



Anatomy team  
med 438



# Nose, Nasal cavity, Paranasal Sinuses & Pharynx

Respiratory block-Anatomy-Lecture 2

Editing file



# Objectives

**At the end of the lecture, the students should be able to:**

- Describe the boundaries of the nasal cavity.
- Describe the nasal conchae and meati.
- Demonstrate the openings in each meatus.
- Describe the paranasal sinuses and their functions.
- Describe the pharynx and its parts.

**Color guide :**

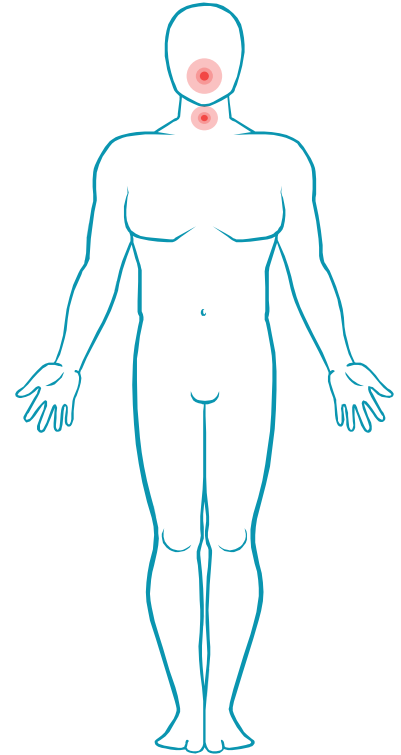
Only in boys slides in **Green**

Only in girls slides in **Purple**

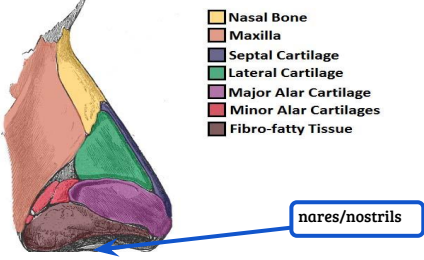
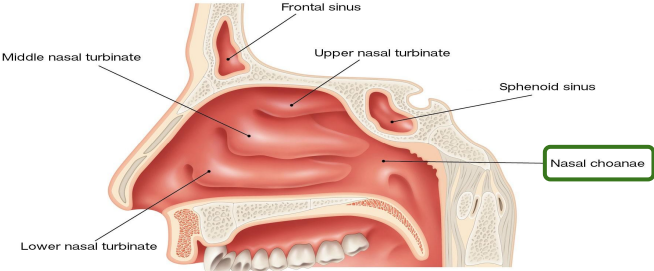
important in **Red**

Doctor note in **Blue**

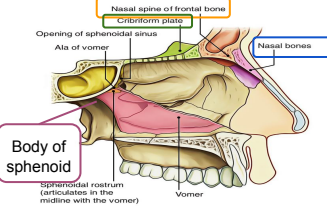
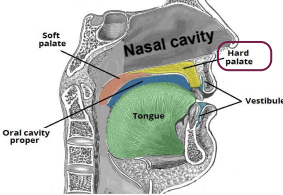
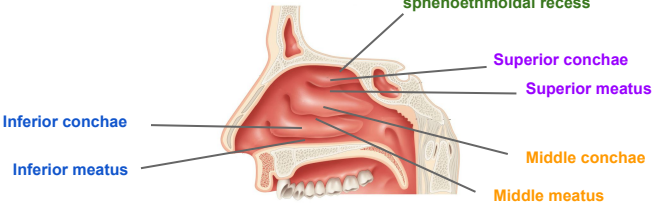
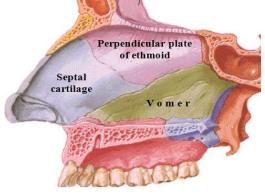
Extra information in **Grey**



