

INTRODUCTION TO CHRONIC DISEASE MANAGEMENT



TREATMENT PRINCIPLES & LIFESTYLE INTERVENTIONS

BMSH4302 INTRODUCTION TO CHRONIC DISEASE

PHARMACOLOGY & CLINICAL PRINCIPLES



MEDICATION
REGIMENS &
ADHERENCE



CARDIOVASCULAR
RISK REDUCTION



RESPIRATORY
SYMPTOM
MANAGEMENT



METABOLIC CONTROL
& GLUCOSE
REGULATION



CAUTION: DRUG INTERACTIONS & SIDE EFFECTS
MONITORING

LIFESTYLE & EXERCISE INTERVENTIONS



PHYSICAL ACTIVITY
PRESCRIPTION



DIETARY
MODIFICATION &
NUTRITION



SLEEP HYGIENE
& REST



STRESS
MANAGEMENT &
BEHAVIORAL
CHANGE



CLINICAL CONSIDERATION: INDIVIDUALIZED EXERCISE
CLEARANCE

Dr. Peter Herbert

Identity: Practitioner,
Researcher, Athlete

Focus: The science and
lived reality of healthy
ageing.

Listen For:



Training principles
sustained across
decades.



The interaction of
strength, aerobic
fitness, and
mindset.



Adaptation,
recovery, and
longevity.



Session Roadmap



Inspiration
(Guest Speaker Q&A)

The Framework
(Referral & Shared Care)



The Foundation
(NICE & 5 Pillars)

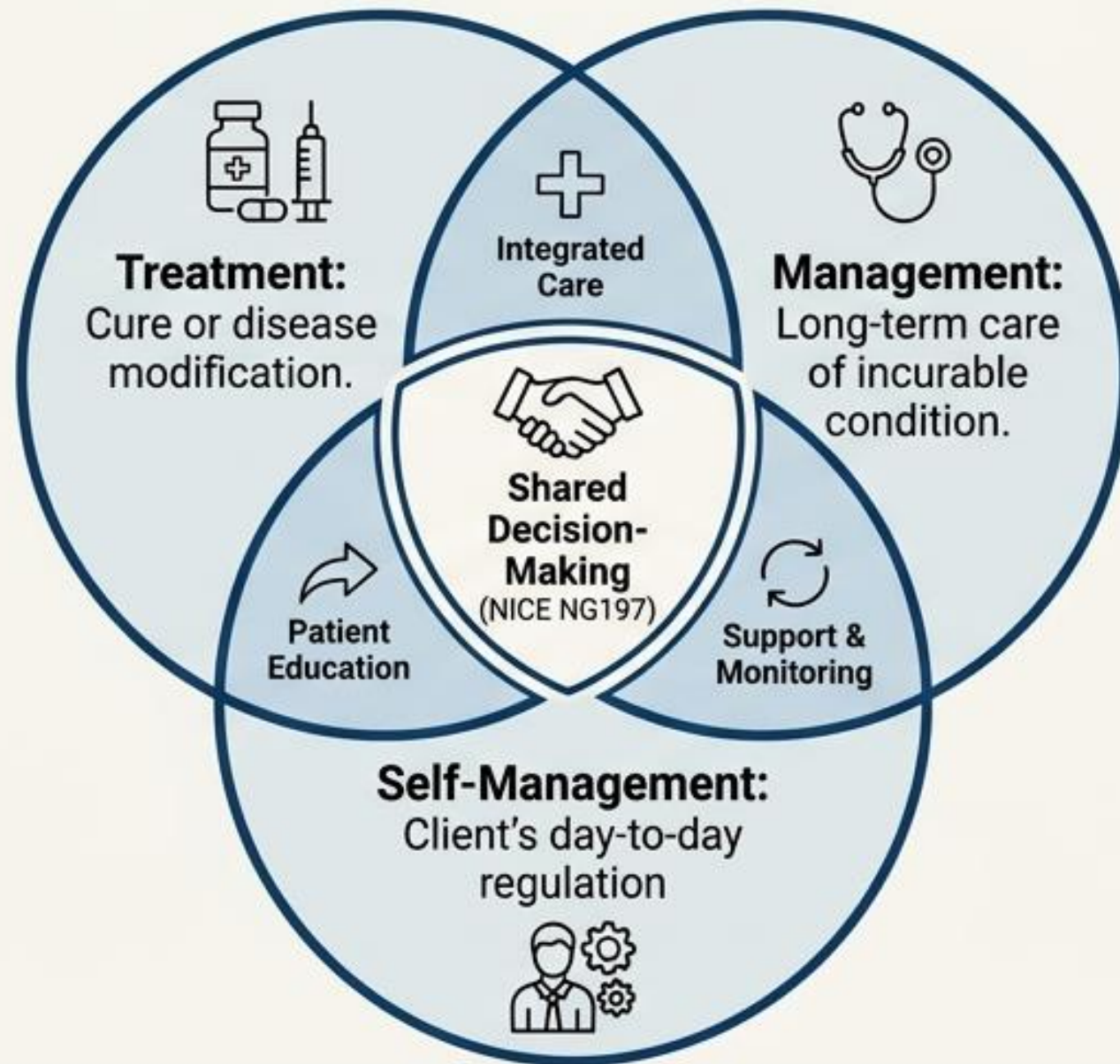
The Arsenal
(Condition Dashboards)



