The Science of Fatigue, and Fatigue Management

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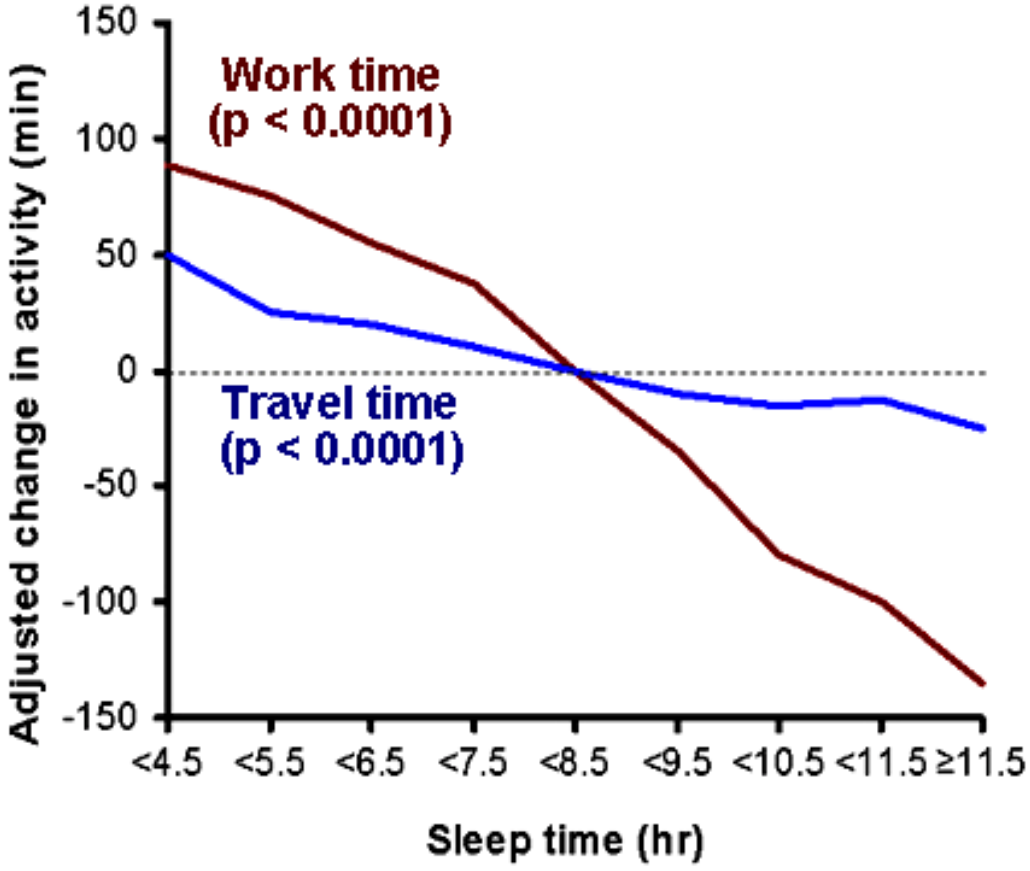
Professor David F. Dinges, PhD
Chief, Division of Sleep & Chronobiology
Department of Psychiatry
University of Pennsylvania
School of Medicine
Philadelphia, PA

Work time and travel time were the two activities related to less sleep

Data on 47,731 Americans from the American Time Use Survey



Basner et al. *SLEEP* (2007)

