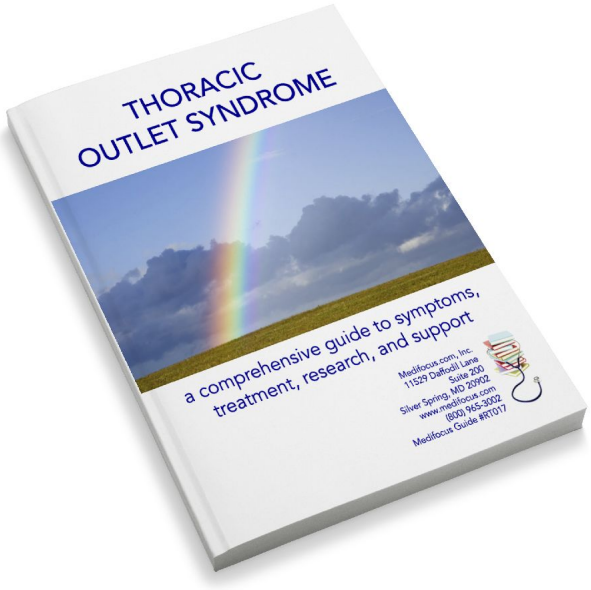
## Preview of the Medifocus Guidebook on: Thoracic Outlet Syndrome

**Updated January 11, 2018**




This document is only a SHORT PREVIEW of the **Medifocus Guidebook on Thoracic Outlet Syndrome**. It is intended primarily to give you a general overview of the **format and structure** of the Guidebook as well as select pages from each major Guidebook section listed in the Table of Contents.

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# Table of Contents

# 1 - Background Information

## Introduction

Chronic or life-threatening illnesses can have a devastating impact on both the patient and the family. In today's new world of medicine, many consumers have come to realize that they are the ones who are primarily responsible for their own health care as well as for the health care of their loved ones.

When facing a chronic or life-threatening illness, you need to become an educated consumer in order to make an informed health care decision. Essentially that means finding out everything about the illness - the treatment options, the doctors, and the hospitals - so that you can become an educated health care consumer and make the tough decisions. In the past, consumers would go to a library and read everything available about a particular illness or medical condition. In today's world, many turn to the Internet for their medical information needs.

The first sites visited are usually the well known health "portals" or disease organizations and support groups which contain a general overview of the condition for the layperson. That's a good start but soon all of the basic information is exhausted and the need for more advanced information still exists. What are the latest "cutting-edge" treatment options? What are the results of the most up-to-date clinical trials? Who are the most notable experts? Where are the top-ranked medical institutions and hospitals?

The best source for authoritative medical information in the United States is the National Library of Medicine's medical database called PubMed®, that indexes citations and abstracts (brief summaries) of over 7 million articles from more than 3,800 medical journals published worldwide. PubMed® was developed for medical professionals and is the primary source utilized by health care providers for keeping up with the latest advances in clinical medicine.

A typical PubMed® search for a specific disease or condition, however, usually retrieves hundreds or even thousands of "hits" of journal article citations. That's an avalanche of information that needs to be evaluated and transformed into truly useful knowledge. What are the most relevant journal articles? Which ones apply to your specific situation? Which articles are considered to be the most authoritative - the ones your physician would rely on in making clinical decisions? This is where *Medifocus.com* provides an effective solution.

*Medifocus.com* has developed an extensive library of *MediFocus Guidebooks* covering a wide spectrum of chronic and life threatening diseases. Each *MediFocus Guidebook* is a

high quality, up- to-date digest of "professional-level" medical information consisting of the most relevant citations and abstracts of journal articles published in authoritative, trustworthy medical journals. This information represents the latest advances known to modern medicine for the treatment and management of the condition, including published results from clinical trials. Each *Guidebook* also includes a valuable index of leading authors and medical institutions as well as a directory of disease organizations and support groups. *MediFocus Guidebooks* are reviewed, revised and updated every 4-months to ensure that you receive the latest and most up-to-date information about the specific condition.

# About Your MediFocus Guidebook

## *Introduction*

Your *MediFocus Guidebook* is a valuable resource that represents a comprehensive synthesis of the most up-to-date, advanced medical information published about the condition in well-respected, trustworthy medical journals. It is the same type of professional-level information used by physicians and other health-care professionals to keep abreast of the latest developments in biomedical research and clinical medicine. The *Guidebook* is intended for patients who have a need for more advanced, in-depth medical information than is generally available to consumers from a variety of other resources. The primary goal of a *MediFocus Guidebook* is to educate patients and their families about their treatment options so that they can make informed health-care decisions and become active participants in the medical decision making process.

