Medical Conditions That Mimic Impairment

Master Sergeant Allan Kolak
Medical Conditions That Mimic Impairment
I am NOT a doctor. This information was obtained from Dr. Richman, Dr. Citek, Lee Health Emergency Personnel, and through research.
Medical Conditions / Excuses

- Diabetes (Hypoglycemia)
- Schizophrenia
- Multiple Sclerosis
- Bi-Polar Disorder
- Epilepsy
- Bell’s Palsy
- Head Trauma (Concussion)
An officer stops a lurching, swerving vehicle and finds a driver whose eyes are red, speech slurred, confused, and disoriented.

Is the Driver IMPAIRED?

Is this due to Alcohol and/or Drugs?

Is this due to a Medical Condition that is Similar to Drug Impairment?
Is the Driver IMPAIRED?

Is this due to Alcohol and/or Drugs?

Because they are Abusing a Drug

**IT DOES MEAN**

*they will be exhibiting symptoms of IMPAIRMENT At that time.*
Is the Driver IMPAIRED?

Is this due to a Medical Condition that is Similar to Drug Impairment?

Because they have a Medical Condition

DOES IT Mean they will be exhibiting symptoms of IMPAIRMENT all the time.
Is the Driver IMPAIRED?

Because they have a Medical Condition DOES NOT MEAN they will be exhibiting symptoms of IMPAIRMENT all the time.

This will depend on:
- Active Phase of Disease
- Treatment Level and Effect
- Stages of the Disease (Early-Late)
Is the Driver IMPAIRED?

ASSUME a Medical Condition UNTIL you can RULE it out based on History, Interview, and Totality of Signs!

THEN consider Alcohol /Drugs!
Let’s Look at Specific Medical Conditions and What signs of IMPAIRMENT they may exhibit

- Untreated
- Treated but in Later Stages

General Medical Problems

- Hypoglycemia
- Hyperglycemia
- Stroke
- Bells Palsy
- Head Trauma (TBI)
- Shock
Let’s Look at Specific Medical Conditions and What signs of IMPAIRMENT they may exhibit

- Untreated
- Treated but in Later Stages

**Neurological Problems**

- Multiple Sclerosis
- Muscular Dystrophy
- Seizures
- Vertigo
- Ataxia and Dysarthria
Let’s Look at Specific Medical Conditions and What signs of IMPAIRMENT they may exhibit

- Untreated
- Treated but in Later Stages

Mental Health Problems

- Bipolar
- Schizophrenia
Let’s Look at Specific Medical Conditions and What signs of IMPAIRMENT they may exhibit

- Untreated
- Treated but in Later Stages

General Medical Problems

- Hypoglycemia
- Hyperglycemia
Diabetes

Early:
- TREMBLING
- EXCESSIVE SWEATING
- UNEQUAL TRACKING
- MOODINESS
- HUNGER
- NERVOUSNESS
- IRRITABILITY

Severe:
- UNCOORDINATED
- DISORIENTED
- SLUGGISH
- THICK, SLURRED SPEECH
- DRUNK LIKE BEHAVIOR
- DROWSINESS
- DROOPY EYES
- FUMBLING
- GAIT ATAXIA

*** If in doubt, get them checked out
“Step out of the vehicle Sir. Sir, step out of the vehicle.”
Hypoglycemia Unawareness

- Perception of early warning symptoms impaired.
- Is not an all-or-none phenomenon.
- Affects one quarter of Type 1 diabetic patients.
- Correlates with glycemic control?
- Duration of diabetes?
- May be Acute or Chronic (Central autonomic failure).
Condition: Hypoglycemia
May Mimic Drug Impairment

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Condition: Hypoglycemia
May Mimic Drug Impairment

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<td>Romberg</td>
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</table>
Sequence of responses to decrements in plasma glucose mg/dl

70  Counter regulation
60  Adrenergic symptoms
50  Neuroglycopenic symptoms
40  Lethargy
30  Coma
20  Convulsions
10  Permanent Damage Death
**Hyperglycemia:** Common symptoms

