

## SCAFFOLDING: AN EFFECTIVE APPROACH FOR TEACHING ENGLISH FOR HEALTH CONTENT PURPOSES

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### ABSTRACT

*EFL students of all language proficiencies that are focused on studying Medicine or Engineering need scaffolding techniques and practical methodologies that build language competencies and bridge the understanding of content based material that is demanded of them. How can EFL teachers teach the language that students need to be successful in the field of Medical Science without necessarily being an expert in the field? This paper explores the application of teaching methodologies in an EFL for Medicine classroom that uses Vygotsky's scaffolding and the ZPD theory to create material that allows the students to practice and build the four integrated skills of English while at the same time building English language Schema of the content material needed to excel. This paper will argue that this approach is possible with all EFL learners, despite their level of English or TOEFL / IELTS score and that if this practice is implemented in foundation level courses at the beginning of the student's study, and then true learning of the language, skills and content will merge*

Keywords: EFL, scaffolding techniques, language competencies, ZPD theory

### INTRODUCTION

Global EFL and ESL English preparatory programs for Medical and Science universities have reached a problem in teaching EFL and ESL in the last few decades. How do they educate and train their students in their respective field of study while building and enhancing their language proficiency. If homogenous populations of English language learners are learning English as a foreign language in their country birth, then what role does English play in their professional and personal lives? If English is needed for a specific, professional purpose, should EFL students be learning only CALP (Cognitive Academic Language Proficiency) or should their English study be a balance between BICS (Basic Interpersonal Communication Skills) and CALP? These are questions that EFL educators need to pose, ponder, wrestle with and debate in order to create programs that are suitable for the needs of their students.

In order to respond to the inquiry on how programs can teach content needed for specific purposes in an English based classroom, one must first differentiate between both ESL and EFL and therefore define the specifications for teaching EFL to students learning English as a foreign

language, not a second language. ESL is of course the field of teaching English to students learning English as a second language. ESL is catered to learners who have immigrated to or live in a country that uses English as the first or one of the primary languages for all aspects and functions of life. EFL is the teaching of English as a foreign language to a homogenous population of students within their home country, where English may not be the main language used for everyday functions and pragmatic situations of communicative exchange. Usually, the native language of the country is the language used functionally, whereas, English is the language used professionally and academically in professions that require a high aptitude for speaking, reading and writing in English. This creates a unique setting for the EFL students. The EFL teachers must be responsible for linking the student's own cultural perceptions, cognitive and meta-cognitive first language abilities and academic skills to English. The first step is for the teacher to realize the role of English for these students. English for an EFL student is not necessarily for the utilization of these skills in everyday exchanges. It is for the specific purpose of using English in the professional realm that is related to their field, whether it is Medicine, Engineering or business. The majority of EFL students will probably not be using English to communicate in the functional aspects of their lives. They will use English for academic study and to engage in their professional stance such as a doctor or engineer.

Therefore it is pertinent that materials, text books, and the entire curriculum that is designed and implemented for EFL students are supported by the above premise. This is a serious issue because the textbooks are designed as ESL books and not EFL. They are socially and culturally irrelevant and do not meet the specific needs of the target demographic. They use poor scaffolding techniques if any and they assume that English is learned by linear points grammatically and linguistically, not as a whole language that is socially and peer/mentored influenced. Neither ESL nor EFL should be compartmentalized into neat and pretty blocks of learning functional language. ESL and EFL cannot be harnessed by a set of competencies that check off certain points as soon as they are thought. The vibrant and dynamic EFL classroom should be a place where learning specific content for the specific needs of the students takes place. This naturally occurs when solid scaffolding and use of the theory of the Zone of proximal development (Vygotsky) is embedded and then implemented into the curriculum. What proceeds is the student's gain of English language and academic skills infused with the knowledge, understanding and utilization of the content area material. When all this blends together, the EFL student blossoms in their individual development of their English proficiency skills (BICS) and content information in English (CALPS).

