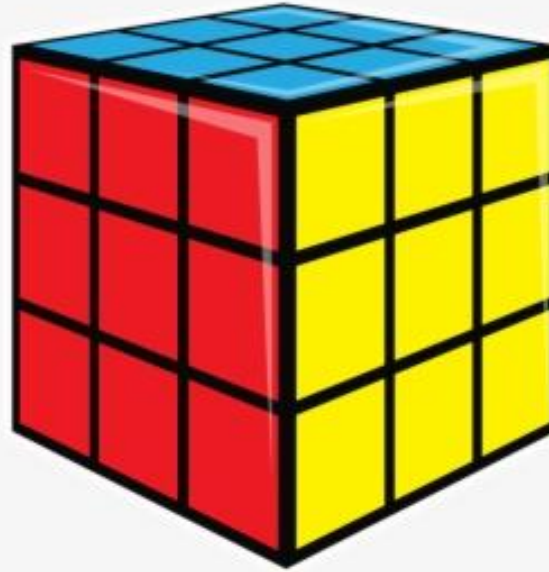


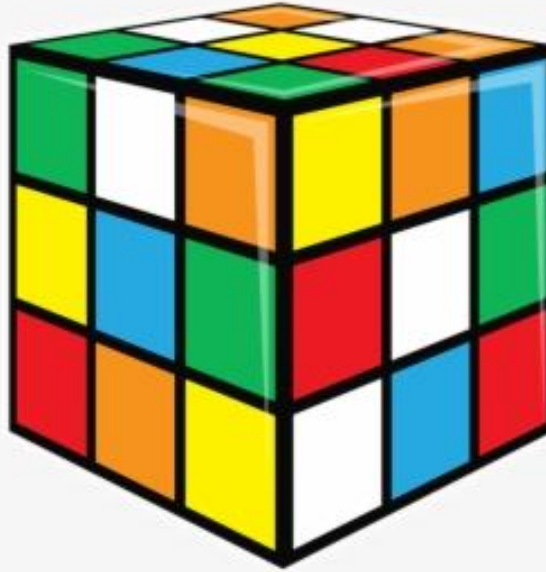
Occupation-Centered Practice in Osteoporosis



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Human being is multidimensional and multilayer



Human being is multidimensional and multilayer

Osteoporosis is an insidious disease because its progression usually goes unnoticed until a painful fracture occurs

Excessive bone resorption results in the gradual thinning and increased porosity of cortical bone and a reduction in the number and thickness of trabeculae in cancellous bone

Common osteoporosis-related fractures include those sustained at the hip, wrist, humerus, and vertebrae

The structural integrity of bone is usually compromised to such an extent that fractures occur in **circumstances that would not normally cause damage to the skeleton.**

Osteoporosis Classification

Primary

Primary osteoporosis is age-related and may manifest in the form of idiopathic or involutional osteoporosis.

Type I (post-menopausal) usually affects women within 25 years following menopause

Vertebral fractures, back pain, spinal deformity, and loss of body height are characteristic of Type I osteoporosis


Type II (age-related) osteoporosis affects elderly people and is characterized by a proportional loss of cortical and trabecular bone