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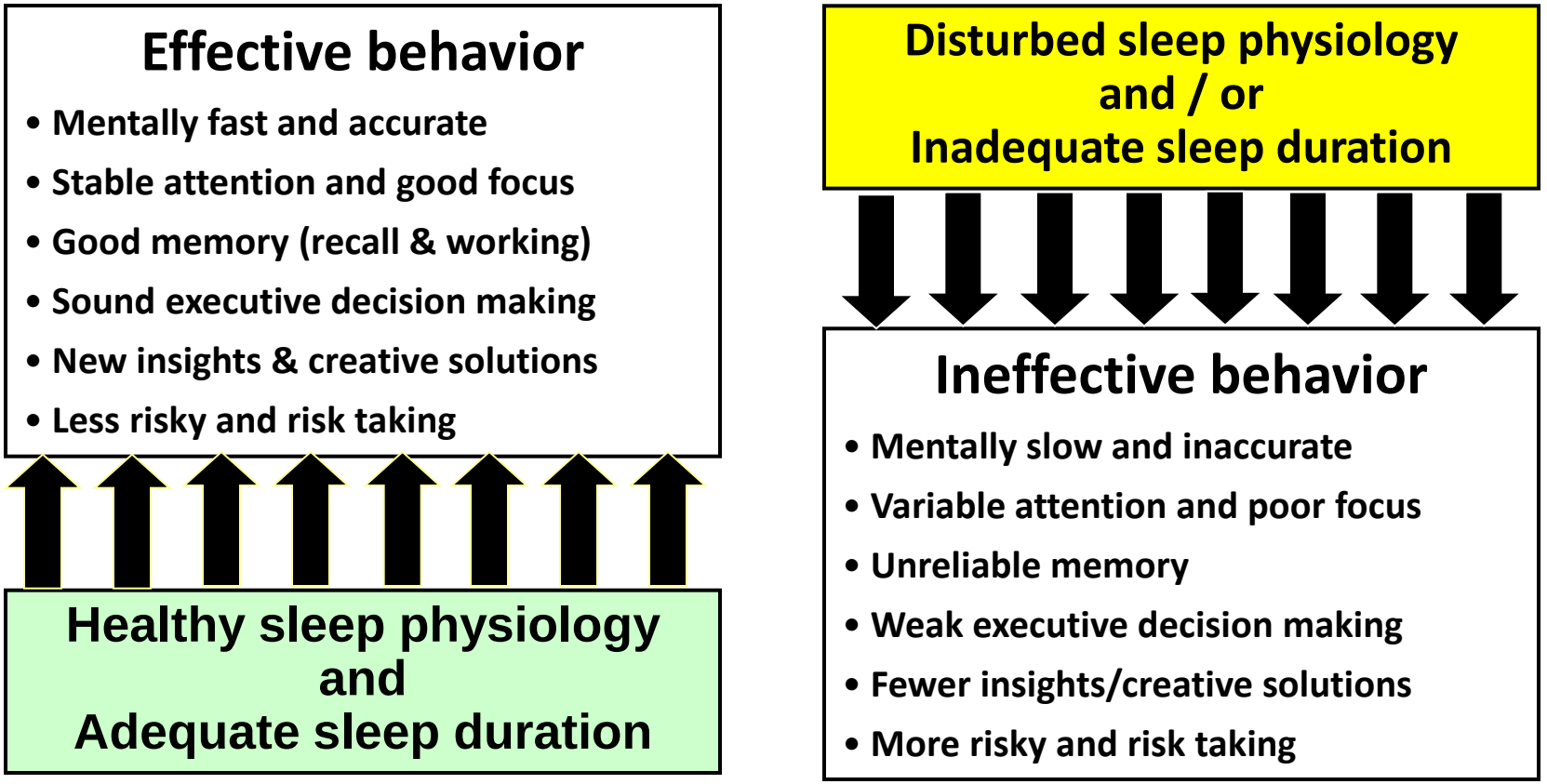
Adequate sleep is essential for alertness and effective performance



Goel et al. *SLEEP* (2009)

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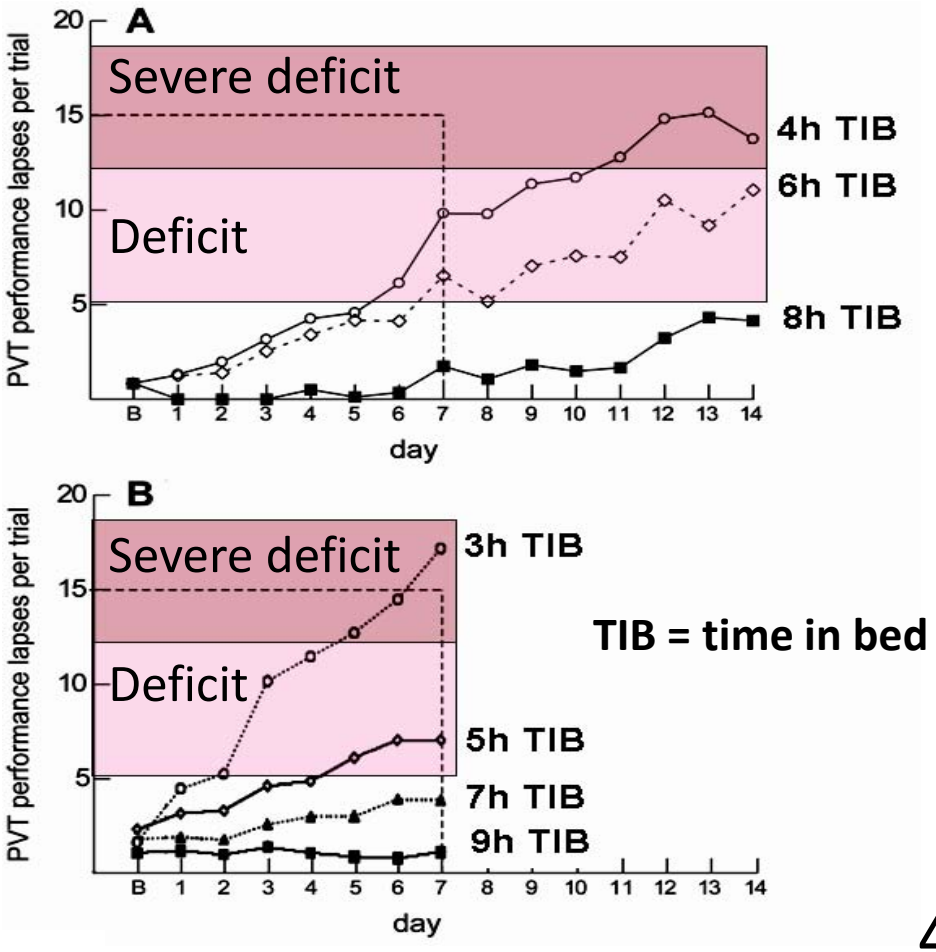
The more sleep is restricted, the greater the deficits in performance

