老人一般急重醫學概論與特殊考量

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Epidemiology

- Although only 25% of all trauma fatalities occur in the elderly, they have a much higher relative mortality for any given injury, and consume 33% of the total trauma health care resources

1. Katz PR et al. Geriatrics Syllabus for specialists. New York: American Geriatrics Society, 2002.
2. Taylor MD, Tracy JK, Trauma in the elderly: intensive care unit resource use and outcome. J Trauma 2002; 53(3):407–414.

Introduction of elderly trauma

- Higher admission rates in elderly with ISS >9, and >24 most likely to expire or transfer)
- Significantly more ICU days, especially if >75 years old
- Over 80% of the injured elderly patients can return to their independent level of activity if early aggressive resuscitation and follow-up care is provided.
- Outcome can be maximized by a more aggressive approach, rather than one which is expectant.
- We need to think of disregarding the "minor" injury in the elderly.

Jacobs, et al, J. Trauma (54):391-416, 2003

Objective

- Developing a guideline for the trauma practitioner with some considerations to make decision in the care of the geriatric trauma patient.
- Developing a series of questions, the answers supported by the existing scientific literature.

Questions for Elderly

1. Should age itself be a marker of increased morbidity/mortality?
2. Should pre-existed conditions be a worsen factor of poor outcome?
3. Should we have specific considerations about treatment of elderly?
4. Should all geriatric patients be benefit from invasive homodynamic monitoring?
5. Should outcomes be measured in geriatric patients if practice early procedure and aggressive treatment?

Literature Review

- McCoy GF found
  - The mortality rate for all grades of injury about 10% higher in the 70 and over age group when compared to the 20 to 70 years old age group.
- Champion HR, et al also found
  - The older group had higher case fatality and complication rates, and longer hospital stays when compared to non-elderly trauma patients in 111 United States and Canadian trauma centers.

Literature Review

- Lonner J and Richmond TS found
  - Mortality in the elderly group was virtually twice as much as that of mortality in the younger group (28% vs. 12%；27% vs. 14%).
- Richmond TS found
  - The elderly group had higher pulmonary and infectious fatality complications.
- Johnson CL found
  - Elderly trauma patients' deaths were significantly higher than in the younger patient group, whether in the SICU or after SICU discharge.

Literature Review

- Richmond et al. reported
  - The mortality was nearly 10% with a mean age of 77.5 years old in patients who suffered a serious injury.
  - Among them, injury severity, total number of injuries, complications, and increasing age were all predictors of mortality.

Literature Review

- Tornetta P, et al - A retrospective study reported
  - Mortality correlates closely with the ISS, the GCS score, systemic complications, and a need for general surgery in elderly patients.

Literature Review

- Aalst JA reported
  - Late mortality is high and their long-term outcome is poor.
- Oreskovich MR showed
  - The mortality factors were including the mechanism of injury, body region affected, Injury Severity Score, shock, pre-hospital GCS in over 70 years old trauma patients, who had a high mortality rate of up to 15%.

What's Special Considerations in elderly trauma? Outline: **PREPPR**

- **P**opulation considerations
  - Growth and Expenditure
- **R**isk considerations
  - Groups, Medication/Past history, Health status, Care facility , Safe environment
- **E**arly considerations
  - Thinking, Diagnosis and Treatment
- **P**itfall considerations
  - Underestimate, Delay symptoms/ signs and Atypical presentations
- **P**hysicopathological considerations
  - Changes in aging capacity, functional reserve and Stress loading, 3D
- **R**esuscitation considerations
  - CPR and Mortality factors

Population considerations in the Elderly

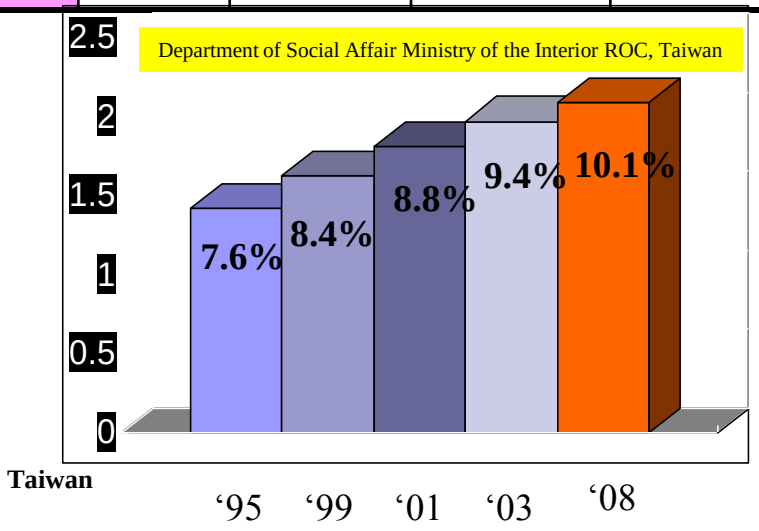
- The population of people in the United States over the age of 65 constitutes about 11 %.
  - It is projected that this segment will increase by **6%** over the next ten years and by the year 2025 these Seniors will represent 25% of all Americans.
- " If by the year 2025 the average life span does indeed reach 85-115 years, the potential for injury will likely increase.

Population considerations

- Recent advances in public health and medical science has led to an increasing proportion of elderly citizens in the population of Taiwan.
- Since 2008, Taiwan has been an "aging country", a label applied to any country in which 10% or more of the population are 65 years of age or older

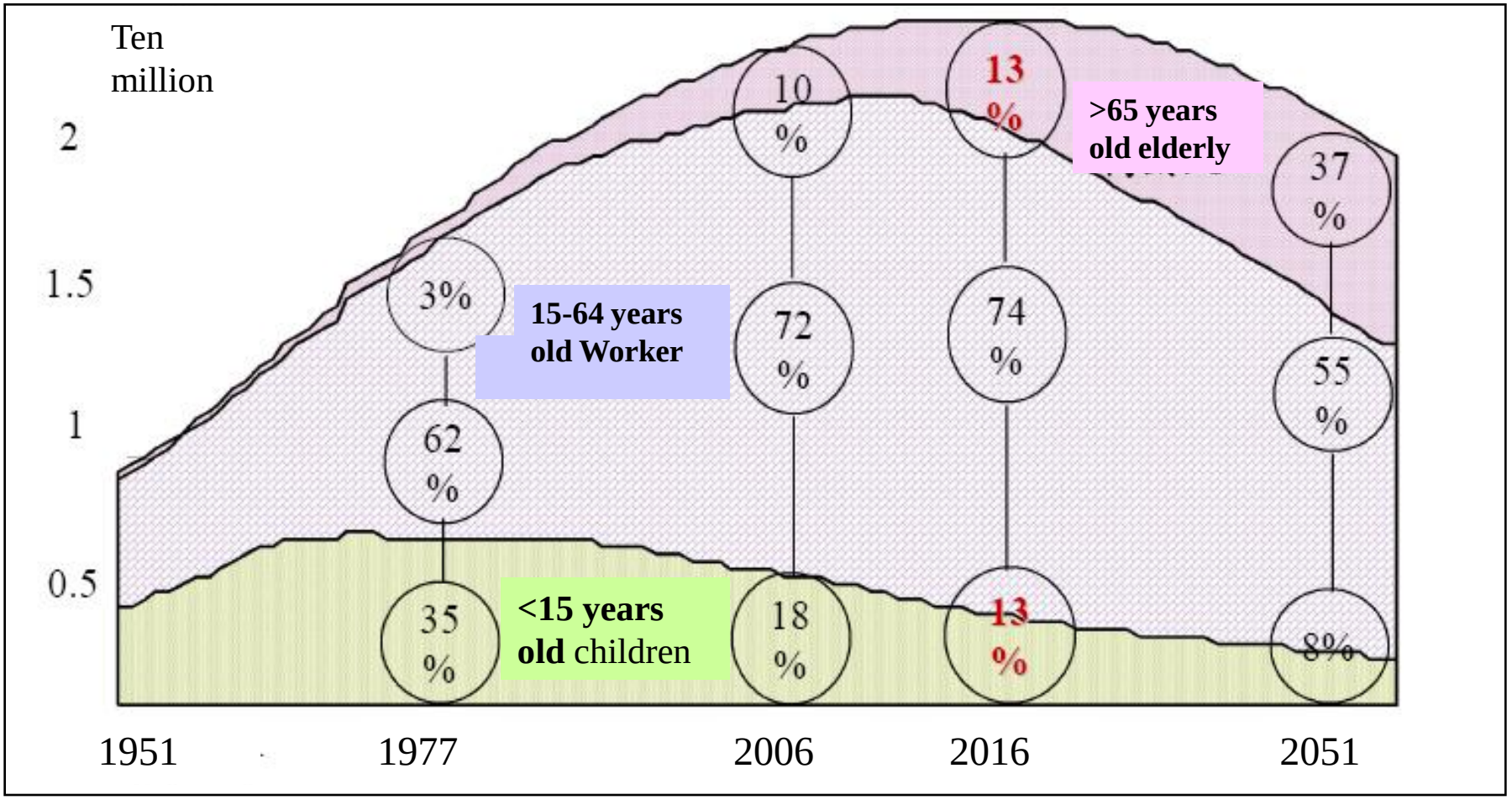
Aging index in Taiwan

	1980	1990	2000	2008
Aging index	12.6%	22.6%	41.3%	53.9%
Elder %	4.1%	6.1%	8.5%	10.1%
Live alone	-	16,8000	30,2000	29,9100



Population Projections for Taiwan Area 2006-2051 Report. In: Council for Economic Planning and Development, Executive Yuan, Republic of China (Taiwan); 2005 June.

Aging population distribution in Taiwan



Medical utilization for the Elderly between Medical center and Regional Hospitals at CGMH

Taiwan	Linkou Medical Center **n = 18285**		Keelung Regional hospital **n = 8038**	
Gender				
male	10225	(55.9%)	4277	(53.2%)
Female	8060	(44.1%)	3761	(46.8%)
Treatment				
Discharge	8209	(47.9%)	4892	(60.9%)
Admission	8237	(45.1%)	2665	(33.2%)
ICU	730	(4.0%)	210	(2.6%)
AAD	563	(3.1%)	178	(2.2%)
Death	146	(0.8%)	93	(1.7%)

LUI et.al. CGMJ 2000，23（1）681-7 °W-H chang

Medical expenses

Billion/10

單位：億元

	總計	0~9歲	10~19歲	20~29歲	30~39歲	40~49歲	50~59歲	60~69歲	70~79歲	80歲以上
總計	**6,957**	**451**	**379**	**535**	**653**	**947**	**1,251**	**1,054**	**1,095**	**592**
消化系統疾病	950	92	99	124	118	149	152	94	81	41
呼吸系統疾病	931	170	80	56	63	75	87	89	155	156
泌尿生殖系統疾病	835	6	10	38	69	135	198	168	150	61
循環系統疾病	786	2	4	10	25	78	168	182	211	106
腫瘤	660	6	12	18	46	123	168	128	114	46
骨骼肌肉系統及結締組織之疾病	448	2	12	25	36	65	97	91	89	32
損傷及中毒	436 6.3%	18 4.0%	45 11.9%	58 10.8%	51 7.8%	65 6.8%	68 5.4%	48 4..6%	51 4.6%	30 5.0%
內分泌、營養及新陳代謝疾病與免疫性疾患	330	6	10	11	18	41	84	77	62	21
神經系統及感覺器官之疾病	310	28	26	20	22	32	48	52	59	24
精神疾患	269	19	12	31	49	57	43	23	21	13
其他疾病	1,002	102	68	142	157	126	139	103	103	61

附註：「其他疾病」之比例為其餘疾病占率較小者的加總。

資料來源：行政院衛生署「國民醫療保健支出 2007」

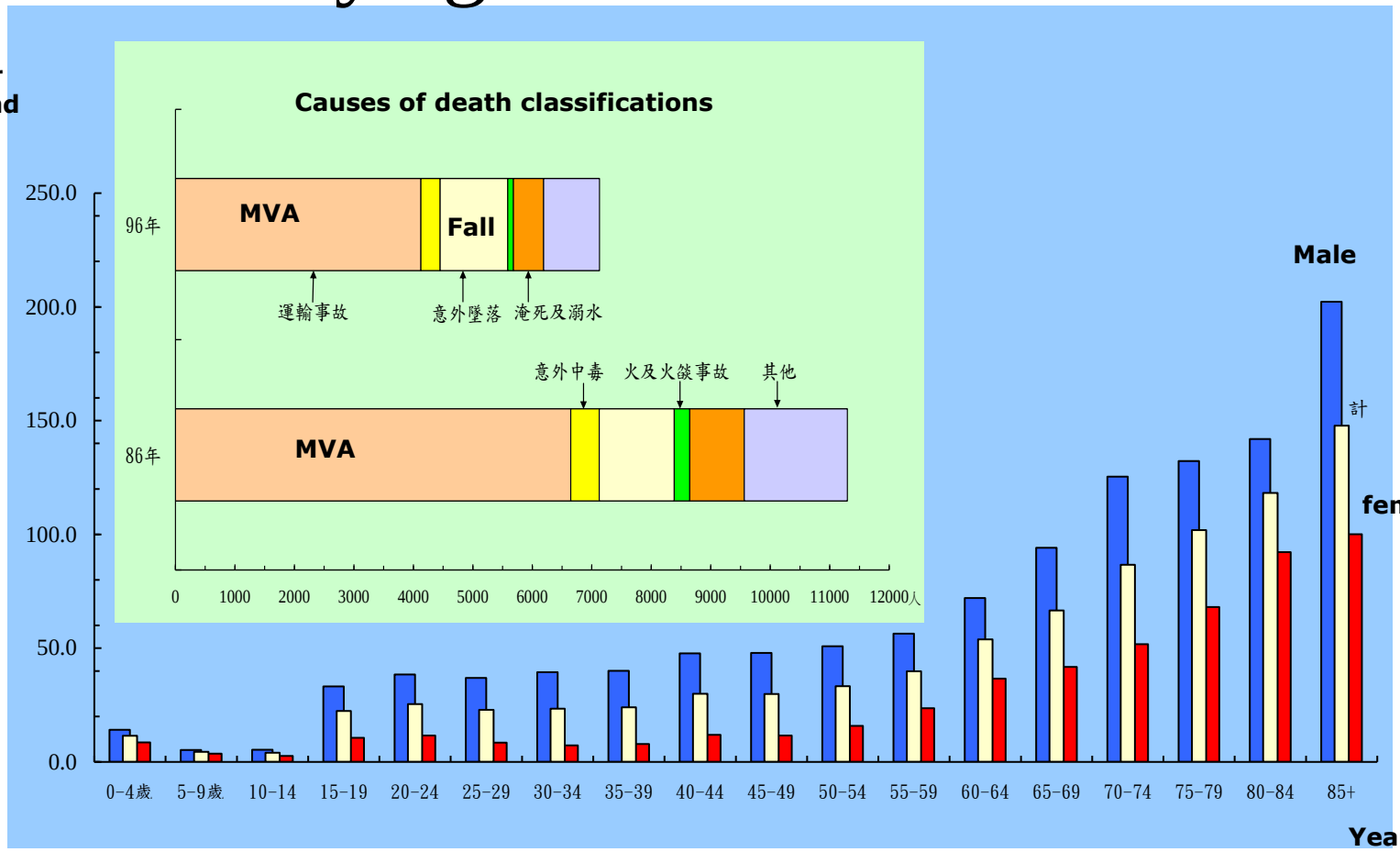
W-H chang

Department of Health, Executive Yuan, ROC Taiwan 2007

Elderly Trauma Causes

- Trauma is one of the leading causes of death in the elderly (Mistovich, Hafen and Karren, 2000).
  - The type of trauma seen most frequently is blunt trauma from falls, MVC's and pedestrians struck by motor vehicles.
- The changes that may increase the elderly person's susceptibility to injury include the following:
  - Slow reflexes;
  - Failing eyesight;
  - Hearing loss;
  - Arthritis;
  - Fragile skin, bones and blood vessels; and
  - Altered mental status.