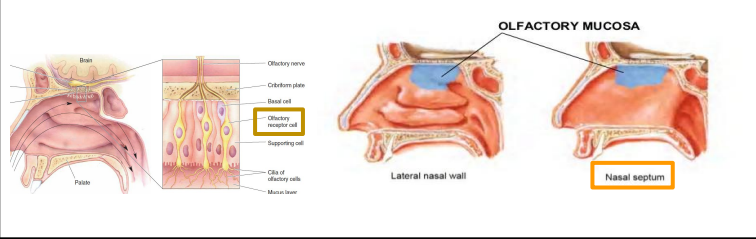
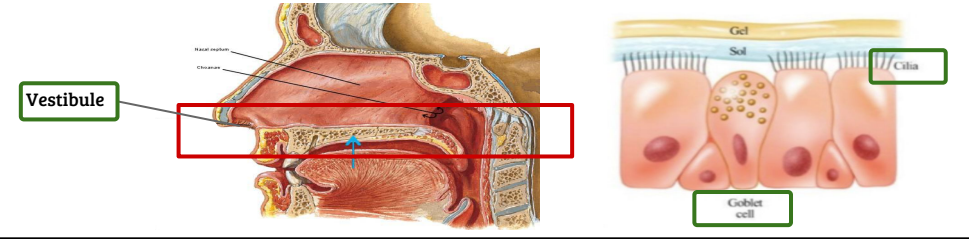
# Nose & Nasal cavity

Nose	Nasal cavity
	
<p>The external (anterior) <b>nares</b> or <b>nostrils</b>, lead to the nasal cavity.</p> <ul style="list-style-type: none"> <li>- Formed above by: <b>Bony skeleton</b>.</li> <li>- Formed below by: plates of <b>hyaline cartilage</b>.</li> </ul>	<ul style="list-style-type: none"> <li>- Extends from the <u>external</u> (anterior) <b>nares</b> to the <u>posterior</u> nares (<b>choanae</b>).</li> <li>- Divided into right &amp; left halves by the <b>nasal septum</b>.</li> <li>- Each half has a:             <ul style="list-style-type: none"> <li>▪ Roof</li> <li>▪ Lateral wall</li> <li>▪ Medial wall (septum)</li> <li>▪ Floor</li> </ul> </li> </ul>

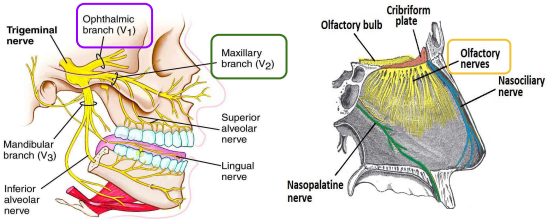
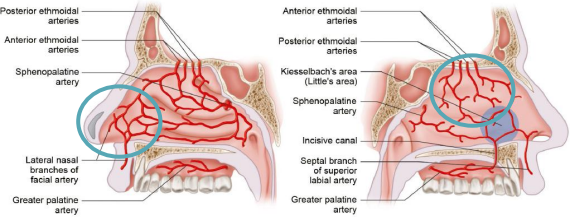
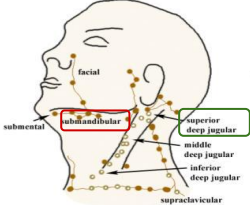
# Nasal cavity

Roof	Floor	★ Lateral	Medial
			
<p>Narrow &amp; formed (from <u>behind forward</u>) by the:</p> <ol style="list-style-type: none"> <li>1. <b>Body of sphenoid.</b></li> <li>2. <b>Cribriform plate of ethmoid bone.</b></li> <li>3. <b>Frontal bone.</b></li> <li>4. <b>Nasal bone &amp; cartilage.</b></li> </ol>	<ul style="list-style-type: none"> <li>- Separates it from the oral cavity.</li> <li>- Formed by the <b>hard (bony) palate.</b></li> </ul>	<p>Shows three horizontal bony projections, the <b>superior, middle &amp; inferior</b> conchae.</p> <ul style="list-style-type: none"> <li>- The cavity <u>below</u> each concha is called a <b>meatus</b> (named corresponding to the conchae).</li> <li>- The small space above the <b>superior</b> concha is the <b>sphenoethmoidal recess.</b></li> <li>- The <b>conchae</b> <u>increase</u> the surface area of the nasal cavity.</li> <li>- The <b>recess &amp; meati</b> <u>receive</u> the openings of the: Paranasal sinuses &amp; Nasolacrimal duct.</li> </ul>	<p>Medial Wall (<b>Nasal Septum</b>) Osteocartilaginous partition.</p> <p>Formed by:</p> <ol style="list-style-type: none"> <li>1. <b>Perpendicular plate of ethmoid bone.</b></li> <li>2. <b>Vomer.</b></li> <li>3. <b>Septal cartilage.</b></li> </ol>