The *Guidebook* production process involves a team of experienced medical research professionals with vast experience in researching the published medical literature. This team approach to the development and production of the *MediFocus Guidebooks* is designed to ensure the accuracy, completeness, and clinical relevance of the information. The *Guidebook* is intended to serve as a basis for a more meaningful discussion between patients and their health-care providers in a joint effort to seek the most appropriate course of treatment for the disease.

## *Guidebook Organization and Content*

### Section 1 - Background Information

This section provides detailed information about the organization and content of the *Guidebook* including tips and suggestions for conducting additional research about the condition.

### Section 2 - The Intelligent Patient Overview

This section of your *MediFocus Guidebook* represents a detailed overview of the disease or condition specifically written from the patient's perspective. It is designed to satisfy the basic informational needs of consumers and their families who are confronted with the illness and are facing difficult choices. Important aspects which are addressed in "The Intelligent Patient" section include:

- The etiology or cause of the disease
- Signs and symptoms
- How the condition is diagnosed
- The current standard of care for the disease
- Treatment options

- New developments
- Important questions to ask your health care provider

## Section 3 - Guide to the Medical Literature

This is a roadmap to important and up-to-date medical literature published about the condition from authoritative, trustworthy medical journals. This is the same information that is used by physicians and researchers to keep up with the latest developments and breakthroughs in clinical medicine and biomedical research. A broad spectrum of articles is included in each *MediFocus Guidebook* to provide information about standard treatments, treatment options, new clinical developments, and advances in research. To facilitate your review and analysis of this information, the articles are grouped by specific categories. A typical *MediFocus Guidebook* usually contains one or more of the following article groupings:

- *Review Articles:* Articles included in this category are broad in scope and are intended to provide the reader with a detailed overview of the condition including such important aspects as its cause, diagnosis, treatment, and new advances.

- *General Interest Articles:* These articles are broad in scope and contain supplementary information about the condition that may be of interest to select groups of patients.

- *Drug Therapy:* Articles that provide information about the effectiveness of specific drugs or other biological agents for the treatment of the condition.

- *Surgical Therapy:* Articles that provide information about specific surgical treatments for the condition.

- *Clinical Trials:* Articles in this category summarize studies which compare the safety and efficacy of a new, experimental treatment modality to currently available standard treatments for the condition. In many cases, clinical trials represent the latest advances in the field and may be considered as being on the "cutting edge" of medicine. Some of these experimental treatments may have already been incorporated into clinical practice.

The following information is provided for each of the articles referenced in this section of your *MediFocus Guidebook:*

- Article title
- Author Name(s)
- Institution where the study was done
- Journal reference (Volume, page numbers, year of publication)

- Link to Abstract (brief summary of the actual article)

*Linking to Abstracts*: Most of the medical journal articles referenced in this section of your *MediFocus Guidebook* include an abstract (brief summary of the actual article) that can be accessed online via the National Library of Medicine's PubMed® database. You can easily access the individual abstracts online via PubMed® from the "electronic" format of your *MediFocus Guidebook* by clicking on the corresponding URL address that is provided for each cited article. If you purchased a printed copy of a *MediFocus Guidebook*, you can still access the article abstracts online by entering the individual URL address for a particular article into your web browser.

## Section 4 - Centers of Research

We've compiled a unique directory of doctors, researchers, medical centers, and research institutions with specialized research interest, and in many cases, clinical expertise in the management of the specific medical condition. The "Centers of Research" directory is a valuable resource for quickly identifying and locating leading medical authorities and medical institutions within the United States and other countries that are considered to be at the forefront in clinical research and treatment of the condition.

Inclusion of the names of specific doctors, researchers, hospitals, medical centers, or research institutions in this *Guidebook* does not imply endorsement by Medifocus.com, Inc. or any of its affiliates. Consumers are encouraged to conduct additional research to identify health-care professionals, hospitals, and medical institutions with expertise in providing specific medical advice, guidance, and treatment for this condition.

## Section 5 - Tips on Finding and Choosing a Doctor

One of the most important decisions confronting patients who have been diagnosed with a serious medical condition is finding and choosing a qualified physician who will deliver high-level, quality medical care in accordance with curently accepted guidelines and standards of care. Finding the "best" doctor to manage your condition, however, can be a frustrating and time-consuming experience unless you know what you are looking for and how to go about finding it. This section of your Guidebook offers important tips for how to find physicians as well as suggestions for how to make informed choices about choosing a doctor who is right for you.

