

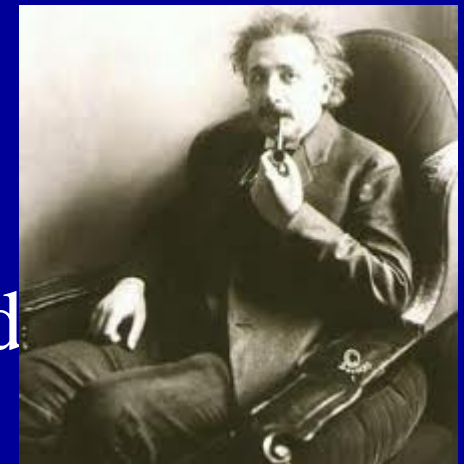
An aerial photograph of Chicago, showing the dense downtown skyline with numerous skyscrapers in the background. In the foreground, the University of Chicago campus is visible, featuring a mix of traditional brick buildings and modern structures, interspersed with green trees. The Lake Michigan shoreline is visible in the distance under a clear blue sky.

My Data Mining Experience

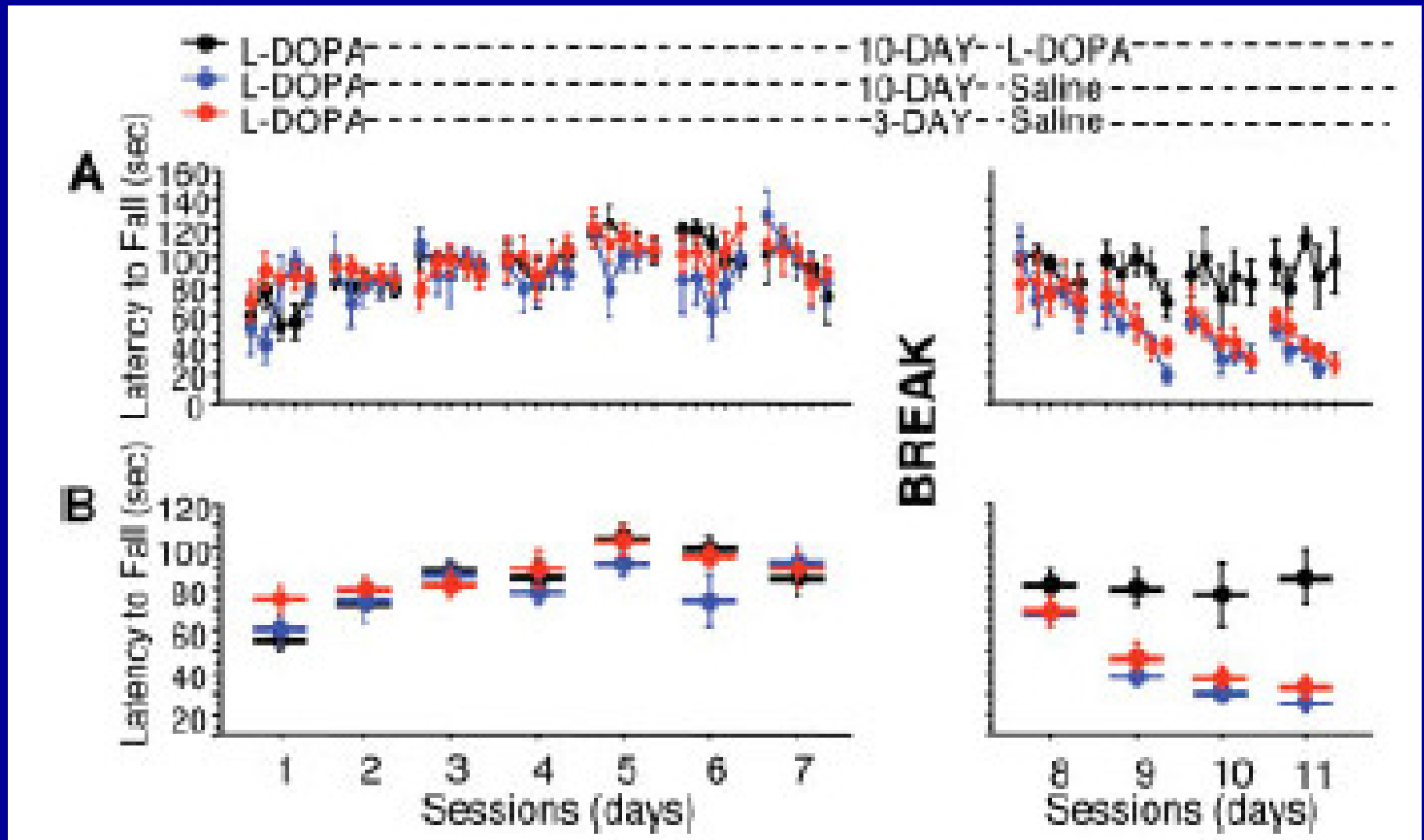
Un Jung Kang, MD
The University of Chicago

