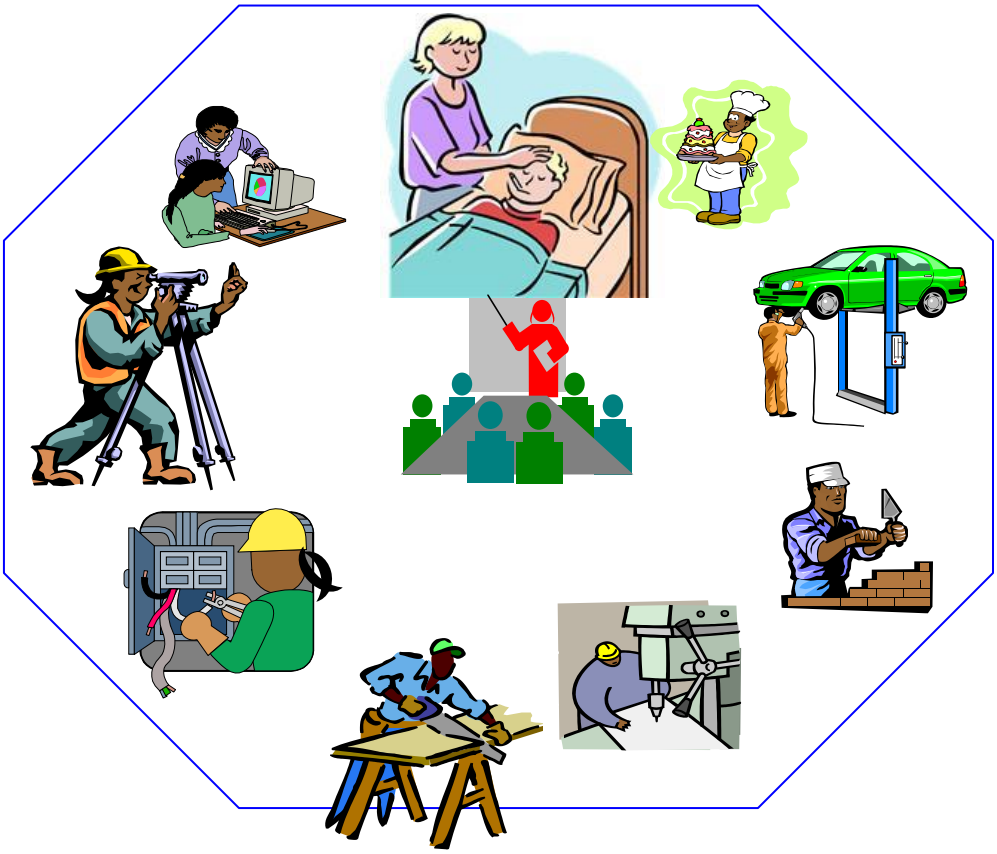
Pharmacy Level-IV

Based on Feb 2018 Version 2 OS and Jun, 2018 Version 1 Curriculum



Module Title:- Enhance the Use of Traditional Medicine

LG Code:- HLT PHS4 M05 LO(1-8) LG(18-25)

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February 2021

Bishoftu, Ethiopia

Table of Contents

LG -18	LO1. Apply the basic knowledge of organic chemistry

Instruction sheet:

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Introduction to Organic Chemistry
- Bonding of carbon compounds
- Hydrocarbons
- Aromatic compounds

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Obtain the required basic knowledge on Organic Chemistry
- Works with a basic understanding of Organic Chemistry
- Relate knowledge of Organic Chemistry with the structure and mechanism of action of drugs.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following all information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. If you earned a satisfactory evaluation proceed to “Operation sheets
7. Perform “the Learning activity performance test” which is placed following “Operation sheets” ,
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Information Sheet-1 Introduction to Organic Chemistry

1.1. Introduction to Organic Chemistry

Organic chemistry is the area of chemistry that involves the study of carbon and its compounds. Carbon is now known to form a seemingly unlimited number of compounds. The uses of organic compounds impact our lives daily in medicine, agriculture, and general life.

In theory (Oparin, 1923) organic chemistry may have its beginnings with the big bang when the components of ammonia, nitrogen, carbon dioxide and methane combined to form amino acids, an experiment that has been verified in the laboratory (Miller, 1950). Organic chemicals were used in ancient times by Romans and

Egyptians as dyes, medicines and poisons from natural sources, but the chemical composition of the substances was unknown.

In the 16th century organic compounds were isolated from nature in the pure state (Scheele, 1769) and analytical methods were developed for determination of elemental composition (Lavoisier, 1784).

Scientists believed (Berzelius, 1807) that organic chemicals found in nature contained a special "vital force" that directed their natural synthesis, and therefore, it would be impossible to accomplish a laboratory synthesis of the chemicals.

Fortunately, later in the century Frederich Wöhler (1828) discovered that urea, a natural component in urine, could be synthesized in the laboratory by heating ammonium cyanate. His discovery meant that the natural "vital force" was not required to synthesis organic compounds, and paved the way for many chemists to synthesize organic compounds.

By the middle of the nineteenth century many advances had been made into the discovery, analysis and synthesis of many new organic compounds.

Understanding about the structures of organic chemistry began with a theory of bonding called valence theory (Kekule, Couper, 1858).

Organic chemistry developed into a productive and exciting science in the nineteenth century. Many new synthetic methods, reaction mechanisms, analytical techniques and structural theories have been developed. Toward the end of the century much of the knowledge of organic chemistry has been expanded to the study of biological systems such as proteins and DNA. Volumes of information are published monthly in journals, books and electronic media about organic and biological chemistry.

The vast information available today means that for new students of organic chemistry a great deal of study is required. Students must learn about organic reactions, mechanism, synthesis, analysis, and biological function.

The study of organic chemistry, although complex, is very interesting, and begins here with an introduction of the theory of chemical bonding.

Self-Check –1	Written Test

Note: Satisfactory rating - 12 points Unsatisfactory - below 12points

Answer Sheet

_____1. Which one is the best treatment give by those T.M.P to treat rheumatism?

A. Bone setting
B. Blood letting
C. Hydro therapy
D. Heat therapy
E. All

_____2. Obesity treat:-

A. Cupping
B. Decoction
C. Fasting and dieting
D. Water balancing
E. None

_____3. _____ treatment is used rodient heat from coalf iro, animal materials

A. Hydrotherapy
B. Heat therapy
C. Cupping
D. Bone setting
E. All

_____4. _____ carried out in traditional medicine as well as modern medicine by the help of the tip finger to facilitate circulation and to relieve muscle strain.

A. Hydrotherapy
B. Heat therapy
C. Massage.
D. None

_____5. Female circumcision and tribal marks are grouped under _____ treatment

A. Surgery
B. Obstetrics and gynecology
C. Psychotherapy
D. None

_____6. All are advantage of traditional medicine except _____

A. Traditional medicine is cheaper than modern medicine.

B. Traditional medicine has more acceptable than modern medicine

C. Development chemotherapeutic agent more in traditional medicine than modern medicine.

D. Traditional medicine healers are more assessable than modern medicine.

E. None.

_____7. In traditional medicine burns are treated by _____ preparation

A. Amulet
B. Herbal
C. Union
D. Yoga
E. All

_____8. All are practicing in traditional medicine except _____

A. Sign
B. symptom
C. diagnosis
D. Pathology
E. None

_____9. _____ is practiced by particular group of community to bring healing force

A. Folk medicine
B. Ritual rite
C. Incantation
D. Herbalism
E. All

_____10. Adbar, subae and fasting grouped under _____ traditional medicine practice

A. Incantation
B. Ritual rite
C. Folk medicine
D. Decocotion
E. None

F.

Answer for choose

1.E2.C 3.C 4.C 5.A 6.E 7.B 8.D 9A 10.D

Name: _____ **Date:** _____

Information Sheet-2 Bonding of carbon compounds

1.2. Bonding in Carbon Compounds

The property of carbon that makes it unique is its ability to form bonds with itself and therefore allows a large number of organic chemicals with many diverse properties. Carbon has the property of forming single, double and triple bonds with itself and with other atoms. This multiple bond ability allows carbon compounds to have a variety of shapes. In all carbon compounds, carbon forms four bonds. The types of bonds used by the carbon atom are known as sigma ( ) and pi ( ) bonds.

Different combinations of these bonds lead to carbon single bonds, double bonds and triple bonds.

Note: Satisfactory rating - 12 points **Unsatisfactory - below 12points**

Answer Sheet

1. _____
2. _____
3. _____

Name: _____ **Date:** _____

Self-Check –2	Written Test

Information Sheet-3 Hydrocarbons

1.3. Hydrocarbons

Carbon forms single, double and triple bonds with elements other than carbon. Atoms involved in the bonding are usually oxygen, nitrogen, sulfur and the halogens. These elements are more electronegative than carbon and thus attract the electrons to themselves. The bonds are therefore **polar covalent bonds**.
Bonds that contain a separation of charge possess a **dipole moment**, a property that contributes to the overall polarity of the molecule

- **Polar Covalent Bonds in Carbon**

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Bonds that contain a separation of charge possess a **dipole moment**, a property that contributes to the overall polarity of the molecule.

- **Hydrogen Bonds and Bond Polarity**

The bonds O-H, N-H and F-H are highly polar covalent bonds because the electronegative draws electrons away from the hydrogen atom. In every case the hydrogen atom has a partial positive charge.
O□--H□+ N□--H□+ F□--H□+
A result of molecules having these highly polarized bonds with the hydrogen atom partly positive in nature, the hydrogen atom is attracted to the basic site in other molecules, such as the non-bonding electrons on oxygen and nitrogen

(non-bonding electrons are electrons belong to an element that complete the octet but do not participate in bonding). This attraction is called hydrogen bonding and is useful for explaining high boiling points and high melting points of fairly low mass molecules.

Thus hydrogen bonding in water explains why the compound with only three atoms boils relatively high when compared with other molecules of similar mass. Extra energy is required to break the hydrogen bonds during the boiling process.

Self-Check –3	**Choose**

Note: Satisfactory rating - 12 points **Unsatisfactory - below 12points**

Answer Sheet

_____1.. All are practicing in traditional medicine except _____

A. Sign

B. symptom

C. diagnosis

D. Pathology

E. None

_____2 _____ is practiced by particular group of community to bring healing force

A. Folk medicine
B. Ritual rite
C. Incantation
D. Herbalism
E. All

_____3. Adbar, subae and fasting grouped under _____ traditional medicine practice

A. Incantation
B. Ritual rite
C. Folk medicine

D. Decocotion

Name:_____

Date: _____

Information Sheet-4 Aromatic compounds

1.4. Aromatic compounds

Aromatic compounds, originally named because of their fragrant properties, are unsaturated hydrocarbon ring structures that exhibit special properties, including unusual stability, due to their aromaticity.

They are often represented as resonance structures containing single and double bonds.

However, the bonding is stronger than expected for a conjugated structure, and it is more accurately depicted as delocalized electron density shared between all the atoms in the ring.

- Aromatic compounds are cyclic compounds in which all ring atoms participate in a network of bonds, resulting in unusual stability.
- Aromatic compounds are less reactive than alkenes, making them useful industrial solvents for nonpolar compounds.
- Aromatic compounds are produced from petroleum and coal tar.

Aromatic compounds as represented by benzene and naphthalene are a group of compounds, which occupy a very important position in organic chemistry

An aromatic compound generally refers to a compound having [4n+2]π electrons with cyclic conjugated structure and is particularly stable (Hückel's rule).

Aromatic compounds exhibit distinctive properties in their structures, reactivity, and magnetic properties besides stability, and are called comprehensively "having aromaticity." Meanwhile, cyclic conjugated structures having 4n number of π electrons are destabilized and show "anti-aromaticity."

On the one hand, cyclic conjugated structures with these electronic states in the case of nonplanar molecules are not subject to any of the stabilization and destabilization above, and such compounds are called “non aromatic” compounds.