The cases of death from accidents when stratified by age in 2007 in Taiwan



Outcome of Patients Requiring Intensive Care

Source	Period	No. of Pts	ICU	Age, y	Hospital Mortality, %
Campion[1]	1977-79	2693	MICU/ SICU	≤ 55 (32%) 55-64 (24%) 65-74 (23%) ≥ 75 (21%)	8.3 13.5 16.3
McLean[2]	1982-83	1018	MICU/ SICU	< 45 (16%) 46-64 (58%) ≥ 65 (26%)	12 12 34
Chelluri[3]	1990	97 (≥ 65 y)	MICU/ SICU	65-74 (43%) ≥ 75 (54%)	40 39

1. Campion EW. *JAMA* 1981;246:2052-56
2. McLean RF. *Crit Care Med* 1985;13:625-9
3. Chelluri L. *JAMA* 1993;269:3119-23

Risk considerations

- Mechanism risks
  - There is dangerous for generalized high energy mechanism of injury (*auto crash, fall from a height* etc.) or if the patient is unconscious. (Campbell, 2000).
  - There is dangerous for focused mechanism of injury suggesting an isolated injury (bullet wound to the lower leg, stab wound to the chest) (Campbell, 2000).
- Drug medication risks
  - Certain ***medications,*** such as, antihypertensives, anticoagulants, beta-blockers, and hypoglycemic agents may profoundly influence the physiological response of the geriatric patient to traumatic injury
- Group risks
  - Poor heath status, old older, bleeding tendency, immune compromised, live alone and communication problems
- Past/Medical History risks
  - Multiple chronic diseases and polypharmacy

Early Considerations

- Early assessment
  - Primary/Secondary survey
  - Victims risk considerations
  - Mechanism/organ injured patterns survey
  - Early diagnosis
  - Stable conditions ongoing monitoring
- Early treatment
  - Early immobilization
  - Early intervention
  - Early resuscitation
  - Adaptive referral/transportation

Geriatric Patients
Special Early Thinking

- Early in their series, one third of the patients who appeared "STABLE" in the resuscitation area with a "normal" blood pressure but died within 24 hours of cardiac arrest.
- Survival was improved in their experience by early survey and early (first 1-2 hours) aggressive, invasive monitoring.
  - Previously unsuspected states of hypo-perfusion were identified and reversed quickly!
  - Early recognize "oxygen debt ".
- Early Hemodynamic resuscitation may require the use of inotropes earlier after volume restoration.
- Early intubation and early ventilation will be required for oxygenation.
- The Early general surgical intervention can decrease the mortality and morbidity.

Geriatric Patient Assessment must be aware…

- Must take into account priorities, interventions, and life-threatening conditions more earlier.
- Must be acutely aware that geriatric patients can die from less severe injuries than younger patients.
- Must separate the effects of the aging process or chronic illness from the consequences of the injury.
- May not have the same response to pain, hypoxia, or hypovolemia as a younger person.
- May tolerate temperature extremes poorly to develop hypo/hyperthermia rapidly and re-warm is difficult
- ***DO NOT UNDERESTIMATE*** the severity of the patient's condition.

PE Special Considerations

- Peripheral pulses may be difficult to evaluate.
  - Check the carotid a. or femoral a.
- Distinguish between signs of chronic disease and those of an acute problem
- Geriatric patients may have nonpathologic rales (crackles found on chest auscultation).
  - New basal rales or more crackles may indicate early lung edematous change
- Dependent edema may be secondary to venous insufficiency with varicose veins or inactivity rather than congestive heart failure.
- Subsequent health care providers may attribute a deceased level of consciousness to a pre-existing condition rather than to trauma.

Elder Early Signs Survey

- Early Sign of mistreatment
  - signs of alcohol abuse, abuse, neglect or violence.
- Early Sign of occult trauma
  - Abdominal bleeding, rib fracture or femoral neck fracture
- Early Sign of consciousness disturbance
  - Psychological (Dementia, Delirium, depressed) or traumatic encephalopathy
- Early Sign of infection
  - Fever or leukocytosis
- Early Sign of hypoxia
  - Cyanosis or SOB
- Early Sign of shock
  - Dehydration, oliguria or hypotension

Early Assessment in the Elderly

-Quick Sonography

- FAST (Focused Abdominal Sonography Exam)
  - Focused ascites was noted before the clinical presentation and vital sign change, in the compensate stage in the blunt injury.
  - Pneumoperitonium- hallow organ perforation
- Cardiac
  - Tamponade or traumatic cadiomyopathy (wall hypokanesia)
  - Cardiac index- Pump or volume problems
- Chest
  - Pleural effusion or rib fracture
- Musculosketal lesion
  - Tenden rupture or soft tissue hematoma
- Vessel problems
  - Ischemia lesion or occlusion (PAOD)

Pitfall Considerations

- Underestimate
- Delay presentations
- Atypical symptoms/signs
- Occult trauma
- Brittle aorta
- Shearing mechanism
- Cause or result ?

Pitfall Considerations Underestimate and delay

- A common pitfall in the evaluation of the older patient following injury is the underestimate that "normal" blood pressure.
  - Blood pressure of 120mmHg may represent hypotension for a patient whose normal pre-injury blood pressure was 170-180 mmHg.
- With the limited ability to increase heart rate, significant blood volume loss may be masked by the absence of tachycardia early in the course, or even hypotension, whose onset may be delayed.
- Elevated peripheral vascular resistance may limit cardiac output and thus underestimate peripheral and coronary oxygen inadequate delivery.

Pitfall Considerations
Atypical symptoms

- SDH may be lack of headache and signs of IICP in elderly head injury and could delay onset than younger group.
- The elderly usually have the absence of complications of fever, leukocytosis of the inflammatory response after trauma.
- Reliance on the abdominal examination will often lead to missed abdominal injuries. The abdominal exam in elderly patients is not typical.
- Blunt aortic injury may occur in the elderly in the absence of conventional signs or symptoms.
- Stroke, myocardial infarction, or seizures may result in falls or motor vehicle crashes, which delayed diagnosis of the principal underlying problem.

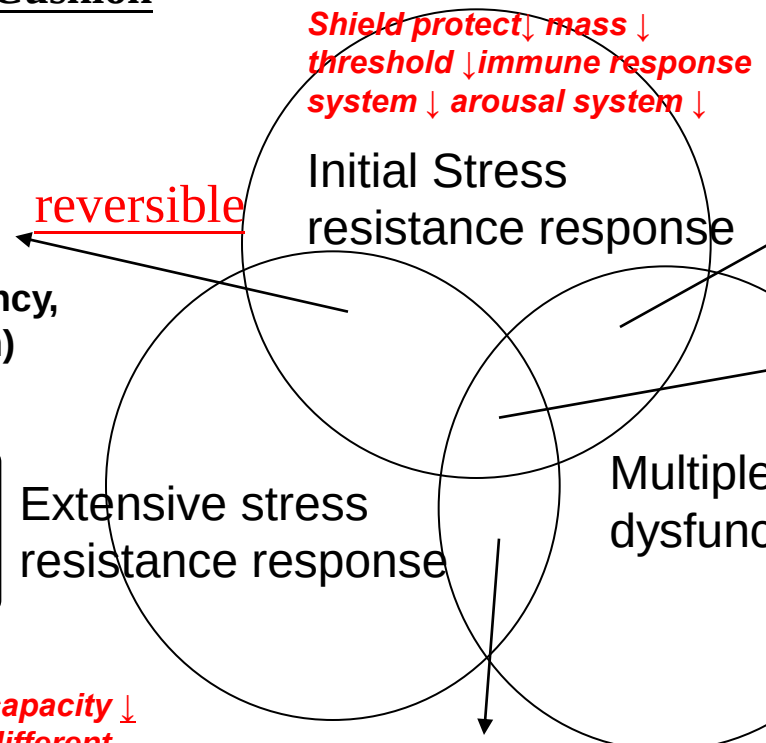
Pitfall Considerations

Occult Trauma

- Occult Blood Loss
  - Blood loss into soft tissue spaces, including subcutaneous / retroperitoneal areas, may be excessive and is often overlooked.
- Brittle Bones
  - Bones of osteoporosis in the elderly are brittle, including the hip, chin, rib, the pelvis bone fracture and femoral neck fracture…. Initial x-ray can be normal.
- Mistreatment
  - Abuse or violence is relatively common and often unreported and undiagnosed

Pathophysiology Considerations

Stress Response Cushion



Shield protect↓ mass ↓ threshold ↓immune response system ↓ arousal system ↓

Delayed response in elder- storm-eye phenomenon

reversible

Tissue perfusion impairment (hypoxia, circulation insufficiency, incomplete perfusion)

CARS (capacity-assist relieved strain)-elasticity, flexibility, strengthen endurance limit

↓

MARS (modulation- relaxed strain)- tension, fatigue, load relaxation <multiple, mixed, maximum, modulate>

Organ function ↓ Physical capacity ↓ (CVS/IMS/MSS/RS/MS/NS) different yield stress load ↓react response ↓immune supply ability ↓ transport ability ↓ integration reserve ↓ metabolic compensate ↓

Multiple organs damage (Major trauma , high energy trauma)

failure

Multiple organs failure

Organ regeneration ↓ preexisting problems↑ recovery or repair ability ↓

Plastic deformity region-hemodynamic collapse (severe hypotension, shock)

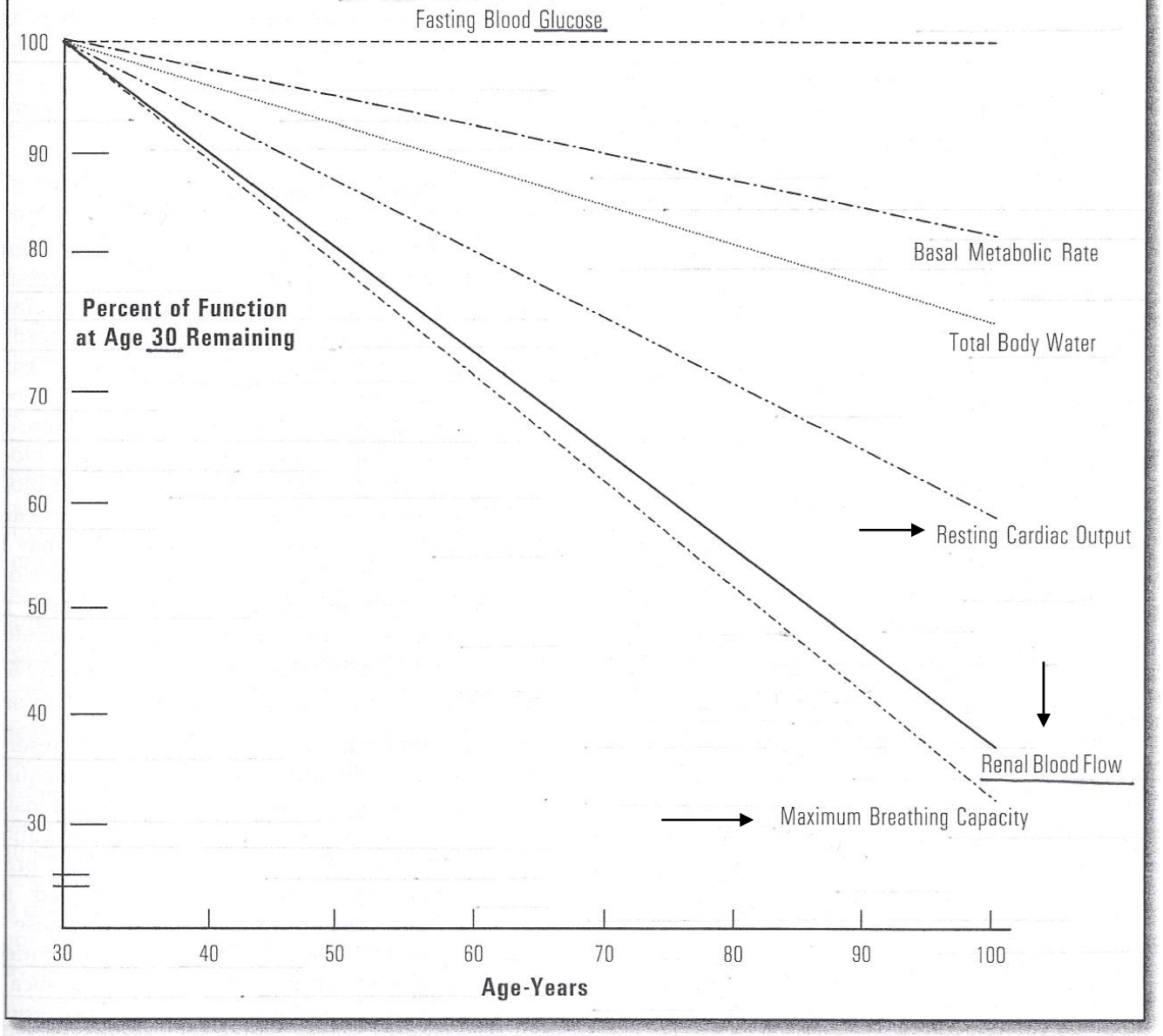
irreversible

易引起骨牌效應

Pathophysiology considerations

- Distinguish between signs of trauma stress and those of an aging problem
  - Cardiovascular system
  - Pulmonary system
  - Renal system
  - Central nervous system
  - Musculoskeletal system
  - Immune system

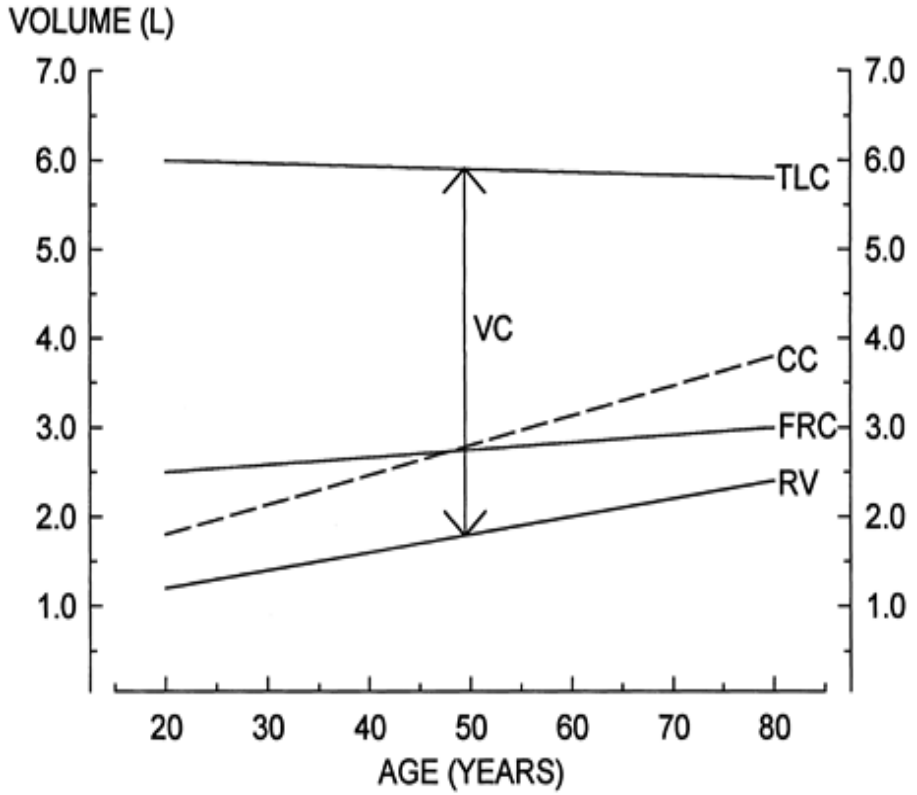
FIGURE 1
Effects of Aging on Organ Systems



Steady decline in function in organ systems is noted during aging. Data are expressed as percentages of the volume observed at 30 years of age. (Reprinted with permission from Shock NW, The physiology of aging. In: Powers JH (ed): *Surgery of the Aged and Debilitated Patient*. Philadelphia, WB Saunders, 1968, Figure 1-16.)