## Section 6 - Directory of Organizations

This section of your *Guidebook* is a directory of select disease organizations and support groups that are in the business of helping patients and their families by providing access to information, resources, and services. Many of these organizations can answer your questions, enable you to network with other patients, and help you find a doctor in your geographical area who specializes in managing your condition.

# 2 - The Intelligent Patient Overview

# THORACIC OUTLET SYNDROME

## Introduction

### *What is Thoracic Outlet Syndrome?*

The thoracic outlet is a space located between the upper thorax (rib cage) and the clavicle (collar bone). Thoracic outlet syndrome (TOS) is painful condition that is associated with compression of a *neurovascular bundle* made up of the brachial plexus nerve, the subclavian artery, and the subclavian vein, as they pass through the superior (higher) thoracic outlet. The severity of symptoms ranges from mild pain with sensory changes, to severe pain and disability. In rare cases, there may be limb complications that can be life threatening.

Actually, TOS is the subject of considerable controversy regarding definition, incidence, pathophysiology, diagnosis, and treatment. Even the term "thoracic outlet syndrome" is only a description of a location, but not a description of the problem.

Thoracic outlet syndrome is considered a "syndrome" since it involves multiple systems, including the:

- Neural complex
- Vascular structures
- Musculoskeletal system

#### Neural Complex

The nerves that travel through the thoracic outlet originate at the level of the cervical and/or thoracic spine (C5-C8 and T1). These nerves are bundled together into the *brachial plexus*. The brachial plexus passes through a notch in the bone at the base of the neck and then passes under the scalene (neck) muscles and continues under the collarbone and across the front of the shoulders. In the area of the axilla (arm pit), the brachial plexus divides into the three major nerves of the arm: the *ulnar*, *median*, and *radial nerves*. One type of TOS involves compression of the brachial plexus as it passes through the thoracic outlet space.

#### Vascular Structures

The blood vessels that may be compressed as they pass through the thoracic outlet include the:

- *Subclavian artery*, which supplies oxygenated blood to the arm from the aorta; and the
- *Subclavian vein*, which returns the deoxygenated blood from the arm to the heart.

### Musculoskeletal System

Bones and muscles form the backdrop for proper alignment and support for the nerves and blood vessels that traverse the upper body. The bones and muscles that relate to the thoracic outlet space include the following:

- Cervical vertebrae, the first rib, and the collarbone - These bones must be aligned properly to allow enough space for the brachial plexus and subclavian blood vessels to pass through without obstruction or interference.

- Scalene muscles - The *scalene muscles* consist of three powerful muscles on each side of the neck that bend and rotate the neck, and assist in breathing by raising the first two ribs during inspiration (breathing in). The ideal posture for correct scalene muscle alignment is when the head sits directly atop the shoulders. Proper head and spinal alignment maintains proper space in the thoracic outlet.

## *Anatomy of the Thoracic Outlet*

The thoracic outlet is made up of three spaces in which compression can occur and cause various symptoms of TOS. All of the spaces are in the shape of triangles. They are all small at rest and become smaller with movement of the arm.

- *Scalene triangle* - This space lies closest to the neck. It is located at the base of the neck, above the first rib, and behind the clavicle (collarbone). The subclavian artery and branches of the brachial plexus pass through this triangle. The boundaries of the thoracic outlet consist of:

    - *anterior scalene muscle* which forms the front of the thoracic outlet
    - *middle scalene muscle* which forms the back of the thoracic outlet
    - *first rib* which forms the bottom of the thoracic outlet

- *Costoclavicular space* - This space is located adjacent to the scalene triangle. The subclavian vein passes through this space that is bordered by bone and muscle, namely, the:

    - first rib
    - costoclavicular ligament
    - subclavious muscle
    - anterior scalene muscle

- *Subcoracoid space* - This space lies adjacent to the costoclavicular triangle and is closest to the arm. The location of this space is:

    - under the pectoralis muscle
    - under the coracoid process (a bony projection)
    - in front of the ribs

Of these three spaces, the scalene triangle is the most common site for neural and vascular compression. At the level of the scalene triangle, the trunks of the subclavian artery and brachial plexus pass between the first rib and the scalene muscle, while the subclavian vein passes outside the scalene muscle. At the levels of the costoclavicular and subcoracoid spaces, the subclavian artery, subclavian vein, and brachial plexus all pass through together, and therefore are called a *neurovascular* bundle.

