Chinese Expert Consensus on Screening and Comprehensive Assessment of Intrinsic Capacity in Older Adults (Post-print)

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Abstract

With the accelerating global population aging, intrinsic capacity, as a core indicator of healthy aging, has attracted increasing attention in the academic community. Intrinsic capacity is the composite of an individual' s overall physical and mental capabilities and specifically encompasses five domains: cognition, locomotion, vitality (nutrition and metabolism), sensory (vision and hearing), and psychological capacity. Decline in intrinsic capacity is significantly associated with a variety of adverse outcomes, including frailty, disability, falls, hospitalization, and death. Establishing a scientific and effective system for the early screening and assessment of intrinsic capacity is of great importance for maintaining functional status in older adults and promoting healthy aging. At present, standardized consensus on intrinsic capacity screening and comprehensive assessment is still lacking in China. Therefore, the Geriatrics Branch of the Chinese Medical Association and the National Clinical Research Center for Geriatric Diseases (Xuanwu Hospital) have taken the lead in organizing the development of this consensus. Based on evidence from evidence-based medicine and adopting the GRADE approach for rating the quality of evidence, this consensus systematically integrates the latest research findings from both domestic and international sources, with the aim of constructing a scientific and standardized system for the screening and comprehensive assessment of intrinsic capacity, and establishing protocols for early identification and dynamic monitoring, so as to provide a reference for delaying the decline of intrinsic capacity in older adults and maintaining functional independence.

Full Text

Preamble

Chinese Expert Consensus on Screening and Comprehensive Assessment of Intrinsic Capacity in Older Adults

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Abstract: With the accelerating trend of global population aging, intrinsic capacity has gained increasing attention as a core metric of healthy aging. Intrinsic capacity encompasses the composite of an individual' s physical and mental abilities, specifically comprising five dimensions: cognition, locomotion, vitality (nutrition and metabolism), sensory (vision and hearing), and psychology. Decline in intrinsic capacity is strongly associated with adverse outcomes such as frailty, disability, falls, hospitalization, and death. Establishing a scientifically valid and effective system for the early screening and assessment of intrinsic capacity is therefore crucial for maintaining functional status in older adults and promoting healthy aging. Currently, China lacks standardized consensus on intrinsic capacity screening and comprehensive assessment protocols. To address this gap, the Chinese Geriatrics Society and the National Clinical Research Center for Geriatric Diseases (Xuanwu Hospital) spearheaded the development of this consensus. Based on evidence-based medicine and utilizing the GRADE framework for evidence grading, this consensus systematically integrates the latest research. It aims to establish a scientific and standardized screening and comprehensive assessment system for intrinsic capacity, implement strategies for early identification and dynamic monitoring, and ultimately provide a reference for delaying the decline of intrinsic capacity and maintaining functional independence.

Key words: Intrinsic capacity; Aged; Healthy Aging; Screening; Assessment; Expert consensus

The global proportion of elderly individuals continues to rise, making population aging an increasingly serious challenge. Data show that by the end of 2024, China' s population aged 60 years and above reached 310 million, and those aged 65 years and above reached 220 million, accounting for 22% and 15.6% of the total population, respectively, marking China' s entry into a deeply aging society [2]. To address global aging challenges, WHO proposed the concept of healthy aging, defining it as the process of developing and maintaining the functional ability needed for well-being in older age. Intrinsic capacity represents the core of functional ability, referring to the composite of all physiological and psychological capacities of an individual. This concept marks an important shift from traditional disease management models to function-centered approaches

[3].

To advance the application of intrinsic capacity in clinical practice, WHO published the Integrated Care for Older People (ICOPE) implementation handbook for primary care systems in 2019 [4] and updated it with a second edition in 2025 [5], providing guidance for screening and assessment of intrinsic capacity and person-centered care pathways. ICOPE has now been implemented in multiple countries worldwide. The French INSPIRE project applied the ICOPE pathway for regular intrinsic capacity assessment and management among older adults, developing supporting software and self-monitoring devices that demonstrated strong feasibility in primary care [6]. The Korean ICOOP Frail project integrated core ICOPE components into existing frailty assessment and integrated care systems, emphasizing a person-centered, holistic care philosophy [7]. ICOPE screening tools also demonstrate good applicability among Chinese older adults, with studies showing a high prevalence of intrinsic capacity decline [8-9], though larger longitudinal studies are needed. These experiences demonstrate that the ICOPE framework is operable and scalable across different national contexts, providing an important practical foundation for promoting healthy aging.