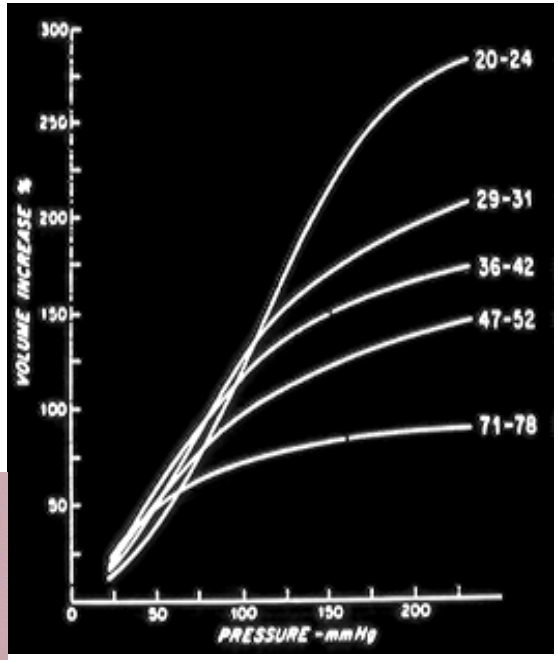
Pathophysiology Considerations Respiratory system

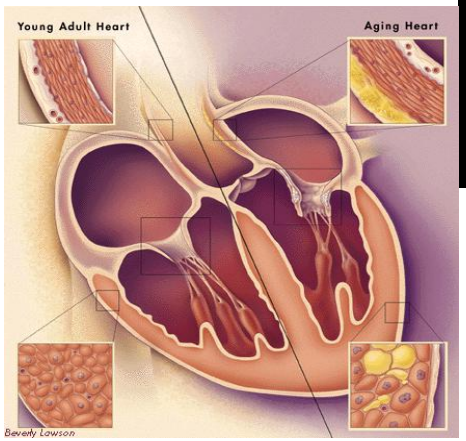
- Anatomic change
  - ↑Thoracic stiffness
  - ↓Lung recoil
  - ↓Alveolar surface area
- Functional change
  - ↓Vital capacity / ↑FRC
  - ↓FEV1
  - Impaired efficiency of gas exchange
- Stress loading change
  - ↑Complications
  - ↑Mortality causes



Pathophysiology Considerations Cardiovascular system

- Anatomic change
  - ↓Elasticity
  - ↓ β-adrenergic responsiveness
  - Coronary artery narrowing
- Functional change
  - ↓ Cardiac and arterial compliance
  - ↓ Maximal heart rate
  - ↓ Cardiac output
- Stress loading change
  - ↓ HR responsiveness
  - ↓ Hormonal mediators
  - ↓ Cells responsiveness

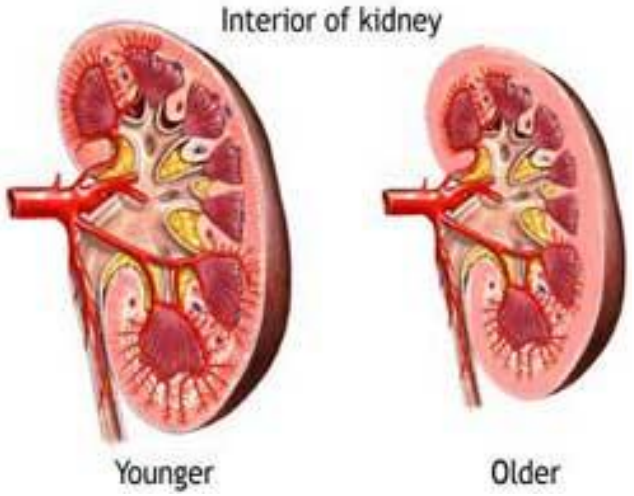




"Loss of distensibility and elasticity in the large capacitance vessels"

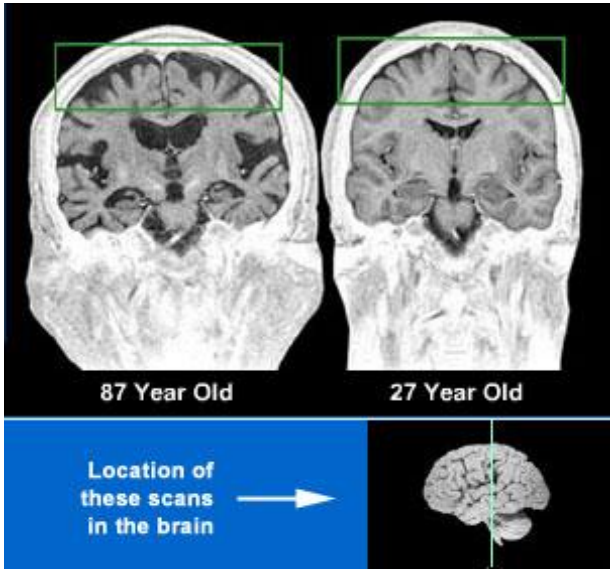
Pathophysiology Considerations Renal system

- Anatomic change
  - ↓vascularity and perfusion
  - Loss of tissue mass
  - Basic membrane thickness
- Functional change
  - 80 y/o – GFR ↓45%
  - ↓Drug clearance
  - Inability to withstand salt or water loads
- Stress loading change
  - ↑Ischemic change
  - ↑Potential nephrotoxic
  - ↓Therapy window



Pathophysiology Considerations Nervous system

- Anatomic change
  - Loss of neuronal tissue mass
    - ↓ 10% at 70years old
  - ↓ Central neurotransmitter activity
  - ↑ Ventricular space
- Functional change
  - ↓ Neural plasticity
  - ↓ Anesthetic requirement
  - Impaired autonomic homeostasis
  - ↓BBB
- Stress loading change
  - ↑Space occupancy
  - ↑Disability
  - ↑Degeneration ; ↑Demyelinization



Pathophysiology Considerations Musculoskeletal system

- Anatomic change
  - ↓Body muscle mass
    - >25 ↓4%/y; >50 ↓ 10%/y
  - ↓ 35% growth factors
  - ↓ Strengthen
- Functional change
  - Articular cartilage shorter
  - ↑Subcondral bone density
  - ↑ Proteoglycans
  - Osteoporosis
- Stress loading change
  - Deterioration of tendon, ligament and joint
  - ↓Intervertebral disc
  - ↑Degeneration
  - ↓Capsular fluids

Pathophysiology Considerations Immune system

- Anatomic change
  - >50 years↓15% Tymic tissue
  - ↑ killer cells
  - ↓ IL-1 ↓ interferon
- Functional change
  - ↓ cytotoxin activity
  - ↓ T cell activity ↓B cell activity
  - ↑ antibody confuse
- Stress loading change
  - ↑ response time
  - ↓ antibody response
  - ↓ immune complex

Resuscitation considerations

Introduction

- Dilemmas in decision-making about resuscitation
  - The factors guiding resuscitation decision-making are
    - 1) Quality of life (pre-existed medical condition, physical preserve, age and complications, ABE, GCS and injured scores), and
    - 2) The involvement of others (ethics, mechanism, doctors and families) versus loss of autonomy.
- Kvale JN concerns about quality of life and the cost of elder CPR efforts
  - Cost based on charges for intensive care total over $100,000
- Morse WI pointed out
  - CPR was rarely effective for those elderly with cardiopulmonary arrest that had occurred out of hospital, was unwitnessed or was associated with asystole or electromechanical dissociation.

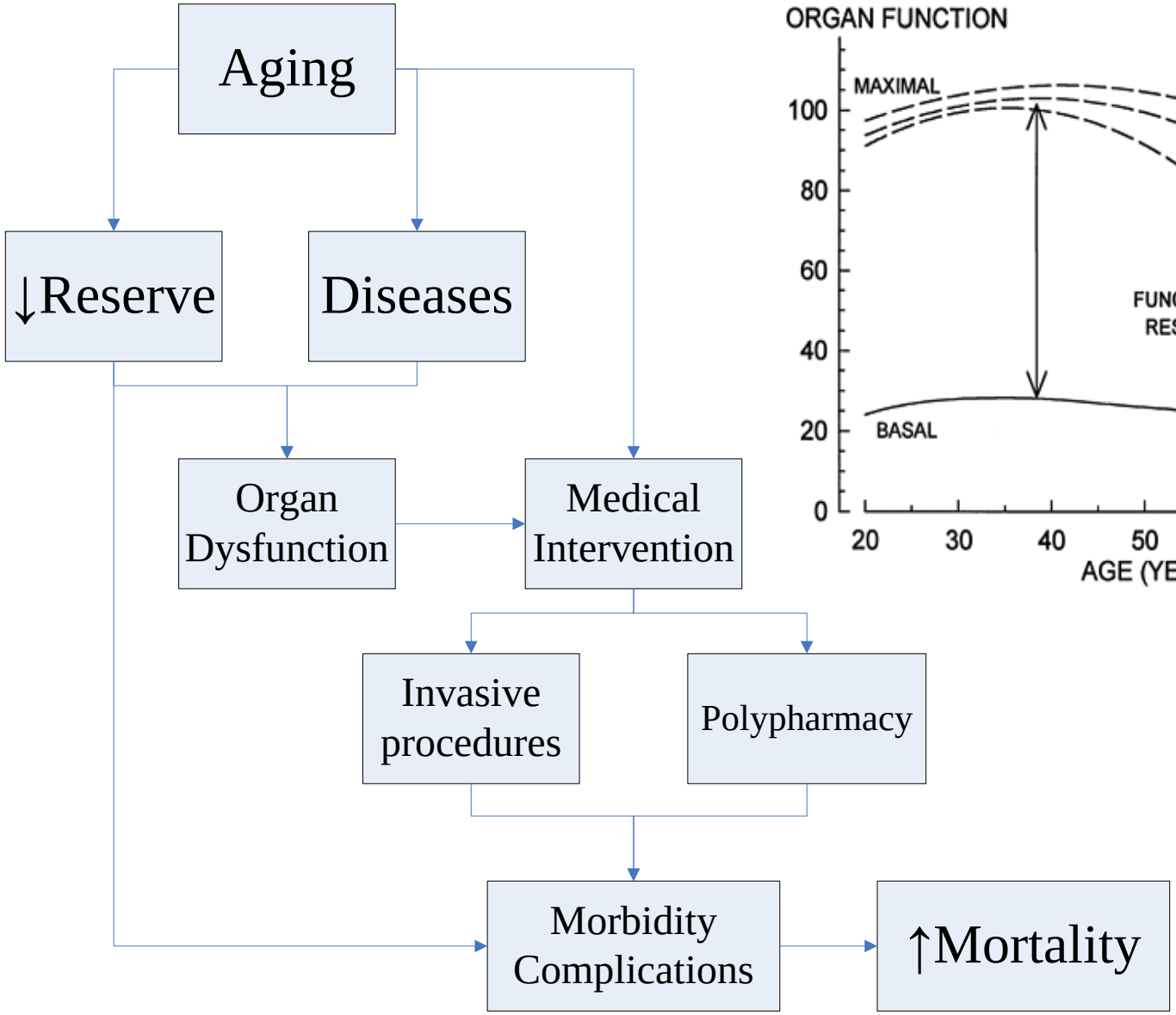
Resuscitation considerations Physical Reserves and Mortality

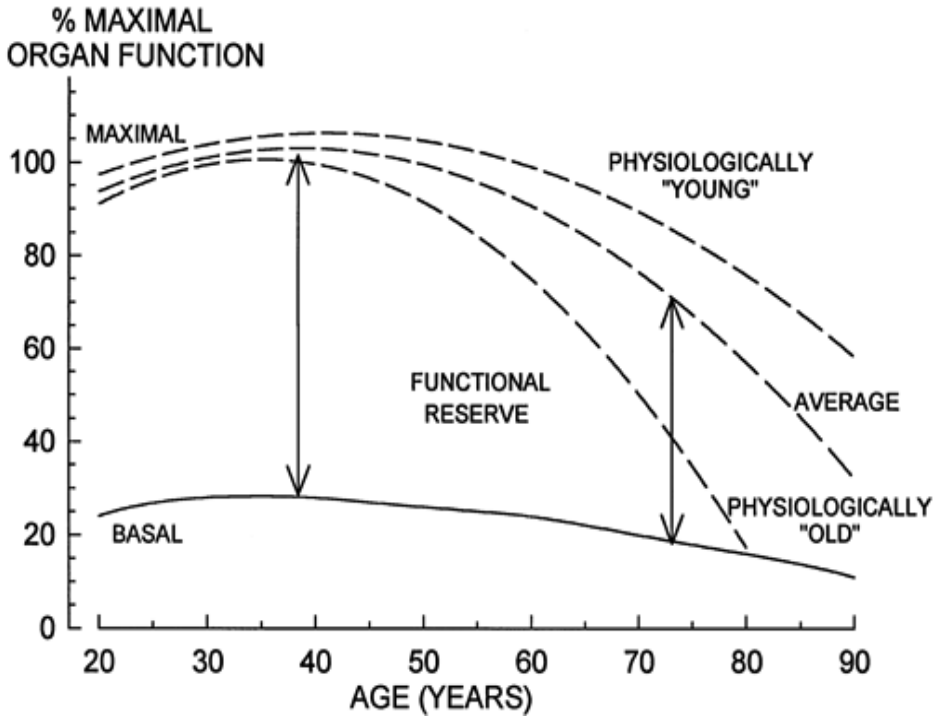
- Perdue PW and Finelli FC
  - Mortality may be caused by the decreased physiologic reserves that accompany aging, with a higher incidence of pre-existing medical problems in the geriatric patient.
- Horst HM and Van Aalst JA reported that
  - Shock in the elderly was easy to under-compensate, which leads to inadequate oxygen delivery, creating an **"oxygen debt** ".
- Fairman R found
  - Elderly patients cannot handle the load that the stress of the injury than their younger counterparts, especially in relation to their cardiopulmonary system.
- Scalea et al. found that
  - There was significantly different mortality rates between severely elderly trauma patients with and without lower cardiac outputs and higher peripheral vascular resistances.

Resuscitation considerations Mechanism and Mortality

- DeMaria E reported
  - The slip-and-fall and pedestrians – vehicle accidents are the most reasons for elder trauma patients.
  - Beside the slip-and-fall injuries, the overall mortality rate in the elderly was 18.1%.
- Zietlow et al. also found that
  - In 1931 trauma patients, with a 23% mortality rate in that group, linked to falls (59%) and motor vehicle crashes (36%) which were the predominant causes of injury.
- Finelli et al. demonstrated
  - 46% of the elderly patients had simple falls, resulting in a mortality rate of only 11.7%, compared with a 33% mortality rate after pedestrians were struck, and a 21% mortality rate after motor vehicle crashes.

Resuscitation considerations





Resuscitation considerations

Age and Mortality

- Morris et al in 1990.
  - The mortality from minor injury (ISS <9) begins to increase beyond the age of 65
- Pelicane et al demonstrated
  - Age greater than or equal to 65 years had a poor outcome if death occurred within 24 or 48 hours of injury, prior to ICU or hospital discharge and at three or four years post injury
- Knudson et al reported
  - 1.33-fold increased risk of death associated with age status greater than 75 years.
- Battistella et al in 1998
  - Age greater than *75*, associated mortality was 23%

Resuscitation considerations

Age and Mortality

- Van der Sluis CK A
  - Age was a significant predictor to identify late mortality.
- Perdue PW et al
  - Age was significantly predictive of both early (<24 hours) and late (>24 hours) mortality.
  - Elderly trauma was associated with a 2.46-fold increased likelihood of early mortality, versus a 4.64-fold increased risk of late mortality.
- Van Aalst et al
  - A poor outcome was particularly significant in the 75.5 years and over group, after following blunt geriatric trauma patients for 3 years.