## *What Causes Thoracic Outlet Syndrome?*

Compression of the brachial plexus or subclavian blood vessels in TOS can be caused by:

- Skeletal abnormalities
- Skeletal misalignment
- Muscular changes or soft tissue abnormalities

### Skeletal Abnormalities

Any skeletal abnormality can cause a change in the shape of the thoracic outlet space, resulting in compression of the brachial plexus or blood vessels. Skeletal anomalies may or may not be congenital (present at birth). Noncongenital anomalies may result from an improperly healed fracture of the clavicle (collarbone) or any part of the thoracic outlet, or from the presence of bone fragments related to a fracture that was never resolved.

Congenital anomalies may include:

- Extra cervical rib - An extra cervical rib is the most common skeletal anomaly that causes TOS. It is an extra rib (smaller than normal ribs) that arises from the 7th cervical vertebra and is located above the first rib. Extra cervical rib occurs in less than 1% of the population, and only 10% of people with an extra cervical rib develop symptoms associated with TOS.
- Abnormally long bony transverse process - The transverse process is the name of a slender, bony projection that arises on each side of a vertebra and serves as attachments for muscles and ligaments. An abnormally long transverse process impacts proper alignment and function of the muscles that are attached to it.
- Fibrous muscle tissue - Less commonly, there may be a band of fibrous muscle tissue that increases the stiffness of the scalene muscles bordering the scalene triangle, which affects proper function of the muscles.

Usually, the brachial plexus and the blood vessels adapt to the presence of these anomalies, so that only a small percentage of people with these anomalies actually develop TOS.

### Skeletal Misalignment

If the bones in the upper chest (e.g., cervical vertebrae, first rib, and collarbone) are not aligned properly, or have shifted or rotated out of their natural positions, they may cause a narrowing in the opening of the thoracic outlet, thereby causing pinching or irritation to the neurovascular bundle. Irregularities in the ligaments (connecting tissue) that support the clavicle can also cause skeletal misalignment.

### Muscular Changes

The scalene muscles undergo change by shortening and tightening when the posture is not erect and the body is held with a head-forward slouch. This posture leads to the muscles adhering to each other and to other structures as they seek physical support from the strain of misalignment. If the scalene muscles adhere to the fascia (outer lining) of the brachial plexus, then every time the head moves or turns, the brachial plexus is irritated, and this irritation can be the source of considerable pain.

Other changes to the scalene muscles may result from:

- Hypertrophy (overgrowth) of the scalene muscle
- Swelling of adjacent tissue or ligaments which may be due to:
    - repetitive awkward movements
    - accelerated wear-and-tear that results from repeated activity
    - a sudden straining injury

Long-term abnormal posture from skeletal misalignment or muscle changes can lead to:

- Increased pressure around the neurons at points of nerve entrapment
- Muscles remaining in a shortened state and resetting themselves at the new length (primarily found with the scalene, sternocleidomastoid, and pectoralis muscles)
- Shortening of some muscles that causes other muscles to be maintained in an abnormally lengthened state
- Weakness in the middle and lower trapezius (located in the upper back), as well as serratus anterior muscles (located at the side of the chest), all of which are active during arm movement

Any change to muscles, such as shortening or lengthening, results in the underuse and overuse of others to compensate for the imbalance, thereby throwing off the delicate balance needed for healthy posture and body movement. In the case of TOS, shortening of the scalene muscle may result in overuse of the upper trapezius and levator scapulae muscles, causing muscle hypertrophy. Shortened scalene muscles may cause the first ribs, to which the scalene attaches, to pull upward, resulting in a narrowing of the space in the thoracic outlet, namely between the first rib and collarbone, thereby causing compression of the blood vessels through that area, with consequent pain.

## *Types of Thoracic Outlet Syndrome*

There are two basic categories of TOS: neurogenic and vascular.

### Neurogenic Thoracic Outlet Syndrome

*Neurogenic* TOS involves compression of the brachial plexus and can be divided into *true* neurogenic TOS, where symptoms are confirmed by objective diagnostic findings, or *disputed*

neurogenic TOS, where there are chronic symptoms, but there are no objective diagnostic findings. A history of trauma to the neck or shoulder girdle area (such as may have occurred in a car accident), or a stressful repetitive activity (such as overhead painting) is common to both types of neurogenic TOS.

### *True Neurogenic Thoracic Outlet Syndrome*

*True* neurogenic TOS is a rare disorder caused by congenital (birth) anomalies. It usually affects one side of the body, and predominantly occurs in women, manifesting between the ages of 15 to 60 years old. True neurogenic TOS may often be confused with carpal tunnel syndrome.