Research shows that intrinsic capacity decline is closely associated with adverse outcomes including frailty, disability, falls, hospitalization, and death [10-14]. Therefore, establishing scientifically effective systems for early screening, assessment, and intervention of intrinsic capacity is crucial for advancing healthy aging. However, unified standards for intrinsic capacity screening and assessment are lacking, with significant heterogeneity in tools used across studies. China currently lacks a standardized system built on evidence-based medicine. To address this, the Chinese Geriatrics Society and the National Clinical Research Center for Geriatric Diseases (Xuanwu Hospital) organized authoritative domestic experts to develop the "Chinese Expert Consensus on Screening and Comprehensive Assessment of Intrinsic Capacity in Older Adults." This consensus systematically integrates the latest domestic and international research evidence to establish a standardized screening and assessment framework, providing normative guidance for clinical practice to improve early identification and precise assessment of intrinsic capacity decline among Chinese older adults, maintain functional independence, and promote healthy aging.

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1.1 Target Population and Applicable Settings

This consensus applies to adults aged 60 years and older, particularly those with existing or potential intrinsic capacity decline. It aims to provide practical guidance for clinical healthcare professionals at all levels, community health workers, and related multidisciplinary professionals (such as social workers, rehabilitation therapists, and nutritionists involved in integrated geriatric care). The content covers definitions, screening, and assessment of intrinsic capacity decline to promote multidisciplinary collaboration in maintaining and improving intrinsic capacity among older adults.

1.2 Consensus Development Working Group

This consensus was led by the Chinese Geriatrics Society and the National Clinical Research Center for Geriatric Diseases (Xuanwu Hospital). Experts from geriatrics, neurology, internal medicine, general practice, sports medicine, rehabilitation medicine, clinical nutrition, neuropsychology, nursing, epidemiology, and evidence-based medicine formed the consensus development working group. Based on the latest domestic and international evidence and clinical experience, the working group developed the consensus content through multiple rounds of expert discussion and revision.

1.3 Literature Search Strategy

Systematic searches were conducted in PubMed, Cochrane Library, Medline, Web of Science, Embase, CNKI, Wanfang Data, and Chinese Biomedical Literature Service System. English search terms included: intrinsic capacity, cognition, cognitive impairment, locomotor capacity, mobility impairment, vitality, malnutrition, vision, vision impairment, hearing, hearing loss, psychological capacity, depressive symptoms, comprehensive geriatric assessment, assessment, older adults. Chinese search terms included: intrinsic capacity, cognition, locomotion, vitality, vision, hearing, psychology, comprehensive geriatric assessment, assessment, older adults. The search period covered from database inception to May 2025, with retrieved literature summarized and integrated.

1.4 Evidence Grading

The consensus development working group systematically reviewed and evaluated included literature, referencing domestic and international guidelines and consensus to formulate recommendations. Recommendations followed expert consensus principles, using the Delphi method for multiple rounds of surveys and online voting with options of "agree," "basically agree," "uncertain," and "disagree." Each recommendation required $ 75% agreement ("agree" plus "basically agree") to achieve consensus. This consensus adopted the Grades of Recommendations Assessment, Development and Evaluation (GRADE) system, classifying recommendation strength as strong (Grade I) or weak (Grade II), and evidence quality as high (A), moderate (B), low (C), or very low (D) [15].

1.5 Consensus Updates

The consensus development expert group will regularly monitor research progress in the intrinsic capacity field and update the consensus promptly based on emerging clinical evidence.

1.6 Registration Statement

This consensus has been registered with the International Practice Guideline Registration and Transparency Platform (http://guidelines-registry.cn/) with registration number PREPARE-2025CN1226.

2 Concept, Epidemiology, and Risk Factors of Intrinsic Capacity Decline

2.1 Clinical Question 1: What is intrinsic capacity? What major adverse outcomes does its decline cause?

Evidence Summary: The concept of intrinsic capacity is based on the healthy aging framework, with WHO defining it as the composite of all physiological and psychological capacities, including cognition, locomotion, vitality (nutrition and metabolism), sensory (vision and hearing), and psychological dimensions. Decline in any dimension indicates intrinsic capacity decline [4]. Intrinsic capacity decline increases the risk of adverse outcomes [16-18] and serves as an important predictor of health risks in older adults. A 21-year longitudinal study showed that intrinsic capacity declines progressively with age, and regular monitoring can predict long-term adverse outcomes [18]. Intrinsic capacity is dynamic and reversible; early identification and intervention can delay or even reverse its decline [19]. Therefore, screening and comprehensive assessment of intrinsic capacity are crucial for maintaining functional ability and delaying age-related functional decline, representing a key strategy for promoting healthy aging.

