Health Technology
MANUAL

Improving the Integrated Management of Chronic Diseases at the First Level of Health Care Services

Pan American Health Organization

World Health Organization
REGIONAL OFFICE FOR THE Americas

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Washington DC, 2016

Prepared by:

Alberto Barceló, *PAHO - Washington, DC*

José Roberto da Silva Jr., *PAHO - Washington, DC / Instituto de Medicina Integral Prof. Fernando Figueira - IMIP, Recife, Brasil*

María Cristina Escobar, *Ministry of Health, Chile*

Naydene Williams, *Ministry of Health, Jamaica*

Ailton Alves, *Secretaría Municipal de Salud de Ribeirão das Neves - Minas Gerais, Brasil*

Sandra Delon, *Alberta Health, Canada*

Elisa Prieto, *PAHO - Washington, DC*

Faith Brebnor, *Ministry of Health, Trinidad & Tobago*

Johanna Segovia, *PAHO - Washington, DC*

With contributions from:

Ilta Lange, *Universidad Católica de Chile*

Noël Barengo, *Organización para la Excelencia de la Salud, Colombia*

Adriana Blanco, *PAHO - Washington, DC*

Deborah Kestel, *PAHO - Washington, DC*

Pedro Ordúñez, *PAHO - Washington, DC*

Silvana Luciani, *PAHO - Washington, DC*

Contents

List of Key Terms

A1c/HbA1c	Glycosylated or Glycated Hemoglobin
ADA	American Diabetes Association
BMI	Body Mass Index
BP	Blood Pressure
CCM	Chronic Care Model
CPG	Clinical Practice Guidelines
CVD	Cardiovascular Disease
DM	Diabetes Mellitus
DSME	Diabetes Self-Management Education
eGFR	Estimated Glomerular Filtration Rate
EKG	Electrocardiogram
Expected Effect (Component of Technology)	The outcomes anticipated based on the intervention being applied
FBG	Fasting Blood Glucose
GCR	Global Cardiovascular Risk
GDM	Gestational Diabetes Mellitus
HTN	Hypertension
IFG	Impaired Fasting Glucose
IGT	Impaired Glucose Tolerance
LDL-C	Low Density Lipoprotein Cholesterol
MOH	Ministry of Health
NCDs	Noncommunicable Diseases
OGTT	Oral Glucose Tolerance Test
PDSA Cycle	Plan-Do-Study-Act Cycle of Change Implementation

PEN	Package of Essential Noncommunicable Disease Interventions for Primary Health Care in Low-Resources Settings
PHC	Primary Health Care
PRC	Patient Record Card
Responsible Staff (Component of Technology)	Human resource personnel who will have a specific task identified in the Technology
Staff Persons	A staff member who may: provide overall leadership to the program, be responsible for organizing the tasks, and obtain buy-in from organizational leaders
Steps (Component of Technology)	The sequential order in which the intervention will be effected
Technologies	The sets of descriptions, expected effects, tools, tips, steps and named persons needed for the implementation of the particular intervention elected for improving chronic care
Tips (Component of Technology)	Any suggestions based on experience or evidence which would improve the success and ensure the integrity of the particular technology
Tools (Component of Technology)	Any instrument, document, guideline, or resource necessary to implement the intervention

Introduction

Care for persons with noncommunicable diseases (NCDs), such as cardiovascular disease, diabetes, cancer, and chronic obstructive pulmonary disease, is a major health priority for most countries worldwide, particularly for low-middle income countries where the problem seems to be worsening. Globally, research demonstrates that the vast majority of people with NCDs receive suboptimal care. Many people living with chronic conditions remain undiagnosed and unaware of their condition, while many others remain untreated or with inadequate control.[1] Meanwhile the premature mortality caused by NCDs remains high in many countries.[2] In response to the global epidemic of NCDs, the World Health Organization (WHO) launched the Global Strategy for the Prevention and Control of Noncommunicable Diseases in 2012, which establishes 9 voluntary global targets and indicators to be considered by Member States when formulating national plans to combat NCDs.[1]

The Pan American Health Organization's (PAHO's) Strategy for the Prevention and Control of Noncommunicable Diseases, ratified by the Directing Council in 2012, recommends the reorientation of health systems based on core principles of the integrated management of chronic diseases. These include providing training and capacity-building, as well as paying special attention to the integration of NCD prevention and control in the first-level of health care. Furthermore, the Plan of Action for the Prevention and Control of Chronic Diseases in the

Set of 9 voluntary global NCD targets for 2025

Premature mortality from NCDs 25% reduction

Harmful use of alcohol 10% reduction

Essential NCD medicines and technologies 80% coverage

Physical inactivity 10% reduction

Drug therapy and counseling 50% coverage

Salt/ sodium intake 30% reduction

Diabetes/ obesity 0% increase

Tobacco use 30% reduction

Raised blood pressure 25% reduction

Mortality and Morbidity
Risk Factors for NCDs
National Systems Response

World Health Organization

Americas (2013-2019) establishes objective 3.1, to improve quality of health services for NCD management. The indicator to monitor this objective is the number of countries implementing a model of integrated management of NCDs (e.g. chronic care model with evidence-based guidelines, a clinical information system, self-care, community support, and multidisciplinary team-based care).[3]

The Chronic Care Model

The Chronic Care Model (CCM), a framework aimed at improving the quality and the redesign of health services, was developed by Ed Wagner and colleagues from the MacColl Center for Health Care Innovation in Seattle, Washington (USA), during the 1990s. The model is based on the idea that our current health system represents the main barrier to effective management of chronic conditions. Our health system today is the result of an evolution of care models that were originally created in response to acute and episodic illnesses. The control of infectious diseases is still necessary, but these are ineffective care models to address chronic conditions, which currently account for a larger share of the burden of morbidity. Wagner et al. proposed an alternative organization framework, the Chronic Care Model, to support effective management of chronic conditions.[4] The CCM uses a systematic approach to restructuring the services for chronic conditions by creating partnerships between health systems and communities. The CCM proposes that for best results in the care of chronic diseases, a radical change is needed from traditional interventions directed at patients to interventions aimed at the different components of the health system. The CCM emphasizes the importance of six interrelated components to be addressed in order to improve the care of patients with chronic conditions. The
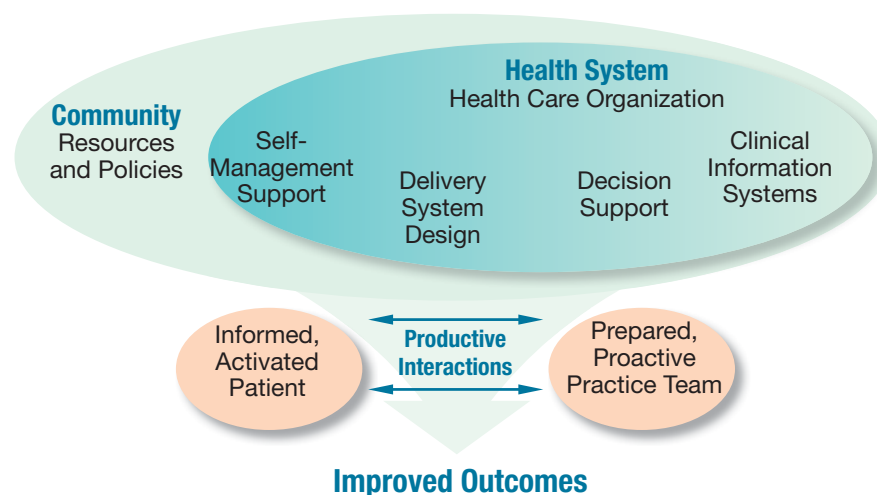
model has a practical approach and can be adapted to different organizational settings.

The Purpose and Use of the Manual

Guidelines and protocols are published aiming to assist in the treatment of various chronic diseases. For the most part, the guidelines are disease-oriented and reflect a reactive approach to handling the challenge of chronic diseases, generally offering direction on how to treat the patient as the problem arises. This manual reflects a more modern, comprehensive, unified, proactive, prevention-focused and population-directed approach to the delivery of care as it relates to chronic diseases. It embodies a public health perspective that emphasizes the role of prevention and health preservation through the continuum of care. Such care

encompasses goal setting and progress measurements from the individual receiving health services to the provision of health services on behalf of health care facilities or the community.

The manual outlines steps to implement key interventions identified as having a more effective impact on chronic care delivery. The interventions were selected based on observed gaps through situation analyses and expert advice based on the best evidence available. PAHO recently created a document outlining the most effective strategies to improving chronic care, based on the CCM.[5] The interventions have been selected from this publication.

An attempt was made to choose key actions and thus develop various interventions from the six different components of the Chronic Care Model. The expectation is that if the key interventions are implemented using the technologies developed (see List of Key Terms), the health care services will indeed improve their capacity to provide an even higher quality of care for persons with or at risk for noncommunicable diseases. The technologies included in this manual are recommended for improving care for patients with diagnosed NCDs, as well as for promoting healthy habits and providing screening of risk factors among those apparently healthy individuals visiting health centers for any reason. Suggested use: It is suggested that the facilities choose interventions that are relevant, applicable, implementable, and presumably cost-effective and sustainable. It is also suggested that a relevant intervention from each component of the Chronic Care Model is identified and implemented at the same time in order to improve the care delivered by the health care facility, resulting in positive changes in patient outcomes as well as process measures. There is evidence that all CCM components are equally fundamental; however, a synergistic effect is evident when the components are interconnected and coordinated. Therefore, it is recommended to implement the technologies from all components.

The manual is not meant to replace country or regional guidelines; neither does it speak to specific therapy. Rather it is a guide to achieve general improvements in health care delivery by systematically applying strategies aimed at health promotion, disease prevention and control, capacity improvement for patients and the health care team, as well as global risk reduction.

The manual is meant to be user-friendly, feasible (in both resource-constrained facilities and other contexts), as well as dynamic.

Based on further situation analyses, it is expected that new technologies will be developed in the future and will be continuously and systematically included in the manual over the ensuing years. The manual is predominantly designed around the management of diabetes mellitus and hypertension in first-level health care facilities, which are the most prevalent chronic diseases in the region. The manual may also be adapted and utilized in the management of other chronic diseases and in other clinical contexts. An example of this is cancer screening, as it is an important aspect of NCD management in the first level of care, especially for cervical, breast, and colorectal cancer. However, the guidance or key steps to implementing such interventions are not included in this manual.

Aim

To provide step-by-step instructions for the implementation of actions designed to improve the quality of care for people with chronic diseases in first-level health care facilities, as well as prevent or reduce the risk of developing chronic diseases or risk factors by promoting healthy lifestyles in the population.

Methodology

This manual was drafted after several meetings, consultations, situation analyses, and evaluations of various interventions as well as assessments of the best existing practices.

Various models of chronic care were explored. The Chronic Care Model was deemed most applicable to the context of chronic disease care in the Region of the Americas. This model was used as the template to build strategies for the improvement of chronic care delivery. The most effective strategies and key interventions were selected and chronicled after several consultations and meetings with experts involved in chronic disease care across the region, as well as assimilation of best practices emerging from the application of the Chronic Care Model to chronic care delivery.

Based on these identified key interventions, technologies (step-by-step guidelines for the implementation of the particular intervention) were developed.

The PAHO draft format for these technologies was crafted based on various tools which were reviewed.

The components of the technologies are:
- **Concept:** description and basis of the technology
- **Expected Effect:** anticipated outcome after implementing the technology
- **Steps:** a series of measures to take in implementing the technology
- **Tools:** instruments, devices, documents, or references needed for the implementation of the technology
- **Responsible Staff:** suggestion of those who will be involved in the implementation of the technology
- **Tips:** insight on strategies for easier implementation based on the experience of other groups and recommendations

The technologies developed were grouped according to their association with the components of the Chronic Care Model.

The manual has been designed to facilitate further inclusions of technologies in the future.

It is expected that with continuous application of this manual in different health settings, many countries will achieve most of the global NCD targets set by the World Health Organization for the year 2025.

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Health Care Organization

This component of the Chronic Care Model is about ensuring that professionals within the organization have the motivation, support, and resources to redesign the health system that provides services for patients with chronic diseases.

The Evidence   (Annex 1)

Element	Quality of Evidence
Nutrition therapy referral.	High[1-2]
Overt CVD: Target LDL-C <70 mg/dl (1.8 mmol/l).	High[3]
Target A1c <7% in patients with diabetes.	Moderate[4-6]
Target LDL-C <100 mg/dl (2.6 mmol/l) in patients with diabetes.	Moderate[7]
Target BP <140/80 mm Hg in patients with diabetes.	Moderate[8-10]

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Technology: Monitoring of practice process and outcome measures in diabetes mellitus

Concept/Description:
A mechanism for evaluating the quality of diabetes care delivery through an assessment of patient care process and outcome measures, according to established guidelines. Better diabetes care generally translates to better health care[1], better quality of life, and reduced risk for long-term complications and disability.

Expected Effect:
1. Increased use of guidelines.
2. Health care providers would be appraised of the impact (improved outcome) of their interventions through the use of guidelines.
3. An increase in the proportion of patients with glycemic control: A1c <7%.
4. Reduced cardiovascular risk: BP, glycemic control, kidney function, BMI.
5. Early detection of diabetes complications (e.g. eye, foot, kidney, peripheral vascular disease, cardiovascular disease).
6. General improvement in health care delivery within health care facilities.

Steps		Tools	Responsible	Tips
1.	Circulate clinical guidelines within the health center.	Selected guidelines. Example: the ADA Clinical Practice Guidelines.[2]	Administrative management. Physician specialist.	Hold training sessions on the circulation of guidelines. Post wall and pocket guidelines.
2.	Evaluate the use of the guidelines by clinical staff within 3 months of circulation.	Simple question and response form.	Administrator.	Users should indicate challenges with guidelines on the response forms.
3.	Review patient charts that have laboratory tests requested (e.g. lipids, creatinine, A1c).	Patient charts. PRC.	Clinical management. Nurses.	Annual audit (chart review: once per year). Target sample proportion of 40% in large and 100% in small facilities is suggested.
4.	Review patient charts to determine if actual results or reports have returned.	Patient charts.	Physicians. Clerk.	Results should be actively sought if they have not arrived on time.
5.	Review patient charts for evidence of particular exams: foot, eye, BP, BMI.	Patient charts.	Physicians. Nurses.	Nurses and nurse assistants should be trained for foot examination to assess ulcer risk.
6.	Determine the proportion of patients who have achieved metabolic control [i.e.: A1c <7%/FBG <130 mg/dl, lipid control LDL-C <100 mg/dl (2.6 mmol/l), BP <140/80 mm Hg, and who are without complications[2]].	Patient charts.	Physicians. Nurses. Clerks.	Target goal of >50% of patients with A1c <7% is suggested. In patients with overt CVD, LDL-C target <1.8 mmol/l.

7.	Determine the proportion of patients who are involved in self-monitoring of glucose.	Simple patient response form.	Clerk. Nurse manager.	
8.	Determine the proportion of patients who are smokers.	Patient charts.	Clerk. Nurses. Physicians.	Smoking history should reflect past and current use.
9.	Determine the percentage of smokers: • Referred to a smoking cessation program. • Enrolled in a smoking cessation program. • Who have been advised on smoking cessation. • Who are trying to quit. • Who have quit.	Patient charts. Referral forms. Local tobacco guidelines.	Administrator. Physicians. Nurses. Researcher/clerk.	PHC facilities should be aware of smoking cessation programs. Smoking within 1 year draws the same cardiovascular risk.
10.	Calculate the proportion of patients who attended a self-management education session within the last year.	Simple patient response form.	Nurse manager.	The patient may attend external DSME sessions.

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2. American Diabetes Association. Standards of medical care in diabetes. Diabetes Care. 2014;37:1.January 2014.

Technology: Monitoring of practice process and outcome measures in hypertension

Concept/Description:
A mechanism for evaluating the quality of health care delivery through assessment of process and outcome measurements of care for the patient with hypertension according to established guidelines.[1]

Expected Effect:
1. Clinician's use of the guidelines would be increased.
2. Health care providers would be appraised of the impact of their interventions through the use of guidelines.
3. An increase in the proportion of persons with blood pressure control: <140/90 mm Hg.
4. Early detection of hypertension complications (e.g. renal failure, heart failure, stroke).

Steps		Tools	Responsible	Tips
1.	Circulate the guidelines within the health center.	Selected guidelines.	Administrator.	Hold training sessions on circulation of guidelines. Post wall and pocket guidelines.
2.	Evaluate the use of the guidelines by clinical staff within 3 months of circulation.	Simple question and response form.	Administrator.	Users should indicate challenges with guidelines on the response forms.
3.	Review patient charts for evidence of requested lab tests (e.g. creatinine, lipid profile: LDL cholesterol, triglycerides).	Patient charts.	Clerk. Nurse manager.	Frequency depends on guidelines.
4.	Review of patient charts to determine if actual results or reports have been received.	Patient charts.	Physicians. Clerk.	Results should be actively sought if they have not arrived on time.
5.	Calculate the proportion of patients whose BP is recorded during clinic visits.	Simple patient response form.	Clerk. Nurses.	
6.	Determine the proportion of patients with hypertension control (BP <140/90 mm Hg).	Patient charts.	Physicians. Nurses.	Target goal of >50% is suggested. Annual chart review if possible.
7.	Determine the proportion of patients with hypertension who have cut salt intake.		Nurses.	
8.	Determine the proportion of patients who are smokers.	Patient chart. PRC. CCP.	Clerk. Nurses. Physicians.	Smoking history should reflect past and current use.

9.	Determine the percentage of smokers: • Referred to a smoking cessation program. • Enrolled in a smoking cessation program. • Who have been advised on smoking cessation. • Who are trying to quit. • Who have quit.	Patient charts. Referral forms. Local tobacco guidelines.	Administrator. Physicians. Nurses. Researcher/clerk.	PHC facilities should be aware of smoking cessation programs and strategies. Patients should always be asked about smoking. Basic advice should be given to smokers.
10.	Calculate the proportion of patients who have attended a self-management session within the last year.	Simple patient response form.	Nurse manager.	

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Technology: Training the health care team to manage chronic conditions

Concept/Description:
Training a multidisciplinary team who communicate among each other regularly about the care of a defined group of patients and participate in that care, while they are simultaneously being trained in educating patients in self-management, and in longitudinal patient-centered care.[1]

Expected Effect:
1. Improved quality of care and health outcomes.
2. Reduced health care costs due to more efficient use of resources.
3. An expansion of skill sets of the health care team to provide effective care for chronic conditions.