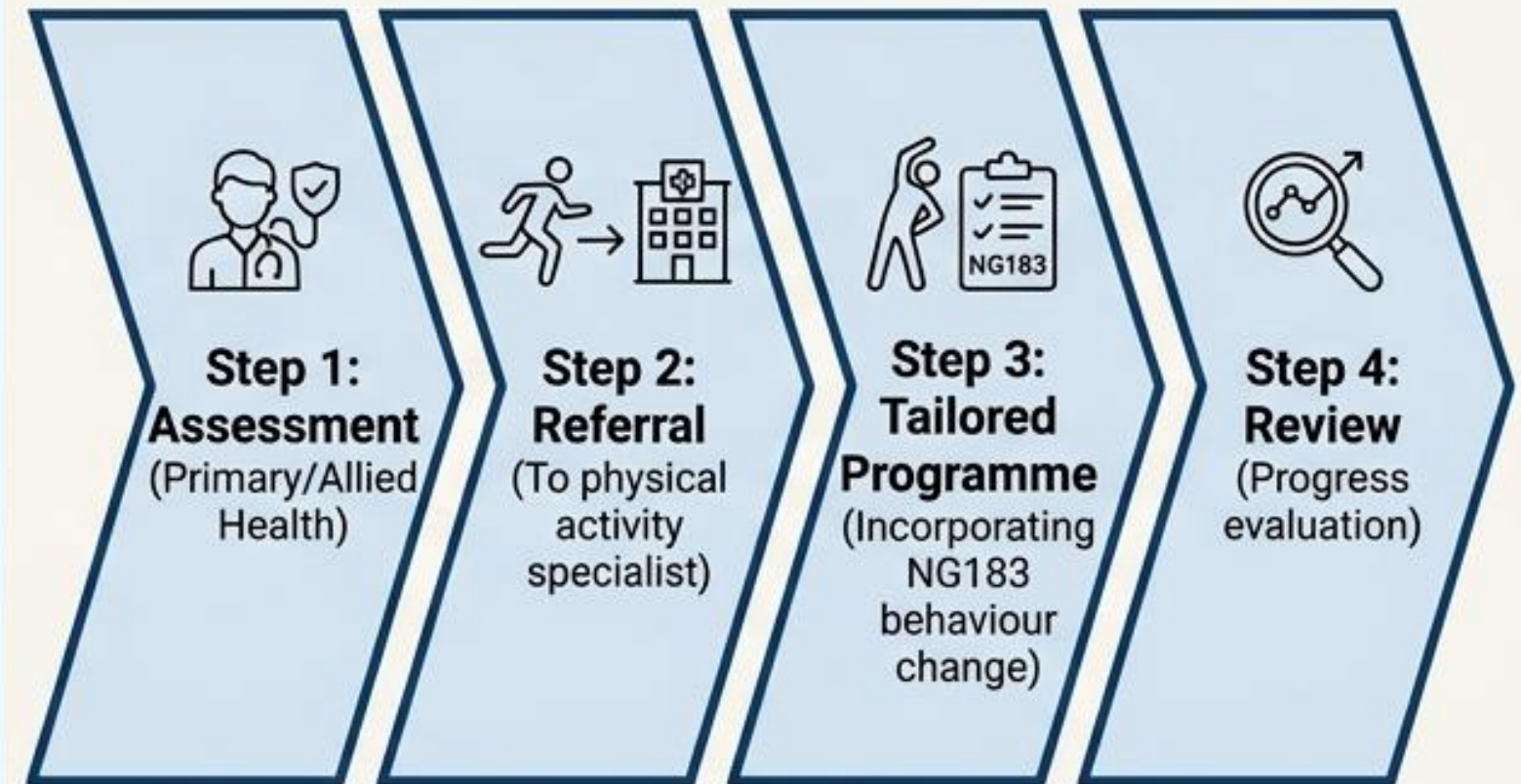
Synthesis
(Multimorbid Case Study)