Recommendation: Intrinsic capacity is the composite of all physiological and psychological capacities, encompassing five dimensions: cognition, locomotion, vitality, sensory, and psychological. Its decline significantly increases risks of frailty, disability, falls, hospitalization, and death. Given its dynamic reversibility, we recommend early screening and systematic assessment to promptly identify older adults with intrinsic capacity decline for targeted interventions to delay functional decline. (Recommendation strength: I; Evidence level: A)

2.2 Clinical Question 2: What are the epidemiological characteristics of intrinsic capacity decline in older adults?

Evidence Summary: Intrinsic capacity declines gradually with age, particularly during older adulthood [20]. Multiple global studies show high prevalence of intrinsic capacity decline among older adults, with significant variation across countries and regions. The French ICOPE-Care cohort study found that 92.6%

of adults aged $ $60 had intrinsic capacity decline [6]. A Singapore study reported 77.4% of community-dwelling older adults had intrinsic capacity decline [21]. The Mexican Health and Aging Study showed 87.8% of adults aged $ $50 had decline in at least one intrinsic capacity dimension [22]. A study across 11 communities in Hong Kong found 72.7% of adults aged $ $60 had intrinsic capacity decline on initial screening, with 66.4% having decline in at least one dimension after detailed assessment [23]. The China Comprehensive Geriatric Assessment Study (CCGAS) showed a standardized prevalence of 39.9% for intrinsic capacity decline among community-dwelling adults aged $ $60 in China [9]. Furthermore, intrinsic capacity dimensions are interrelated; decline in any dimension is associated with adverse outcomes, and the risk of functional decline increases with the number of impaired dimensions [24-25].

Recommendation: Intrinsic capacity declines progressively with age. The proportion of older adults with intrinsic capacity decline is substantial. The five dimensions (cognition, locomotion, vitality, sensory, psychological) are interrelated; more impaired dimensions confer higher risk of functional decline. (Recommendation strength: I; Evidence level: A)

2.3 Clinical Question 3: What are the risk factors for intrinsic capacity decline in older adults?

Evidence Summary: Intrinsic capacity decline in older adults results from multiple factors, including sociodemographic factors (advanced age, female sex, living alone, low education, low income), unhealthy lifestyle (smoking, physical inactivity, unhealthy diet, obesity, insufficient sleep), chronic diseases and geriatric syndromes (such as osteoarthritis, cerebrovascular disease, frailty, sarcopenia, insomnia, anxiety, depression, malnutrition), and unsafe environments with limited social participation [9,26-31]. The English Longitudinal Study of Ageing showed intrinsic capacity decline is associated with older age, female sex, low education, and more chronic diseases [28]. CCGAS data indicated that advanced age, low education, low income, low physical activity, insomnia, and chronic diseases correlate with intrinsic capacity decline [9]. Other studies found associations with female sex, advanced age, low education, smoking, obesity, insufficient fruit and vegetable intake, and chronic diseases [29]. Additionally, lack of safe surroundings (fall hazards, poor transportation) and reduced social participation (social isolation, low community activity engagement) increase intrinsic capacity decline risk [30-31]. Early identification and intervention for these risk factors are crucial for delaying decline.

Recommendation: Risk factors for intrinsic capacity decline include sociodemographic factors, unhealthy lifestyle, chronic diseases and geriatric syndromes, unsafe surroundings, and reduced social participation. Early identification and comprehensive management of these risk factors should be prioritized. (Recommendation strength: I; Evidence level: A)

3 Screening for Intrinsic Capacity Decline

Clinical Question 4: How should screening for intrinsic capacity decline be conducted in older adults?

Evidence Summary: To better maintain functional ability and optimize intrinsic capacity, WHO published the ICOPE handbook in 2019, supporting multidisciplinary teams in identifying and managing intrinsic capacity decline through integrated care pathways to optimize integrated services for older adults [4]. The ICOPE screening tool identifies older adults with decline in key intrinsic capacity domains and has been validated across different countries and populations [21,23,32-38]. The Chinese version of the ICOPE screening tool demonstrates good reliability and validity [33], accurately identifying individuals with intrinsic capacity decline to provide reliable basis for comprehensive assessment, tiered care, and early intervention.

Multiple studies have validated the ICOPE tool' s effectiveness: In the French INSPIRE-T cohort, the ICOPE screening tool showed high sensitivity (42.0%-97.2% across domains, highest for vision at 97.2%) and maintained high specificity (>70% for all domains except vision), effectively identifying older adults at high risk for functional decline and disability, suitable for large-scale screening [34-35]. The Spanish VIMCI (Validity of an Instrument to Measure Intrinsic Capacity) cohort study showed overall accuracy of 62.7%-87.9% and specificity of 68.2%-96.0% [36]. Singapore studies confirmed the ICOPE screening tool is convenient, clinically practical, and highly feasible [21].

Chinese research found the ICOPE screening tool achieved 95.96% sensitivity, 51.80% specificity, 80.34% accuracy, and 73.90% effectiveness for diagnosing intrinsic capacity decline, confirming its suitability for screening older adults [37]. A Taiwan study of 1,235 older adults showed the Taiwanese version of the ICOPE screening tool (ICOPES-TW) correlated moderately to highly with age, basic activities of daily living, instrumental activities of daily living, quality of life, and frailty severity, serving as an effective tool for identifying intrinsic capacity decline [38]. These findings demonstrate the ICOPE tool' s clinical applicability in Chinese populations, effectively identifying intrinsic capacity decline to inform localized intervention strategies.