### *Disputed Neurogenic Thoracic Outlet Syndrome*

This type of TOS is by far the most common and accounts for up to 95% of cases of diagnosed TOS. The term *disputed TOS* (also known as "*non-specific TOS*") was chosen because its existence is controversial. While some experts believe that it is a "real" disorder and occurs frequently, others have argued that it does not exist as a true clinical health condition.

In general, both types of neurogenic TOS are associated with neck trauma, usually from a whiplash injury from a car accident; or with repetitive arm movements, where scalene muscles may become scarred or injured, resulting in compression on the brachial plexus. The most prominent symptoms of disputed TOS are pain, paresthesia (numbness or tingling), and limb weakness (up to 95% of patients); however, extensive clinical examination often fails to detect any objective evidence of an underlying problem or cause. Several theories have been proposed regarding additional underlying causes of disputed TOS (besides trauma), including congenital anomalies or postural abnormalities.

Disputed thoracic outlet syndrome can present either as:

- *Upper plexus* TOS, which involves the nerve roots arising from the fifth, sixth, or seventh vertebrae (C5, C6, or C7)
- *Lower plexus* TOS, which involves nerve roots arising from C8-T1 (first thoracic vertebra)

## Vascular Thoracic Outlet Syndrome

*Vascular TOS* involves compression of the subclavian artery or vein and usually occurs secondary to strenuous repetitive arm activity, though it can also occur spontaneously. Vascular TOS usually occurs in people younger than those with neurogenic TOS who have a history of strenuous work or vigorous arm activity.

There are two types of vascular thoracic outlet syndrome:

- Arterial TOS
- Venous TOS

### *Arterial Thoracic Outlet Syndrome*

Arterial TOS is the rarest form of TOS, accounting for less than 1% of cases. It is typically associated with compression from a cervical rib on the subclavian artery. Symptoms result from chronic (long-term), intermittent vascular compression due to repetitive trauma to the artery. Although it may occur spontaneously, arterial TOS occurs frequently in young adults with a

history of vigorous arm activity (for example, from intense sports such as volleyball and swimming).

Chronic, episodic compression of the artery leads to:

- Damage to the intimal (inner) arterial wall that can ultimately lead to stenosis (narrowing) or dilatation (widening) of the artery
- Thrombus (a clot in the blood vessel that stays in place and does not move or dissolve)
- Complications from thromboembolism (the thrombus detaches from its source and travels through blood vessels, potentially blocking the circulation of blood)

The majority of cases of arterial TOS arise due to congenital anomalies including:

- Cervical ribs at the point of fusion with thoracic ribs
- Fibrous bands arising off an incomplete cervical rib
- Elongated transverse process (bony projection) of a vertebrae
- Anomaly in the union of bones following fracture of the clavicle or first rib

Symptoms may initially be ignored since they are often mild (e.g., aching arm or fatigue after exercise). Early arterial compression is asymptomatic and is typically recognized only when it is more chronic and has lead to changes in the arterial wall.

The first sign of pathology (disease) is usually stenosis (narrowing) of the subclavian artery. The stenosis may spontaneously recede following a surgical procedure called thoracic outlet decompression. If the artery continues to be compressed, causing long standing inflammation, the artery may become fibrotic (where tissue takes on fibrous quality). This could result in the formation of emboli (blood clots that move through the bloodstream), ranging from mild to severe. Ischemic events (events that occur due to a lack of oxygen) may occur because of distal emboli (blood clots in the arm or hand) or proximal thrombosis (blood clots that occur close to the thoracic outlet).

### *Venous Thoracic Outlet Syndrome*

Venous TOS usually develops as a result of compression of the subclavian vein by the subclavius muscle and it occurs in the costoclavicular space.

There are two types of venous TOS:

- *Primary venous TOS* - This type of TOS is caused by a congenital narrowing of the thoracic outlet space and compression in the part of the thoracic outlet where the subclavian vein passes. Approximately 80% of cases occur in the dominant arm (the right arm for a right-handed person). Compression causing primary venous TOS may be due to:
    - an anomalous first rib
    - a long transverse process of the cervical spine
    - cervical ribs
    - a hypertrophic (enlarged) scalene muscle resulting from repetitive heavy lifting

- *Secondary venous TOS* - This type of TOS is caused by stenosis or thrombosis secondary to a medical procedure during which the wall of the subclavian vein may be damaged, such as:

    - placement of a central line catheter
    - infusion of medications
    - incorrect catheter placement

Venous TOS typically occurs in young men. When it is related to overexertion, sufferers usually experience pain, swelling and/or cyanosis. Veins in the neck, shoulder, or front of the chest may be distended, and the symptoms will intensify with increased activity of the involved arm.