The Architecture of Clinical Management & Referral

Clinical Management Models



NICE PH54 Exercise Referral Schemes



Pathway for inactive adults with specific conditions.



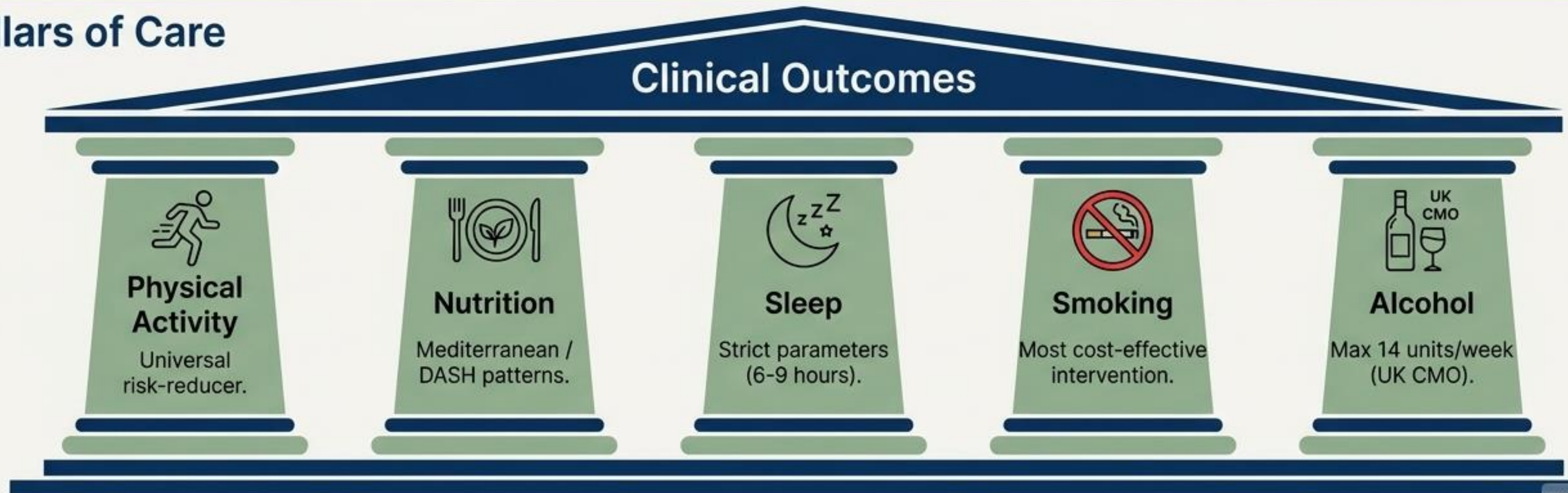
Funded only for inactive adults with conditions/risks.
Cardiac, pulmonary, and cancer rehab sit outside PH54.