High blood sugar has only a few or no symptoms are all. Impairment? The common symptoms are:

- Frequency in urination
- Thirst
- Dry mouth
- Urination at night
- Drowsiness or fatigue

- Loss of weight
- Increase in appetite
- Slow healing of wounds
- Blurriness in vision
- Dry and itchy skin
Stroke

• occurs when the blood supply to a part of your brain is interrupted or severely reduced, depriving brain tissue of oxygen and nutrients

• HGN and VGN can be present

• Dilated pupils
  – (usually different in sizes)

• Gait Ataxia
Acute Ischemic Stroke
(What do you see?)

Deficits:

- **Unilateral** (though not always) weakness
- **Unilateral** sensory deficit
- **Visual deficits** (blindness, gaze palsy, double)
- **Speech** (slurred – a motor dysfunction)
- Dysarthria
Acute Ischemic Stroke (AIS) (What do you see?)

Deficits:

- **Language** (aphasia – damage to the brain’s speech center)
- **Ataxia** (lack of coordinated movement)
- Cognitive impairment

Like real estate—

Location, Location, Location
Middle Cerebral Artery – MCA

The most common artery occluded in AIS

Features:

- Motor/Sensory Deficit: face, arm, leg
- Speech deficit – dysarthria (slurred speech)
- Language deficit – if in dominant hemisphere
- Blindness – visual field cut
- **Gaze palsy** – eyes directed towards side of AIS
Gaze palsy – eyes directed towards side of AIS
Stroke Assessment Scale
(Cincinnati Pre-hospital Stroke Scale)

Facial Droop
*Normal*: Both sides of face move equally
*Abnormal*: One side of face does not move at all

Arm Drift
*Normal*: Both arms move equally or not at all
*Abnormal*: One arm drifts compared to the other

Speech
*Normal*: Patient uses correct words with no slurring
*Abnormal*: Slurred or inappropriate words or mute
Vertebral—Basilar Artery

Features:

- Cranial nerve involvement – hearing, visual, facial, swallowing
- Can have bilateral weakness
- **Cerebellar signs** – ataxia
- Sensory deficits
- **Vertigo** – often nystagmus
- Nausea and vomiting
- Common to have waxing and waning symptoms
Cerebellar Hemorrhage

- Neurosurgical emergency
- Suspected in any patient with sudden onset headache, vertigo, vomiting and ataxia
- May have gaze preference
- Motor-sensory exam usually normal
- Gait disturbance often not recognized because patient appears too ill to move
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The KEY is **UNEQUAL RESPONSE or SIZE_**

More on ONE SIDE
Seizures There are many types of seizures other than Epilepsy.

Not everything that looks like a seizure is a seizure. Non-epileptic seizures can be caused by a number of things, including:

- Low blood sugar
- Fainting
- Heart disease
- Stress or anxiety
- Stroke
- Drug and alcohol withdrawal
Conditions That Mimic Stroke

- Bells’ palsy
- Seizure
Bell’s Palsy

- HGN will not be present due to the Bell’s Palsy
- Pupil sizes should be equal and within the normal ranges
- All vitals will be within the normal range
- May complain of pain behind ear of affected side
Bell’s Palsy: Conditions That Mimic AIS

- Can’t close eye completely or raise forehead
- No other stroke symptoms
- May have no risk factors for stroke

There is NO SIGNS or IMPAIRMENT on the Drug Influence Evaluation
Head Trauma (TBI)

- HGN can be present
  - Will not appear to be "normal"
- Pupils may be different in sizes, 1mm or more
- May be confused
- May resemble an impaired individual
Traumatic Brain Injury is...