Resuscitation considerations Pre-Existing Conditions (PEC's) and Mortality

- Morris et al. in 1990
  - The effect of PECs on mortality became less important in patients over the age of 65
- Gubler found that
  - Patients with PEC's were anywhere between 2.0 and 8.4 times as likely to die within five years of injury compared to those without PEC's depending upon the number and severity of PEC's.
- Milzman et al. reported
  - the mortality rates of elderly trauma patients with pre-existing disease aged 65 to 74 years, and 75 years and older, were 13.9% and 30.1%, compared with 11.1% and 27.9% for patients without pre-existing disease.

Resuscitation considerations Arterial Base Deficit, Lactate and Mortality

- Davis JW showed
  - Arterial base deficit was helpful to detect the content of shock to the adequacy of resuscitation in elderly trauma patients.
  - Elderly patients with severe base deficits (over –10) had a high mortality of 80% versus 60% in patients with (-6 to –9). Even a "normal" (2 to -2) carried a mortality rate of 24%.
- McNelis J
  - An elevated serum lactate level has also been implicated in occult hypo-perfusion and the rate of clearance directly correlates with mortality.
- Schulman AM
  - Elderly patients are less able to compensate for occult hypo-perfusion.
  - The presence of a lactic acidemia level of more than 22 mg/dL (>2.4 mmol/L) for longer than 12 hours is associated with an increased mortality.

Resuscitation considerations Injury Scoring and Mortality

- Horst H, Oreskovich MR and DeMaria E reported
  - Injury Severity Scores are useful in predicting mortality in young patients, but they have not been as effective in the elderly population.
- DeMaria E indicated that
  - Predicted mortality was strongly associated with the Injury Severity Score and other factors.
  - The mortality rate for elderly trauma patients with an ISS > 18 was 37%, compared with only 4% in patients with an ISS <or=to 18. ISS>24 were most likely to expire and more ICU days in elderly.
- Van der Sluis CK reported
  - No elderly patient with an ISS greater than or equal to 50 survived.
- Carrillo, published in 1994 found
  - Elderly trauma mortality correlated well with both APACHE II and ISS, better than with APACHE II or ISS alone.

Resuscitation considerations

Complications and Mortality

- DeMaria EJ and Osler T reported that
  - higher mortality cases had a higher incidence of cardiac and septic complications and respiratory complications in elderly trauma patients
- Smith JS showed
  - 5.4% mortality rate for those patients with no complications, 8.6% for those with one complication, and 30% for those with more than one complication.
- Pellicane JV demonstrated that
  - it is actually of importance to decrease complications, which contributed to mortality in 32% of all deaths.
  - 62% of deaths were related to multiple organ systems failure.

Resuscitation considerations GCS and Mortality from Head Injury

- Penning JL found
  - the GCS scores of elderly patients with head injuries were usually down to delays, and attributed the underestimation of the risk of severity.
- Vollmer DG
  - Mortality rate with severe brain injuries in younger patients with a GCS <8 was 38%, but was 80% for older patients. (>55 ys)
- Reuter F reported
  - There is an 87% mortality rate in elderly patients (age > 60) with traumatic intracranial hemorrhage and GCS < 8.
- Zietlow, Rozelle and Van Aalst all reported elderly patients with multi-system injuries and found
  - a GCS < 8 or 7 to be the predictor of mortality.

Resuscitation considerations GCS and Mortality from Head Injury

- Cagetti's studies found that
  - Almost 100% mortality for head injured elderly patients (>80 ys) with a GCS < 11.
- Kotwica Z reported that
  - 90% mortality rate for head injured elderly patients (>70 ys) with a GCS < 9.
- Amacher AL studied that
  - Poor outcome for head-injured patients (>80 ys) with "low" GCS scores in the range of 3 to 6.
- Ross noted
  - Nearly 100% six month trauma mortality rate in elderly with persistent GCS < 8 at 72 hours following admission.

Resuscitation considerations Ethics, Aggressiveness treatment and Mortality

- Harbrecht BG noted that
  - Elderly patients had higher mortality rates for both operative and non-operative management of splenic injuries.
- Tornetta P, et al found
  - To make decisions aggressively to give general surgery rapidly for elderly trauma patients decreases their mortality.
  - There are circumstances when the need for aggressive treatment for elderly trauma patients is delayed, as the physician and patient, or family member(s), may hesitate and reject this type of treatment.
  - Most of them may choose only vital support for the reasons of age in the patient.

Resuscitation considerations Ethics, Aggressiveness treatment and Mortality

- Demetriades D reported
  - Outcomes in elderly trauma can be maximized by a more aggressive approach, rather than one which is expectant.
  - There exists good outcome benefits from early diagnosis and decisions, where the physicians have the ability to diagnose and manage the injury for the elderly trauma patients quickly.
  - Survival was improved, in their experience, by early (the first 1-2 hours) aggressive, and invasive monitoring.
- Godley CD showed that
  - Advanced age alone should not be the reason to abandon the chance of an operation for any injury.

Resuscitation considerations Ethics, Aggressiveness treatment and Mortality

- Albrecht reported
  - A high failure rate of 33% in elderly patients, who received the non-operative method.
- Tsugawa K found
  - An increased splenic fragility and their decreased physiologic reserves associated with their advanced age and had higher mortality.
- Peitzman AB and Harbrecht BG all populated that
  - Successful non-operative management of blunt splenic injuries could be predicted by hemodynamic stability, grade of splenic injury, and Glasgow Coma Score, but never in regard to patient age.

Resuscitation considerations

Advanced Geriatric Life Support

A	Difficult airway Denture
B	Flail chest without evident signs Pain control for multiple ribs fracture (Epidural analgesia) Early intubation and ventilator
C	Reliable sign of shock? (Limited reserve, complex medication) Poor tolerance to blood loss Early blood transfusion to improve O_2 delivery
D	EDH rare and SDH 3~4 × young age
E	Environmental emergency and Hypothermia Early assessment and treatment
F	Early fluid resuscitation and aggressive hemodynamic monitoring Fall down survey
G	Geriatric considerations General conditions evaluate

Resuscitation considerations

Airway and breathing

- Anatomy and functional changes
  - Mouth opening limited
  - Dentures and bridges
  - An edentulous airway, the seal may be hard to mouth-to-mask procedures.
  - Motion of C-spine limited, forced extension can result in atlanto-occipital subluxation. .. Emerg Med Clin N Am 2006;24:261-272
  - Poor oral conditions: periodontal diseases, oral manifestations of systemic diseases and smoking
- More intubation complications

Resuscitation considerations Endotracheal Intubation

- Complications
  - Soft tissue trauma/bleeding
  - Dental injury
  - Laryngeal edema
  - Laryngospasm
  - Vocal cord injury
  - Barotrauma
  - Hypoxia
  - Aspiration
  - Esophageal intubation
  - Mainstem bronchus intubation
  - Nosocomial pneumonia

Resuscitation considerations

Airway and breathing

- Adequate oxygenation
  - Laryngeal mask airway or Lighted stylets should be provided for difficult airway
  - Higher respiratory rate with tidal volumes 6 to 8 mL/kg should be given
- Mechanical ventilation
  - Weaning from ventilator is very difficult; but Weaning should not be the reason for delay intubation.
- Rapid Sequence Intubation
  - BZD and etomidate should be reduced 20 to 40%
  - Neuromuscular block agents should not be reduced.

Resuscitation considerations Circulation

- Evaluation
  - Palpate a carotid pulse, carotid artery lesions
  - Femoral pulse is a reasonable alternative
  - Multiple small （250ml）fluid boluses with repeated reassessment
  - Central line or pulmonary catheter
  - Normal vital sign may still have significant tissue hypoperfusion
- Chest compression
  - less effective due to underlying valvular dysfunction
  - Injury to ribs, sternum, heart, great vessels, lung, liver, upper GI tract
  - Dorsal kyphosis

Resuscitation considerations

Hemodynamic goal directed therapy

- Hypovolume or Sepsis induce *hypoperfusion* during the first 6 hrs of resuscitation
  - CVP of 8–12 mmHg, MAP of 65mmHg, Urine output of 0.5mL/kg/hr
  - Central venous (superior vena cava) (ScvO2) saturation of 70%.
- High-risk elective surgery, severe trauma, and septic shock
  - Transfuse packed RBCs to achieve a Hct of > 30% or administer a dobutamine infusion (up to a maximum of 20g/kg/min) to achieve this goal.
  - Therapeutic goals were CI > 4.5 L/min m2, PAWP < 18, DO2 > 600 mL/min m2 , Oxygen consumption > 170 mL/min m2.
- *Early Interventions fluids* first then inotropes if hemodynamic targets were not achieved.

Resuscitation considerations
Drug and Medications

- Drug interactions are frequently
- Side effects are common due to the very narrow therapeutic window in the elderly.
- Adverse reaction to some medications may even contribute to the injury producing event.
- ALS drugs during resuscitation do not require modification in the elderly.
- The elderly are susceptible to hypomagnesiumia
  - Poor daily intake, diuretic, malabsorption, diabetes
  - Cardiac arrhythmias, sudden cardiac death

Resuscitation considerations Drug Adverse Reaction

- Beta-adrenergic blocking agents may limit chronotropic activity.
- Calcium channel blockers may prevent peripheral vasoconstriction and contribute to hypotension.
- Non-steroidal anti-inflammatory agents may contribute to blood loss due to the adverse effects on platelet function.
- Steroids and other drugs may further reduce the inflammatory response.
- Chronic anticoagulant use may increase blood loss.
- Chronic diuretic ingestion may render the elderly patient chronically dehydrated and with total body deficits of potassium and sodium.

Conclusions

- Increasing age moves an elderly trauma patient into a higher-risk category.
- Elderly patients have higher complications and mortality rates than their younger counterparts if they sustained major trauma.
- Although advanced age is a risk factor for poor outcomes in trauma patients, better outcomes in elderly trauma patients can be improved by experienced physician with the special considerations of early diagnosis, intensive monitoring, aggressive management, and comprehensive care provided by the experienced trauma team.

台灣老人常見急重症與面臨問題

問題思考與課程大綱

- 現階段人口結構對老人急重症的演變為何?
- 老人急重症對醫療給付發展趨勢?
- 老人老化引起急症有那些特點?
  - 憂鬱症 尿失禁 痴呆心智 跌倒 臥床　藥物使用
- 環境中影響老年人之危險因子?
- 老人有那些常見致命急症?重症?
  - 中風 心血管急症 消化道出血 腎衰竭 肺炎與COPD
- 老人常見保健之道?

台灣地區未來人口結構推估

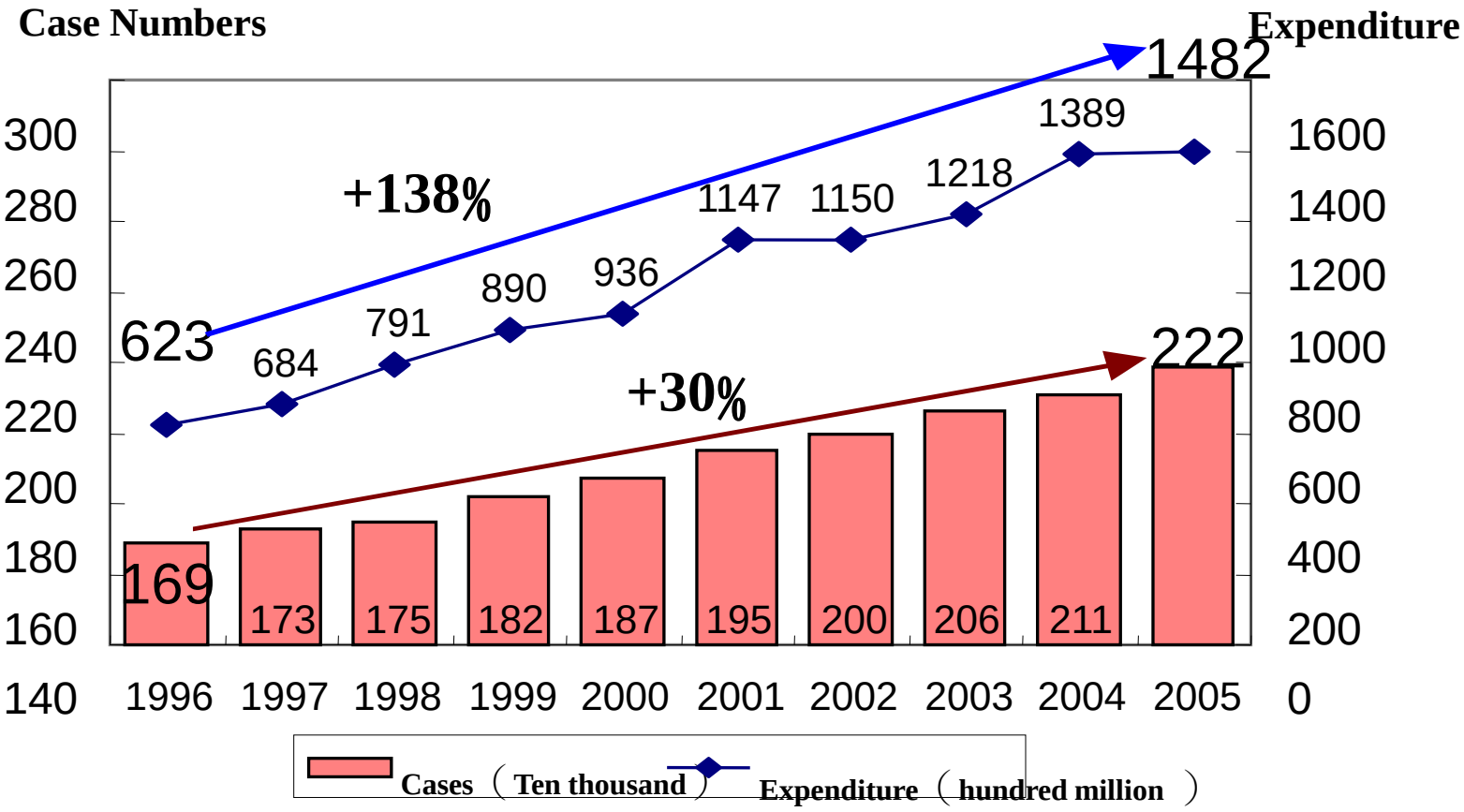
資料來源 衛生署

項　　目		90 年	100 年	110 年	120 年	130 年	140 年
人　數（千人）	0--14 歲	4,779	4,800	4,584	4,370	4,477	4,320
	15--64 歲	15,709	16,867	16,839	16,170	15,458	14,825
	65+歲	1,971	2,390	3,585	5,028	5,720	5,999
占總人口百分比	0--14 歲 （1）	21.3	20.0	18.3	17.1	17.5	17.2
	15--64 歲（2）	69.9	70.1	67.3	63.2	60.3	59.0
	65+歲 （3）	8.8	9.9	14.3	19.7	22.3	23.9
幼年人口扶養比（1）/（2）%		**30.4**	**28.5**	**27.2**	**27.0**	**29.0**	**29.1**
老年人口扶養比（3）/（2）%		**12.5**	**14.2**	**21.3**	**31.1**	**37.0**	**40.5**
百歲人瑞	男（人）	281	512	1,059	1,702	1,651	2,386
	女（人）	601	1,706	3,129	5,385	7,688	12,034

1. 老急重醫療資源使用逐年增加，由15-64歲之保險無法負荷全部醫療給付，健保收入嚴重休克

2. 倒金字塔結構與壽命延長，醫術進步，癌症已非絕症，使得老急重醫療(心梗塞 出血中風 外傷 感染)更為重要

The case numbers and expenditure for elderly in recent years in Taiwan



2000年長期照護需求概況

資料來源 衛生署

失能程度	人數	比例
輕度	117,005	40.9
中度	55,785	19.5
重度	70,947	24.8
極重度	42,340	14.8
合計	286,077	100.0
未滿15歲	14,802	5.2
15-44歲	45,704	16.0
44-64歲	53,219	18.6
65歲以上	172,352	60.2

