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SHORT COMMUNICATION:

**GERIATRIC MEDICINE CONCEPTS: TRAJECTORY OF ILLNESS, LIFE COURSE APPROACH AND
COMPREHENSIVE GERIATRIC ASSESSMENT**

SHYH POH, TEO

Geriatrics and Palliative Unit, Department of Internal Medicine, Raja Isteri Pengiran Anak Sale-ha (RI-PAS) Hospital, Brunei Darussalam

Running Title: Geriatric Medicine Concepts Review

Corresponding author: shyhph.teo@moh.gov.bn

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ABSTRACT:

Globally, there is an increase in older people. Clinicians, particularly primary care physicians, will need to equip themselves with knowledge and have a general approach for management of older people. In this paper, the following geriatric principles and concepts are covered: the trajectory of illness and the life course approach, multifactorial diagnoses and attributable risk, and comprehensive geriatric assessment. The illness trajectory concept enables clinicians to recognize where the patient is at, predict their likely prognosis and offer appropriate treatment decisions, balanced between aggressive curative intent and symptomatic management. The life course approach provides a model for planning intervention, which usually needs cooperation with other specialties. It is a worthwhile reminder for clinicians that older people tend to present with atypical symptoms, with multiple contributing factors towards their illness. Comprehensive geriatric assessment enables the clinician to gather sufficient information to complete clinical decision making for older people.

Keywords: Cardiac Failure; Geriatric Assessment; Healthy Ageing; Illness trajectory; Life course

INTRODUCTION:

There is a global increase in the proportion of older people. In the Western Pacific region, older people are the fastest growing age group due to longer life expectancies and declining fertility rates [1]. The transition from ageing to aged is rapid; there are more than 700 million people aged 65 and older worldwide, of which more than 240 million are in the Western Pacific

region. This is expected to double by 2050 [1]. Older patients admitted to hospital also tend to have a high burden of comorbidities, cognitive and functional decline, requiring medical and allied health input for assessment, treatment and rehabilitation [2].

Clinicians, particularly primary care physicians, will need to equip themselves with knowledge

and have a general approach for management of older people. In this paper, the following geriatric principles and concepts are covered: the trajectory of illness and the life course approach, multifactorial diagnoses and attributable risk, and comprehensive geriatric assessment.

Trajectory of illness and life course approach:

The trajectory of illness and a life course approach are useful concepts that can be applied to chronic diseases to formulate a comprehensive management plan and the required integrated care services for patients. The trajectory of chronic illnesses can be broadly categorised into three subgroups: [3]

1. For conditions such as cancer, there is a short period of evident decline in function before the person dies.
2. For heart and lung failure, there is a progressive longer-term decline with intermittent exacerbations of disease.
3. For frailty and dementia, there is usually a prolonged dwindling before a person dies.

The “life course approach” focuses on contributors to illness and health needs over a person’s lifetime. Healthy ageing starts at birth based on genetic inheritance; over time, the interaction with positive or negative environmental influences determines their intrinsic capacity and functional ability [4]. Over a life-course, there are multiple opportunities for intervention to promote healthy ageing and function.

For each older patient presenting for clinical review, it is useful to take a step back and decide where the patient is within this trajectory of disease. This helps decide the overall goals and expected management for an older patient, assisting clinicians, patients and family to plan appropriate care between the continuum of active and palliative management.

This can be illustrated further by exploring in more detail a patient with cardiac failure. The typical disease trajectory for cardiac failure is a gradual decline, with episodes of acute deterioration requiring hospitalisation and some recovery, finally resulting in a more sudden, seemingly unexpected death.

Figure 1 shows a hypothetical survival-time graph with specific critical points as follows:

[A]: For a healthy individual without illness, a prolonged survival rate is expected but this likelihood will gradually decrease with age and over time.

[B]: A catastrophic event may occur unpredictably leading to an immediate demise of a person (Example: sudden cardiac death in Brugada syndrome or Ventricular Arrhythmia).

[C]: An acute illness, such as myocardial infarction occurs, with associated increased risk of mortality.

[D]: With treatment, such as percutaneous coronary interventions and medications, the survival rate improves but does not return to pre-illness stage.

[E]: However, without treatment, there is a steep decline in likelihood of survival.

[F]: Despite optimal treatment, the initial insult [C] leads to a downward trajectory, gradually leading to onset of organ failure (cardiac failure).

[G]: Other concurrent illnesses (for example, chronic obstructive pulmonary disease, chronic renal impairment) will cause a cumulative effect to the decline in survival and function.