Aromatic compounds exhibit the following features specifically:

- **Structural features**: Equivalency of bond lengths are observed. The C–C bond lengths in the aromatic ring take values between those of the single and double bonds, and in particular, the lengths of the six bonds in benzene are equal. This is described by “no bond alternation.” Bond alternation can be observed depending on the substitution pattern and the ring structure.
- **Chemical behavior:** The reactivity of the double bond in the aromatic ring is reduced compared to the usual ones.They are also prone to the electrophilic substitution reaction rather than the addition reaction**.**
- **Magnetic properties:** Aromatic compounds show characteristic magnetic effects such as magnetic anisotropy and diamagnetism by the ring current effect of π electrons on the aromatic ring.
- **The Hückle Rule:** Most aromatic compounds contain a benzene ring or a related structure. What is responsible for the characteristic stability of benzene and its unique reactivity? Several general criteria must be met if a molecule is to be aromatic.

  1. An aromatic molecule must be cyclic.
  2. An aromatic molecule must be planar.
  3. An aromatic ring must contain only sp^2-hybridized atoms that can form a delocalized system of π molecular orbitals.

1. The number of π electrons in the delocalized π system must equal 4n + 2, where n is an integer.

   The“4n + 2 rule” was proposed by E. Huckel, and is known as the **Hückel rule**.

   The theoretical basis for this rule is beyond the scope of this text.

However, based on the Huckel rule, cyclic π systems with 6 (n = 1), 10 (n = 2), and 14 (n = 3) electrons are aromatic

Physical Properties of Aromatic Compounds

Aromatic compounds are generally non polar and immiscible with water. As they are often unreactive, they are useful as solvents for other nonpolar compounds.

Due to their high ratio of carbon to hydrogen, aromatic compounds are characterized by a sooty yellow flame.

Reactivity of Aromatic Compounds

The double bonds in aromatic compounds are less likely to participate in addition reactions than those found in typical alkenes.

Instead, cyclic aromatic compounds undergo electrophilic substitution reactions (reactions in which the ring acts as an nucleophile to a suitable electrophilic).

When benzene participates in such substitution reactions, the product retains the stability associated with the aromatic electron system.

This stability is lost in electrophilic addition because the product is not aromatic.

Sources of Aromatic Compounds

Aromatic compounds are produced from a variety of sources, including petroleum and coal tar.

Poly-aromatic hydrocarbons are components of atmospheric pollution and are known carcinogens.

Aromatic compounds are also interesting because of their presumed role in the origin of life as precursors to nucleotides and amino acids.

Ortho, meta, and Para nomenclature of aromatic compounds This nomenclature tutorial video takes you through the IUPAC rules for naming disubstituted benzene compounds using ortho-, meta-, and Para- prefixes

Self-Check –4	Written Test

Note: Satisfactory rating - 12 points Unsatisfactory - below 12points

Answer Sheet

_____1. _____ carried out in traditional medicine as well as modern medicine by the help of the tip finger to facilitate circulation and to relieve muscle strain.

A. Hydrotherapy
B. Heat therapy
C. Massage.
D. None

_____2. Female circumcision and tribal marks are grouped under _____ treatment

A. Surgery
B. Obstetrics and gynecology
C. Psychotherapy
D. None

_____3. All are advantage of traditional medicine except _____

A. Traditional medicine is cheaper than modern medicine.
B. Traditional medicine has more acceptable than modern medicine
C. Development chemotherapeutic agent more in traditional medicine than modern medicine.
D. Traditional medicine healers are more assessable than modern medicine.
E. None.

_____4. In traditional medicine burns are treated by _____ preparation

A. Amulet
B. Herbal
C. Union
D. Yoga
E. All

_____5. All are practicing in traditional medicine except _____

A. Sign

B. symptom

C. diagnosis

D. Pathology

Name: _____ **Date:** _____

LG -19	**LO2. Identifying medicinal plants in their natural and dry state**

Instruction sheet:

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- **Introduction to traditional medicine**
  - ✓ Definition of Terms
  - ✓ Traditional Medicine vs Allopathic Medicine
  - ✓ Advantages and disadvantages of traditional medicine
- **Traditional Medicine in Ethiopia**
  - ✓ History of Traditional Medicine in Ethiopia
  - ✓ Medicinal plants used in various ailments in Ethiopia
  - ✓ Poisonous plants in Ethiopia
- **Macroscopic Characters of properly dry plants**
- **Botanical features of medicinal plants**

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Highly poisonous plants of Ethiopia are recognized in their natural state
- Major medicinal plants of Ethiopia are recognized in their natural state
- Properly dried plants are recognized organoleptic ally
- The main botanical features of the major medicinal plant are described

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Information Sheet-1 Introduction to traditional medicine

2.1.1. Definition of terms

- **Traditional medicine (TM):** It is the sum total of the knowledge, skill, and practices based on the theories, beliefs, and experiences indigenous to different cultures
- **Complementary medicine (CM):** The terms “complementary medicine” or “alternative medicine” refer to a broad set of health care practices that are not part of conventional medicine and are not fully integrated into the dominant health-care system.
- **Allopathic medicine:** a system in which medical doctors and other health care professionals treat symptoms and disease using drugs, radiation, or surgery.
- **Complementary/Alternative medicine (CAM):-**CAM is a group of diverse medical and health care systems, practices, and products that are not generally considered to be part of conventional medicine.

2.1.2. Traditional Medicine vs Allopathic Medicine

Types of CAM

- ## Major domains of CAM (non allopathic)
  - Manipulative and body-based practices:- chiropractic or osteopathic manipulation or massage therapy
  - Energy medicine:- therapies affecting “body energy fields” (qi gong, healing touch, Reiki) or unconventional use of electro-magnetic fields.
  - Mind-body medicine:- techniques designed to enhance the mind's capacity to affect bodily function and symptoms e.g. meditation, mental healing.
  - Biologically based practices:- herbs and other dietary supplements
  - Alternative medical system

Allopathic medicine:

- a system in which medical doctors and other health care professionals treat symptoms and disease using drugs, radiation, or surgery.
- Allopathic medicine refers to the broad category of medical practice that is sometimes called Western medicine, biomedicine, scientific medicine, mainstream medicine or modern medicine or conventional medicine.
- This system was developed in the Western countries.
- In this system drugs (tablets, capsules, injections, tonics etc.) are manufactured using synthetic chemicals and / or chemicals derived from natural products like plants, animals, minerals etc.
- This system also uses modern equipment for diagnosis, analysis, surgery etc.
- Medicines or drugs of this system are often criticized for its treatment of the symptoms rather than the cause of the disease, harmful side effects of certain drugs and unaffordable to poor people due to the high cost and treatment

2.1.3. Advantages and disadvantages of traditional medicine

- **Advantages of traditional medicine**

TM/CAM therapies are generally available, affordable and commonly used in low- and middle-income countries. Surveys conducted by the WHO Roll Back Malaria Programme in 1998 showed that in Ghana, Mali, Nigeria and Zambia, more than 60% of children with high fever are treated at home with herbal medicines.

Many TM/CAM therapies are supported by empirical evidence on safety and effectiveness. Such evidence is usually based on sources such as traditional scriptures, pharmacopoeias and/or clinical experience collected over hundreds of years. An increasing number of scientific studies now support the use of certain TM/CAM therapies. The effectiveness of acupuncture, for example, a popular treatment for pain relief, has been demonstrated both through numerous clinical trials and laboratory experiments . Another example is Artemisia in, a new ant malarial medicine, which is purified from a traditionally used medicinal plant. Other examples of TM/CAM therapies with a research-derived evidence base are: St John's Wort (Hypericum Perforatum) for mild depression; and Saw Palmetto (Serenoa Repens) for reducing symptoms of benign prostate hyperplasia

- **Disadvantages of traditional medicine**

- ✓ Teanicides – Blindness & changes in CNS function took over dosage of Hygeia abyssinica.
- ✓ Traditional healers may delays in the treatment of communicable diseases such as TB
- ✓ Other harmful practices: female genital mutilation, uvulectomy, and milk tooth extraction

Self-Check –1	True/False

Say True for the correct statement and False for the incorrect statement

___1. When the whole plant is desired, it is advisable to harvest the plant at the time when the flowers are all in bloom.

___2. Many medicinal plants are seasonal, some not easily accessible, available only in deep forests or mountain peaks.

___3. The dried plant materials should be placed in plastic containers or tightly covered bottles; brown colored bottles are preferred as they maximum deterioration due to sunlight

Information Sheet-2 Traditional Medicine in Ethiopia

2.2.1. History of traditional medicine in Ethiopia

Ethiopia is rich in medical lore. The use of plants in religious ceremonies as well as for magic and medicinal purposes is very commonplace and widespread

Based upon strong primitive roost, the art of native medicine is still widely practice do while much of this lore is indigenous, yet there are strong indications of Hebrew and Egyptian as well as Greek and other Arabic influences.

Among natives of various countries, knowledge of medicine has been passed by word of mouth from one generation to the next by priests, witchdoctors or medicine men. This is no less true in Ethiopia where written records in this field are almost absent even though the country has had a written language for over two thousand years. The method is crude and highly conducive to distortion in an area where much accuracy is needed. Some of the lore is lost at each point of transfer or otherwise modified and thereby becomes erroneous and dangerous to use. In addition, witchdoctors, to safeguard their interests and win the respect of the inflicted masses, usually compose a long and impressive list of curative herbs for a particular disease when they know that it is only one of those listed that causes a cure. This is also done to fence out or discourage others from becoming herbal doctors if they are forced to tell the secret. For the same reasons, the plants comprising the remedy are selected from different ecological locations such as alpine, highlands, or lowlands; thus rendering it more difficult to exactly duplicate the ingredients. This means that even if one knew and had the list of the alleged curative herbs, he would not necessarily be able to become a practicing witchdoctor.

More fascinating is the belief witchdoctors have been able to implant into the minds of many that the healing power of the plant loses its curative and healing virtues should the secret (that is, the name) of the plant and its reputed use, be disclosed. The informant is also thought to be subject to misfortune and bad luck and a life full of uncertainty. This has meant that a witchdoctor will

be hesitant to pass on his knowledge and, as a rule, will not pass on his knowledge of medicine to anyone except his offspring, and even then only as he nears death. In medicine, it is the first-born son that is entrusted with the secrets. If he is found unworthy of the trust and is believed to talk too freely and is generally careless about his ways, then another member of the family is considered. At any rate, whoever merits the honor, is sworn to keep the secret with due care throughout his life and only pass it on in a similar manner. Having given his solemn oath, he is then taken to all the places, near and far, where the plants are known to grow. Should this not be possible, he is given verbal directions and descriptions of the plants and their localities. Thus at each point or act of transfer, secrecy becomes more and more binding and cloaked in mystery. As with the herbalists of sixteenth century Europe, bizzarre stories, legends and beliefs developed in Ethiopia; astrological implications became common place and were incorporated quite freely as part of the cure. The gathering of the medicinal herbs, their preparation and administration to the patient is still as etiologically determined in many cases. Advocating or implementing such practices as the wearing of a certain grass around one's neck to dispel meningitis, or applying lard from a snake to an infected organ as a cure against elephantiasis are seemingly unfounded practices.

It is difficult to determine, much less assess, the role of the native medicine man in a given community. Sometimes he has no other profession. Sometimes priests, students of the church, and farmers are doctors as the need arises. It is always men who take up the art, though many women possess the knowledge. A medicine man does not, as a rule, collect a flat fee for his services. A small and voluntary payment is sometimes made by the patient's immediate family or by the patient himself as a token of friendship and as an expression of gratitude. A more substantial reward is oftentimes made by the patient after his complete recovery.

The sick invariably go to the medicine man at a late stage of the illness; they may turn still later to the modern man of medicine. Many die needlessly when disease strikes because of the ignorance which is translated into negligence and indifference. It is not an unfounded assumption that many seem to think that they may offend God if they should look for a cure other than from His own Hands.

It is difficult to explain why Ethiopia never put any of the medical lore into writing. Only the church may be said to possess records of this nature, but they are unavailable to non-church men. Few accounts have appeared by people who visited or went through the country, notably German, French, English and Italian naturalists or explorers, fragmentary though these reports may be (Chivenda, 1912 and 1931; Tubiana, 1952; Merab, 1912; Paillieux et Bois, 1890; Branun,1848; Cacciapuoti, 1941; Burton, 1966; Lemordant, 1960). More recently, Aumerican botanists of the United States Department or of Agriculture Research Service (F. G. Meyers, New Crops Research Branch, R. E. Perdue,Jr., Medicinal Plant Resources Laboratory, Beltsville, Maryland) have made an extensive collection of native Ethiopian medicinal plants, and from the preliminary screening tests the list of plants showing positive action against cancer has been encouraging. A similar screening program has been developed to test Ethiopian plants by some Institutes of Tropical Medicine in Great Britain. These preliminary efforts will no doubt reveal the need for more work in this line.