In summary, the WHO ICOPE screening tool demonstrates high feasibility and applicability across populations, effectively identifying intrinsic capacity decline in older adults. This consensus recommends using the WHO ICOPE screening tool (Table 2) for screening, with annual screening for adults aged $ $60 and semi-annual screening for high-risk individuals (those with multimorbidity, polypharmacy, recent hospitalization, living alone, or existing functional decline). The 2025 second edition updated the ICOPE pathway to four steps: initial assessment, in-depth assessment, personalized care plan development, and implementation/monitoring. If impairment is identified in the initial assessment, in-depth assessment is recommended [5]. The second edition adjusted the cognitive, vision, and hearing dimensions in the initial assessment by adding

screening questions that trigger direct referral to in-depth assessment if answered positively. For cognition, participants are first asked about memory or orientation problems (e.g., not knowing current location or date). For vision, questions about eye problems were added, including external eye examination and WHO vision screening chart testing. For hearing, participants are asked about hearing problems (with hearing aid users asked specifically about persistent problems despite aid use) [5].

Recommendation: Screen adults aged $ $60 for intrinsic capacity decline annually and high-risk individuals (including those with multimorbidity, polypharmacy, recent hospitalization, living alone, or existing functional decline) every 6 months; use the WHO ICOPE screening tool. (Recommendation strength: I; Evidence level: A)

WHO ICOPE screening tools

4 Assessment of Intrinsic Capacity

4.1 Clinical Question 5: How should intrinsic capacity assessment be conducted in older adults?

Evidence Summary: Older adults screening positive for intrinsic capacity decline require comprehensive assessment, considering interactions and combined effects across dimensions [5]. While assessment standards are not yet unified, core content typically includes the five dimensions: cognition, locomotion, vitality, sensory (vision and hearing), and psychology.

4.1.1 Cognition Evidence Summary: Cognitive function includes attention, memory, executive function, language, and visuospatial ability [39], all of which decline with age [40]. Common assessment tools in intrinsic capacity research include the Mini-Mental State Examination (MMSE), Short Portable Mental Status Questionnaire (SPMSQ), five-item cognitive test (attention, memory, visuospatial ability, language, reasoning), and three-item cognitive test (verbal fluency, delayed memory, attention) [9,24,28,41-43]. MMSE is widely used in clinical, community, and research settings [44-46]. This consensus recommends MMSE for cognitive assessment, considering education and cultural background while noting copyright issues [47]. Other tools such as the Montreal Cognitive Assessment (MoCA), Addenbrooke' s Cognitive Examination-III (ACE-III), and brief cognitive screening tests are also applicable [47-48]. Digital cognitive assessment using computerized scales, task-based assessments, and virtual reality can evaluate specific cognitive domains, overall function, social and daily living abilities, and neuropsychiatric symptoms, supporting clinical diagnosis [49].

Recommendation: Use standardized cognitive assessment tools such as MMSE, MoCA, ACE-III, or brief cognitive screening tests. Validated digital cognitive assessment tools may serve as adjuncts. Assessment should cover

multiple cognitive domains and consider education and cultural background. (Recommendation strength: I; Evidence level: B)

4.1.2 Locomotion Evidence Summary: During aging, muscle function decline reduces gait speed and balance, increasing risk of intrinsic capacity decline and disability [50]. Locomotion assessment in intrinsic capacity research includes the Short Physical Performance Battery (SPPB), gait speed test, Five-time Sit-to-Stand Test (FTSST), 6-Minute Walk Test (6MWT), and Tinetti Balance and Gait Scale [9,13,23-24,43,51-53], with SPPB being most commonly used. SPPB includes balance, gait speed, and FTSST components [54], demonstrating better predictive ability for falls and mortality than single tests [55-59]. SPPB scores range 0-12, with <10 indicating locomotor decline [60]. This consensus recommends SPPB for locomotion assessment, with other methods available as alternatives.

Recommendation: Use SPPB for locomotion assessment, with SPPB<10 indicating decline. Alternative methods include gait speed test, FTSST, 6MWT, and Tinetti Balance and Gait Scale. (Recommendation strength: I; Evidence level: A)