1.以老人急重處理為優先機構者，需優先培育(含無礙環境 安全指標 低感染 完整復健各科整合照護計劃 老人用藥標準 飲食 高關注數位監測 身心靈活動 特殊急救 後送醫療鏈 完善資金規劃等)2.探討老人急重輕度失能 回歸社會體系之可行性 減輕未來社會負荷

離島高齡化的問題

- 年輕人到本島工作造成老化比例增加
  - 老化的過程以 50-60 歲最快
- 逐漸老化醫療問題浮現
  - 緊急醫療資源分配不均
  - 重大急重症需依賴本島支援
- 老化產生社會問題
  - 在於如何不與社會脫節
  - 社會也需配合高齡化而調整，鼓勵適合中老年人的活動

老年老化與疾病鑑別

項目	老化現象		疾病現象	
整體	脂肪增加	全身水份降低	肥胖	厭食症
	肌肉質量改變			
感覺系統	老花眼	眼力減低	眼失明	耳失聰
	白內障			
內分泌系統	血糖增加	ADH增加	糖尿病	甲狀腺失調
	甲狀腺素、睪丸酮製造減少		骨骼酥鬆	性功能喪失
呼吸系統	肺彈性下降	胸部硬度減低	氣喘	低血氧
心臟系統	動脈彈性下降	收縮壓增加	昏厥	心律不整
腸胃系統	肝功能下降	胃酸度下降	肝硬化	便祕
	腸蠕動減低	腸胃吸收減低	骨骼酥鬆	維生素缺乏
	擴約肌鬆弛		大小便失禁	
免疫系統	抗體增加	T細胞下降	貧血	免疫性疾病
腎臟系統	絲球體灌流下降		肌肝酸增加	鈉下降
泌尿系統	黏膜萎縮		尿道炎	尿失禁
	前列腺腫大		尿儲留	
肌骨系統	骨隔密度降低	肌肉組織改變	肌功能減低	關節炎
神經系統	腦部萎縮		老年性癡呆	瞻妄
			憂鬱症	巴金氏症
			跌倒	

老化速度的差異

- 遺傳因子
  - 個人在同一個年齡所表現的器官功能不一樣。
- 外界環境
  - 任何系統功能的突然喪失，代表一種疾病的產生而不是正常的老化。
- 個人習慣
  - 正常老化的速度可能藉由危險因子產生而加速
    - (如：高血壓、抽煙、長時間工作而不運動)
  - 不良習慣造成慢性病而引發急重症發生

預期生命與安全保障餘年

（單位：年）

年齡	預期生命		安全保障餘年	
	男	女	男	女
65-69	13	20	9	11
70-74	12	16	8	8
75-79	10	13	7	7
80-84	7	10	5	5
>85	7	8	3	3

*安全保障餘年：預期能夠自我照顧所餘之年數

老年急重症的特點(1)

- 疾病的產生對於老年人的身體器官很容易造成損害
  - 特別是事前已經生理或病理功能上已經改變的器官，其疾病的表現也是不典型的。
- 甲狀腺功能亢進
  - 腫塊(Goiter)、顫抖、突眼症
  - 心房振動、全身虛弱、昏厥、心智紊亂、憂鬱
- 腦部、泌尿、骨骼肌肉與心臟血管系統

老年急重症的特點(2)

- 身體上的潛能下降，老年人所表現與疾病發作的初期非常的雷同
  - 心臟衰竭與甲狀腺功能亢進
  - 認知機能與老年性癡呆
  - 尿儲留與前列腺腫大
  - 非酮酸性高血糖與血糖耐受性失常

老年急重症的特點(3)

- 常造成日後生理上的平衡破壞，而越來越難適應生活
  - 老年性癡呆所造成認知力的偏差
    - 憂鬱症
  - 器質老化傷害
    - 聽力與視力的障礙
    - 心臟衰竭
    - 電解質不平衡
    - 尿失禁
    - 便秘
    - 吃藥(利尿劑)或多種藥

老年急重症的特點(4)

- 有些藥物在年輕人身上不會產生副作用的情形，在老年人身上則會。
  - 抗組織銨造成心智紊亂
  - 利尿劑造成尿失禁
  - 毛地黃引發憂鬱症
  - 神經興奮劑引起尿存留與前列腺阻塞尿道

老年急重症的特點(5)
-- 發生較多在老人身上之問題

- 年輕人不常見疾病在老年人卻是非常普通，不可以停止找尋疾病的感染源
  - 菌尿症
  - 早期心房收縮
  - 骨質密度酥鬆
  - 糖耐受性失常
  - 膀胱收縮抑制
  - 貧血
  - 3D:憂鬱狀態、譫罔、痴呆

常見一般老年人急診問題

- 中風
- 心血管急症
  - 高血壓 心肌梗塞
- 胃腸出血
- 腎衰竭
- 肺部急症
  - 肺炎 住加護 插管
- 感染與敗血

老年急重症診治陷阱(1)

- 老年人的所表現的症狀為許多原因所造成，因此平常所用的一些診斷的原則無法使用。
  - 發燒敗血
  - 貧血休克
  - 心臟雜音
  - 四肢水腫
  - 意識改變

老年急重症診治陷阱(2)

- 老年人即使輕微急症，也會引起致命的問題。
  - 潛在傷害
  - 免疫不全
  - 慢性病史
  - 生理負荷不良
  - 多器官功能障礙
  - 老化反應鈍化

老人急重症病患照護特性

- 疾病複雜程度高

1.檢查種類、項目多

2.治療繁瑣

3.用藥項目品項多

4.醫療監視儀器多

5.侵入性裝置管路多

- 老化問題加重照護安全需求

1.知覺感覺改變

2.應付壓力能力降低

3.溝通表達能力障礙

4.自我保護能力降低

一般老年老化問題的處理

智能損傷引起急重情形

- 第一個重要的步驟即是找尋並立即改正所有可能影響認知上損傷的原因
  - 環境危機的因子 (例如：忘了關爐子、到外遊走、迷失等)
  - 不良生活方式
  - 多種藥物副作用
  - 獨居失能
- 社區的服務也必須介入，幫忙家屬面對問題
- 突如其來的崩潰症狀則須要去了解其中是否為疾病或藥物的原因
  - 自殺防治
  - 暴力事件

一般老年老化問題的處理

精神急症-憂鬱症

- 老年人的憂鬱症約佔5%左右，但經常被忽視
- 憂鬱症會伴隨疾病、喪親之痛、缺乏社交支持或轉入安養院、具有精神病史而產生
- 憂鬱症的診斷
  - 診斷標準(見以下)
  - 家屬憂鬱症的病史
  - 抗憂鬱症藥物有反應之上
- 任何老年人的憂鬱症經常是隨著藥物使用與全身性疾病而產生

一般老年老化問題的處理

憂鬱症

- 診斷的確立須要連續二週情緒低落期再加上以下八種症狀中的四種。
  - 睡眠失常(Sleeping disturbance)
  - 缺乏興趣(Lack of interest)
  - 罪惡感(Feeling of guilt)
  - 缺乏活力(Decreased energy)
  - 注意力不集中(Decreased concentration)
  - 食欲不振(Decreased appetite)
  - 情緒激動或延遲(Psychomotor agitation/retardation)
  - 自殺傾向(Suicide ideation)

一般老年老化問題的處理

排泄急症-尿失禁或多尿 解尿困難 血尿

- 排尿的控制須要適當的活動、心理狀態、刺激、手部纖細的動作和整體性的控制下泌尿道來共同完成。
- 尿失禁分為暫時性的尿失禁與建立診斷的尿失禁
- 常見的尿失禁有便祕・過度排尿・限制活動・藥物使用・心理因素・感染・譫妄・尿道萎縮・尿道阻塞・尿道不全・排出肌過度活動或活動太少等
  - 膀胱排出肌過度活動所造成的尿失禁約佔所有兩性的老年性尿失禁的三分之二
    - 女性→不經過應力性動作尿存留
    - 男性→膀胱排出肌過度活動經常伴隨尿道阻塞
- 行為療法；當病人清醒且有尿意時，病人每隔一至二小時須要被提醒去上廁所，以壓制頻尿症狀的發生
- 使用尿片而不要使用尿管插入法，以減少感染

尿失禁常見的原因

暫時性	永久性
譫妄/心智紊亂	膀胱排出肌過度活動
感染	膀胱排出肌活動度減低
萎縮的尿道/陰道炎	尿道阻塞
藥物造成	尿道不全
心理因素(憂鬱症)	
過度排尿(充血性心臟病)	
限制活動	
便泌	

一般老年老化問題的處理

解尿困難

- 可能是來自於腫瘤、膀胱結石、或其他附近器官的發炎延伸
  - 攝護腺腫大 發炎
  - 尿阻塞
- 治療的基本原則是
  - 超音波確認餘尿
  - 膀胱功能測試
  - 尿道鏡
  - 導尿
    - 如滲尿可使用尿片而不要使用尿管插入法，以減少感染
  - 手術
- 注意阻塞性腎水腫與衰竭

一般老年老化問題的處理
尿道阻塞

- 為男性老年人第二常見的尿失禁原因
  - 常是由於前列腺腫大、腫瘤、尿道狹窄、膀胱頸部收縮、前列腺瘤所造成
- 它的表現為在尿完之後又有零星滴尿現象、頻尿感、尿存留
  - 餘尿達到200cc時，腎超音波檢查可以排出是否有腎積水的可能
- 治療除了手術之外，可以使用尿管插入或尿袋或藥物治療等方法取代

一般老年老化問題的處理

尿失禁 膀胱排出肌活動度減低

- 佔的比例最少約為10%左右
  - 表現的症狀為頻尿、夜尿、小量的尿漏等
- 主因為膀胱排出肌活動度減低
  - 原因不明可能為脊髓運動神經控制不全
- 治療的原則可以使用加強排出的技巧
  - 二次排尿或在恥骨上加壓等方法較為有效
  - 其他可以使用間歇性的導尿法配合預防性抗生素的使用

造成跌倒的內部缺陷與預防措施

危險因子	建議預防措施
視力不佳	限制活動. 白內障手術
聽力不佳	去耳膜手術. 助聽器使用
眩暈	神經或內耳評估, 評估使用之藥物
神經麻木	篩檢維生素缺乏症, 頸部僵直症
老年癡呆	找尋可逆因素
肌肉功能不協調	診斷評估
腳疾(繭, 黏液腫)	去繭, 手術除去黏液腫, 治療下肢水腫
姿位性低血壓	評估疾病與藥物使用
藥物使用中	減藥, 減量

環境中影響老年人之危險因子

環境因子	注意事項與建議
點燈	不要有燈影，容易開燈，臥室、大廳、浴室有夜間照明。
地板	防滑地板，鋪設地毯，地毯不要翹邊，地板清乾淨。
樓梯	燈光充足，上下都有開關，設有扶手，第一階有反光標誌，階高小於12公分，隨時整修。
廚房	物品取用儘量不須彎腰或墊腳，配備寬型小腳凳。
浴室	設扶手，浴缸內具有防滑印花，出門毛毯，去處門鎖設製以防緊急事件。
玄關	修整柏油小洞。
公共設施	適當高度，保持乾淨，防滑。
鞋襪	低腳跟，防滑設計。

一般老年問題的處理
臥床或靜止不動(一)

- 老年人不動主要的原因有虛弱、僵硬、疼痛、無法平衡、心理因素等
  - 虛弱來自於肌肉的疾病、營養不良、電解質不平衡、貧血、神經或肌肉病變等
- 僵硬最常見的原因有退化性關節炎、巴金森氏症、類風濕性關節炎、痛風(假性痛風)和抗憂鬱症藥物作用
- 疼痛來自於骨頭
  - 骨質酥鬆、骨質軟化、骨癌、外傷)、關節(關節炎)、關節囊、肌肉(多發性肌炎、跛行)等

一般老年問題的處理
臥床或靜止不動原因(二)

- 無法平衡與害怕跌倒為靜止不動的主要原因
- 無法平衡源起於衰弱、神經因素(中風、姿位反應喪失、周邊神經麻庫、姿位性或飯後低血壓)、藥物(利尿劑、抗高血壓藥、抗憂慮藥物、抗精神分裂藥物)
  - 在周邊神經麻庫方面所引起的原因有糖尿病、酒精帘悠蝢i不良、內耳神經或中樞神經所造成
- 心理上的原因可以為嚴重的憂慮或是憂鬱

一般老年問題的處理
臥床或靜止不動(三)

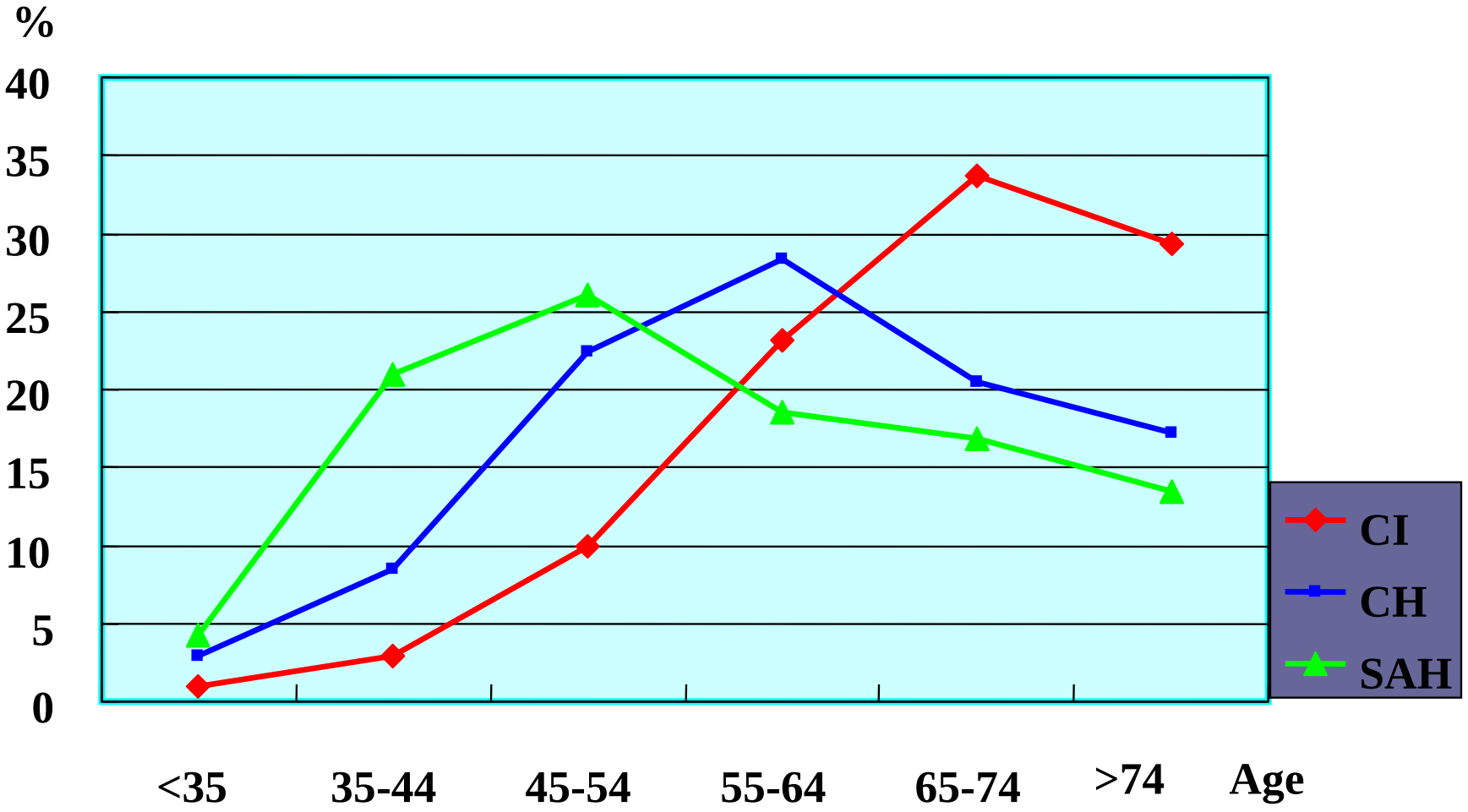
- 長期臥床休息的老年人產生的後遺症有多發性、嚴重度高、容易發生不易治療的特質
  - 心臟血管系統
  - 肌肉的變化尤其明顯，其強度與張力會與日俱降
  - 褥瘡是非常常見的後遺症主要來自源對於組織物理性的壓力、濕潮、摩擦與對應剪力
- 避免長期臥床的後遺症最佳的方法即是避免臥床。
  - 病人也必須儘量以靠近垂直的姿式臥床，至少每天數次
  - 一旦有褥瘡出現，須要用各種方式去處理，包括物理防護、藥膏使用、外科擴創術、特別床墊使用
- 可能造成臥床的原因也要儘可能除去
  - 包括降低床的高度、設置床欄給病人運動機會、輪椅使用等