Fractures of the hip and wrist are typical of type II osteoporosis

Secondary

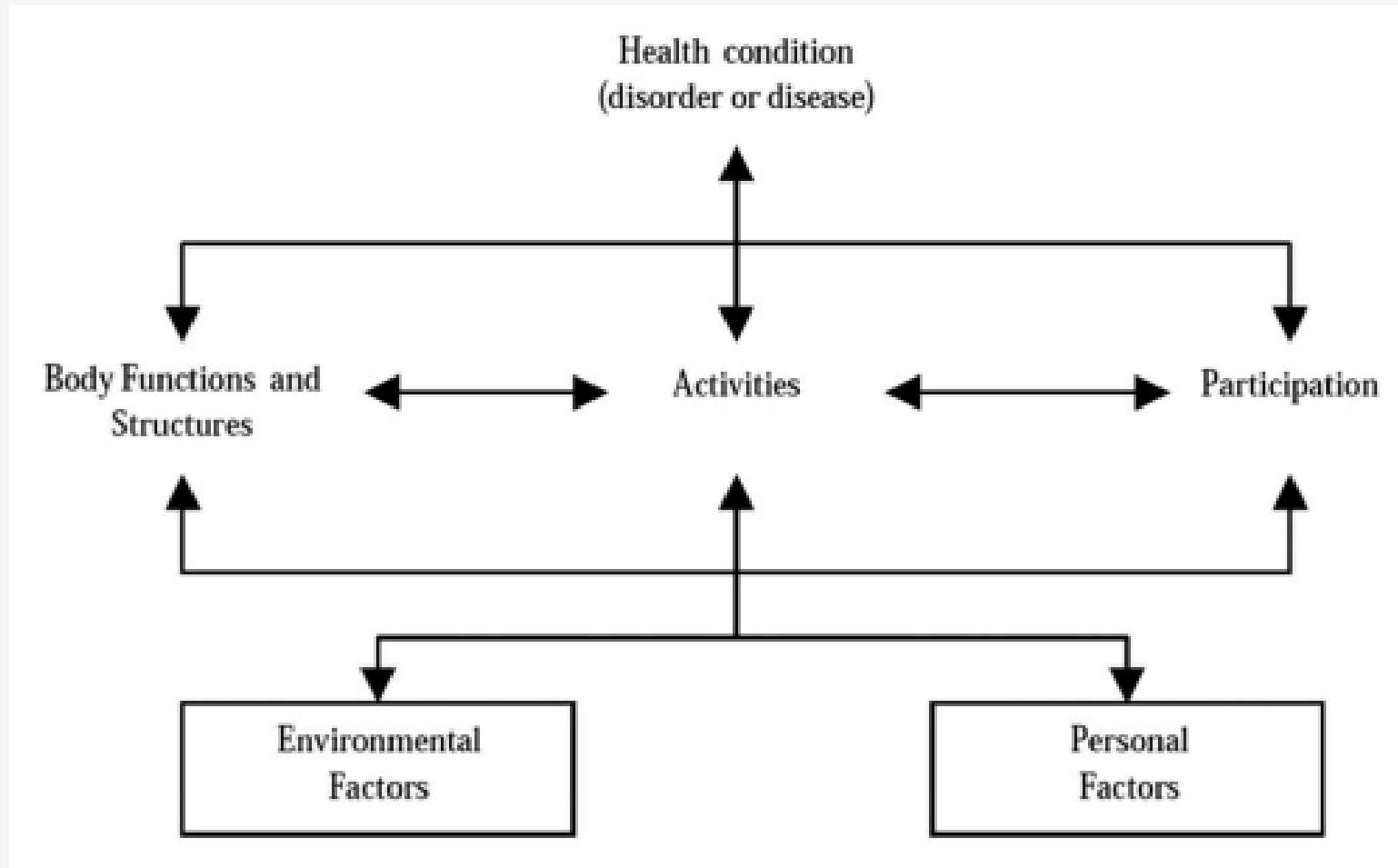
Secondary osteoporosis is often the result of other physical conditions,

such as primary biliary cirrhosis, rheumatoid arthritis, chronic pulmonary disease, endocrine abnormalities, nutritional deficiencies, immobilization, medications, heritable disorders, or neoplasms