Steps		Tools	Responsible	Tips
1.	Create a health care team responsible for the care of chronic conditions based on available resources and patient profile.	Preparing a healthcare workforce for the twenty-first century (WHO).[1]	A clinical professional in a management position.	Team should include (if available): 1. A nurse. 2. A medical doctor. 3. A medical specialist. 4. A social worker. 5. A dietitian. 6. A health educator. 7. A pharmacist. 8. A physical therapist. 9. A psychologist. 10. A community health worker.
2.	Plan monthly workshops to strengthen team members' competencies. Competencies include: • Patient-centered care activities (e.g. interviewing and communicating effectively, supporting self-management). • Partnering with patients, providers, and community. • Quality improvement. • Information and community technology. • Public health perspective.	Preparing a healthcare workforce for the twenty-first century (WHO).[1] Activities or courses (with certification or diploma status), on-line or in-person, delivered by universities, medical or scientific entities, MOH, or PAHO.	Health center manager.	Workshops planned with team members should include courses, clinical sessions, and dissemination of clinical guidelines. Workshop components should be easily available via web or hard-copy for the health care team. Workshop participants should be periodically evaluated on gained skills/knowledge; could use online evaluations or comprehensive tests. This would be useful for quality improvement.
3.	Train the team to coordinate pre- and post-visit meetings. Organize parameters within which the meeting will be conducted.	The planned visit technology.	Health center manager.	The design of the planned visit would vary according to the disease.

4.	Assign roles and responsibilities to each team member.	A list of composition and roles of the team.	Health team leader for chronic disease care.	Delegate responsibilities according to aptitude.
5.	Design a coordination mechanism among team members to assure quality of care.		Medical specialist (may be off-site) Senior nurse.	Meet at least once a week to discuss different groups of patients.

Examples of Roles and Responsibilities of the Health Care Team Members

Health Team Member	Roles	Responsibilities
Health Educator.	These individuals focus their educational efforts in health promotion and disease prevention activities. They provide adequate information to the client to assure an understanding of the medical problem and treatment plan.	Design and promote messages, fliers, or posters reflecting the particular focus of the health center, using language and graphics that are easy to understand and acceptable.
Community Health Worker.	These individuals connect health care providers with persons in need of care, as well as promote health concepts, particularly to persons with low health care access.	Perform home visits to assess medication and diet compliance as well as general well-being.

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Technology: Quality of care improvement

Concept/Description:
Framework for developing, testing, and implementing changes in current methods that will lead to improvement. The model consists of two parts that are of equal importance: "thinking" and "doing" based on the PDSA cycle.[1]

Expected Effect:
1. Improved quality of health care delivery using a simple approach.
2. A closure of health care delivery gaps identified in the particular health setting.
3. Successful quality improvement on a small scale with minimization of risk, therefore creating a template for larger-scale implementation.
4. An opportunity developed for planning, developing, and implementing change.
5. The development of a skill set which will be universally applicable.

Steps		Tools	Responsible	Tips
1.	Determine specific targets of the improvement strategies.	Health center reports on chronic care.	Health team leaders.	Health care team should initially identify goals of improvement.
2.	Set parameters of change and determine how it will be measured.	Quality improvement measurement.	Health team leaders.	Choose an indicator that is measurable and a true reflection of the status of the element being evaluated. Indicators may reflect health care structure (referral, number of medical visits), process (number of educational activities, foot or eye exam during the previous year), or patient outcomes (development of complications).
3.	Measure the selected parameter as a baseline.	Patient charts. Instruments in the health facility.	Health team leaders.	Ensure adequate documentation.
4.	Implement specific strategies.	PDSA cycle.	Health provider responsible for chronic care.	There should be evidence that the strategy chosen will result in the identified target.
5.	Re-measure the specific indicator.	Patient charts. Instruments in the health facility.	Administrative and appropriate providers of the health team.	A comparison before and after implementation should be made, and the extent, impact, and cause of the difference (if any) should be evaluated, although there may be no difference.
6.	Identify factors which facilitate or impede the success of a particular strategy, then strengthen or negate as applicable.		Health team leader. Nurse manager. Administrator.	
7.	Repeat the strategy for improvement and re-evaluate the target.		Health team leader.	

8.	The results of the entire quality improvement exercise should be discussed with the health team and stakeholders.		Quality improvement process leader.	Any identified factors that mitigated the quality of care initially or along the process should be documented as elements to be actively avoided.
9.	Repeat the cycle as needed to reach the desired target or outcome.			

The PDSA Cycle

Act
- What changes are to be made?
- Next cycle?

Plan
- Objective
- Questions and predictions (why)
- Plan to carry out the cycle (who, what, where, when)

Study
- Complete the analysis of the data
- Compare data to predictions
- Summarize what was learned

Do
- Carry out the plan
- Document problems and unexpected observations
- Begin analysis of the data
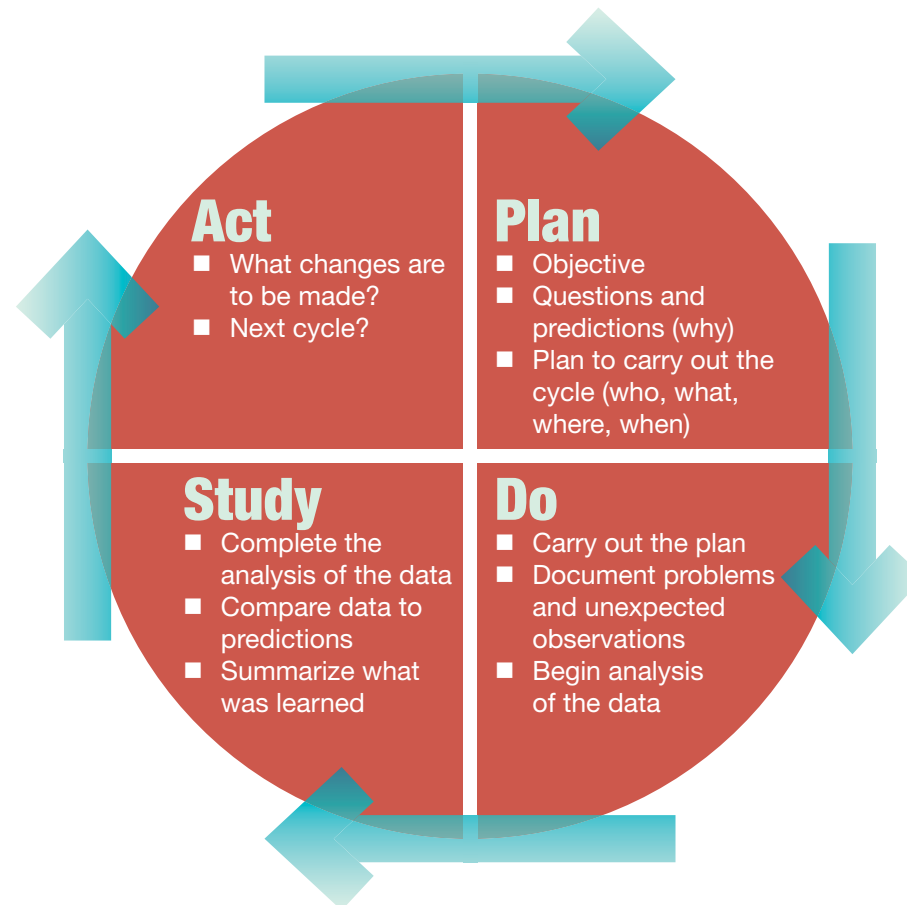
PDSA worksheet

Aim: Overall goal you wish to achieve.
Example: To include the use of a self-management goal form in clinic visits.
Tip: Objectives need to be clearly defined (specific, measurable, action-oriented, realistic, and time-bounded). Every goal will require multiple, smaller tests of change.

Describe your first (or next) test of change:	Person responsible	When to be done	Where to be done
1. Testing acceptability and usefulness of self-management goal sheet for patients in the primary health care facility.	Clinical manager.	Time zero. First Visit.	First-level health care facility.
Plan	Physician & nurse.	1 month.	First-level health care facility.
2. Identify the self-management goal sheet that will be used (obtain team consensus).			
3. Pilot test the form on three patients.			
4. Have the nurse, provider, and 2 other health team members comment on the form.			
5. Predict what will happen when the test is carried out.			
6. Identify measures to determine if prediction succeeds.			
Do	Charge nurse.	3 months.	First-level health care facility.
7. Distribute the self-management goal form (see form on the next page) in the clinic.			
Study	Physician & nurse.	4 months.	First-level health care facility.
8. Describe what actually happened when you ran the test.			
9. Describe the measured results and how they compared to the predictions.			
Act	Physician & nurse.	6 months.	First-level health care facility.
10. Describe what modifications will be made to the plan for the next cycle from the lessons learned. Implement the modified plan.			

Self-management goal form

My Healthy Lifestyle Goals	Date	Reached	
		Yes	No
1.			
2.			
3.			
4.			
5.			

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Technology: Specific risk factor intervention for obesity

Concept/Description:
Obesity is a major and common risk factor for most chronic noncommunicable diseases. It is defined as BMI >30 kg/m^2 and increases the relative risk of cardiovascular morbidity and mortality, hypertension, and diabetes as well as many cancers. Recognition of its existence, implementation of exercise prescription, and dietary advice are essential to managing this far-reaching risk factor.[1]

Expected Effect:
1. Patients with this particular risk factor will be easily identified through the development of an obesity registry.
2. The patient's progress will be tracked.
3. Average BMI of the clinic populations will reduce.
4. Morbidity and mortality from NCDs will significantly lower due to reduction in the prevalence of obesity and improved control of chronic diseases.
5. Patients will be self-empowered and motivated to reduce their BMI.

Steps		Tools	Responsible	Tips
1.	Perform initial BMI screening of all patients visiting the health center and document the BMI calculation on the patient's chart.		Front desk receptionist. Nurse.	The initial BMI calculation will inform the medical provider if the patient is at risk for obesity and, therefore, qualifies for the intervention. Patients with BMI >30 kg/m^2 should be selected for the intervention.
2.	Inform patients of intervention to improve their health through weight management.	Phone calls. Text messaging. Posters.	Nurse manager or physician.	Increasing awareness potentially initiates behavior change through pre contemplation.
3.	Identify patients with BMI >30 kg/m^2 based on last visit from the patient registry and create a registry for this intervention.	PRC. Patient registry.	Nurse. Clerical assistant.	Recognize that the BMI may fluctuate. Patients should be advised that they are being contacted based on results of their last visit.
4.	Contact the identified persons; invite them to the health center individually or as a group visit or select the scheduled clinic visit for this activity.	Text messaging. Letter. Obesity patient register.	Clerk. Nurse manager.	
5.	Establish the diagnosis and extent of obesity (BMI, waist circumference); document complications of obesity (osteoarthritis, obstructive sleep apnea, hypertension, diabetes, fatty liver, depression*, heart disease, stroke, gallstones, and cancers) and comorbidities.	Weight and height scale, tape measure, BMI chart (Annex 2). Depression risk tool*.	Nurse assistant. Charge nurse. Physician.	Do BP measurements, FBG or A1c measurements, lipid profile (particularly LDL-C and triglyceride), and renal function. Remember the hormonal causes of obesity (e.g. hypothyroidism, polycystic ovarian syndrome, cushing syndrome).

6.	Evaluate risk and group the patients according to the risk level. (Obesity stage, comorbidities, BP, cholesterol profile, smoking, physical inactivity, hyperglycemia, and family history of premature heart disease affect risk.)	Patient charts. BMI chart. PRC. WHO/ISH risk tables (Annex 3).	Weight management specialist. Physician. Nurse.	Smaller groups are more impactful for educational activities and measuring the impact of an intervention. Refer for consultation as necessary.
7.	Educate patients about facts on obesity, the causes, the impact and risk for NCDs and its complications, possible interventions, the benefits of even modest weight loss, the need for a long-term strategy, and treatment options.	Patient charts. Educational tools. Patient take home material.	Behavioral counselor.	It is important for patients to understand how lifestyle modifications can influence success in weight management. Patients are educated depending on their stage in the behavioral change continuum.
8.	Set and strive for target BMI goals (also waist circumference and weight goals) with patients who are aware of their risk and agree to target goals.	BMI charts. CCP.	Behavioral counselor. Physician.	The color correlation on various BMI charts helps reinforce patient self-monitoring and target goals.
9.	Write exercise prescription or referral, if possible, to an exercise trainer or similar provider. Include the type, frequency, duration, and goals of exercises.	Exercise prescription template. Patient profiles.	Exercise chronic care specialist.	The exercise prescribed has to be affordable, acceptable, and accessible. Comorbidities should be considered.
10.	Advise patients to adjust lifestyle in addition to weight loss: healthy eating plan, watching portion size, fresh meats, low fat, low caloric diets.	Menu plans. Shopping tips. Food Exchange List (Annex 4).	Dietitian. Nurse. Physician.	
11.	Refer to nutritionist for dietary management and bariatric surgeon if indicated and available.	Referral form. Lists of consultants.	Nutritionist.	Consider bariatric surgery if BMI[2] is >40 kg m^2.
12.	Reassess impact of interventions monthly.	Weight scale. Tape measure. BMI chart.	Charge nurse. Nurse assistant.	Determine challenges with the intervention.

Recommended targets in the management of obesity include:

1. BMI <25 kg/m^2
2. Waist circumference <100 cm (40 inches) men, <90 cm (35 inches) women
3. Weight loss 1-2 kg/week over 6 months

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Technology: Nutritional intervention for medical services without nutritionist

Concept/Description:
Healthy nutrition is a major factor in the prevention of chronic diseases and in the management of diabetes, hypertension, and other chronic diseases.

Expected Effect:
1. An improvement in the patient's self-management capacity regarding nutrition.
2. A decline in the prevalence of obesity.
3. An improvement in control of diabetes, hypertension, and other chronic diseases.
4. A reduction in the prevalence of chronic disease complications.

Steps		Tools	Responsible	Tips
1.	Provide a short nutrition questionnaire to all patients visiting the health center, regardless of consultation reason, and attach to the patient's chart for the medical team.	Nutrition questionnaire (see Example on next page); show card to be developed locally.	Front desk receptionist.	This will help identify individuals with poor nutrition habits to further recommend nutritional intervention.
2.	Determine the status of the patient (e.g. diagnosis of obesity, hypertension, diabetes mellitus, hypercholesterolemia, and BMI).	Patient Record Card. BMI chart. Passport to Healthy Lifestyle.	Nurse manager.	All patients with diabetes should be referred for medical nutrition therapy.
3.	Review the patient's short nutrition questionnaire and assess the patient's eating habits. Ask the patient to complete a food diary for a week.		Nurse. Patient.	The patient should include snacks.
4.	Calculate nutritional requirements based on disease profile, BMI, and level of physical activity.	Local nutritional protocol.	Physician.	If BMI <19 kg/m^2 30-50 calories/kg If BMI 19-24 kg/m^2 30-40 calories/kg If BMI >24 kg/m^2 20-25 calories/kg
5.	Provide a food exchange list which is based on locally available foods and explain it to the patient.	Food Exchange List (Annex 4).	Nurse.	The Food Exchange List in the Passport to Healthy Lifestyle may be used as a base but should be expanded according to the context.
6.	Prepare a meal plan based on the calorie calculation.	Calculator. Passport to Healthy Lifestyle.	Physician. Nurse. Health educator	The caloric intake should be fairly balanced through the day. A general suggestion is that one should have 3 main meals and 3 small snacks distributed through the day.

7.	Advise patients to eat 5 servings of fruits and vegetables per day. Advise on proportion size for various food types and the nature of the various food types.		Public health nurse.	
8.	Stress the need for the reduction of salt intake.		Public health nurse.	Teach patients how to assess sodium content by reading food labels. Educate patients to choose right foods and snacks by reading food labels.
9.	Agree on changing eating patterns depending on the results of the evaluation from the food diary, calorie calculation, and meal planning.	Passport to Healthy Lifestyle.	Nurse in charge.	The meal plan agreed upon is entered in the passport or patient diary.
10.	Make recommendations for available and affordable fruits and vegetables to assist in the decision-making for healthy food intake.	Local Meal Exchange Chart (Annex 4: Food Exchange List).	Public health nurse. Diabetic educator.	Seasonal fruits and vegetables should be identified and suggestions made for different seasons.
11.	Refer to a nutritionist if necessary.	Referral form.	Nutritionist.	

Example of a Short Nutritional Questionnaire[1]

1	In a typical week how many days do you eat fruits?	
2	In a typical week how many days do you eat vegetables?	
3	In a typical week how many meals do you eat outside the house?	
4	Do you regularly add salt to your food at the table?	Yes ☐ No ☐
5	What type of oil or fat is most often used for meal preparation in your household?	Vegetable ☐ Lard or suet ☐ Butter ☐ None ☐ Other ☐ Which?_____

People not eating fruits and vegetables on a regular basis, adding salt to the food plate, and preparing food with animal fat are at higher risk of becoming obese and developing NCDs and are eligible for this intervention.

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Delivery System Design

The design of the service delivery system entails organizing health care staff, scheduling appointments, and providing other services to ensure that all patients receive evidence-based planned care.

The Evidence

Element	Quality of Evidence
Good glycemic control reduces microvascular complications in patients with diabetes.	**High**[1-3]
Asking about lifestyle habits.	**High**[4-5]
5% body weight decrease in patients with BMI >25 kg/m^2.	**High**[6-8]
Aerobic activity: 30 min/day for diabetes prevention.	**High**[9]
Resistance training: 2 x/week for diabetes prevention.	**High**[10]
Foot examination for patients with diabetes.	**Moderate**[11]
Target BP <140/80 mm Hg for patients with diabetes.	**Moderate**[12-14]
Ophthalmology exams for patients with diabetes.	**Moderate**[15]
Patient education: foot care.	**Moderate**[11]
Screening and treating CVD risk factors.	**Moderate**[16-17]
Fiber: 14 g/1,000 calories.	**Moderate**[18-19]
Influenza vaccination: patients with diabetes >6 months of age.	**Low**[20-22]
Pneumococcal vaccine: patients with diabetes >2 years of age.	**Low**[23]
Hepatitis B vaccine: patients with diabetes 19-59 years of age.	**Low**[24]

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Technology: Risk stratification, population management

Concept/Description:
A system that classifies or stratifies a patient population by level of risk, allowing the most qualified clinical personnel to dedicate more time to patients with the highest level of risk for complications or severe disease. The risk stratification guides the pyramid of care.

