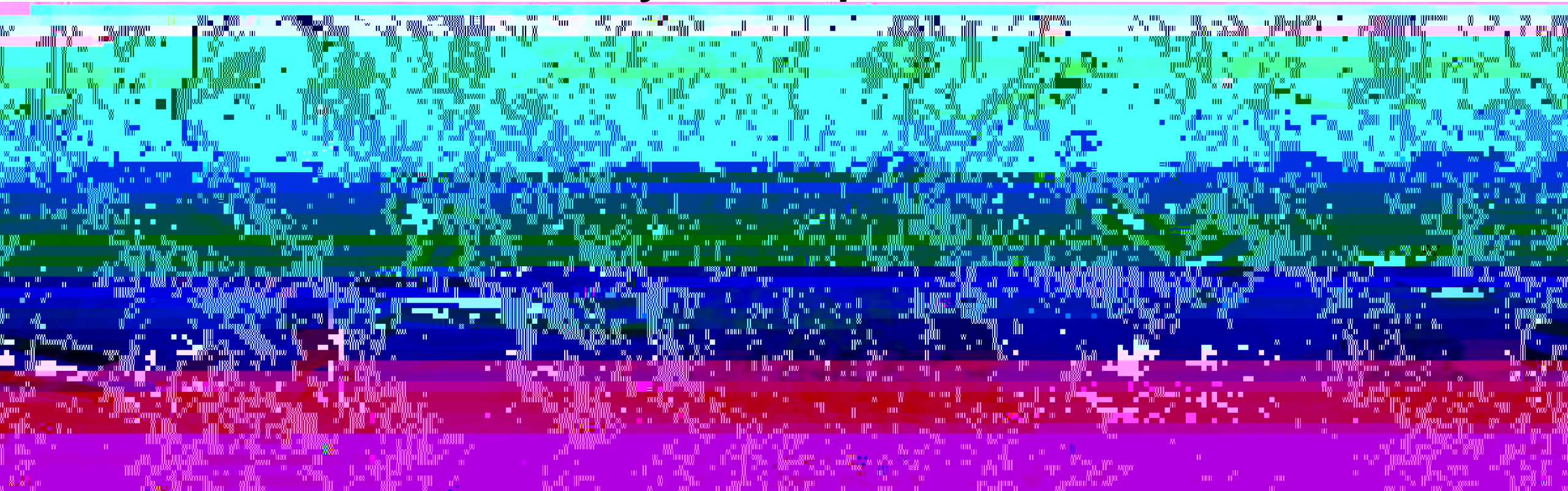


An Algorithm to Estimate Body Temperature



EFFICIENT INSIDE ESTIMATION



Washington, DC

STUMPER



CSMPREK

PRESENTER



Firefighting Affects all Systems of the Body



- : Cardiovascular (Increased HR and BP, Decreased SV, Increased Arterial Stiffness)
- : Hematological (Decreased Plasma Volume, Hemoconcentration, Procoagulatory)
- : **Thermoregulatory (Elevated Core Temperature, Dehydration)**
- : Respiratory (Increased Breathing Rate and Oxygen Consumption)
- : Metabolic (High Oxygen Cost, Increased Lactate, Fatigue)
- : Immune/Endocrine (Increased Leukocytes and Hormones)
- : Nervous (Sympathetic Surge and Increased Adrenaline)
- : Muscular (Increased Oxygen Use and Heat Production)

Physiological/Psychological Stress of Firefighting

³ The greatest stress ever imposed on the human cardiovascular system is the combination of exercise and hyperthermia. Together these stresses can present life-threatening challenges, especially in highly motivated athletes who drive

L.Rowell, 1993. In Human Cardiovascular Physiology, Oxford Press.

PPE



Hyperthermia (and dehydration)



