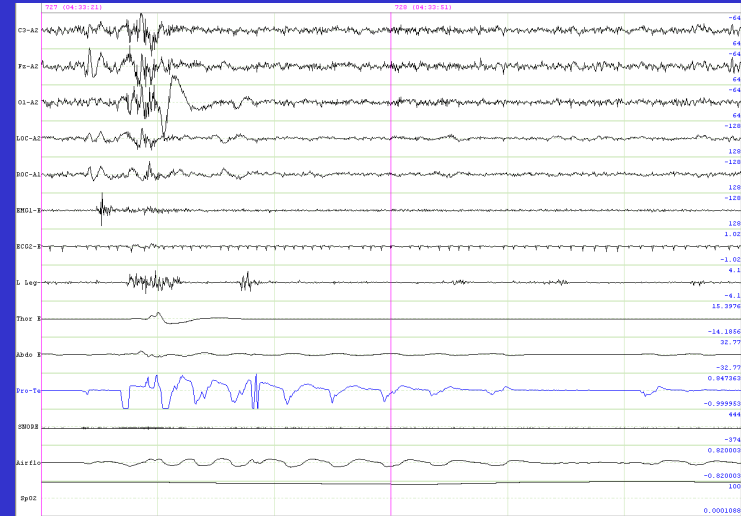


NPSG Data Exchange

Where We Are Today and What We Need

Philadelphia
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What is an Electronic NPSG?

Raw Data

Events (“scoring”)

Patient Information and ID

Associated Data (video, tech notes, etc)

Representations of Data
(Windows)

Data are usually collected to, and displayed from, a proprietary file format.

Benefits of Standardized Electronic NPSG File Format

Multicenter Studies

Centralized reading from multiple acquisition formats

Data Dissemination

Sharing of scored data and completed data sets (eg SHHS)

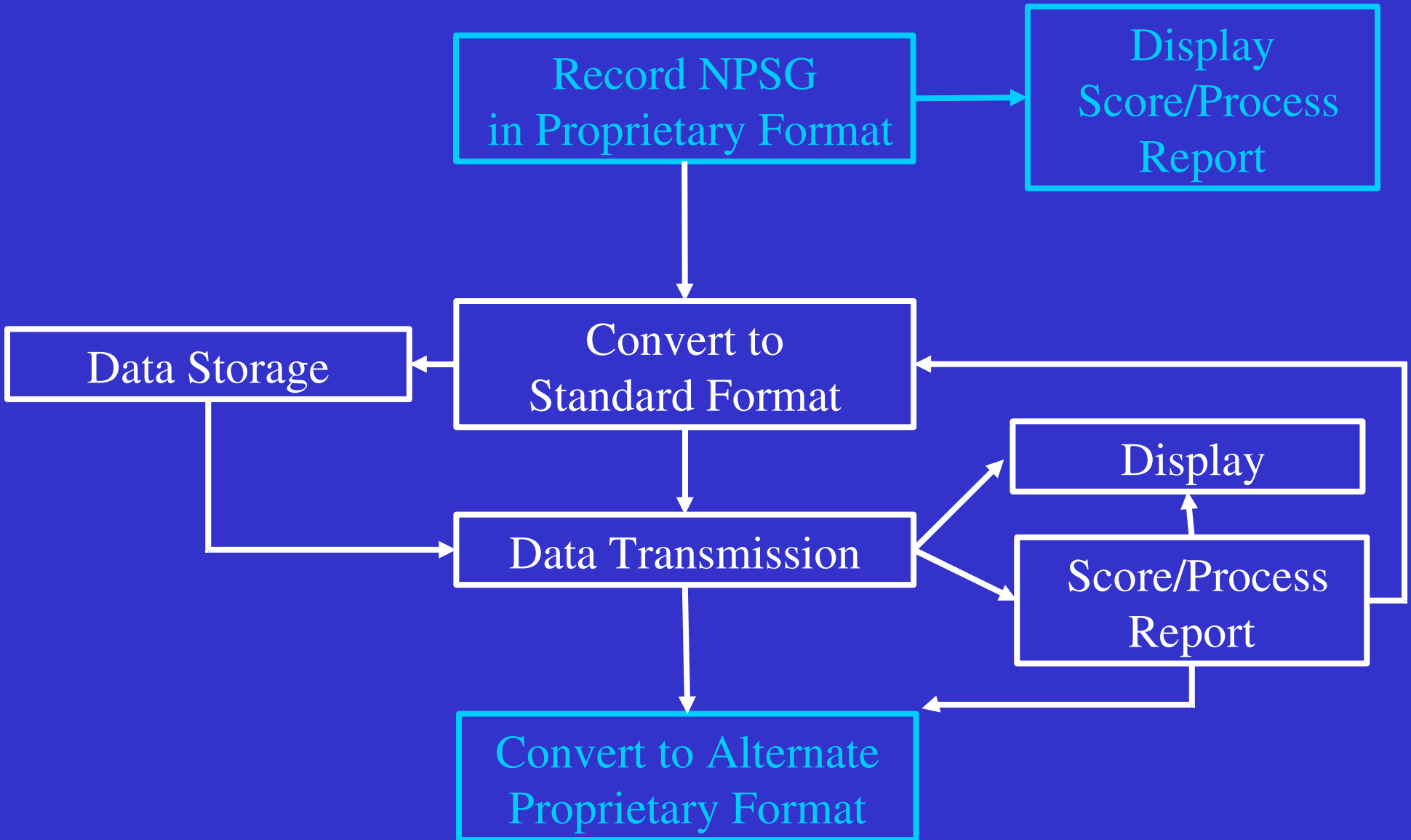
Additional processing of previously collected data

