses.

SECTION I: INTRODUCTION

The Palestinian Health Sector Reform and Development Project is a five-year initiative funded by the U.S. Agency for International Development (USAID), designed and implemented in close collaboration with the Palestinian Ministry of Health (MOH). The Project's main objective is to support the MOH, selected non-governmental organizations, and selected educational and professional institutions in strengthening their institutional capacities and performance to support a functional and democratic Palestinian health sector able to meet its priority public health needs. The Project works to achieve this goal through three components: (1) supporting health sector reform and management, (2) strengthening clinical and community-based health, and (3) supporting procurement of health and humanitarian assistance commodities.

The Project provided 19 ECG machines to the MOH; nine units for PHC clinics in the Nablus and Salfit Directorates, and 10 were given to five MOH hospitals (Rafidia, Alia, Jenin, and Jericho). It was noted that many of the machines were seldom used due to a lack of ECG interpretation skills by the MOH staff. In response, this STTA assignment was carried out in order to:

- Train all PHC physicians on interpreting ECG in a systematic approach.
- Train PHC nurses on ECG tracing.
- Train PHC staff on how to maintain the ECG machine, and ensure that it is ready for use.
- Carry out periodic follow-up among trainees.

SECTION II: ACTIVITIES CONDUCTED

To address the objectives of this consultancy, the following stages were identified:

STAGE ONE

- ECG interpretation courses conducted at northern West Bank districts Nablus, Jenin and Tubas districts for PHC physicians.
- Bed-side coaching for nurses on ECG tracing

STAGE TWO

- Attending medical clinics with PHC physicians in order to identify candidates for ECGs, establish a diagnosis, proper ECG results documentation, filing of ECG and proper disposition of patients
- Nurses' training delivered via OJC and hands-on activities.

STAGE THREE

The results of the previous stages were refined and the enhancement process began through:

- Individual site visits to follow, explain and discuss the Project's intention to cooperate for enhancing the level of care provided and standards of care.

SECTION III: FINDINGS, CHALLENGES, RECOMMENDATIONS, AND NEXT STEPS

A. Findings

Two samples of clinic findings, one is satisfactory and the other is not.

Huwwara Clinic

1. Medical staff (physician and nurse)
 - a) Physicians: endocrinologist & GP
 - b) Three nurses
 - c) Excellent attitude
 - d) Willing to improve
 - e) Interested to learn
 - f) Motivated
 - g) Helpful and cooperative
 - h) Ready and prepared
 - i) Demanding another visit
 - j) Need training

2. ECG machine
 - a) Ready to function
 - b) Covered
 - c) Clean
 - d) No missing parts
 - e) Spare parts are available
 - f) Enough tracing papers
 - g) No razors (for chest hair removal)
 - h) Four ECG trace were done in two years

3. Location of ECG machine
 - a) Accessible
 - b) Clean and tidy
 - c) Privacy is ensured
 - d) Bed is high (need steps)
 - e) Fan is available

4. Filing system
 - a) Every patient has a separate medical file
 - b) The file contains pages for ECG trace results
 - c) ECG pages in patient's file were blank

5. Volunteers: patients with indications were selected for the ECG

- a) Jamal: 18 year old young man with history of Juvenile diabetes mellitus (DM). ECG showed **right bundle branch block (RBBB)**.
- b) Hamdeh: 70 year old patient, history of DM and hyperthyroidism. ECG showed **rapid atrial fibrillation (AF) and heart rate was 171/min**. Patient was transferred to hospital for rate control
- c) Najeh: 56 year old patient, history of ischaemic heart disease (IHD), underwent coronary artery bypass grafting (CABG). ECG showed no ST – T wave changes and occasional **atrial premature complexes (APCs)**. However there was not an old ECG available for comparison.
- d) Najah: 52 year old female patient, history of DM and peptic ulcer (PUD), complained of chest discomfort, ECG was **normal**.
- e) Roqaya: 50 year old patient, history of DM, complained of fatigue, ECG showed **T wave inversion in VI, V2, and V3**. Patient was started on aspirin, oral nitrate and was advised to attend a cardiology clinic for follow-up.

