

# Att som sjuk arbeta i värme

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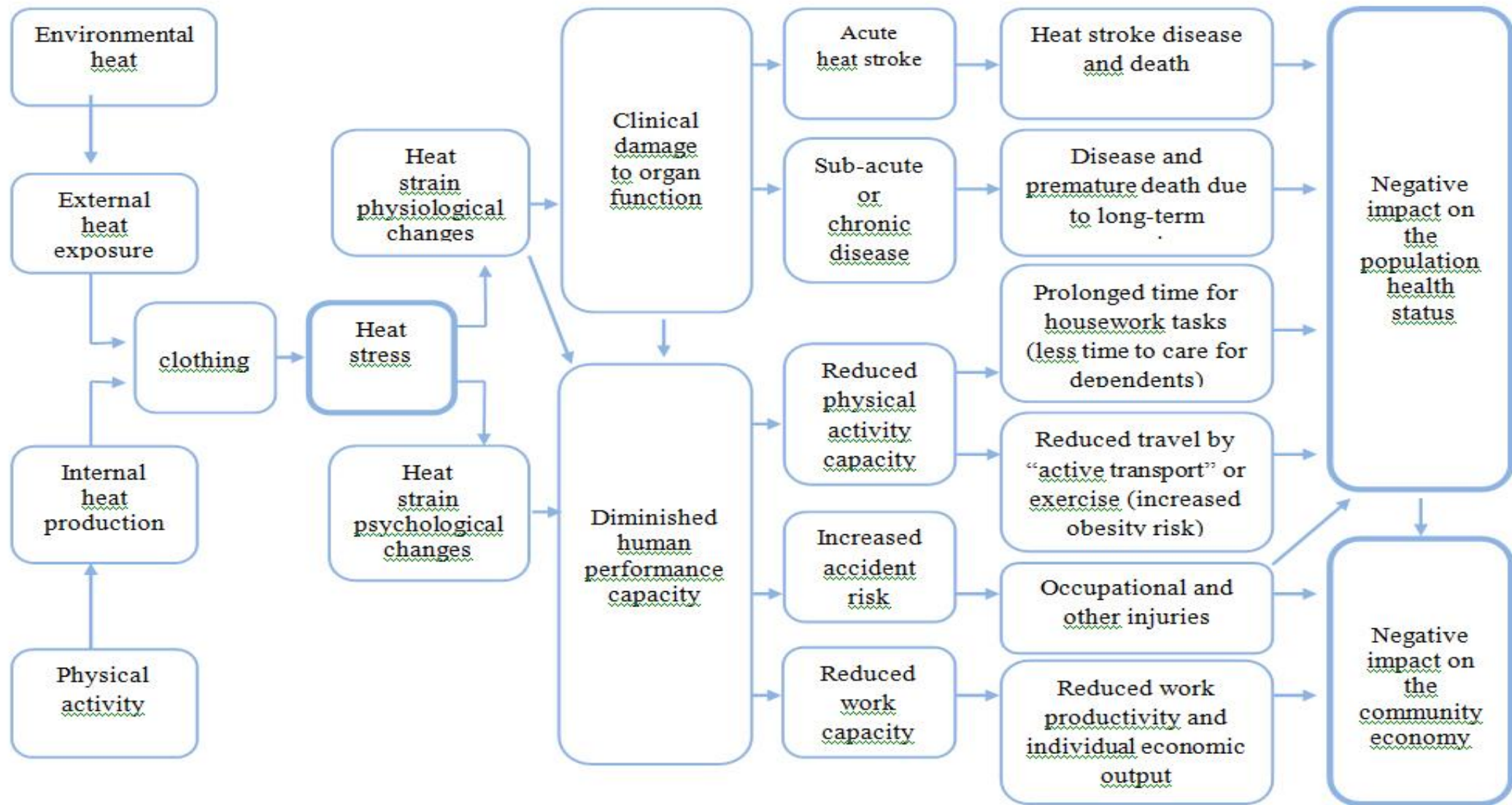
# Ökad känslighet för värme

## Riskfaktorer

- Sjukdom
- Hög ålder
- Läkemedel

”Bristande” kunskap: Arbete i värme med sjukdom

*”God” kunskap: Tungt fysiskt arbete i värme hos friska*



# Kritiska komponenter

- Kroppstemperatur
- Vätskebalans

Ökad kunskap pga värmeböljor (t ex Frankrike 2003):

WHO

IPCC

Hazard exposure	Health impact	Confidence* of this impact	Specific effects at organ level	Source
Intense heat	Heat stroke death	Very high	Heart strain; CNS malfunction; dehydration	IPCC (2014) WHO (2014)**
	Heat stroke morbidity	Very high	Heart strain; CNS*** malfunction; dehydration	IPCC (2014)
	Heat exhaustion, Work capacity loss	High	Heart strain; mental fatigue	IPCC (2014)
Forced migration	Under-nutrition; infections; mental stress; injuries	High	Work capacity loss, heart disease, fatigue	IPCC (2014)