Expected Effect:
1. The development of a needs- or risk-based approach to care for those with chronic diseases.
2. More efficient use of scarce resources (human and physical).
3. Improved self-care support for patients with well-controlled and stable conditions.
4. Regular contact with multidisciplinary team to ensure effective management of patients with fairly controlled conditions.
5. Use of a case-management approach to anticipate, coordinate, and link health and social care for patients with complex conditions.

Steps		Tools	Responsible	Tips
1.	Organize clinic visits according to risk and available resources.		PHC team: Nurse or Physician.	Define frequency of visits according to resources and Clinical Practice Guidelines. Suggested frequency of encounters.
2.	Classify patients according to risk and disease profile and level of control, examples as follows:	Risk Stratification Pyramid. WHO ISH risk tool.[1]	PHC team: Nurse or Physician.	
	Level 1 Classify patients with DM or HTN as Well Controlled (usually meeting goals): A1c <7%/ FBG <130 mg/dl (7.2 mmol/l) or BP <130/80 mm Hg or GCR <10%	Risk Stratification Pyramid. Global Cardiovascular Risk Assessment tool. WHO ISH risk tool.[1]	PHC team: Nurse or Physician.	Level 1. Available health care provider visit at least once a year. Consider adding one group visit. Available resources will guide the choice of the tool.
	Level 2 Classify patients with DM or HTN as Poorly Controlled: A1c 7-9% or FBG 130-199 mg/dl (7.2-11.0 mmol/l)/ BP<140/90 mm Hg; GCR <30%		Nurse. Physician.	Level 2. Physician/nurse visit every three months. Consider alternating with group visits.

Level 3 Classify patients with DM or HTN as Poorly Controlled or High GCR (usually not meeting goals): A1c >9%/ FBG ≥200 mg/dl (11.1 mmol/l) or BP ≥140/90 mm Hg .		Physician. Nurse. Clerk.	Level 3. Physician/nurse visit at least every two months, alternating specialist and PHC. Consider adding group visits. Frequency of visits depends on the needs of the patient and available resources.
Complex comorbidity situations and complex psychosocial situations affect management.			

Risk Stratification Pyramid
Modified Kaiser Permanente Risk Stratification Pyramid[2]

Intensive Case/Care Management

Disease/Care Management

Professional Care

Self-management

Inequalities Targeted High Risk Primary Prevention

Population Wide Prevention, Health Improvement & Health Promotion

Level 3
Complex comorbidity
3 - 5%

Level 2
Poorly controlled single condition
15 - 20%

Level 1
Self-management
70 - 80%

Level Zero
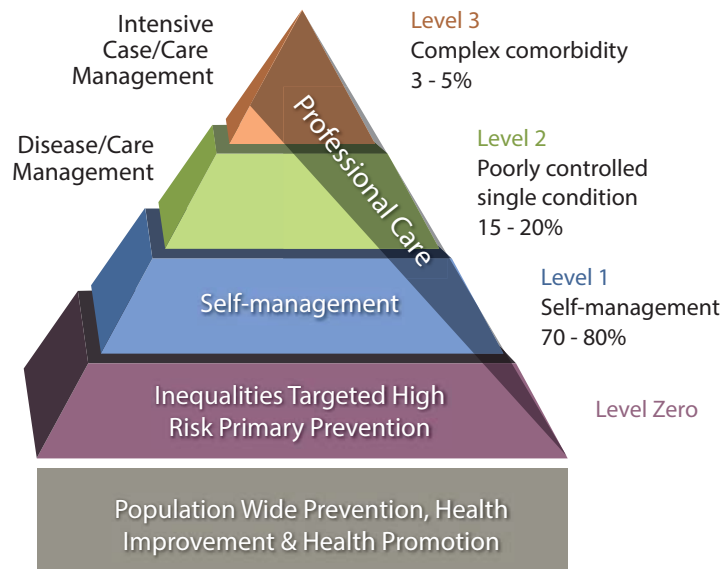
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Technology: The planned visit

Concept/Description:
The planned visit prepares the patient and provider to have more effective and productive follow-up visits. The provider obtains the necessary information on patient care needs beforehand; there will be a consensus between the provider and patient regarding expectations. In addition, staff will be better utilized with regards to the organization of the visit and delivery of care.
Information may be obtained from patient charts or directly via phone, e-mail, or texting.[1]

Expected Effect:
1. Increased collaboration between the patient and provider.
2. The health care team will be utilized more efficiently.
3. The patients' expectations and needs will be addressed and met more consistently, resulting in more empowered patients.
4. Improved clinical outcomes and satisfaction of patients.

Steps		Tools	Responsible	Tips
1.	Program weekly health team meetings to review patient's records.	Patient records.	Clinical manager.	Review cases not achieving goals if time-constrained. (See example below: Brief Patient Review Form.)
2.	Outline tasks needed for a planned visit.	Patient records.	Physician. Nurse manager.	These tasks may differ depending on patients' diagnoses.
3.	Meet with health team to determine areas of capacity and preferences for tasks to be assigned before the visit.	"Role roster" developed for the staff.	Administrative assistant. Medical director. Nurse manager.	These roles should rotate in order to improve the general capacity of the staff. Tasks should be assigned to the most prepared/less expensive team member.
4.	Assign all tasks to various health team members.	Task roster.	Nurse manager.	Even the most trivial task should be delegated. Staff may be assigned more than one role if human resources are limited. (See task list below.)
5.	Create a script for calling the patients.	Standards and protocol book.	Nurse manager.	The script should include the fact that the visit is a chance for the patient to address his/her concerns and discuss a management plan. (See example below: script.)

6.	Call the patient initially to remind him/her of the appointment 2 weeks prior to the visit and again the day before the visit.	Roster.	Person assigned to make the calls.	Remind the patient to bring his/her notes, medications, BP and glucose reading diary, and any other useful items. (A mailed reminder may help, but 50% of persons may not respond.)
7.	Pull the patient chart so it can be reviewed.	Patient records.	Person assigned to pull the records.	Lab results need to be placed in the charts. This is best done the day before the visit.
8.	Use standing orders for some care processes.	Guideline protocols.	Physician.	For example: weight and BP, during each visit. Order chemistry lap panels annually (lipid, liver, etc.). Physician to determine the standing orders.
9.	Execute the planned visit.	Patient chart.	Physician. Public health nurse. Assistant.	The patient's written concerns and doctor's priorities should both be addressed.
	9a. Patient completes pre-visit questionnaire, which includes questions on symptoms of possible complications and depression risk.	Depression risk tool mhGAP[2].	Receptionist. Nurse.	The patient answers questions regarding the challenges he/she faces in achieving the set goals.
	9b. Height and weight measured, BMI is determined.	Scale. Height ruler. BMI chart.	Practical nurse. Community health aide.	
	9c. Physical examination and lab review.		Physician. Nurse practitioner.	
	9d. Education and goal setting occurs.		Nurse. Health educator. Physician.	Ensure that collaborative goal setting is the key end point of the planned visit.
10.	Further appointments should be made.	Appointment book.	Person assigned to that task.	An acute visit (patients arriving at the health facility between appointments) can be used as an opportunity to integrate components of the planned visit, e.g. ensuring components of standing orders are addressed.

Task list for a planned visit

1.	Pre-visit: Retrieve patient charts 2 weeks before visit.
2.	Retrieve and peruse lab results and identify areas of concern.
3.	Call patient to remind him/her of visit, bring concerns, diaries, results, and medications.
4.	At visit: Receive the patient warmly, ask of outstanding labs.
5.	Check on outstanding labs, include them in chart.
6.	Have patient complete pre-visit questionnaire, which should include self-management goal and depression screening tool.
7.	Measure height, weight, and check BMI.
8.	Have patient write self-management goal.
9.	Send patient into physical examination.
10.	Conduct physical examination and discuss mutual concerns.
11.	Change therapy, give orders for new labs as necessary.
12.	Collaborative goal setting to be completed.
13.	Set new appointment, reinforce new self-management goals.

Brief patient review form[3]

This brief review form can be used to evaluate patient progress and plan new actions to achieve treatment goals. It can be used for summarizing the issues related to specific patients during preparation of the programmed visit and should be discussed with all members of the health care team.

Patient Name/ Record Number	Previous Visit			New Action
	Patient Problem	Intervention	Outcome	

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Technology: Annual diabetes evaluation

Concept/Description:
This is a tool designed for standardizing the annual visit for patients with diabetes irrespective of risk. It is embedded in the clinical practice and is based on the best scientific evidence available.[1] This technology can be used in combination with other technologies such as patient's goal setting and the planned visit.

Expected Effect:
1. Increased evidence-based clinical practice and standardization in team's performance.
2. Each patient with diabetes will be systematically evaluated annually and none will be lost during follow-up.
3. Increased glycemic control.
4. Delay long-term complications of diabetes as tighter glycemic control reduces microvascular complications.
5. Reduced premature mortality due to long-term complications of diabetes.

Steps		Tools	Responsible	Tips
Before the annual medical visit				
1.	Contact patients as a reminder and confirmation for their follow-up clinic visit. Remind them to do lab tests and attend outstanding appointments (e.g. ophthalmology, EKG, chest X-ray).	Patient register. Telephone. Mail. Home visit.	Clinic clerk. Administrative personnel. Nurse manager. Community health aide.	Remind patients to enter their BP and glucose readings, and to bring meds, diaries, lab results, and concerns to the visit.
2.	Gather the patient chart and review the most recent lab results reported as well as prior entries.	Lab results. Patient chart.	Administrative personnel. Health care personnel.	Results should be available before the visit to avoid unnecessary cancellations and appointment delays.
3.	Place checklists, standardized forms, or standing orders in the chart as applicable.	Standardized forms. Checklists.	Clinic clerk.	Forms and checklists to be derived from national or clinic guidelines.
During the annual visit				
	Medical history.	Standardized forms or checklists. PRC. Country guidelines.	Physician. Nurse.	Checklists are created to reflect active symptoms of hyper- or hypoglycemia, complications of DM, cardiovascular complications, and compliance with preventive recommendations for other chronic diseases.
4.	Ask about lifestyle habits (e.g. tobacco, alcohol use, physical activity, diet). Advise all patients not to smoke.	Standardized forms or checklists. PRC.	Physician. Nurse.	Ask about efforts to modify lifestyle and challenges encountered.

5.	Ask about symptoms of chest pain, exercise-induced shortness of breath, swollen feet, change in urine volume or quality, numbness or tingling of hands and feet, erectile dysfunction, symptoms of depression.	Standardized forms or check-lists. Patient Record Card.	Physician. Nurse.	Remember patients with diabetes may have silent heart attacks, and shortness of breath may be a sign of heart attacks as well as heart failure.
6.	Ask about recommended preventive interventions according to sex and age.	Standardized forms or check-lists. Patient Record Card. Country guidelines.	Physician. Nurse.	For example: breast, prostate, cervical cancer and colorectal cancer screening per national guidelines.
7.	Ask about self-monitoring of DM and HTN capacity, equipment availability, and frequency.	Patient diaries where glucose and BP measurements are recorded.	Physician. Nurse.	BP machines and glucometer machines can be calibrated at the annual visit by appropriate technician.
	Physical exams.	Standardized forms. Patient Record Card.	Nurse assistant.	Assess the physical exam results and the changes achieved in relation to the proposed goals. Compare to standard or prior measurements.
8.	Height, weight.	Height and weight scale. BMI chart.	Nurse assistant.	Assess weight, height, BMI over time.
9.	Waist circumference and BMI.	Tape measure. BMI chart.	Nurse assistant.	Target BMI <25 kg/m^2 or realistic goals for the patient.
10.	Blood pressure.	Sphygmomanometer.	Nurse. Nurse assistant.	Target <140/80 mm Hg or realistic goals for the patient.
11.	Cardiopulmonary auscultation.	Stethoscope.	Physician.	Remember to listen for carotid bruits as well as signs of heart failure.
12.	Foot examination, assessment for the risk of ulcers and amputation (e.g. inspection, pulses, loss of protective sensation).	Cotton wool. 10-g monofilament. Gloves. Vibration fork (128/Hz).	Nurse. Physician. Foot specialist, if available.	Foot exam for ulcer risk can be conducted by trained staff before patient is seen by the physician.
13.	Oral exam for periodontal health, dental caries, oral ulcers, and oral candidiasis.	Light. Tongue depressor.	Nurse. Physician. Oral hygienist. Dentist, if available.	Refer to dentist if any abnormalities are detected.

Review clinical exams and labs			
14.	These tests will include: FBG, A1c, lipid profile, creatinine, eGFR, liver and muscle enzymes, urine testing for micro albuminuria.	Patient Record Card. Target goals. Guidelines.		The patient should be given feedback related to target goal achievements.
15.	Electrocardiogram.	EKG machine.		Interval per guidelines.
16.	Ophthalmology report. (All type 2 patients should have an initial eye exam, Type 1 patients 5 years after diagnosis.)	Report from eye exam or ophthalmologist.	Ophthalmologist or internist as available.	Interval for fundoscopy/exam is determined by report.
17.	Assess cardiovascular risk (e.g. family history, smoking, hypertension, abnormal lipid profile, albuminuria).	Risk tables. WHO/ISH recommended.		Follow-up interval is determined by level of control and level of risk.
Review the medication			
18.	Review all the medications, including the dose and frequency that the patient is taking.	List of available medications and their adverse effects.	Physician. Public health nurse.	Consider the need for change depending on control, side effects, and interactions.
19.	Ask about adverse reactions to the medication.	Checklist for adverse drug events.	Physician. Nurse.	Ask about hypoglycemic symptoms in patients on insulin and oral drugs.
20.	Discuss management plan with the patient.	Passport for Healthy Lifestyle. Patient Record Card.	Physician. Diabetes nurse educator.	The patient should understand and agree with the plan.
21.	Adjust medication according to change in cardiovascular risk.	Patient Record Card.	Physician.	Aspirin and lipid therapy is recommended with increased CVD risk. Higher risk requires higher statin doses.
22.	Schedule the patient for self-management education session.	Passport for Healthy Lifestyle. Patient Record Card.	Diabetes nurse educator. Physician.	Educate all patients on foot self-care.
23.	Schedule a follow-up clinic visit depending on the patient´s status of control, complications, and level of risk.	WHO/ISH risk tables.	Nurse manager. Physician.	Remember that a smoking history up to a year prior adds the same risk as current smoking.

*If metabolic targets are not met, the health care provider should do the following:
- ✓ Investigate whether the patient is getting the medication.
- ✓ Determine whether the patient is actually taking the medication as prescribed.
- ✓ Review the medication with the patient to ensure he/she is indeed taking it as prescribed.
- ✓ Determine if there are reasons why the patient may not be compliant with the medications.
- ✓ Review eating habits.
- ✓ Consider the possibility of diabetic gastroparesis with erratic glucose absorption.
- ✓ Review the level of physical activity.
- ✓ Evaluate the patient for stressors that may precipitate poor glycemic control.
  - o Emotional stressors, infections (especially painless foot infections, oral infections, and urinary sepsis), and silent heart attacks.
- ✓ If any of the above are relevant, then lifestyle and/or pharmaceutical therapy should be intensified.
- ✓ Additional strategies should be employed, such as
  - o pointed goal setting.
  - o recognizing and dealing with language, numeracy, or cultural barriers to care.
  - o integrating clinical-based guidelines and clinical information tools into the process of care.
  - o engaging all the members of the care management team.[2]

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Technology: Prevention of type 2 diabetes

Concept/Description:
Research in various populations demonstrated that type 2 diabetes can be prevented or delayed by intensive lifestyle modifications. This includes losing 5-7% of body weight by following a healthy diet and a physical exercise plan.[1-9] Recent systematic reviews reported that type 2 diabetes prevention can be achieved[10] and can be cost effective.[11]

Expected Effect:
1. 30-58% reduction in incident cases of type 2 diabetes.
2. Reduction of cardiovascular risk related to diabetes, especially cardiovascular disease, retinopathy/blindness, amputation, and renal terminal disease.

Steps		Tools	Responsible	Tips
1.	Apply Diabetes High Risk Questionnaire to patients >35 years of age visiting the clinic for any reason.	A simple questionnaire to identify people at risk of diabetes is shown on page 48. The FINRISK[12] and ADA[13] questionnaires are tools to identify high-risk individuals. These tools may need validation for specific populations.	Nurse or nurse assistant.	Have a team member (i.e. health promoter) apply the Diabetes High Risk Questionnaire in the waiting room. The Diabetes High Risk Questionnaire can also be completed by patients. Be sure a member of the health care team reviews each patient's answers.
2.	Identify patients as High Risk if BMI ≥25 kg/m^2 and one additional of the following risk factors: · physical inactivity · first-degree relative with diabetes · women who delivered a baby weighing 9 lb (4 Kg) or were diagnosed with GDM · hypertension (≥140/90 mm Hg or on therapy for hypertension) · HDL cholesterol level 35 mg/dl (0.90 mmol/L) and/or a triglyceride level 250 mg/dL (2.82 mmol/l) · women with polycystic ovary syndrome	BMI chart (Annex 2), Diabetes High Risk Questionnaire (page 48)	Nurse or nurse assistant.	
3.	Measure fasting blood glucose in those at risk. Perform a 2-hour oral glucose tolerance test (2h-OGTT), if available.	Diabetes guidelines.	Physician or nurse.	