Remote Access, eg via internet

Dependent on transmission and compression.

Archiving

Old records/migration of data to new systems or new analyses



Why Can't We Do This Now?

Most systems use proprietary data format for raw and scored data

Standards for data exchange exist (eg EDF), but....

Often used as “intermediate” data format for RAW DATA ONLY

Rules for using the “standard” are frequently incompletely implemented

Standards for event and scored data incompletely or not defined

New solution for each new problem or advance in the field (lack of extensibility)

Examples of Issues in Implementing EDF

Dates 02-05-05 → February 5, 2005 or May 2, 2005?

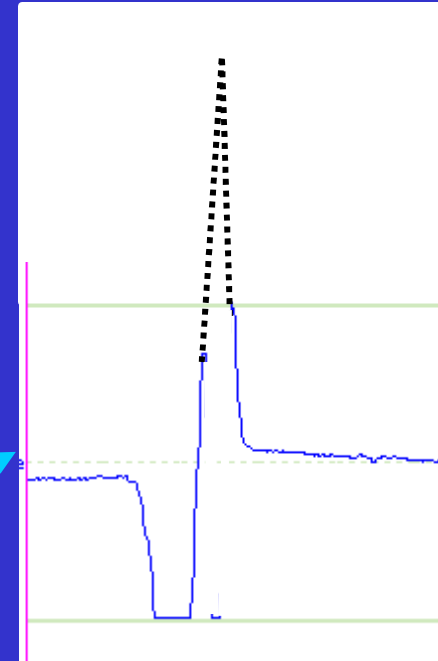
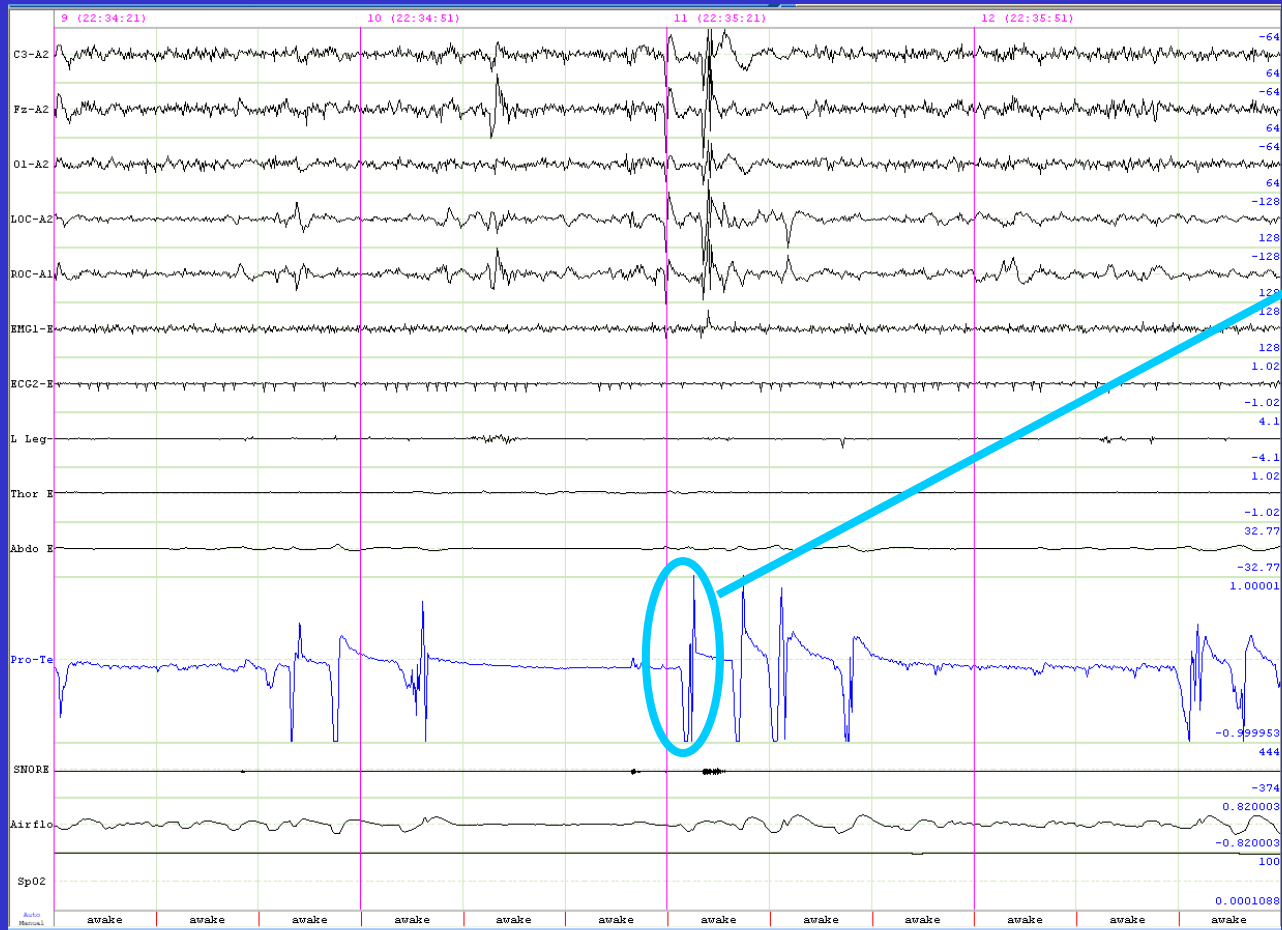
Sampling frequency – non integer causes “clock drift” if rounded

Calibration information often lost

Integer “wraparound” – maximum values that can be stored are

-32,768 to +32767

Example of Wrap-around



Standardization Targets

Standardized file format for data

Standardization of what a program utilizing the “standard” data can/must do

Read data

Write file or data

Display data (including processed data)

Manipulate data

Components of an Electronic NPSG

Raw Data

Time series of data points

Information about what data is, sampling freq, calibration, display, etc

Conventions on storage

- Parallel or multiplexed data points for multiple channels

- Data compression

- Data integrity (watermarking)

Examples: EDF, SDF, ASCII, proprietary binary formats

Components of an Electronic NPSG

Events (eg apneas, sleep stages)

Several Categories

No fixed set of events

Linkages between events

Examples: EDF plus, ASCII, proprietary binary formats

Event “Categories” in Electronic NPSG

Discrete Events (eg scoring that occurs intermittently or not at all)

Examples include apnea, hypopnea, arousal

Continuous Descriptors (eg – scoring that always has a value)

Changes occurring at Fixed Intervals (eg R&K epochs of sleep staging)

Changes occurring at Variable intervals (eg position)

Linkages between events – can either change an event or only qualify it

Examples include different definitions of hypopnea (with arousal or desat)

Development of a New NPSG Standard Format

Perspectives and Input needed

Research

Clinical Practice

NIH (Regulatory)

Industry

Procedures to disseminate/implement a “standard”