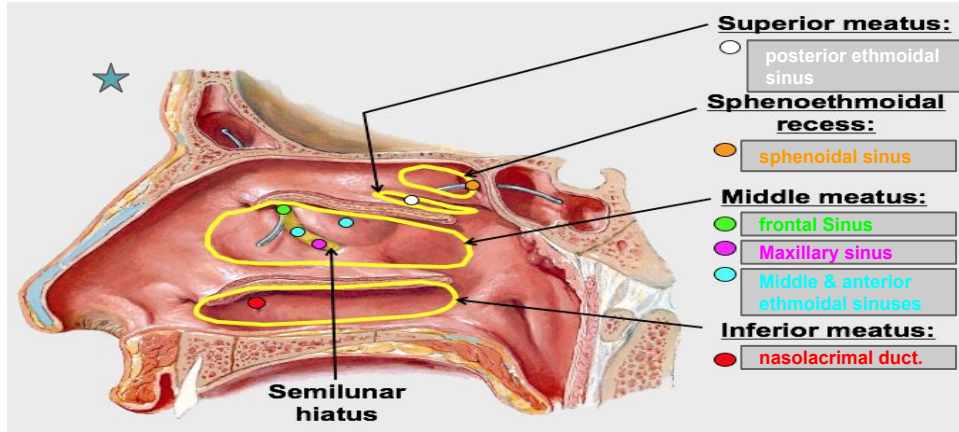
# Nasal Mucosa & Respiratory Mucosa

	
<h2 style="text-align: center;">Nasal/olfactory mucosa</h2>	<h2 style="text-align: center;">Respiratory mucosa</h2>
<ul style="list-style-type: none"> <li>- It is delicate and contains <b>olfactory nerve cells</b>.</li> <li>- It is present in the <b>upper part of nasal cavity</b>:             <ul style="list-style-type: none"> <li>→ On the <b>Roof</b></li> <li>→ On the <b>lateral wall</b>: upper surface of the superior concha &amp; the sphenoidal recess.</li> <li>→ On the <b>medial wall</b>: it lines the superior part of the <b>nasal septum</b>.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>- It is thick, ciliated, highly vascular and contains mucous glands &amp; <b>goblet cells</b>, it lines the <b>lower part of the nasal cavity</b>.</li> <li>- Functions: moisten, clean &amp; warm up the inspired air.             <ul style="list-style-type: none"> <li>→ The air is moistened by the secretion of numerous serous glands.</li> <li>→ The air is cleaned by the removal of the dust particles by the ciliary action of the columnar ciliated epithelium that covers the mucosa.</li> <li>→ The air is warmed by a submucosal venous plexus.</li> </ul> </li> <li>- The <b>vestibule</b> is lined by <b>skin</b>.</li> </ul>

# Nasal Mucosa & Respiratory Mucosa

★ Nerve supply	★ Arterial supply & Venous supply	Lymphatic drainage
 <p>Trigeminal nerve</p> <p>Ophthalmic branch (V<sub>1</sub>)</p> <p>Maxillary branch (V<sub>2</sub>)</p> <p>Mandibular branch (V<sub>3</sub>)</p> <p>Inferior alveolar nerve</p> <p>Superior alveolar nerve</p> <p>Lingual nerve</p> <p>Olfactory bulb</p> <p>Cribriform plate</p> <p>Olfactory nerves</p> <p>Nasopalatine nerve</p>	 <p>Posterior ethmoidal arteries</p> <p>Anterior ethmoidal arteries</p> <p>Sphenopalatine artery</p> <p>Lateral nasal branches of facial artery</p> <p>Greater palatine artery</p> <p>(a) Lateral wall of cavity</p> <p>Anterior ethmoidal arteries</p> <p>Posterior ethmoidal arteries</p> <p>Kiesselbach's area (Little's area)</p> <p>Sphenopalatine artery</p> <p>Incisive canal</p> <p>Septal branch of superior labial artery</p> <p>Greater palatine artery</p> <p>(b) Nasal septum</p>	 <p>submental</p> <p>submandibular</p> <p>facial</p> <p>superior deep jugular</p> <p>middle deep jugular</p> <p>inferior deep jugular</p> <p>supraclavicular</p>
<p>Olfactory mucosa is supplied by <b>olfactory nerves</b>.</p> <p>Nerves of general sensation are derived from:</p> <ul style="list-style-type: none"> <li>● <b>Ophthalmic nerves</b></li> <li>● <b>Maxillary nerves</b></li> <li>● <b>Autonomic fibers</b></li> </ul>	<p><b>Arterial Supply:</b></p> <ul style="list-style-type: none"> <li>- Branches of the: <u>maxillary</u>, <u>facial</u> &amp; <u>ophthalmic</u> arteries.</li> <li>- The arteries make a rich anastomosis in the region of the <b>vestibule</b> &amp; the anterior portion of the <b>septum</b>.</li> </ul> <p><b>Venous Drainage:</b></p> <ul style="list-style-type: none"> <li>- Drain into the: <u>facial</u>, <u>ophthalmic</u>, and <u>spheno-palatine veins</u>.</li> </ul>	<ul style="list-style-type: none"> <li>- The lymphatics from the <b>vestibule</b> drain into: the <b>submandibular</b> lymph nodes.</li> <li>- The rest of the cavity drains into the <b>upper deep cervical</b> lymph nodes.</li> </ul>