The Foundation of Care: Principles & Pillars

NICE Principles



Pillars of Care



Clinical Screening & Exercise Parameters



The Prescription Formula (FITT)



- **Frequency/Time:** 150 min moderate OR 75 min vigorous weekly.



- **Type:** +2x resistance per week. Older adults add balance/functional 2x weekly.



The Intake Decision Tree

Screen: PAR-Q+ and Medication Review.



**Proceed.
Cleared.**

Rule: Use RPE (Borg 6-20) if heart rate is pharmacologically altered.



Defer.

Recent injury, acute illness, uncontrolled BP, undiagnosed symptoms.



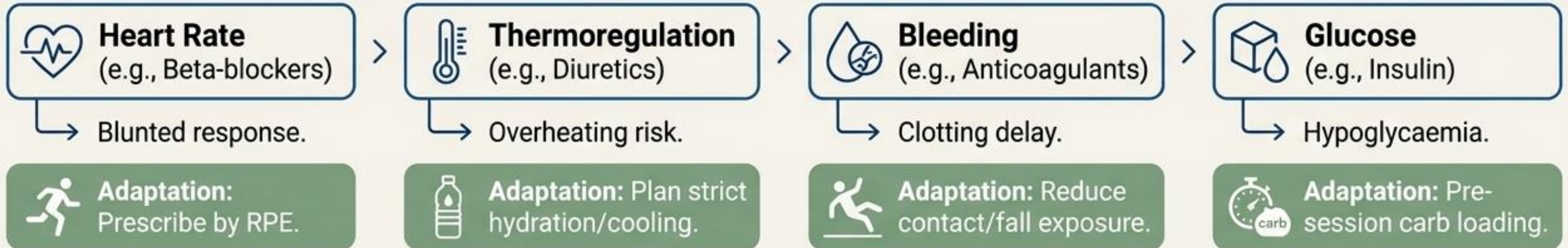
Refer to GP.

Chest pain, unexplained breathlessness, dizziness on exertion, multiple CV risk factors.



The Interaction Matrix: Pharmacology, Food & Exercise

Drug to Exercise Adaptations



Food & Timing Axioms

	Levothyroxine:	Empty stomach	→ Wait 30-60 min	before food/coffee/iron.
	Bisphosphonates:	Plain water	→ Upright for 30 min	No other meds.
	Metformin:	Take with food (reduces GI distress).		
	Statins:	Zero grapefruit or grapefruit juice.		
	Warfarin:	Keep Vitamin K consistent (not low).		

Cardiovascular Disease & Heart Failure

Impact includes breathlessness, fatigue, and reduced independence.   



Pharmacology



Antihypertensives: ACE inhibitors, ARBs, Beta-blockers, Diuretics.



Lipid/Clot: Statins, Antiplatelets, Anticoagulants.



Heart Failure Core 4: ACE/ARB, Beta-blocker, MR antagonist, SGLT2 inhibitor.



Angina: GTN spray for symptom relief.



Lifestyle



Cardio: 3-5 days/wk, RPE 11-13, 30-60 min.



Resistance: 2-3 days/wk, 8-15 reps (50-70% 1RM). Avoid Valsalva.



Diet: Med/DASH pattern. Sodium <6g/day. Fluid restriction in HF.



Red Flags



Beta-blockers blunt HR -> Use RPE.



Diuretics require session hydration planning.



Statins (simvastatin/atorvastatin) strictly contraindicate grapefruit.



Warfarin requires consistent Vitamin K.

The Airways: COPD & Asthma



COPD (progressive/irreversible limitation); **Asthma** (variable/reversible bronchoconstriction).

