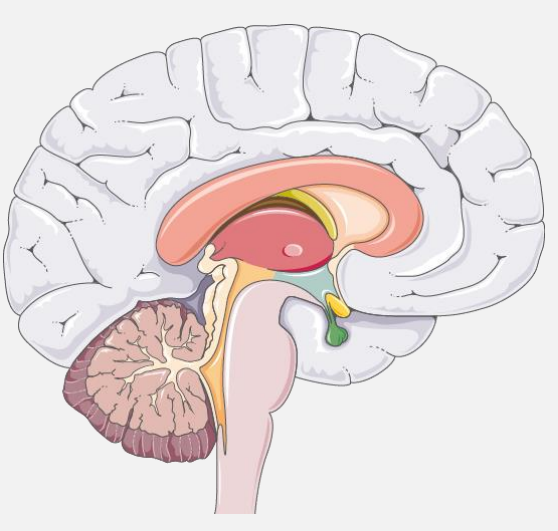


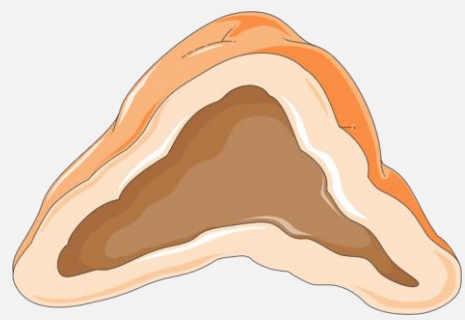
# NOREPINEPHRINE & EPINEPHRINE IN STRESS

Wentzel, Malan, von Känel 2020

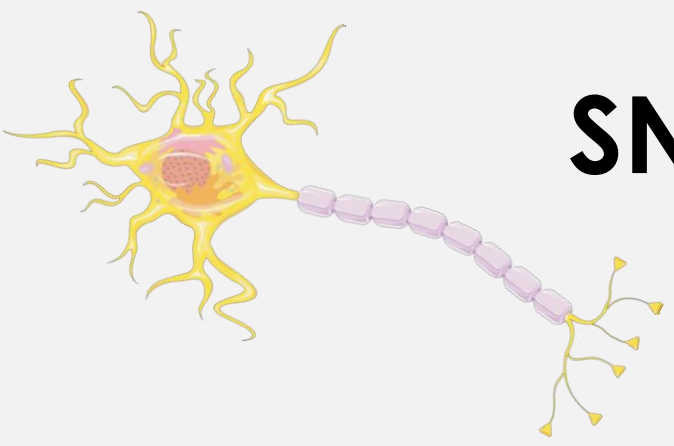
Main sites of release



**Brain (Locus coeruleus, (NE))**



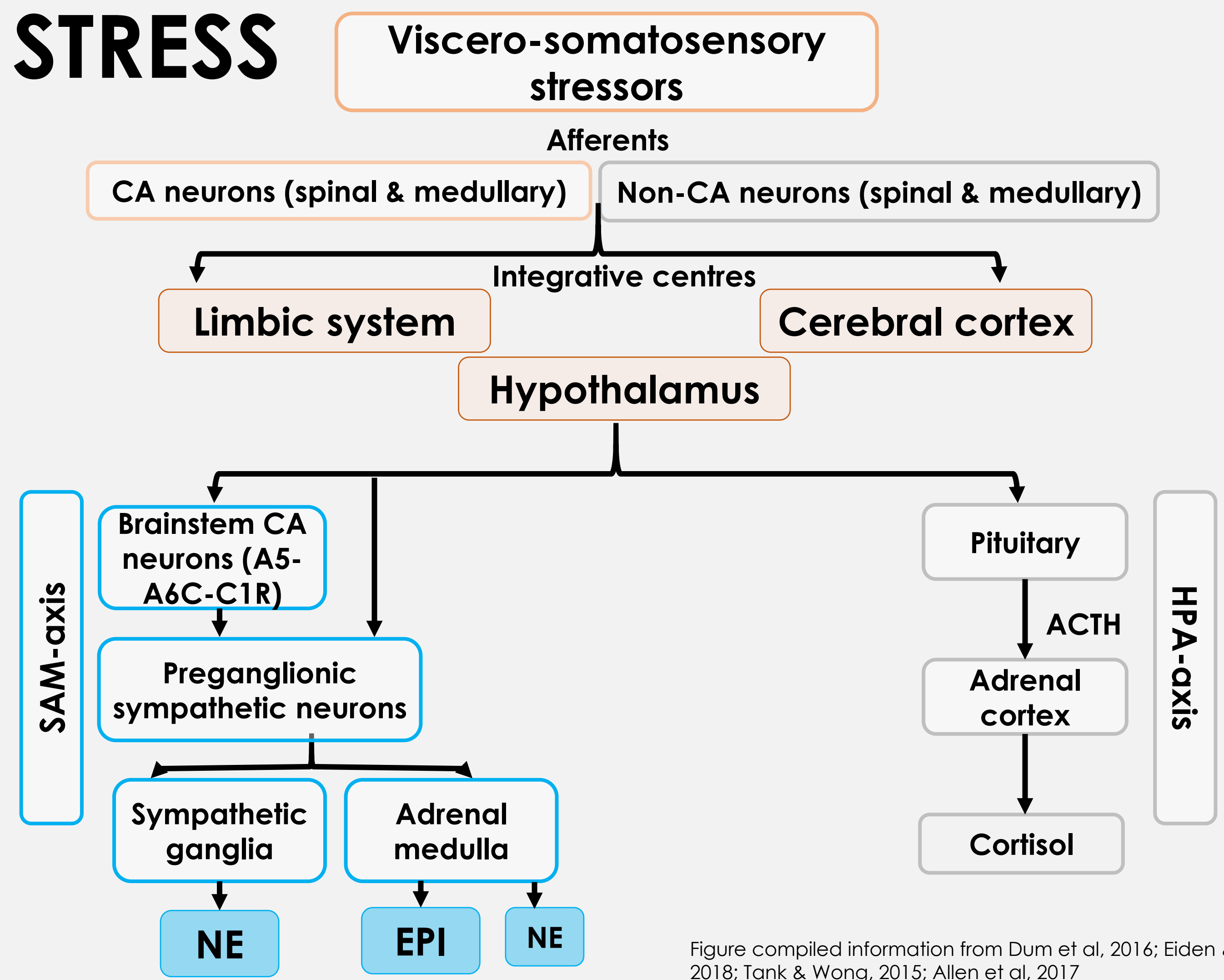
**Adrenal medulla (EPI and NE (80:20))**