FIREFIGHTER PHYSIOLOGICAL MONITORING

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STIMMEL

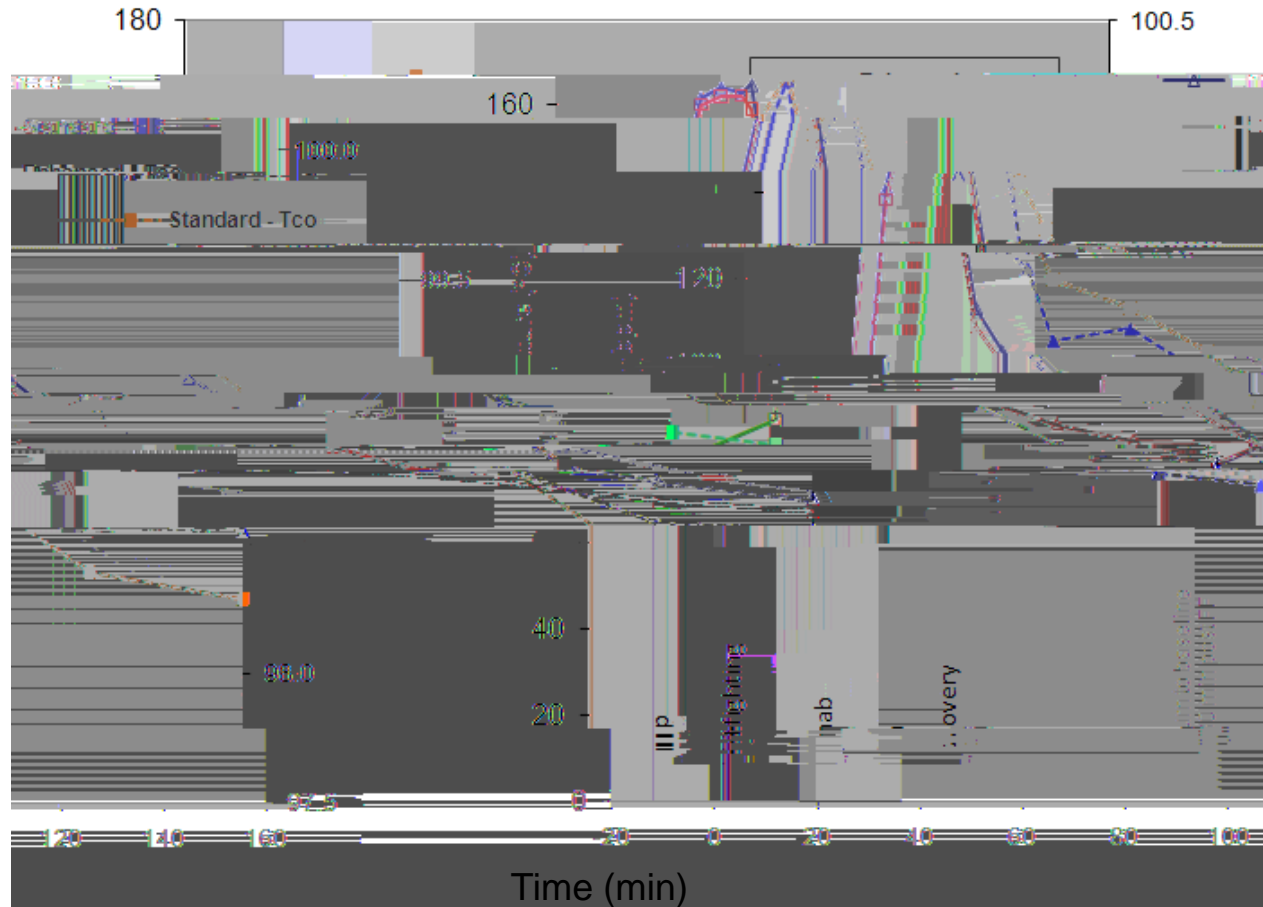
OSHA

CSMP/TEK

PROVIDENT



Heart Rate and Core Temperature Recovery



Horn et al., Prehospital
Emergency Care 2011

FIREFIGHTERS' PHYSIOLOGICAL MONITORING

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STIMMELT

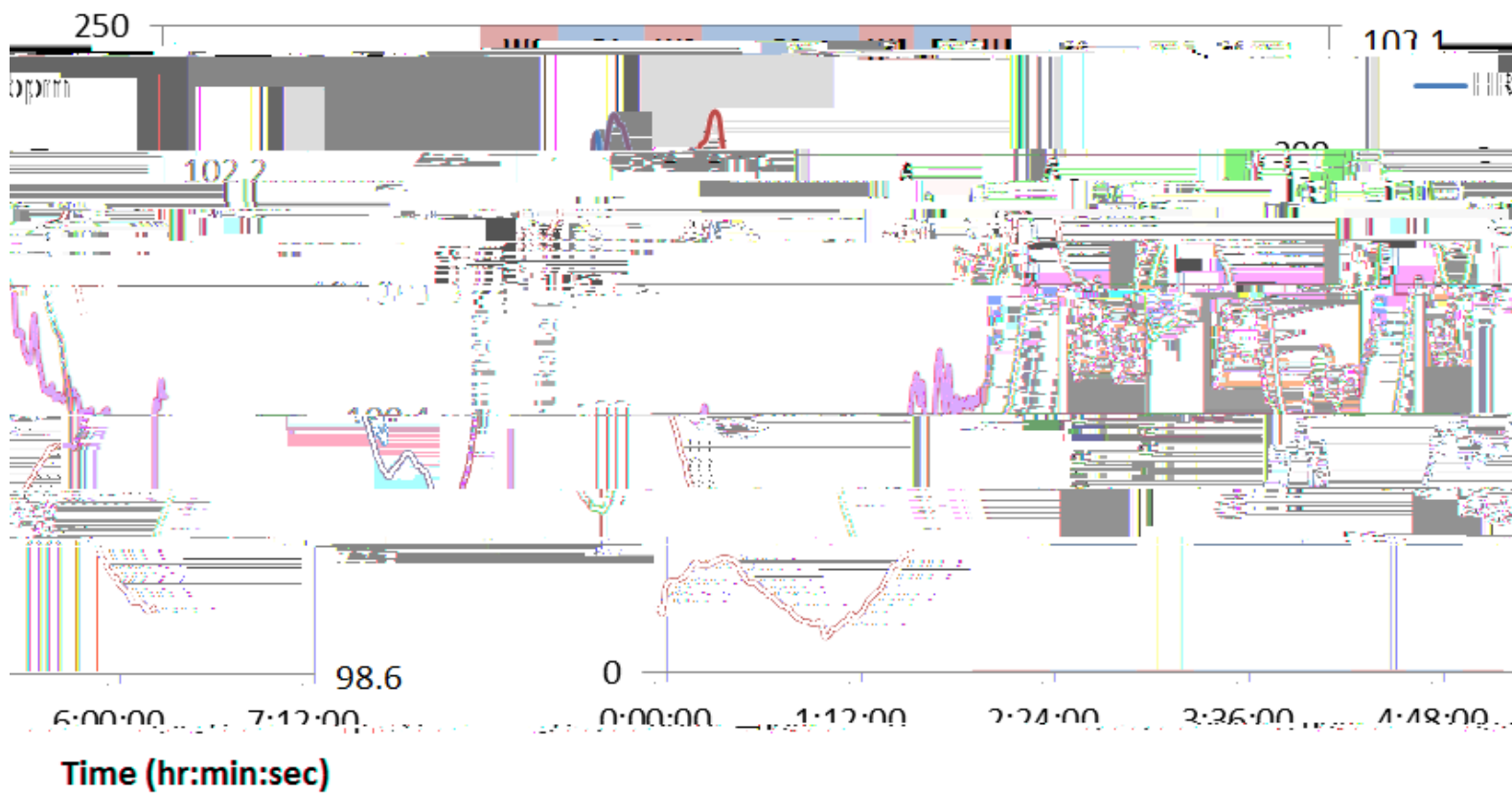
