PHYSICAL DIAGNOSIS THE PULMONARY EXAM
WHAT SHOULD WE KNOW ABOUT THE EXAMINATION OF THE CHEST?

- LANDMARKS
- PERTINENT VOCABULARY
- SYMPTOMS
- SIGNS
- HOW TO PERFORM AN EXAM
- HOW TO PRESENT THE INFORMATION
- HOW TO FORMULATE A DIFFERENTIAL DIAGNOSIS
IMPORTANT TOPOGRAPHY OF THE CHEST
TOPOGRAPHY OF THE BACK
LOOK AT THE PATIENT

- RESPIRATORY DISTRESS
- ANXIOUS
- CLUTCHING
- ACCESSORY MUSCLES
- CYANOSIS
- GASPING
- STRIDOR
- CLUBBING
TYPES OF BODY HABITUS

NORMAL  "BARREL CHEST"  KYPHOSIS  PECTUS EXCAVATUM  PECTUS CARINATUM
WHAT IS A BARRELL CHEST?

- THORACIC INDEX – RATIO OF THE ANTIERIORPOSTERIOR TO LATERAL DIAMETER NORMAL 0.70 – 0.75 IN ADULTS - >0.9 IS CONSIDERED ABNORMAL
- NORMALS - ILLUSION
- COPD

PURSED – LIPS BREATHING

• COPD – DECREASES DYSPNEA
• DECREASES RR
• INCREASES TIDAL VOLUME
• DECREASES WORK OF BREATHING

CHEST 101:75-78, 1992
WHITE NOISE (NOISY BREATHING)

• THIS NOISE CAN BE HEARD AT THE BEDSIDE WITHOUT THE STETHOSCOPE
• LACKS A MUSICAL PITCH
• AIR TURBULENCE CAUSED BY NARROWED AIRWAYS
• CHRONIC BRONCHITIS

CHEST 73:399-412, 1978
RESPIRATORY ALTERNANANS

• NORMALLY BOTH CHEST AND ABDOMEN RISE DURING INSPIRATION

• PARADOXICAL RESPIRATION IMPLIES THAT DURING INSPIRATION THE CHEST RISES AND THE ABDOMEN COLLAPSES

• IMPENDING MUSCLE FATIGUE
DO NOT FORGET THE TRACHEA

• TRACHEAL DEVIATION

• AUSCULTATE - STRIDOR

• TRACHEAL TUG (OLIVER'S SIGN) – DOWNWARD DISPLACEMENT OF THE CRICOID CARTILAGE WITH VENTRICULAR CONTRACTION – OBSERVED IN PATIENTS WITH AN AORTIC ARCH ANEURYSM

• TRACHEAL TUG (CAMPBELL'S SIGN) – DOWNWARD DISPLACEMENT OF THE THYROID CARTILAGE DURING INSPIRATION – SEEN IN PATIENTS WITH COPD
ABNORMAL BREATHING PATTERNS

APNEA - CARDIAC ARREST
BIOTS - INCREASED INTRACRANIAL PRESSURE - DRUGS- MEDULLA
CHEYNE STOKES – CONGESTIVE HEART FAILURE – DRUGS – CEREBRAL
KUSSMAULS – METABOLIC ACIDOSIS
HOOVERS SIGN

- COPD
- IN COPD THE DIAPHRAGM MAY BE FLATTENED, DURING THE INSPIRATORY PHASE OF A BREATH THE RIBS ARE PULLED INWARD AND MEDIANLY RATHER THAN OUTWARD AND LATERALLY
THORACIC EXPANSION

- ASYMMETRY IN EXPANSION OF THE THORAX CAN BE DETECTED DURING INSPECTION OF THE CHEST
- DURING PROMPTED INHALATION OBSERVE THE MOVEMENT OF THE THORAX
- PLEURAL EFFUSION, PNEUMOTHORAX
COPD

PINK PUFFERS  BLUE BLOATERS
PALPATION

• FEELING WITH THE HAND – FINGERTIPS
• TEXTURES
• DIMENSIONS
• CONSISTENCY
• TEMPERATURE
• EVENTS
PERCUSSION

TWO TECHNIQUES

• DIRECT – BLOW LANDS DIRECTLY ON THE CHEST
• INDIRECT – PLESSIMETER - USUALLY THE MIDDLE FINGER

THREE TYPES

• COMPARATIVE
• TOPOGRAPHIC
• AUSCULATORY

DISEASE A MONTH 41:643-692, 1995
METHODS OF PERCUSSION

DIRECT

INDIRECT

DISEASE A MONTH 41;643-692:1995
PERCUSSION SOUNDS

• TYMPANY – HEARD OVER THE ABDOMEN
• RESONANCE – HEARD OVER NORMAL LUNG
• DULLNESS – HEARD OVER LIVER OR THIGH
AUSCULTATORY PERCUSSION