4.	Continue diabetes diagnosis and management procedures with those with FBG ≥ 125 mg/dl (7.0 mmol/l) or 2h-OGTT > 200 mg/dl (11.1 mmol/l).	Diabetes guidelines.	Physician or nurse.	Screening for and treatment of modifiable risk factors for CVD is suggested.
5.	Select patients with impaired glucose tolerance [2h-OGTT 140-200 mg/dl (7.8-11.1 mmol/l)] or impaired fasting glucose [fasting blood glucose 100-125 mg/dl (5.6-6.9 mmol/l)] and provide lifestyle interventions.[2]	Diabetes High Risk Questionnaire.	Nurse or nurse assistant.	This strategy is proven to be effective among those with IGT (2h-OGTT between 140 and 199 mg/dl) or IFG (FBG between 100 and 125 mg/dl).
6.	Evaluate the patient's general health (diabetes, impaired fasting glucose, or impaired glucose tolerance).	Global Cardiovascular Risk Table, PEN (Annex 3).	Physician or nurse.	Evaluate patient using Global Cardiovascular Risk tables.
7.	Help patient select objectives for the next six months. These are the suggested personal objectives: • Decrease body weight by 5-7% in six months. • Decrease consumption of fat to less than 30% of total energy intake starting today. • Decrease consumption of saturated fat to less than 10% of total energy intake starting today. • Increase consumption of fiber to 15 g (or more) per 1,000 calories starting today. • Do 30 min or more per day of physical (aerobic) activity starting tomorrow.	Food Exchange List (Annex 4). Ask patients to write their objectives in the Passport for Healthy Lifestyle.	Physician or nurse nutritionist.	Objectives can be personalized by taking into account the real characteristics of the patient.
8.	Recommend that patients with BMI >25 kg/m² decrease body weight by 5%.	BMI chart (Annex 2).	Physician or nurse.	Measure weight and height in each visit. Calculate BMI. Calculate 5% of BMI by multiplying BMI vs. 0.05. Establish weight reduction target for patient in the first visit and evaluate the progress in follow-up visit (use small but continuous and realistic reductions such as 0.5 kg/week). Adjust the recommendations for nutritional and physical activity based on the patient's needs and progress.

9.	Review the patient's current diet and calculate the daily recommended total number of calories as 20-25 calories per kg of body weight.	Food Exchange List (Annex 4).	Physician or nurse. Nutritionist/dietitian.	Refer to a nutritionist or a dietitian, if available. Multiply body weight by 0.25 calories if BMI 25-29 kg/m^2. Multiply body weight by 0.20 calories if BMI 30 kg/m^2 or more.
10.	Calculate calories in each meal. Example: • Breakfast 30% • Snack 10% • Lunch 20% • Snack 10% • Dinner 20% • Snack 10%	Food Exchange List (Annex 4).	Physician or nurse. Nutritionist/dietitian.	Calculate the number of calories in each meal: • Breakfast Total Calories multiplied by 0.30 • Snack Total Calories multiplied by 0.10 • Lunch Total Calories multiplied by 0.20 • Snack Total Calories multiplied by 0.10 • Dinner Total Calories multiplied by 0.20 • Snack Total Calories multiplied by 0.10
11.	Decrease the consumption of fat to less than 30% of total energy intake. Decrease the consumption of saturated fat to less than 10% of total energy intake. Increase consumption of fiber to 14 g (or more) per 1,000 calories.	Food Exchange List in the Passport to Healthy Lifestyle.	Physician or nurse. Nutritionist/dietitian.	Recommend a healthy diet by explaining the exchange list in the Passport to Healthy Lifestyle highlighting the types of food: Low fat (e.g. fish, skinless chicken). Vegetable oil (e.g. canola or other vegetable oil). High in fiber (e.g. whole wheat, whole grains and cereals).
12.	Write a physical activity prescription that includes at least 30 minutes of daily moderate intensity physical (aerobic) activity plus at least 2 sessions per week of resistance training.	Passport to Healthy Lifestyle. Simple exercises. Physical activity prescription.	Physician or nurse. Nutritionist/dietitian.	Refer to a physical trainer, if available. Help the patient find his/her favorite activity. Suggest: • Walking. • Swimming. • Biking. • Jogging. If the patient has physical limitations, try using the simple exercises listed in the Passport to Healthy Lifestyle. (See below: simple exercises.) Select the appropriate number of repetitions to complete at least 30 minutes per day: • Walking. • Knee flexion. • Stair climb. • Leg balance. • Calf stretch. • Heel exercise. • Chair exercise. • Leg exercise. • Ball of the feet exercise.

| 13. | Organize follow-up as frequently as possible. Evaluate weight during every visit, keeping in mind the target of 5-7% decrease in body weight. Revisit meal and exercise plan if necessary. | Passport to Healthy Lifestyle. | Nurse or nurse assistant. | Follow-up counseling is important for success. Decrease the number of calories or increase intensity or duration of physical exercise, as necessary. |

Identifying People at Risk of Diabetes

Diabetes High Risk Questionnaire

Patient Name: _____

Clinical Record: _____

Height: _____ **Weight:** _____

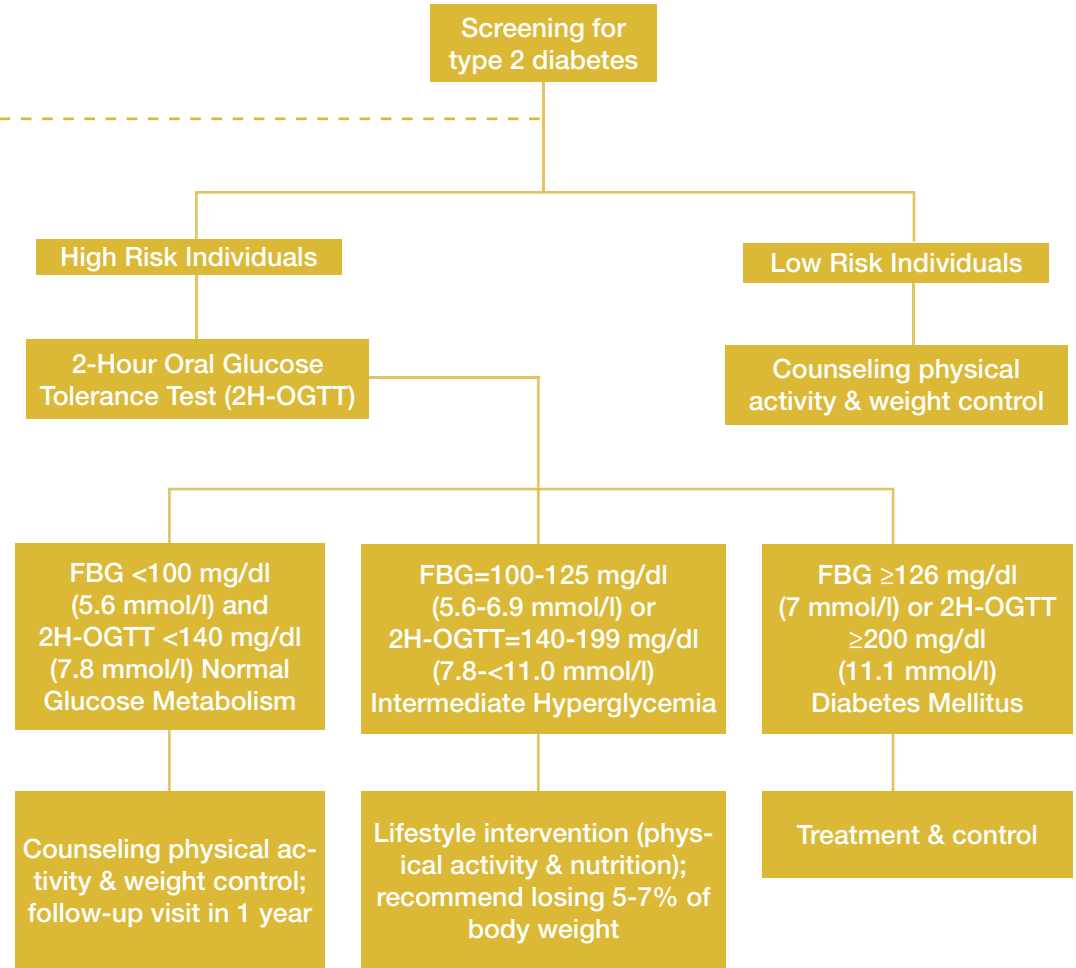**BMI = Weight (kg) / [Height (meters)]² =** _____

A. **Is your BMI 25 Kg/m² or more?**
If your answer is No = It is not necessary to continue with the questionnaire. You are not eligible for this intervention. If your answer is Yes = Continue answering the questionnaire.

B. **If your answer to one of the following questions is Yes, you are eligible to be screened for diabetes and perhaps be included in a diabetes prevention program.**

	Questions	Yes	No
1.	**Are you physically inactive?** (your daily activity includes less than 30 minutes of physical activity, including work and leisure time)		
2.	**Have your parents, siblings, or children been diagnosed with diabetes?**		
3.	**(Only for women) Have you delivered a baby weighing 9 lb. (4 kg) or were you diagnosed with GDM?**		
4.	**Have you ever been told you have (or taken medication for) hypertension, high cholesterol, or high triglycerides?**		

Flowchart: Identifying persons with high risk of diabetes mellitus

Screening for type 2 diabetes

High Risk Individuals

Low Risk Individuals → Counseling physical activity & weight control

2-Hour Oral Glucose Tolerance Test (2H-OGTT)

FBG <100 mg/dl (5.6 mmol/l) and 2H-OGTT <140 mg/dl (7.8 mmol/l) Normal Glucose Metabolism

FBG=100-125 mg/dl (5.6-6.9 mmol/l) or 2H-OGTT=140-199 mg/dl (7.8-<11.0 mmol/l) Intermediate Hyperglycemia

FBG ≥126 mg/dl (7 mmol/l) or 2H-OGTT ≥200 mg/dl (11.1 mmol/l) Diabetes Mellitus

Counseling physical activity & weight control; follow-up visit in 1 year

Lifestyle intervention (physical activity & nutrition); recommend losing 5-7% of body weight

Treatment & control

Source: Modified from Noël C. Barengo

Simple Exercises

5 **Balls of the feet exercise:** Holding the back of a chair, raise and lower your heels while not moving from place, as though you were walking without raising the point of your feet from the floor.

1 **Walking:** Walk at a brisk pace for 30 minutes to 1 hour daily and try to increase the distance every day.

6 **Knee flexions:** Holding the back of a chair, bend your knee 10 times while keeping your back straight.

2 **Stair climb:** Climb a staircase using the balls of your feet.
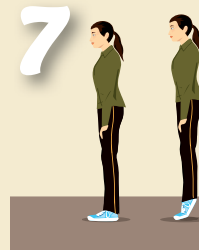
7 **Heel exercise:** Come to the balls of your feet by raising and lowering your heels 20 times. Additionally, try to alternate placing all your weight on one leg and then on the other.

3 **Calf stretch:** Support your hands against a wall, keeping your legs further away than your torso and your feet flat on the floor. Bend your arms 10 times while keeping your back and legs straight.

8 **Leg balance:** While standing on a book with one leg, swing the other leg forward and back 10 times. Use a table or other fixed object to balance yourself. Alternate leg and repeat.

4 **Chair exercise:** Sit and stand 10 times while keeping your arms crossed.

9 **Leg exercise:** Sit on the floor with your hands flat behind your back and balance your legs until you feel them relaxed and warm.

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Technology: Early detection and management of depression and other mental health issues in all patients

Concept/Description:
The prevalence of depression and other associated mental health issues is higher in persons with chronic disease. This is often not detected nor investigated after. Early detection of these disorders will improve the outcome of chronic disease while decreasing the consequence of depression or mental health issues. Systematic application of simple detection tools should increase the number of patients appropriately treated for the same.[1]

Expected Effect:
1. Greater detection of persons with chronic disease who have depression or who are at greater risk of depression.
2. Early intervention with at risk individuals will improve compliance.
3. Greater control will be achieved by improving management of depression.

Steps		Tools	Responsible	Tips
1.	Determine a depression indicator tool to be used.	mhGAP Intervention Guide for non-specialized settings. (http://www.paho.org/mhgap/en/)	Medical director. Team leader for chronic diseases. Mental health specialist.	Several tools exist.[2] mhGAP Intervention Guide is published by WHO. Advice from local mental health specialist regarding culturally acceptable tools would be useful.
2.	List all patients being cared for a specific chronic noncommunicable disease (all NCDs should be listed).	Chronic Disease Registry.	Team leader.	Patients with a diagnosed chronic disease should be the focus of evaluation as they are seen during their clinic visit.
3.	Advise the patient that all patients will be asked similar questions. (Questions will be based on mhGAP guidelines.) Note: Pay attention to "Other, Significant, Emotional or Medically Unexplained Complaints-OTH" (e.g. bereavement or loss).	mhGAP.	Nurse manager.	Patient or health care provider may complete questionnaire. All patients should be asked how diabetes (or the relevant NCD) has impacted their life.
4.	Stratify risk or diagnosis of mental health conditions based on the outcome of questions.	Assessment tool.	Nurse manager.	Several mental health issues are associated with NCDs including: clinical depression, diabetes-related distress and anxiety disorders, and eating disorders.

5.	Refer patients for psychiatric care according to level of risk or concern. Indications include gross disregard for management plan of NCD, depression, possibility of self-harm, debilitating anxiety, indications of an eating disorder, and cognitive functioning that significantly impairs judgment.	Active referral list. Mental health alert protocol.	Physician or nurse practitioner.	This activity needs collaboration with the mental health team, social worker, psychologist, psychiatrist, and community- and hospital-based mental health teams.
6.	Manage the condition if the risk is relatively low.	mhGAP. (http://www.paho.org/mhgap/en)	Physician. Nurse practitioner. Local mental health aide.	Non-specialist doctors and nurses can use mhGAP, which provides intervention guidelines even for non-specialists. This link provides a printable version: http://www.paho.org/mhgap/en.

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Technology: Prevention guidelines to reduce possible infections in patients with diabetes

Concept/Description:
Patients with diabetes are at increased risk of infections due to suppressed immunity and increased exposure through use of insulin needles and pens. Infections contribute to higher mortality rates in patients with diabetes. Implementing various strategies to reduce the infection rate will reduce the overall mortality rate of diabetes mellitus.

Expected Effect:
1. A reduction in the number of infections in patients with diabetes.
2. A reduction in the number of hospitalizations.
3. A reduction in the mortality among patients with diabetes.
4. An improvement in the quality of life among patients with diabetes.
5. A reduction in the number of amputations.

Steps		Tools	Responsible	Tips
1.	Establish an infection prevention protocol for patients with diabetes in the health care facility.	National guidelines.	Physician.	Patients should be educated on care of needles, pens, glucometers, and their injection sites.
2.	Educate staff, patients, and families regarding foot care, ulcer prevention, and detection.	Foot care policies.	Diabetic educator. Nurse practitioner.	Patients should be taught to routinely inspect feet daily.
3.	Decide on accepting immunization recommendations.	American Diabetes Association Standard of Care Recommendations 2014.	Physician. Public health nurse.	The immunization program would be adopted from the national immunization program.
4.	Implement immunization guidelines.			
	4a. Administer influenza vaccines to all patients with diabetes over 6 months old once per year.	Guidelines. Influenza vaccines. Diabetic register.	Nurse in charge of immunization program.	
	4b. Administer pneumococcal vaccine to all patients with diabetes over 2 years of age.*	Guidelines. Pneumococcal vaccines. Diabetic register.	Nurse in charge of immunization program.	
	4c. Administer hepatitis B vaccines once to all unvaccinated patients with diabetes 19-59 years.*	Guidelines. Hepatitis B vaccines. Diabetic register.	Nurse in charge of immunization program.	Consideration for hepatitis B vaccination could be made for adults with diabetes >60 years.

*Pneumococcal vaccine: A one-time re-vaccination is recommended for individuals >64 years of age previously immunized when they were less than 65 years of age if the vaccine was administered more than 5 years before.[1, 2] Hepatitis B vaccines provides immunity for more than 20 years in individuals without diabetes. Duration of immunity among people with diabetes is unknown.[3]

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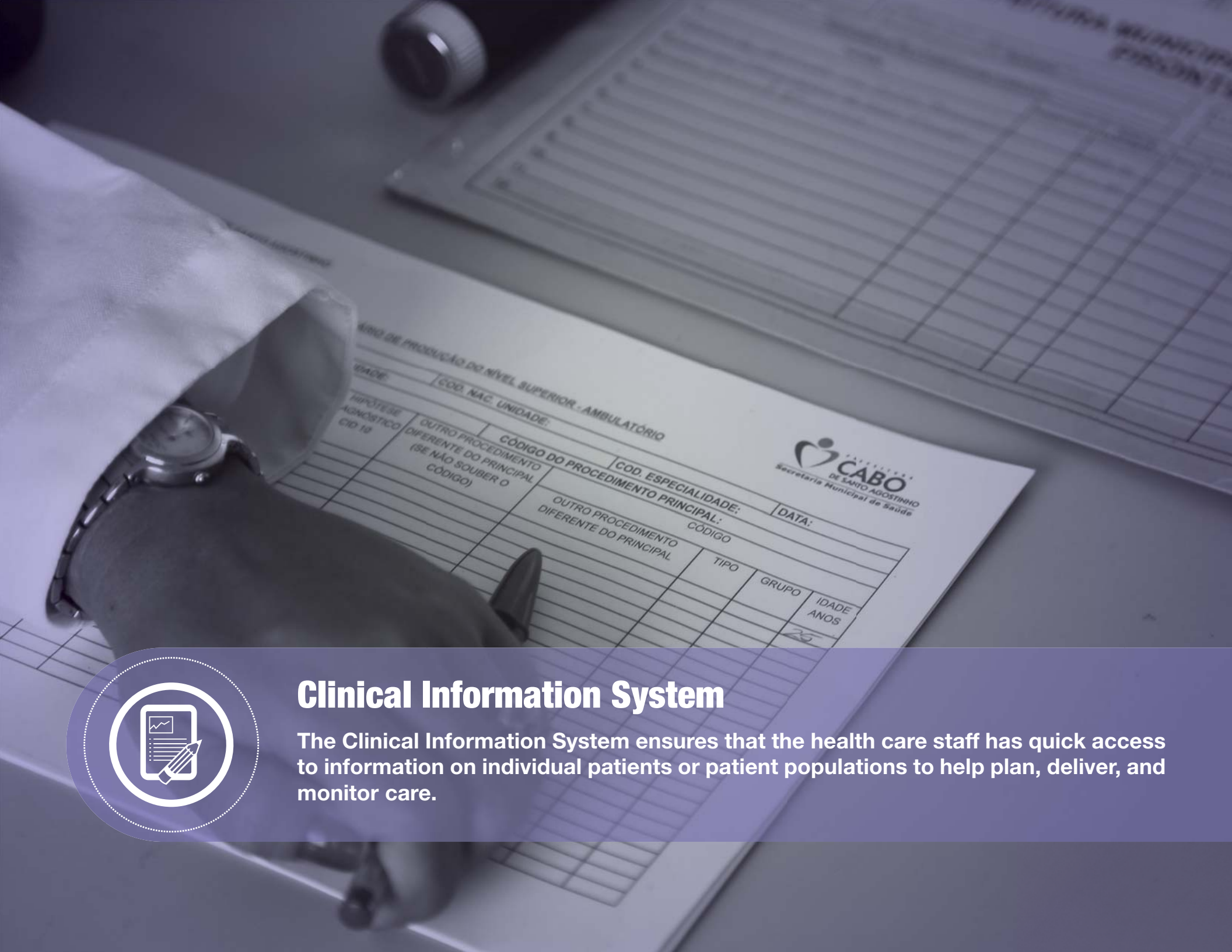
Clinical Information System

The Clinical Information System ensures that the health care staff has quick access to information on individual patients or patient populations to help plan, deliver, and monitor care.