**SNS neurons (NE)**

NE and EPI have a plasma half-life of approximately 1-2min. Physiological effects via binding to alpha- and beta-adrenergic receptors

## STRESS

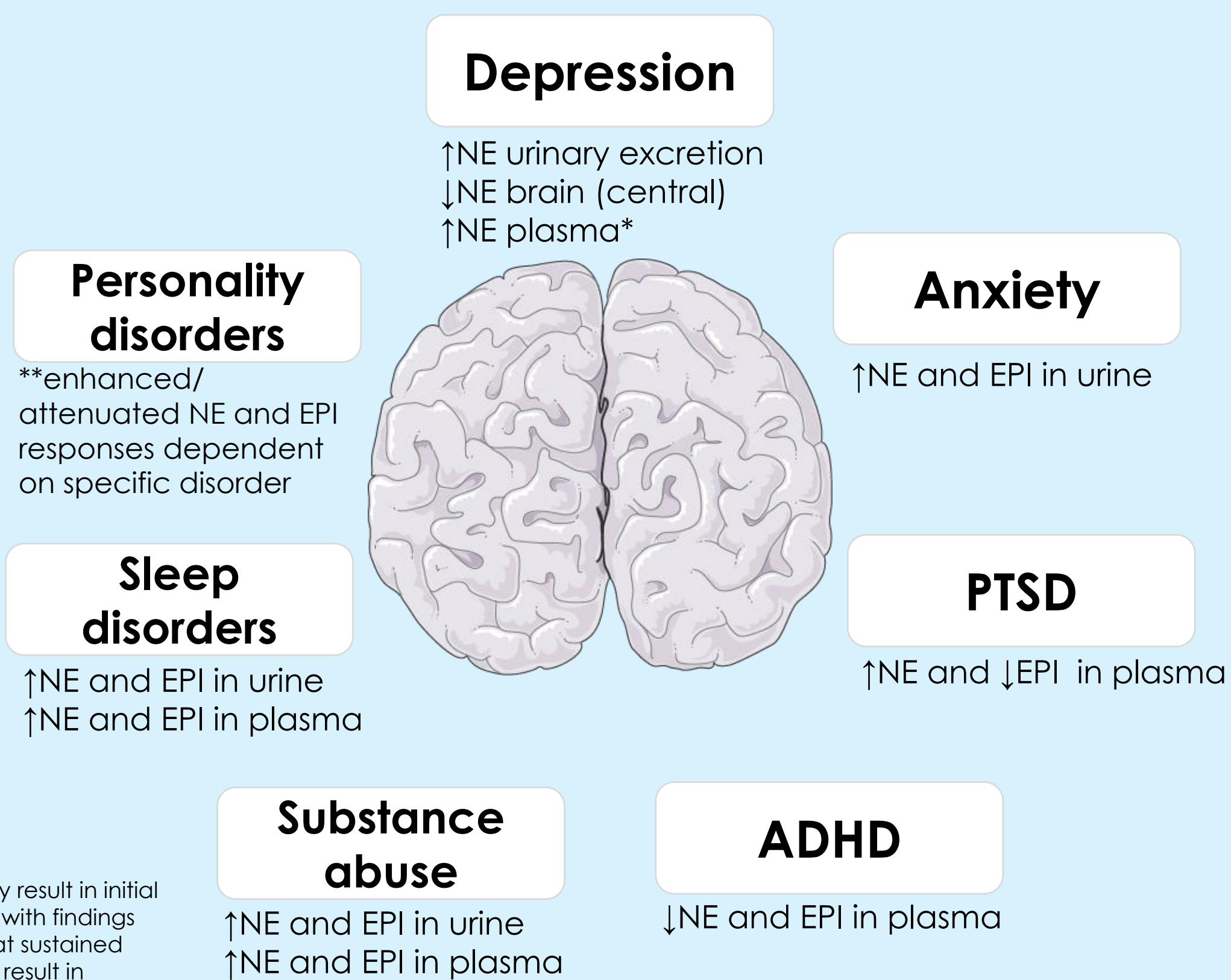


Stress Axis