# Paranasal Sinuses



- They are air filled cavities located in the **bones** around the nasal cavity:  
Ethmoid, Sphenoid, Frontal and Maxillae.

- They are lined by **respiratory mucosa** which is continuous with the mucosa of the nasal cavity.

\***Drain into the nasal cavity.**

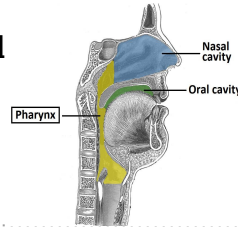
<b>Sphenoethmoidal recess</b>	sphenoidal sinus
<b>Superior meatus</b>	posterior ethmoidal sinus
<b>Middle meatus</b>	middle ethmoidal, maxillary, frontal & the anterior ethmoidal sinuses
<b>Inferior meatus</b>	nasolacrimal duct

## Functions

- Lighten the skull
- Act as resonance chambers for speech.
- Air conditioning: The respiratory mucosal lining helps in warming, cleaning and moistening the incoming air.

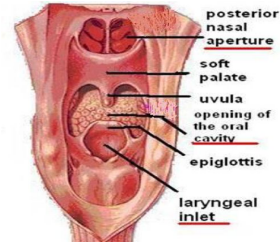
# Pharynx

- **Muscular tube** lying behind the nose, oral cavity and larynx.
- Extends from the base of the **skull** to level of the **6th cervical vertebra**, where it is continuous with the esophagus.
- Note: It starts at the nose and continuous as the esophagus.



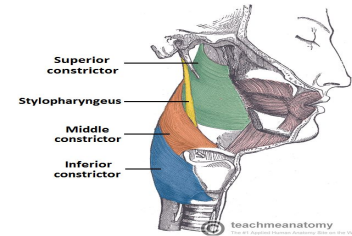
The deficient of the anterior wall shows the following (from above downward):

1. **Posterior nasal apertures.**
2. **Opening of the oral cavity.**
3. **Laryngeal inlet.**

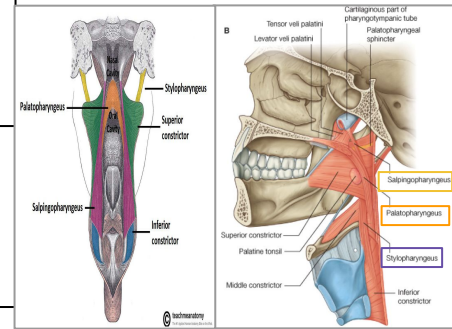


Muscles arrangement of the pharynx	muscles	Function
A- Circular muscles	<ol style="list-style-type: none"> <li>1. <b>Superior constrictor</b></li> <li>2. <b>Middle constrictor</b></li> <li>3. <b>Inferior constrictor</b></li> </ol> <p>The three muscles <b>overlap</b> each other.</p>	<ul style="list-style-type: none"> <li>• Propel the bolus of food down into the esophagus. (swallow)</li> <li>• Lower fibers of the <b>inferior constrictor</b> (Cricopharyngeus) act as a <b>sphincter</b>, preventing the entry of air into the esophagus between the acts of swallowing.</li> </ul>
B- Longitudinal muscles	<ol style="list-style-type: none"> <li>1. <b>Stylopharyngeus</b></li> <li>2. <b>Salpingopharyngeus</b></li> <li>3. <b>Palatopharyngeus</b></li> </ol>	Elevate the <b>larynx</b> and <b>pharynx</b> during swallowing