4.1.3 Vitality Evidence Summary: WHO uses "Vitality" to describe physiological factors comprising intrinsic capacity, including energy balance and metabolism, neuromuscular function, and immune and stress responses. Malnutrition (under- or over-nutrition) is a core manifestation. The ICOPE guidelines emphasize malnutrition as a key factor affecting vitality decline, stressing that nutritional screening in primary care is both feasible and essential as a routine component of comprehensive health assessment. Common assessment methods include Mini-Nutritional Assessment Short-Form (MNA-SF), Mini-Nutritional Assessment (MNA), Malnutrition Universal Screening Tool (MUST), Nutritional Risk Screening 2002 (NRS2002), grip strength, BMI, and muscle-to-fat ratio [9,12,24,41,52,61-66]. WHO recommends MNA for nutritional status assessment [4]. MNA-SF is more convenient than MNA, with high concordance and better clinical feasibility [67-69]. Studies show MNA-SF and MNA have high sensitivity and specificity for malnutrition risk screening in long-term care residents, with high consistency; MNA-SF can independently predict hospital length of stay, suggesting it may replace MNA in long-term care settings [70]. In overweight hospitalized patients, MNA-SF detected nutritional risk in 36.1% compared to 17.7% with NRS2002, with better predictive efficacy for adverse outcomes [71]. Grip strength decline correlates with malnutrition, cognitive decline, cardiovascular disease, and mortality risk [72-75], and has been used as a vitality assessment method [52], though with low specificity. This consensus recommends MNA-SF for vitality assessment, with NRS2002 or MUST as alternatives. Those at nutritional risk require comprehensive nutritional assessment using Global Leadership Initiative on Malnutrition (GLIM) criteria for severity grading [76]. The "Chinese Expert Consensus on Multidisciplinary Decision-Making Model for Malnutrition in Older Adults (2023)" [77] recommends mul-

tidisciplinary teams conduct comprehensive nutritional assessment within 48 hours of malnutrition diagnosis to inform personalized nutrition support plans.

Recommendation: Use MNA-SF for vitality assessment, with NRS2002 or MUST as alternatives; those with nutritional risk should undergo comprehensive nutritional assessment to confirm diagnosis and severity. (Recommendation strength: I; Evidence level: A)

4.1.4 Vision Evidence Summary: Most studies currently use self-report methods for vision assessment, such as asking about difficulties seeing near or far despite glasses, eye diseases, or vision problems affecting daily life [9,43,61]. Some studies use WHO Simple Vision Chart, Tumbling E chart, Frisby stereo test, Strawbridge hearing and vision questionnaire, or Likert scales [12,23,41,65]. This consensus recommends using the WHO Simple Vision Chart for distance and near vision assessment, with normal distance vision defined as correctly identifying $ $3 small "E" directions at 3 meters, and normal near vision as correctly identifying $ $3 largest "E" directions at 40 cm [4].

Recommendation: Vision assessment can use self-report, vision testing tools, or questionnaires. This consensus recommends the WHO Simple Vision Chart: identifying $ $3 small "E"at 3 meters indicates normal distance vision; identifying $ $3 largest "E" at 40 cm indicates normal near vision. (Recommendation strength: II; Evidence level: B)

4.1.5 Hearing Evidence Summary: Hearing assessment is an effective method for early detection and management of hearing loss. The "Expert Consensus on Diagnosis and Intervention of Age-Related Hearing Loss (2019)" [78] states hearing assessment includes: self-observation in daily life, simple physician assessment, questionnaire screening (such as simplified Hearing Handicap Inventory for the Elderly), simple device screening (remote hearing screening via communication tools and digital audiometry), and audiometric screening (pure-tone air conduction by trained professionals). Intrinsic capacity studies commonly use whisper tests [34,36], self-reports about hearing problems in daily life (including with hearing aids) [43], or questionnaires like the simplified Hearing Handicap Inventory [79]. This consensus recommends whisper tests, with diagnostic audiometry when available [5]. Confirmed hearing loss requires referral to otolaryngology for specialist evaluation, including detailed history of onset, laterality, severity, precipitating factors, impact on daily life, and associated symptoms like ear pain, tinnitus, or vertigo [78]. Otologic examination and diagnostic hearing tests clarify etiology and inform intervention plans [80].

Recommendation: Use whisper tests for hearing assessment, with diagnostic hearing tests when possible, and detailed history collection. Confirmed hearing loss requires otolaryngology referral for specialist evaluation and intervention planning. (Recommendation strength: II; Evidence level: B)

4.1.6 Psychological Evidence Summary: Depressive states are common in older adults, especially among those with disability or social isolation, and increase mortality risk. Hearing loss and locomotor decline increase depression risk by affecting social function and participation. The WHO ICOPE handbook recommends community health professionals identify depressive states and distinguish them from depressive disorders [4]. Common assessment tools include the 15-item Geriatric Depression Scale (GDS-15), 30-item Geriatric Depression Scale (GDS), Center for Epidemiologic Studies Depression (CES-D), EuroQol-5D (EQ-5D), and Patient Health Questionnaire (PHQ-9) [9,12,23-24,28,41,61,66]. GDS-15, a modified brief version, enables rapid and accurate depression assessment. A meta-analysis of various geriatric depression scales found GDS-15 had the highest accuracy (AUC=90%) with good sensitivity and specificity, outperforming GDS [81]. Another meta-analysis of 42 studies found PHQ-9 had overall sensitivity of 37%-98%, specificity of 42%-99%, positive predictive value of 9%-92%, and negative predictive value of 80%-100%, making it a reliable tool [82]. This consensus recommends GDS-15 or PHQ-9 for depression assessment, with referral to psychiatry or psychology for diagnostic evaluation and individualized intervention when needed.