The Evidence

Element	Quality of Evidence
Asking about lifestyle habits.	High[1-2]
Aerobic activity: 30 min/day for diabetes prevention.	High[3]
Target A1c <7% for patients with diabetes.	Moderate[4-6]
Target LDL-C <100 mg/dl (2.6 mmol/l) for patients with diabetes.	Moderate[7]
Target BP <140/80 mm Hg for patients with diabetes.	Moderate[8-10]
Foot examination for patients with diabetes.	Moderate[11]
Ophthalmology exams for patients with diabetes.	Moderate[12]
Annual Influenza vaccination: patients with diabetes >6 months of age.	Low[13-15]
Pneumococcal vaccine: patients with diabetes >2 years of age.*	Low[16]

* A one-time re-vaccination is recommended for people <64 years of age 5 years after the initial dose.

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Technology: Patient support interventions through text messaging between clinic visits

Concept/Description:
Text messaging (either by mobile phone or e-mail) is a very accessible means of communicating with patients collectively and individually. Contact with patients after clinic visits reinforces decision-making, increases compliance, and improves the patient-health care provider relationship, as patients retain only 10% of discussion during consultation. Contact prior to visits reminds patients of upcoming appointments. It also allows patients to communicate emergency events and potentially strengthens the patient-provider relationship. Furthermore, such communication methods are an opportunity to increase risk factor awareness and strengthen risk factor management among patients. (See examples below: text messages.)

Expected Effect:
1. Self-management behaviors will be reinforced.
2. There will be greater levels of compliance with management plans.
3. Increased rate of compliance with clinic visit attendance.
4. Increased patient awareness of risk factors.
5. Improved risk factor management of patients.
6. Clinic visits will be more effective and satisfying to the provider and patient if they arrive prepared to discuss their issues as identified.
7. Patients feel a greater level of support if they have access to the health team in between visits.

Steps		Tools	Responsible	Tips
1.	Create a list of patients with their contact information, either mobile phone numbers or e-mail addresses. Patients can be identified using a computerized registry or by reviewing medical records or patient cards.	Computer or paper-based patient register.	Health center clerk. Administrator.	At registration, the patient should indicate the most useful mode or point of contact.
2.	Identify persons who have appointments in the upcoming week, and extract their contact information.	Appointment register.	Health center clerk.	Sometimes the next of kin needs to be contacted.
3.	Contact persons 1 week before clinic visit: reminding them of their clinic visits, ask them to write a list with the issues they want to discuss, and ask them to bring this list, medications, and laboratory test results to the clinic visit. If test results are not available, inquire when the tests were done.	Phone or computer dedicated to this process.	Health center clerk. Nurse manager.	Establishing a rhythm for calling from the facility will improve the efficiency of this technology.

4.	At clinic visits reconfirm the contact information; identify reasons why some persons may have been reached.	Contact list.	Health center clerk.	
5.	Contact persons 1 week after the clinic visits, reinforcing management decisions agreed upon and clarifying any questions or issues.	Appointment book. Patient Record Card.	Health manager.	Have the patient first recall his/her understanding of the management plan.
6.	If possible, establish an open access number (if possible, toll free) where patients can call between clinic visits if an emergency arises, and where they can leave a voice message.	Dedicated phone (mobile or landline).	Health center administrator.	
7.	The special event calls are attended to by an assigned member of the health team.		Health team manager.	The assignment is to be rotated by the health team manager.

Examples of patient support interventions using text messaging

✉ This is a notice from the Windward Road Health Centre.

Remember to submit your application for renewal for your government discounted health card. The deadline is in 2 weeks. Your medication will be much less expensive and your blood pressure and sugar machine free.

✉ This is an alert especially to our asthmatics.

There is a fire raging in the landfill and a lot of smoke is in that area. Avoid the area or wear a mask and remember to walk with your medication. Avoid an asthma attack.

✉ Hello friends and patients of the Mount Vieja Health Centre.

There will be a Farmers Market in the Mount Vieja community center this weekend: Friday and Saturday. Come buy fresh fruit and vegetables. Very cheap prices. Don't miss it.

Technology: Education reminders and patient support interventions for diabetes through text messaging

Concept/Description:
Text messaging (via mobile phone or e-mail) is an accessible means of communication with patients collectively and individually. Weekly clinical reminders and specific educational foci will contact with the patients in the period between scheduled appointments.[1,2]

Expected Effect:
1. Patients will know more about diabetes.
2. The patients will feel a greater sense of support contacted weekly.
3. Compliance with medication, attendance, lifestyle modification, and self-monitoring will improve.
4. The patients will keep updated with their knowledge of diabetes mellitus.
5. Greater control of glycemia, blood pressure and healthy weight will be achieved.
6. The frequency of complications will be reduced, thus decreasing morbidity and mortality.

Steps		Tools	Responsible	Tips
1.	Create a diabetic registry or list of all patients with diabetes registered along with their contact information, including mobile phone numbers (e-mail may be used also).	Computer or pen and paper. PRCs.	Clerk. Nurse manager.	Alphabetical listing improves efficiency.
2.	The patients should then be grouped according to risk or existing complications or special concerns.	Diabetes registry. Risk stratification tables.	Nurse manager. Physician.	
3.	Create the listing with phone numbers and e-mail addresses.	Register. Mobile phone. Computer.	Clerk. Nurse manager.	Include mobile phone numbers of some health center staff for quality control purposes.
4.	Make a schedule of weekly reminders.	Clinical reports.	Health care team.	The reminders sent will vary in different weeks.
5.	Decide on educational material to be shared.	Diabetes updates.	Diabetic educator. Nurse manager. Physician.	Should be simple, based on group visits, related to access to medication, material, or latest diabetic updates that are patient relevant.
6.	Run a test of the diabetes text messaging intervention.	Diabetes or NCD register.	Health educator. Clinic clerk.	Ask patients and members of the health team to provide feedback.
7.	Launch the mobile phone (or e-mail) texting diabetic intervention.	Mobile phone.		

Examples of clinical reminders and educational focal points

Clinical Reminders	Educational Foci
Take your medications as scheduled, at the same time every day.	Regular foot examinations reduce the risk of amputations.
Examine your feet daily.	You should have your complete eye exam done every year.
Always come to your clinic appointment.	Excessive alcohol use may cause your blood pressure to rise and your blood sugar to fall.
Measure your blood sugar and record the readings.	Heart attacks may be silent and only present as worsening fatigue or shortness of breath on exertion.
Do your blood lab tests 2 weeks before your appointment so the results can come back on time.	Low blood sugar may present as strange behavior; if it gets worse, you may lose consciousness.

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Technology: Patient Record Card (PRC)

Concept/Description:
The PRC is a page-sized form kept in the clinic for each patient. The PRC contains patient information: demographics, disease status, risk factors and goals, results of physical exams, complications, as well as laboratory tests requested and management plans. It also contains instructions for completing the form and patient care guidelines.

Expected Effect
1. Patient information is regularly updated, securely stored, and accessible.
2. Patient visits, test results, and treatment plans are tracked.
3. A system to establish and assess risk factor management in patients.
4. A health care team that has an available reminder of the basic care plan for people with diabetes and/or hypertension.
5. A means of easily measuring the effectiveness of care for chronic diseases.
6. Systematic identification of patients or groups of patients with abnormal test results is facilitated.
7. A system that allows for patients to be placed in subgroups.
8. A paper-based system that allows for data to be analyzed as needed.

Steps		Tools	Responsible	Tips
1.	Review the attached PRC and compare to the standards of care.	Patient Record Card. Clinical Practice Guidelines.	PHC team.	Standards of care and treatment outcomes based on practice guidelines should be posted in the PRC and in the health center, as is applicable.
2.	Have new PRCs available at the clinic/center reception desk.	Patient Record Card.	Administrator.	
3.	Write the health center and physician's name as well as the patient's name, age, gender, date of birth (DOB), and home address.	Patient Record Card.	Receptionist.	Keep the PRC in a box organized alphabetically.
4.	Add information on existing diseases and their complications (including the dates of diagnosis).	Patient Record Card.	PHC team.	Complications could be identified by color assigned stickers.
5.	Add results of laboratory tests as soon as they arrive from the lab.	Patient Record Card. Lab results.	PHC team.	Reference ranges should be available to easily identify abnormalities.

6.	Mark with a red pencil patients with indicators of chronic illness(es), such as: • diabetes and A1c >7% or FBG >130 mg/dl (7.1 mmol/l). • BP ≥140/90 mm Hg. • cholesterol >200 mg/dl (5.0 mmol/l).	Red pencil. Patient Record Card.	PHC team.	The upper limits selected can be determined by guidelines.
7.	Mark with a red pencil patients with indicators of risk factor(s), such as: • High BMI. • Tobacco use. • Excessive alcohol use.	Red pencil. Patient Record Card.	PHC team.	The upper limits selected can be determined by guidelines.
8.	Identify cards with red marks.	Patient Record Card.	Nurse or nurse assistant.	Discuss with health care team the proportion of patients not achieving goals. Review how many red marks a particular patient has. This is an indicator of increased level of risk.
9.	Call patients to visit the clinic if they have dangerously abnormal results or indicate the presence of risk factors for NCDs.	Patient Record Card. Lab results.	Receptionist. Physician.	Use phone, letter, e-mail, or mobile phone texting.
10.	Classify and state the patient's level of risk.	See Risk Stratification Technology.	Physician.	Use the risk stratification system agreed upon.

Patient Record Card (PRC)

Unit/Health Area: _____ Physician/Nurse:_____ Patient's Name:_____

Gender: M ☐   F ☐   Date of Birth: ___/___/___ Home Address: _____

Complication	Yes	Date	Complication	Yes	Date	Complication	Yes	Date	Complication	Yes	Date
Hypertension			Heart Disease			Stroke			Retinopathy		
Neuropathy			Nephropathy			Diabetic Foot			Amputation		
High Cholesterol											

MEDICAL VISITS

Date	Use		Measure		BMI	Exams		Tests			Treatment		Vaccines
	Tobacco	Alcohol	Blood Pressure	Weight/ Height		Foot	Eye	Blood Glucose/A1c	Lipid Profile	EKG	Medication	Dose	

INSTRUCTIONS:

1. Write the unit or clinic as well as the physician's and nurse's names.
2. Write the patient's name, gender, date of birth, and home address.
3. Make a check mark (√) if the patient has these complications; if not listed, write the complication the patient has. Write the date of diagnosis of complications if known.
4. Write the date of the visit or encounter.
5. Inquire on tobacco and alcohol use; if positive answer, write T+ or A+ in the corresponding box.
6. Measure patient's blood pressure, height, and weight and calculate the BMI.
7. Ask the patient to remove shoes and socks and examine patient's feet.
8. Examine retina after dilating pupils or refer the patient to the ophthalmologist once per year.
9. Review and write the results of (or request new) fasting blood glucose test, A1c, and lipid profile.
10. Explain to patient his/her educational goals as per the protocol for the non-pharmacological treatment of diabetes mellitus. Make a check mark (√) in the corresponding box if diet and exercise education are provided. Using codes in parentheses, write what other educational subjects are discussed with the patient, i.e. (1) General knowledge of diabetes; (2) Administration of medications and related risks; (3) Relation between diet, exercise, and blood glucose and other metabolic indicators; (4) Foot care; (5) Use of medical and community services; and (6) Negative consequences of risk behaviors such as smoking and alcohol use, and ways of eliminating these behaviors.
11. Ask and write the name of all medicines and doses that the patient is taking.
12. Write the date of influenza or pneumococcal vaccination, and record EKG results if available.

Standards of Diabetes Care

	Component	Frequency	Description
MEDICAL VISITS	Blood Pressure.	Each visit.	<130/80 mm Hg.
	Eye Exam.	Annual.	Ophthalmologist/ optometrist.
	Dental Exam.	Every 6 months.	Teeth and gum exam.
	Brief Foot Exam.	Each visit.	Remove shoes and socks.
	Complete Foot Exam.	Annual.	Visit the podiatrist if high risk.
	Flu Vaccine.	Annual.	If available (optional). Consider also pneumococcal or hepatitis B vaccines.
LABORATORY	Hemoglobin A1c.	Every 3-6 months.	<6.5%
	Triglycerides.	Annual.	<150 mg/dl (1.7 mmol/l).
	Cholesterol Total.	Annual.	<200 mg /dl (5.0 mmol/l).
	LDL-C Cholesterol.	Annual.	<100 mg/dl (<2.2 mmol/l).
	HDL Cholesterol.	Annual.	>40 mg/dl (>1.0 mmol/l) men; >50 mg/dl (1.1 mmol/l) women.
	Proteinuria/ Albuminuria.	Annual.	<30 µg/mg. If higher referral.
	EKG.	Annual.	Normal pattern. If not normal referral.
EDUCATION	Treatment Goals.	Each visit.	Discuss with patient.
	Self-Blood Glucose Monitoring.	Individualized.	Recommend based on patient's control goals.
	Foot Care	Each visit	Recommend daily foot self-exam
	Healthy Eating.	Each visit.	Recommend always.
	Physical Activity.	30 minutes, 5 times/week.	Recommend always.

Decision Support

Decision support ensures that the health care team has the training, information, and scientific foundation to systematically provide evidence-based, patient-centered care adhering to guidelines.

Technology: Mailing printed bulletin with a succinct message containing systematic review of evidence

Concept/Description:
This strategy of contacting several health care providers at a time is termed mass mailing (via printed bulletin, e-mail, or texting). The content mailed summarizes a systematic review of evidence in a single clear message and is shown to improve evidence-based practice.[1]

Expected Effect:
1. Motivation of health care providers to improve the quality of health care delivery even in the context of the first level of care.
2. Increased base knowledge of a particular aspect of clinical care, or an identified/named chronic disease by a broader population of health care providers.
3. Clinical practice will be escalated in response to the implementation of the single message selected.
4. Health indicators will improve.

Steps		Tools	Responsible	Tips
1.	Identify the topic or focus to be circulated through conducted gap analyses or review of current literature.	Journals. World Wide Web. Departments of Epidemiology/ Surveillance. Connection Readiness Survey (Assessment of the State of Preparation for Chronic Care).	Epidemiologist. Researcher. Clinical management. Administrative management.	The chosen topic should reflect a need in the particular context and be consistent with current standards of care.
2.	Create the message.		Health educator. Communication specialist.	
	2a. Identify the target population.	Scientific literature.	Physician. Administrator.	The literature should help identify the health worker involved in the particular action.
	2b. Identify the objectives of the message (the impact that will be achieved if the message is adopted).	Journals. World Wide Web. Departments of Epidemiology/ Surveillance. Connection Readiness Survey (Assessment of the State of Preparation for Chronic Care).	Physician. Nursing administrator.	The evidence of impact should be documented and referenced.

	2c. Develop the single clear message and include: a. The desired message. b. The benefit for the patient (achieved by the altered practice). c. Evidence to support the desired change in practice.	Pre-existing educational material.	Health educators. Health administrators. Physicians. Communication specialists. Nurse manager.	The message should be culturally relevant.
3.	Determine the communication channels (e.g. printed bulletins, e-mail, text messages, social media, etc.).	Resource tool outlining available media.	Health educators. Health administrators. Physicians. Communication specialists.	Suggest multiple channels to increase the likelihood of success of this activity.
4.	Design the message using the relevant media.		Communication specialists /graphic-designer.	Media used should be culturally acceptable.
5.	List the recipients and their addresses.	PHC contact lists. Medical associations. Professional associations.	Health educators. Health administrators.	Persons listed for contact should be able and positioned to effect change (i.e. decision makers as well as those who will affect the actual work).
6.	Send the message using the predetermined channels.	Personal computer. Mail- regular post. Mobile phones.	Communication specialists. Health educators. Health administrators.	Use an operative center must to centralize activities.
7.	Obtain feedback from the providers regarding efficiency of these messages.	Mobile phone. Computer. Letter writing tools.	Health center administrator.	The feedback should inform further plans for sending other clear messages.

Examples of single clear messages containing systematic review of evidence

1. **Help your patient quit smoking! Brief clinical interventions work!:** When a doctor takes 10 minutes or less to advise a patient who wants to quit smoking about quitting, it only accounts for a 1-3% reduction in smoking.[2]
2. **Foot examination:** Check for pulses, ulcers, infection, and deformities and do the monofilament test. A comprehensive foot care program reduces amputation by 45-85%.[3]
3. **Instruction for the monfilament test[4]:**
   a. Place the patient in supine or sitting position with shoes and socks removed.
   b. Hold the red filament by the paper handle (see step 1).
   c. Touch the filament to the skin at each site for only 1-2 seconds. Touch near the side of, and NOT directly on, an ulcer, a callous, or scar. Push to make the filament bend (see step 2).
   d. Touch the filament to all of the sites circled in the foot drawing to the right.
   e. Place a "+" in the circle if you feel the filament at that site and a "-" if you cannot feel the filament.
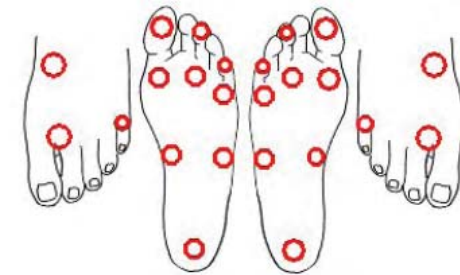
   If the patient reports any "-" in any circle, treat or refer the patient to the corresponding health provider.

step 1   step 2   step 3

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Technology: Embed evidence-based guidelines into daily clinical practice of foot examination for patients with diabetes

Concept/Description:
Evidence-based guidelines provide the basis and the path towards improved health care. The parts of selected guidelines can be adapted to the particular context.