- injury to the head from a blunt or penetrating object
- injury from rapid movement of the head that causes back and forth movement inside the skull
Causes of TBI

- Blow to the head with any object
- Pushed against the wall or other solid object
- Strenuous shaking of body
- Falling and hitting your head
- Strangled
- Punched in the face
- Use of firearms
- Near drowning
Mild TBI/Concussion

- Headaches
- Dizziness
- Slowed processing
- Clumsiness
- Decreased vision/hearing/smell
- Forgetfulness
- Fatigue
- Sensitivity to noise and lights
# Head Trauma

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<tr>
<td><img src="X" alt="Lack of Convergence" /></td>
<td><img src="X" alt="Pupil Size" /> Unequal</td>
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No two brain injuries are exactly the same. The effects of a brain injury depend on such factors as **cause, location, and severity**.
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No two brain injuries are exactly the same. The effects of a brain injury depend on such factors as **CAUSE, LOCATION AND SEVERITY**.
Shock

- Cardiogenic Shock
- Neurogenic Shock
- Hypovolemic Shock
- Psychogenic Shock
- Anaphylactic Shock
Cardiogenic Shock

Causes

- Acute myocardial infarction
- Very low heart rates (bradycardias)
- Very high heart rates (tachycardias)
Neurogenic Shock

- Loss of peripheral resistance
- Spinal cord injured
- Vessels below injury dilate
Hypovolemic Shock

- Loss of volume
- Causes
  - Blood loss: trauma
  - Plasma loss: burns
  - Water loss: Vomiting, diarrhea, sweating, increased urine, increased respiratory loss
Psychogenic Shock

- Simple fainting (syncope)
- Caused by stress, pain, fright
- Heart rate slows, vessels dilate
- Brain becomes hypoperfused
- Loss of consciousness occurs
Septic Shock

- Results from body’s response to bacteria in bloodstream
  - Vessels dilate, become “leaky”
Anaphylactic Shock

- Results from severe allergic reaction
- Body responds to allergen by releasing histamine
- Histamine causes vessels to dilate and become “leaky”
Shock: Signs and Symptoms

- Restlessness, anxiety
- Decreasing level of consciousness
- Dull eyes
- Rapid, shallow respirations
- Nausea
- Vomiting
- Thirst
- Diminished urine output
Shock: Signs and Symptoms

- **Hypovolemic shock** will cause: weak, rapid pulse, pale, cool, clammy skin

- **Cardiogenic shock** may cause: weak, rapid pulse or weak, slow pulse, pale, cool, clammy skin

- **Neurogenic shock** will cause: weak, slow pulse, dry, flushed skin

- **Sepsis and anaphylaxis** will cause: weak, rapid pulse, dry, flushed skin
Shock: Signs and Symptoms

Patients with anaphylaxis will:

– Develop hives (urticaria)
– Itch
– Develop wheezing and difficulty breathing (bronchospasm)
Shock is **NOT** the same thing as a low blood pressure!

A falling blood pressure is a **LATE** sign of shock!
# Shock

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<td>Pupil Size</td>
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<td>Pulse</td>
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## Shock

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</table>
What Is Multiple Sclerosis (MS)?

- Disease that affects the central nervous system (CNS)
- Occurs when myelin, the fatty tissue surrounding and protecting neurons, is destroyed by the body’s immune system
- Destruction of myelin results in formation of plaques and lesions (inflammation and sclerosis)
- MS is characterized by periodic loss of neurologic function and often progressive disability
Common symptoms?

- Tingling
- Numbness
- Problems with balance*
- Poor muscle coordination*
- Muscle weakness*
- Changes in vision* Abnormal Eye Movements and Nystagmus
- Fatigue
- Sexual problems
- Slurred* speech
- Bladder or bowel problems
## Presenting Symptoms of MS

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Approximate Prevalence</th>
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<tbody>
<tr>
<td>Weakness in one or more limbs</td>
<td>40-50%</td>
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<tr>
<td>Sensory loss/paresthesias</td>
<td>40-45%</td>
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<tr>
<td>Visual loss</td>
<td>16-36%</td>
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<tr>
<td>Gait disturbance/ataxia</td>
<td>5-15%</td>
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<tr>
<td>Diplopia</td>
<td>7-15%</td>
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<tr>
<td>Dizziness/vertigo</td>
<td>5%</td>
</tr>
<tr>
<td>Pain</td>
<td>3%</td>
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<tr>
<td>Sensory in face</td>
<td>3%</td>
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Ocular Signs