Figure compiled information from Dum et al, 2016; Eiden & Jiang, 2018; Tank & Wong, 2015; Allen et al, 2017

Clinical Conditions

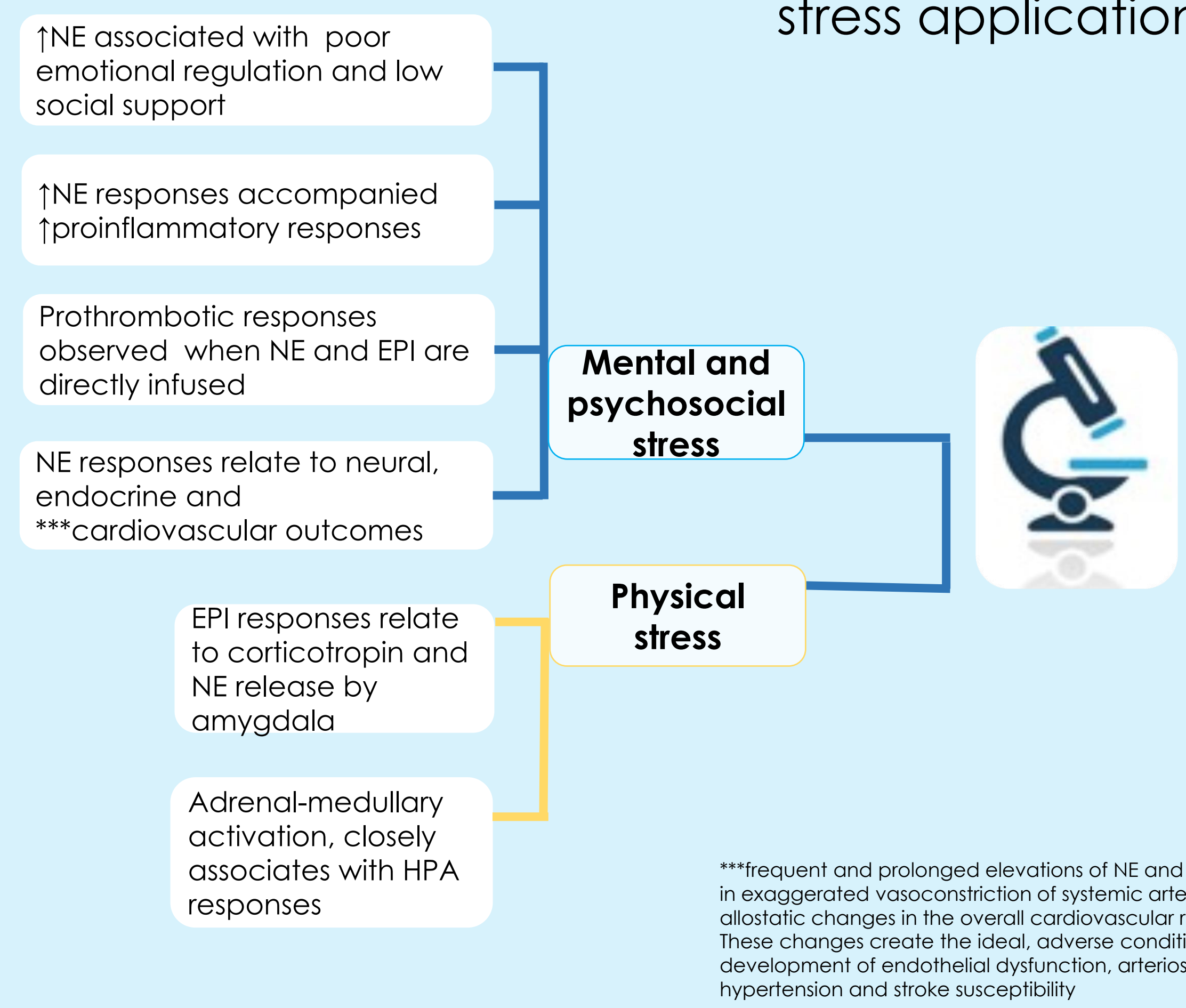
Classic, behavioural, stress-related psychiatric disorders are directly linked to alterations in NE and EPI levels