Some people develop *Paget-Schroetter Syndrome* (PSS) which is a condition where a thrombus (clot) develops in the subclavian vein which results in pain, swelling, blue discoloration, and congestion of the arm. It is most commonly caused by compression of the vein between the collarbone and the first rib, and is considered one of the venous manifestations of TOS. Paget-Schroetter syndrome can be caused by primary (congenital anomaly) or secondary TOS, and is associated with strenuous activity or unusual positioning of the arm. Approximately 15% of people with subclavian vein thrombosis demonstrate some degree of occlusion (blockage) in the unaffected arm. A minority of people spontaneously form collateral veins around the point of occlusion, or the obstruction resolves by itself. In the remainder of people experiencing these symptoms, immediate medical treatment is necessary.

## Incidence of Thoracic Outlet Syndrome

Because thoracic outlet syndrome (TOS) is thought by some experts to be underdiagnosed and in some cases misdiagnosed, it is difficult to estimate with any degree of accuracy how many people suffer from this condition. The incidence of TOS in the U.S. population has been broadly estimated to range from 0.3% to 8% with the most common age at onset between 25 and 40 years old.

Additional information about the incidence of TOS includes:

- Approximately 95% of cases are diagnosed as neurogenic TOS, and up to 15% of cases may also have an arterial component.
- Approximately 70% of cases of neurogenic TOS occur in women between the ages of 20-50.

- Women are 3-4 times more likely than men to develop neurogenic TOS.

- Less than 1% of cases are diagnosed as arterial TOS.
- Approximately 3-5% of cases are diagnosed as venous TOS.
- The incidence of vascular TOS among non-athletic men and women is equal; however, among athletic men and women, twice as many athletic men suffer from vascular TOS compared to athletic women.

## Risk Factors for Thoracic Outlet Syndrome

A *risk factor* is anything that increases a person's chances developing a medical condition, Risk factors for TOS include:

- Occupation - Epidemiologic studies have shown that thoracic outlet syndrome is associated with certain occupations that involve positioning the arm in such a way that can cause compression of the space between the neck and shoulder. The result is compromised blood flow to the subclavian blood vessels supplying the arm, and/or compression of the brachial plexus, causing significant pain. Occupations involving heavy lifting, working in a static position for an extended period of time, or prolonged raising of the arm above the head, are a risk factor for development TOS. Examples of these occupations include:

    - secretary
    - computer operator
    - bench worker
    - jackhammer operator
    - electrician
    - carpenter
    - violinist
    - flutist
    - assembly line worker
    - sports players (e.g., baseball, volleyball, basketball, or swimming)

- Trauma

    - fracture of the clavicle
    - trauma to the shoulder
    - hyperextension injuries of the neck (whiplash)
    - jerking injury to the neck/shoulder area (results in chronic muscle spasm and pain)

- Congenital anomalies (as discussed above)

- Postural distortions, such as drooping or sagging shoulders
- Specific daily activities, including holding the phone between the shoulder and neck, that may lead to compression and muscular imbalance

The **Intelligent Patient Overview** in the complete **Medifocus Guidebook on Thoracic Outlet Syndrome** also includes the following additional sections:

- **Diagnosis of Thoracic Outlet Syndrome**
- **Treatment Options for Thoracic Outlet Syndrome**
- **Lifestyle Modifications and Quality of Life in Thoracic Outlet Syndrome**
- **Questions to Ask Your Doctor About Thoracic Outlet Syndrome**

To Order the Complete **Guidebook on Thoracic Outlet Syndrome** Click Here
Or Call 800-965-3002 (USA) or 301-649-9300 (Outside USA)

# 3 - Guide to the Medical Literature

## Introduction

This section of your *MediFocus Guidebook* is a comprehensive bibliography of important recent medical literature published about the condition from authoritative, trustworthy medical journals. This is the same information that is used by physicians and researchers to keep up with the latest advances in clinical medicine and biomedical research. A broad spectrum of articles is included in each *MediFocus Guidebook* to provide information about standard treatments, treatment options, new developments, and advances in research.