- Loss of Vision (Monocular and Binocular) optic neuritis
- Diplopia
- Oscillopsia
- Abnormal Eye Movements and Nystagmus
Ocular Motility Disorders

Saccadic abnormalities

- Saccadic Intrusions
  - Square wave jerks
  - Saccadic pulses
  - Ocular flutter

Gait ataxia in MS
Marijuana Eases Spasticity in MS Patients

Studies Show Marijuana Extracts May Have Therapeutic Value for Multiple Sclerosis Symptoms

Many MS patients report that cannabis has a startling and profound effect on muscle spasms, tremors, balance, bladder control, speech and eyesight. Many wheelchair-bound patients report that they can walk unaided when they have smoked cannabis.
## Multiple Sclerosis

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*Atypical and Often Unequal on Each side*
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Depends on STAGE or REMISSION of Disease
Ataxia and Gait Disturbances

- Generally symptoms of another disease
- Ataxia
  - Failure to produce smooth intentional movements
- Gait Disturbance
  - Inability to perform smooth coordinated gait
- May be described by patient as
  - Weakness - Dizziness
  - Stroke - Falling
Ataxia and Gait Disturbances

Intoxication

- Ethanol
- Sedative-hypnotics
- Anticonvulsants
  - Hyponatremia
  - Cerebellar disorders*
- Tumor
- Hydrocephalus
- Cerebral vascular accidents *
- Inborn errors of metabolism

- Multiple Sclerosis*
- Thalamic disorders*
- Parkinson’s Disease*
- Cervical spondylosis
- Posterior column disorders
- Peripheral neuropathy
- Vestibulopathy*
- Disequilibrium of aging

*Similar to Drug Impairment
# Ataxia

<table>
<thead>
<tr>
<th>LIKELY to HAPPEN</th>
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<tr>
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# Ataxia

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<tr>
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Epilepsy and Other Seizures

- HGN may be present
  - Will not appear to be “normal”
- Pupils dilated
- Blood pressure and pulse rate will be up
- May be confused with a Hallucinogen user
- Postictal can last minutes to hours
Epilepsy and Other Seizures

Seizures are due to sudden urges of disorganized electrical impulses in the brain.
Seizures There are many types of seizures.

- **Absence seizures** staring into space, though eyelids may flutter and muscles may twitch.
- **Clonic seizures** cause convulsions, or jerking movements on both sides of the body.
- **Myoclonic seizures** involve jerking of the upper body and the limbs. It may look like the person has been shocked.
- **Tonic seizures** result in sudden stiffness in the muscles. These seizures are more common in sleep.
- **Tonic-clonic seizures** The person quickly stiffens, loses consciousness and then convulses with repeated jerking of the arms and legs.
Seizure symptoms

Sensory/Thought:
• Black out
• Confusion
• Deafness/Sounds
• Electric Shock Feeling
• Loss of consciousness
• Smell
• Spacing out
• Out of body experience
• Visual loss or blurring

Emotional:
• Fear/Panic
Seizure symptoms: Physical

Chewing movements
Convulsion
**Difficulty talking**
Drooling
**Eyelid fluttering**
Eyes rolling up
Falling down
Foot stomping
Hand waving
**Inability to move**
Incontinence
Lip smacking

Making sounds
**Shaking**
Staring
Stiffening
Swallowing
**Sweating**
**Teeth clenching/grinding**
Tongue biting
Tremors
**Twitching movements**
Breathing difficulty
**Heart racing (Tachcardia)**
# Seizures

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<td>Pulse</td>
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## Seizures

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Let’s Look at Specific Medical Conditions and What signs of IMPAIRMENT they may exhibit