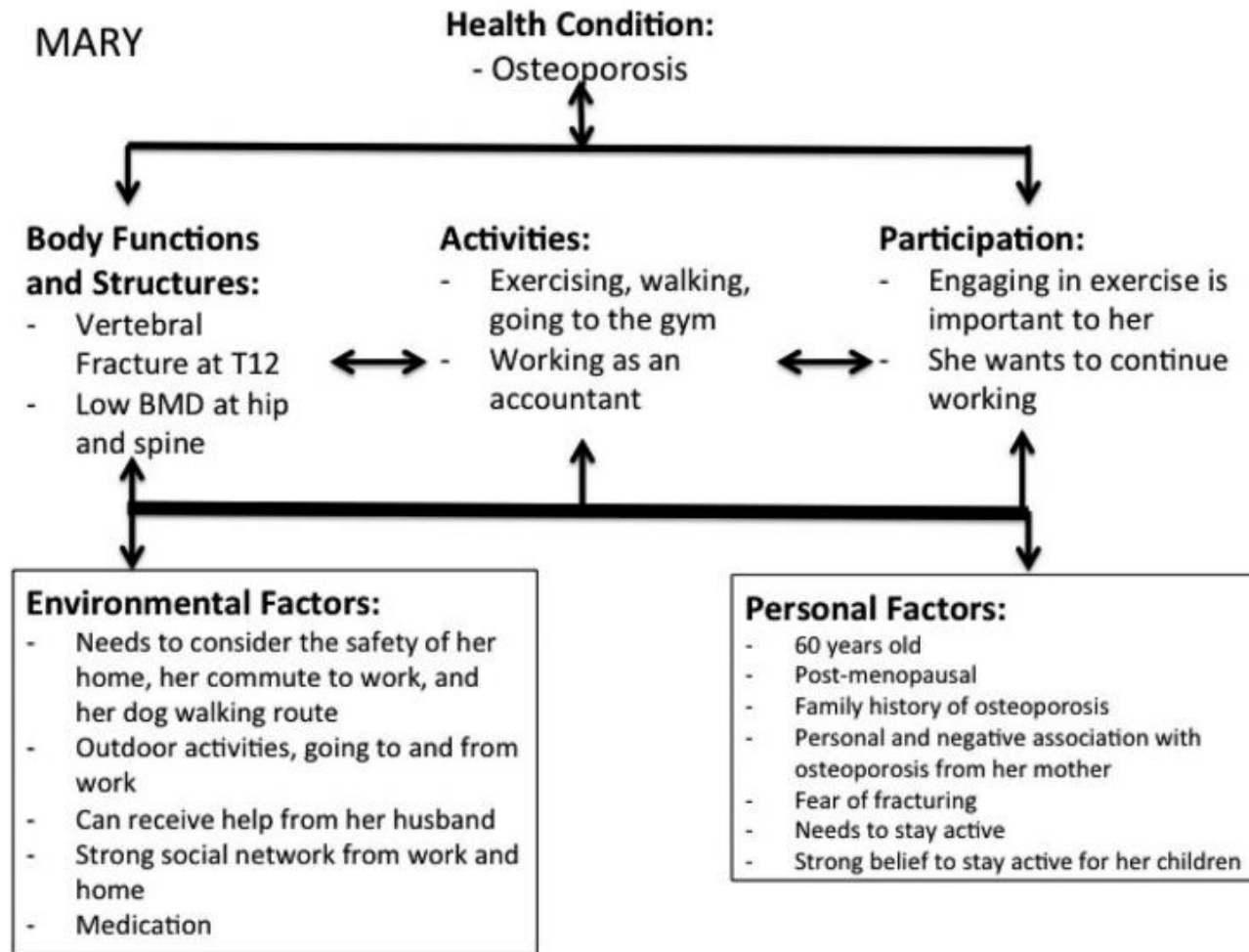


Until recently, **conventional treatment** of osteoporosis has tended to **focus mainly on the medical management** of the disease process however, it is known that osteoporosis **can progress in severity** and lead to both extensive **physical** and **psychosocial issues** of concern.

The ICF and Osteoporosis



The ICF and Osteoporosis



Conventional treatment of osteoporosis

Conventional treatment of osteoporosis includes **nutritional counselling, medical management, and physical exercise.**

Physical therapy management of osteoporosis involves variety of exercises aimed at:

maintaining and increasing bone mass

improving back extensor muscle strength

reducing postural deformity

increasing cardiovascular capacity

weight-bearing exercises and Back extensor strengthening are effective PT interventions

Occupational therapy is beneficial for those individuals in whom **the condition** interferes with their ability to perform daily activities.