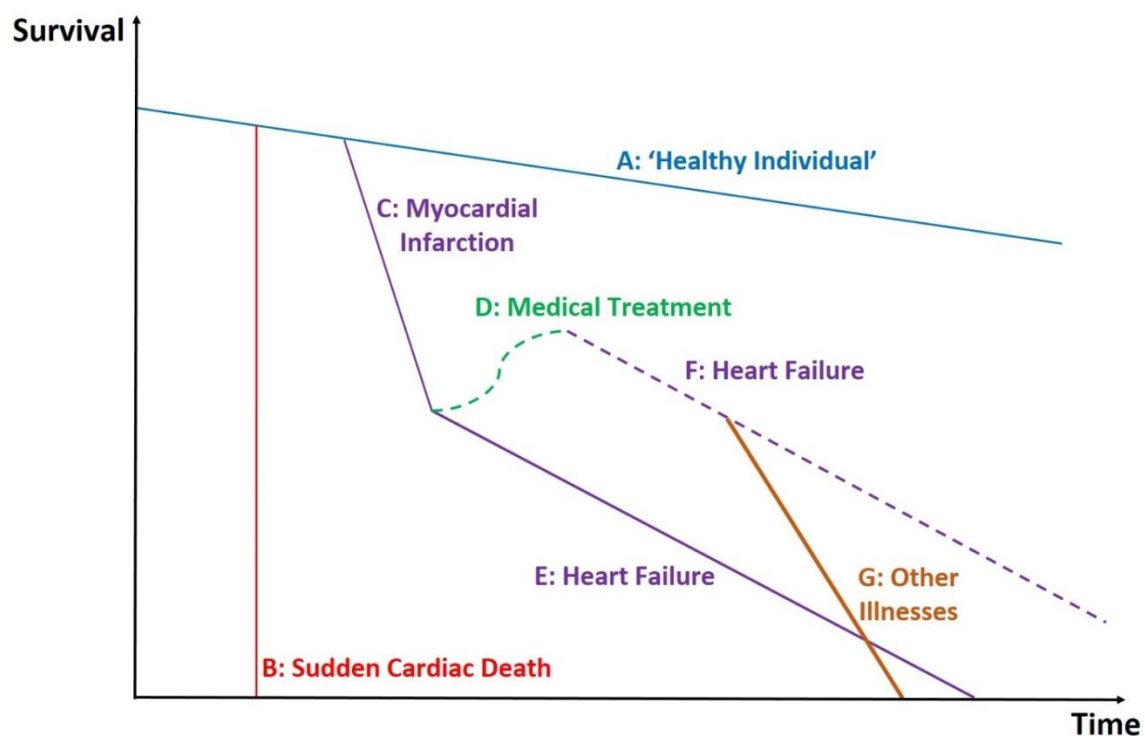


Figure 1: Survival-Time graph illustrating the life course and trajectory of illness

The vertical axis (survival) may also represent individual or organ function. For example, in cardiac failure, function may represent a person's exertional tolerance or ejection fraction on echocardiography. It is important to note that rather than an obvious downhill 'slippery slope', the trajectory will be punctuated by exacerbations and recovery after symptomatic treatment of cardiac failure.

Once the concept of illness trajectory is recognised, several strategies can be put in place to reduce the burden of chronic disease in a population. For example, in the case of preventing cardiac failure, these considerations should start as early as antenatal care, such as folic acid supplementation and ameliorating risk factors such as maternal rubella to prevent congenital cardiovascular defects [5].

These strategies include:

[A]: Public health measures should be in place to optimise organ development, such as nutrition, physical activity and effective health education.

[B] and [C]: Primary prevention, early diagnosis of risk factors, and delay in disease onset improves survival from chronic disease. This relies on effective health education and primary care.

[D]: After disease onset, early and effective treatment to salvage function is important. This requires ongoing improvement and accessibility of medical services, availability of treatment modalities and medications, as well as research for ongoing advancement in treatment.

[E], [F] and [G]: Secondary prevention measures and ongoing follow-up to optimise cardiac failure is required. Patient self-management is essential to slow any further decline in function. The patients should be advised to seek medical attention early if there is any further deterioration so assessment can be initiated to rule out other medical problems.

Awareness of where a patient is within this trajectory is useful for advance care planning, so that appropriate treatment can be instituted, with an emphasis on function. A downward spiral in function should be identified when frequent exacerbations occur so that palliative care can be introduced early to maintain quality of life [6].

When clinicians utilise this approach to recognise the trajectory of disease, longitudinal data on prognosis of patients with cardiac failure found that the majority of patients had a predictable and gradual progression towards death [7].

In short, it is important for clinicians to understand the illness trajectory concept so that they can recognize where the patient is at, predict their likely prognosis and offer appropriate treatment decisions, balanced between aggressive curative intent and symptomatic management. The life course approach provides a model for planning intervention, which needs cooperation with other specialties such as primary care, public health, geriatrics and palliative care outside subspecialty care, which in this case is cardiology [8].