- Untreated
- Treated but in Later Stages

Neurological Problems

- Vertigo
What Tests Will MOST LIKELY be Affected

HGN
OLS
WAT
Romberg
Causes of Vertigo

- BPPV
- Labyrinthitis
  - Acute suppurative
  - Serous
  - Toxic
  - Chronic
- Vestibular neuronitis
- Ménière’s
- Acoustic neuroma
- Cerumen impaction
- Traumatic Head Injury

- Tumor (Benign or Neoplastic)
- Cerebellar infarct
- Cerebellar hemorrhage
- Vertebrobasilar insufficiency
- Multiple Sclerosis
- Basilar artery migraine
- Hypothyroidism
- Hypoglycemia
BENIGN PAROXYSMAL POSITIONAL VERTIGO (BPPV)

(BPPV) is an inner ear problem that results in short lasting, but severe, room-spinning vertigo.

- The most common cause of BPPV in people under age 50 is head injury.
- The symptoms of BPPV include dizziness or vertigo, lightheadedness, imbalance, and nausea.
- Positional dizziness get worse on standing rather than lying down.
What Are The Symptoms?
The symptoms are:
- Rotational vertigo (attacks of a spinning sensation)
- Tinnitus (a roaring, buzzing, or ringing sound in the ear),
- Vertigo
- Hearing Loss in the affected ear.
- Nystagmus (horizontal nystagmus), up and down (vertical nystagmus) or rotary.

Can last several hours

What Is Meniere's Disease?
A disorder of the inner ear resulting from an abnormality in the fluids of the inner ear.
One of the most common causes of dizziness originating in the inner ear.
# Vertigo

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LOSP, X

Nystagmus, X

VGN, X

Lack of Convergence, X

Pupil Size, X

Pulse, X

Blood Pressure, X

HGN During Active Phase
## Vertigo

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Mental Health Problems

- Bipolar
- Schizophrenia
- Manic
- Depression
What is bipolar disorder?

Bipolar disorder (also known as manic depression) causes serious shifts in mood, energy, thinking, and behavior—from the highs of mania on one extreme, to the lows of depression on the other.

**MANIC EPISODE**, a person might impulsively quit a job, charge up huge amounts on credit cards, or feel rested after sleeping two hours.

**DEPRESSIVE EPISODE**, the same person might be too tired to get out of bed and full of self-loathing and hopelessness.
Bipolar Disorder

*manic episode*

- Increased energy, activity, and restlessness
- Excessively "high," overly good, euphoric mood
- Extreme irritability
- Racing thoughts and talking very fast, jumping from one idea to another
- Distractibility, can't concentrate well
- Little sleep needed
- Unrealistic beliefs in one's abilities and powers

Stimulant
Bipolar Disorder
depressive episode

- Lasting sad, anxious, or empty mood
- Feelings of hopelessness or pessimism
- Loss of interest or pleasure in activities once enjoyed, including sex
- Decreased energy, a feeling of fatigue or of being "slowed down"
- Difficulty concentrating, remembering, making decisions
- Sleeping too much, or can't sleep
- Change in appetite and/or unintended weight loss or gain
- Chronic pain or other persistent bodily symptoms that are not caused by physical illness or injury
- Thoughts of death or suicide, or suicide attempts

Stimulant “down side”
Incidence is about 1% of population, with a strong, but not invariable, hereditary component.

Increase in dopamine receptors in limbic system (especially in left hemisphere) is consistently found.
Common symptoms of Schizophrenia

- DAZED APPEARANCE
- VIVID SENSATIONS
- HALLUCINATIONS
- PARANOIA
- VOCAL HALLUCINATIONS
- DELUSIONS
- INCOHERENT OR IRRELEVANT SPEECH
Basis of Classical Dopamine Hypothesis of Schizophrenia

- Dopamine-releasing drugs (amphetamine, mescaline, LSD) **CAN INDUCE STATE CLOSELY RESEMBLING PARANOID SCHIZOPHRENIA.**

- Antipsychotics, that are effective in the treatment of schizophrenia, have in common the ability to **INHIBIT THE DOPAMINERGIC SYSTEM BY BLOCKING ACTION OF DOPAMINE IN THE BRAIN.**
Evidence for Dopamine Hypothesis

**Dopamine enhancing drugs** (eg: amphetamines) may produce transient **psychotic states** indistinguishable from schizophrenia.