Oreef Clinic

1. Medical staff (nurses)

- a) Two nurses
- b) Excellent attitude
- c) Willing to improve
- d) Interested to learn
- e) Motivated
- f) Helpful and cooperative
- g) Ready and prepared
- h) Complainers
- i) No volunteers were there for the ECG
- j) Partially trained (need more)

2. ECG machine

- a) Was not ready to function (bulbs were not attached)
- b) Covered
- c) Clean
- d) No missing parts
- e) Spare parts are available
- f) Enough tracing papers
- g) No razors (for chest hair removal)
- h) Two ECG trace were done in two years

3. Location of ECG machine

- a) Accessible
- b) Clean and tidy
- c) Privacy is ensured

- d) Bed steps are available
 - e) Fan is available
4. Filing system
- a) Every patient has a separate medical file
 - b) The file contains pages for ECG trace results
 - c) ECG pages in patient's file were blank
5. Volunteers:
- a) No volunteers or patients were available
 - b) We had to call a young man" Ali" for an ECG recording, ECG showed incomplete RBBB, so patient was asked to have an echocardiography.

B. Challenges

Major challenges include lack of confidence among clinicians in using the ECG machines, as well as lack of supplies such as tracing paper and razors.

C. Recommendations

Facility Level Manager and Staff should:

- Create and maintain an ECG record that contains patient's demographic data and ECG findings.
- Keep and document correctly the ECG results in patient's file
- Carry out simple preventive maintenance of the ECG machine

District Level Medical Directors should:

- Carry out site visits and continuous follow-up
- Identify areas where training is needed.
- Ensure comprehension and implementation of the course content.
- Starting formulating an idea to expand care services particularly those related to cardiology problems such as acute coronary syndrome (ACS) and dysrhythmias.
- Facilitate knowledge, skills, and experience of the PHC physician by providing short term courses in MOH hospital's Critical Care Unit to prepare them for future plans.
- The Project should deliver hard copies of the most recent power point ECG lectures.
- Ensure that all ECG machines are being used and utilized (or re -allocate).
- Emergency crash cart should be installed at PHC clinics.

The MOH with support of the Project should deliver hard copies of the ECG lectures presented.

a) Next Steps

- Conduct ECG interpretation courses as soon as possible.
- Provide participants with ECG lecture slides and all web sites for ECG learning

- Coaching at relevant MOH hospital's cardiology units to improve PHC physicians' knowledge and skills.
- Ensure implementation and optimal utilization of the ECG machine.
- Keeping ECG records and documentation.
- Produce ECG posters as well as posters showing electrodes placement.

ANNEX A: SCOPE OF WORK

Short-Term Consultancy Agreement Scope of Work

SOW Title: Support Clinical Training on Electrocardiogram (ECG) Machines

Work Plan No: Technical , E. 08.

SOW Date: 3/20/2012

SOW Status: FINAL

Consultant Name: Dr. Mazen Abu Gharbieh

Job Classification: Short-Term Local Professional Consultant

Reporting to: Hazem Khweis, Bio-medical Engineering Support Manager

I. Project Objective

The Palestinian Health Sector Reform and Development Project is a five-year initiative funded by the U.S. Agency of International Development (USAID), and designed in close collaboration with the Palestinian Ministry of Health (MOH). The Project's main objective is to support the MOH, select non-governmental organizations, and select educational and professional institutions in strengthening their institutional capacities and performance to support a functional, democratic Palestinian health sector able to meet its priority public health needs. The Project works to achieve this goal through three components: (1) supporting health sector reform and management, (2) strengthening clinical and community-based health, and (3) supporting procurement of health and humanitarian assistance commodities.

The Project supports the MOH in implementing health sector reforms needed for quality, sustainability, and equity in the health sector. By addressing key issues in governance, health finance, human resources, health service delivery, pharmaceutical management, and health information systems, the MOH will strengthen its dual role as a regulator and main health service provider. The Project also focuses on improving the health status of Palestinians in priority areas to the MOH and public, including mother and child health, chronic diseases, injury prevention, safe hygiene and water use, and breast cancer screening for women.

II. Specific Challenges to Be Addressed by this Consultancy

A congressional hold on funding to the USAID/West Bank Gaza (WBG) mission since September 2011 has resulted in a reduction of activities and staffing. With the recent release of partial funding in late December 2011, the Project's technical activities can be supported by providing further training on ECG utilization and ECG results interpretation.

MOH identified a need to improve non-communicable diseases (NCDs) services at PHC level. The Project responded by developing and updating a number of protocols and guidelines, in Year 2, focusing on non-communicable diseases (NCDs), mother and child health, infection prevention, nursing care, as well as Standards of Care (SOC) for health centers' management that would ensure the unification of health services provision process and that the health center staff have the up-to-date and essential clinical guidance.

The SOC were produced to serve as a reference and a guide for service delivery and a tool to support performance improvement. ECG service is part of the regular follow-up for NCD patients. The Project responded by providing ECG machines to various PHC clinics.