Multifactorial Diagnoses and Attributable Risk:

Older people tend to present with atypical symptoms, while the underlying diagnoses causing their cognitive and functional decline are usually multifactorial. An older patient presenting with acute confusion usually does not present with primary brain pathology. The patient presenting with delirium may actually have a urinary tract infection contributed by benign prostatic hypertrophy and a background of undiagnosed dementia with multiple vascular risk factors.

The concept of attributable risk divides each contributor or risk factor to cause the likelihood of the disease. For example, an older patient

with atrial fibrillation and uncontrolled hypertension may develop a stroke contributed mainly by these two risk factors. The CHA₂DS₂-VASc scoring system assesses the risk of embolic stroke for patients with atrial fibrillation and determines if a patient will benefit from anticoagulation [9]. It is essentially a mnemonic which stands for the following: congestive cardiac failure, hypertension, age 75 or over (Scoring 2), diabetes, previous stroke or transient ischaemic attack (Scoring 2), vascular disease, age 65 to 74 years and female gender. The risk of stroke increases significantly for old age and female gender, which are non-modifiable risk factors. Each of the remaining risk factors should therefore be managed to reduce the risk of stroke as much as possible. A study found that clinicians tended to focus on anticoagulation rather than the other risk factors with a 75% compliance rate for anticoagulation, while two-thirds of the patients did not have their hypertension well-controlled [10]. The challenge for clinicians is to identify and manage as many attributable risk factors as possible in older people to significantly alter the trajectory of decline for the patient.

Falls are another reason for older people to present to hospital, which has multiple attributable risk factors. For example, if an older person fell after tripping over a rug, removal of the rug alone may not be enough to reduce their future risk of falls if other risk factors such as lower limb weakness contributed by a poor nu-

tritional status or visual impairment remained unaddressed. Fall risk assessment tools have been developed to identify fall risk (even prior to an actual fall) for older people presenting to hospital [11]. Applying the life-course approach, community and public health interventions should also be planned from the start to reduce the risk of falls in older people [12].

Comprehensive Geriatric Assessment:

Comprehensive geriatric assessment is an approach that should be applied for older people with complex medical conditions. This multidimensional approach reviews the medical, psychosocial and functional aspects of a patient with an emphasis on functional status and quality of life [13].

There are multiple areas for assessment including their symptoms and illness, medications, family situation and available support, environment and whether it is conducive for function, cognition, mobility, balance, nutritional status and rehabilitation potential [14]. Clinicians also should assess the reliability and objectivity of history, which may need corroboration through collateral history taking. To reiterate previous points, this long “checklist” is necessary because older people tend to present with non-specific symptoms and multi-system disorders. They may also interpret these issues as normal for age. The clinician may find it challenging to decide which issues to prioritise. Communication barriers, such as cognitive dysfunction, vision and hearing impairments or

depression may also complicate the assessment process. Essentially, everything is inter-related, and pathology in one organ may indicate pathology in another (for example, delirium).

This can be seen in an older person presenting with weight loss. This could be due to medical conditions, such as cardiac failure, cancer, dementia or even constipation. However, more commonly, this is contributed by limited dentition or poorly fitting dentures. Their appetite may be affected by loneliness, depression or drugs. This could also be due to social circumstances such as lack of financial resources or disabilities which are non-compensated, causing limited access to getting food or preparing meals.

Functional assessment is important, as autonomy and independence are a priority for older people. A systematic enquiry is required for activities of daily living (bathing, dressing, toileting, transferring, continence, feeding) and instrumental activities of daily living (shopping, preparing meals, cleaning the house, laundry, driving or using public transport, taking medications, managing finances). If these functions are unable to be performed, clinicians should consider rehabilitation of these patients if they have potential, and consider adaptive approaches or availability of social support. Assessment and discharge planning is usually through coordination of a multidisciplinary team, which includes a physiotherapist, occu-

pational therapist, social worker, dietitian and speech language therapists, depending on the indication.

Overall, comprehensive geriatric assessment gathers sufficient information to allow the clinician to complete clinical decision making for older people. Formulating a management plan should then take into account, the strength of supportive scientific evidence, tolerability of treatment, remaining life expectancy (applying the concept of the trajectory of illness) and patient preferences [15].

CONCLUSION:

Given the increase in the number of older people, clinicians should become more familiar with assessment and management of geriatric conditions. It is hoped that these concepts; the trajectory of illness and life-course approach, multifactorial diagnoses and attributable risk, as well as comprehensive geriatric assessment assist clinicians in this role to maintain the health and well-being of older people.

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