

Injury Amongst Our Elders: *Death & Disability in the "Prime" of Life*

C. William Schwab, M.D.

Athletic feats, senior style

Seniors from throughout the city spent the busy day as competitors as they took to the track and the field for the Philadelphia Senior Games. The games were held yesterday in Temple University's Pavilion Hall and at various outdoor facilities at 10th Street and Norris Avenue.



Margaret Long celebrates her victory in the walk race.



Joe Granatzer crosses the finish line to win the 100-meter dash. From left are Joseph Sauer, Clarence Ferguson and Ted Kaban.



Beverly Harris displays her medals. She won the 100-, 200- and 400-meter dashes.



George Barker shorts the pole vault. He has made five consecutive jumps in the 400-pound weight class in a row.

Insquirer photographs by Gerald S. Williams



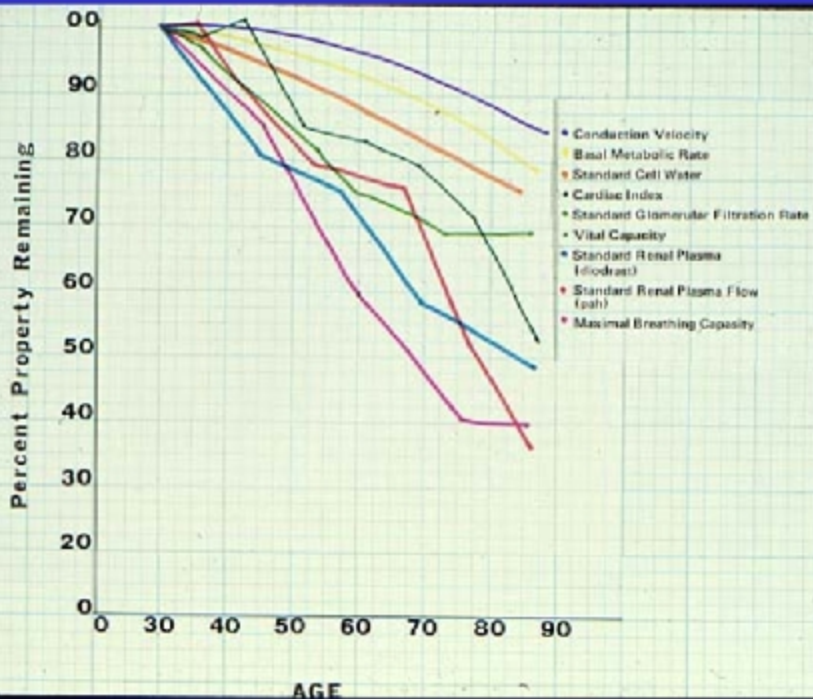
DEMOGRAPHICS

- Trauma -- 5th Leading Cause of Death
- Disproportionate
 - USA
 - ♦ 11% of Population
 - ♦ 25% of ALL Trauma Deaths
 - Sweden
 - ♦ 17% of Population
 - ♦ 55% of Fatalities

OVERVIEW

- Demographics
- Mechanism of Injury
- Physiology
- Clinical Perspectives
- Outcomes...??

BIOLOGIC & PHYSIOLOGIC CHANGES OF NORMAL AGING



DEMOGRAPHICS

■ 1980

- 26.5 Million People
- 11.3% of Population

■ 2000

- 52 Million People
- 68% Increase

■ 1990

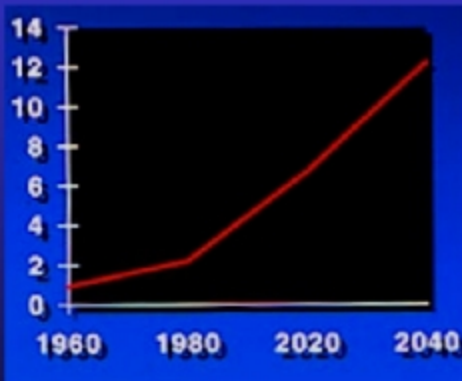
- 30.9 Million People
- 16.6% Increase
- 12.5% of Population