Circular:



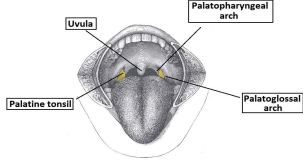
Longitudinal:

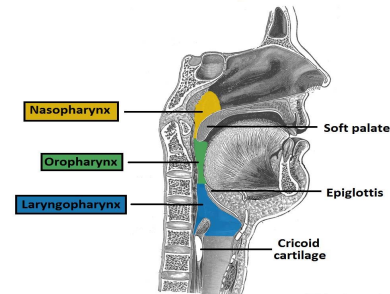
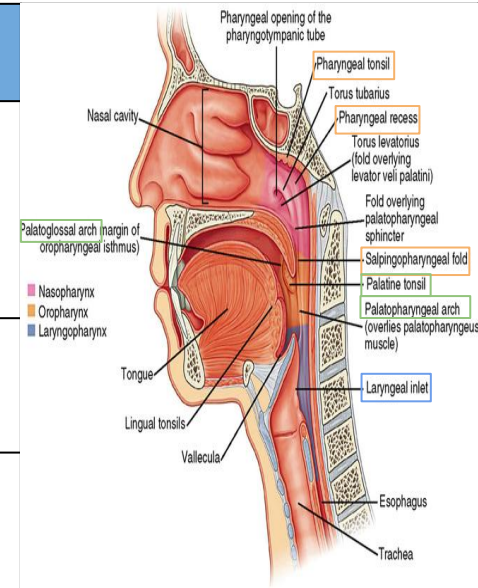




# Parts of pharynx

9

Nasopharynx	Oropharynx	Laryngopharynx
<p>- Extends from the base of the <u>skull</u> to the <u>soft palate</u>.</p>	<p>- Extends from <u>soft palate</u> to upper border of <u>epiglottis</u>.</p> <p>- It lies behind the mouth (tongue).</p>	<p>- Extends from upper border of <u>epiglottis</u> to lower border of <u>cricoid cartilage</u>.</p> <p>- It lies behind the laryngeal inlet and the posterior surface of larynx.</p>
<p>Communicates with the nasal cavity through <b>posterior nasal apertures</b>.</p>	<p>Communicates with the oral cavity through the <b>oropharyngeal isthmus</b>.</p>	<p>Communicates with larynx through the <b>laryngeal inlet</b>.</p>
<p><b>Pharyngeal tonsils</b> (Adenoides) present in the submucosa covering the Roof.</p>	<p>Lateral wall:</p> <ol style="list-style-type: none"> <li>1. Palatopharyngeal fold. (Posterior)</li> <li>2. Palatoglossal fold. (Anterior)</li> <li>3. Palatine tonsil.</li> </ol> <p>Located between them in a depression is the <b>tonsillar fossa</b>.</p>	<p>A small depression situated on either side of the laryngeal inlet is called <b>Piriform Fossa</b>.</p>
<p>Lateral wall:</p> <ol style="list-style-type: none"> <li>1. Opening of auditory tube (middle ear).</li> <li>2. Tubal elevation (produced by posterior margins of the auditory tube).</li> <li>3. Tubal tonsil.</li> <li>4. Pharyngeal recess.</li> <li>5. Salpingopharyngeal fold (raised by salpingo-pharyngeus muscle).</li> </ol>	<p>Located between them in a depression is the <b>tonsillar fossa</b>.</p>  <p style="text-align: right; font-size: small;">© teachmeanatomy</p>	<p>- It is a common site for the lodging of foreign bodies.</p> <p>- Branches of internal laryngeal and recurrent laryngeal nerves lie deep to the mucous membrane of the fossa and are vulnerable to <b>injury</b> during removal of a foreign body.</p>



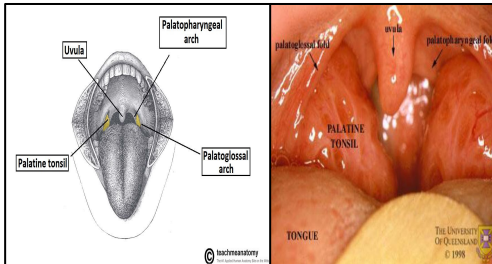
# Pharynx

## Palatine tonsil:

- Two masses of **lymphoid tissue** located in the lateral wall of the oropharynx in the tonsillar fossa.