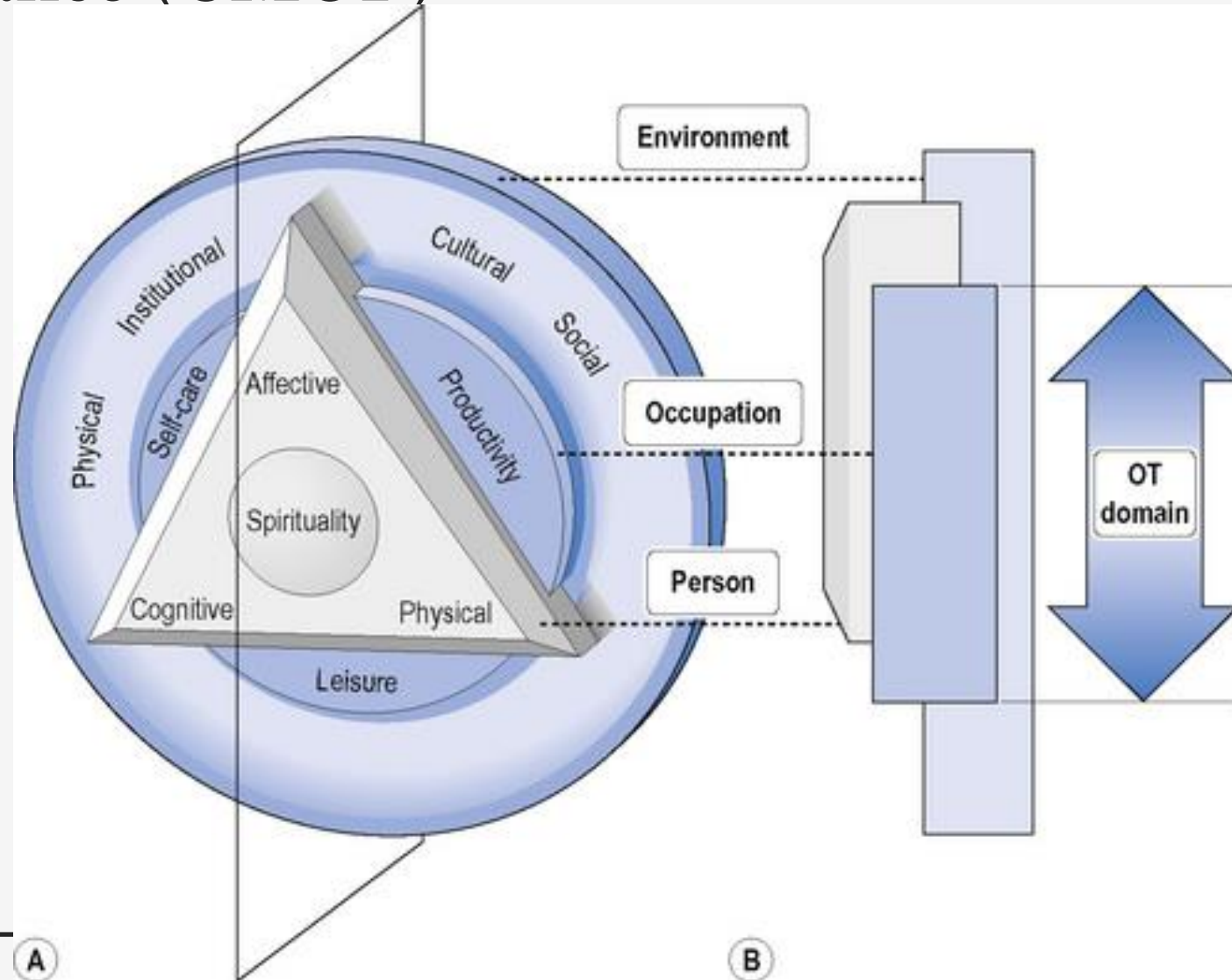
Occupational therapists evaluate the need for adaptive equipment (e.g., special jar openers, long-handled combs, and long-handled reachers) to maximize independence and to prevent injury.