METHOD

AUSCULTATORY PERCUSSION
TOPOGRAPHIC PERCUSSION

METHOD

TRANSITION POINT BETWEEN DULLNESS AND RESONANCE AT FULL INSPIRATION AND EXPIRATION

DIAPHRAGMATIC EXCURSION IS THE DISTANCE BETWEEN THESE TWO POINTS

NORMAL 3 – 6 CM
LONG FORGOTTEN PERCUSSION TERMS

• SKODAIC RESONANCE – HYPERRESONANT SOUND GENERATED BY PERCUSSION OF THE CHEST ABOVE A PLEURAL EFFUSION

• GROCCO’S TRIANGLE – RIGHT - ANGLED TRIANGLE OF DULLNESS FOUND OVER THE POSTERIOR REGION OF THE CHEST OPPOSITE A LARGE PLEURAL EFFUSION

DISEASE A MONTH 41:643-692, 1995
GROCCO’S TRIANGLE

DISEASE A MONTH 41;643-692:1995
MAIN SYMPTOMS OF PULMONARY DISEASE

• COUGH
• DYSPNEA
• HEMOPTYSIS
• CHEST PAIN – PLEURITIC
• WHEEZING
• CYANOSIS
• SPUTUM PRODUCTION
WHAT QUESTIONS SHOULD BE ASKED WHEN PRESENTED WITH A SPECIFIC SYMPTOM? COUGH

- QUALITY
- QUANTITY
- CHRONOLOGY
- SETTING
- AGGRAVATING FACTORS
- ALLEVIATING FACTORS
- ASSOCIATED MANIFESTATIONS
- LOCATION
ALWAYS DESCRIBE THE COUGH

• PRODUCTIVE – NONPRODUCTIVE
• ACUTE – CHRONIC
• TIME OF DAY
• PRECIPITANTS – RELIEF
• BLOODY – NON BLOODY
• BARKING – HACKY
WHEEZING

- ASTHMA
- BRONCHITIS
- VOCAL CORD DYSFUNCTION
- FOREIGN BODY ASPIRATION
- INFECTIONS – CROUP LARYNGITIS
- CONGESTIVE HEART FAILURE
- COPD
- FORCED EXPIRATION IN NORMAL SUBJECTS
- CYSTIC FIBROSIS

NOT ALL THAT WHEEZES IS ASTHMA
THE NUMEROUS ETIOLOGIES OF CHEST PAIN

- PLEURITIC – PARIETAL PLEURA – SHARP STABBING – INSPIRATION
- ESOPHAGEAL – REFLUX
- CARDIAC – MYOCARDIAL INFARCTION
- GALL BLADDER – CHOLECYSTITIS
- CHEST WALL – COSTOCHONDRITIS
- GREAT VESSELS – DISSECTION
- PULMONARY - PNEUMOTHORAX
THE PNEA’S

- **DYSPNEA** – SOB - IS NOT THE SAME AS TACHYPNEA - RR > 25 BR/MIN
- **BRADYPNEA** - RR< 8 BR/MIN
- **PND** - PAROXYSMAL NOCTURNAL DYSPNEA SUDDEN ONSET OF SOB DURING SLEEP
- **ORTHOPNEA** – SOB LYING FLAT
- **PLATYPNEA** – SOB SITTING UP AND BETTER LYING FLAT
- **TREPOPNEA** – SHORTNESS OF BREATH IN ONE LATERAL DECUBITUS POSITION WHICH IS IMPROVED BY TURNING ON THE OPPOSITE SIDE
SPUTUM - WHAT ARE ITS CHARACTERISTICS?