Recommendation: Use GDS-15 or PHQ-9 for depression assessment in older adults, with referral to psychiatry or psychology for diagnostic evaluation and individualized intervention when necessary. (Recommendation strength: I; Evidence level: A)

4.2 Clinical Question 6: How should intrinsic capacity decline be graded?

Evidence Summary: Current methods for calculating composite intrinsic capacity scores are not unified, including counting impaired dimensions, summing dimension scores into a composite index, averaging dimension Z-scores, and exploratory factor analysis modeling [9,28,52,59,79,83-87]. Chinese scholars proposed in 2021 a scoring system assigning 2 points for normal, 1 point for mild impairment, and 0 points for severe impairment across five dimensions (cognition, locomotion, vitality, sensory, psychological), yielding total scores of 0-10, where lower scores indicate more severe impairment [9]. López-Ortiz et al. [59] further refined this: 9-10 points = normal intrinsic capacity, 5-8 points = decline, 0-4 points = significant decline. This scoring system provides objective basis for graded management of intrinsic capacity status, informing individualized interventions.

Recommendation: Use the intrinsic capacity composite scoring system: 9-10 points indicates normal capacity, 5-8 points indicates decline, and 0-4 points indicates significant decline. This score provides objective basis for graded management and should inform individualized intervention plans. (Recommendation strength: II; Evidence level: B)

4.3 Clinical Question 7: What comprehensive assessment strategy should be used for older adults with intrinsic capacity decline to systematically identify health problems and guide individualized care?

Evidence Summary: Intrinsic capacity assessment covers five interrelated and dynamically interacting dimensions (cognition, locomotion, vitality, sensory, psychological). Clinical practice should analyze overall intrinsic capacity rather than focusing on single dimensions. Multiple health conditions related to intrinsic capacity decline interact complexly across levels, requiring integrated approaches for systematic intervention. Frailty, sarcopenia, falls, multimorbidity, polypharmacy, pain, and urinary incontinence risks increase with age, significantly affecting health and functional ability [88-92]. Comprehensive Geriatric Assessment (CGA) uses multidisciplinary teams to comprehensively evaluate physical condition, functional status, mental health, and social environment. This consensus recommends CGA for older adults with intrinsic capacity decline, using comprehensive, multidimensional functional assessment to inform individualized management strategies aimed at maintaining functional independence and improving quality of life.

Recommendation: Implement CGA for older adults with intrinsic capacity decline through multidisciplinary, multidimensional systematic assessment to comprehensively identify complex physical, psychological, and social problems and inform individualized intervention plans to maintain functional independence and improve quality of life. (Recommendation strength: II; Evidence level: B)

5 Assessment of Comorbidities

Clinical Question 8: How should comorbidities be assessed in older adults?

Evidence Summary: With age, older adults often develop multiple chronic conditions. Comorbidity is defined as the coexistence of two or more chronic health problems, which is highly prevalent among older adults [93]. A meta-analysis showed comorbidity prevalence rises rapidly with age, affecting over 30% of Chinese older adults [90]. Comorbidity is associated with increased hospitalization risk, polypharmacy, disability, reduced quality of life, and mortality [94]. Assessment methods include Charlson Comorbidity Index (CCI), Geriatric Index of Comorbidity (GIC), Cumulative Illness Rating Scale (CIRS), Elixhauser Comorbidity Index (EC), and Kaplan-Feinstein Comorbidity Index (KFI). CCI assigns severity weights to each condition and sums them [95], being the most commonly used tool. For older adults with comorbidity, CGA systematically evaluates its impact on health status and risk for adverse outcomes like functional loss and quality of life decline, informing medical decision-making [93]. This consensus recommends CCI for comorbidity assessment, with regular CGA focusing on common geriatric syndromes and vigilant monitoring of polypharmacy effects.

Recommendation: Use the Charlson Comorbidity Index to assess comorbidity in older adults. Conduct CGA for patients with comorbidity to evaluate its health impact, focusing on geriatric syndromes such as frailty, fall risk, and polypharmacy, and implement individualized interventions based on assessment results. (Recommendation strength: I; Evidence level: B)