III. Objective and Result of this Consultancy

The objective of this consultancy is to provide additional support in clinical training related to equipment previously procured, further capitalizing on interventions already conducted. Further it will serve to provide further on job coaching for part of the SOC at clinics, specifically ECG service for NCD patients.

The training will target nurses and doctors, hence will address proper placement of ECG electrodes, using the machines as well as interpreting ECG results. Training on the proper ECG utilization at the PHC level should aid in easing the burden on Secondary Healthcare level.

The main objectives of this consultancy can be summarized by the following:

- To enhance the capacity of General Practitioners (GPs) and nurses working at PHC directorate level and in the Champion Communities to properly utilize ECG machines.
- To improve the ability of GPs working at PHC level to interpret ECG results
- To link ECG utilization with the relevant parts of the SOC.

IV. Specific Tasks of the Consultant

Under this Scope of Work, the Consultant shall perform, but not be limited to, the specific tasks specified under the following categories:

A. **Background Reading Related to Understanding the Work and Its Context.** The Consultant shall read, but is not limited to, the following materials related to fully understanding the work specified under this consultancy:

B.

- Work Plans for year 1-4, highlight Y4.
- PHC Facility Levels Summary
- Most recent quarterly report

B. **Background Interviews Related to Understanding the Work and Its Context.** The Consultant shall interview, but is not limited to, the following individuals or groups of individuals in order to fully understand the work specified under this consultancy:

- Dr. Jihad Mashal, Deputy Chief of Party –Technical Programs
- Hazem Khweis, Biomedical Engineering Support – Manager
- Dr. Daoud Abdeen, Primary Healthcare Director
- Dr. Salem Jaraiseh, Quality Assurance Manager

C. **Tasks Related to Accomplishing the Consultancy's Objectives.** The Consultant shall use his/her education, considerable experience and additional understanding gleaned from the tasks specified in A. and B. above to:

- Prepare for and conduct formal training on the proper use, utilization and care of ECG machines for MOH's relevant health professionals
- Prepare for and conduct formal training as needed for MOH's General Health Practitioners on ECG interpretation by using different tools and methods to include but not limited to formal lectures, best practices approach, simulation etc.
- Plan for and perform on-job-training for GP(s) and nurses in different health facilities as required in full coordination with Project staff.

- Identify remaining gaps and address them through subsequent engagements
- In the event that new priority tasks are introduced during the consultancy, the consultant will work with the Project staff to revise the tasks and expected products to accommodate for the new priorities.
- In addition to the above-listed tasks, the Project welcomes additional contributions and creative ideas in support of the Project objectives.
- The consultant is encouraged to support the identification of additional STTA and scopes of work to help accomplish Project goals and objective where possible.
- The Consultant shall not provide advice or carry out activities that are, or could be construed as, the practice of medicine

V. Expected Products.

Within three days of the consultant's first day of work (unless otherwise specified), the consultant should provide the methodology for successfully completing the work (using Annex I: STTA Methodology). The substance of, findings on and recommendations with respect to the above-mentioned task shall be delivered by the Consultant in a written report, policy statement, strategy, action plan, etc. for submission to USAID (using Project-provided STTA report template provided in the Welcome Packet). A draft of this report is due no later than 3 business days prior to the consultant's last day of work and final no later than 7 business days after the consultant's last day of work. Please note that USAID requires a debrief to be scheduled prior to your last day.

1. Formal training materials and on job-training materials on ECG utilization and interpretation of ECG results based on most common cases in PHC.
2. Training materials, tools and presentations that the STTA will utilize to achieve the objective of the consultancy.

VI. Timeframe for the Consultancy.

The timeframe for this consultancy is on or about 4/16/2012 and will conclude on or about 12/31/2012.

VII. LOE for the Consultancy.

The days of level of effort are estimated to be **up to 15** days for work in West Bank. Unless otherwise specified, up to two (2) days may be allocated for preparation of the work and up to two (2) days upon conclusion of work in West Bank to complete the assignment.

VIII. Consultant Qualifications.

The Consultant shall have the following minimum qualifications to be considered for this consultancy:

Educational Qualifications

- Masters degree in related field or equivalent in experience

Work Experience Qualifications

- At least 10 years of experience in the field of medicine
- Experience with international standards development
- Familiarity with USAID and international experience

VII. Other Provisions.

This Scope of Work document may be revised prior to or during the course of the assignment to reflect current project needs and strategies.