No country in Africa enjoys as great a diversification of geology, land forms, soils, and climate as Ethiopia. There are more than forty five vegetation types where forests, savannas, woodlands, steppes and grasslands comprise 75% of the vegetation cover. As a result, Ethiopia (Somalia and Socotra included) possesses one of the richest floras in Africa, with no less than 7.000 species of Pteridophytes and Spermatophytes. Much of this floristic wealth is reflected in the fact that Ethiopia is one of the primary centers of origin of many of the world's cultivated crops, e.g. , wheat, barley, teff, coffee, peas, okra, sorghum, millets, lentils. The flora is 35% endemic and is an independent floristic region closely allied to the flora of tropical East Africa and Central Africa.

The field work yielding the information herein presented was carried our throughout Ethiopia the bulk of the data was obtained from the Eastern (Harar) region. The information was particularly difficult to obtain for the reasons already explained. Paying informants was hazardous as it encouraged instant fabrication. The recording of the information was done when it was verified by more than one person. Voucher specimens, whenever possible, have been deposited in the Herbarium at the College of Agriculture, Haile Sellassie I University, Dire

Dawa, Ethiopia. Duplicate specimens of some of these are deposited in the National Herbariun, Addis Ababa, Ethiopia; the East African Herbarium, Nairobi, Kenya; and the Herbarlum of the Royal Botanlcal Gardens, Kew, England. Much of the collection has been sent to the Herbarium of the Royal Botanical Gardens, Kew, England and the East African Herbarium, Nairobi, Kenya for identification. I am grateful to the taxonomic staff of both herbaria for identifying and verifying the plant material I had sent upon which this work is based.

2.2.2. Medicinal plants used in various ailments in Ethiopia

BORAGINACEAE

This is a very graceful shade tree that produces white blossoms and edible yellow fruits, both of which are attractive.

Wood ash mixed with butter is used for skin troubles locally referred to as "Spider disease" because they believe the spider causes the skin trouble by depositing its urine or other forms of excretion on the skin while they are asleep.

Heliotropium geometricum

A weedy herb of pastures and eroded poor, dry sites that blooms the year round.

It may prove a suitable hedge plant in semi-arid areas and poor sandy grounds.

The leaves are crushed and the volatile sap or vapors inhaled for the treatment of fever and influenza.

Plant extract administered orally to women following childbirth for quick expulsion of the placenta.

BURSERACEAE

Frankincense has been an item of commerce for many centuries in Ethiopian.

The Biblical record mentions that it was one of the gift items the Queen of Sheba took for King Solomon. It is found in most of the low lying arid regions of the country, particularly in Ogaden.

Its use in religious rites and customs is wide-spread both by the Christians and Moslems. It is used with spices against fever and is also believed to have a tranquilizing effect. The smoke is also thought to relieve people from evil spirits. Administration is usually done at night.

CACTACEAE

Kulkual is a very common sight in low altitudes and dry regions of the Empire. One may be misled to think the plant is native because of its wide occurrence. In some regions, it is the dominant species. Its density is high along highways and caravan routes. The plant is native to Central America.

The colonization of pasture and range areas by kulkual is rapid indeed. Many types of grassland are being taken over by it and becoming less useful as range lands with a much lowered grazing capacity. The cost of clearing for farming is also high because of the extreme difficulty in clearing the kulkual.

A moth that feeds on, and destroys, the vascular system of the plant has been employed as a biological control agent against its spread in Australia where kulkual is quite endemic over a wide area. If a light fire can be applied only enough to burn off the spines and bristles without further damage to the rest, it could be made into silage as is reportedly done in Australia.

Some members of the Ethiopian Horticultural Society, Addis Ababa, have found the dried stem-branches an excellent medium to grow epiphytes such as orchide. One may cook or boil the stem-branches and dry them before use.

In Ethiopia, spiny varieties are found and from the popularity of the fruit, spine-less varieties should be introduced. The fruit is on the market during the months of June to September Farmers and those living on the outskirts of towns drive good income from the sale of the fruit, though the prickly pear is not cultivated. To the farmers, it is a much needed complement to their diet during this non-harvest time when all food grains stored for home use are low or exhausted.

The consumption of considerable amounts causes constipation which results from a drying effect on the digestive system. But most people fond of eating the fruit have learned their own solution for this side effect, which usually means consuming large quantities of tea.

In India, the fruit is reportedly eaten for the treatment of asthma.

CANNABIDACEAE

A leafy annual herb 1-3 m.high occasionally grown by farmers as a cash crop in the absence of enforced government restrictions. The plant is a source of a powerful narcotic. Moslems or those with a strong Arabic influence use it or handle the cultivation and marketing.

CAPPARIDACEAE

Symptoms: In camel-- it loses coordination and collapses after three to four days. There is also a creaking sound of all natural joints brought on by poisoning. After that, the camel either suffers severe diarrhea and is cured, or is short of its natural breath and death finally results.

Duration: As long as two weeks.

Treatment: Drenching the animal with a mixture of soap from a well cooked sheep or goat, and milk with its fat un removed. This apparently acts as a purgative as the animal ingests this soapy mixture by licking itself.

Gynadropsis speciosa

A tea preparation from this herb is taken for a period of two weeks. This is considered effective against kidney stone.

A close relative, G. gynadra (L.) Berqu., is used as a vegetable in parts of Ethiopia when food is scarce. This herb grows profusely in gardens or on old and abandoned village yards.

CELASTRACEAE

Tree up to 7 meters high, occasionally attaining 15-20 m. The shrubby tree is cultivated for its leaves and tender shoots mostly in Eastern Ethiopia where it competes with coffee as an important cash crop.

Chat is believed to have 5Ol different kinds of cures equaling the numerical value of the letters of its Arabic name, Ga-a-t (400 + 100 + 1). The root is used in some parts of Africa as a remedy for influenza, for stomach troubles and diseases of the chest. The most wide spread use is as a masticatory agent. The leaf has an inebriant narcotic and stimulatory effect which produces a marked release from fatigue and hunger. It is also spaid to have a euphoric effect.

Quality tej is made using equal amounts of chat and hop (Rhamnus prinoides). Quality of the chat tej deteriorate after 8 days, after which time, the tej becomes more sour.

Maytenus ovatus

Very common shrub in Ethiopia, much so, that two large localities, Kombolcha in Wollo and Kombolcha in Harar are named after this shrub signifying its ecological dominance in these localities.

Recent investigations have shown that this plant is an important source of anti-cancer drug. Locally the leaf decuction is used to control external parasites both in domestic animals and in humans.

CHENOPODIACEAE

This is a very common weed of garden and abandoned areas. The plant varies in size depending on the fertility of the soil.

The plant is used for its anthelmintic properties and the oil from the seeds is effective against many forms of intestinal parasites.

COMBRETACEAE

A very showy shrub which grows over tall trees. It is seen growing in the warm, moist areas of Wollega and Jimma, and flowers in January and February.

The fresh flowers are ground and the juice is used in the treatment of conjunctivitis and other eye ailments. It is also used to treat leprosy. In this regard, it may actually be Terminalia glaucescens Engl. ex Benth, that is used and not Combretum paniculatum Vent. as the same common names are used for both species.The plant should be introduced wherever possible into cultivation for its bright red flowers.

COMPOSITAE

Plant is commonly found in damp places near river beds under shady areas and on waste grounds.The whole fresh plant is used to dress wounds and sores.

2.2.3. Poisonous plants in Ethiopia

The art of preparing and administering poisons is equally as rich in lore as more conventional medicine. Ethiopians possess an extensive knowledge of poisonous plants and the art of preparing poisons from diverse sources. Poisonous preparations applied to weapons were probably first used for hunting game and arrow poisons are common in East, Central and West Africa. A number of plants are used in Ethiopia in the preparation of poison arrows, i.e. Acocanthera schimperiana, Adenium obesum, Adenium somalense, Cassia sp., Crotalaria retusa, Euphorbia spp., Securidaea lonqependuculata, Tephrosia vogelii. Nowadays, poison preparations are used more for homicidal purposes than for hunting game animals. Homicidal poisoning is quite prevalent in the northern provinces. Its common occurrence is well borne our by the

standard custom in this reqioh where a host irrespective of closeness of kin, serving a drink or food, must first consume or taste some before serving the guest. In the case of drinks the host spills some on the cupped palm of the hand and drinks it in front of the guest to establish good faith.

The passion to change occurs nowhere more theatrically than in Ethiopia - a country wanting to change from stone age to nuclear age overnight. The young generation, a product of an aristocratic educational system, is being weaned away from its immediate family ties and removed from its native environment. This is bringing an almost immediate death to the country's heritage of rich oral tradition. The introduction of new and improved agricultural practices and crop seeds has also accelerated this process. The collection and recording of the native lore is essential before it is lost. For this reason, the preliminary study to be presented here was undertaken.

Self-Check –2	**Written Test**

___1All of the following are Good collecting practice except

A. Make detailed field notes. It is a good idea to make them before digging up the plant of interest, particularly if you are inclined to be impatient.
B. Tag your plants when you collect them.
C. Press your plants while they are fresh
D. Lay them out as you want them to look
E. None

Information Sheet-3 Macroscopic Characters of properly dry plants

2.3. Macroscopic Characters of properly dry plants

When medicinal plant materials are prepared for use in dry form, the moisture content of the material should be kept as low as possible in order to reduce damage from mould and other microbial infestation. Information on the appropriate moisture content for particular medicinal plant materials may be available from pharmacopoeias or other authoritative monographs.

Medicinal plants can be dried in a number of ways: in the open air (shaded from direct sunlight); placed in thin layers on drying frames, wire-screened rooms or buildings; by direct sunlight, if appropriate; in drying ovens/rooms and solar dryers; by indirect fire; baking; lyophilization; microwave; or infrared devices. When possible, temperature and humidity should be controlled to avoid damage to the active chemical constituents. The method and temperature used for drying may have a considerable impact on the quality of the resulting medicinal plant materials. For example, shade drying is preferred to maintain or minimize loss of color of leaves and flowers; and lower temperatures should be employed in the case of medicinal plant materials containing volatile substances. The drying conditions should be recorded.

In the case of natural drying in the open air, medicinal plant materials should be spread out in thin layers on drying frames and stirred or turned frequently. In order to secure adequate air circulation, the drying frames should be located at a sufficient height above the ground. Efforts should be made to achieve uniform drying of medicinal plant materials and so avoid mould formation.

Drying medicinal plant material directly on bare ground should be avoided. If a concrete or cement surface is used, medicinal plant materials should be laid on a tarpaulin or other appropriate cloth or sheeting. Insects, rodents, birds and other pests, and livestock and domestic animals should be kept away from drying sites.

For indoor drying, the duration of drying, drying temperature, humidity and other conditions should be determined on the basis of the plant part concerned (root, leaf, stem, bark, flower, etc.) and any volatile natural constituents, such as essential oils.

If possible, the source of heat for direct drying (fire) should be limited to butane, propane or natural gas, and temperatures should be kept below 60 °C.6 If other sources of fire are used, contact between those materials, smoke and medicinal plant material should be avoided.

Self-Check –3	choose

1 an empty pulse may feel rather big but soft. The pulse may be rather big but empty on slightly stronger pressure. This type of pulse signifies deficient chi. A weak pulse can also feel thin or thready which signifies deficient blood.