■ 2040

- 30% Increase
- 68 Million People
- 20% of Population

DEMOGRAPHICS

- “Elderly” Elderly
 - > 85 Years Old
 - Highest Growth Rate
 - 1960 -- .9 Million
 - 1980 -- 2.2 Million
 - 2000 -- 6.7 Million
 - 2040 -- 12.2 Million



DEMOGRAPHICS

■ Aging

- No Set Age
- “Normal” Biologic Process
- Statistically Impacts > 55 Years Old
- 65 Years Old is a Social Parameter
- 75 Years Old is a Geriatrician's View



DEMOGRAPHICS

■ Subgroups

- "Young" Old -- 55-64 Years
- "Old" Old -- 65-74 Years
- Greater than 75 Years

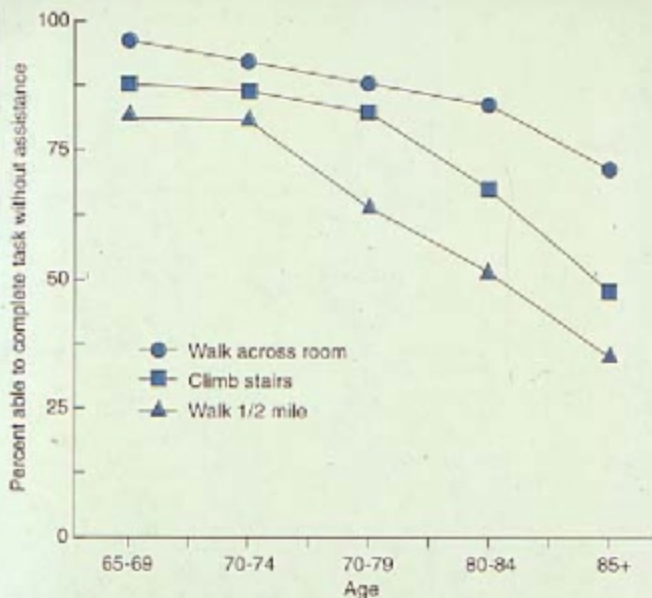


FIGURE 471-1. Percentage of Caucasian women in five counties in North Carolina who reported that they were able to complete three tasks (walking across a room, walking 0.5 mile, and climbing one flight of stairs) without assistance, by age group. (National Institute on Aging. Established populations for epidemiologic studies of the elderly. Vol. II: Resource data book, Publication 90-495, Bethesda, MD: National Institutes of Health, 1987.)

MECHANISMS OF INJURY

- Falls
- Motor Vehicle Accident
- Pedestrian- Vehicular Trauma
- Burns
- Violence

MECHANISMS OF ELDERLY INJURY

■ 65-74 Years

- 33% MVA
- 25% Falls
- 8% Burns

■ 75 Years

- 20% MVA
- 50% Falls
- 8% Burns

falls



FALLS

■ Epidemiology

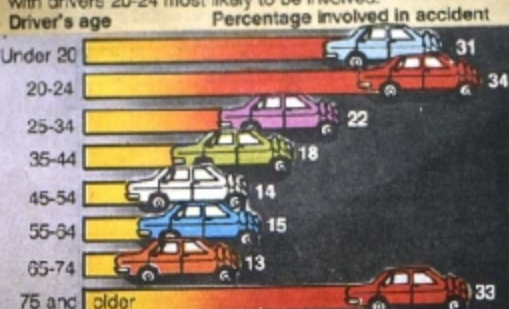
- 40% Fall/Year
 - ♦ 17% Serious Injury
- Most Common Injury > 75 Years
- Most Common Injury Resulting in Death
- 3,650 Deaths in 1990 (81%)
- Fatality Rate 23/100,000 (1.8%)

mva



Car accidents and age

A total of 33 million drivers were in car accidents last year with drivers 20-24 most likely to be involved.