Pharmacology



Relievers: SABA (salbutamol).



Maintenance: LABA, LAMA, ICS (Inhaled Corticosteroids).



COPD Advanced: Triple therapy / Oxygen for chronic hypoxaemia.



Asthma Advanced: Biologics for severe eosinophilic variants.

Lifestyle



COPD Cardio: Interval focus (3:1 rest:work ratio), up to 30 min. Target RPE 11-13.



Asthma Cardio: 3-5 days/wk, RPE 11-15.



Resistance: Peripheral muscle focus (COPD) / Endurance focus (Asthma).



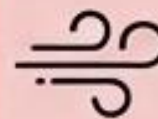
Red Flags



SpO2 Monitoring: Keep >88% during COPD activity.



Asthma Prep: SABA 2 puffs 10-15 mins pre-exercise. 15-min warm-up.



Triggers: Cold/dry air. Pursed-lip breathing for COPD.



Hygiene: Rinse mouth post-ICS to prevent oral candidiasis.

Diabetes Mellitus: Type 1 vs Type 2

T1DM (Autoimmune beta-cell destruction) vs T2DM (Insulin resistance & metabolic dysfunction).

Type 1 (Autoimmune)



Pharmacology

Basal-bolus insulin or pump. CGM standard.



Lifestyle

Daily bursts to 150m/wk. Resistance 2-3 days.



Lifestyle

Carb counting matched to insulin.



Strict Rules: Aim 6-10 mmol/L pre-exercise. <6 needs 15-30g fast carbs. Blood ketones >1.5 = DEFER. Do not inject active muscles.



Shared Red Flags: Always carry fast-acting carbohydrates. HR unreliable if co-prescribed beta-blockers (T2DM).

Type 2 (Metabolic)



Pharmacology

Metformin first-line, SGLT2 / GLP-1, Sulfonylurea.



Lifestyle

Resistance is critical (muscle buffers glucose). RPE 11-13.



Lifestyle

Structured weight loss (DiRECT trial remission). Reduce ultra-processed food.



Strict Rules: Hypo risk with sulfonylureas/insulin. Metformin with food. Check footwear for peripheral neuropathy.

Endocrine: Hashimoto's Thyroiditis

Autoimmune hypothyroidism causing fatigue, weight gain, and cold intolerance.



Pharmacology

- **First-line:** Levothyroxine (lifelong).
- **Titration:** Dose adjusted against TSH; reviewed 6-8 weeks post-change.
- **Note:** No NHS role for T3 or combo therapy.



Lifestyle

- **Cardio:** Standard 150 min/wk moderate. Start RPE 11-13.
- **Resistance:** 2-3 days/wk, full-body.
- **Diet:** Iodine and selenium adequacy. Screen for coeliac (10% co-occurrence). Avoid massive iodine excess.



Red Flags



The Empty Stomach Rule:

Levothyroxine must be taken 30-60 mins before food, coffee, calcium, or iron.



Adaptation Alert: Adding lean muscle mass alters thyroid requirement; prompt TSH re-check.



Environment: Pronounced cold intolerance requires extended warm-ups.

Metabolic: Obesity Management

Chronic, relapsing disease of dysfunctional adipose tissue with multi-system consequences.

Pharmacology



- **Traditional:** Orlistat (NHS mainstay).
- **Modern:** GLP-1 (Semaglutide) and dual agonists (Tirzepatide) via specialist All-Wales Pathway.
- **Surgical:** Bariatric surgery for severe disease.

Lifestyle



- **Cardio:** 5-7 days/wk, RPE 11-13, 40-60 min (low-impact preferred to protect joints).
- **Resistance:** 2-3 days/wk, full body.
- **Diet:** Structured energy deficit (Med/DASH). Cut ultra-processed foods.