6 Assessment of Other Geriatric Syndromes

6.1 Clinical Question 9: How should frailty be screened and assessed in older adults?

Evidence Summary: Frailty is an age-related geriatric syndrome characterized by decreased physiological reserve and increased vulnerability, with reduced stress resistance [88]. The International Conference on Frailty and Sarcopenia Research (ICFSR) recommends multiple screening tools including FRAIL scale, Clinical Frailty Scale (CFS), Vulnerable Elders Survey-13, Kihon Checklist, ICOPE screening tool, Osteoporotic Fractures Study index, and electronic Frailty Index [96]. The Frailty Screening Questionnaire (FSQ), developed for Chinese older adults, is self-reported with five items (slow gait, weak muscle strength, low physical activity, fatigue, weight loss), scoring 0-5 (0=robust, 1-2=pre-frail, $ $3=frail), validated in community, emergency, and hospitalized settings [97-98]. The "Chinese Expert Consensus on Frailty Assessment and Intervention in Older Patients" [99] recommends screening adults aged $ $70 or those with unintentional weight loss $ $5% in the past year. The 2025 "Clinical Practice Guideline on Exercise Intervention for Intrinsic Capacity Decline and Frailty in Older Adults" [100] emphasizes routine frailty screening for adults aged $ $60, with positive screens undergoing Fried Frailty Phenotype assessment or CGA. Fried Frailty Phenotype includes weight loss, fatigue, slow gait, weak grip strength, and low physical activity, scoring 0-5 (0=robust, 1-2=pre-frail, $ $3=frail) [88], and is most widely used. This consensus recommends FSQ or FRAIL scale for screening, with Fried Frailty Phenotype for positive screens.

Recommendation: Use FSQ or FRAIL scale for frailty screening, with Fried Frailty Phenotype assessment for positive screens; conduct dynamic monitoring and regular assessment for frail older adults. (Recommendation strength: I; Evidence level: A)

6.2 Clinical Question 10: How should sarcopenia be screened and assessed in older adults?

Evidence Summary: The Asian Working Group for Sarcopenia defines possible sarcopenia as reduced muscle strength and/or physical performance; sarcopenia as reduced skeletal muscle mass plus reduced muscle strength or physical performance; and severe sarcopenia as reductions in all three [101]. Skeletal muscle mass measurement methods include dual-energy X-ray absorptiometry (DXA), bioelectrical impedance analysis (BIA), CT, and MRI. Grip strength is the most common muscle strength indicator. Physical performance assess-

ment includes SPPB, gait speed test, 6MWT, Timed Up and Go Test (TUG), and FTSST [101-103]. Screening tools include SARC-F questionnaire and calf circumference [101,104]. SARC-F ($ $4 points positive) shows good internal consistency and validity [104]. Calf circumference <34 cm in men and <33 cm in women indicates sarcopenia risk, suitable for large-scale community screening [101]. This consensus recommends SARC-F or calf circumference for screening, with positive screens undergoing skeletal muscle mass (DXA or BIA), muscle strength (grip), and physical performance (SPPB or gait speed) assessment. The "Chinese Guidelines for Diagnosis and Treatment of Sarcopenia (2024)" [105] recommends individualized interventions based on severity and comorbidity.

Recommendation: Use SARC-F or calf circumference for sarcopenia screening, with skeletal muscle mass (DXA or BIA), muscle strength (grip), and physical performance (SPPB or gait speed) assessment for positive screens. (Recommendation strength: I; Evidence level: B)

6.3 Clinical Question 11: How should falls be screened and assessed in older adults?

Evidence Summary: Falls are a common geriatric syndrome affecting functional independence and quality of life [106]. The "World Guidelines for Falls Prevention and Management in Older Adults: A Global Initiative" [107] recommends three key screening questions: "Have you fallen in the past year?" , "Do you feel unsteady when standing or walking?" , and "Are you worried about falling?" Positive screens require comprehensive risk stratification (low, medium, high) considering these questions plus gait and balance, fall history, and risk factors [108]. Assessment tools include Morse Fall Scale (MFS), Fall Risk Questionnaire (FRQ), TUG, FTSST, and Berg Balance Scale. Individualized fall prevention interventions should target risk factors to improve function and reduce risk [109]. Wearable or non-wearable sensors can objectively capture daily movement and balance data, using machine learning algorithms for accurate fall risk classification [110].

Recommendation: Use the three key questions for fall risk screening, with risk stratification and individualized intervention plans for positive screens. Wearable/non-wearable sensors with machine learning can objectively assess fall risk. (Recommendation strength: I; Evidence level: B)

6.4 Clinical Question 12: How should polypharmacy be assessed in older adults?

Evidence Summary: Polypharmacy refers to the concurrent use of multiple or excessive medications, typically defined as the inappropriate use of $ $5 medications [111]. Polypharmacy is common among older adults and increases adverse drug reaction risk [112]. Understanding polypharmacy patterns and preventing potential drug-related problems reduces adverse drug reactions and

improves medication safety. Assessment methods include: (1) Subjective methods like Medication Appropriateness Index and prescribing optimization; (2) Objective methods based on literature, guidelines, or expert consensus such as STOPP/START criteria and Beers Criteria; (3) Comprehensive analysis tools like ARMOR [113]. Medication adherence can be assessed using Morisky Medication Adherence Scale and other tools [111]. The "Chinese Expert Consensus on Polypharmacy Assessment and Management in Older Adults (2024)" [111] recommends using Lexicomp database and other drug interaction databases to screen interaction levels and determine assessment results based on evidence.

