

Today's Program

- What labs in a routine admission exam
- Why these labs are important to our adolescent population
- What information can be deduced from a specific lab
- Interpretation of specific lab values
- Indications for repeating specific labs
- Labs included in annual physicals

Screening Principles

- The purpose of screening is to detect individuals with early, mild, and asymptomatic disease.
- The disease should be common in the population being screened.
- The disease should result in significant morbidity or mortality.
- The disease should be treatable.

Youth Entering Detention

- In 1974 and 1980 two separate studies reported a rate of health problems approaching 50%.
- 25 years later another study found a 23% incident of serious health problems.
 - Only 1/3 of youth had a regular source of health care.

Youth Entering Detention

- Incarcerated youth are more likely to be from low socioeconomic status families who have inadequate access to health care.
- Despite high rates of health problems found in youths entering detention health screening is often lacking.

Youth Entering Detention

- The Office of Juvenile Justice and Delinquency reported in 1994:
 - Only 68% of detained juveniles were tested for TB.
 - Only 53% were tested for an STD.
 - Of the 90% who received a health screen 33% were screened by non-medical personnel.

Youth Entering Detention

- Youths in detention as a group are more likely to engage in health compromising behaviors.
 - Tobacco.
 - Alcohol.
 - Drugs (including IV)
 - High risk sexual behaviors.

Laboratory Screening at PYR

- Complete Blood Count with Differential.
- Hemoglobin Electrophoresis.
- Complete Chemistry Panel.
 - Including liver function tests.
- RPR.
- Urinalysis
- LCR Urine Test for Chlamydia and Gonorrhea

Complete Blood Count

- Normal Hemoglobin (Hb)/Hematocrit (Hct).
 - 12 to 14 years old:
 - Hb 12.5 (14.0)
 - Hct 37.0 (43)
 - 15 to 17 years old:
 - Hb 13.0 (15.0)
 - Hct 38.0 (46)

Complete Blood Count

- Anemias are categorized according to mean corpuscular volume (MCV)

Microcytic (↓ MCV)	Normocytic (normal MCV)	Macrocytic (↑ MCV)
Iron Deficiency Thalassemia Chronic Disease	Sickle Cell G6PD Deficiency Acute Infections	Vit. B12 Deficiency Acute Blood Loss Hyperthyroid

Hemoglobinelectrophoresis

- Helps to detect hemoglobinopathies
 - Red blood cell disorders caused by variations in the structure of hemoglobin.
 - Sickle Cell Anemia and Sickle Cell Trait
 - α and β Thalassemia and Thalassemia Trait
 - Hemoglobin C Disease

Hemoglobinelectrophoresis

- Sickle Cell
 - Hb S > 75% and no Hb A
 - Sickle Trait = Hb A + Hb S (AS)
- Thalassemia Trait
 - β Thal Trait
 - $\bar{M}CV$, $\bar{H}b$
 - $Hb A_2 > 4.5$

Hemoglobinelectrophoresis

- **Thalassemia Trait**
 - a Thal Trait
 - $\bar{M}CV$, \bar{M} or normal Hb
 - Normal values on hemoglobinelectrophoresis and iron deficiency is ruled out.
- **Hb C**
 - Hb C, no Hb A
 - Hb C + Hb A = Hb C trait (AC)

Chemistry Panel

- Screen for general health status by offering clues to the presence of chronic disease.
- Measures renal function. (BUN/Creatinine)
- Helps to clarify the causes of abnormalities in the CBC and UA.

Chemistry Panel

- Liver Function Test (AST, ALT, GGTP, Total and Direct Biliruben).
 - May detect subclinical liver infections.
 - May be abnormal in the presence of alcohol or drug abuse.
 - Can indicate the possibility of undisclosed drug use or give a clue as to the extent of drug abuse.

Chemistry Panel

- Laboratory values which maybe abnormal for reasons other then illness.
 - - Potassium (K+).
 - - Glucose
 - - AST

National Cholesterol Education Program Recommendations

- Measure total blood cholesterol in high risk adolescents.
 - Borderline levels 170-199mg/dl ⊃ Repeat Total Cholesterol yearly.
 - High levels [≥]200mg/dl ⊃ Do lipoprotein profile.
 - Lipoprotein abnormal (>110mg/dl) ⊃ Nutritional counseling

Urinalysis

- Performed by chemstrip.
- Presence of leukocyte esterase (LE) indicates urethritis vs. Bladder infection (UTI)
 - True UTI is rare in adolescent males
 - +LE is suspicious for STD in sexually active male.

Urinalysis

- Presence of glucose may indicate subclinical diabetes mellitus.
- ³ +1 protein
 - Rule out orthostatic proteinuria with a early AM first void UA for protein.
 - Consider a 24 hour urine collection for protein to evaluate for Nephrosis .
 - Urine protein (UP) > 40mg/m²/hr or UP/Cr >1.0.

Urinalysis

- Presence of blood.
 - Consider local trauma (i.e. masturbation).
 - Rule out infection with a urine culture.
 - Consider glomerulonephritis .

Urine Ligase Chain Reaction

- Ligase Chain Reaction (LCR) tests detect Gonorrhea and Chlamydia DNA in urine.
- Can detect the presence of gonorrhea and chlamydia even in asymptomatic individuals with normal urinalysis
- Non-invasive.

Special Considerations

- Several laboratory tests have significant differences in interpretation in adolescence.
- These differences may vary with regard to level of physical maturation or represent a movement from childhood normal values towards adult normal values.

Special Considerations

- Serum Alkaline Phosphatase.
 - Elevated alkaline phosphatase levels are characteristic of early adolescence.
 - Due to accelerated skeletal growth.
 - May be as high as the mid-300's

Special Considerations

- Cholesterol and Triglyceride Level.
 - 95th percentile values for adolescence are:
 - Cholesterol: 200mg/dl
 - Triglyceride : 140mg/dl
 - Adolescent values in the 95th percentile are considered borderline in adults.

Special Considerations

- **Hemoglobin and Hematocrit Levels**
 - Hematocrit levels increase dramatically in boys.
 - Due to the hemopoietic effects of testosterone.
 - Hematocrit levels increase from 39% at tanner stage 1 to 44% at tanner stage 5.

Guidelines for Adolescent Health

- **Guidelines for Adolescent Preventative Services (GAPS).**
 - American Medical Association
- **Bright Futures.**
 - Maternal and Child Health Bureau
- **Recommendations for Pediatric Preventative Care.**
 - American Academy of Pediatrics

Guidelines for Adolescent Health

- **Age Charts for Periodic Health Examinations.**
 - American Academy of Family Practice
- **Guide to Clinical Preventative Services.**
 - US Preventative Service Task Force