Ots Assist clients in **following prescribed diets, educate** them about the advantages of exercise and **how to incorporate it into daily routines, encourage** the use of proper **body mechanics, promote energy conservation, make home visits** to identify and educate about environmental hazards, and **counselling** clients and their families with respect to any possible **psychological and emotional issues** associated with the disease

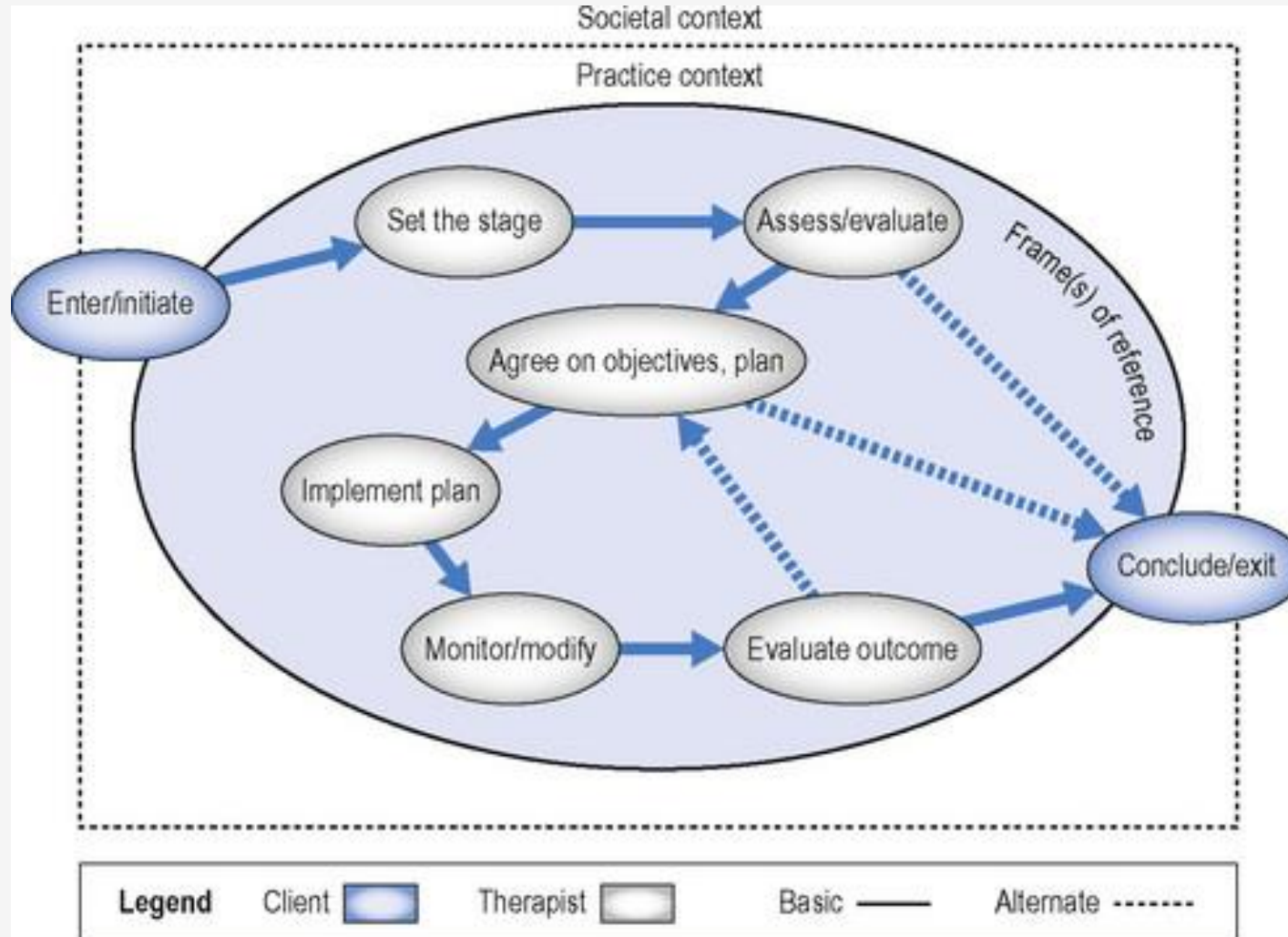
A review of the literature concerning osteoporosis reveals that issues associated with quality of life, psychological concerns, and questions related to the environment are often considered secondary to those of a medical nature.