A. WEAK OR EMPTY PULSE
B. FULL PULSE
C. SLOW=COLD
D. FAST=HEAT

____2. more than 5 beats per respiration of the practitioner or 80 or more beats per minute

A. WEAK OR EMPTY PULSE
B. FULL PULSE
C. SLOW=COLD

Information Sheet-4 Botanical features of medicinal plants

2.4. Botanical features of the medicinal plants

Botany, also called plant science(s) or plant biology, is the science of plant life and a branch of biology. The term "botany" comes from the Ancient Greek word βοτάνη (botane) meaning "pasture", "grass", or "fodder"; βοτάνη which is in turn derived from βόσκειν (boskein), "to feed" or "to graze".[1][2][3] A person who studies plants may be called a botanist or a plant scientist. Traditionally, botany has included the study of fungi and algae, studied by mycologists, phycologists respectively, with the study of plants and these three groups of organisms remain within the sphere of interest of the International Botanical Congress. Nowadays, botanists study approximately 400,000 species of living organisms[4] of which some 260,000 species are vascular plants and about 248,000 are flowering plants.[5]

Botany originated in prehistory as herbalism with the efforts of early humans to identify – and later cultivate – edible, medicinal and poisonous plants, making it one of the oldest branches of science. Medieval physic gardens, often attached to monasteries, contained plants of medical importance. They were forerunners of the first botanical gardens attached to universities, founded from the 1540s onwards. One of the earliest was the Padua botanical garden. These gardens facilitated the academic study of plants. Efforts to catalogue and describe their collections were the beginnings of plant taxonomy, and led in 1753 to the binomial system of Carl Linnaeus that remains in use to this day.

In the 19th and 20th centuries, new techniques were developed for the study of plants, including methods of optical microscopy and live cell imaging, electron microscopy, analysis of chromosome number, plant chemistry and the structure and function of enzymes and other proteins. In the last two decades of the 20th century, botanists exploited the techniques of molecular genetic analysis, including genomics and proteomics and DNA sequences to classify plants more accurately.

Modern botany is a broad, multidisciplinary subject with inputs from most other areas of science and technology. Research topics include the study of plant structure, growth and differentiation, reproduction, biochemistry and primary metabolism, chemical products, development, diseases, evolutionary relationships, systematics, and plant taxonomy. Dominant themes in 21st century plant science are molecular genetics and epigenetics, which are the mechanisms and control of gene expression during differentiation of plant cells and tissues. Botanical research has diverse applications in providing staple foods and textiles, in modern horticulture, agriculture and forestry, plant propagation, breeding and genetic modification, in the synthesis of chemicals and raw materials for construction and energy production, in environmental management, and the maintenance of biodiversity.

Self-Check –4	Written Test

This pulse requires a deeper pressure to discern. It must be felt with a heavy pressure of the fingers close to the bone. A deep and weak pulse indicates deficiency of chi and yang, a deep and full pulse indicates stagnation of chi or blood in the interior, or internal cold or heat.

A. DEEP PULSE
B. FULL PULSE
C. WEAK OR EMPTY PULSE
D. FAST=HEAT

LG -20	Lo3.Communicating knowledge of herbal medicine philosophy, principles and practice

Instruction sheet:

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics

- **Central philosophies and historical developments of traditional medicine**
- **Principles, Methods and Practices of the Ethiopian Traditional Medicine**
  - ✓ **Preventive practice**
  - ✓ **Diagnostic practice**
  - ✓ **Therapeutic practice**
  - ✓ **Surgical practice**
- **Integration of traditional medicine into health care system of the country**
- **Traditional medicine and primary health care (PHC)**
  - ✓ **Overview of PHC**
  - ✓ **Methods of using traditional medicine in PHC**
  - ✓ **Training the traditional medical practitioners**
- **Some popular complementary medical practices**
  - ✓ **Herbal medicine**
  - ✓ **Homeopathy**
  - ✓ **Traditional Chinese Medicine**
  - ✓ **Traditional Indian Medicine**
  - ✓ **Naturopathy**
- **Disseminate valid information to clients and other health care providers regarding**
  - ✓ **Indications**
  - ✓ **Adverse effects and contraindications**

Interactions of commonly used herbal preparations

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following all information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. If you earned a satisfactory evaluation proceed to “Operation sheets
7. Perform “the Learning activity performance test” which is placed following “Operation sheets” ,
8. If your performance is satisfactory proceed to the next learning guide,
9. If your performance is unsatisfactory, see your trainer for further instructions or go back to “Operation sheets”.

Information Sheet-1 Central philosophies and historical developments of traditional medicine

3.1. Central philosophies and historical developments of traditional medicin

In this first decade of the 21st century, immense advances in human well-being coexist with extreme deprivation in many parts of the world1). Inequities in availability, accessibility and affordability of health care have increased, between as well as within populations the world over. Access to appropriate healthcare is increasingly being acknowledged as a human right through international instruments such as the United Nations Human Rights Commission, Millennium Development Goals (MDGs) and the World Health Organization (WHO).

In the recent past there has been a growing interest in Traditional medicine/Complementary and Alternative Medicine (TCAM) and their relevance to public health both in developed and developing countries. Diversity, flexibility, easy accessibility, broad continuing acceptance in developing countries and increasing popularity in developed countries, relative low cost, low levels of technological input, relative low side effects and growing economic importance are some of the positive features of traditional medicine (WHO 2002). In this context, there is a critical need to mainstream traditional medicine into public health care to achieve the objective of improved access to healthcare facilities. However, evidence suggests a disparity between personal choices the public make in terms of integration of different medical systems and the TCAM policy formulation and their implementation. According to WHO some of the major policy challenges include safety, efficacy, quality and rational use of traditional medicine.

In this background, the article is an overview of TCAM, its global presence, various policy measures for promotion, their role in primary health care and major contemporary challenges for integration of TCAM into public

Self-Check –1	True/False

1. Dried medicinal herbs keep best in a cool environment. Heat can cause essential plant oils to evaporate_____
2. Herbs need some air circulation while drying to prevent molding. Once herbs are dried, seal them in airtight jars for storage-_____

Information Sheet-2 Principles, Methods and Practices of the Ethiopian Traditional Medicine

3.2. Introduction

Principles

- Healing in ETM is not only concerned with curing of diseases but also with the protection and promotion of human physical, spiritual, social, mental and material wellbeing.
- Although modern medicine influence some aspects of the traditional system, ETM remains rooted in magi co-religious beliefs and empirical knowledge from the natural environment.
- Traditional Healing knowledge is guarded by certain families or social groups.
  In ETM , the issue of health is seen holistically and not separated into physical health and mental health
- Health is seen as a 'gift of God' or 'the will of God' and many Ethiopians generally believe that their religion helps keep them healthy.
- These perceptions are related to the belief that supernatural forces are involved in causing disease as well as in their treatment.
- For instance, while the devil is considered to be the cause of a number of illnesses, God is believed to provide the healing.
- Using of prayer to a supernatural power as a therapy is a much longer time practice of ETM.

Methods and practices

- Traditional medicine is largely practised by traditional medicine practitioners, particularly by the elderly and sometimes by mothers.
- The more widely known spiritual healers are grouped into two categories according to their religious beliefs.

Members of the Orthodox Christian clergy are called the debteras and members of the Muslim community are known as kalichas

Debtera & Kalichas

- Kalicha: Muslim traditional healer

- Debtera: A person with some religious training who may participate in church ceremonies or religious education.

- The debteras (Christian spiritual leaders) are popular for their prayer which is known as degmit, which they perform on behalf of clients.
- Along with this, they prepare Tsebel (holy water) and kitab amulets containing a written script.
- By means of the degmit, the debteras claim to have the ability to perform miracles, which are believed to be manifested by the reactions of their patients.
- Also other spiritual practices such as Emnet (ash), Kiba kudus (holy oil) and Mar (holy honey) in combination with prayer and the cross were used.
- Tsebel is believed to be able to cure any ailment, no matter what it may be; however, it is preferred over modern medicine in the cure of mental illness.
- Tsebel is commonly used to ward off evil spirits from patients who are believed to be possessed by the devil.
- Kitabs are worn for the purpose of protecting oneself against the evil eye or Buda, as well as snake and scorpion bites.
- Holy honey: It can be applied directly to the diseased part of the body on the outside of the skin, it can be eaten by itself, or it can be mixed with holy water and drunk.
- Use of Emnet: Emnet includes both the use of incense ash and soil in the church. It is taken in dry form and used on the forehead or all over the face to bless one's self or it could be mixed with holy water and ingested. Emnet in the form of soil is thought to have curative practices.
- Kiba kudus: Holy oil or kiba kudus, are also commonly used by priests on people suffering from earaches and deafness. The consecrated oil is poured into the ears and the person is prayed for by the priest.
- The kalichas is the religious leader who can investigate the causes of a disorder and advise the patient on what to do.
- Mental disorders are generally explained as resulting from disturbances in the relationship between people and divinity.

- They conduct special ceremonies to effectively perform their practices which include the use of excessive smoke by burning incense such as myrrh, and frankincense (etan).
- They also prepare kitabs of their own kind to be worn by their clients.
- Other traditional practitioners include bonesetters, birth attendants, (called 'Wogesha' and yelimd awalaj' respectively in amharic) and tooth extractors, herbalists.
- Generally, ETM is helpful in preventing the evil eye, overcoming demons, defeating human enemies, obtaining long life, clear eye sight, a good memory, as well as a large family and a faithful wife.

3.2.1. Preventive practice

- ETM includes several elements or disease prevention methods.
- In the past, spread of highly infectious diseases such as small pox was prevented by places where the epidemics occurred.
- Amulets, arm rings, hair style and eye make-up (antimony or kool) are also supposed to protect from the evil eye.
- Sweeping or covering floors with particular plants also well practiced.
- Isolating people with contagious diseases, prohibition or controlling movement and taking children away from the affected areas.

3.2.2. Diagnostic practice

TCM diagnosis is based on a differential system where several parameters are examined based on the four diagnosis, questioning, observation, palpation and listening and the predominant concurring findings are taken as the basis for the diagnosis.
This is called 'differential' diagnosis and strongly contrasts with the earlier simplistic **iridology** and **kinesiological** "good-bad" systems and other overly simplistic diagnostic systems that are based on one finding only.
Western medical diagnosis is also based on a differential system of evaluating several parameters before making a fully authoritative diagnosis.
The problem is that Western medicine aims only at diagnosing the named pathology while Traditional diagnostic systems such as Ayurveda and TCM aim at diagnosing dynamic functional organic systems encompassed by the concepts of the Zangfu organ syndromes.

Both traditional systems see health as a state of balance or homeostasis. TCM seeks to achieve a balance of yin-passive and yang-active physiological function which equates to the concept of shiva-shakti in Ayurveda. Ayurveda, nevertheless, emphasizes a balance in terms of three using the tridosha or three humor system.

Both systems really accomplish Scudder's dictum that "diagnosis means cure" since the specific diagnosis of each system is integrally linked with a classification of foods, herbs, lifestyle, exercise that is intended to counterbalance any perceived diagnostic imbalance

The greatest difference with Western scientific diagnosis is again that the objective of Western scientific diagnosis is to arrive at a specifically named pathology for which a drug or surgery is usually prescribed whose intent is to somehow inhibit the expression of the pathological condition. Traditional herbal medicine, aims at providing herbs and special foods whose purpose is to stimulate innate biological functions that help the body heal it self. The difference between these two systems is not really so black and white but represents a more general tendency. With allopathic herbalism, the intention is to use herbs to stop an itch, kill a virus, bacteria or yeast; with traditional herbalism herbs may also be used 'allopathically' but there is always a dominance of treating the underlying causes of imbalance.

The fundamental difference therefore between Western and traditional diagnostic systems is the difference between "form and function." Western medicine, being more material is based on form whereas traditional medicine is more energetic and is based on function.

3.2.3. Therapeutic practice

- The conditions that claim to be treated include:
  - ✓ gastrointestinal disturbances, respiratory disorders, sexually transmitted infections,
  - ✓ TB, impotency, haemorrhoids, rabies, intestinal parasites, skin problems, liver diseases, mental disorders, hypertension, diabetes, gynaecological conditions, rheumatism, malaria and others
- Medhanit awakis (Herbalists) – Using plants as their primary means of providing treatment.
- Medhanit awakis: Diagnose disease conditions mostly by physical examination and questioning patients.