MOTOR VEHICLE ACCIDENTS

- 21.8 Million Drivers >65 Years
 - (12.9% of All Drivers)
- 2nd Highest Collision Rate
- 18-36% of Injury Related Fatalities



PEDESTRIAN-VEHICULAR TRAUMA

- 1990 -- 1,800 Deaths (24%)
- Highest Pedestrian Fatality Rate
 - 6/100,000 (3)
- 30-50% of Injury Related Deaths

PEDESTRIAN-VEHICULAR TRAUMA

■ Causes

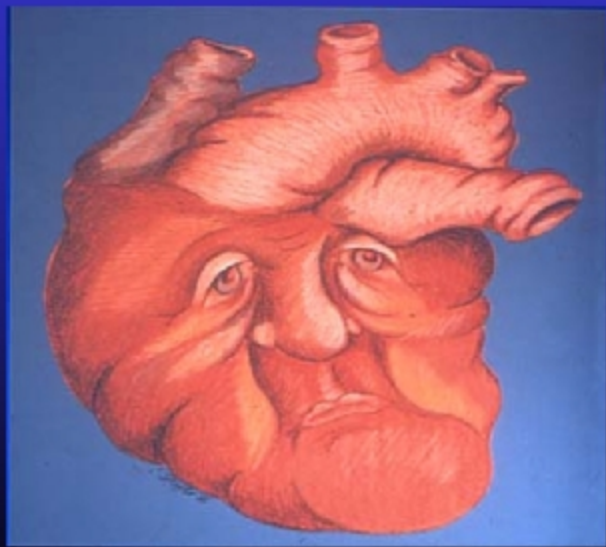
- Slow Pace
- Gait/Balance
- Posture
- Strength/Coordination
- Neurosensory Impairment
- Judgement/Cognition

PHYSIOLOGY

- Cardiovascular
- Renal
- Respiratory
- Nervous System
- Musculoskeletal

MARKED PHYSIOLOGIC
VARIABILITY

CARDIOVASCULAR SYSTEM



CARDIOVASCULAR

- Less Effective Pump
- Minimal Reserve
- Medication Effects
- “Misleading” Response to Hypovolemia
- Superimposed Ischemia/Hypoxia

CLINICAL PERSPECTIVES

Cardiovascular

■ History

- MI/Arrhythmia/Stroke
- Drugs-
 - COUMADIN
 - Beta Blockers

■ Baseline Studies

- ECG/Rhythm Strip

■ Fluids

- Judicious
 - Too Much May be Worse Than Too Little



RESPIRATORY CHANGES

■ Lungs

- Decreased Elasticity
- Decreased Alveolar Number and Function
- Decreased Baseline pO_2

RESPIRATORY CHANGES

■ Musculoskeletal

- Increased AP Diameter
- Kyphosis
- Decreased Chest Wall Strength
- Increased Chest Wall Rigidity

RENAL SYTEM

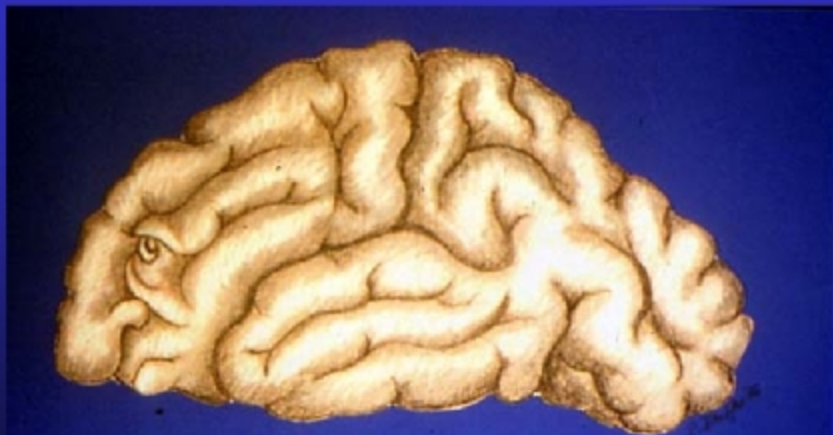


RENAL

■ Functional Changes

- Loss of Surface Area
- Diminished Real Blood Flow
- Progressive Decline in Filtration Function
- Decline in Creatine Clearance (30-50%)
 - ♦ Normal Serum Creatinine III