Van Dongen et al. *SLEEP* (2003)

Increased lapses in sustained attention performance



Belenky et al. *J Sleep Res* (2003)

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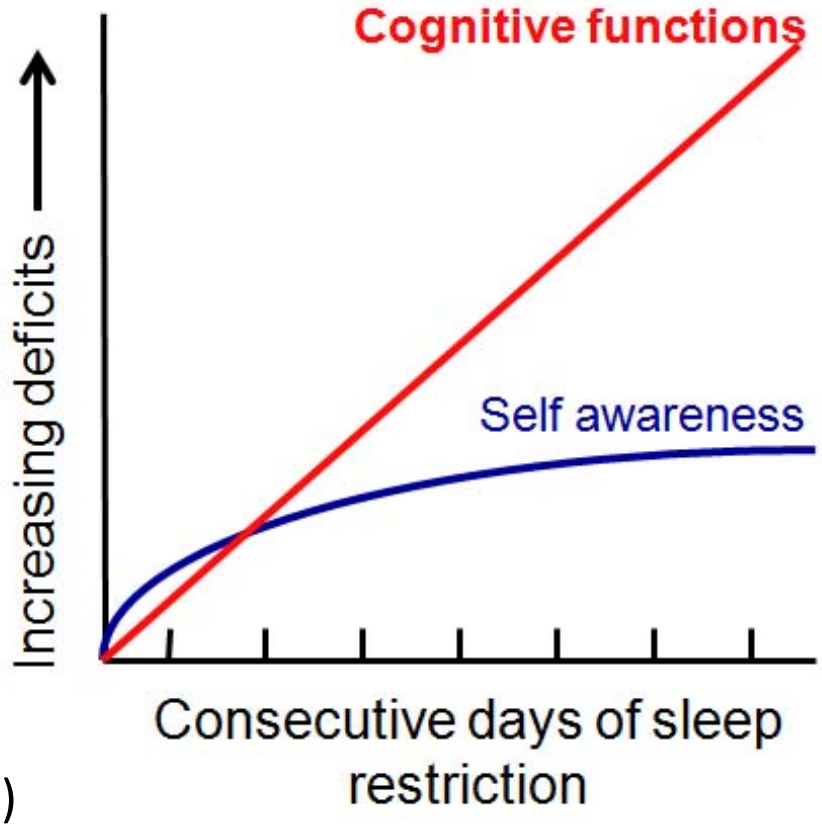
As performance deficits increased with restricted sleep, self awareness of the deficits was less accurate

Healthy sleep-restricted adults cannot accurately judge their fitness to perform



Results summarized from Van Dongen et al. *SLEEP* (2003)