OT'S HOLISTIC PERSPECTIVE ON OSTEOPOROSIS

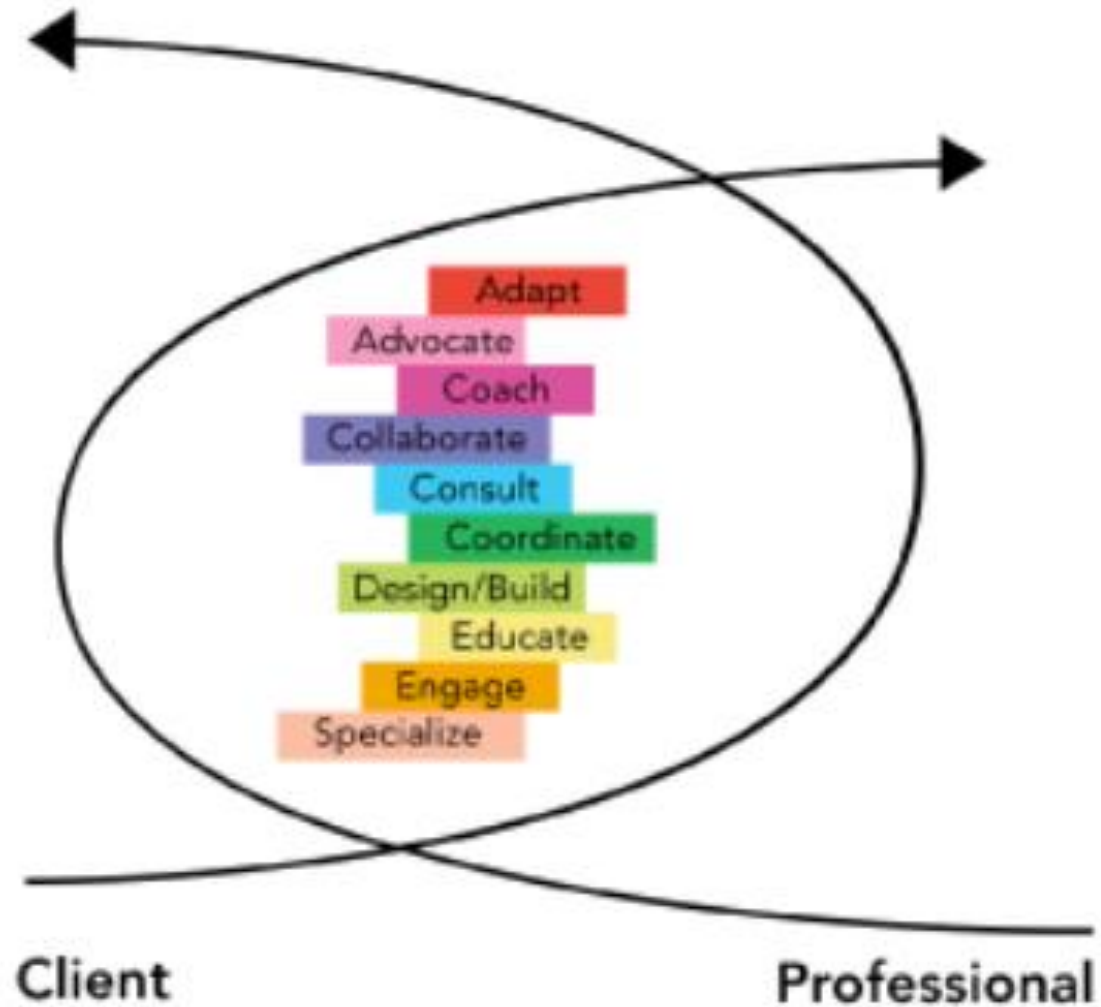
The Canadian Model of Occupational Performance (CMOP)




The Canadian Model of Occupational Performance (CMOP)



The Canadian Model of Occupational Performance (CMOP)





The purpose of applying the CMOP to clients with osteoporosis is to understand the occupational limitations likely to be experienced by those affected with this condition and, in turn, determine how they might affect overall occupational performance.