一般老年問題的處理
藥物的使用

- 老年人受到藥物的影響比一般人多出三倍，而其所使用的藥物也比年輕人多得多
  - 老年人的肝或腎排泄的速度比一般人為低，造成許多藥物存留的體內的量與時間比較長
  - 脂溶性藥物存留體內的時間與水溶性藥物的在體內的濃度就相對的增加
- 吃藥會進一步增加因藥物產生之危機
  - 種類錯用、劑量不當、交互反應、副作用所造成
- 在使用藥物之前，必先考慮症狀是否為其他藥物所造成的
  - 使用的劑量也要比一般人所使用劑量的略低
  - 劑量的增加也必須採行漸進性的
- 病人的家屬，切記不得使用來自不同醫師的共同藥物
  - 中藥與西藥不要同時使用，須間隔三十分鐘以上

老年急重症處理 – 中風

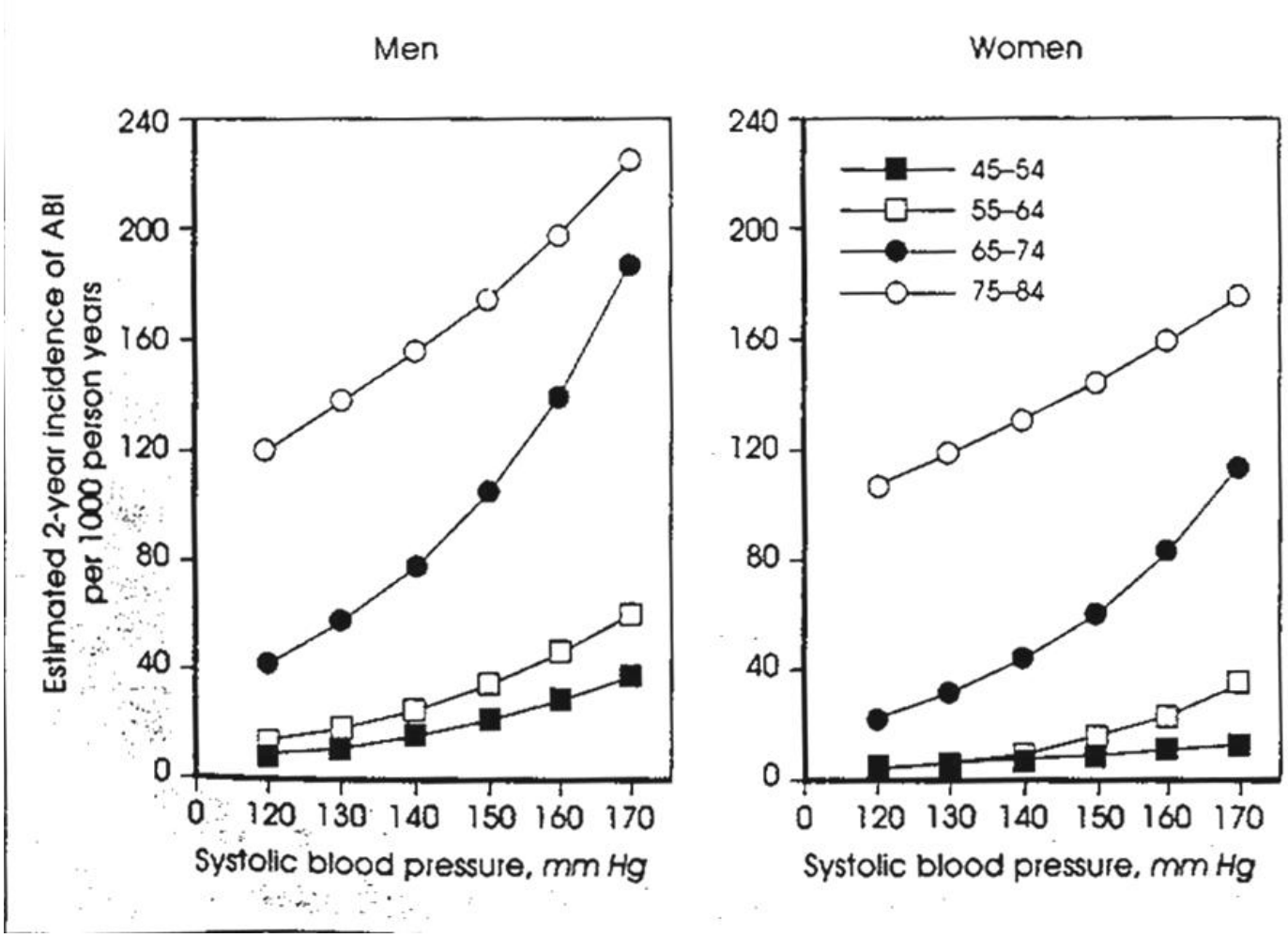
中風型態與年齡分佈關係



Age and Stroke

- The incidence of stroke increases greatly with age.
  - Half of all strokes occur in people who are aged ≥70 years
  - nearly one-quarter affect individuals who are >85 years of age.
  - For each successive 10 years after age 55 years, the stroke rate more than doubles in both men and women.
- Stroke in the elderly is of serious concern
  - higher incidence of the disease with increasing age
  - increased disability that is associated with a stroke in an older individual
- Age is one of the strongest predictors of functional disability after a stroke.
  - Up to half of patients who survive a stroke do not regain independence
  - older age is associated with relatively poorer outcome.

老年血壓之變化



Incidence of ischemic stroke according to systolic BP and age

Strokes in the Elderly:
Explanation for higher mortality

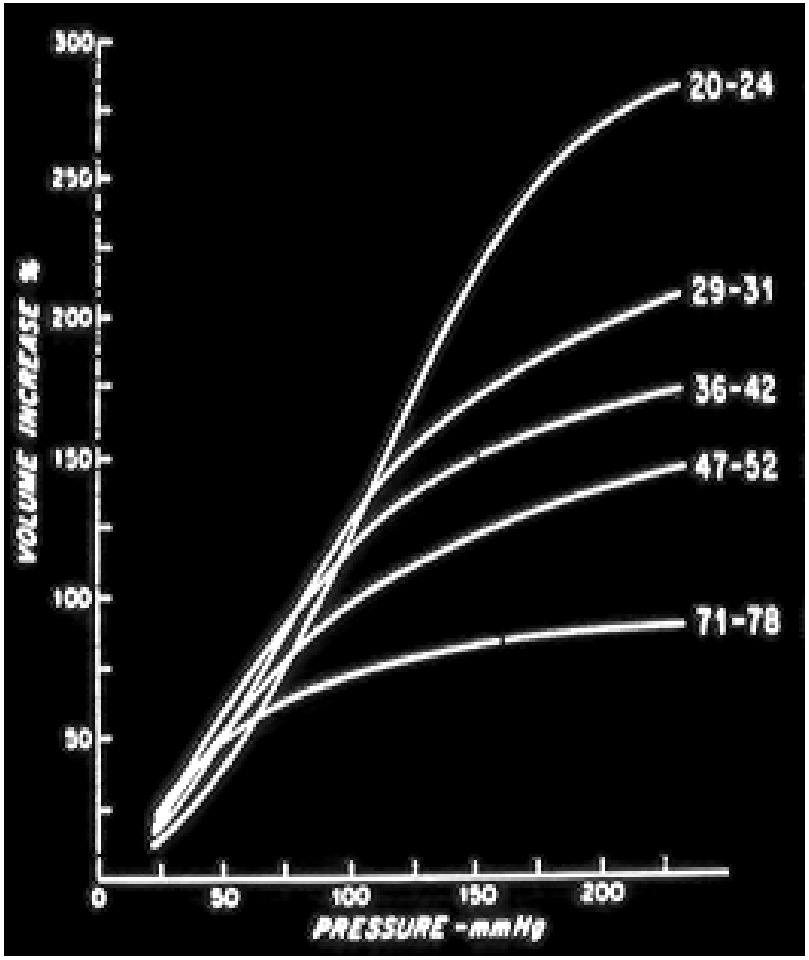
- The older stroke patients had more severe pre-stroke disability and more severe neurological impairment for similar stroke severity and pathology.
- Early mortality was more influenced by pre-stroke global health than age
  - 3-month mortality was influenced by age to the exclusion of all other known prognostic factors.
- The older stroke patients have more disabling stroke and an increased mortality for a similar spectrum of stroke severity and pathology.
- The explanation for higher mortality of the older patients is the poor pre-stroke health and higher immediate post-stroke disability

Sharma J. *Cerebrovasc Dis* 1999;9:2

老人心血管急重症

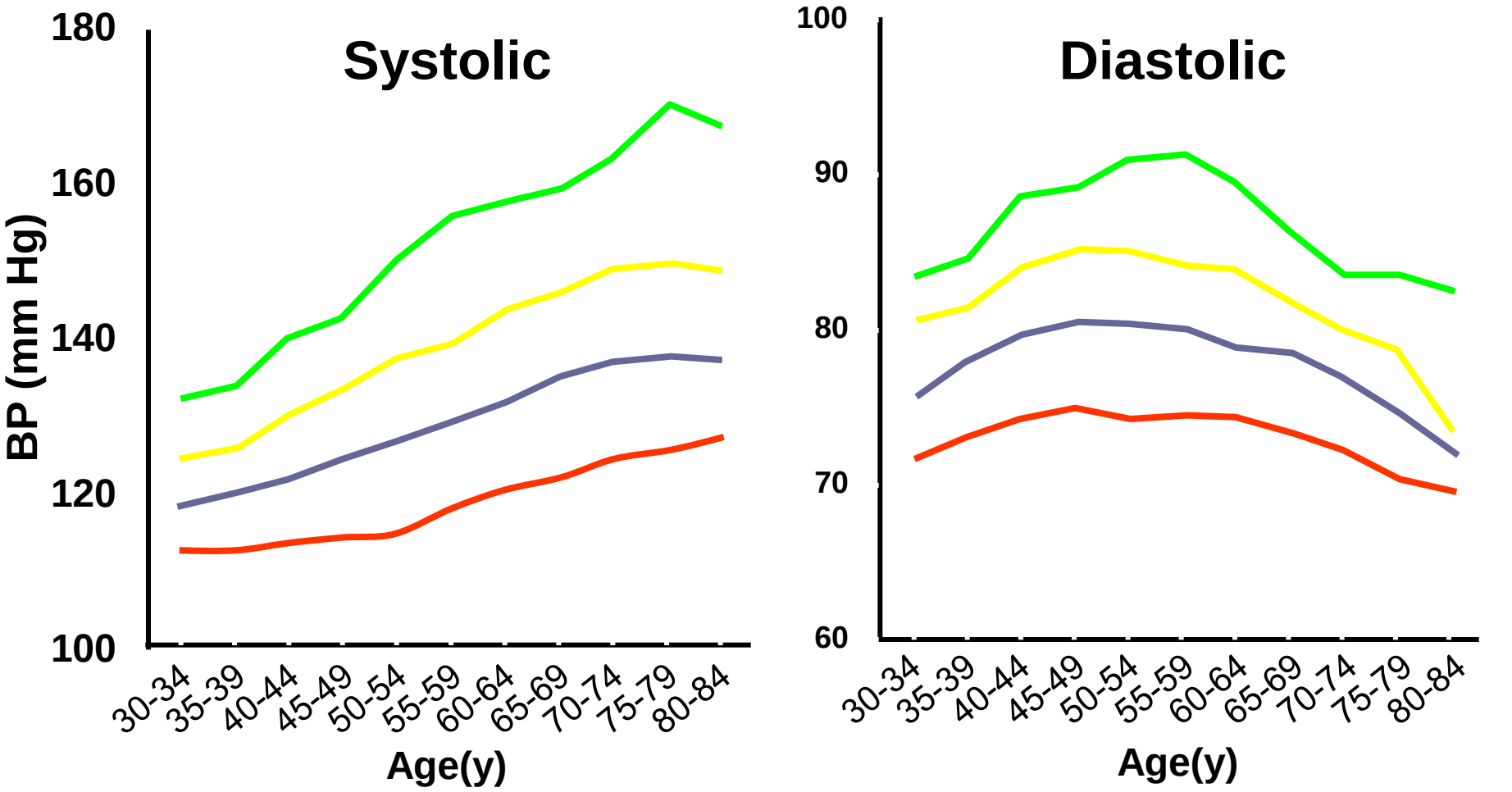
隨著年齡大血管越硬化

Rigidity of the Elderly Arteries



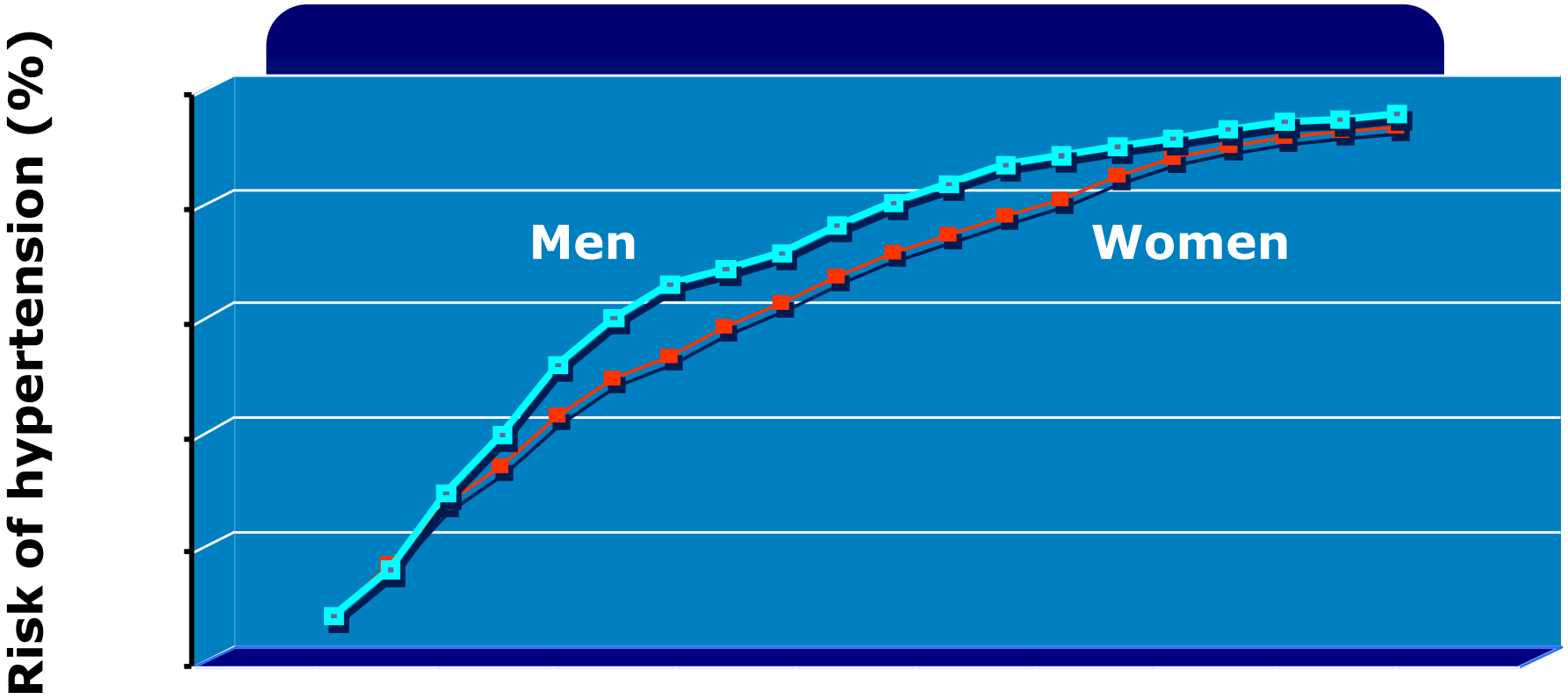
“Loss of distensibility and elasticity in the large capacitance vessels”

Patterns of age-related changes in SBP and DBP at indexed examination



Franklin SS, Gustin W, Wong ND et al. *Circulation.* 1997;96:308-315.