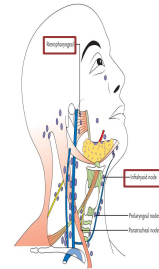
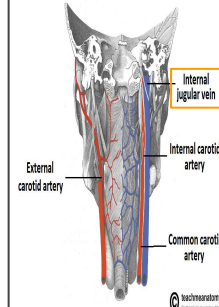
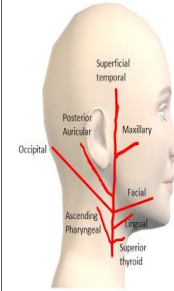
- Each one is covered by mucous membrane and laterally by fibrous tissue (capsule).

- It reaches a maximum size during childhood, after puberty it diminishes in size.



## Supply and drainage:

Nerve supply		Arterial supply	Venous drainage	Lymph drainage
Sensory	Motor			
1- Nasopharynx: <b>Maxillary nerve.</b> 2- Oropharynx: <b>Glossopharyngeal nerve.</b> 3- Laryngopharynx: <b>Vagus nerve.</b>	- All the muscles of pharynx are supplied by the <b>pharyngeal plexus.</b>  <b>Except for: the Stylopharyngeus which is supplied by the glossopharyngeal nerve.</b>	1- Ascending pharyngeal. 2- Ascending palatine. 3- Facial. 4- Maxillary. 5- Lingual.	pharyngeal venous plexus, which drains into the <b>internal jugular vein.</b>	Deep Cervical <b>lymph nodes</b> (either directly or indirectly) via the retropharyngeal or Paratracheal lymph nodes.



# MCQs

**Question 1:** We can find the sphenoidal recess on the:

- A. Roof
- B. Floor
- C. Medial wall
- D. Lateral wall

**Question 2:** Which branches of the following arteries doesn't supply the nasal mucosa?

- A. Maxillary
- B. Ophthalmic
- C. Lingual
- D. Facial

**Question 3:** The lymphatics from vestibule drains into the:

- A. Upper deep cervical
- B. Superficial cervical
- C. Submental
- D. Submandibular

**Question 4:** We can find the opening of the posterior ethmoidal sinus in the:

- A. Middle meatus
- B. Superior meatus
- C. Sphenoidal recess
- D. Inferior meatus

**Question 5:** Muscular tube lies behind the nose:

- A. Pharynx
- B. Larynx
- C. A&B
- D. None of the above

**Question 6:** Which muscle act as a sphincter?

- A. Superior constrictor
- B. Inferior constrictor
- C. Palatopharyngeus
- D. Stylopharyngeus

**Question 7:** Laryngopharynx Communicates with larynx through the:

- A. Laryngeal inlet
- B. Oropharyngeal isthmus
- C. Posterior nasal apertures
- D. Nasal cavity

**Question 8:** The motor supply for the stylopharyngeus is:

- A. Pharyngeal plexus
- B. Glossopharyngeal nerve
- C. Maxillary nerve
- D. Vagus nerve

# Best wishes



**Don't forget to leave  
your feedback:**



# Team members

## Boys team:

- Khalid AL-Dossari
- Naif Al-Dossari
- Faisal Alqifari
- Salman Alagla
- Ziyad Al-jofan
- Suhail Basuhail
- Ali Aldawood
- Khalid Nagshabandi
- Mohammed Al-huqbani
- Jihad Alorainy
- Khalid AlKhani
- Omar Alammari

## Team leaders

- Abdulrahman Shadid
- ★ Ateen Almutairi

## Girls team :

- ★ Ajeed Al Rashoud
- ★ Taif Alotaibi
- Noura Al Turki
- Amirah Al-Zahrani
- Alhanouf Al-haluli
- Sara Al-Abdulkarem
- Rawan Al Zayed
- Renad Al Haqbani
- Nouf Al Humaidhi
- Jude Al Khalifah
- Nouf Al Hussaini
- Alwateen Al Balawi
- Rahaf Al Shabri
- ★ Danah Al Halees
- Rema Al Mutawa
- Amirah Al Dakhilallah
- Maha Al Nahdi
- Ghaida Al Braithen