- They prepare their medicines in various dosages forms and administer medicines via different routes.
- Professional traditional healers known by different names in different parts of the country are the primary players in the curative aspect of traditional medicine practice.
- One of the well recognized groups of these healers are the secular medhanit awakis (kitel betashs) herbalists using plants as their primary means of providing treatment.
- A large number of plant medicines are used, and for the purpose of references, most medhanit awakis possess pharmacopoeias. Minerals and animal-derived substances are additional items in the pharmacopoeia of medhanit awakis.
- The medhanit awakis diagnose disease conditions mostly by physical examination and questioning patients. Sometimes they prescribe medicines based on descriptions from informants.
- They prepare their medicines in various dosages and forms and administer medicines via different routes.
- After preparations, many of the medicines are stored in containers anywhere at home without special requirements.
- Although the medhanit awakis make efforts to modernize their practices, they do not normally employ any of the equipment and techniques used in conventional medical or pharmaceutical practices.

3.2.4. Surgical practice

- Bone-setting, uvulectomy, circumcisions, bleeding and cupping, scarification and tooth extraction.
- Other procedures are indicated for more specific conditions such as rheumatism, bleedings, swelling, wounds, headache, localized infections, and snake and scorpion bites.
- **Bone-setting:** The setting of bones is regarded as an important surgical procedure which requires a certain degree of skill and experience on the part of the healer.

  In most places, the healer involved in bone-setting is the local wogesha.

In many situations, the wogesha practices his/her skills without aseptic conditions, with or without the application of medicines

- **Midwifery** is one of the most common practices of traditional Ethiopian medicine.
- It is performed by traditional midwives commonly known in Amharic as **yelmid awalajs**, (traditional birth attendants) and most yelmid awalajs are women.

Traditional bone setting

- Traditional bone setting is an old practice found almost in all communities of the world.
- Modern technology and modern **orthopaedics** treatment have made traditional bone setting obsolete in developed countries, the practice is still much with us in developing countries and in Africa in particular.

Fig.

Cupping therapy

- **Cupping therapy** is an ancient Chinese form of alternative medicine in which a local suction is created on the skin; practitioners believe this mobilizes blood flow in order to promote healing. Suction is created using heat (fire) or mechanical devices (hand or electrical pumps).
- Stagnation stagnant blood and lymph, thereby improving qi flow — to treat respiratory diseases such as the common cold, pneumonia and bronchitis.
- Cupping also is used on back, neck, shoulder and other musculoskeletal conditions.
- Its advocates say it has other applications, as well. Cupping is not advised over skin ulcers or to the abdominal regions of pregnant women

Fig. .....

Tooth extraction

- The use of herbs as an adjunct to dental treatments like tooth extractions and the management of some dental problems has been documented.
- Herbs have been reported to have anti-inflammatory, analgesic, antimicrobial and anti-hemorrhagic (haemostatic) properties.

NB

- Traditional medicines are sold in every open market in Ethiopia and households, especially in the rural areas. Market vendors selling these materials are women.
- These medicines are usually sold to the public together with other materials such as spices, salt and other food items.
- Traditional medical treatments are also commonly given at the household level.
- There is significant knowledge of medicinal plants in the non professional public domain where most ailments are diagnosed and treated at the household level.
- Where traditional professionals are consulted, it is often for their specialized traditional knowledge and skills pertaining to a relatively limited range of health.

Self-Check –2	Written Test

1. **define Cupping therapy**
2. **write need of practice**

Information Sheet-3 Integration of traditional medicine into health care system of the country

3.3. Integration of traditional medicine into health care system of the country

Several countries are developing TCAM policies by introducing regulation, education, public financing and research funding (WHO 2002). National Centre for Complementary and Alternative Medicine (NCCAM) under the National Institute of Health in the United States of America classifies TCAM therapies based on the clinical approach into five broad groups such as whole medical systems (Chinese medicine, Ayurveda); mind-body medicine; biologically based practices (herbs, food, vitamins); manipulative and body based practices (chiropractic, osteopathy) and energy medicine (bio field therapies). Similarly the House of Lords subcommittee in the United Kingdom has classified therapies into three such as professionally organized alternative therapies; complementary therapies; and alternative therapies. It has recommended self regulation as a key approach for TCAM. European Union has also taken active measures to encourage use of TCAM. Similarly a Whitehouse commission on alternative medicine is created to set legislative and administrative recommendations to maximize benefits of TCAM

Another approach called “integrated medicine”, refers to certain evidence based management which use best of both conventional medicine5) as well as alternative medicine in conjunction and is often considered best strategy for promotion of TCAM6). It calls for openness to understanding the benefits and limitations of allopathic medicine and realization that science alone will not effectively deal with all the complex needs of patients (Snyderman and Weil, 2002).

Self-Check –3	True/False

_____1.Professional Standards and Guidance on Patient Consent, Patient Confidentiality and theSale and Supply of Medicines.

___2. Dispensing of Raw materials is the second process in tablet production, after which, we will have sifting, blending, lubrication, compression and coating.

Information Sheet-4 Traditional medicine and primary health care (PHC)

3.4. Traditional medicine and primary health care (PHC)

In this first decade of the 21st century, immense advances in human well-being coexist with extreme deprivation in many parts of the world1). Inequities in availability, accessibility and affordability of health care have increased, between as well as within populations the world over. Access to appropriate healthcare is increasingly being acknowledged as a human right through international instruments such as the United Nations Human Rights Commission, Millennium Development Goals (MDGs) and the World Health Organization (WHO)

In the recent past there has been a growing interest in Traditional medicine/Complementary and Alternative Medicine (TCAM) and their relevance to public health both in developed and developing countries. Diversity, flexibility, easy accessibility, broad continuing acceptance in developing countries and increasing popularity in developed countries, relative low cost, low levels of technological input, relative low side effects and growing economic importance are some of the positive features of traditional medicine (WHO 2002)

In this background, the article is an overview of TCAM, its global presence, various policy measures for promotion, their role in primary health care and major contemporary challenges for integration of TCAM into public health.

3.4.1. Overview of PHC

According to World Health Organization (2002: 7), “Traditional medicine refers to health practices, approaches, knowledge and beliefs incorporating plant, animal and mineral based medicines, spiritual therapies, manual techniques and exercises, applied singularly or in combination to treat, diagnose and prevent illnesses or maintain well-being.” Further the term ‘complementary’ and ‘alternative’ medicine (and sometimes also non-conventional or parallel) are used to refer to a broad set of healthcare

practices that are not part of country's own tradition, or not integrated into the dominant healthcare system. Based on this broad definition it may be hard to find a region without some form of TCAM practice. As per the context in which it is practiced or the form of knowledge, often it is called in various ways such as traditional medicine, alternative medicine, complementary medicine, natural medicine, herbal medicine, phyto-medicine, non-conventional medicine, indigenous medicine, folk medicine, ethno medicine etc. Chinese medicine, Ayurveda, Herbal medicine, Siddha, Unani, Kampo, Jamu, Thai, Homeopathy, Acupuncture, Chiropractic, Osteopathy, bone-setting, spiritual therapies, are some of the popular, established systems

3.4.2. Methods of using traditional medicine in PHC

- **Forms of Traditional Medical Knowledge**

In countries such as India, China and many other parts of Asia one can observe traditional medical knowledge in various forms such as codified medical systems, folk systems, allied disciplines and new systems of knowledge

- **Codified Medical Systems**

These are also known as great traditions. Ayurveda, Siddha and Unani medical systems in Indian subcontinent or Traditional Chinese medicine and Acupuncture in China, have evolved in a historical period spanning over 3–4 millennia with their own unique worldviews, conceptual, theoretical frameworks and elaborate codified literature. For example the oldest medical text of Ayurveda, Caraka samhita is estimated to be written and redacted through various versions from 1,500 BC–200 AD. Such codified medical traditions have unique understanding of physiology, pathogenesis, pharmacology and pharmaceuticals, which is different from Western biomedicine3)

- **Folk Medicine**

The folk knowledge traditions which are mostly orally transmitted, are more diverse, ecosystem and ethnic community specific with household level health practices (home remedies for primary health care, food recipes, rituals, customs), specialized healing

traditions like bone setting, poison healers, birth attendants, veterinary healers, general healers etc. These are generated over centuries by communities and use components of ecosystems (plants, animal and mineral/metal derivatives) that are primarily locally available, easily accessible and often cost effective. It varies hugely owing to social, ecological and historical circumstances. Hence, countries with similar ecosystems are often found to nurture similar health practices indicating the strong linkages between environment and health. These are also known as indigenous medicine, ethno medicine, bush medicine, little traditions etc

- **Allied Forms of Health Knowledge**

There are allied forms of health knowledge such as yoga, tai-chi, qigong, kalari, judo-seifuku, various forms of meditations, breathing techniques, massage techniques, among many others which are related to wellbeing. Though these are not purely medical systems they have been adapted as health applications and contribute to health sector immensely.

- **New Forms of Alternative Health Knowledge**

There is also new knowledge generated in the west and other developed countries with a mix of ancient and contemporary scientific knowledge such as phyto-medicine, health supplements and macrobiotics among many others which are of relatively recent origin. There are other therapies such as reiki or shiatsu (the term and form as it is practiced today) which are of 20th century origin**.**

Self check -4	Compeer and contest

1. **Codified Medical Systems**
2. **Allied Forms of Health Knowledge**
3. **Folk Medicine**

Information Sheet-5 Some popular complementary medical practices

3.5. Some popular complementary medical practices

- Plants have been used for medicinal purposes since before recorded history.
- An Archaeological evidence indicates that humans were using medicinal plants during the Palaeolithic, approximately 60,000 years ago.
- The use of herbs and spices in cuisine developed in part as a response to the threat of food-borne pathogens.
- In all cultures vegetables are spiced less than meat, presumably because they are more resistant to spoilage.
- The **first written record of herbs** used as medicines was made over 5000 years ago by the Sumerians, in ancient Mesopotamia (present day Iraq).
- Caraway and thyme have been found by archaeologists on tablets made of clay on Sumerians prescription.
- At about the same time, herbal traditions were being developed in China and India

3.5.1. Herbal medicine

- Medical herbalism, or simply, herbalism or herbology, is “the study of herbs and their medicinal uses”.
- Pharmacognensy is the study of all medicines that are derived from natural sources.
- Plants have the ability to synthesize a wide variety of chemical compounds that are used to perform important biological functions, and to defend against attack from predators such as insects, fungi and herbivorous mammals.

Herbal Medicine

- An approach to healing which uses plant or plant-derived preparations to treat, prevents, or cures various health conditions and ailments.

- The scope of herbal medicine is sometimes extended to include fungal and bee products, as well as minerals, shells and certain animal parts.
- Chemical compounds in plants mediate their effects on the human body through processes identical to those already well understood for the chemical compounds in conventional drugs;
    - thus herbal medicines do not differ greatly from conventional drugs in terms of how they work
- This enables herbal medicines to be as effective as conventional medicines, but also gives them the same potential to cause harmful side effects.

The use of herbs to treat disease is almost universal among non-industrialized societies, and is often more affordable than purchasing expensive modern pharmaceuticals.

- The WHO estimates that 80% of the population of some Asian and African countries presently use herbal medicine for some aspect of primary health care.

Studies in the USA and Europe have shown that their use is less common in clinical settings, but has become increasingly more in recent years as scientific evidence about the effectiveness of herbal medicine has become more widely available

- Many of the pharmaceuticals currently available to physicians have a long history of use as herbal remedies, including aspirin, digitalis, quinine, and opium.

3.5.2. Homeopathy

- Homeopathy, an alternative medical system was first mentioned by Hippocrates (462–377 BC), but it was a German physician, Hahnemann (1755–1843), who established homeopathy's basic principles: law of similarity, direction of cure, principle of single remedy, the theory of minimum diluted dose, and the theory of chronic disease.
- Its goal is to help the body heal itself by using very small doses of highly diluted substances that in larger doses would produce illness or symptoms (an approach called "**like cures like**"). Most homeopathic remedies are derived from natural substances that come from plants, minerals, or animals.

- Homeopaths evaluate not only a person's physical symptoms but emotions, psychological state, lifestyle, nutrition, and other aspects. In homeopathy, different people with the same symptoms may receive different homeopathic remedies.