Expected Effect:
1. The clinical staff will be empowered by increased knowledge of the contents of the guidelines.
2. Patient care will be standardized.
3. An improvement in clinical outcomes such as reduction in amputation rates.

	Steps	Tools	Responsible	Tips
1.	Select appropriate guidelines agreed upon by the health authorities.	Local or international guidelines as agreed upon (e.g. WHO, ADA, or IDF).	Clinical director. The clinical team.	Guidelines chosen should be properly evaluated and agreed on by the team.
2.	Select the appropriate part of the guideline to be implemented. In this example, foot examination.	Local guidelines.	The clinical team.	The part selected should be clear in its directions.
3.	Identify and place a reminder in the patient's chart (e.g. foot sticker placed on the front of the chart of patients with diabetes).	Foot-shaped stickers.	Front desk staff.	This is done at registration or at the time of diagnosis. This is a visual reminder of the focus for the health care team.
4.	Determine the date of the last foot exam.	Clinical chart or PRC.	Nurse doing vital exams.	The method and results of the last exam should be determined.
5.	Have the patient remove shoes and socks if foot exam is due and place monofilament on the chart, if available.	Monofilament.	Medical assistant doing the vitals.	The reason for the foot exam should be explained to the patient.
6.	Determine risk for ulcer and amputations: history of foot ulcer, amputations, symptoms of peripheral artery diseases, physical or visual difficulty in self-foot care.	Patient records. PRC.	Medical assistant. Nurse. Physician.	Clinical team should be clear on the relevant symptoms.
7.	Examination of footwear.	Footwear.	Diabetic foot care specialist. Nurse/Physician.	Appropriateness and safety of the footwear should be discussed with the patient.

8.	Physical exams: check for ulcers and/or signs that indicate an increase in the risk for ulcers (e.g. bony prominences, trophic changes, calluses, nail deformities).		Diabetic foot care specialist. Nurse/Physician.	Clinical team should be aware of the relevant signs.
9.	Examine for neuropathy by 10 g monofilament, a 128 Hz tuning fork, or non-traumatic pinprick.	Monofilament. Tuning fork. Non-traumatic pin for testing.	Physician. Diabetic foot care specialist.	The method of the examination depends on available resources.
10.	Palpation for foot pulses (dorsalis pedis and posterior tibial).		Physician. Foot care specialist.	The patient should be given feedback.
11.	Implement appropriate care management (e.g. care of superficial infection, footwear change recommendations, foot-care team referral or secondary care referral as deemed necessary).	List of consultants available for referrals.	Physician. Foot care specialist.	Blood glucose control is fundamental to reduce risk for foot ulcers and amputations.
12.	Foot-care education and foot-care plan with appointment for review of foot exam made.		Foot care specialist. Physician. Nurse.	Review annually if normal or more frequently, depending on findings.
13.	Review the need to continue with the particular focus: whether to sign off on it or reinforce it, depending on the level of success and ease of implementation.	Local data with respect to NCD indicators that are off target or of concern.	Physician. Nurse manager.	Application of the guidelines into daily clinical practice will occur depending on the concerns of the context.

Self-Management Support

Self-management is a group of tasks that an individual must undertake to live well with one or more chronic conditions.

Technology: Group visits – Drop-in group medical appointments

Concept/Description:
Group visits can be conducted in various ways with the aim to increase access to medical providers, improve patient satisfaction, and increase the health care team's productivity. Drop-in group medical appointments are a technology designed to take place in a supportive group setting led by one or more health care professionals. Such group visits provide patients, with the same chronic condition, the opportunity for an extended medical appointment where their health needs are addressed.[1,2]

Expected Effect:
1. Greater efficiency is achieved in terms of time and cost as providers are able to speak at one time to a large group.
2. There are more planned visits with clinicians.
3. Enhanced chronic disease management and self-management support.
4. Greater emotional and social support from peers.
5. Increased exposure to a wider array of health professionals.

	Steps	Tools	Responsible	Tips
1.	Create groups of 8-12 people based on risk, gender, disease, or disease complication, as applicable.	The Group Visit Starter Kit: Improving Chronic Illness Care. www.improvingchroniccare.org	Project manager. Assigned clinician.	
2.	Schedule 90-minute sessions and meet monthly (or as convenient).	Paper / digital record of the schedule.		
3.	Assign roles to health care team members according to competence and availability.		Team leader.	A mix of health team members should be chosen.
4.	Establish a group facilitator.		Senior member of the health team.	This role can be rotated.
5.	The team leader and providers decide on terms of reference of the group (e.g. location, possibility of reimbursement for providers) and schedule group visits.	The Group Visit Starter Kit: Improving Chronic Illness Care. www.improvingchroniccare.org	Health team.	
6.	The team should decide on the topics to be addressed.	The Group Visit Starter Kit: Improving Chronic Illness Care. www.improvingchroniccare.org	Health team.	

7.	Identify community and stakeholder support.		Community liaison officer.	
8.	Write rules of engagement (e.g. family members are able to attend group meetings at the invitation of the members).		Health team.\n\nPatient representative.	
9.	Review the process and the outcome after 6 months.		Group facilitator.	Reviews should include an evaluation of self-management of the patients as well as an assessment of patient satisfaction.

References

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Technology: Blood pressure self-monitoring

Concept/Description:
High blood pressure is a major risk factor for NCDs and complications thereof. Readings vary according to position, time of day, location (home vs. doctor's office), and also the time the medication is taken. Blood pressure self-monitoring will provide a more realistic basis for management decisions.

Expected Effect:
1. Increased compliance with medication as patients become more involved in self-management.
2. Patients understand better the dynamics of blood pressure levels.
3. Increased proportion of patients with controlled blood pressure.
4. A reduction in vascular complications of diabetes, including kidney failure and heart attacks and strokes.
5. Reduced cardiovascular complications such as heart failure.[1,2]

Steps		Tools	Responsible	Tips
1.	Initially educate the patient individually about the concept of high blood pressure and its measurement and consequences.	Diagrams or models of arteries or blood vessels.	Health educator. Nurse. Physician.	Emphasize the benefit of blood pressure on current and future health status.
2.	Assist the patient to acquire a reliable, calibrated machine.	Sphygmomanometer.	Nurse/patient/physician.	The educator should ensure machine accuracy before instructing the patient.
3.	Teach the patient how to measure blood pressure.*	Sphygmomanometer.	Patient educator. Physician. Nurse.	Give the patient written tips for BP measurement.*
4.	Ensure the patient reliably measures an accurate BP.	Sphygmomanometer.	Health educator/nurse. Physician.	
5.	Advise patient on the timing of BP measurements.	Stethoscope. Sphygmomanometer.	Nurse.	
6.	At the time of training, emphasize compliance with medication, salt reduction, and exercise.		Nurse. Physician.	
7.	Schedule calibrations and check-ups on blood pressure measuring.		Nurse assistant.	Every 6 months to 1 year.

*Expanded tips for the patient:
1. The patient should take his/her blood pressure in a warm, comfortable place 5 minutes after sitting. He/she should not have had coffee, alcohol, or medications or smoked in the previous 2 hours. Both morning and evening readings should be taken.
2. Any symptom experienced at the time of the BP measurement should be documented, for example: dizziness, chest pain, shortness of breath, and headache.
3. The patient should be clearly taught to identify the brachial artery and the lower border of the cuff, placed 3-4 cm above the elbow crease.

References
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2. Stowasser M, Armstrong. Self-measurement of blood pressure: a paper for health professionals. Available at http://www.heartfoundation.org.au/SiteCollectionDocuments/self-measurement-blood-prssure-health-professionals.pdf. Accessed 28 August 2013.

Technology: Patient educational intervention: 5 As brief intervention for smoking cessation

Concept/Description:
The original 5 As —Ask, Advise, Assess, Assist, Arrange— are specifically used for tobacco cessation. This is a brief, opportunistic intervention that can be done in 3 to 5 minutes. It is effective: 40% will make an attempt to quit, increasing the quit rate by 30%. It is an efficient intervention with the potential to reach more than 80% of the general population at least once per year. It is meant to be integrated into normal professional practice, rather than applied separately.[1-6]
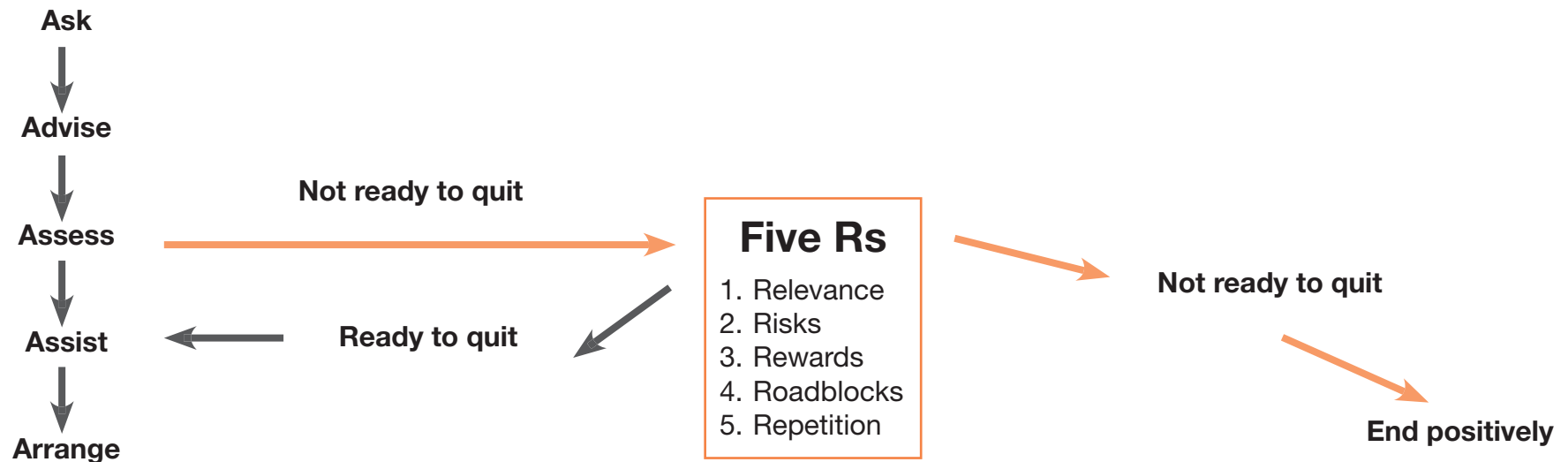
Expected Effect:
1. An increase in the proportion of smokers who will make a quit attempt.
2. An increase in the number of smokers who quit.
3. Reduction in the use of tobacco within the population.
4. A decrease in the frequency of complications from NCDs due to a reduction in tobacco-related diseases.

Steps		Tools	Responsible	Tips
1.	**Ask** Systematically identify all tobacco users among patients visiting the center for any reason. This can be implemented by a short questionnaire delivered by the center receptionist.	Clinical history.	All health personnel. Activity not confined to smoking cessation specialists.	All patients should be asked about past and present use of tobacco. "Ask" encompasses identifying the individual's smoking behavior (current tobacco user vs. recent quitter), his/her knowledge, beliefs, priorities, health risks, etc.
2.	**Advise** Advise all tobacco users that they need to quit.		Behavioral change counselor. Nurse. Physician.	Formulate a clear statement to be used. If possible, tailor it to the patient.
3.	**Assess** Determine the patient's readiness to quit.		Behavioral change counselor.	Implement the five Rs approach (see opposite page) if patient is not ready to quit. Useful questions: 1. Do you want to quit smoking? 2. Do you think you can do it?
4.	**Assist** Assist the patient with quit plan, including identifying potential barriers to change and strategies/resources for overcoming them.	Cards for documenting the plan, barriers, and strategies.	Behavioral change counselor. Physician. Nurse. Psychologist.	Should be mutually negotiated, achievable, and specific. Teach the patient self-management and problem-solving/coping skills. Alternatives to smoking should be agreed on. Refer to specialist support or cessation services, if available. The plan is best when written.

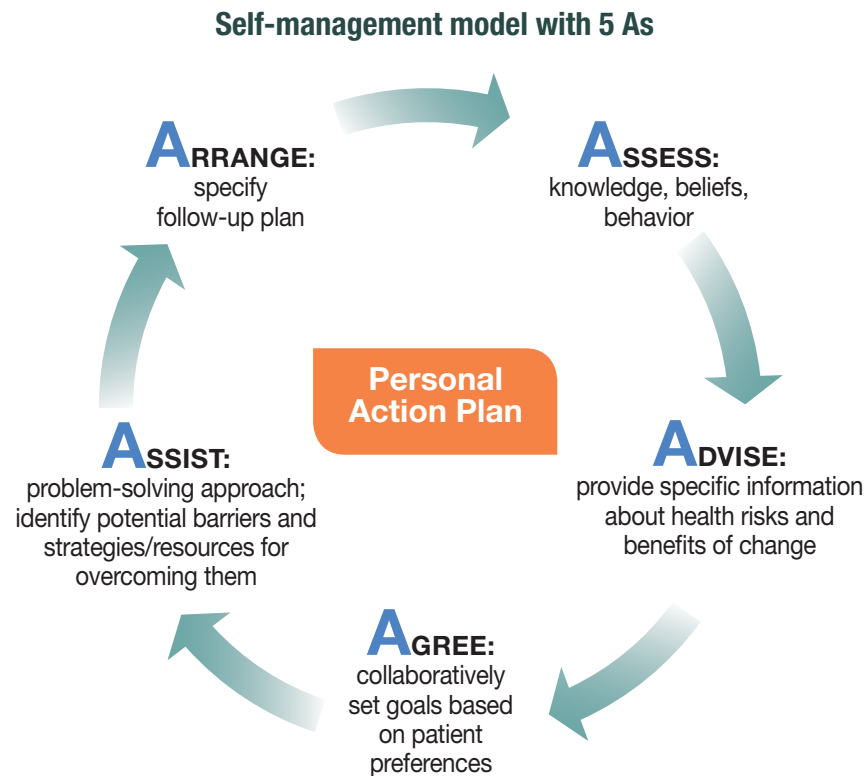| 5.	Arrange Schedule follow-up contacts or a referral to specialist support.	Lists of specialists, pharmacies, and facilities which may provide nicotine replacement therapy.	Behavioral change counselor. Physician. Nurse.	Form routine follow-up to assess and support via telephone, visits, or other contact. Initial follow-up should be within the first week of quit date. Future follow-up can be spaced by longer intervals (e.g. monthly).

Implementing the 5 Rs motivational intervention during the "Assess" stage.[7]

Ask → Advise → Assess

Not ready to quit → Five Rs

Ready to quit → Assist

Five Rs
1. Relevance
2. Risks
3. Rewards
4. Roadblocks
5. Repetition

Five Rs → Not ready to quit → End positively

Assess → Assist → Arrange

The 5 Rs to be used during "Assess" to increase motivation of patients who are not ready to quit

5 Rs	Examples
Relevance: Help the individual identify why quitting is personally relevant to him/her.	Relevance to individual's situation: • Disease status or risk. • Health concerns. • Family or social.
Risks: Encourage the individual to identify possible negative outcomes of smoking that are relevant to him/her.	Risks: • Acute risks: shortness of breath, exacerbation of asthma, increased risk of respiratory infections, harm to pregnancy, impotence, and infertility. • Long-term risks: heart attacks and strokes, lung and other cancers, chronic obstructive pulmonary diseases, osteoporosis, long-term disability, and need for extended care. • Environmental risks: increased risk of lung cancer and heart disease in household members; increased risk for low birth weight, sudden infant death syndrome (SIDS), asthma, middle ear disease, and respiratory infections in children of smokers.
Rewards: Help the individual identify the possible benefits of quitting smoking that are relevant to him/her.	Rewards: • Improved personal health (physical and mental). • Improved household health. • Saving money.
Roadblocks: Help the individual identify possible obstacles to quitting, and generate solutions to the obstacles.	Typical obstacles: • Withdrawal symptoms. • Fear of failure. • Weight gain. • Lack of support. • Depression. • Enjoyment of tobacco. • Being around other tobacco users.
Repetition: Repeat collaborative agreement based on individual's readiness to quit.	• If the individual is ready to quit, continue with the 5 As. • If the individual is not ready to quit, end the 5 Rs motivational intervention positively.

The following 5 As self-management model is applicable to address prevalent health-related behaviors including lack of physical activity, and poor diet[8,9].

Self-management model with 5 As

ARRANGE: specify follow-up plan

ASSESS: knowledge, beliefs, behavior

ADVISE: provide specific information about health risks and benefits of change

AGREE: collaboratively set goals based on patient preferences

ASSIST: problem-solving approach; identify potential barriers and strategies/resources for overcoming them

Personal Action Plan

References

1. Stead LF, Bergson G, Lancaster T. Physician advice for smoking cessation. Cochrane Database of Syst Rev. 2008;2:CD000165.
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Technology: Goal setting

Concept/Description:
In this patient-centered model of care, the drive behind each patient's visit is achieving his/her goal and agenda. Goal setting could encompass elements within self-management and risk factor management. Creating and addressing that goal is the best stimulus for motivating the patient toward positive health-seeking behavior. The goal should be patient-centered, reasonable, measurable, and functional.[1]

Expected Effect:
1. Compliance will improve as patient-determined goals are derived.
2. General improvement in health behavior through self-management and risk factor management.
3. Risk factor reduction for NCDs and their complications.
4. General improvement in health outcomes.

Steps		Tools	Responsible	Tips
1.	Outline the patient's health profile including current illnesses, complication status and presence of risk factors for NCDs and general risk for complications of NCDs.	Patient chart. Risk tool.	Health care coach. Physician.	Include the status of smoking, physical inactivity, harmful use of alcohol, obesity, unhealthy diet, and glycemic, lipid, and blood pressure control.
2.	Determine and outline the weight of risk of each factor as it relates to outcome of NCDs.	Risk tool.	Physician.	A color-coded chart may be most impactful.
3.	Discuss behavioral changes which will modify each particular risk factor (e.g. swimming will reduce the level of inactivity or salt reduction will reduce the risk of hypertension); formulate a list.	Risk chart.	Physician. Health educators.	The discussion around behavioral change should embrace activities acceptable to the patient.
4.	Determine which behavior and associated activities the patient is most willing in which to participate.	The list of behavioral changes derived in Step 3.	Physician. Health care provider. Health educator.	The patient will discuss the level of confidence he/she has in his/her ability to successfully carry out the particular activities.