### **Teaching English for Content Purposes**

Content and Language Integrated Learning or CLIL; (Subject Teaching through a Foreign Language) has gained popularity globally in the last few years. As English continues to be the Global language of choice for specific content and studies of various fields, students learning English as a Foreign Language are attuned that their skills and knowledge of their specific area of study lies in the reality that they must be proficient in English in order to engage in their particular discipline. Thus many types of English programs are implementing subject teaching content in English as a Foreign Language classes. Sometimes this takes the form of a Subject teacher utilizing EFL strategies and EFL teachers learning content in order to teach a particular subject through English. One obvious advantage for EFL instructors, who teach

specific subjects such as Science, Math or History, is that the content is tailor made (Shelagh & Christine, 2007).

Teachers don't need to spend a lot of time and energy intuiting topics because the subjects are given. The topics are the content. This usually engages and motivates the students more and more because they view English as a means to an end.

Another benefit is that teachers can use the theory of Howard Gardner's multiple intelligences in implementing practical activities in the content classroom. When teachers instruct another subject through EFL, they draw on certain multiple intelligences that may be useful to students in learning the particular subject through English. It may be a linguistic, kinesthetic or mathematical/logical intelligence that is tapped into (Shelagh & Christine, 2007). The methodology of CLIL involves using pictures, charts, graphs and other visual materials to teach content and reinforce the language being learned. Lessons that support the language and learning needs are a chart to complete beside a reading text or a framework for writing activity. Identifying vocabulary and differentiating instruction are all useful technique. Lots of repetition and consolidation can take place as well. A reading may need to be read several times; orally, listened to aurally, read in chunks with pairs or groups and then individually in order for the learners to be exposed to new lexicon, content specific material as well sentences (Shelagh & Christine, 2007).

Another strategy is utilizing the mother tongue. The use of code switching the ability to move between two languages is a necessary tool for the students to check for comprehension and knowledge of the exact ideas in their own language. This can be done orally in discussions, in translating what they read orally or in writing and can be a useful resource to prior knowledge, schema and clarification (Shelagh & Christine, 2007).

CLIL portrays a content area or EFL teacher instructing an EFL class in a particular subject. However, what about institutions whose teachers strive to teach English for the purpose of enhancing the comprehension and ability to learn and master skills that are academic, content based? It is not the purpose of this type of teacher to teach the subject, but to support the subject by focusing on the linguistic aspects of what the learners need to know and be able to do in their subject courses. They create similar contexts and sometimes completely different ones utilizing the content specific concepts, vocabulary and skills needed to master the subject area.

For example, an EFL instructor in Saudi Arabia may introduce the concepts of the water cycle taken from a Life Science or Biology class. The instructor would focus on how the water cycle is affected in desert climates such as Saudi Arabia and how the water cycle is gradually being altered due to climate change. The instructor uses vocabulary they are learning in the Life Science course, but is teaching a reading class. Therefore, the teacher creates an adapted text with vocabulary that describes the Water Cycle in a socially and culturally relevant context and focuses on the linguistic reading competencies that his/her individual students need to practice and learn.

## Connecting and utilizing Scaffolding and the Zone of Proximal Development to Teaching English for Content Purposes

How is teaching English for Content Purposes relevant to the idea of Scaffolding and the Zone of Proximal Development? Learning is social in nature. This is true for all kinds of learners and certainly true for EFL learners. Students learn cognitively and socially. This process is called interaction; where students and teachers engage in joint activities that focus on factors of shared interest and possess opportunities for learning. This interaction that takes place in the EFL classroom is socio-cultural and involves learning academic and language skills to learn the subject matter needed (Walqui, 2003)

One way that this process occurs is through scaffolding. Scaffolding is a teaching method whereby the instructor models the desired learning technique or task, then gradually shifts responsibility to learners. Scaffoldig instruction originates from Lev Vygotsky's sociocultural theory and his concept of the zone of proximal development (ZPD)."The Zone of proximal development is the distance between what children can do by themselves and the next learning that they can be helped to achieve with competent assistance"(Raymond,2000,p.176).It is a level of development achieved when learners engage in social activity.