Evidence also suggests too many dopamine receptors rather than too much dopamine.
Amphetamine Psychosis

• The only drug effect that is Clinically indistinguishable from Schizophrenia

• Stimulants such as amphetamine that release dopamine can produce the positive symptoms of schizophrenia in “normals”
Too much dopamine causes nervousness, irritability, aggressiveness, paranoia, and bizarre thoughts.

Too little dopamine causes low mood, depression, fatigue, tremors, and problems with muscle control.
Physical Effects

- Heart rate
- Blood pressure
- Pupil size
- Breathing rate
- Sound sensitivity
- Body temperature
- Appetite
- Sleep
- Reaction time
Why can’t people with schizophrenia track a smoothly moving target?

Hypotheses:

- A fundamental deficit in the ability to sustain and focus spatial attention

- Enhancing attention to target improves pursuit
Smooth Pursuit: Attention

“Abnormal tracking patterns indistinguishable from those observed in schizophrenics can be produced in normal people by distracting them, or allowing their attention to wane through boredom or fatigue”
# Schizophrenia and BiPolar

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Stimulant Characteristics are More Likely
## Schizophrenia and BiPolar

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Other Medical Conditions

• Paraplegic

• Exhaustion / Tired

• Eye Problems / Excuses

• Physical Defects / Limitations

• Dyslexia

• Physical Limitations / Injuries
Exhaustion/Tired:

- Driving pattern very comparable to that of a DUI/alcohol
- HGN will not be present
- Easily stimulated to be woken up and follow instructions
Eye Excuses

- Bad Vision
- LASIK Surgery
- Macular Degeneration
- Contacts
- Cataracts
- Amblyopia
- Glaucoma
- Natural Nystagmus
Bad Vision

- Not an eye test
- Can they see the stimulus?
LASIK Surgery

- Laser-Assisted *In Situ* Keratomileusis
- A procedure that permanently changes the shape of the cornea, the clear covering of the front of the eye, using an excimer laser.
Macular Degeneration

- a chronic eye disease that occurs when tissue in the macula, the part of your retina that's responsible for central vision, deteriorates
- Gray or blank spots may mask the center of your visual field
- affects your central vision, but not your peripheral vision; thus it doesn't cause total blindness
Contacts

• Help reduce Nystagmus slightly
• Benefit to defendant
• Also helps with the vision
Cataracts

- Clouding of the normally clear lens of your eye
- as the clouding progresses, the cataract eventually interferes with your vision
Amblyopia

- Lazy eye
- Truth is in the Eyes video
Glaucoma

• not just one disease, but a group of them
• common feature of these diseases is damage to the optic nerve, usually accompanied by an abnormally high pressure inside your eyeball
• Optic nerve is a bundle of more than a million nerve fibers at the back of your eye
Truth is in the EYES
Natural Nystagmus

• Doesn’t look normal
• Less then 2% of the population has it
• Usually will have to wear glasses
Dyslexia

- The word 'dyslexia' comes from the Greek meaning 'difficulty with words'.
- Dyslexia is difficulty in learning to read.
- Dyslexia can be related to brain injury, hereditary, or hormonal influences.
- Letter and number reversals are a common warning sign of dyslexia.
Physical Limitations / Injuries

Problems
• Knee problems
• Head injury
• Elderly
• Overweight

Recommendations
• Ask questions about work, recreation, how it limits them
• When was injury…..
• 65 and older doesn’t mean you can’t do the tests
• If overweight, look at possible alternate tests
...to determine the alcoholic content of your blood and/or breath.
Master Sergeant Allan Kolak

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Cell: 239-707-2845
Email: akolak@capecoral.net