CNS

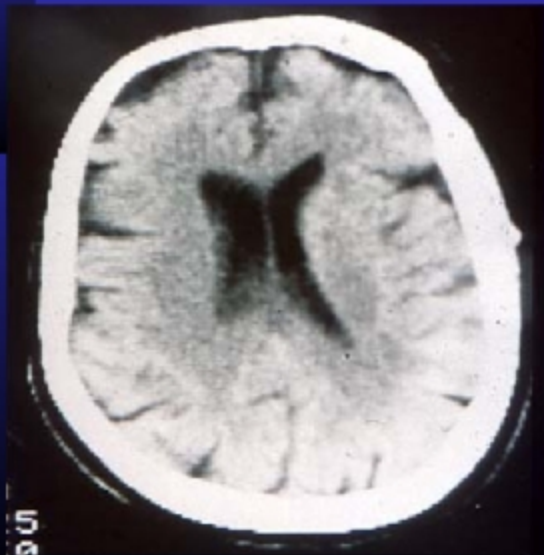


- ➡ Hearing) 73% > 65yrs.
- ➡ Visual Acuity
- ➡ Balance
- Cerebral Degeneration
(10^5 Cells A Day)
- Altered Cognitive Function
- Intelligence (spared)

NERVOUS SYSTEM

■ Confounding Factors

- Brain/Skull Relationship
 - Delayed Diagnosis Intracranial Hemorage
- Cervical Spine
 - Narrow Canal
 - Degenerative Changes
- Altered "Baseline" Mental Status



CO-MORBIDITY IN THE AGED

PED

Common:

Hypertension, Cardiac, Psychoses,
Diabetes, ETOH/drug, Pulmonary

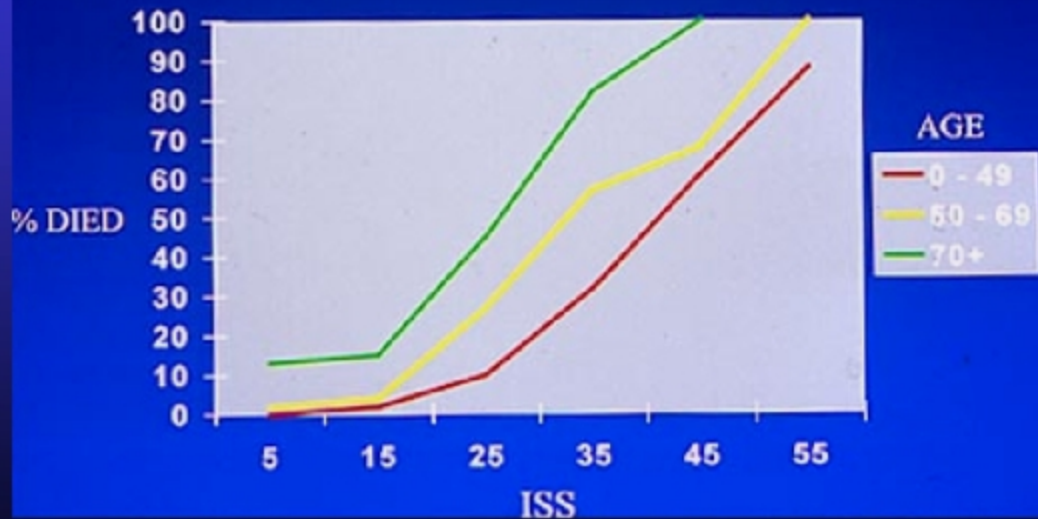
More Mortal:

Cirrhosis, Renal, Malignancy,
Coagulopathy, Cardiac,
Pulmonary(COPD)

PEC's...EFFECT ON MORTALITY

- LIVER
- RENAL
- CANCER
- CHF
- COAD
- IMMUNOSUPPRESSIVE

SEVERITY



APPROACH



Greater 85 +

Old Old 74 - 85

Young Old 65 - 74

TREATMENT AXIOMS

65-74 Years

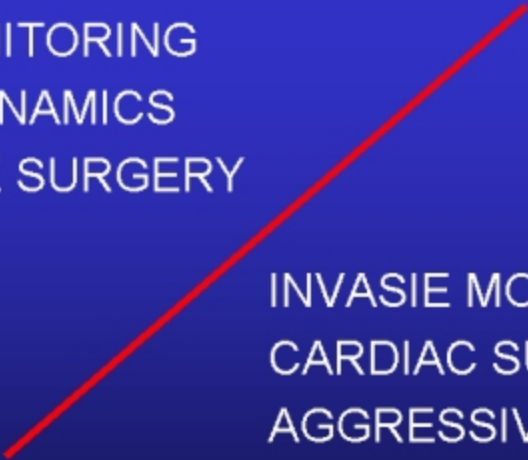
- Alteration in Mental Status or Cognition Indicative of Brain Injury
 - CT Mandatory
- Standard Management/Early OR
- Expect Poor Outcome
 - Sever CNS Injury/Physiologic Deterioration
 - Check for Advanced Directives

TREATMENT AXIOMS

65-74 Years

- Presence of Acquired Physiologic Alterations
- Presence of Age-Related Disease/Medication
 - Review Medical History
- Aggressive Monitoring to Optimize Cardiac Performance and O₂ Delivery

INVASIE MONITORING
OPTIMIZE DYNAMICS
AGGRESSIVE SURGERY



INVASIE MONITORING
CARDIAC SUPPORT
AGGRESSIVE NUTRITION

ENDOCRINE RESPONSE



ADH



T₃ T₄



Aldosterone
EPI



CLINICAL PERSPECTIVES

Social Issues

- Living Situation
- Family Support
- Living Well

Depression...



OUTCOME

■ 1983 -- Oreskovitch

- 12% Independent

■ 1987 -- De Maria

- 57% Independent
- 89% Home

■ 1994 -- Johnson

- Age *Per Se* not
Reliable Predictor of
SICU Death

■ 1994 -- Shapiro


- Aggressive ICU Care
is Justified

Difficult to predict and the literature does not help....

Overall, Pre-Existing Disease,
Along with Aging and Injury
Severity, have a Profound
Effect on Outcome after
Trauma to the Elderly

TERMINATION OF LIFE SUPPORT AFTER MAJOR TRAUMA

Dennis J. Sullivan, MD, and John Hansen-Flaschen, MD



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PATRICK M. REILLY, MD, GUEST EDITORS

THE SURGICAL CLINICS OF NORTH AMERICA

Critical Care of the Trauma Patient

J U N E
2 0 0 0



HERMAN



10/29

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Liniger

**"Your grandfather ... has left you ...
his bicycle!"**

A Modern Version of the Hippocratic Oath...

As I enter into the profession of medicine, I swear by whatever I hold most sacred, to keep according to my ability the following oath:

...I Hold the beauty and mystery of life as well as death in deepest reverence and will do all in my power to provide comfort, relieve suffering, and preserve human dignity in each of my patients

Futility...

serving no useful purpose:
completely ineffective

Webster's Dictionary, 1994

Heroic measures...

invasive procedures to halt or
reverse the process of death

Outcome...

physiologic: immediate response

holistic: long term, quality of life









■ WITH:

- Judgement
- Humanity
- DIGNITY