- YELLOW – GREEN
- RUSTY
- CURRANT JELLY
- PINK – BLOOD TINGED
- FROTHY
- BLOODY
- SMELL – FOUL?
HEMOPTYSIS REQUIRES CAREFUL QUESTIONING

• THIS SYMPTOM USUALLY DENOTES A SERIOUS ILLNESS. TB, TUMOR, BRONCHIECSTASIS, PE, CARDIAC DISEASE

• THE PATIENT SHOULD BE QUESTIONED CAREFULLY REGARDING HOW MUCH, FREQUENCY WEIGHT LOSS ETC.
CLUES TO DIFFERENTIATING HEMOPTYSIS FROM HEMATEMESIS

<table>
<thead>
<tr>
<th>HEMOPTYSIS</th>
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<tbody>
<tr>
<td>COUGH</td>
<td>NAUSEA – VOMITING</td>
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<tr>
<td>FROTHY</td>
<td>NOT FROTHY</td>
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<tr>
<td>COLOR- BRIGHT RED</td>
<td>COFFEE GROUNDS</td>
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<tr>
<td>PUS</td>
<td>FOOD</td>
</tr>
<tr>
<td>DYSPNEA</td>
<td>NAUSEA</td>
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<tr>
<td>CARDIAC DISEASE</td>
<td>GI DISEASE</td>
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CYANOSIS

- **PERIPHERAL** – HANDS, FEET – WARMING DECREASES CYANOSIS – DECREASED CARDIAC OUTPUT

- **CENTRAL**- LIPS, TONGUE, SUBLINGUAL - RIGHT TO LEFT SHUNTS

- **PSEUDOCYANOSIS** – BLUE PIGMENTS IN SKIN - AMIODARONE

CRIT CARE NURS 13:66-72, 1993
CLUBBING

- PAINLESS – FINGERNAILS CURVED AND WARM
- ENLARGEMENT OF THE CONNECTIVE TISSUES IN THE TERMINAL PHALANGES OF THE FINGERS \(>\) TOES
- HEREDITARY
- DISEASE – INTERSTITIAL FIBROSIS, TUMOR, BRONCHIECSTASIS, HEART DISEASE, ENDOCARDITIS
- OCCASIONALLY ASSOCIATED WITH HYPERTROPHIC OSTEOARTHRATHROPATHY
LOVIBOND’S ANGLE – THE ANGLE BETWEEN THE BASE OF THE NAIL AND SURROUNDING SKIN.

CLIN CHEST MED 8:287-298, 1987
INTERPHALANGEAL DEPTH IS THE RATIO OF THE DIGITS DEPTH MEASURED AT B DIVIDED BY THAT AT A. O.9 normal  1.2 CLUBBED  A RATIO > 1 INDICATES CLUBBING (B-distal phalangeal depth  A- interphalangeal joint depth)

HYPONYCHIAL ANGLE IS THE ANGLE W XY. AN ANGLE > 190 DEGREES INDICATES CLUBBING. 185 DEGREES NORMAL – 200 DEGREES CLUBBED
CLUBBING

SCHAMROTH'S SIGN – LOSS OF THE SUBUNGUAL ANGLE
CLIN CHEST MED 8:287-298, 1987
LUNG SOUNDS

BREATHE SOUNDS

ADVENTITIOUS
BREATH SOUNDS

• VESICULAR – NORMAL BREATH SOUNDS - SITE OF PRODUCTION THE ALVEOLI

• TRACHEAL – TUBULAR – LIKE BLOWING AIR THROUGH A HOLLOW TUBE – PHYSIOLOGIC

• BRONCHIAL – TUBULAR - ALWAYS PATHOLOGIC WHEN THEY OCCUR OVER POSTERIOR OR LATERAL CHEST WALL

• BRONCHOVESICULAR – CHARACTERISTICS OF BOTH VESICULAR AND TUBULAR – DO THEY EXIST?

• ADVENTITIOUS – EXTRA SOUNDS
BREATH SOUNDS

TIMING

<table>
<thead>
<tr>
<th>CHARACTERISTIC</th>
<th>TRACHEAL</th>
<th>BRONCHIAL</th>
<th>BV</th>
<th>VESICULAR</th>
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<tbody>
<tr>
<td>INTENSITY</td>
<td>VERY LOUD</td>
<td>LOUD</td>
<td>MODERATE</td>
<td>LOW</td>
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<tr>
<td>I:E RATIO</td>
<td>1:1</td>
<td>1:3</td>
<td>1:1</td>
<td>3:1</td>
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</tbody>
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ADVENTITIOUS SOUNDS

- THESE ARE SOUNDS HEARD DURING AUSCULTATION OTHER THAN BREATH SOUNDS OR VOCAL RESONANCE
- NOMENCLATURE – HAS BEEN CONFUSING
- CRACKLES – DISCONTINUOUS SOUNDS
- WHEEZES AND RHONCHI – CONTINUOUS SOUNDS