Spiritual performance component of a person

Concepts of spirituality refer to the innate essence of self; the quality of being uniquely and truly human; the expression of will, drive, and motivation; the source of determination and personal control; and a guide for expressing choice.

Impairment that impedes daily activities may “stifle the spirit’s desires”. However, the extent to which osteoporosis-related impairment affects the spirit remains to be explored.

Physical performance component of a person

The physical component of a person's occupational performance takes into consideration all sensory, motor, and sensory-motor functions and addresses how these functions allow people to engage in physical activity.

Although functional limitations are secondary to osteoporosis, they can have a negative impact on all areas of occupational performance, especially in the absence of a supportive environment.

Functional limitations, in part, are preventable and are not an inevitable consequence of the disease.

SKELETAL DEFORMITIES

RISK FACTORS FOR SKELETAL DEFORMITIES

VERTEBRAL COMPRESSION FRACTURES

(Anterior wedging of the vertebral bodies)

- kyphosis
- reduced height
- altered lumbar lordosis

Risk factors associated with sustaining vertebral compression fractures:

- Back flexion and heavy lifting (Sinaki, 1982).
- Gonadal steroid hormone deprivation (DeSmet et al., 1988; Nguyen et al., 1995).
- Weak back extensor muscles (Sinaki et al., 1992)

HIP FRACTURE

- femoral neck
- intra-trochanteric
- subcapital

Risk factors associated with falling and sustaining a hip fracture:

- being tall (Nevitt & Cummings, 1993).
- weak triceps (Nevitt & Cummings, 1993).
- landing on a hard floor (Nevitt & Cummings, 1993).
- post-menopausal status (Millar & Hill, 1994)

WRIST FRACTURE

Risk factors associated with falling and sustaining a wrist fracture:

- being tall (Nevitt & Cummings, 1993).
- weak grip strength (Nevitt & Cummings, 1993)

Mechanisms of development of skeletal deformities and their functional limitations: Impact on occupation

SKELETAL DEFORMITIES	MECHANISMS OF DEVELOPMENT	FUNCTIONAL LIMITATIONS	IMPACT ON OCCUPATION (self care, productivity and leisure)
<p>VERTEBRAL COMPRESSION FRACTURES (Anterior wedging of the vertebral bodies)</p> <ul style="list-style-type: none"> • kyphosis • reduced height • altered lumbar lordosis 	<ul style="list-style-type: none"> • Gradual compression of reduced mineralized mid-thoracic and thoracolumbar vertebrae leads to anterior wedging and the development of hyperkyphosis (DeSmet et al., 1988). • To compensate for hyperkyphosis, the following may eventually develop: <ul style="list-style-type: none"> - altered lumbar lordosis - posterior tilt of the sacrum and pelvis - knee flexion However, such compensation only seems to promote back pain (Itoi, 1991). • Demineralization of vertebrae, combined with traumatic event(s) or regular activity that normally does not result in fractures, can induce both compression fractures and anterior wedging of the vertebral body • Back flexion promotes vertebral compression fractures and may increase kyphosis (Sinaki, 1982) 	<p>Musculoskeletal:</p> <ul style="list-style-type: none"> • Back pain (Itoi, 1991; Ryan et al., 1994; Satoh et al., 1988). • Reduced range of lumbar extension (Satoh et al., 1988) <p>Respiratory:</p> <ul style="list-style-type: none"> • Reduced inspiratory function due to severe kyphosis (Culham et al., 1994; Lisboa et al., 1985). • Back pain (Galindo-Ciocon et al., 1995; Helmes et al., 1995). • Limited movement patterns: The individual should avoid stooping, bending, and heavy lifting (Sinaki, 1982) 	<p>Self-care:</p> <ul style="list-style-type: none"> • Difficulty finding suitable clothing (Ryan et al., 1994). • Difficulty bathing and washing (Ryan et al., 1994). • May have difficulty with toileting, dressing, transfers, and continence (Galindo-Ciocon et al., 1995). • Sleep disturbance (Ryan et al., 1994). • Limited positioning: The individual should avoid sleeping in the fetal position (Sinaki, 1982). <p>Productivity:</p> <ul style="list-style-type: none"> • Fatigue • Reduced functional reach (Lyles et al., 1993). • Heavy lifting or strenuous activity may result in back pain (Sinaki, 1982). • May need lower back support (Sinaki, 1982). • Reduced sitting and standing tolerance (Cirullo, 1989). • Fear of falling and fractures (Cook et al., 1993). • Overall, the effect of kyphosis on the ability to perform daily activities is not considered significant (Ryan et al., 1994)

