Substance Misuse and Toxicity

Substance Use Disorder (Diagnose by doctor): Treatable, chronic diseases characterized by a problematic pattern of use of substances leading to impairments in health, social function, and control over substance use. It is a cluster of cognitive, behavioural, and physiological symptoms indicating use of substance despite harmful consequences. **Substance Misuse:** Use at high doses or in inappropriate situations, resulting in health or social problems. **Substance Dependence:** Withdrawal symptoms when discontinued. (biological effect) **Substance Addiction:** Loss of control over intense urges to take a substance even at expense of adverse consequences. **Substance tolerance:** Body gets used to medication, so more medicine needed or different medicine needed.

SUD PH Issue? Lost of life, health deterioration and physical injuries, quality of life affected, high financial burden, disrupts social systems and order.

Fentanyl: A lot more potent than meth. Meth products could be adulterated with fentanyl to make it 1. More potent (increase customer satisfaction. 2. Increase profit margin. (lower cost)

Meth effects: 1. Euphoria, increase energy and alertness. 2. Chronic mood and cognitive changes (irritability, aggression, panic, hallucination, memory impairment. 3.Increase risk of early mortality and suicide attempts. 4. Cardiovascular problems (heart failure, arrhythmia, myocardial infarction) 5. Stroke

Meth enforcement: legal enforcement: illegal to possess or consume in or outside SG. Screening and assessment: prompted by signs and symptoms from presentation, history and physical examination. Drug testing: urine, saliva, blood and hair

Meth management: 1. Motivational interviewing (help them find their motivation to quit smoking) 2. Drug counselling (for young , ignorant drug abuser) 3. Cognitive-behavioural therapy (help change their behaviour surrounding the substance abuse e.g changing smoking after lunch to eating sweet after lunch.)

Meth Challenges in prevention: 1. Surge in young drug abuser (easily influenced and hard to reach population) 2. New psychoactive substances (NPS) (make detection hard, low cost and easy to produce, falsely marketed as safe and legal.

Alcohol Risk factors: 1. Drinking at an early age 2. Family history of A problems 3. Mental health conditions or past trauma

Alcohol Effects (5.1% of DALYs): 1.AUD 2. suicides 3. interpersonal violence 3. traffic injuries 4. epilepsy 5. liver cirrhosis. 6.mouth cancers 7. pancreatitis. 8.tuberculosis.9. colorectal cancer 10. breast cancer 11. hypertensive heart disease.

Alcohol consumption centred approach: Reduce population-level consumption: 1. raise taxes 2.raise the minimum price of alcohol sold. 3.raise legal minimum age. 4.reduce permitted hours for sale 5. advertising restrictions

Injury centred approaches: Reduce alcohol-related road injuries: 1. Publicity campaigns 2. Police enforcement of laws: fines, driving license suspension 3. Random breath testing 4.Ignition or alcohol interlock devices. Reduce alcohol-related interpersonal violence: reduce trading hours, improve venue security

Singapore law on alcohol: 18 years old. >30mcg alcohol in 100mL breath or >80mg alcohol in 100mL blood while driving, maximum fine of 10,000, up 1 year jail

SG Alcohol Prevention (Recommendations) 2 standard drinks per day for men, 1 for female. (Because men have a lower % of body fat than woman and men produce more alcohol dehydrogenase enzyme.) **(Screening and assessment)** 1.Patient's alcohol history (to analysis if drinking is a health problem) 2.Physical examination (check for health issues relating to alcohol use) 3.laboratory investigation (find biomarkers for alcohol misuse) **(Diagnosis)**: DSM-5 criteria (**Management)** 1.patient education on drinking limits and law 2.psychosocial interventions 3.referral to community resources or psychiatric services

Opioids Function: act on opioid receptors in brain and spinal cord for 1.analgesia (reduce pain) 2.cough suppression 3.Sedation 4.Respiratory depression 5.Euphoria

Opioids Overdose: (Symptoms): 1.constricted pupils 2.breathing difficulty 3.unconsciousnes 4.seizures **(Management):** 1.Antidote (Naloxone) (reverse function of opioid) 2.Supportive care: improve breathing and ventilation

Opioids Withdraw: (Symptoms): 1.Sweating 2.bone aches 3.Runny nose, tearing 4. Tremor 5. restlessness 6.anxiety or irritability **(Management):** 1.Buprenorphine (slightly reverse function) 2.Naloxone 3.Symptomatic management