# Andra effekter av intensiv hetta

<b>Chronic kidney disease linked to dehydration</b>	<b>Wesseling et al., 2013</b>
<b>Increased incidence of violent crimes</b>	Gamble and Hess, 2012; Raleigh et al., 2014
<b>Increased incidence of suicides</b>	Berry et al., 2010; Kim et al., 2015
<b>Teratogenic effects of high body temperature in pregnant women; damage to development of brain</b>	Edwards et al., 1995
<b>Interactions with prescription drugs</b>	Vanakoski and Seppala, 1998
<b>Deteriorated clinical status in chronic NCDs</b>	Kjellstrom et al., 2010; Parsons, 2014

# ”Värmeslag” (Heat stroke)

- Kroppstemperatur 40+ grader
- Heat shock proteins
- Njursvikt
- Leverpåverkan
  
- Bestående neurologiska skador även om man överlever den akuta fasen (30%)
  
- Acklimatisering viktig

# ”Heat strain” (belastning av värme)

- Klassisk (non-exertional heat strain)
  - Skadorna visar sig **senare** >1 dag
- Fysisk belastning (exertional heat strain)
  - Skadorna visar sig **snabbt** (<24 h)



Heat Strain								
Heat strain type	Age	Weather	Activity	Sweat	Renal Failure	Rhabdomyolysis	Hyperkalaemia	Hypoglycaemia
Classic								
Classic	Young, Elderly	Heat-waves	Sedentary	Absent	Not common	Not common	Not common	Not common
Exertional								
Exertional	15-64 yrs	Hot weather	Strenuous Exercise	Profuse	Common	Common	Common	Common

# Sjukdomar

- Hjärta - kärl
  - Hjärtsvikt, stroke
- Lungor
- Njurar
- Diabetes/fetma
- Hud
- Neurologiska
- Mentala
- .....
  
- ***Äldre/gravida***

# MS (multipel skleros)

- Ökad känslighet för värme (69-80 %) –
  - ökande symptom (synstörningar, nedsatta kognitiva funktioner)
  - Nedsatt svettfunktion

Medication	Mechanism
Anticholinergics (eg atropine)	Can affect central thermoregulation, reduce cognitive alertness and prevent or reduce sweating. Many of the drugs below have anticholinergic effects.
Antipsychotics	Can inhibit the sweating mechanism and reduce systolic blood pressure, central thermoregulation, cognitive alertness and vasodilation.
Antihistamines	Can inhibit the sweating mechanism and reduce systolic blood pressure.
Anti-Parkinson's drugs	Can inhibit the sweating mechanism, reduce systolic blood pressure and cause dizziness and confusion.
Tricyclic antidepressants	Reduces sweating; some can decrease centrally induced thermoregulation and cognitive alertness.
SSRI (eg Prozac)	Increases serotonin levels which can increase body temperature in high doses. (Liechti, 2014)
Anxiolytics and muscle relaxants	Reduce sweating and increase dizziness, decrease cardiac output and therefore reduce cooling by vasodilation, and worsen respiratory symptoms
Antiadrenergics and beta-blockers (eg propranolol)	Can prevent an increase in heart rate hence allowing a drop in BP as the skin blood vessels vasodilate.
Sympathomimetics	Vasodilators, including nitrates and calcium channel blockers, can worsen hypotension in vulnerable patients
Antihypertensives and diuretics	Can lead to dehydration and reduce blood pressure; hyponatremia is a common side effect and can be worsened by excess fluid intake.
Antiepileptics	Can reduce cognitive alertness and increase dizziness.

# Läkemedel forts

- Amfetamin (ADHD)
  - Ökar kroppstemperaturen
  - Vanligare med behandling idag än tidigare – även vuxna
  
- Mental ohälsa – särskild riskgrupp

# Sammanfattning

- Individuell **bedömning av individen**

- Sjukdom (typ och svårighetsgrad)
- Läkemedel
- Ålder
- ...

Table 4: Heat tolerance time at different levels of heat exposure for Hong Kong construction workers of different ages. (Source: (Chan, 2013))

Age effect on heat tolerance time				
Temp	Age			
	25 yrs	35 yrs	45 yrs	55 yrs
28°C	133 min	108 min	82 min	56 min
29°C	129 min	103 min	77 min	51 min
30°C	124 min	98 min	72 min	47 min
31°C	119 min	93 min	68 min	42 min

- Individuell **grad av värmebelastning**

- Acklimatisering
- Fysisk ansträngning
- Klädsel
- .....