To facilitate your review and analysis of this information, the articles in this *MediFocus Guidebook* are grouped in the following categories:

- Review Articles - 32 Articles
- General Interest Articles - 52 Articles
- Surgical Therapy Articles - 25 Articles
- Clinical Trials Articles - 1 Articles

The following information is provided for each of the articles referenced in this section of your *MediFocus Guidebook:*

- Title of the article
- Name of the authors
- Institution where the study was done
- Journal reference (Volume, page numbers, year of publication)
- Link to Abstract (brief summary of the actual article)

**Linking to Abstracts:** Most of the medical journal articles referenced in this section of your *MediFocus Guidebook* include an abstract (brief summary of the actual article) that can be accessed online via the National Library of Medicine's PubMed® database. You can easily access the individual abstracts online via PubMed® from the "electronic" format of your *MediFocus Guidebook* by clicking on the URI that is provided for each cited article. If you purchased a printed copy of the *MediFocus Guidebook*, you can still access the abstracts online by entering the individual URI for a particular abstract into your computer's web browser.

 

# Recent Literature: What Your Doctor Reads

**Database: PubMed <January 2010 to January 2018>**

**Review Articles**

**1.**

## Modified Interscalene Approach for Resection of Symptomatic Cervical Rib: Anatomic Review and Clinical Study.

**Authors:** Abdel Ghany W; Nada MA; Toubar AF; Desoky AE; Ibrahim H; Nassef MA; Mahran MG

**Institution:** Department of Neurosurgery, Ain Shams University, Abbasseya, Cairo, Egypt. Electronic address: wghany@gmail.com. Abbasseya, Cairo, Egypt. Cairo, Egypt.

**Journal:** World Neurosurg. 2017 Feb;98:124-131. doi: 10.1016/j.wneu.2016.10.113. Epub 2016 Oct 28.

**Abstract Link:** http://www.medifocus.com/abstracts.php?gid=RT017&ID=27989967

**2.**

## Thoracic outlet syndrome: wide literature for few cases. Status of the art.

**Authors:** Doneddu PE; Coraci D; De Franco P; Paolasso I; Caliandro P; Padua L

**Institution:** Department of Geriatrics, Neurosciences and Othopaedics, Universita Cattolica del Sacro Cuore, Largo F. Vito 1, 00168, Rome, Italy. Morandi, 6, 20121, Milan, Italy. "Sapienza" University, Rome, Italy. Morandi, 6, 20121, Milan, Italy. Morandi, 6, 20121, Milan, Italy. Sacro Cuore, Largo F. Vito 1, 00168, Rome, Italy.

**Journal:** Neurol Sci. 2017 Mar;38(3):383-388. doi: 10.1007/s10072-016-2794-4. Epub 2016 Dec 16.

**Abstract Link:** http://www.medifocus.com/abstracts.php?gid=RT017&ID=27987052

The **Guide to the Medical Literature** in the complete **Medifocus Guidebook on Thoracic Outlet Syndrome** includes the following sections:

- Review Articles - 32 Articles
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Or Call 800-965-3002 (USA) or 301-649-9300 (Outside USA)

# 4 - Centers of Research

This section of your *MediFocus Guidebook* is a unique directory of doctors, researchers, medical centers, and research institutions with specialized research interest, and in many cases, clinical expertise in the management of this specific medical condition. The *Centers of Research* directory is a valuable resource for quickly identifying and locating leading medical authorities and medical institutions within the United States and other countries that are considered to be at the forefront in clinical research and treatment of this disorder.

Use the *Centers of Research* directory to contact, consult, or network with leading experts in the field and to locate a hospital or medical center that can help you.

The following information is provided in the *Centers of Research* directory:

- **Geographic Location**
    - United States: the information is divided by individual states listed in alphabetical order. Not all states may be included.
    - Other Countries: information is presented for select countries worldwide listed in alphabetical order. Not all countries may be included.
- **Names of Authors**
    - Select names of individual authors (doctors, researchers, or other health-care professionals) with specialized research interest, and in many cases, clinical expertise in the management of this specific medical condition, who have recently published articles in leading medical journals about the condition.
    - E-mail addresses for individual authors, if listed on their specific publications, is also provided.
- **Institutional Affiliations**
    - Next to each individual author's name is their **institutional affiliation** (hospital, medical center, or research institution) where the study was conducted as listed in their publication(s).
    - In many cases, information about the specific **department** within the medical institution where the individual author was located at the time the study was conducted is also provided.

# Centers of Research

## United States

### *AZ - Arizona*

| Name of Author | Institutional Affiliation |
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### *CA - California*

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- Centers of Research for relevant states in the United States
- Centers of Research listed for relevant countries outside the United States

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# 5 - Tips on Finding and Choosing a Doctor

## Introduction

One of the most important decisions confronting patients who have been diagnosed with a serious medical condition is finding and choosing a qualified physician who will deliver a high level and quality of medical care in accordance with currently accepted guidelines and standards of care. Finding the "best" doctor to manage your condition, however, can be a frustrating and time-consuming experience unless you know what you are looking for and how to go about finding it.