3.5.3. Chinese Traditional Medicine

- An alternative medical system that originated in China. The earliest records of traditional Chinese medicine date back to the 8th century BC. It is based on the concept that disease results from disruption in the flow of qi and imbalance in the forces of yin and yang.
- Qi: In traditional Chinese medicine, the vital energy or life force proposed to regulate a person's spiritual, emotional, mental, and physical health and to be influenced by the opposing forces of yin and yang.
- Yin and Yang: The concept of two opposing yet complementary forces described in traditional Chinese medicine. Yin represents cold, slow or passive aspects of the person, while yang represents hot, excited, or active aspects. A major theory is that health is achieved through balancing yin and yang and disease is caused by an imbalance leading to a blockage in the flow of qi.
- TCM uses three main therapeutic approaches: acupuncture and moxibustion, herbs and other natural products, and massage and manipulation.
- Acupuncture: A family of procedures that originated in traditional Chinese medicine. Acupuncture is the stimulation of specific points on the body by a variety of techniques, including the insertion of thin metal needles through the skin. It is intended to remove blockages in the flow of qi and restore and maintain health.
- Moxibustion: Moxibustion is the application of heat from the burning of the herb moxa wool(from mugwort herb) is burned and used to promote healing and good health by reinvigorating the blood and stimulating the flow of vital energy or Qi.
- The herb mugwort has long been used in folk medicine. It is known as an emmenagogue herb, which stimulates menstrual flow.

- Manipulation: The application of controlled force to a joint, moving it beyond the normal range of motion in an effort to aid in restoring health.
- Cupping involves creating a vacuum with a cup to release stagnation in the body, usually using an earthenware, glass or bamboo cup. Varying size cups are applied depending on the body part being worked on.
- A cotton bail is burned in the cup to create a vacuum and, after safely discarding the ball, the cup is placed over the acupuncture points that require attention.
- The cup is kept in this position for five to ten minutes to encourage the drawing forth of the chi.
- The patient is often left with bruising, which disappears in a few days. Because of the bruising, care should be taken to be certain the patient does not have a blood or skin condition that could worsen with this treatment

3.5.4. Indian Traditional Medicine

Ayurvedic medicine

- It is considered by many scholars to be the oldest healing science and it is one of the world's oldest medical systems.
- In Sanskrit, Ayurveda means "The Science of Life".
- Ayurvedic knowledge originated in India more than 5000 years ago and is often called the "Mother of All Healing".
- The aim of Ayurvedic medicine is to integrate and balance the body, mind, and spirit. This is believed to help prevent illness and promote wellness
- Ayurvedic medicine relies on therapies such as diet, exercise, meditation, herbs, massage, exposure to sunlight, and controlled breathing.
- The goals of treatment are to eliminate impurities, reduce symptoms, reduce worry, increase harmony in a person's life, and help resolve both physical and psychological problems.
- Meditation: Meditation refers to a variety of techniques or practices intended to focus or control attention. Most of them are rooted in religious or spiritual traditions. These techniques have been used by many different cultures throughout the world for thousands of years.

- Herb: Herb is a plant or plant part (such as leaves, flowers, or seeds) that is used for its flavour, scent, and/or therapeutic properties. Botanical is often used as a synonym for herb. Herbal supplement may contain a single herb or mixtures of herbs.

Ayurveda

- Ayurveda is not only a system of medicine, but also a way of living.
- It is used to both prevent and cure diseases.
- Ayurvedic medicine includes herbal medicines and medicinal baths.

3.5.5. Naturopathy

- Naturopathy attempts to help the body heal itself, and naturopaths consider a person's physical, emotional, genetic, environmental, and social circumstances when evaluating treatment. The emphasis is on supporting health rather than fighting disease.
- Practitioners of naturopathy prefer to use treatment approaches that they consider to be the most **natural and least invasive**, relying on methods other than standard medications and surgery. They focus on changes in diet and lifestyle and on preventing disease, together with CAM therapies such as herbs and massage.
- Naturopathy is a clinical specialty that emphasizes the **use of natural products** in both prevention and treatment of disease.
- **It is founded on six basic principles ;-**
    - Nature has the power to heal
    - Treat the whole person
    - "do no harm"
    - Identify and treat the cause of the disease
    - Prevention is as important as cure
    - Doctors should be teachers
- Naturopathic doctors (NDs) use many forms of therapy including therapeutic diets, fasting, herbal supplements, hydrotherapy, psychotherapy, stress management, massage and other physical manipulation therapies, and homeopathy.
- In certain states, NDs can perform minor surgeries and prescribe specific conventional medicines such as antibiotics

Self-Check –5	Written Test

1. **What are the** six basic principles of herbal medicine

Information Sheet-6 Disseminate valid information to clients and other health care providers regarding

3.6. Disseminate valid information to clients and other health care providers regarding Rhamni Frangible Cortex and Rhamni Purshiani Cortex are widely used as laxatives. The action of the latter drug is more drastic than that of the former and it is comparable to that of aloe [3]. The effective dose in man is

100-300mg p.o. Rats require 300mg/kg to achieve a laxative effect [5].

The anthra-glycosides are active in the colon after glycosidic cleavage and reduction to the anthrones. A detailed description is presented in a general discussion on anthranoids elsewhere in this volume.

A general discussion of the adverse reactions of herbal medicines containing anthranoid derivatives is presented elswhere in this volume.

Lg21	LO4.Using appropriate guidelines for plant collection.
Instruction Sheet	

Learning Instructions:

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Steps in scientific analysis of medicinal plants
  - ✓ Selection of the plant material
  - ✓ Collection of the plant
  - ✓ Taxonomic identification of the plant
  - ✓ Literature survey on the identified plant
  - ✓ Preparation of the plant material for extraction
- Factors affecting the collection of medicinal plants

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- The major and minor forms of diagnosis and treatment practices are effectively communicated on a one-to-one or group basis
- Central philosophies and historical developments of traditional medicine are explained
- Recent developments and new practices are integrated into client services

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following all information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. If you earned a satisfactory evaluation proceed to “Operation sheets
7. Perform “the Learning activity performance test” which is placed following “Operation sheets” ,
8. If your performance is satisfactory proceed to the next learning guide,
9. If your performance is unsatisfactory, see your trainer for further instructions or go back to “Operation sheets”.

Information Sheet-1 Steps in scientific analysis of medicinal plants

4.1.1. Selection of the plant material

This section describes the general strategies and basic methods for small- and large-scale collection of fresh medicinal plant materials. Collection practices should ensure the long-term survival of wild populations and their associated habitats. Management plans for collection should provide a framework for setting sustainable harvest levels and describe appropriate collection practices that are suitable for each medicinal plant species and plant part used (roots, leaves, fruits, etc.). Collection of medicinal plants raises a number of complex environmental and social issues that must be addressed locally on a case-by-case basis. It is acknowledged that these issues vary widely from region to region and cannot be fully covered by these guidelines.

4.1.2. Collection of plant parts

Good collecting

- Make detailed field notes. It is a good idea to make them before digging up the plant of interest, particularly if you are inclined to be impatient.
- Tag your plants when you collect them.
- Press your plants while they are fresh
- Lay them out as you want them to look
- Make sure that both the top and the bottom surface of leaves are visible
- Collect flower and fruit whenever possible; positive identification often requires that both be present
- For herbaceous plants, be sure that enough of the below-ground plants are available to show whether it had a caudex, tap root, rhizomes, or whatever.

Time of collection

Therapeutic efficacy varies during different times or seasons of the year. The constituent and active principles vary quantitavely at different seasons of the year and the majority of plant materials are usually best collected during the dry season, when the herbs are at peak maturity and concentration. Dry as quickly as possible, away from bright sunlight, to preserve the ingredients and prevent oxidation.

Roots and rhizomes: Best collected October to February, when the plants are more vigorously storing food in their underground organs.

Leaves: The most opportune time is when the plant is about to bloom.

Flowers: Buds are preferred, best collected in the morning after the morning dew has evaporated; flowers, just before or shortly after opening. Dry the herbal materials as quickly as possible.

Bark materials and stems: Generally, best gathered in summer time. When the climate is warm and humid, the bark of any plant usually contains richer nutritive substances including the medicinal metabolites. Preferably, barks and stems should be removed

only from fully grown plants. Do not remove all the bark or a band of surrounding bark. Fruits and seeds: Fully ripened fruits and mature seeds are preferred. Collection of pod fruits is done in the morning to avoid unnecessary opening up of the fruit wall to the detriment of losing the seeds. Turn the fleshy fruit frequently for even drying. Whole plant: When the whole plant is desired, it is advisable to harvest the plant at the time when the flowers are all in bloom. Old and withering plants are less effective when used as a source of drugs.

Habitat

Information about the whereabouts of the plants, especially the rare ones, can facilitate the search for them. It saves both time and energy. Low altitudes probably range from sea level to about 300 meters; medium altitudes from about 310 meters to about 1000 meters; and high altitude from about 1000 meters and up.

Storage

Many medicinal plants are seasonal, some not easily accessible, available only in deep forests or mountain peaks. Such restrictions necessitate ways and devices to store them for future use. Dirt and other foreign substances should be removed. If washing is needed, it should be done quickly to minimize deterioration and loss of active substances. As a rule, all parts of the plant collected should be dried as soon as possible to avoid unnecessary waste of the drug materials through natural processes of denaturation, decay and fungal attacks. Some commonly used storage methods used by the Chinese are as follows:

Sun-drying method: Spread the herbs over the dry beaches, patio or benches that are under the direct scorch of the sun until the materials turn dry and brownish. Shade-drying method: Some plant materials are preferably dried under shade at room temperature by wind action- because of heat-labile substances that they contain. As such, free circulation of air is important. Drying processes should be shortened, if higher drug contents are to be sought for. Floral and fruit materials should be dried by this method.

Heat-drying method: Some materials may be placed over an oven and dried under the intense heat released or under regulated soft heat. Plants that contain high sugar and

starch are best preserved by this method. In places where the rain falls throughout the year, this method is strongly recommended.
Other Special Methods: Succulent materials are usually washed first in boiling water or steam-cooked in a container before actually drying it. For spiny and hairy materials, remove the unwanted appendages. Some plant materials (ex. succulent materials) may require cutting or sectioning before drying. In general, the moisture content of the dried plant materials should be less than 10% before storage. Moisture content higher than 10% usually leads to growth of microorganisms and pest infestation with consequent drug deterioration.

The dried plant materials should be placed in plastic containers or tightly covered bottles; brown colored bottles are preferred as they minimize deterioration due to sunlight. Dry charcoal (separated from the medicinal plant) may be placed inside the bottles to absorb moisture. The storage place should be dry, well-ventilated, and spacious, lest fungi and insects may invade rampantly. Drug materials (dry ones) after proper processing can be kept in large open wooden shelves. The humidity of the storehouse should then be as low as possible. Materials rich in volatile oils are advised to be kept in airtight containers. Otherwise, their efficacy will decrease as time passes by. If all factors are favorable, the prepared drugs can be used even after years of storage.

Preservation and Conservation

know how to preserve and conserve plant sources. Complete depletion of all medicinal plants founds in an area should be avoided. Once collected, all the materials should be processed at once for long storage. Well planned activity in the collection of plant materials will always prove to be economical and advantageous in the long run. Cultivation of these medicinal plants should be tried in places where conditions favor because cultivated plants contain higher percentages of the medicinal principles desired

Self check -2	True or false and choose

- Say True for the correct statement and False for the incorrect statement

___1. When the whole plant is desired, it is advisable to harvest the plant at the time when the flowers are all in bloom.

___2. Many medicinal plants are seasonal, some not easily accessible, available only in deep forests or mountain peaks.

___3. The dried plant materials should be placed in plastic containers or tightly covered bottles; brown colored bottles are preferred as they maximum deterioration due to sunlight.

Choose the best answer

___1All of the following are Good collecting practice except

F. Make detailed field notes. It is a good idea to make them before digging up the plant of interest, particularly if you are inclined to be impatient.
G. Tag your plants when you collect them.
H. Press your plants while they are fresh
I. Lay them out as you want them to look
J. None

___2. Moisture content higher than ____% usually leads to growth of microorganisms and pest infestation with consequent drug deterioration.