Learners mediate and socially interact in order to develop and learn further. The Zone of Proximal Development is the apex in which this learning takes place (Walqui, 2003). The ZPD is the distance between the precise development level of a learner attempting to solve a problem and the level of potential development as decided by problem solving under the adult guidance of a teacher or through the collaborative effort of peers. This theory was later adapted and interpreted for the use of teaching ESL and EFL (Walqui, 2003). Scaffolding is directly linked to the ZPD .It comes about through social interaction in the classroom and works through the process of learners assisting others to figure out language and concepts that may be above their proximity level of competence and proficiency. It is best defined by Bruner who said it is, "a process of setting up the situation to make the child's entry easy and successful and then gradually pulling back and handing the role to the child as skilled enough to manage it"(Bruner, 1983; p.60).

Scaffolding has pedagogical purposes such as providing a support structure for EFL learners in three stages:

Stage 1: includes a planned curriculum over time that is implemented through a series of ritualistic tasks.

Stage 2: incorporates the procedures used in an activity that is set forth in stage 1.

Stage 3: is the collaborative process of interacting which is the actual achievement of stage 2 (Walqui, 2003). For example; an instructor plays an audio of a scientific laboratory experiment and students must listen and take notes. This occurs over a period of two class periods. Then the next day the instructor gives the students a script of the audio lab experiment with missing words and phrases. They listen again and complete the script. Then they discuss the script and the procedural lab experiment and then in pairs they rewrite the lab experiment and explain it to the entire class. Finally, they write their own outline for a lab experiment, conduct it in their science class and then write a report on the outcomes and report back to their EFL class the findings. All



of this may take several if not many class periods, depending on the proficiency level of the participants however, this is a classic example of how each stage in the scaffolding process functions.

In reading a content based text, EFL learners benefit from texts that are “amplified, not simplified”. A text chosen and adapted for EFL readers should be grammatically, structurally and lexically linked. Paragraphs should have sentences that contain multiple attachment points and vocabulary and phrases that are linked to the main idea. A paragraph can have redundancy, abundance and elaboration (Walqui & DeFazio, 2003)

### **Teaching English for Medical Purposes at Al-Ghad Colleges' Preparatory Program**

Al-Ghad International Colleges for Health Sciences are new four year colleges located in different cities in Saudi Arabia. They have different specialties such as nursing, emergency, radiology, medical laboratory, health management and that esteems itself on being research and technologically driven in health sciences. Al-Ghad colleges have a one semester preparatory program where students can study intense academic and foundation English as well as the Sciences of Biology, Chemistry, Physics, in order to prepare them for rigors of study in their pathway of choice at Al- Ghad. The uniqueness of the program is that most of the instructors hold MA. The program is currently new and there are ten colleges and about (910) male and female students.

Ninety six percent of the student population is Saudi nationals, who speak Arabic as their first language. Most of them come from public and private high schools and have a low average G.P.A. However, many of them lack the foundational levels of English to perform at a high, potent academic level. They also struggle to adapt to a student centered, communicative, sometimes project orientated and peer/group guided style of instruction and learning. There is only one level of English and their course is for general English then these students are streamed into health Sciences courses.

Consequently, all of these students need scaffolding in language competencies and main science concepts. Many of them are still in the beginning stages of their speaking, reading and writing proficiencies in English. Some of the English faculty have linked themselves to the General Science instructors and are teaching English for Science in their Communication, Reading and Writing Courses. I use the main vocabulary terms and concepts in their health sciences courses (10 week quarters) and developed scaffolded lessons based on these terms and concepts. The philosophy is that even though the reading material, terms and science lectures are above their level of proficiency in English; they will respond and learn the language objectives that they need to attain by engaging in meaningful, scaffolded lessons that enable them to produce the language skills and scientific concepts.

I worked to create lessons that target beginners and are scaffolded so that meaningful scientific ideas and language skills and competencies forge and the student's language and knowledge of the scientific concepts they need emerge. I Applied the Theory of Scaffolding English for health Science in speaking, listening, reading, grammar and Writing classes. All English instructors were brought from different cities and trained how to teach the course according to the scaffolding theory.