5.	The patient will then set the goal he/she wants to achieve by determining that behavior he/she is most likely to embrace and the risk factor that will impact his/her health status the most.	Passport for Healthy Lifestyle.	Health care provider.	The patient should have at least a 70% level of confidence of success of carrying out the activity.
6.	Write the action plan (see create Action Plan Technology).		Patient. Health care provider.	There must be a written plan for follow-up with person, time, and follow-up method clearly stated.

This is an example of a goal-setting card, which can be given to the patient. Goals can be set and the path to achievement monitored.

Healthy Lifestyle Goals

Your healthy lifestyle goals are the objectives that you intend to reach in regards to your general health and your disease.

I want to work on:	Examples of Long-Term Goals (in the coming months)
Blood Glucose	Diabetes: I will decrease my A1c from 10% to less than 7% (or fasting blood glucose from 160 mg/dl to less than 130 mg/dl) within three months.
Blood Pressure	Hypertension: I will decrease my blood pressure from 160/95 to less than 140/90 mm Hg within a month.
Total Cholesterol	I will reduce my weight from 140 to 127 pounds (63 to 57 kg) within three months.
HDL	I will quit smoking within three months.
LDL-C	**Examples of Short-Term Goals (at present or in the coming weeks)**
Weight	I will take medicines every day as prescribed by my health provider.
Nutrition	I will stop eating fried food.
Physical Activity	I will eat vegetables twice per day every day.
Smoking	I will replace white bread with whole wheat bread.
Other	I will eat red meats only once per week or less.
	I will reduce my salt intake.
	I will do physical activity for 30 minutes most days (walk, bike, dance, swim).

Establish together with your health care team the goals that you intend to reach, related to the challenges that you confront in order to control your disease. Your goals should be reasonable to be achieved within a time frame established by you (short or long term). Place your goals in priority order. Write the date you plan to reach each goal. Check off "yes" or "no" in the column Reached if you achieve your goal or not, on the date you established. Look at all options to achieve your goals and discuss with your health care team the difficulties you encounter. Make corrections to your goal list if necessary.

My Healthy Lifestyle Goals	Date	Reached	
		Yes	No
1			
2			
3			
4			
5			

References
1. Randall KE, McEwen IR. Writing patient-centered functional goals. Phys Ther. 2000;80:1197-1203.

Technology: Creating an action plan (e.g. an exercise plan)

Concept/Description:
An action plan is geared towards a particular behavioral change that will result in a successful goal. In addition to self-management, the action plan is a tool that can be used for risk factor management. The plan is based on the patient's desire, the issues that need to be addressed, and resources, and is culturally competent.[1,2]

Expected Effect:
1. The patient will be more empowered and motivated to accomplish a goal.
2. The patient would have achieved a target towards improved health.
3. Increased awareness of individual risk factors.
4. Risk factor and self-management capacity would be significantly improved.
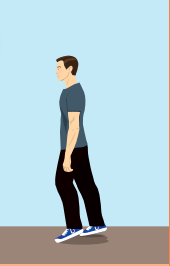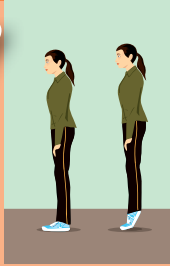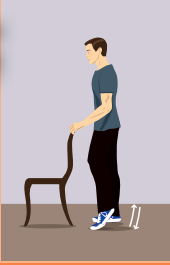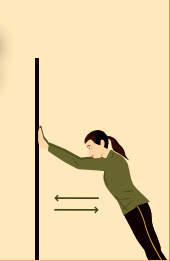
Steps		Tools	Responsible	Tips
1.	Patients examine their health profile and risk factors that need to be addressed in order to identify the goal they will target and the plan of action that will help them achieve their goal (e.g. to establish a regular exercise plan). (See below: exercise plan)	See goal-setting technology.	Physician. Team manager. Patient.	This goal will be based on the patient's choice but directed by the physician's evaluation.
2.	The action plan will be detailed The exact activity will be identified e.g. **What** are you going to do? (Walk) The quantity of the activity is determined e.g. **How much** will you do? (for 15 minutes twice daily) The timing of the activity is scheduled e.g. **When** will you do this? (I will walk to and from work in the morning and evening) The frequency of the activity is stated e.g. **How often** will you do the activity? (I will do this on weekdays and on weekends; in the evening, I will walk to and from the park that is 15 minutes each way)	Patient diary.	Physician. Team manager. Patient.	The exact activities planned should be realistic.

3.	Support or resources needed to activate the particular action should be stated (For example, a new pair of socks, shorts, or walking shoes when walking to the park on the weekends).		Patient.	The patient should itemize the needs for the determined activity.
4.	**Anticipated barriers** help the patient imagine what might get in the way of his/her plan. (For example, it may rain, or a late start or overtime at work may interfere with the planned activity time)		Physician. Team manager. Patient.	Planning for eventualities also improves the level of confidence and likelihood of being consistent with the behavior change.
5.	**Arrive at potential solutions for barriers**. Has the patient come up with ideas that might help him/her overcome the barriers? (An alternative is walking time at home if it rains.)		Health team partner.	
6.	**Determine the patient's confidence.** Rating scale 1-10: 1 having no confidence in the plan, 10 having full confidence the plan will be successfully completed.		Physician.	The plan should only be enacted if the confidence level in successfully completing the action is at least 7/10.
7.	**Follow-up plan**. Arrange a time for checking on how the plan is going. Review challenges faced at this follow-up plan. Alter the plan where necessary in order to improve the likelihood of success.		Health team partner.	Set a specific review date or time and method (whether face to face, by phone, or by email).

Exercise Plan

(see exercise description on page 49)

	Exercise	Repetitions	Exercise	Repetitions	Exercise	Repetitions
Date: / /						
	1		**4**		**7**	
	2		**5**		**8**	
	3		**6**		**9**	

References

1. Diabetes Education and Self Management for Ongoing and Newly Diagnosed. Getting to Grips with Type 2 Diabetes. United Kingdom; 2010. Available at www.desmond-project.org.uk.
2. Lorig K, Holman H, Sobel D, Laurent D, Gonzalez V, Minor M. Living a Healthy Life with Chronic Conditions, 2nd ed. Boulder, Co: Bull Publishing Company; 2000.

Technology: Problem solving

Concept/Description:
The expectation that problems may accompany most types of change helps reduce the distress when those problems occur. The intention to follow a set management plan may be thwarted with challenges, including risk factors. This technology provides a guide to help the patient find solutions when faced with such challenges.[1]

Expected Effect:
1. The patient will be more empowered to embrace self-care.
2. The patient will identify methods for better risk factor management.
3. The patient is less likely to get stressed when faced with an obstacle.
4. The health status of patients will improve when they are able to manage the nuances of their own chronic diseases without feeling overwhelmed each time.

	Steps	Tools	Responsible	Tips
1.	Recognize and name the problems that adversely affect achievement of health goals.	Patient diary.	Patient. Physician. Nurse.	The patient should express the problem.
2.	Suggest several ideas that are potential solutions.		Patient. Physician. Nurse.	All potential solutions should be listed.
3.	Select and implement one of the solutions.	List of solutions identified.		The potential solutions may be complementary and can be combined.
4.	Reevaluate the success of the solution after 2 weeks.		Patient. Physician. Nurse. Health team partner.	
5.	Identify another potential solution if the initial one fails.	List of solutions identified.		Encourage the patient that some solutions may need further time.

Guide patients to accomplish their goals by asking[2]

What's the health issue I want to work with?	What's going to stop me?	What can I do about it?

References
1. Lorig K, Holman H, Sobel D, Laurent D, Gonzalez V, Minor M. Living a Healthy Life with Chronic Conditions, 2 ed. Boulder, CO: Bull Publishing Company; 2000.
2. Diabetes Education and Self Management for Ongoing and Newly Diagnosed. Getting to Grips with Type 2 Diabetes. United Kingdom; 2010. Available at www.desmond-project.org.uk.

Technology: Text messaging addressing common risk factors for NCDs in the population through interventions at the PHC level

Concept/Description:
Most NCDs can be impacted positively by reducing common risk factors through behavioral change. Repeatedly educating patients about making the right behavioral choices can reduce the occurrence of NCDs.

Expected Effect:
1. Patients will be more aware of how their own behavior can impact their health.
2. Patients will more consistently make healthy choices.
3. The incidence of NCDs will reduce.
4. The incidence of complications of NCDs will reduce.

	Steps	Tools	Responsible	Tips
1.	Simple messages are created reflecting the recommendations for reducing risk factors.		Medical director. Health promotion team. Local staff.	MOHs should help formulate and execute these messages.
2.	The risk reduction messages are created for dissemination of information through various media channels and are made available to local PHC units.	Posters. Pocket guidelines.	Health educator. Media specialists. Health care personnel.	
3.	The health center focuses on one risk factor at a time.	Schedule determined by the health center.	Health educator.	The health center may choose to focus on one risk factor per quarter and add to the preceding message. Behavioral change specialists, health educators, public speakers, and medical, nursing, lay, and peer educators are all resource persons.
4.	The messages will be clear, repeated, and told in various ways, through creative means (see examples below).		Health educator. Communication specialists.	
5.	Repeat the health education programs.		Health educator.	

Examples of text messages addressing risk factors for NCDs

I

Quit smoking, try to reduce amount of cigarettes smoked, and/or enroll in a program to assist persons in quitting smoking.

II

Limit alcoholic drinks daily to no more than 2 for men, and no more than 1 alcoholic drink daily for women.

III

Exercise regularly 30 minutes daily (brisk activity) for at least 5 days per week in addition to 2 days of strength training*.

IV

Eat at least 5 servings of fruit and vegetables daily, and reduce intake of processed foods. Use local seasonal produce.

V

Reduce salt intake to <1 tsp. daily (i.e. 5-6 g salt or 2.5 g sodium), use food labels as a guide.

*Advice to exercise should be cautioned against if:
1. The blood pressure is uncontrolled.
2. There is severe autonomic neuropathy.
3. There is severe peripheral neuropathy.
4. There is a history of foot lesions.
5. There is unstable proliferative retinopathy.
6. It is deemed to be potentially unsafe.

Community Resources and Policies

Community resources and policies assist patients to have feasible and efficient access to services that can be found in the surrounding community.

Technology: Peer-led self-management training

Concept/Description:
Self-management aims to provide information and promote behavioral skills that will help patients carry out the tasks necessary to live as well as possible with chronic illness. It is also a tool used to understand the implications of risk factors and develop methods to strengthen risk factor management. It may be led by either peers or professionals and may be disease-specific or more general, providing information and strategies for developing problem-solving skills regardless of the chronic condition. This technology focuses on how to implement peer-led, self-management training for patients with different chronic conditions.[1,2] The selection of the group members, peer leaders, and meeting locations is heavily reliant on community buy-in and involvement. This, in turn, strengthens community capacity.

Expected Effect:
1. Improved chronic care outcomes.
2. Increased awareness of risk factors and empowerment to overcome them.
3. Development of disease-affected peers as effective leaders for self-management programs.
4. Increased opportunities for training sessions to be held outside of normal working hours.
5. Sustained improvement in health behaviors due to increased follow-up contact.
6. Affected patients develop relationships and community-based support.
7. Increased capacity of the broader community to manage various chronic diseases and to support affected persons and their families.

Steps		Tools	Responsible	Tips
1.	Decide on the format of the program (typical class sizes of peer-led programs range from 10-15 participants and include patients' family members and friends; some meet weekly for a 2-hour session over 6 weeks).	The Chronic Disease Self-Management Program (CDSMP): http://patienteducation.stanford.edu	A staff person (to provide overall leadership to the program).	The structure is modified according to the local situation. There are 7 models of peer-based self-management.[3]
2.	Develop patient materials including interactive exercises to build self-efficacy and coping skills. Topics will include: • Managing negative emotions. • Dealing with side effects of medications. • Relating to health care providers. • Fighting fatigue through exercise and diet. • Best practices to get through the day. • Identifying risk factors and methods to overcome them.	The Chronic Disease Self-Management Program (CDSMP): http://patienteducation.stanford.edu	Trainer of the program.	

3.	Identify special privileges the peer leader will have (e.g. secured parking, reimbursement, official title, recognition by health authority).		Administrator. Trainer.	Recognition strengthens commitment.
4.	Find community location to offer program.	List of possible community sites provided by the municipality.	Community health aide liaison. Administrative staff.	Churches and community centers are possible sites.
5.	Recruit and train peer leaders. Peer leaders are recommended from among the patient population or response to advertisements.		Health facility staff.	Having 2 trained peer leaders teaching the program increases the success of the program.
6.	Start the peer-led sessions; document the challenges and successes of the sessions.	Dedicated files/journals or computer for chronicling the journey of the group.	Peer leader. Staff person.	Staff person will organize the meeting, including scheduling, preparing the meeting room, and delivering materials to the room.
7.	Hold special events periodically to recognize the program.	Certificates, trophies, gifts, or tokens.	Administrator.	
8.	Review the program after 3 months and then periodically.		Administrator. Peer leader.	

Models of peer-based self-management training

1. Professional-Led Group Training.
2. Peer-Led Self-Management Training.
3. Peer Coaches.
4. Community Health Workers.
5. Support Groups.
6. Telephone-Based Peer Support.
7. Web- and Internet-Based Programs.

References
1. Goldstein MG, Whitlock EP, DePue J. Multiple behavioral risk behavior interventions in primary care: summary of research evidence. Am J Prev Med. 2004;27(2):61-79.
2. Lorig KR, Holman H. Self-management education: history, definition, outcomes and mechanisms. Ann Behav Med. 2003;26(1):1-7.
3. Heisler M. Building Peer Support Programs to Manage Chronic Disease: Seven Models to Success. California Healthcare Foundation, 2006. Available at http://www.chcf. org/~/media/MEDIA%20LIBRARY%20Files/PDF/B/PDF%20BuildingPeerSupportPrograms.pdf.

Technology: Cardiovascular, diabetes, and cancer screening for all patients (opportunistic screening)

Concept/Description:
Primary prevention or screening can be applied to all patients seen in the health clinic, independently of being diagnosed for a particular disease. However, it is critical for prevention screenings to be applied to people diagnosed with NCDs and at risk of NCDs. The morbidity and mortality in patients, with or without a chronic illness, can be reduced by early detection of other risk factors and other NCDs. The timetable is directed by standard local guidelines.

Expected Effect:
1. Persons will have applied age and gender-guided screening measures.
2. The prevalence of comorbidities will decrease.
3. The morbidity and mortality among persons with chronic diseases will reduce.
4. Comorbidities will be detected earlier.
5. Fewer persons will slip through the cracks with systematic application of prevention measures in patients with NCDs.

Steps		Tools	Responsible	Tips
1.	Extract prevention timetables from local guidelines and put together a list of screening recommendations.	Instructions for completing the Passport for Healthy Lifestyle.[1] Local screening measures.	Chronic disease team leader. Health center clerk.	Ensure the guidelines are posted strategically as reminders in the health center.
2.	Place a sticker in each patient's chart reflecting the prevention recommendations.	Stickers.	Health center clerk. Medical personnel.	
	SUGGESTIONS FOR SCREENING:			
3.	Measure height and weight, calculate BMI, and measure **BP** of all adults at each visit.	Height and weight scales. Sphygmomanometer. BMI charts.	Public health nurse.	
4.	Do **lipid profile** in patients with hypertension and diabetes mellitus.	Phlebotomy equipment. Lab forms.	Nurse. Physician. Phlebotomist.	All patients need at least a one-time lipid profile measurement.
5.	**Blood glucose** testing in patients with hypertension, diabetes, and obesity and other persons per guidelines.	Phlebotomy equipment. Lab forms.	Nurse. Physician. Phlebotomist.	
6.	**Mammography** with or without clinical breast examination after 40 years of age.	Mammography request forms. Local guidelines.		Local cancer society may partner to reduce cost.

7.	**Cervical cancer screening** in sexually active women who have a cervix intact.	Pap smear equipment. Referral forms to gynecology clinic.	Public health nurse.	Abnormal results should be reviewed by specialist or doctor.
8.	**Colorectal cancer screening** after 50 years of age.	Fecal occult blood testing. Fluoroscopy. Colonoscopy. Local guidelines.	Medical director to decide on this.	Other screening measures (e.g. double contrast barium enema, sigmoidoscopy, and colonoscopy should be accessible through local public hospitals, as indicated). Frequency depends on screening tool and findings.
9.	**Prostate cancer screening** Prostate specific antigen (PSA) and digital rectal exam (DRE) after 50 years of age.	Lab forms. Phlebotomy equipment. DRE trays.		
10.	**Depression screening** in clinical practices that have systems in place to assure accurate diagnosis, effective treatment, and follow-up.	Depression screening tool.	Nurse. Physician.	
11.	Tick off the various screening measures that have been completed.	Patient Record Card.	Clinic clerk.	

- Screening activities should only occur if acceptable to the patient, if early intervention can alter the course of disease, and if treatment is available for the disease being considered.
- The recommendations for age of screening and intervals for screening depend on and vary according to the level of personal risk.
- Diabetes is associated with increased risk of cancer of the liver, pancreas, endometrium, colon/rectum, breast, and bladder.[2]

These activities are suggestions based on global recommendations and are not meant to replace country guidelines.

References

1. Pan American Health Organization. Passport to Healthy Lifestyle [Internet]. Washington, DC: PAHO; 2014. Available at http://www.paho.org/hq/index.php?option=com_docman&task=doc_download&gid=25664&Itemid=270&lang=en. Accesed 24 February 2016.
2. Suh S, Kim KW. Diabetes and cancer: is diabetes causally related to cancer? Diabetes Metab J. 2011;35:193-198.