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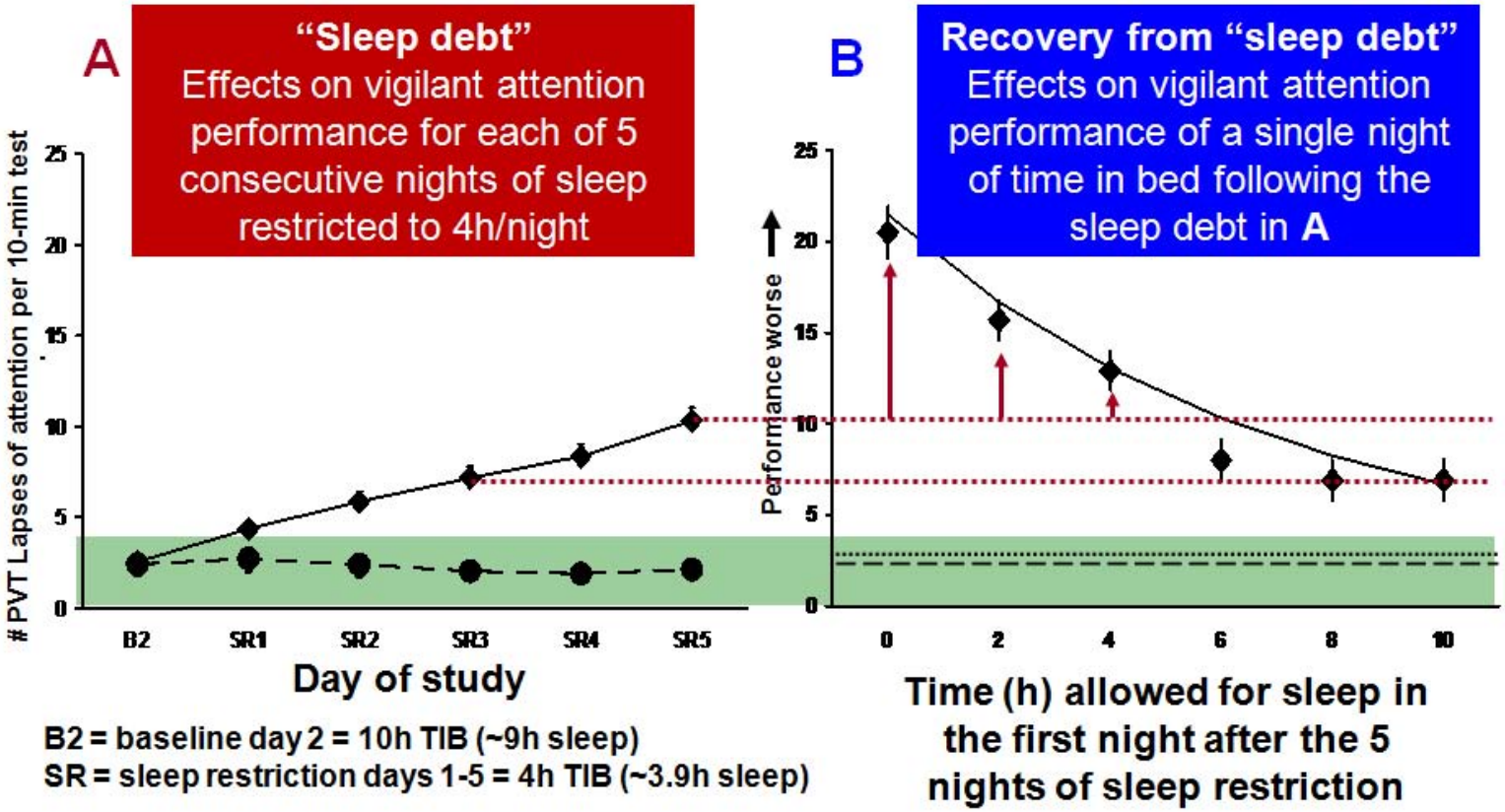
Performance lapses from restricted sleep require longer sleep to recover



Results summarized from Banks et al. *SLEEP* (2010)

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Fatigue Management Strategies

- Prevention (AVAILABLE NOW)
  - Work schedules that avoid acute and cumulative sleep loss
  - Treatment of sleep disorders (e.g., Sleep Apnea, Shift Work Disorder)

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Fatigue Management Strategies

- Intervention (NOT ADEQUATE)
  - Power naps
  - Caffeine

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Fatigue Management Strategies

- Prediction (IN DEVELOPMENT)
  - Mathematical model analysis of fatiguing schedules
  - Identifying those most vulnerable to sleep loss

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Fatigue Management Strategies

- Detection (IN DEVELOPMENT)
  - Monitoring sleep loss with wrist actigraphy output
  - Performance feedback from fatigue detection technology

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