\*Chronic stress may result in initial higher NE, low EPI, with findings also supporting that sustained chronic stress may result in chronically low NE

## RELEVANCE

NE and EPI responses to acute stress application.



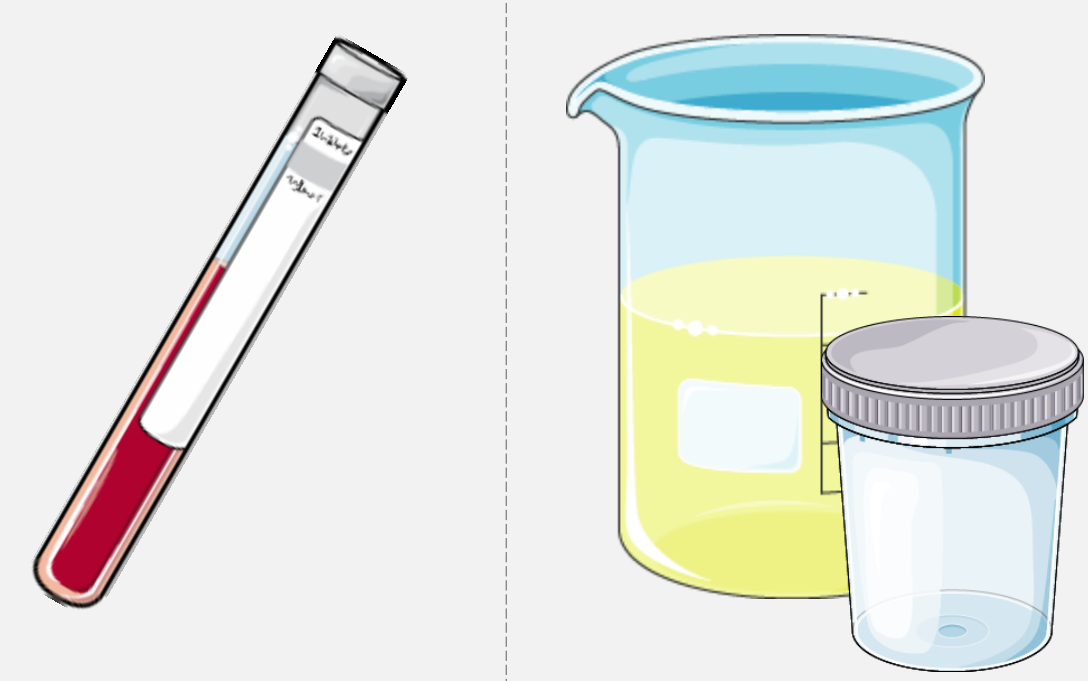
Stress Research

\*\*\*frequent and prolonged elevations of NE and EPI may result in exaggerated vasoconstriction of systemic arteries, leading to allostatic changes in the overall cardiovascular response. These changes create the ideal, adverse conditions for the development of endothelial dysfunction, arteriosclerosis, hypertension and stroke susceptibility

Plasma

- Supine position, indwelling catheter inserted (antecubital vein) 30min prior to the collection of baseline samples.
- Samples collected in a chilled lithium-heparin tube.
- Several samples taken during stressor testing.
- Samples centrifuged at 4°C, < 20min after sample collection.
- Plasma frozen immediately/ kept on dry-ice and long-term storage at -80°C.
- Analysis: HPLC, LC-MS-MS and carbon dot assays are employed

## MEASURE



Urine

- Samples should be collected in containers with a pH of less than 3.5 to 4 (i.e. acidified with HCl), and kept cold.
- In adults, preferred use of 24h collection,
- In children, however, random collection is preferred as 24h urine sampling is often incomplete in child-cohorts.
- Creatinine as volume correction (NE/EPI: creatinine ratio).
- Measured via HPLC, LC-MS-MS and carbon dot assays are employed

## CONSIDER

- Patient/ participant characteristics (Age, gender, psychiatric history, medication usage, posture whilst sampling, fasting status etc.)
- NE and EPI physiological kinetics and pharmacologically influenced kinetics,
- Conditions when sampling e.g. time of day, environmental temperature
- Study context and design