

## Background

Pre-hospital care is delivered in almost every environment on earth and practitioners may encounter extreme heat, extreme cold or rapid changes in temperature, which can also affect their equipment and drugs. Practitioners may be operating in unfamiliar climates when, for example, providing humanitarian aid, on expeditions or providing medical cover for oil exploration. In a medical emergency, it is crucial that practitioners know that the drugs administered have not degraded due to storage conditions.

# The Impact of Drug Storage Temperatures on their Efficacy in Extreme Environments

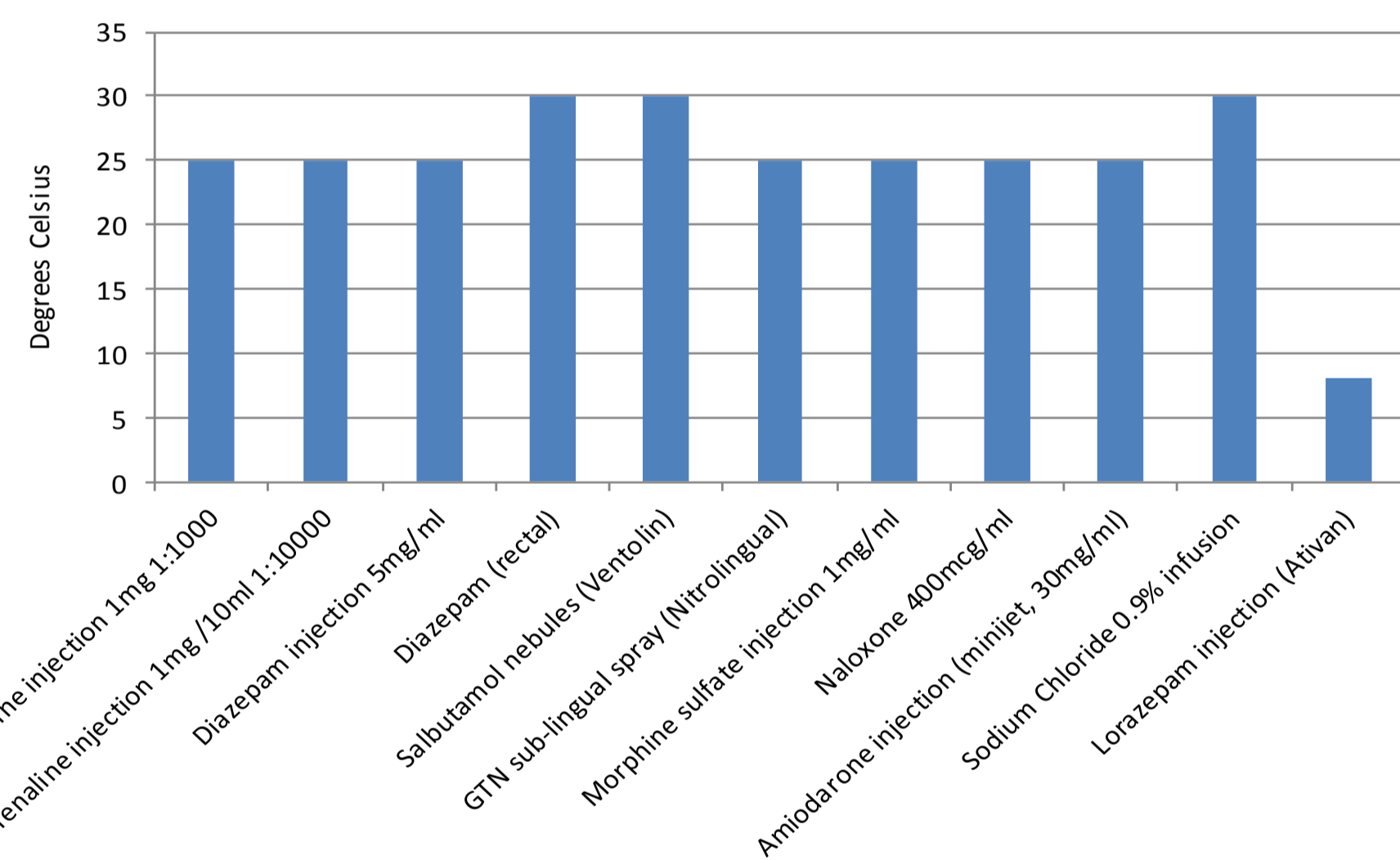
## An Evidence-Based Approach

By C.Schroth & P. Phillips, Bournemouth University, 2017

## Challenges

- Drugs can degrade or become unusable outside certain temperature ranges
- Ambient temperature variations can be significant, even in the United Kingdom
- No clear guidance on best practice for drug storage in pre-hospital care exists
- Temperature management technology is often impractical or unavailable