The "Asthma" lessons began with a pre-listening exercise where the students have been directed to discuss questions on Asthmas in pairs or in small groups, then the teacher introduced the key vocabulary which is associated to the conversation, and let the students look up the dictionary if necessary. Students were asked to revise the key vocabulary then fill in the blanks with the right vocabulary from the box. Students listened to an audio of the semi biographical and informative reading text three times (in chunks or paragraphs and then discussed ideas and familiar words that they recognized in each paragraph) and then discussed what they thought was the topic and main ideas. They were asked to choose the right answer. When the main points were identified aurally, they made a list of them on paper and then listened once more; this time with the printed text displayed on a Smart board for the students to visualize and connect the audio to an actual text. As the students listened they would jot down words, phrases or sentences that connected to the main ideas they had previously listed. They would listen to the pronunciation of target words from the reading and practice pronouncing and reading them. Finally, they listened to the text a final time in chunks then they were directed to write the words they heard in the correct blank as they individually read a printed copy of the text. Finally, they did the post-listening exercise: students would break into groups; each with assigned paragraphs and discussed the main idea and key vocabulary of their paragraphs. This would be followed by a mini lesson of the simple present tense where students were trained to use the tense. (see pages 8-11)

The next step was to practice speaking in medical Situations because oral interactions play a crucial role in student progression. Based on the theory from "more oral to "more written language". (Walqui, 2010), students were shown a picture about a person who had ASTHMA and the instructor introduced the vocabulary by giving examples of how to use them in a dialogue. Then the instructor would ask the students questions to discuss the picture and allow them to refer to the vocabulary list. After that students would be given a medical problem to solve. Students were given more medical situations related to emergency and how to deal with it to expose them to as much vocabulary as they would need later on to do other language tasks and help them to carry out their career goals. The aim of this step is to help learners to focus on how language is used to convey points of view (Gibbson, 2009; Schleppegrell, 2009; Walqui and Van Lier, 2010). (see pages 12-18)

In the next set of lessons, the students explored the general topic of "ASTHMA" in a more culturally and socially relevant custom that they are all familiar with; the Arabian Incense (Bukhor). They listened to a brief audio about The correlation between home exposure to Arabian Incense (Bakhour) and asthma symptoms in Saudi Arabia. Then they read the short text and discussed in groups the main ideas and related vocabulary to ASTHMA. After group discussions about how asthma is correlated to Arabian incense, they would prepare a 2 minute oral presentation, in which they would present to the entire class their own point of view the claim that Arabian incense (Bakhour) is one of the common indoor smoke sources to which individuals are frequently exposed, and may be an important contributory factor to the observed high prevalence and severity of asthma in Saudi Arabia. By giving them this task, students are involved in teaching which is very important in students' development and at the same time establish a balance among students' tasks, the demands of a task, and the teacher support. (Walqui, 2010; Walqui and Van Lier, 2010). (see pages 19-20).

Since Scaffolding is based on a socio-cultural view of learning that states development is an outcome of learning and that instruction proceeds development, students are now expected to use all the knowledge from the listening, reading, speaking activities to write a paragraph describing with as much detail as they could, the indoor and outdoor risk factors that might cause high prevalence and severity of asthma in Saudi Arabia.

For a homework assignment, the students wrote a second draft. After the instructor corrected errors, they wrote a third draft.

This text became the final product and is an example of scaffolding and using the ZPD. All support was finally stripped away and the reading and communicative exercises became product or task based orientated and the students were able to create their own text using the concepts and vocabulary of ASTHMA reading text.

The original reading was above their capacity to read and comprehend, but was supported by a series of steps that involved practicing the basic skills of listening, reading and speaking as well as being able to speak about what they had read utilizing new vocabulary accurately. Finally, they demonstrated their understanding by practicing writing about their new found vocabulary and understanding of the topic and ideas in another context.

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Appendex

# Asthma

Q1: What is Asthma?  
Q2: What causes an Asthma attack?  
Q3: What else do you know about  
Asthma?