Cautions



- **The GLP-1 Rule:** Appetite suppression risks sarcopenia. Must protect protein intake (1.2-1.6 g/kg) to preserve muscle mass.
- **Screening:** Sleep apnoea screen if BMI >35 with daytime sleepiness.
- **Psychosocial:** Weight stigma is clinically significant; adjust language and environment.

Joint Pathology: Rheumatoid vs. Osteoarthritis

RA (Systemic Autoimmune Synovium Attack) vs **OA** (Localized Mechanical/Degenerative).

Rheumatoid Arthritis (Systemic)



Pharmacology

DMARDs (Methotrexate, Sulfasalazine) -> Biologics. Short-term steroids/NSAIDs.



Lifestyle

Low-impact cardio. Isometrics during joint inflammation. Daily mobility.



Cautions: Immunosuppression risk. Pace activity around unpredictable flares. Minimize alcohol with Methotrexate.



Shared Red Flags: NSAIDs must be taken with food. Sudden, severe new joint symptoms warrant immediate GP referral.

Osteoarthritis (Mechanical)



Pharmacology

Paracetamol, topical NSAIDs. Oral NSAID short courses.



Lifestyle

Strengthen surrounding musculature (e.g., quadriceps for knee OA). Aquatic therapy.



Cautions: Avoid deep-flexed loaded knee positions early on. Modest weight loss dramatically reduces joint load.

Structural Degradation: Osteoporosis vs. Sarcopenia

Osteoporosis (Deterioration of bone microarchitecture) vs **Sarcopenia** (Age-related loss of muscle mass/function)

Osteoporosis (Bone)



Pharmacology

Bisphosphonates (Alendronate) first-line.
Calcium/Vit D adjuncts.



Lifestyle

Weight-bearing rhythmic activity.
Progressive load. Graded impact.

Sarcopenia (Muscle)



Pharmacology

NO LICENSED PHARMACOTHERAPY



Lifestyle

Resistance training is non-negotiable (3 days/wk). Balance training (2x/wk).
Protein focus: 1.2-1.5g/kg/day. Spread across meals (~30g/meal) with leucine-rich evening meal.



Shared Red Flags: Bisphosphonates require plain water, empty stomach, upright 30 mins. Avoid spinal flexion under load in severe disease. Prioritize resistance over caloric restriction in sarcopenic obesity. Watch for cognitive decline.

Neurological: Multiple Sclerosis

Autoimmune destruction of CNS myelin resulting in fatigue, gait, sensory, and visual symptoms.

Pharmacology



- **DMTs:** Interferon beta, oral agents, higher-efficacy monoclonals.
- **Symptom Mgmt:** Fampridine (gait), Baclofen/Gabapentin (spasticity).
- **Acute:** Steroids for relapses.

Lifestyle



- **Cardio:** 3-5 days/wk low-impact, RPE 11-13. Work within the energy envelope.



- **Resistance:** 2-3 days/wk, 8-15 reps moderate load.



- **Diet:** Med pattern, strict Vitamin D adequacy (immunomodulatory).



Red Flags

- **Uhthoff's Phenomenon:** Extreme heat sensitivity. Mandates pre-cooling, AC environments, and hydration.
- **Fatigue Management:** Split sessions. Schedule during highest-capacity times.
- **Steroid Caution:** Awareness of temporary muscle wasting post-steroid course.

Neurological: Dementia (Alzheimer's and Vascular)



Pharmacology: Cholinesterase inhibitors (Donepezil). Vascular requires aggressive CV risk management. Antipsychotics avoided (mortality signal).



Lifestyle: Group-based, meaningful activity. Familiar settings. Simple compound moves.



Cautions: Hydration/appetite oversight is your responsibility (clients forget). Use simple verbal cues. Watch for bradycardia with inhibitors.

Cancer



Pharmacology: Surgery, radiotherapy, systemic (cytotoxic, targeted, endocrine/tamoxifen).



Lifestyle: Prehabilitation (4-6 weeks pre-treatment). Resistance to preserve lean mass during chemo.