A. 7% B.10% C. 5% D. 15%

Answer for true/false 1true 2.true 3. False

Answer for choose 1.E 2.B

LG22	LO5.Manufacturing herbal medicines according to pharmacy guideline

Learning Instructions:

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Definition of Crude drugs
- Classification of crude drugs
- Processes of preservation, drying and storing of crude drugs
- Extraction of crude drugs
  - ✓ The need for extraction
  - ✓ Methods of extraction (Maceration, Percolation and Infusion Techniques)
  - ✓ Factors Affecting Choice of Extraction Process
- Isolation and purification of the active constituents
  - ✓ Classical methods
  - ✓ Chromatographic Techniques
- Primary and secondary plant metabolites

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Fresh medicinal plants are preserved
- Medicinal plants are correctly dried and stored
- Plant material is extracted using different menstruum
- Various types of herbal medicines are manufactured

1 .Read the specific objectives of this Learning Guide.

2, Follow the instructions described below.

3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.

4.Accomplish the “Self-checks” which are placed following all information sheets.

5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).

6. If you earned a satisfactory evaluation proceed to “Operation sheets

7. Perform “the Learning activity performance test” which is placed following “Operation sheets” ,

8. If your performance is satisfactory proceed to the next learning guide,

9. If your performance is unsatisfactory, see your trainer for further instructions or go back to “Operation sheets”.

Information Sheet-1	Definition of Crude drugs

5.1. Definition of crude drugs

A crude drug is defined as a drug which is naturally occurring ,unrefined substance, derived from organic source as plant, animal ,bacteria organs or whole organisms intended for use in the diagnosis, cure, mitigation, treatment or prevention of disease in human or animals

Source crude drug: They may be obtained from;

- vegetable
- Animals
- Minerals

The most important natural source of drug are ; a) Higher plants, b) Microbes, c) Animals, d) marine organism

Information Sheet-2	Classification of crude drugs

5.2. Classification of crude drugs

Because of their wide distribution the arrangement of classification in a definite sequence is necessary to understand easily. Although each system of the classification has its own merits and demerits, but for the purpose of the study the drug are classified in the following different ways:-

- Alphabetical classification
- Morphological classification
- Taxonomical classification
- Pharmacological classification
- Chemical classification
- Chemo-Taxonomal classification

Information Sheet-3 Processes of preservation, drying and storing of crude drugs

Preservation of Fresh medicinal plants

5.3. Processes of preservation, drying and storing of crude drugs

Preservation of Fresh medicinal plants

Preserving Herbs

Herbs for preserving should be harvested on a dry, sunny morning, after the dew has evaporated. To obtain maximum flavor & nutritional content, material for preserving needs to be at its very best. This will depend on the part of the plant that is required

Leaves should be harvested just before the plant flowers.

Flowers are at their best when they have just opened.

Fruit should be just ripe.

Seed is ripe when it changes from green to brown. For seeds in pods, shake the stem. You will hear the seeds rattle when they are ripe.

Roots are at their best when the top growth of the plant has completely died back, in autumn or winter

Drying

Herbs for drying should be harvested on a dry, sunny morning, after the dew has evaporated. Cut the stems just above ground level. Trim & discard any discolored or damaged leaves. Tie into small bunches and hang in a dark, dry, airy place, or put them in a paper bag punched with holes, to eliminate light and dust. When the plant is completely dry, it will become brittle. Remove the leaves from the stems and store in airtight jars, in a dark place. To retain maximum flavor, it is best to store the leaves whole & crush, if necessary, just before using

Storage and drying of Medicinal plants

You've decided to try a natural cure for your illness or condition. You've visited the best herbalist in town and come home with some great natural remedies. Storing dried medicinal herbs

properly isn't difficult. It is essential. People are returning to medicinal herbs as natural cures. The average person knows little about storing dried medicinal herbs to retain potency. Improperly stored medicinal herbs lose effectiveness quickly. Keep your dried medicinal herbs fresh with proper storage techniques.

Buying Dried Medicinal Herbs

Always buy herbs in the smallest quantity needed. Even when storing dried medicinal herbs properly, large quantities can spoil before use. Be sure to buy your medicinal herbs from an herbalist or a store specializing in natural remedies. Beware of large price differences. This can indicate an inferior or 'cut' product. It may contain filler ingredients.

Keep Dried Medicinal Herbs Cool

Dried medicinal herbs keep best in a cool environment. Heat can cause essential plant oils to evaporate. This reduces the potency of dried medicinal herbs. Choose a cool room in which to store your natural remedies. This holds true for bottled essential oils as well. In addition to keeping herbs cool, they must be kept at the right humidity.

Excess moisture in the air can cause dried medicinal herbs to mold and spoil. When storing dried medicinal herbs, choose a dry location. A basement is fine in the arid Western United States. On the other hand, if you live in a humid area, the basement may be too damp for herb storage. Molds can contaminate medicinal herbs, rendering them useless or even dangerous.

Keep Dried Medicinal Herbs in the Dark

Light is damaging to both fresh and dried medicinal herbs. It can quickly deteriorate the quality of herbs. Light can even cause chemical changes in fresh and dried medicinal herbs. Ever notice the brown bottles at the herbalist? These are to keep light from penetrating the glass. Light ages **all living things, whether animal or vegetable.**

Keep Dried Medicinal Herbs Airtight

Herbs need some air circulation while drying to prevent molding. Once herbs are dried, seal them in airtight jars for storage. This will keep them from drying further and losing potency. Store in small jars. Why? Using large containers means you will be opening and re-opening the whole batch too many times. Small containers will keep your unopened herbs fresh longer.

Keep Dried Medicinal Herbs in Glass

Glass is the best material for storing dried medicinal herbs. Why? Plastic emits fumes that can contaminate and spoil herbs. What's the best type of glass container to use? Canning jars are wonderful because they have a rubber seal. They aren't made from dark glass, so keep them in a cool, dark place. The best option for smaller quantities are covered brown glass apothecary jars

5.4. Extraction of crude drugs

Natural products from medicinal plants, either as pure compounds or as standardized extracts, provide unlimited opportunities for new drug leads because of the unmatched availability of chemical diversity. Due to an increasing demand for chemical diversity in screening programs, seeking therapeutic drugs from natural products, interest particularly in edible plants has grown throughout the world. Botanicals and herbal preparations for medicinal usage contain various types of bioactive compounds. The focus of this paper is on the analytical methodologies, which include the extraction, isolation and characterization of active ingredients in botanicals and herbal preparations. The common problems and key challenges in the extraction, isolation and characterization of active ingredients in botanicals and herbal preparations are discussed. As extraction is the most important step in the analysis of constituents present in botanicals and herbal preparations, the strengths and weaknesses of different extraction techniques are discussed. The analysis of bioactive compounds present in the plant extracts involving the applications of common photochemical screening assays, chromatographic techniques such as HPLC and, TLC as well as non-chromatographic techniques such as immunoassay and Fourier Transform Infra Red (FTIR)

5.4.1. The need for extraction

Many antioxidant compounds can be found in fruits and vegetables including phenolics, carotenoids, anthocyanins, and tocopherols . Approximately 20% of known plants have been used in pharmaceutical studies, impacting the healthcare system in positive ways such as treating cancer and harmful diseases. Plants are able to produce a large number of diverse bioactive compounds. High concentrations of phytochemicals, which may protect against free radical damage, accumulate in fruits and vegetables. Plants

containing beneficial photochemical may supplement the needs of the human body by acting as natural antioxidants.

5.4.2. Methods of extraction (Maceration, Percolation and Infusion Techniques)

INFUSION

- Infusion (Hot Teas) – basically a herbal tea which is usually drunk hot,
- Infusions prepared for colds and flu. It should be taken hot.
- Sweeten the tea with honey.
- Standard Dosage: One cup three times a day.

Method of preparation

- Measure 1 tbsp of dried herb per one cup of water into a glass or ceramic pot. (The normal amounts are about ½ to 1 ounce of the plant to 1 pint of boiled water)
- Pour boiling water onto the fresh or dried herbs and cover the container.
- Allow herbs to steep for 15-20 minutes
- Strain through muslin cloth or a strainer
- Store in the refrigerator for 1-2 days
- Strain the tea, cool it to a comfortable temperature &serve.

MACERATION (Cold extract)

- Suitable for the preparation of mucilage containing herbs such as flax seed.
- Method of preparation: Prepared by allowing a tea herb to steep in cold water for several hours to extract its active principles.
- The different types of teas are Loose tea, tea bags and instant teas. Example: Chinese herbal tea shop

Information Sheet-5Isolation and purification of the active constituents

5.5. Isolation and purification of the active constituents

Purification and isolation of bioactive compounds from plants is a technique that has undergone new development in recent years [28,29]. This modern technique offers the ability to parallel the development and availability of many advanced bioassays on the one hand, and provided precise techniques of isolation, separation, and purification on the other. The goal when searching for bioactive compounds is to find an appropriate method that can screen the source material for bioactivity such as antioxidant, antibacterial, or cytotoxicity, combined with simplicity, specificity, and speed

In vitro methods are usually more desirable than in vivo assays because animal experiments are expensive, take more time, and are prone to ethical controversies. There are some factors that make it impossible to find final procedures or protocols to isolate and characterize certain bioactive molecules.

This could be due to different parts (tissues) in a plant, many of which will produce quite different compounds, in addition to the diverse chemical structures and physicochemical properties of the bioactive phytochemicals [30]. Both the selection and the collection of plant materials are considered primary steps to isolate and characterize a bioactive photochemical. The next step involves a retrieval of ethno-botanical information to discern possible bioactive molecules. Extracts can then be made with various solvents to isolate and purify the active compounds that are responsible for the bioactivity.

Column chromatographic techniques can be used for the isolation and purification of the bioactive compounds. Developed instruments such as High Pressure Liquid Chromatography (HPLC) accelerate

the process of purification of the bioactive molecule. Different varieties of spectroscopic techniques like UV-visible, Infrared (IR), Nuclear Magnetic Resonance (NMR), and mass spectroscopy can identify the purified compounds

Self check -2	**write**

1.Write Classification of crude drugs

IG-23	LO6. Operating and monitoring the dispensing process

Learning Instructions:

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Materials, equipment and work environment required for dispensing raw materials
- Monitoring production process and equipment performance
- Waste management.

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Availability of materials, equipment and work environment to meet processing and dispensing requirements are ensured
- Raw materials are dispensed according to manufacturing instructions
- Out-of-specification product, production process and equipment performance are monitored to ensure quality standards
- Waste generated by both the process and cleaning procedures is collected, treated, disposed or recycled according to organization procedures
- Feedback and complaints are appropriately responded

1 .Read the specific objectives of this Learning Guide.

2, Follow the instructions described below.

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Information Sheet-1 Operating and monitoring the dispensing process

6.1. Materials, equipment and work environment required for dispensing raw materials

The Society has issued professional standards and guidance on various issues relating to the dispensing process (see References & Further Information). These standards include

Professional Standards and Guidance on Patient Consent, Patient Confidentiality and the Sale and Supply of Medicines. The general principles listed below are not intended to replace these professional standards and guidance, but to expand on them, in the context of EPS use, and these documents will be referenced in these Guidelines, where relevant.

The EPS has the potential to deliver major benefits to internet pharmacy providers. This guidance applies equally to internet pharmacy businesses and other professional standards for internet pharmacies will also still apply (Professional Standards and Guidance for Internet Pharmacy Services):

There are a number of general principles that are relevant to the use of EPS in the dispensing process:

Dispensing of Raw materials

This is the first process in tablet production, after which, we will have sifting, blending, lubrication, compression and coating.

Our Russian Specialists were using the word "Развешивание" for dispensing. But I didn't find this meaning in any dictionaries. Need clarification

Information Sheet-2 Monitoring production process and equipment performanc

6.2. Monitoring production process and equipment performance

When it comes to your Coil Processing Equipment needs, Red Bud Industries is your "one stop shop". We offer a wide range of Coil Processing Systems. We design and manufacture Light Gage Cut-To-Length and Multi-Blanking Lines, Heavy Gage Plate Cut-To-Length Lines with and without our "SUREGRIP®" Stretcher Levelers, Light and Heavy Gage Slitting Lines, and environmentally friendly Pickling Lines. However, our Processing Equipment is only a part of the services we offer.