Level:	Topic:	Type:	Speakers:	Length:
2	Asthma	conversation	man	01:36

### **Key vocabulary:**

**Introduce the key vocabulary which is associated to the conversation, you may let the students look up the dictionary if necessary.**

Asthma	disease	condition	immune system	risk factors
breathe	symptoms	tightening	wheezing	pressure
infection	treatment	sensitivity	signs	features
exposure	allergens	inflammation	case	
breath obstruction				

**I. Revise the key vocabulary then fill in the blanks with the right vocabulary from the box below.**

### **Features - asthma — Immune system – triggers – tightening**

2. Asthma is a disease that causes \_\_\_\_\_ of air pathways.
3. Approximately 10% of children have \_\_\_\_\_.
4. Airway obstruction and airway sensitivity are common \_\_\_\_\_ of asthma.
5. Children don't have strong \_\_\_\_\_.
- 6.

### **Listening Exercises:**



**II. Listen to the conversation. Do not take notes. Choose the right answer.**

- 1) What are some common symptoms associated with asthma?
  - A. shortness of breath
  - B. coughing



- C. chest pain
  - D. all of the above
- 2) What age does asthma present at?
- A. any age
  - B. childhood
  - C. 30s
  - D. 10-12 years
- 3) Asthma is \_\_\_\_\_ of the lungs.
- A. a part
  - B. a disease
  - C. a risk factor
  - D. a symptom
- 4) Family history of asthma, regular lung infections, and exposure to tobacco smoke are all \_\_\_\_\_ of asthma.
- A. risk factors
  - B. triggers
  - C. diseases
  - D. exposures
- 5) Recently, there has been an increase in asthma cases among \_\_\_\_\_.
- A. young adults
  - B. IV drug users
  - C. the elderly
  - D. children

### III. Listen to the conversation again. Write the words you hear in the correct blank.



(1).....is a disease of the..... (2) that is characterized by tightening of the air pathways. Common symptoms of asthma are wheezing, shortness of (3)..., coughing, chest pain, tightness or pressure. Many of these conditions are reversible with medication but not 100% reversible in all patients. Some common (4).....of asthma are inflammation, airway obstruction and airway sensitivity. Some (5)..... (6).....for asthma are a family history of asthma, regular lung infections, presence of allergies, exposure to tobacco smoke, low birth weight, and being male. The current rise in asthma cases among (7).....is alarming. Asthma may occur at (8).....age but is very common in children. Approximately 10% of children have asthma and that rate may rise in the future. Experts don't agree why the rate is increasing but here are some ideas:

- Children are being exposed to more (9)..... (things that bring on asthma attacks; dust, tobacco smoke, pollution)
- Children don't have strong (10)..... (they aren't exposed to many childhood diseases.)
- Decreases in the rates of breast feeding may also play a role.

Asthma is a disease that causes many problems for the patient. However, it can be controlled. With the right information and medical attention, medical professionals can prevent many deaths.

### Post-Listening Exercises:

- What are the main features of asthma?
- What are some triggers for asthma attacks?
- What information is important to tell the patient about Asthma?

### IV-Fill in with the correct simple present tense

(1) Asthma (be) ..... a disease of the lung that is characterized by tightening of the air pathways. Common symptoms of asthma (2) (be) ..... wheezing, shortness of breath, coughing, chest pain, tightness or pressure. Many of these conditions (3) (be) ..... reversible with medication but not 100% reversible in all patients. Some common features of asthma (4) (be) ..... inflammation, airway obstruction and airway sensitivity. Some risk factors for asthma (5) (be) ..... a family history of asthma, regular lung infections, presence of allergies, exposure to tobacco smoke, low birth weight, and being male. The current rise in asthma cases among children (6) (be) ..... alarming. Asthma may occur at any age but (7) (be) ..... very common in children. Approximately 10% of children (8) (have) ..... asthma and that rate may rise in the future. Experts don't agree why the rate is increasing but here are some ideas:

- Children are being exposed to more Triggers (things that bring on asthma attacks; dust, tobacco smoke, pollution)
- Children don't have strong Immune system (they aren't exposed to many childhood diseases.)
- Decreases in the rates of breast feeding may also play a role.

Asthma (9) (be) ..... a disease that causes many problems for the patient. However, it can be controlled. With the right information and medical attention, medical professionals can prevent many deaths. (Hospital English.com, 2011)

## Medical Situations Speaking Activities





Unconscious (adj): Alive, but appearing to be asleep and unaware of the surroundings.