Cautions: Anthracycline cardiotoxicity- strictly RPE-led.
Platinum chemo -> neuropathy/balance risks.
Strict food hygiene on chemo (no raw meat/unpasteurised dairy).

Depression and Anxiety

Depression

Pharmacology



SSRIs (Sertraline, Citalopram) first-line. Avoid abrupt cessation.

Lifestyle



Positioned as first-line intervention. Advance from RPE 11-14 to 16. Group activity aids adherence.

Cautions



Reduce/eliminate alcohol, especially during dose titration. Review sleep/weight at 4-6 weeks. Avoid over-emphasizing aesthetic outcomes.

Anxiety Disorders

Pharmacology



SSRIs/SNRIs. Propranolol for physical symptoms. Benzodiazepines (short-course crises only).

Lifestyle



Resistance: 70-80% 1RM but requires 24-48h rest (resistance spikes adrenaline).

Cautions



Strict caffeine reduction (mimics panic). Propranolol blunts HR -> RPE. Educate clients that physiological exertion sensations are benign.

Mental Health: Eating Disorders

Profound physical and psychological morbidity with elevated mortality risk.

Pharmacology

-  • **Bulimia:** Fluoxetine (best evidence).
-  • **Anorexia:** No first-line drug. Focus on physical complications (electrolytes, refeeding risk).
-  • **Psychological:** CBT-ED, MANTRA, Family-based therapy.

Lifestyle

-  • **Nutrition Priority:** Nutritional restoration strictly supersedes training adaptation.
-  • **Bone Health:** Cautious weight-bearing only when medically stable.

Cautions

-  • **MDT Clearance:** Exercise programming ONLY within a multidisciplinary team plan with documented medical clearance.
- **Do Not Proceed:** Active disorder = REFER. Do not initiate unilateral training.
- **Language Ban:** Never prescribe weight-loss-framed exercise.
- **Monitor:** Bradycardia, hypotension, electrolyte derangement.

Integrated Synthesis: The Multimorbid Case Study



Client Profile



Demographics: 62-year-old female.



Goals: Weight management, knee pain reduction, mood improvement.



Pathology: Type 2 Diabetes | Osteoarthritis (Right Knee) | Mild Depression



Medications: Metformin | Atorvastatin | Paracetamol | Sertraline

The Challenge

Draft a 20-minute first-session plan. Identify one dietary, timing, or exercise adaptation for each medication.

Metformin: Timing for GI tolerance? (🕒 🤢)

Atorvastatin: Dietary ban? (🍴, 🚫)