Besides building world class equipment, we can also assist you with many other aspects of your project. We are experts in the design and layout of service centers. Whether you are building an addition or a whole new facility, adding one new machine or several, we can help you optimize your new plant to assure you get the most out of your investment.

We can work with you to optimize material flow through your plant. We can suggest the best locations and space requirements for incoming material, machine placement, and outgoing material storage. Using your building drawings, we can layout the machines in your facility. This lets you see areas that might create problems with the installation, such as crane locations, building pillars, truck bays or rail sidings. This will allow you to make whatever adjustments necessary to the layout to avoid problems during construction and the installation of the equipment.

Already have equipment? Make sure you are getting the most out of it with our consulting services. One of our experts will provide a comprehensive on-site evaluation of your line's operation. This includes time studies to measure the performance of the operators, set up people, and material handlers to help find and eliminate those wasted minutes that rob productivity and impact your bottom line.

Self check -2	write

1.Monitoring performance against quantifiable objectives

Information sheet 3 Waste management.

6.3. Waste management.

The problem with this from a clinical perspective is that there are many causes of depression and related insomnia. It most certainly has an emotional cause which is different for each individual. There are many who tend to fall depressive slump for which, I suppose St Johns Wort might be effective. The question is how long must it be taken before such favorable results are noticed and assuming that the depression comes in cycles, how can we distinguish the difference between a self limiting cycle and the effect of St Johns Wort. Further, supposing that the cause of one individual's chronic depression is traumatic memories of child abuse or lack of self esteem perhaps aggravated by a recent separation, what is St. Johns Wort going to do about these causes for depression which usually take time to resolve.

LG-24	LO7: Completing documentation

Learning Instructions:
This learning guide is developed to provide you the necessary information regarding the following content coverage and topics: • Record Workplace information This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to • Workplace information is recorded in the appropriate format • Herbal medicines are labeled correctly
1 .Read the specific objectives of this Learning Guide. 2, Follow the instructions described below. 3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them. 4. Accomplish the “Self-checks” which are placed following all information sheets. 5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks). 6. If you earned a satisfactory evaluation proceed to “Operation sheets 7. Perform “the Learning activity performance test” which is placed following “Operation sheets” , 8. If your performance is satisfactory proceed to the next learning guide, 9. If your performance is unsatisfactory, see your trainer for further instructions or go back to “Operation sheets”.

Information Sheet-1 Record Workplace information

7.1. Recording the Workplace information

Your organization will have a preferred way to present information to its various stakeholders. These should be reviewed periodically so that their ongoing effectiveness is ensured

Your task:

Talk to people in your workplace and review policies and procedures to find out what information your organisation provides to its many stakeholders.

Use the template Workplace communication template (Word doc 39Kb) to:

- list at least ten types of communication you currently have or will have in the future with your organisation's many stakeholders
- list the current method for communicating the various pieces of information
- evaluate the current methods used and suggest possible improvements.

Use the discussion board that has been set up to get suggestions from others on the best possible methods for communicating or presenting information to stakeholders.

You may want to share your completed information with your workplace supervisor.

The following lists some information that needs to be communicated to various people at the festival:

- informing the Festival Risk Manager of the schedule of activities
- informing the public of the safety requirements at the festival
- providing maps from the Woombalah Council and Parks Department
- informing emergency response teams of the entry and exit points
- informing the public of changed traffic conditions
- enquiring about the availability of temporary traffic light.

Labeling of Herbal medicines

On January 5, 2000, the Food and Drug Administration (FDA) published its final rule that defines the types of statements that can be made concerning the effect of a dietary supplement on the structure or function of the body pursuant to the Dietary Supplement Health and Education Act of 1994 (DSHEA).

While this rule is not expected to affect the availability of dietary supplement products or consumer access to them, it may affect whether certain claims can be made under the 1994 Act. This in turn may result in some labeling changes for these products (FDA Talk Paper: FDA Finalizes Rules for Claims on Dietary Supplements.)

This page will review a brief history of the labeling of drugs and will then focus on the 1994 Act and the most recent developments in the labeling of herbal products and dietary supplements.

Self check -1	write

Write short answer

1. Define Labeling of Herbal medicines

- Answer for short answer

The Food and Drug Administration (FDA) published its final rule that defines the types of statements that can be made concerning the effect of a dietary supplement on the structure or function of the body pursuant to the Dietary Supplement Health and Education Act of 1994 (DSHEA).

LG-25	LO8: Ensuring ongoing development of self and team

Learning Instructions:

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Skills and knowledge development on traditional medicine
  - ✓ Scheduled trainings like continuing pharmacy education
  - ✓ Peer education
  - ✓ Education through experience
  - ✓ Conducting survey on locally available herbal preparations
- Monitoring and developing to enhance team performance
- Coaching and advising for the development of workplace knowledge, skills and attitudes

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Individual performance is monitored regularly against work plans, clinic objectives and client needs
- Opportunities for formal and informal development of skills and knowledge to optimize performance are sought and accessed
- Individual performance is monitored and developed to enhance team
- Coaching and advising which contributes effectively to development of workplace knowledge, skills and attitudes are provided

1 .Read the specific objectives of this Learning Guide.

2, Follow the instructions described below.

3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.

4. Accomplish the “Self-checks” which are placed following all information sheets.

5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).

6. If you earned a satisfactory evaluation proceed to “Operation sheets

7. Perform “the Learning activity performance test” which is placed following “Operation sheets” ,

8. If your performance is satisfactory proceed to the next learning guide,

9. If your performance is unsatisfactory, see your trainer for further instructions or go back to “Operation sheets”.

Information Sheet-1	**Skills and knowledge development on traditional medicine**

8.1. Monitoring the Individual performance

The key to effective monitoring performance is to identify a range of methods – so you can then choose the method that's easiest to apply and most effective. Let's begin with the easy part – monitoring performance against quantifiable objectives. Here are some examples

Self check -1	write

1. what are The key to effective monitoring

Information Sheet-2 Monitoring and developing to enhance team performance

8.2. Monitoring performance against quantifiable objectives

Methods:

- Sales reports
- Deadlines met
- Error reports
- Accuracy reports
- Documents
- Proposals
- Plans
- Budget forecasts
- Widgets produced

These tend to be the monitoring methods most managers are comfortable with because they're about what the employee does. It's easy to see if your employee is achieving a sales target or submitting accurate work and these are great monitoring methods for the quantity, quality and time elements of the job

The difficulty arises when these are the only monitoring methods a manager uses because most jobs aren't just about the 'what', they're also about 'how' your employee's do their job. About:

- how they work as a team member
- how they work with customers
- how they deal with problems
- how they deal with change and so on

In short, their behaviors

If you only monitor the 'what' of the job you will only be monitoring half of the job. And if you only monitor half of the job then possibly that's the only half that the employee will feel it's worth focusing on!

Self check -2	True or false

_____1. If you only monitor the ‘what’ of the job you will only be monitoring half of the job

_____2. The difficulty arises when these are the only monitoring methods a manager uses because most jobs aren’t just about the ‘what’, they’re also about ‘how’ your employee’s do their job

Information Sheet-3	Coaching and advising for the development of workplace knowledge, skills and attitudes

8.3. Formal and informal development of skills and knowledge

People are constantly learning everywhere and at all times. Not a single day goes by that does not lead to additional skills, knowledge and/or competences for all individuals. For people outside the initial education and training system, adults in particular, it is very likely that this learning, taking place at home, at the workplace or elsewhere, is a lot more important, relevant and significant than the kind of learning that occurs in formal settings.

However, learning that occurs outside the formal learning system is not well understood, made visible or, probably as a consequence, appropriately valued. Until this OECD activity on the recognition of non-formal and informal learning involving 23 countries on 5 continents, it has also been under-researched (see also ongoing EU work). Most research has focused on learning outcomes from formal education and training, instead of embracing all types of learning outcomes; allowing visibility and portability of such outcomes in the lifelong learning system, in the labor market or in the community.

In 1996, the OECD education ministers agreed to develop strategies for “lifelong learning for all”. The approach has been endorsed by ministers of labor, ministers of social affairs and the OECD Council at ministerial level. The concept of “from cradle to grave” includes formal, non-formal, and informal learning. It is an approach whose importance may now be clearer than ever and non-formal and informal learning outcomes are viewed as having significant value. Policy-makers in many OECD countries, and beyond, are therefore trying to develop strategies to use all the skills, knowledge and competences – wherever they come from – individuals may have at a time when countries are striving to reap the benefits of economic growth, global competitiveness and population development.

- Formal learning is always organized and structured, and has learning objectives. From the learner’s standpoint, it is always intentional: i.e. the learner’s explicit objective is to

gain knowledge, skills and/or competences. Typical examples are learning that takes place within the initial education and training system or workplace training arranged by the employer. One can also speak about formal education and/or training or, more accurately speaking, education and/or training in a formal setting. This definition is rather consensual.

- Informal learning is never organized, has no set objective in terms of learning outcomes and is never intentional from the learner's standpoint. Often it is referred to as learning by experience or just as experience. The idea is that the simple fact of existing constantly exposes the individual to learning situations, at work, at home or during leisure time for instance. This definition, with a few exceptions (see Werquin, 2007) also meets with a fair degree of consensus.
- Mid-way between the first two, non-formal learning is the concept on which there is the least consensus, which is not to say that there is consensus on the other two, simply that the wide variety of approaches in this case makes consensus even more difficult. Nevertheless, for the majority of authors, it seems clear that non-formal learning is rather organized and can have learning objectives. The advantage of the intermediate concept lies in the fact that such learning may occur at the initiative of the individual but also happens as a by-product of more organized activities, whether or not the activities themselves have learning objectives. In some countries, the entire sector of adult learning falls under non-formal learning; in others, most adult learning is formal. Non-formal learning therefore gives some flexibility between formal and informal learning, which must be strictly defined to be operational, by being mutually exclusive, and avoid overlap.

Because non-formal and informal learning is happening everywhere all the time, this OECD activity could not address all the issues related to non-formal and informal learning in general. In consultation with the participating countries, it was agreed to focus solely on the processes that make visible this learning that has not been formal. Therefore, this OECD activity focuses on the process of formal recognition of non-formal and informal learning. Whether through the awarding of a full certification, a partial certification, a right of access to the higher education system or to any program in the formal lifelong learning system or any recognized document (portfolio of competences, competence passport…): this activity makes the case that individuals

engaging in a recognition process for their non-formal and informal learning outcomes must be awarded a document that has social value and is widely recognized so that they can benefit from it, now or later in life, when returning to the formal lifelong learning system or to the labor market.

The assumption behind the work reported here is that all learning has value and most of it deserves to be made visible and recognized. It is a clear possible option, and a plausible alternative to formal education and training, to have non-formal and informal learning assessed. The real question is under which condition(s) the learning that has not been recogniztnted can be codified, and lead to the awarding of a document. There are issues of cost and motivation of individuals that are somewhat difficult to address.

Nevertheless, many countries are putting recognition of non-formal and informal learning at the top of their policy agenda and the time has come for a thorough evaluation of what it entails. This is what this OECD activity attempts to do, in collaboration with the 23 countries, using the existing literature, the scarce data in the field and fact-finding study implicit in the thematic review visits carried out in 16 countries.

The recognition of non-formal and informal learning is an important means for making the 'lifelong learning for all' agenda a reality for all and, subsequently, for reshaping learning to better match the needs of the 21st century knowledge economies and open societies.

Monitoring Individual performance

Performance management (PM) includes activities which ensure that goals are consistently being met in an effective and efficient manner. Performance management can focus on the performance of an organization, a department, employee, or even the processes to build a product of service, as well as many other areas.

PM is also known as a process by which organizations align their resources, systems and employees to strategic objectives and priorities.

Performance management as referenced on this page in a broad term coined by Dr. Aubrey Daniels in the late 1970s to describe a technology (i.e. science imbedded in

applications methods) for managing both behavior and results, two critical elements of what is known as performance.

Self check -3	True or falce

_____1.Performance management (PM) includes activities which ensure that goals are consistently being met in an effective and efficient manner.

___2.. Non-formal learning therefore gives some flexibility between formal and informal learning,

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