Example-I hit my head on the steering wheel and I was still unconscious when the ambulance arrived.

Critical condition (n): Requiring immediate and constant medical attention

You can't see her right now; she's in critical condition.

Asthma (attack) (n): a condition that causes a blockage of the airway and makes it difficult for a person to breathe.

I carry an inhaler when I run because I have asthma.

Fatal (adj): Causing death.

The bullet was fatal, it pierced his heart, and he died on spot.

Cardiopulmonary resuscitation (CPR) (n): Restoring a person's breath and circulation.

You saved your brother's life by performing CPR.

Life-threatening (n): When injuries and conditions are extremely serious.

The victim was shot in two places but the bullet wounds are not life-threatening

- What do you see in the picture?
- Describe the situation.
- What do you think is wrong with the person?
- What is CPR?
- When do people need it?
- What could happen when a person has an asthma attack?
- If you were in a situation where you have to take care of such a case, what would you do?
- What do people usually carry with them for breathing problems?

#### Problem solving

You are in a shopping area and it is very crowded. You see a person fall down in the middle of the crowd. What would you do?

1. Wait for the ambulance to come?
2. Put water on her/his face?
3. Check her pulse?
- 4.

Reasons:



Ambulance (n): a special vehicle used to treat and transport ill people.

Oxygen mask (n): a device, worn over the nose and mouth, to which oxygen is supplied from a cylinder or other source: used to aid breathing.

The man couldn't breathe, so he used an oxygen mask to help him breath.

Stretcher (n): a device for transporting the ill, wounded, or dead, consisting of a frame covered by canvas or other material.

The man was put on a stretcher after he had a sudden heart attack.

Emergency mode (n): The use of light and sirens in an ambulance.

Cars cleared out the road for the ambulance because of its emergency mode.

Patient (n): a person staying in a hospital or medical facility or coming to visit a doctor.

The patients in Room 4 are not getting along.

Pain killer, pain reliever (n): a type of medicine that takes away some or all of the discomfort of an illness or injury.

You can take two pain killers every four hours.

Narcotic (n): a type of drug that stops pain or makes one sleep, often addictive when taken in large doses or in regular basis without a doctor's prescription.

Narcotics shouldn't be taken unless under supervision.

- Look at the picture. Where is the situation taking place?
- Are they in a hospital?
- How many people are there?
- What is the nurse doing to the patient?
- Is the patient conscious?
- Is she lying on a bed?
- What is on her face?
- What is it for?
- How could they know her heart condition?

- Have you ever worked in an ambulance?
- Can you describe the situation in detail?
- Do you have emergency services in your city?
- How would you contact them if you need them?
- Can you tell me the most important items that an ambulance should have?

### Problem solving

You are in situation that a person needs emergency care but refuses to take any action? What would you do?

1. Shout at him/her to listen?
2. Call someone to talk to him/her?
3. Tell him not to get nervous?



Emergency (n): a medical problem that needs immediate attention.

It is important that children know which number to dial in case of an emergency

Illness (n)

ill (adj): general term for any condition that makes a person feel sick for a certain period of time.

Her illness went away when she started eating better.

Paramedic (n): a healthcare professional who works in emergency medical care, or the care of patients for conditions that require immediate or very prompt medical attention.

Physician (n): a doctor that practices medicine.

The physician prescribed a medicine to his patient.

Stethoscope (n): An instrument used by doctors for listening to the heart-beats and breathing sounds.

The physician used his stethoscope to examine his patient.

Critical condition (n): Requiring immediate and constant medical attention.

You can't see her right now; she's in critical condition

Vital sign (n): a sign of life.

Paramedics always check the injured vital signs.



- What is happening in the picture?
- Is there anyone in the stretcher?
- What are they rushing for?
- Where are they?
- How many people are there in the picture?
- What are they wearing?
- Do they look worried? Why?
- Are they part of medical team or paramedics?
- What do you think will happened next?
- Does it look like a critical situation to you? Why?