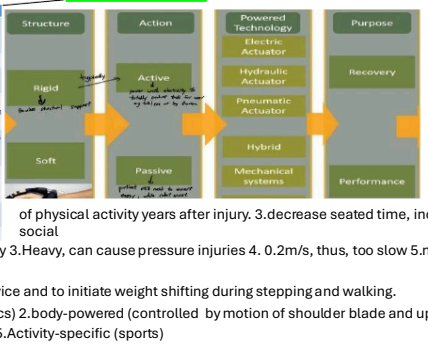
Prevention of opioid misuse World: 1. Increase availability of opioid dependence treatment. 2.Reduce and prevent irrational or inappropriate opioid prescribing. 3. Monitor opioid prescribing and dispensing 4. Limit inappropriate over counter sales

Prevention of opioid misuse SG: (Controlled drug). (License to import, store, wholesale, export or manufacture.) (Require approval from HSA to bring personal medication into SG) (Restriction on supply of codeine cough preparations) **(National guidelines on safe prescribing of opioids).** (should not be prescribed as first line treatment) (identify risk and patient factors before opioid therapy) (monitor those under opioid therapy) (Patient Education)

Robotics in Healthcare Purpose: 1. Enhance patient care 2. Improve healthcare outcomes. 3. Streamline healthcare outcomes

Surgical Assistance Robot: allow remote muti-party surgical collaborations. **Modular Robots:** Function: 1.improve quality of life. 2.monitors patient's form when doing exercise 3.measures degree of motion. 4.Track progress of rehabilitation.

	Laparoscopic surgery	Robotics-assisted surgery
Surgical instrument	2D camera Small instruments	3D camera Surgeon's console Dexterous instruments
Surgeon position	Next to the patient	At the surgeon's console
How surgery is performed	Surgeon operates using the instruments inserted in the incisions	Surgeon sits on the console and perform surgery with the robotic arms
Level of flexibility	Range of motion limited in comparison	Very high – end effectors of robotic arms can rotate about 360 degrees and free from hand tremors
Ability to access hard-to-reach area	More than open surgery, less than robotic surgery	Able to access previously inaccessible areas of the body (with open and laparoscopic surgery)
Recovery	Faster than open surgery Less pain Reduce scarring	Faster than open surgery Less pain Reduce scarring
Complications	Severity – high Occurrence – rare	Severity – high Occurrence – rare
Cost	Less expensive in comparison	Very expensive



Examples: exoskeleton robots, prosthetic limbs . Active: power with electricity to totally conduct task for user. Passive: patient still need to exert energy, robot assist.

Benefits&Limits of exo: B: 1.restores locomotion 2.improve level of physical activity years after injury. 3.decrease seated time, increase standing and walking time for social

L: 1.Long fitting time 2.require good motor learning capability 3.Heavy, can cause pressure injuries 4. 0.2m/s, thus, too slow 5.not suited for all terrains 6.not suited for tetraplegia patients

Exo usage: hand functions required to hold the assistive device and to initiate weight shifting during stepping and walking.

Modular Prosthetic limbs Types: 1.passive (aesthetics) 2.body-powered (controlled by motion of shoulder blade and upper arm) 3.externally powered myoelectric prostheses (nerves operate) 4.Hybrid prostheses 5.Activity-specific (sports)

Ideal upper prosthesis: 1.smooth manipulation with fidelity 2.grip strength 3.dexterity 4.fine motor control in coordinated manner.

Service Robots: uses: 1.logistics and delivery in hospital 2.cleaning and disinfection in public areas 3.blood drawing (increase success, reduce bruising, punctures and discomfort)

Social Robots: Audio, ,visual, and movement capabilities Purpose: 1.friendly interaction 2.companionship 3.assistanace to rehab, learning Example (dementia): PARO:pet robot NAO:humanoid robot Telenoid:telepresence robot (transmit voice and mimic face motions .

Challenges using robots in HC: 1.trust&acceptance 2. Ethical marketing (unrealistic marketing) 3.Privacy&Data security 4.Algorithmic Bias 5.Inequility and digital divide 6.job displacement 7.Defining collaboration bw robots and professionals

Occupational health: Protection and Promotion of health of workers by**:** preventing disease and accidents, eliminate hazardous factors, promotion of safe work, improve physical, mental, social, workers conduct social and productive lives.