SEARCH

CSMP/TEK

PROGRESS



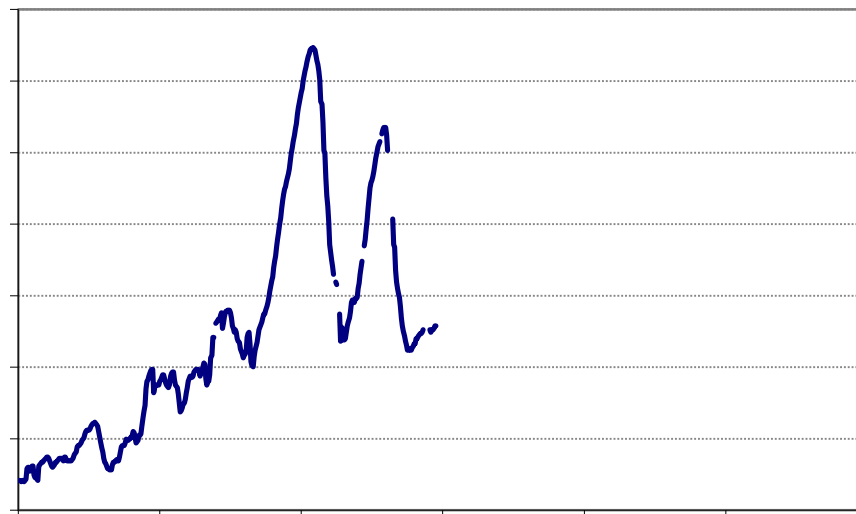
Core Temperature & Heart Rate



Horn et al.,
Ergonomics 2013

FIREFIGHTERS' PHYSIOLOGICAL MONITORING

Common Core Temperatures



FIREFIGHTER NATIONAL SYSTEMS ASSOCIATION



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Fire Department

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Fire Department