ANNEXES

Annex 1. Evidence Grading System

Recommendations for the different facets of care and target goals are based on various levels of evidence. Such levels are determined by the quality of the study (i.e. randomized controlled trials vs. observational studies), study limitations, consistency and precision of results, directness of evidence, and publication bias.[1]

Quality of Evidence	Definition
High	Very confident that the true effect lies close to that of the estimate of the effect.
Moderate	Moderate confidence in the effect estimate: the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
Low	Limited confidence in the effect estimate: the true effect may be substantially different from the estimate of the effect.
Very Low	Very little confidence in the effect estimate: the true effect is likely to be substantially different from the estimate of the effect.

Source: GRADE Handbook. Schunemann, Holger, Brozek, Jan, Guyatt, Gordon, Oxman, Andrew. WHO. Updated October 2013.

[1] World Health Organization. WHO Handbook for Guidelines Development. Geneva: WHO; 2012.
Available at http://apps.who.int/iris/bitstream/10665/75146/1/9789241548441_eng.pdf.
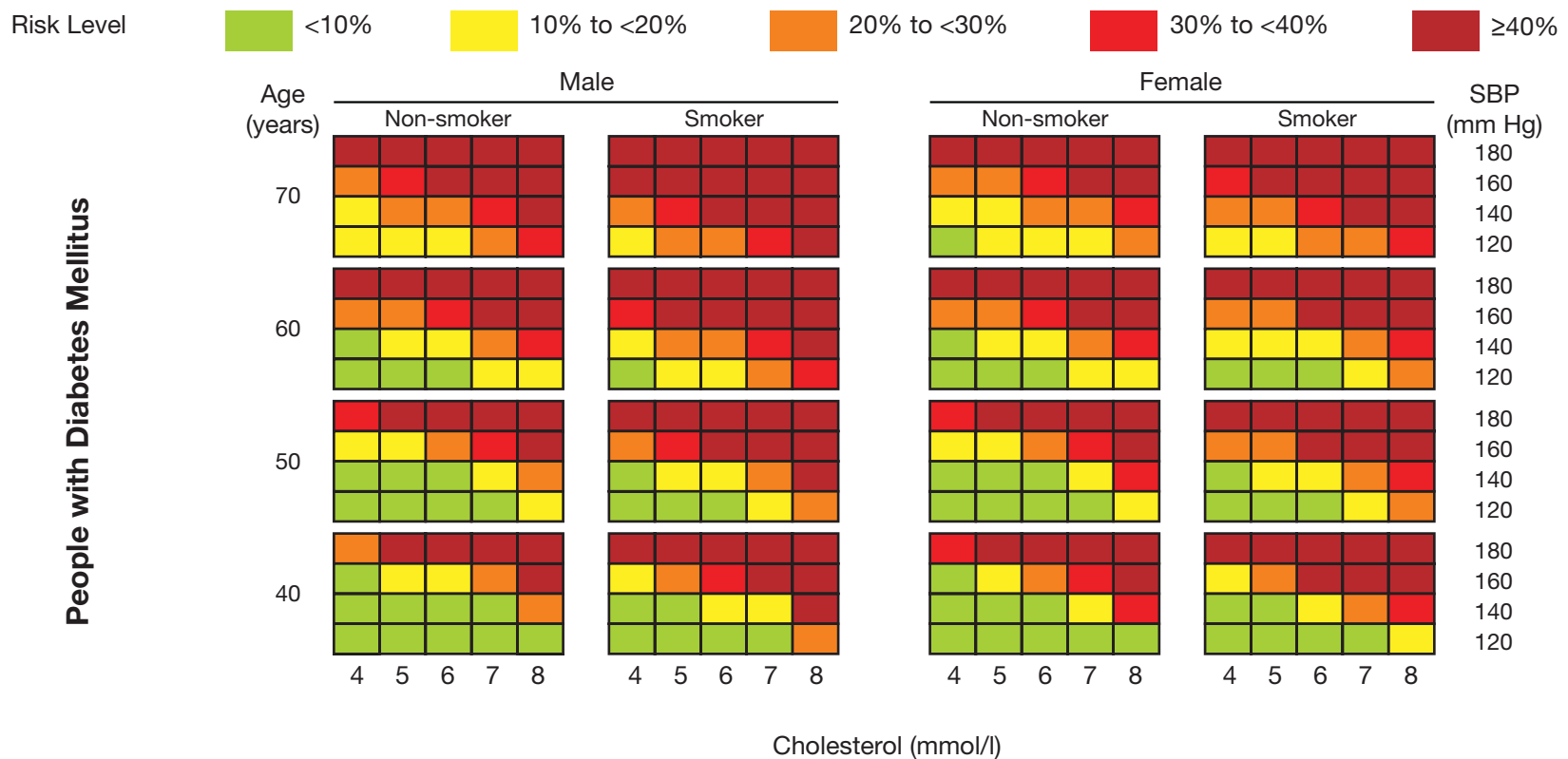
Annex 2. Body Mass Index (BMI) Chart

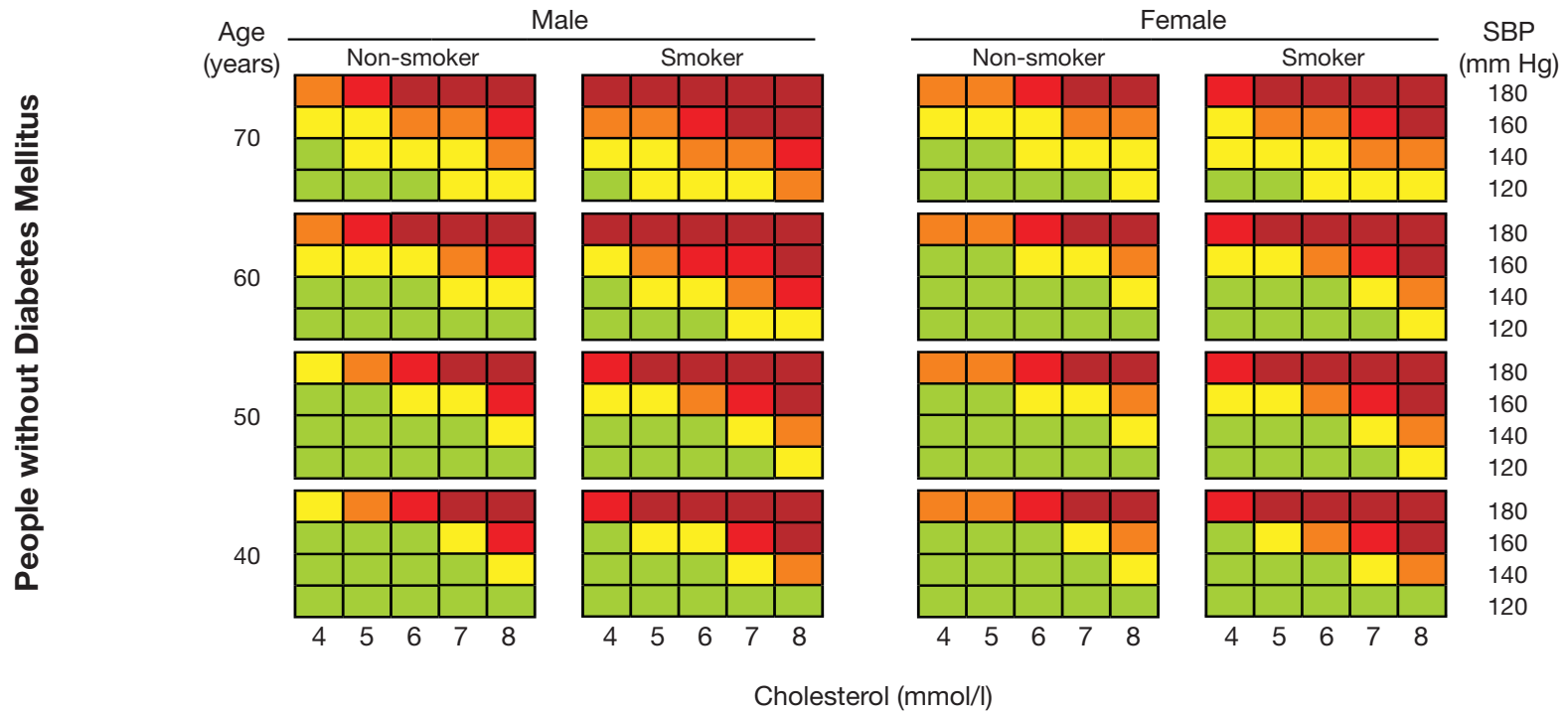| Weight	lb	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215
	kg	45.4	47.6	49.9	52.2	54.4	56.7	59.0	61.2	63.5	65.8	68.0	70.3	72.6	74.8	77.1	79.4	81.6	83.9	86.2	88.5	90.7	93.0	95.3	97.5
Height																									
ft/in	cm																								
5'0''	152.4	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
5'1''	154.9	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	36	37	38	39	40
5'2''	157.5	18	19	20	21	22	22	23	24	25	26	27	28	29	30	31	32	33	33	34	35	36	37	38	39
5'3''	160.0	17	18	19	20	21	22	23	24	24	25	26	27	28	29	30	31	32	32	33	34	35	36	37	38
5'4''	162.6	17	18	18	19	20	21	22	23	24	24	25	26	27	28	29	30	31	31	32	33	34	35	36	37
5'5''	165.1	16	17	18	19	20	20	21	22	23	24	25	25	26	27	28	29	30	30	31	32	33	34	35	35
5'6''	167.6	16	17	17	18	19	20	21	21	22	23	24	25	25	26	27	28	29	29	30	31	32	33	34	34
5'7''	170.2	15	16	17	18	18	19	20	21	22	22	23	24	25	25	26	27	28	29	29	30	31	32	33	33
5'8''	172.7	15	16	16	17	18	19	19	20	21	22	22	23	24	25	25	26	27	28	28	29	30	31	32	32
5'9''	175.3	14	15	16	17	17	18	19	20	20	21	22	22	23	24	25	25	26	27	28	28	29	30	31	31
5'10''	177.8	14	15	15	16	17	18	18	19	20	20	21	22	23	23	24	25	25	26	27	28	28	29	30	30
5'11''	180.3	14	14	15	16	16	17	18	18	19	20	21	21	22	23	23	24	25	25	26	27	28	28	29	30
6'0''	182.9	13	14	14	15	16	17	17	18	19	19	20	21	21	22	23	23	24	25	25	26	27	27	28	29
6'1''	185.4	13	13	14	15	15	16	17	17	18	19	19	20	21	21	22	23	23	24	25	25	26	27	27	28
6'2''	188.0	12	13	14	14	15	16	16	17	18	18	19	19	20	21	21	22	23	23	24	25	25	26	27	27
6'3''	190.5	12	13	13	14	15	15	16	16	17	18	18	19	20	20	21	21	22	23	23	24	25	25	26	26
6'4''	193.0	12	12	13	14	14	15	15	16	17	17	18	18	19	20	20	21	22	22	23	23	24	25	25	26

■ Underweight   ■ Ideal   ■ Overweight   ■ Obese   ■ Extremely obese

■ Underweight = 12-18   ■ Normal healthy weight = 19-24   ■ Overweight = 25-29   ■ Obese = 30-39   ■ Extremely obese = 40+

Annex 3. WHO/ISH Risk Prediction Chart

1. WHO/ISH risk prediction chart for AMR B. 10-year risk of a fatal or non-fatal cardiovascular event by gender, age, systolic blood pressure, total blood cholesterol, smoking status, and presence or absence of diabetes mellitus.


Risk Level: <10% | 10% to <20% | 20% to <30% | 30% to <40% | ≥40%

People with Diabetes Mellitus

Cholesterol (mmol/l)

People without Diabetes Mellitus

Risk Level
- <10%
- 10% to <20%
- 20% to <30%
- 30% to <40%
- ≥40%

Male — Non-smoker, Smoker
Female — Non-smoker, Smoker

Age (years): 70, 60, 50, 40

SBP (mm Hg): 180, 160, 140, 120

Cholesterol (mmol/l): 4 5 6 7 8

This chart can only be used for countries of the WHO Region of the Americas, sub-region B, in settings where blood cholesterol can be measured.

2. WHO/ISH Risk Prediction Chart for AMR B. 10-year risk of a fatal or non-fatal cardiovascular event by gender, age, systolic blood pressure, smoking status, and presence or absence of diabetes mellitus.
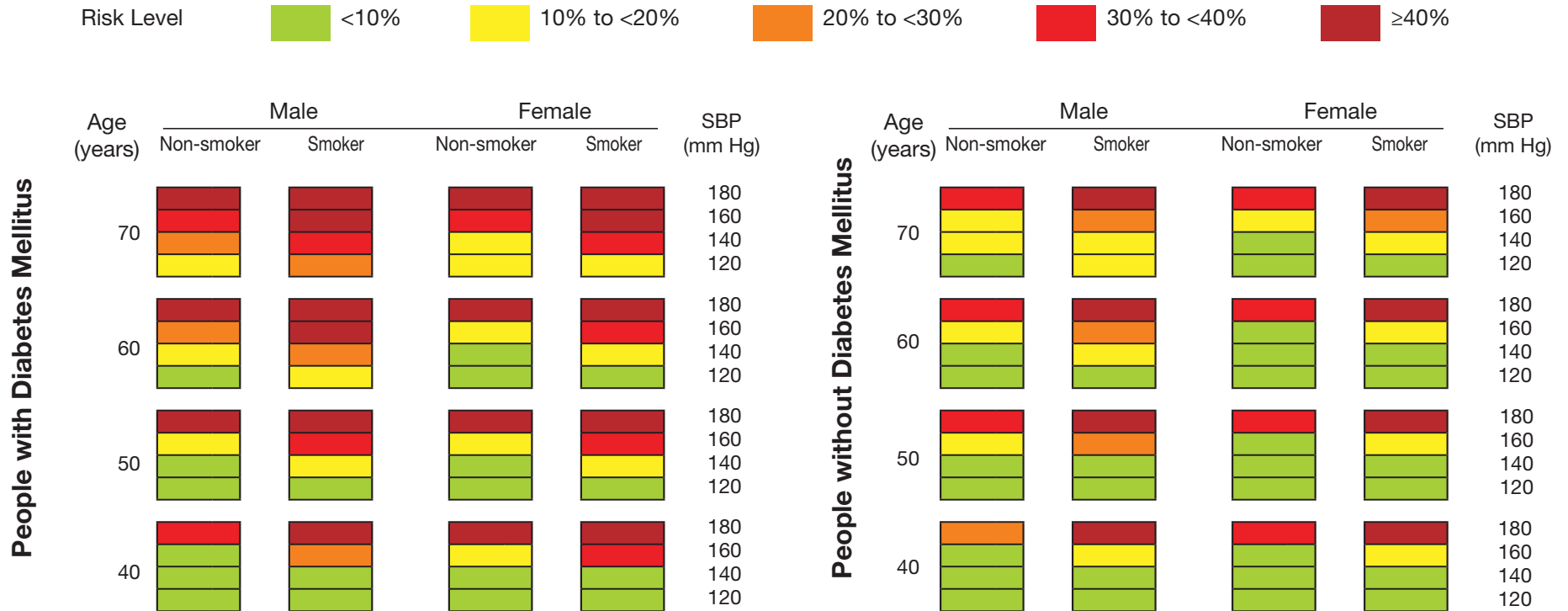
This chart can only be used for countries of the WHO Region of the Americas, sub-region B, in settings where blood cholesterol CANNOT be measured (Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Brazil, Chile, Colombia, Costa Rica, Dominica, Dominican Republic, El Salvador, Grenada, Guyana, Honduras, Jamaica, Mexico, Panama, Paraguay, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, Uruguay, Venezuela).

Annex 4. Food Exchange List[1]
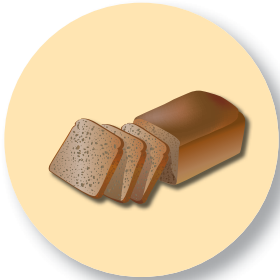
1 Staples
(70 Calories) = 1 slice of bread, or
1 slice of toast bread, or ½ bun, or 3 crackers,
or ½ cup rice / rice & peas / noodle / macaroni /
spaghetti, 1 medium green banana, 1 thin slice
yam, 1/2 medium sweet potato

1 Vegetable
(36 Calories) = Green Raw Vegetable: cabbage,
or cauliflower, or celery, or cucumber, or
lettuce, or spinach, or squash, or tomato: all
you can eat. Yellow Vegetable: ½ cup beetroot /
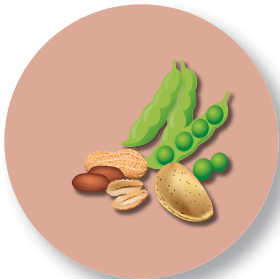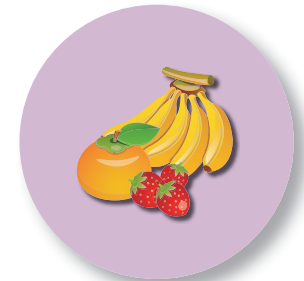carrot / mixed vegetables / pumpkin

1 Food from Animal
(100 Calories) = 1 small drumstick, or 2 slices of
chicken breast, or 1 small 6 ½ to 7 ½ cm slice of
fish / beef / lamb / pork / 5 medium shrimps, ½ cup
of 2% milk / whole milk, 60 g of yogurt
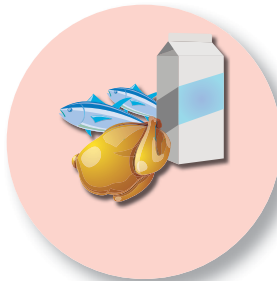
1 Fruit
(40 Calories) = ½ grapefruit,
1 orange, 1 tangerine, ½ banana,
1 cashew, 20 cherries,
1 small mango, ½ cup papaya

1 Legumes
(72 Calories) = 10 almonds, or 16 peanuts, or
7 cashews, or ¼ cup of chickpeas /
dried peas / green pigeon peas / stewed, or
2 tbsp baked beans

1 Fat and Oil
(45 Calories) = 1 tsp margarine / peanut
butter oil

[1] Organización Panamericana de la Salud. Pasaporte de cuidados crónicos [Internet]. Washington: OPS; 2012. Disponible en http://neww.paho.org /hq/index.php?option=com_content&view=article &id=7067%3Ael-pasaporte-de-cuidados-cronicos&-catid=1339%3Ahsd0203a-cncd-integrated-management-home&Itemid=4233&lang=en. Consultado el 23 de agosto del 2012.