Work affect health: 1. Accidents and injuries 2.obvious (hearing loss, skin condition), hidden (cancer, cardiovascular, mental), incurable diseases

Response time: Advancement in technology leads to ability to respond faster, boss expects you to respond faster, do more work, thus, more stress

Asbestos: Material that causes cancer due to exposure

Health affect work: 1. Decrease productivity 2.Danger to self 3.Danger to others (health can result in safety lapse, in which, affect health)

Changes in OH: 1.evolution of work (little WSH, hazardous work to New WSH Laws, causality bw work and disease to rising NCDs and to integrate workplace health promotion HSW to changing work conditions and new employment relationships

Challenges in OH: 1.Shrinking workforce (increase workload, stress) 2.rapidly aging population and workforce (prevalence of chronic health) 3.Health of workforce worse than general population (people get fatter when they work more) 4.cutting back on foreign manpower (increase workload)

Efforts: 1. Workplace safety and health act (HSHA) 2006 (protect health and safety of workers) and Work Injury Compensation Act (WICA) 2019 (work injuries are subjected to entitled work leave outside of agreed leave)

Humanitarian Emergencies: critical threat to health, safety, security or wellbeing of community

Characteristics of Disasters: 1. Large displaced population 2. Temporary locations (lack food/shelter) (unsafe water)(poor sanitation)(infrastructure damage) 3.Increase risk of transmission

RISK involves EXPOSURE AND VULNERABILITY

Vulnerability: 1.susceptibility(conditions of societies) (Basic sanitation? Housing conditions? Nutrition? Poverty? Economic productivity?) 2.Coping capacities(organised measures) (Govt corruption? Medical services? material coverage? 3.Adaptive capacities (long term strategies)(education to know how to adapt ,gender equality ensure all has equal access to education and services, investments in healthsector, ecosystem status as an act of barrier to natural disasters

Humanitarian Coordination Architecture: Different clusters (different internation clusters work with different local clusters)

Disaster management cycle: 1.**Response phase** (day 0 – 6 months)(rescue, medical attention, food, water, tempo shelter) 2.**Recover** (day 1 to 2 years) (food, water, long-term shelter, sanitation, healthcare, return to sch/work) 3.**rebuild** (5 weeks to 15 years) ((engagement of local population in reconstruction of communities) 4.**Prepare** (continuous) (training, policy and procedure creation, relationship building among service providers and communities)

Response (MIRA): Muti-sector Initial Rapid Assessment (MIRA) Phases: Pre-crisis: phase 0: assessment preparedness (adapted MIRA created) Phase 1: 2ry data review (situation analysis created by Day 3) 2. Phase 2: Joint assessment: Primary data collection (MIRA report collected by 2 weeks) Phase 3 (by 4 weeks) and Phase 4: Detailed harmonized sectoral assessments, monitoring (humanitarian needs overview by 6 months)

Response Classification: Lvl 1: National ER Lvl 2:Regional ER Lvl 3:Global ER Based on: scale, urgency, complexity, capacity, reputational risk

Response and Recovery Surveillance: 1. Monitor population health and identifying immediate/long-term health needs 2.disease trends for early detection and control (Early warning alert and response network – EWARN) 3.Assist in planning and implementing health programmes like nutrition support 4. Ensure resources targeted to most vulnerable 5.Monitor quality of healthcare 5.Evaluating coverage and effectiveness of intervention

Preparation: 1. experience of recover feedback into improving resilience and reduce risk

Global Health: improvement of health worldwide, the reduction of disparities, and protection of societies against global threats that disregard national borders.

	Public Health	International Health	Global Health
Geographical reach	Focuses on issues that affect the health of the population of a particular community or country	Focuses on health issues of countries other than one's own, esp those of low-income and middle-income	Focuses on issues that directly or indirectly affect health but that can transcend national boundaries
Level of cooperation	Does not usually require global cooperation	Usually requires binational cooperation	Often requires
Individuals or populations	Mainly focused on prevention programmes for populations	Embraces both prevention in populations and clinical care of individuals	Embraces both prevention in populations and clinical care of individuals
Access to health	Health equity within a national or community is a major objective	Seeks to help people of other nations	Health equity among nations and for all people is a major objective
Range of disciplines	Encourages multidisciplinary approaches, particularly within health sciences and social sciences	Embraces a few disciplines but has not emphasised multidisciplinarity	Highly interdisciplinary and includes work within and beyond health sciences

Why is global health relevant? 1.health is interconnected globally (no borders for disease and strong world health protects everyone) 2.shared health challenges (collaboration for NCDs) 3. Health inequities persist 4.Climate change impacts everyone's health 5.economic impacts of poor global health.