### Problem solving

You are in a shopping mall. It is very crowded. A lady in front of you just fainted.

What will you do?

- 1- Help her immediately
- 2 Wait for the paramedic.
- 3-First check her vital sig.
- 4-
- 5-

Reasons:



[Click here to listen to the text](#)

## **The correlation between home exposure to Arabian Incense (bakhour) and asthma symptoms in Saudi Arabia**

Asthma is a worldwide major health problem with significant variations in its prevalence and severity in different parts of the world. Many studies shown that asthma is common in Saudi Arabia. In addition, Saudi Arabia ranked among the top countries in global ranking of symptoms taken to indicate severe asthma.

Some prevalence of asthma risk factors in Saudi Arabia are: family history, sensitization to pollen and house dust mite, respiratory infections, and dietary habits, in addition to outdoor and indoor air pollutants including incense smoke. These factors may influence the pathogenesis and severity of asthma and require investigation not only to contribute to the understanding of asthma etiology, but also to plan measures for its control. In particular, it is important to explore the less characterized risk factors related to life style, culture and home environment which may be peculiar to different populations.

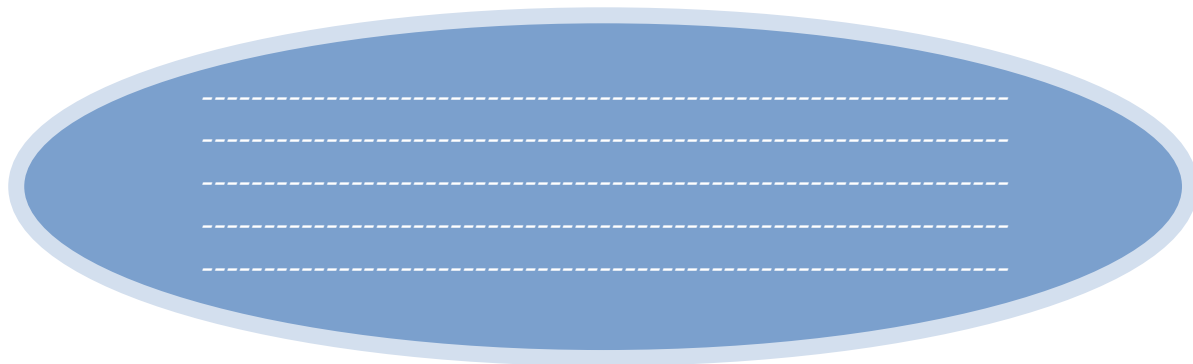
In Saudi Arabia and other Gulf countries, Arabian incense (bakhour) is one of the common indoor smoke sources to which individuals are frequently exposed, and may be an important contributory factor to the observed high prevalence and severity of asthma. A wide variety of substances are used to produce bakhour including frankincense, aromatic wood, herbs, flowers, essential oils, and perfumes burned using charcoal burner . Frankincense is a resin produced by oozing from incisions in the trunks of trees of the genus *Boswellia* that grow in the south of Oman .Other forms of incense are derived from sandalwood and are usually mixed with ingredients such as natural oils and perfumes .Due to its slow and incomplete combustion, incense burning produces continuous smoke, generating pollutants such as toxic gases and chemicals particles including polycyclic aromatic hydrocarbons, carbon monoxide, benzene, and isoprene that easily accumulate indoors, especially under inadequate ventilation .Exposure to incense smoke has been linked to asthma.

### **Here is some vocabulary related to ASTHMA:**

- 1) Health problem
- 2) Symptoms

- 3) Severe
- 4) Prevalence
- 5) Asthma risk factors
- 6) Sensitization to pollen and house dust mite
- 7) Respiratory infections
- 8) Outdoor and indoor air pollutants
- 9) Pathogenesis of asthma and require
- 10) Investigation
- 11) Asthma etiology
- 12) Indoor smoke sources
- 13) Pollutants

### How Asthma is correlated to Arabian Incense?



**Do you agree that Arabian Incense (bakhour) is one of the common indoor smoke sources to which individuals are frequently exposed, and may be an important contributory factor to the observed high prevalence and severity of asthma in Saudi Arabia and WHY?**