The process of finding and choosing a physician to manage your specific illness or condition is, in some respects, analogous to the process of making a decision about whether or not to invest in a particular stock or mutual fund. After all, you wouldn't invest your hard eared money in a stock or mutual fund without first doing exhaustive research about the stock or fund's past performance, current financial status, and projected future earnings. More than likely you would spend a considerable amount of time and energy doing your own research and consulting with your stock broker before making an informed decision about investing. The same general principle applies to the process of finding and choosing a physician. Although the process requires a considerable investment in terms of both time and energy, the potential payoff can be well worth it--after all, what can be more important than your health and well-being?

This section of your Guidebook offers important tips for how to find physicians as well as suggestions for how to make informed choices about choosing a doctor who is right for you.

## Tips for Finding Physicians

Finding a highly qualified, competent, and compassionate physician to manage your specific illness or condition takes a lot of hard work and energy but is an investment that is well-worth the effort. It is important to keep in mind that you are not looking for just any general physician but rather for a physician who has expertise in the treatment and management of your specific illness or condition. Here are some suggestions for where you can turn to identify and locate physicians who specialize in managing your disorder:

- **Your Doctor** - Your family physician (family medicine or internal medicine specialist) is a good starting point for finding a physician who specializes in your illness. Chances are that your doctor already knows several specialists in your geographic area who specialize in your illness and can recommend several names to you. Your doctor can also provide you with information about their qualifications, training, and hospital affiliations.

The **Tips on Finding and Choosing a Doctor** in the complete **Medifocus Guidebook on Thoracic Outlet Syndrome** includes additional information that will assist you in locating a highly qualified and competent physician to manage your specific illness.

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# 6 - Directory of Organizations

### American Academy of Manual Physical Therapists
2104 Delta Way  Suite 7; Tallahassee, FL  32303
850.222.0397
www.aaompt.org

### American Academy of Neurology
1080 Montreal Avenue; St. Paul, MN  55116
800.879.1960  651.695.2717
memberservices@aan.com
www.aan.com

### American Academy of Orthopaedic Surgeons
6300 North River Road; Rosemont, IL  60018-4262
847.823.7186
www.aaos.org

### American Academy of Pain Management
13947 Mono Way  #A  Sonora, CA  95370
209.533.9744
aapm@aapainmanage.org
www.aapainmanage.org

### American Academy of Pain Medicine
4700 West Lake Avenue  Glenview, IL  60025
847.375.4731
info@painmed.org
www.painmed.org

### American Board of Orthopaedic Surgery
400 Silver Cedar Court; Chapel Hill, NC  27514
919.929.7103
www.abos.org

The **Directory of Organizations** in the complete **Medifocus Guidebook on Thoracic Outlet Syndrome** includes a list of selected disease organizations and support groups that are helping people diagnosed with Thoracic Outlet Syndrome.

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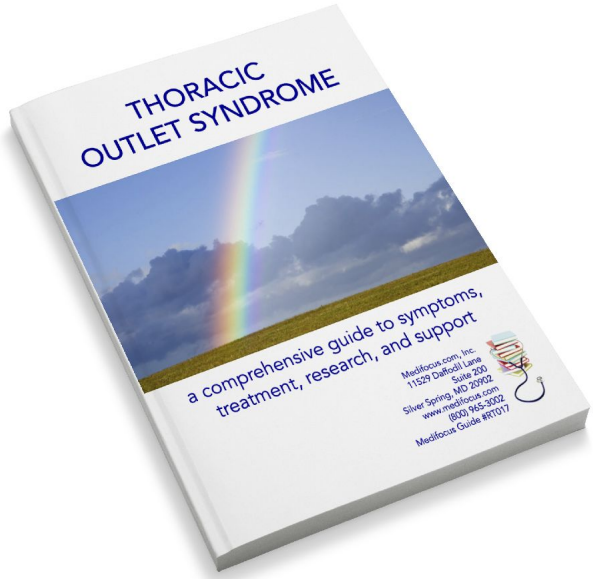


This document is only a SHORT PREVIEW of the **Medifocus Guidebook on Thoracic Outlet Syndrome**. It is intended primarily to give you a general overview of the **format and structure** of the Guidebook as well as select pages from each major Guidebook section listed in the Table of Contents.

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