HIP FRACTURE

- femoral neck
- intra-trochanteric
- subcapital

- Hip fractures often occur prior to a fall/
- **Fall mechanism:** People who experience hip fractures tend to fall sideways or straight down, land near or on their hip, and are unlikely to break a fall by grasping or hitting an object (Nevitt & Cummings, 1993).

Reduced mobility and possible nursing home admission (Melton III, 1993)

Self-care and Productivity:

- Increased dependency on others (Roberto & McGraw, 1991).

WRIST FRACTURE

Fall mechanism: There is a tendency to fall backward, land on one hand, and be unable to break the fall (Nevitt & Cummings, 1993)

Wrist range of motion and strength are limited for 8 to 12 months (Ware, 1993)

Patients remain independent in self-care

Risk factors for falling

PERSONAL RISK FACTORS

- use of diuretics (Torgerson et al., 1993)
- arthritis (Torgerson et al., 1993)
- not owning a car (Torgerson et al., 1993)
- obesity (Torgerson et al., 1993)
- low bone density (Torgerson et al., 1993)
- slow walking speed (Nevitt & Cummings, 1993)
- lower body mass (Nevitt & Cummings, 1993)
- aged 75+ (Nevitt & Cummings, 1993)

ENVIRONMENTAL RISK FACTORS

- environmental obstacles (Kinderknecht, 1992)
 - scatter rugs (Kinderknecht, 1992)
 - electrical cords (Kinderknecht, 1992)
 - unstable furniture (Kinderknecht, 1992)
 - inadequate lighting (Kinderknecht, 1992)
 - unstable handrails in stairwells (Kinderknecht, 1992)
 - slippery surfaces (Worchester & Whatley, 1992)
 - landing on a hard surfaces (Nevitt & Cummings, 1993)
 - height of fall (Nevitt & Cummings, 1993)
-

Cognitive performance component of a person

osteoporosis has no direct bearing on cognitive function. However, cognition is an integral part of occupational performance.

For this reason the CMOP identifies cognition as the domain that comprises, “all mental functions, both cognitive and intellectual, and includes, among other things, perception, concentration, memory, comprehension, judgement and reasoning”

The Environment

- The social element of the environment
- The cultural element of the environment
- The physical element of the environment
- The institutional element of an environment

Individuals with osteoporosis have to manage their own occupational performance components which strongly influence the self-care, productivity, and leisure activities in which they participate. In addition, they must negotiate interacting elements of the social, cultural, physical, and institutional environment in which they perform these activities.

The environment may be either **supportive** or **detrimental** to the way in which individuals with osteoporosis manage their condition.

EBP Recommendations

- The effect of exercise on BMD is area specific. For this reason exercise should be targeted to points of clinical interest (A).
- Aerobic exercise is effective in reducing bone loss in the spine and wrist (A).
- Strength training exercises are effective in reducing bone loss and increasing muscle strength (A).
- Although exercise has proven benefits, the ideal type of exercise, duration and intensity in a Falls prevention program is not yet fully clear (B).
- Exercises that improve balance, including Tai Chi, are effective in populations with a high risk of falling (A).
- In patients who have fallen medications should to be reviewed and modified or discontinued as appropriate in light of the risk of future falls. Particular attention should be given to older people who take four or more medications and those taking psychotropic medications (C).
- The vitamin D supplementation reduces Falls (B).
- Necessary is the evaluation of the house in elderly patients with an increased risk of falling that receive discharge from the hospital in order to facilitate them under new conditions (B).
- There is no direct evidence that the use of assistive devices or educational programs alone helps prevent Falls . Therefore, although it can be effective elements of a multifactorial intervention program, the isolated use without attention to other risk factors cannot be recommended (C).

Any Question?