Recommendation: Conduct systematic polypharmacy assessment including medication appropriateness, adherence, adverse drug reactions, and drug interactions. (Recommendation strength: I; Evidence level: B)

6.5 Clinical Question 13: How should pain be assessed in older adults?

Evidence Summary: Pain assessment requires comprehensive history and physical examination. Ask about pain location, intensity, aggravating/relieving factors, impact on sleep and mood, and sensory abnormalities like allodynia, hypoesthesia, or numbness [114]. Assessment tools include Numerical Rating Scale (NRS), Verbal Descriptor Scale (VDS), Visual Analogue Scale (VAS), Geriatric Pain Measure (GPM), Brief Pain Inventory (BPI), and McGill Pain Questionnaire (MPQ) [115]. NRS and VDS are simple, quick, and widely used [116]. This consensus recommends NRS or VDS for pain assessment, combined with comprehensive history and targeted physical examination to inform analgesic plans.

Recommendation: Use NRS or VDS for pain assessment, with comprehensive history and targeted physical examination to develop personalized analgesic plans. (Recommendation strength: II; Evidence level: B)

6.6 Clinical Question 14: How should urinary incontinence be screened and assessed in older adults?

Evidence Summary: Urinary incontinence is objectively demonstrable involuntary urine leakage, a common health problem and geriatric syndrome [117-118]. It significantly reduces quality of life and may induce psychological problems [119]. Initial screening involves asking about accidental leakage; positive screens require comprehensive history and physical examination, including onset, severity, prior treatments, quality of life impact, and treatment preferences [118]. Assess urinary system status and identify reversible risk factors such as advanced age, fluid imbalance, constipation, polypharmacy, urinary tract infection, delirium, vulvar symptoms, incontinence-associated dermatitis, diabetes, and obesity [5]. Targeted physical examination includes assessment of cognition, mobility, toileting ability, and neurological function [118]. Evaluate toileting accessibility, need for protective products, and assistance requirements to inform intervention plans.

Recommendation: Screen for urinary incontinence by asking about accidental leakage; positive screens require comprehensive assessment including urinary history, reversible risk factors, and targeted physical examination to develop intervention plans. (Recommendation strength: II; Evidence level: B)

6.7 Clinical Question 15: What should social support assessment include for older adults?

Evidence Summary: Social support refers to help received and perceived during social interactions and its utilization [5], representing an important component of comprehensive intrinsic capacity assessment focusing on older adults' ability to access external resources and emotional support. Social support includes assistance with daily activities and care, facilitation of community facility and public service use, alleviation of loneliness, financial security, improved living conditions, and support for meaningful social participation. Poor social support limits activities of daily living and increases intrinsic capacity decline risk [120-121]. WHO ICOPE recommends assessing social support across four domains: home environment (housing safety), financial status (ability to pay for food, housing, and medical expenses), social isolation and loneliness (feelings of loneliness and social connections), and social participation (interests and activities) [5]. Common Chinese assessment scales include Social Support Rating Scale (SSRS), Perceived Social Support Scale (PSSS), and Chinese People' s Social Support Scale (CPSSS).

Recommendation: Include social support in comprehensive intrinsic capacity assessment, evaluating home environment, financial status, social isolation and loneliness, and social participation. (Recommendation strength: I; Evidence level: B)

6.8 Clinical Question 16: What other assessments should be conducted for older adults?

Evidence Summary: Physical function impairment is common among older adults; early identification and scientific intervention improve prognosis and quality of life [122]. Early screening, assessment, and intervention for functional status are important measures to prevent and delay disability [123]. Currently, no specific scales exist for assessing functional impairment in older adults; most use activities of daily living including Barthel Index and Katz Index for basic activities, and Lawton Instrumental Activities of Daily Living Scale and Functional Activities Questionnaire (FAQ) for instrumental activities. The "Chinese Expert Consensus on Prevention and Intervention of Physical Function Impairment in Older Adults (2022)"[124] recommends the Function Impairment Screening Tool (FIST) for Chinese older adults, selecting appropriate tools based on clinical symptoms. FIST demonstrates good reliability and validity in hospitalized and community older adults [125-126]. This consensus recommends FIST for physical function assessment, combined with basic and instrumental activities of daily living assessment, with dynamic assessment every 3-6 months.

Recommendation: Use FIST for physical function assessment, combined with basic and instrumental activities of daily living assessment, with dynamic assessment every 3-6 months. (Recommendation strength: II; Evidence level: B)

The screening and comprehensive assessment process for intrinsic capacity in older adults is shown in Figure 1 [Figure 1: see original paper].

7 Summary and Outlook

Based on recent advances in intrinsic capacity research, China' s aging demographics, and clinical practice, this consensus developed 21 recommendations to standardize screening and comprehensive assessment processes for intrinsic capacity in older adults, aiming for early identification of decline to improve functional status and quality of life, thereby supporting healthy aging.

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Note: Figure translations are in progress. See original paper for figures.