ATS NEWS 3:5-6, 1977
SEMIN RESPIR MED 6:210-219, 1985
ADVENTITIOUS LUNG SOUNDS (BRUITS ETRANGERS – FOREIGN SOUNDS)

- WHEEZE – HIGH PITCHED
- RHONCHI – LOW PITCHED
- CRACKLE ↔ RALES - HAIR VELCRO (FINE – COARSE)
- PLEURAL RUBS – CREAKING LEATHER
- STRIDOR
<table>
<thead>
<tr>
<th>EARLY AND MID INSPIRATORY</th>
<th>LATE INSPIRATORY</th>
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<tbody>
<tr>
<td>COARSE</td>
<td>FINE</td>
</tr>
<tr>
<td>LOW PITCHED</td>
<td>HIGH PITCHED</td>
</tr>
<tr>
<td>CLEAR WITH COUGHING</td>
<td>DO NOT CLEAR WITH COUGHING</td>
</tr>
<tr>
<td>SCANTY</td>
<td>PROFUSE</td>
</tr>
<tr>
<td>GRAVITY IN DEPENDENT</td>
<td>GRAVITY DEPENDENT</td>
</tr>
<tr>
<td>TRANSMITTED TO THE MOUTH</td>
<td>POORLY TRANSMITTED TO THE MOUTH</td>
</tr>
<tr>
<td>ASSOCIATED WITH OBSTRUCTION</td>
<td>ASSOCIATED WITH RESTRICTION</td>
</tr>
<tr>
<td>BRONCHITIS-BRONCHIECTASIS</td>
<td>INTERSTITIAL FIBROSIS - INTERSTITIAL EDEMA</td>
</tr>
</tbody>
</table>
FREMITUS = VIBRATION
TACTILE FREMITUS

- A THRILL OR VIBRATION WHICH IS FELT ON THE CLINICIANS HAND WHILE RESTING IT ON THE PATIENTS CHEST WALL AT THE SAME TIME THE PATIENT SPEAKS. 99 – 1-2-3
- SYMETRY MAY BE SEEN IN NORMALS
- ASYMETRY – IS ABNORMAL
TACTILE FREMITUS

INCREASED
• PNEUMONIA

DECREASED
• PNEUMOTHORAX
• PLEURAL EFFUSION
• COPD
• FAT
VOCAL FREMITUS

• THE PATIENTS VOICE IS HEARD THROUGH A STETHOSCOPE PLACED ON THE PATIENTS CHEST – NORMALLY THE SOUNDS ARE INDISTINCT

• ABNORMALITIES – BRONCHOPHONY, PECTORILOQUY, EGOPHONY

• CONSOLIDATION
VOCAL FREMITUS

• BRONCHOPHONY – SOUND OF THE BRONCHI – SOUND MUCH LOUDER THAN NORMAL - WORDS INDISTINCT

• PECTORILOQUY – VOICE OF THE CHEST – WHISPER – WORDS INDISTINCT

• EGOPHONY – VOICE OF THE GOAT – BLEATING - E – A CHANGES – COMPARE SIDE TO SIDE

• REMEMBER - ALL SUGGEST CONSOLIDATION OF THE LUNG
PUTTING IT ALL TOGETHER

- PNEUMONIA
- PNEUMOTHORAX
- PLEURAL EFFUSION
- ASTHMA
PNEUMONIA

INSPECTION – SPLINTING
PALPATION – INCREASED FREMITUS
PERCUSSION – DULL
AUSCULTATION – BRONCHIAL BREATH SOUNDS, CRACKLES, EGOPHONY, PECTORILOQUY, RHONCHI

ENDOBRONCHIAL OBSTRUCTION MAY MASK THE USUAL PHYSICAL FINDINGS OF PNEUMONIA
PLEURAL EFFUSION

Inspection – lag affected side
Palpation – absent fremitus
Percussion – flat, dull
Auscultation – absent over effusion, bronchial immediately above effusion, rub occasionally
PNEUMOTHORAX

INSPECTION – LAG AFFECTED SIDE
PALPATION – ABSENT FREMITUS
PERCUSSION – TYMPANIC
AUSCULTATION – ABSENT BREATH SOUNDS
ASTHMA

INSPECTION – ACCESSORY MUSCLES, UNCOMFORTABLE
PALPATION – DECREASED FREMITUS
PERCUSSION – HYPERRESONANCE
AUSCULTATION – PROLONGED INSPIRATORY AND EXPIRATORY WHEEZES