Lifetime Risk of Developing Hypertension Beginning at Age 65



Residual lifetime risk of developing hypertension among people with blood pressure <140/90 mmHg

Vasan RS, et al. JAMA. 2002; 287:1003-1010.

老年胃腸胃急重症

- 特點
  - 症狀－不知不覺中進行(insidious) 、非特異性(nonspecific)、非典型(atypical)
    - 沒有典型壓痛
    - 無菌性腹痛多
  - 病史－很難合作而得到完整及正確的病史
- 診斷－須考慮同時存在的多種疾病
- 治療－手術及麻醉風險提高

老年人胃腸出血與年青人之異同

- 相似處
  - 以吐血(hematemesis) 、黑便(melena) 、和吐血合併黑便為初始表現之比例同為50%, 30%及20%
  - 住入加護病房、輸血量、手術頻率和住院日數相同
  - 出血原因類似
  - 內視鏡治療方式以預防再出血相同
- 相異處
  - 腹痛較少見、不典型、甚至描述不清
  - 不管有無使用NSAIDs，很少在出血之前有消化不良
  - 腹部檢查時壓痛(tenderness)少見
  - 貧血和穿孔較常呈現
  - 臨床表現常受患者的視覺和認知能力下降而混淆
  - 須要緊急手術的機會較高、死亡率也較高

老年人上消化道出血

- 病因
  - 消化性潰瘍
    - 藥物(NSAIDs)，細菌感染(H. pylori)
    - 壓力源 術後 腦神經損傷
  - 食道炎
  - 食道靜脈曲張
  - 惡性腫瘤
  - 血管異常
  - 其它

年紀與上消化道出血死亡率的關係

年紀	死亡率
<60歲	0.5~16%
60~69歲	6~44%
70~79歲	14~44%
>80歲	13~31%

合併其它疾病時的上消化道出血死亡率

狀況	死亡率
腎病	29.4%
急性腎衰竭	63.6%
肝病	24.6%
黃疸	42.4%
肺病	22.6%
呼吸衰竭	57.4%
心臟病	12.5%
心臟衰竭	28.4%

Acute renal failure in the elderly

- Renal disease in the elderly. (biopsy in the elderly)
  - Nephrotic syndrome (31%)
  - Acute renal impairment (26%)
  - Chronic renal impairment (25%)
  - Asymptomatic urinary abnormalities (8%)
  - Hypertension (1%)
  - Unrecorded (9%)
- Functional changes with aging
- Incidence, causes and outcome of ARF in the elderly.
- Multi-organ renal failure in the elderly

Functional changes with aging

Progressive decline in :

- Renal blood flow: 50% fall from age 20 to 80 yrs.
- GFR: falls by-1ml/min/yr from age 40 yrs.
- Urinary concentration ability.
- Diluting capacity.
- Ability to conserve Na+, when salt restricted.
- Renal acid excretion.
- Peripheral renin activity and aldosterone.

International urology and nephrology 32:559-565,2001.

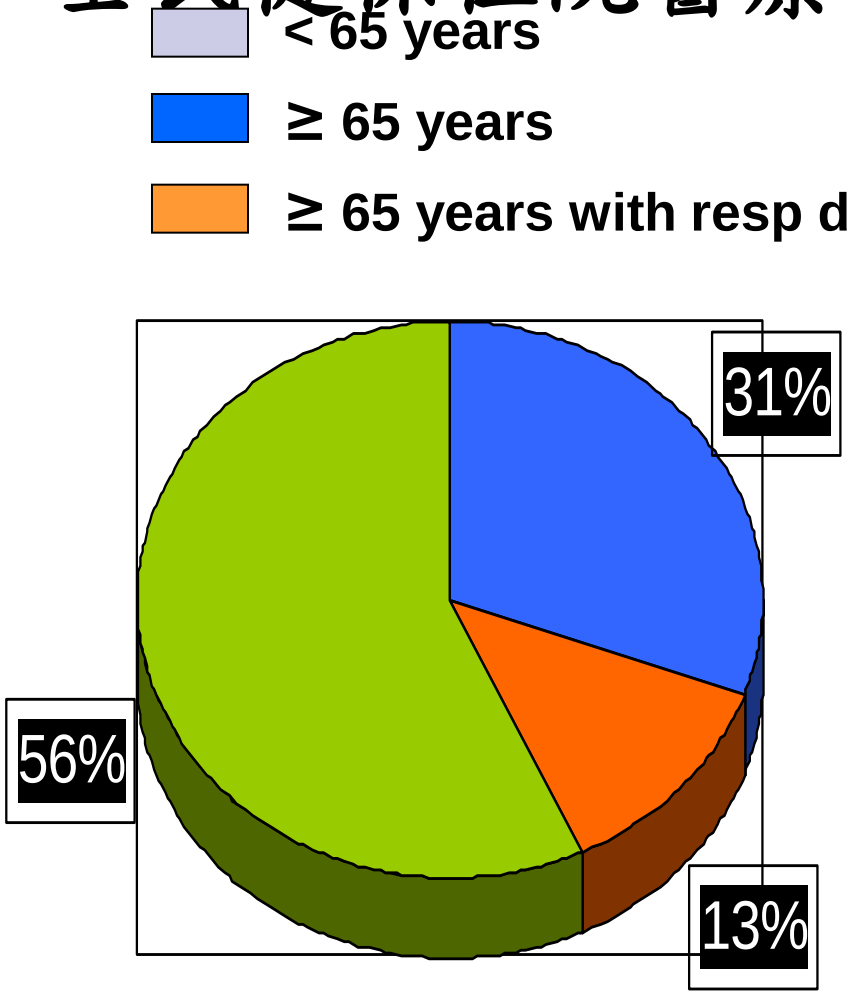
Outcome in the elderly (>65 years)

		Nos	Age	Dialysis	Survival
Lameire N 1987	ARF	100	>65	77%	57%
Bellomo R 1994	ARF	72	>65	100% CHDF	47%
Klouche K 1995	ARF	68	>65	60%	37%
Alarabi 1997	ARF after cardiovasc surgery	111	70 (65-80)	100% CAVHD CAVH	58% (38-91%)
Maziak DE 1998	Ruptured AA	88			60%

International rology and Nephrology 32: 559-565, 2001

呼吸系統疾病

全民健保住院醫療費用統計(2003)



1. 總住院醫療費用：

   120,006,472,000

2. 大於65歲者：

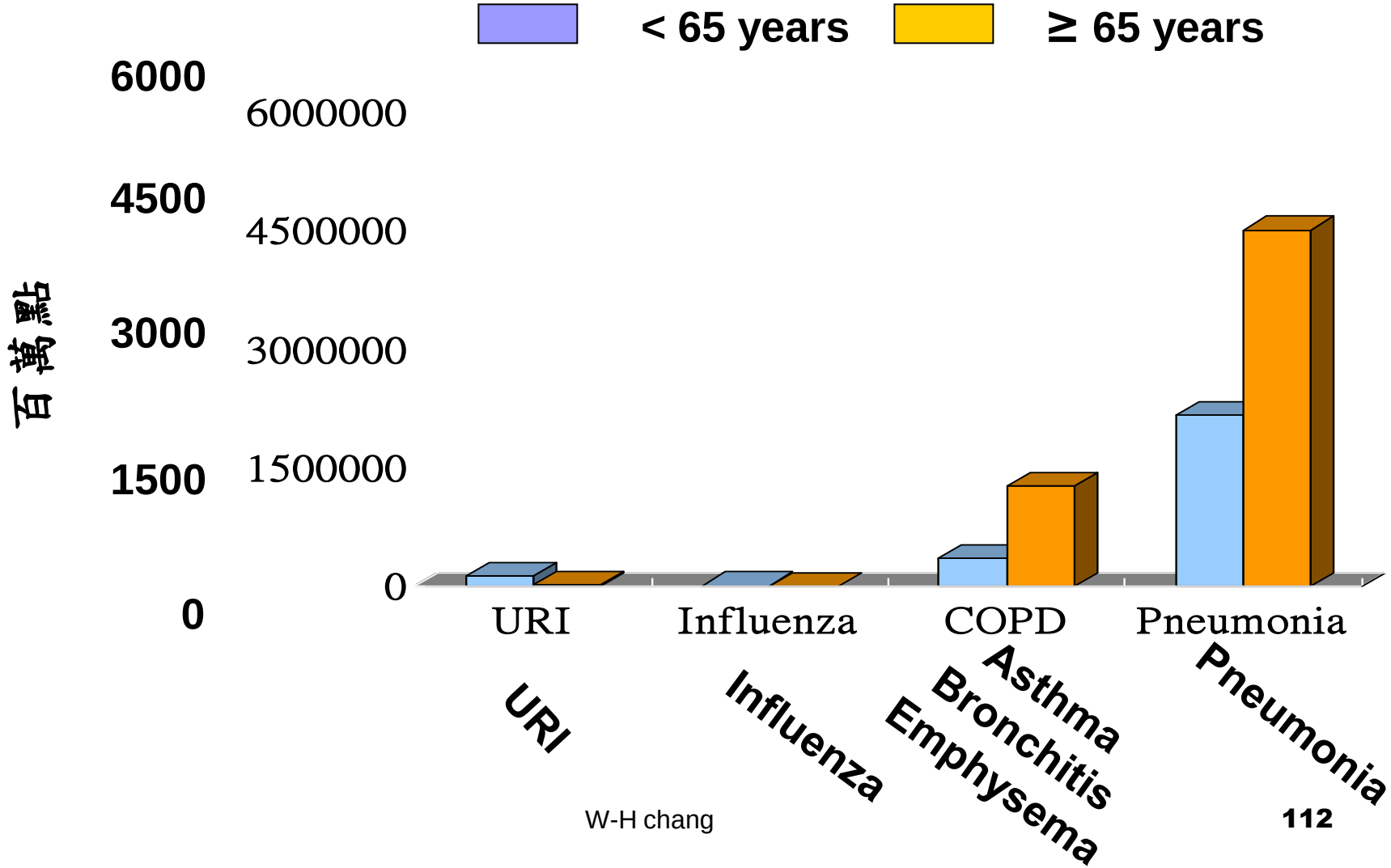
   51,827.579.000(44%)

3. 呼吸系統疾病：

   15,069,454,000

呼吸系統疾病
住院費用年齡別 (2003)

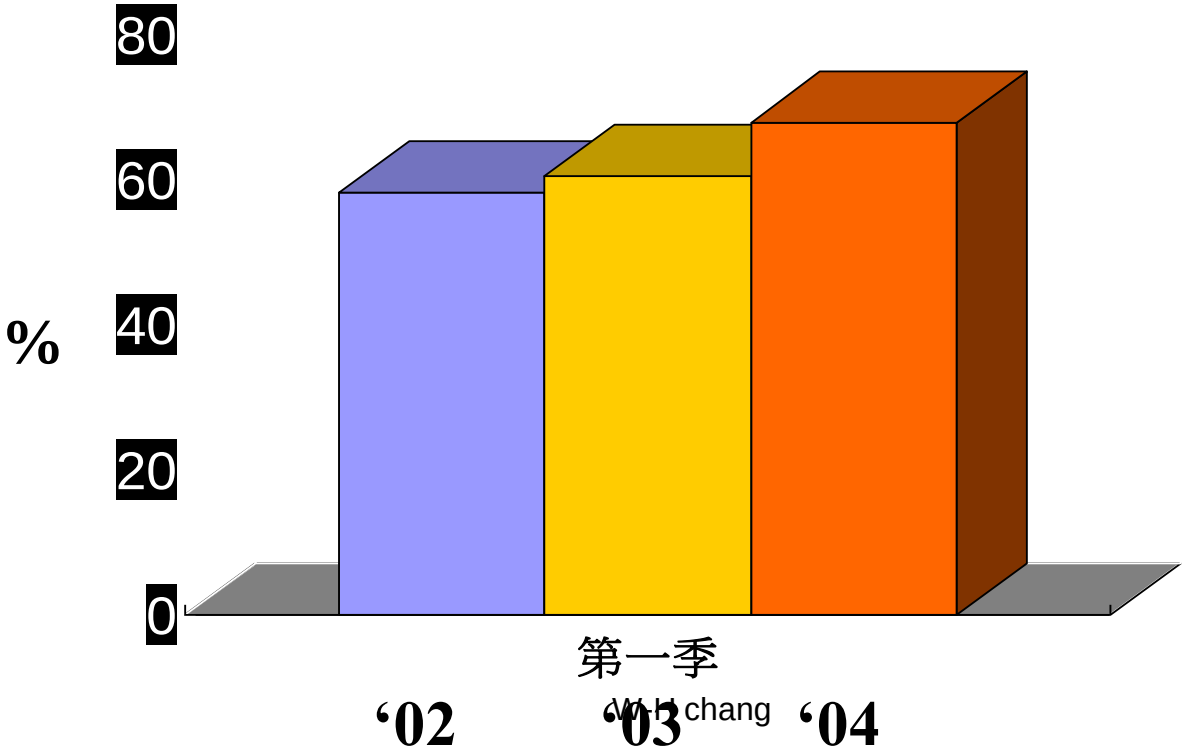
衛生署



Graying of ICU Patients

- **More than half of ICU days were incurred by those older than 65 years** (Angus DC *JAMA* 2000:284;2762-70)