Consultant: _____

Chemonics: _____

ANNEX B: ASSIGNMENT SCHEDULE

Date	Activities	Results	Remarks
April 11, 2012.	Course preparation meeting at USAID office, gathered Dr. Abdeen, Eng Hazem & Dr. Khaled Qaderi health director Nablus district and Nadera	<ul style="list-style-type: none"> • Courses dates were set • The target number of doctors to attend was set. • Course needs were identified • The scope of work was explained • Approach and methodology of the course was planned 	
April 23+24+25 th 2012	3 days ECG interpretation training Nablus	Evaluations available of my visit to the three PHC clinics at Nablus district (Jenin visit almost the same).	
May 29-30 2012	2 days follow-up visits to: 1 Day Sawyeh & Oreef clinic 1 Day Hiwarah clinic Nablus district		
June 27,2012	1 days ECG interpretation training Jenin		
June 28,2012	follow-up visit to 1- Jenin clinics at health directorate 2- Qabatya PHC Jenin district		
October 17, 2012	1 day ECG interpretation training Tubas	20 participants attended the course (2 Doctors from Jenin Hospital + 4 nurses from PHC + 14 PHC doctors)	

ANNEX C: CONSULTANT CV

Curriculum Vitae

Education and courses:

2012	AHA certified BLS instructor
2012	AHA certified ACLS instructor
2009-Dec 2012	Emergency physician consultant at flagship project
2005	Emergency Medicine Management at Johns Hopkins University/school of Public health. Baltimore-Maryland-USA
2005	ACLS instructor course – American Heart Association
2005	PALS instructor course – Johns Hopkins University
2005	Triage instructor course – Johns Hopkins University
2005	Emergency Medicine Education & Development Course – Johns Hopkins University
2003	Teaching Methodology Course in association with Juzoor society and the medical association
2001-Until now	Faculty Member Al-Quds University School of Medicine
2002-Until now	Member of Continued Medical Education at Makassed Hospital.
1995-Until now	Head of Emergency Department Makassed Hospital
1994	Completed residency program in Internal Medicine – Makassed Hospital
1987	Medical Internship at Jordan University Hospital
1986	MBBS Chittagong University – Bangladesh
1979	Secondary School Examination Certificate

Teaching experience

2013 2009	many BLS and ACLS courses with Juzoor upgrading ER at major west bank government hospitals through flagship project
2010	ER triage concept implementation in the main west bank government hospital ER through lectures and field training
2006	ACLS courses in cooperation with Welfare Association
2006 with	PALS courses with Arab American Physicians in association pediatric society and Juzoor Association
2006 with	ACLS courses with Arab American Physicians in cooperation Juzzor and Medical Association
2004 Tolkarm	Emergency Medicine teaching for physicians in cooperation with the medical association in Hebron, Ramallah, Nablus and
2003+04 in	Pre hospital Care Courses in cooperation with juzoor association Bethlehem, Hebron, and Jerusalem
2003 University	High Diploma program “emergency Medicine” Bethlehem
2003	13 courses in Emergency medicine, Triage and ACLS in Cooperation with Johns Hopkins University “EMAP1&2”
2000 – Present 2003 until now	ECG courses to different medical care institutions. More than 100 BLS and modified BLS courses.
2001-until now	Incharge and teaching Emergency Medicine at Al-Quds University School of Medicine
1989-1995	Educational teaching experience during the residency program

ANNEX D: BIBLIOGRAPHY OF DOCUMENTS COLLECTED AND REVIEWED

DI. Standards of Care.

ANNEX E: LIST AND COPY OF MATERIALS DEVELOPED AND/OR UTILIZED DURING ASSIGNMENT

- E1. ECG Agenda
- E2. ECG Schedule *
- E3. ECG Lectures *

*All materials developed and used are available on the Project server.

EI. ECG Agenda Topics

1. Heart anatomy and physiology
2. Heart conductive system
3. Identify normal sinus rhythm
4. Identify sinus tachycardia
5. Identify Sinus bradycardia
6. Identify the following dysrhythmias
 - a) Atrial fibrillation
 - b) A flutter
 - c) Nodal rhythms (supranodal, nodal and infranodal)
 - d) Paroxysmal supraventricular tachycardia
 - e) Multifocal atrial tachycardia
 - f) Ventricular tachycardia
 - g) Torsade pointes
 - h) Ventricular fibrillation
 - i) Identify different types of premature beats (atrial, nodal and ventricular).
7. Identify AV Block (1st degree, 2nd degree I, 2nd degree II and 3rd degree).
8. Recognize the ECG findings of cardiac ischemia and MI.
9. Identify left and right atrial hypertrophy
10. Identify left and right ventricular hypertrophy.
11. Recognize different types of heart axis.
12. Pacing (atrial, ventricular and dual chamber)