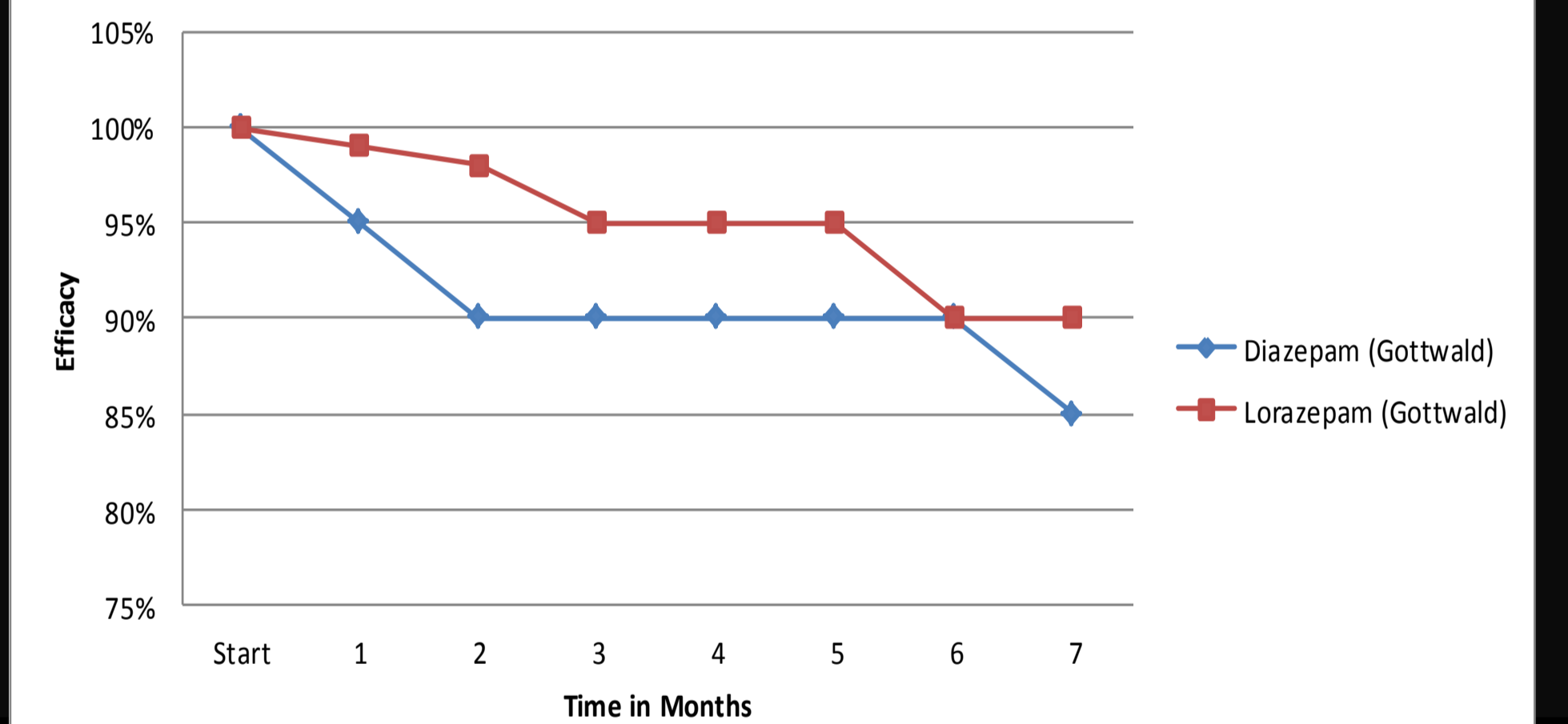
### Maximum Recommended Storage Temperatures



## Recommendations & Solutions

- Commercially available, temperature regulated storage methods are the ideal solution, but even recreational cooler bags or the use of Styrofoam containers to store drugs, could provide more stability in extreme temperatures (DuBois 2000).
- High temperatures are likely to minimise efficacy or even entirely diminish it.
- Low temperatures do not affect most drugs and they will be fully functional upon being defrosted.
- Drug choice is dependent on the environment they are used in.
- Further research is needed in this area, due to lack of high quality data and common protocols.

### Average Deterioration of Drug Concentrations at Constant Ambient Temperatures



## Limitations

- Studies did not all compare the same drugs or took place under the same conditions.
- Insufficient data to adequately compare common drugs (e.g. adrenaline, amiodarone, GTN)
- Quality of studies often poor (e.g. design, outcomes, secondary data use)
- Not all manufacturers specify temperature ranges in their documentation

### Bibliography

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