Equity? Those at a more disadvantage receive more help than those at a less disadvantage.

Determinants of health: 1.social and economic environment (Income&social status, education, social support networks, employment, culture) 2.Individual characteristics&behaviours (genetics,gender) 3.Physical environment (safe water and clean air, healthy workplaces, safe houses, communities & roads 4.working conditions

Primordial prevention: measures that prevent onset of risk Eg. eliminate risk factors: sex work, financial vulnerability, sexual violence

Primary prevention: prevent people who are at risk from having disease Eg.condom, safeblood, early detection and treatment, prevent mother to child transmission

Myths and assumptions of Global Health: 1. Expertise gradient (idea of having superior understanding on how to deal with health issues in elsewhere, elsewhere easy to solve compared to home) 2.Accountability (As long as intention is to help, do not need to seek approval from those im trying to help) 3.Equity vs inefficiency (As long as my intentions is to address the inequity, efficiency not important)

Climate Change: Climate:weather patterns over 30 years (what we expect) Weather:current (what we get) Cilmate variability:short term variations. Cilmate change: operates over decades or longer

Impacts of Climate Change: positive and adverse impacts: 1.water availability 2.Animal and livestock health and productivity. Adverse impacts: 1. Agriculture 2.Fishing 3.Infectious disease 4.Heat, malnutrition and harm from wildfire 5. Mental Health 6.Displacement 7.Inland flooding 8.Damge to cities and key economic sectors Not sure: 1. Terrestrial ecosystems 2. Freshwater ecosystems 3.Ocean ecosystems

Heat stress and those vulnerable to it: Physiological 1. Older/less-abled 2.pre-exisiting medical conditions 3.pregenet 4.infants/children **Exposure** 1.Outdoor workers 2.living in sub-par housing 3.poor,displaced 4.athletes and attendees of outdoor events

CC direct effect on Infectious Disease: 1. Change in temperature, rainfall and humidity impacts vector distribution and lifecycles. 2.impact on biodiversity and host ecology, behaviour and distribution 3.extreme weather events e.g. flooding promotes waterborne diseases 4.Change in agriculture promotes food-borne diseases.

CC INdirect effect on Infectious Disease: 1.Climate driven conflict and migration. 2.Malnutrition due to food scarcity 3.Logistical disruption 4.Comorbidities (condition that piles up due to existing conditions) e.g heat stress 5.health system pressure

Insect vectors dependence on temperature and rainfall: Increases with temperature and high rainfall, but drops afterwards.

CC effect on pollution: How? Wildfire and haze What? Cancer, lung disease and other NCDs. Can increase susceptibility to infectious diseases.

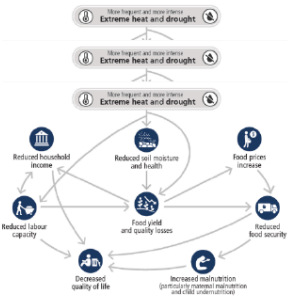
CC effect on mental health: 1. Increased stress due to climate change e.g. natural disasters, economic factors 2.Decreased access to green spaces 3.solastalgia (distress caused by loss of home environment)

mental health adaptations: 1. Institutional (mental health systems, planning and preparedness, informed policies, early intervention) 2.Community (supportive social network) 3.individuals (awareness, preparedness, nature-based therapy)

CC Adaptation measures 1. Early warning systems for climate-sensitive diseases so as to better prepare for it 2.

CC Mitigation measures 1. Reduce fossil fuel 2. Tree planting and carbon capture technologies.

Mitigation and health co-benefit: 1. Improved global warming leads to both fewer extreme heat days and heat stress 2. Clean transportation reduce fossil fuel and improve air quality 3.Reducing meat overconsumption reduce climate impact of livestock and support better nutrition. 4.Expanding green spaces and planting trees to capture carbon and boost mental health.



Climate-resilient health system 1. Identify and monitor risks using climate and health information 2. Manage environmental determinants of health 3.Prepare for emergency 4.Reduce emission from health sector 5.Ensure financing, policies and training in place