Age analysis of ICU patients in medical ICU in MMH

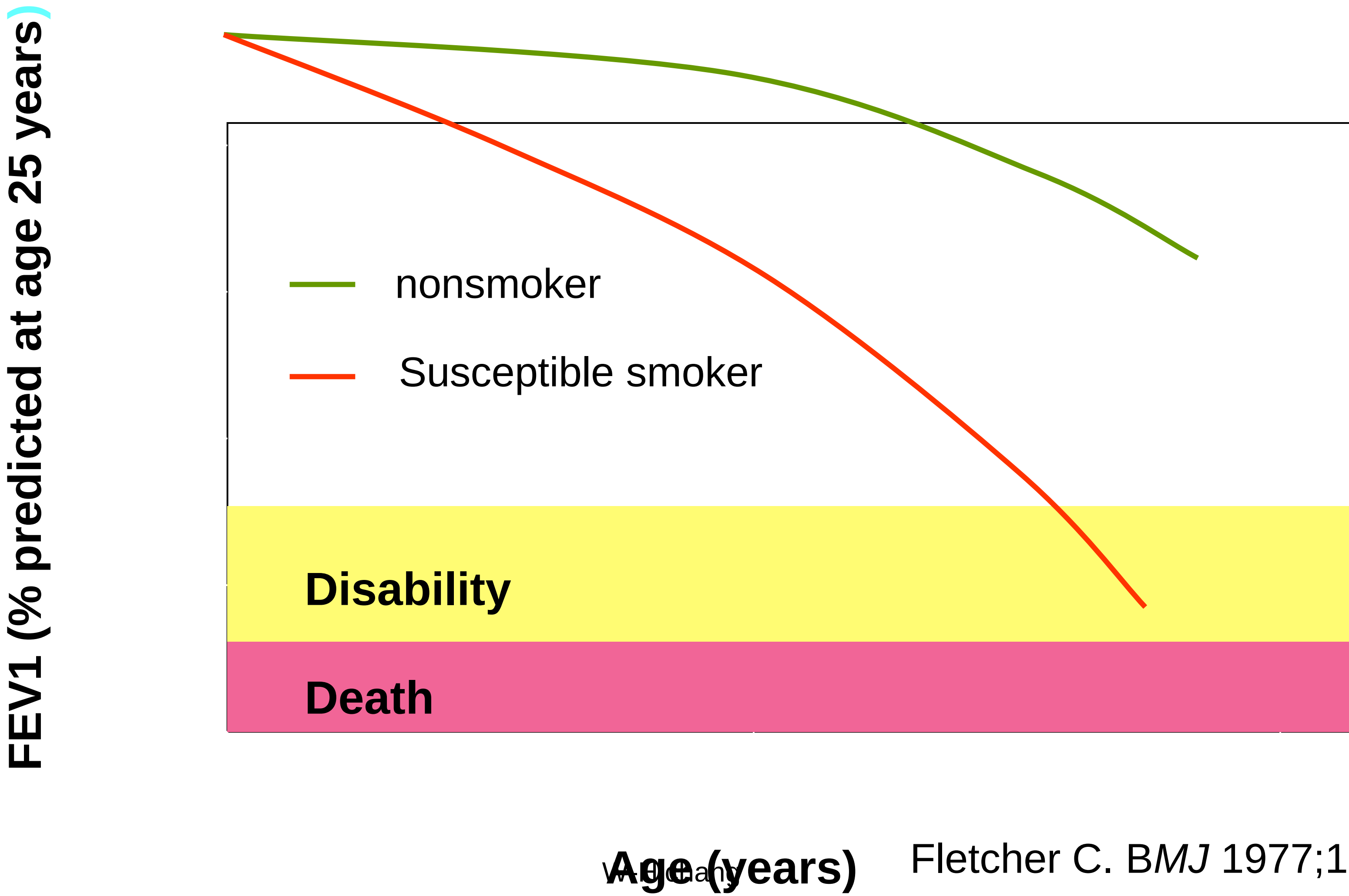


Outcome of Patients Requiring Intensive Care

Source	Period	No. of Pts	ICU	Age, y	Hospital Mortality, %
Campion[1]	1977-79	2693	MICU/ SICU	≤ 55 (32%) 55-64 (24%) 65-74 (23%) ≥ 75 (21%)	 8.3 13.5 16.3
McLean[2]	1982-83	1018	MICU/ SICU	< 45 (16%) 46-64 (58%) ≥ 65 (26%)	12 12 34
Chelluri[3]	1990	97 (≥ 65 y)	MICU/ SICU	65-74 (43%) ≥ 75 (54%)	40 39

1. Campion EW. *JAMA* 1981;246:2052-56
2. McLean RF. *Crit Care Med* 1985;13:625-9
3. Chelluri L. *JAMA* 1993;269:3119-23

肺功能 FEV1 與年齡比較



Fletcher C. B*MJ* 1977;1:1645-8

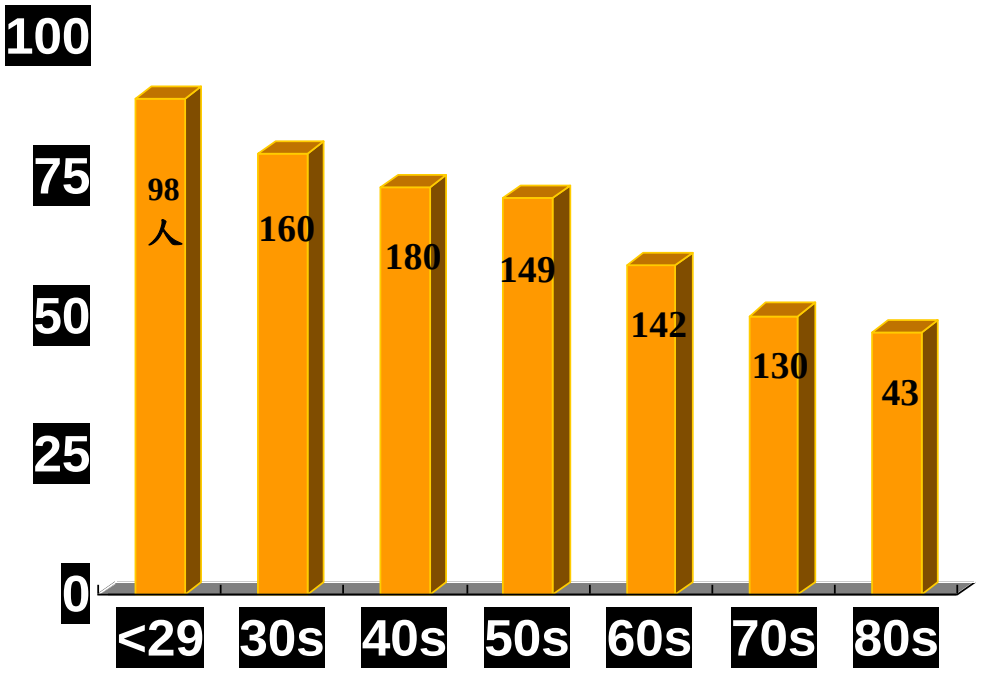
Outcome of Patients Receiving Mechanical Ventilation

Source	Period	No. of Pts	Entry criteria	Age, y	Hospital Mortality, %
Nunn[1]	1970-74	100	> 4 h	< 60 (42%) 61-74 (43%) ≥ 75 (21%)	45 53 73
Stauffer[2]	1982-86	383	> 1 h	< 60 (26%) ≥ 60 (74%)	48 62
O'Donnell[3]	1987-90	75	All	< 70 (76%) ≥ 70 (24%)	43 41

1. Nunn F. *BMJ* 1979;1:1525-27
2. Stauffer JL. *Chest* 1991;104:1222-29
3. O'Donnell A. *Chest* 1993;100(suppl):79

Survival of Patients Receiving Mechanical Ventilation

902 mechanically ventilated pts from ARDS and ALI



1. Pts > 70 years has 2 fold increase in 28-day and 180-day mortality as younger

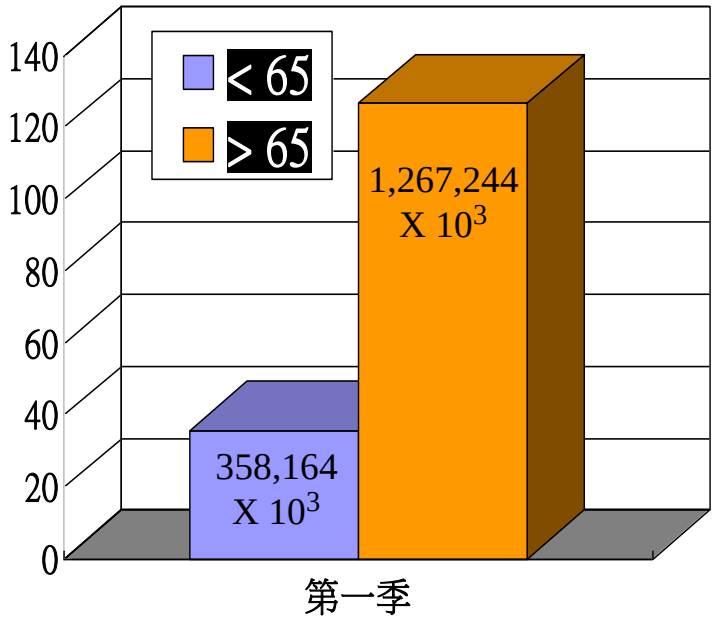
2. Age is a strong predictor of in-hospital mortality. (Hazard ratio: 2.5 for pts 70 years older)

Ely EW. *Ann Intern Med* 2002;136:25-36

COPD in the Elderly

- The highest COPD prevalence rate noted in the elderly (30-43% of current elderly smokers!)
  - Stang P. *Chest* 2000;117:354S
  - Zielinski J. *Chest* 2001;119:731
- COPD is the primary diagnosis for more than 18% of hopsitalizations for pts ≥ 65 years
  - Mannino DM. *Chest* 2002;121:121S

全民健保住院醫療費用統計 (2003)

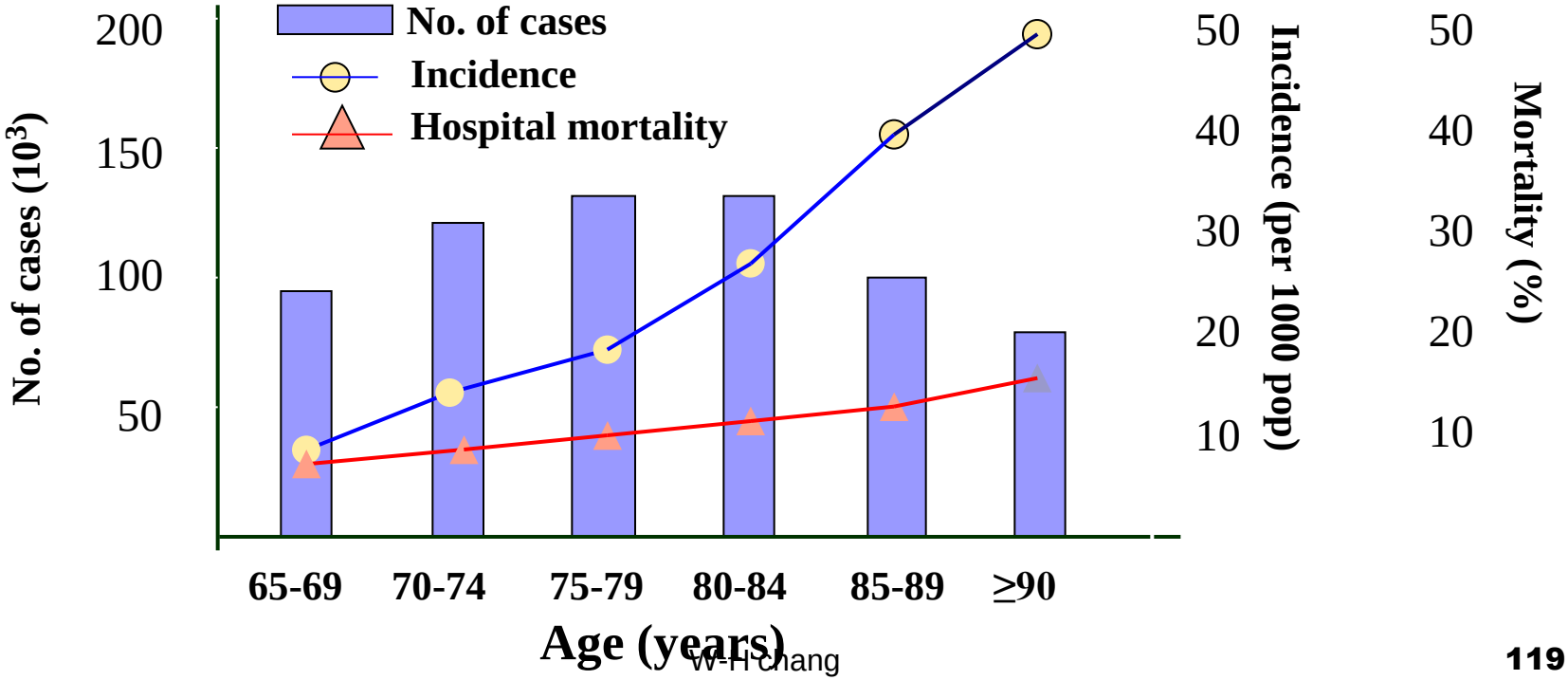


衛生署健保局資料

Pneumonia in the Elderly

1. Community-acquired pneumonia (CAP), is a serious and growing health problem in the world.
2. The incidence and mortality in the elderly is rising

(Kaplan V. *Am J Respir Crit Care Med* 2002;165:766-72)



Prediction Rule: Risk Categories

Total Points	Class	Mortality %	How to Treat
	1	0.1-0.4	Outpatient
≤ 70	2	0.6-0.7	Outpatient
71-90	3	0.9-2.8	Brief hospital observation
91-130	4	8.5-9.3	Inpatient
≥ 130	5	27.0-31.1	Inpatient ICU

Risk categories according to 2 validation cohorts (38,039 inpatients and 2287 in- and outpatients).
Fine MJ et al. *N Engl J Med*. 1997;336:243-250.

Modifying factors - risk of infection

Penicillin-resistant pneumococcci

- Age > 65 years
- B-lactam therapy (within the past 3 months)
- Alcoholism
- Immune-suppressive illness
- Multiple medical co-morbidities

Enteric G(-) bacilli

- A nursing home residence
- underlying cardiopulmonary disease
- Recent antibiotic therapy

Pseudomonas aeruginosa

- Structural lung disease (bronchiectasis)
- Corticoid therapy (> 10mg prednisolone/day)
- Broad-spectrum antibiotic (> 7 d in the past month)
- Malnutrition

ATS guidelines *Am J Respi Crit Care Med* 2001;163

Clinical Features of Pneumonia in the Elderly

Features	Elderly	Young
Mental status change	+++	±
Mortality	++	-
Severe sepsis	++	+
Tachypnea/tachycardia	+++	+
Normal or low WBC	+	±
Cough/sputum	+	+++
Typical CXR findings	+	+++
Rapid resolution	+	++

老年急重症預防(1)

- 營養的攝取須要均衡
  - 在維生素D的攝取方面須要每天一顆避免這方面的缺乏。
- 抽煙與喝酒
  - 以戒除為優先，建議儘量減少。
  - 抽煙每天盡量減少到十支之內。
- 有吃藥習慣的老年人
  - 隨時注意自己使用的藥可不可以減少到最低，甚至不用。藥物的功能不應被誇大。
- 高血壓
  - 收縮壓高或收縮與舒張壓同時高的老年人，必須要治療，以預防任何中風與心臟血管疾病的發生。
  - 治療的步驟，須從飲食習慣、生活習慣著手到藥物的使用，藥物的使用須從利尿劑到神經阻斷劑、鈣阻斷劑等。
  - 非必要不要使用多樣化藥物或別人使用的藥物，以減少可能造成的藥物中毒

老年急重症預防(2)

- 感知障礙急重預防-視障與聽力不全
  - 普及率非常的高、對於生活所造成的不便影響很大、且容易治療與矯正，應提早作一般檢查。
  - 尤其對於青光眼、白內障與重聽可以藉由眼鏡、藥物或助聽器改善，需及早著手。
- 中老年人癌急重預防--婦子較易得到子宮頸癌
  - 此年齡層的發生率隨著年齡增加成正比
  - 每半年須作子宮頸癌篩檢措施。
- 感染急重預防--疫苗的使用
  - 包括流行性感冒、肺炎雙球菌肺炎、破傷風等，對於預防疾病有實質性的功能，建議加種。

老年急重症預防(3)

- 心肺負荷急重衰退預防--運動
  - 在中老年人是一種最佳的良方，不止有降低血壓、加強心肺機能、血糖的穩定度、骨質密度與功能強度
  - 可以穩定情緒與增進社交互動關係、降低失眠與便祕機會、預防跌倒。
  - 脊髓過度彎曲的運動對於須盡量避免。
- 環境急重因子預防-家庭預防跌倒的措施須要加強。
- 老年人特別須注意到除了主訴症狀外常見的和隱藏的問題
  - 特別是心智紊亂、憂鬱症、性功能失常與大小便失禁。
- 活動危險急重因子預防--病人對於一些日常活動危險的評估須要隨時修正避免。
- 社區急重因子預防--對於病情惡化快速的社區老人，須要特別注意其病情與公共環境設施對他所造成的危險性。

結論

- 人口逐漸老化與老人急重醫療健保支出大幅成長，是不可避免之事實，唯有確實認清警覺老人急重症之早期發生症狀，並發展早期診斷治療模式，避免老人變成厲害之重症狀態，減低失能或死亡機率，是本學會與當前老人急重醫療最重要課題。