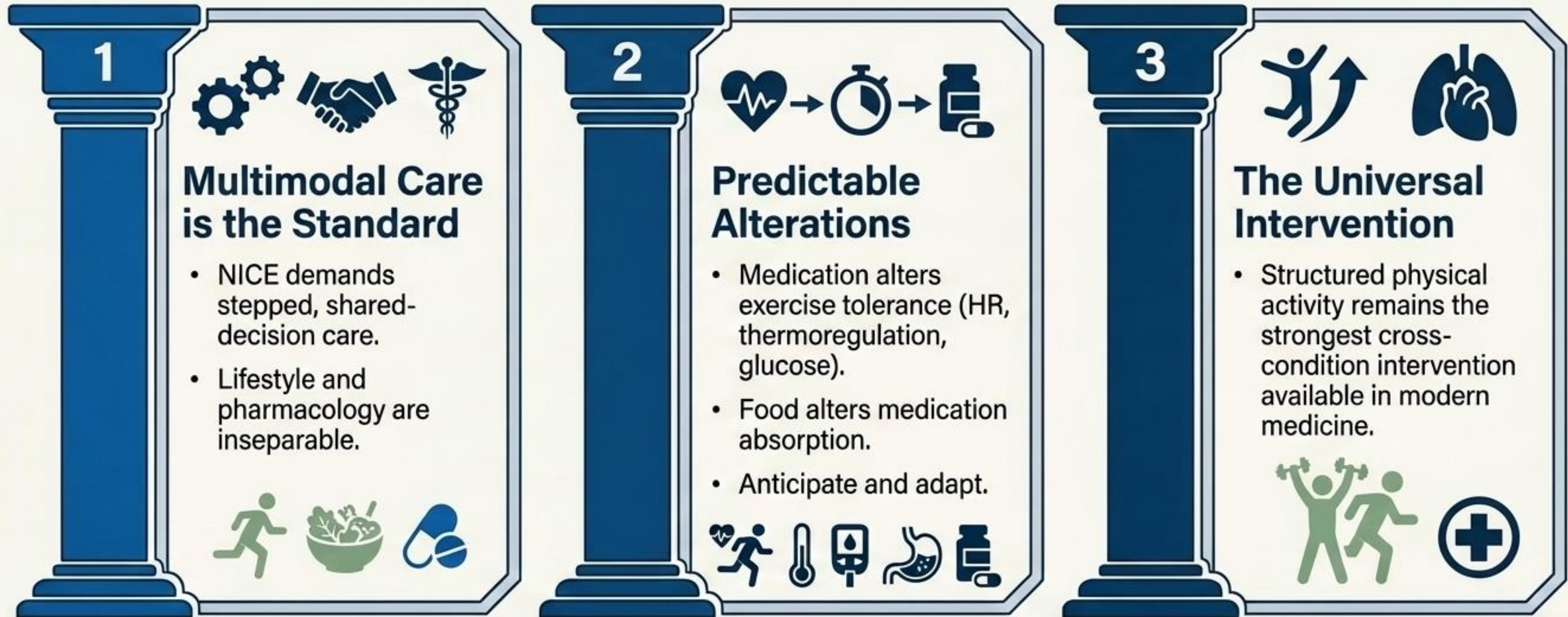
Sertraline: Sleep/alcohol guidance? (🛏️, 🍷 ?)

Paracetamol/OA: Aerobic mode selection? (🏃, 🧘 ?)

Case Resolution: The Multimorbid Matrix

Medications / Conditions	Actionable Adaptations
 Metformin	 Action: Ensure taken with food (evening preferred) to prevent mid-session GI distress.
 Atorvastatin	 Action: Verify client has eliminated grapefruit/juice from diet to avoid statin toxicity.
 Paracetamol & OA	 Action: Select low-impact, non-deep-flexion cardio (e.g., aquatic or seated cycle). Strengthen right quadriceps. Watch 4g/24h limit.
 Sertraline & Depression	 Action: Focus on group adherence over aesthetics. Counsel on eliminating alcohol during initial titration.
 Type 2 Diabetes	 Action: Check footwear (neuropathy). Mandate resistance training to buffer glucose.

The Practitioner's Principles



**Multimorbidity is not the exception; it is the rule.
Treat the whole person, not the isolated condition.**

Clinical Guidelines & Reference Frameworks



NICE Condition Guidelines

- **NG17** (T1DM)
- **NG28** (T2DM)
- **NG136** (Hypertension)
- **NG106** (Heart Failure)
- **NG115** (COPD)
- **NG80** (Asthma)
- **NG145** (Thyroid)
- **NG100** (RA)
- **NG226** (OA)
- **NG221** (Osteoporosis)
- **NG220** (MS)
- **NG97** (Dementia)
- **NG222** (Depression)
- **NG69** (Eating Disorders)



Systemic Frameworks

- **NICE PH54** (Exercise Referral Schemes, 2014)
- **NICE NG183** (Behaviour Change)
- **NICE NG56** (Multimorbidity) & **NG197** (Shared Decision Making)



Practice Standards

- **UK CMO Physical Activity Guidelines** (2019)
- **ACSM Guidelines for Exercise Testing & Prescription** (11th ed., 2021)
- **British National Formulary (BNF, 2025)**
- **All-Wales Weight Management Pathway** (2021)