Data-mining Steps

- Hypothesis to test
- Selecting studies to examine
- PSG Resources and Help
- Data-mining proposal
- Analysis: PSG statistician
- Interpretation and Limitations
- Publication
- Stepping stone for new studies and new insights



Long Duration Response in Animal models



Motor Learning and dopamine in PD: Specific hypothesis for data-mining

- 1) Active hand use enhances the motor function in the presence of levodopa more than either activity without meds or relative inactivity with levodopa
- 2) Active use of dominant hand during washout period will worsen the motor deficit more than relative non-use of non-dominant hand.
- 3) Motor learning occurs with levodopa, but not with D2 agonist

Data-mining Steps

- Hypothesis to test
- **Selecting studies to examine:**
 - **Outcome measures**
 - Motor scores: off and on meds
 - **Variables to consider**
 - Activity
 - Dopaminergic medication
 - Control group
- PSG Resources and Help
- Data-mining proposal
- Analysis: PSG statistician
- Interpretation and Limitations
- Publication
- Stepping stone for new studies and new insights

Data-mining Steps

- Hypothesis to test
- Selecting studies to examine:
- **PSG Resources and Help**
 - Website
 - PSG Working Groups
 - PSG Advisor Program
 - PSG Statistical and Data Center
- Data-mining proposal
- Analysis: PSG statistician
- Interpretation and Limitations
- Publication
- Stepping stone for new studies and new insights

Available Data

Trial	Population	Intervention	# of Subjects
PRECEPT	Early untreated PD	CEP-1347	806
PRESTO	Advanced PD w/ motor fluctuations	Rasagiline	472
TEMPO	PD not on dopaminergic treatment	Rasagiline	404
RAPID	Advanced PD w/ motor fluctuations	Levodopa or etilevodopa	327
PATCH	Untreated PD	Dopamine agonist patch	242
QE2	Early, untreated PD	Coenzyme Q10	80
ELLDOPA	Early, untreated PD	Levodopa	361

Available Data

- Profile of Mood States (POMS)
- Beck Depression Inventory
- Blindedness
- Geriatric Depression Scale
- Hamilton Depression Scale
- Certainty of Idiopathic PD Dx
- Clinical Global Impression
- Con Meds
- Demog
- Medical History
- PD Hx
- Neuro Exam
- Physical Exam
- Vitals
- AEs
- Digit Ordering Test
- Digit Span
- MMSE
- New Dot Test
- Symbol Digit Modalities
- Purdue Pegboard Test
- Selective Reminding Test
- Verbal Fluency
- ECG
- Employment - Functional Status Questionnaire
- EUROQOL
- Hoehn & Yahr-modified
- Need for L-dopa
- PDQUALIF
- SF-36
- Schwab and England
- Social Activities - Functional
- Status Questionnaire
- UPDRS
- On-Off Diaries
- Video Taping

Selecting Data-mining Studies

	DA meds vs. placebo	Motor scores UPDRS	Finger tapping	Handedness	More or less affected
ELLDOPA	levodopa	+ off & on	+	+	+
CALM-PD	pramipexole	+ on	-	-	-
PRIME	pramipexole	+	+	-	-
PATCH	rotigotine	+ on	-	+	+
TEMPO	rasagiline	+	+	-	-
DATATOP	selegiline	+	-	+	+
QE2	coenzyme Q10	+	+	+	+

Available Resources at PSG

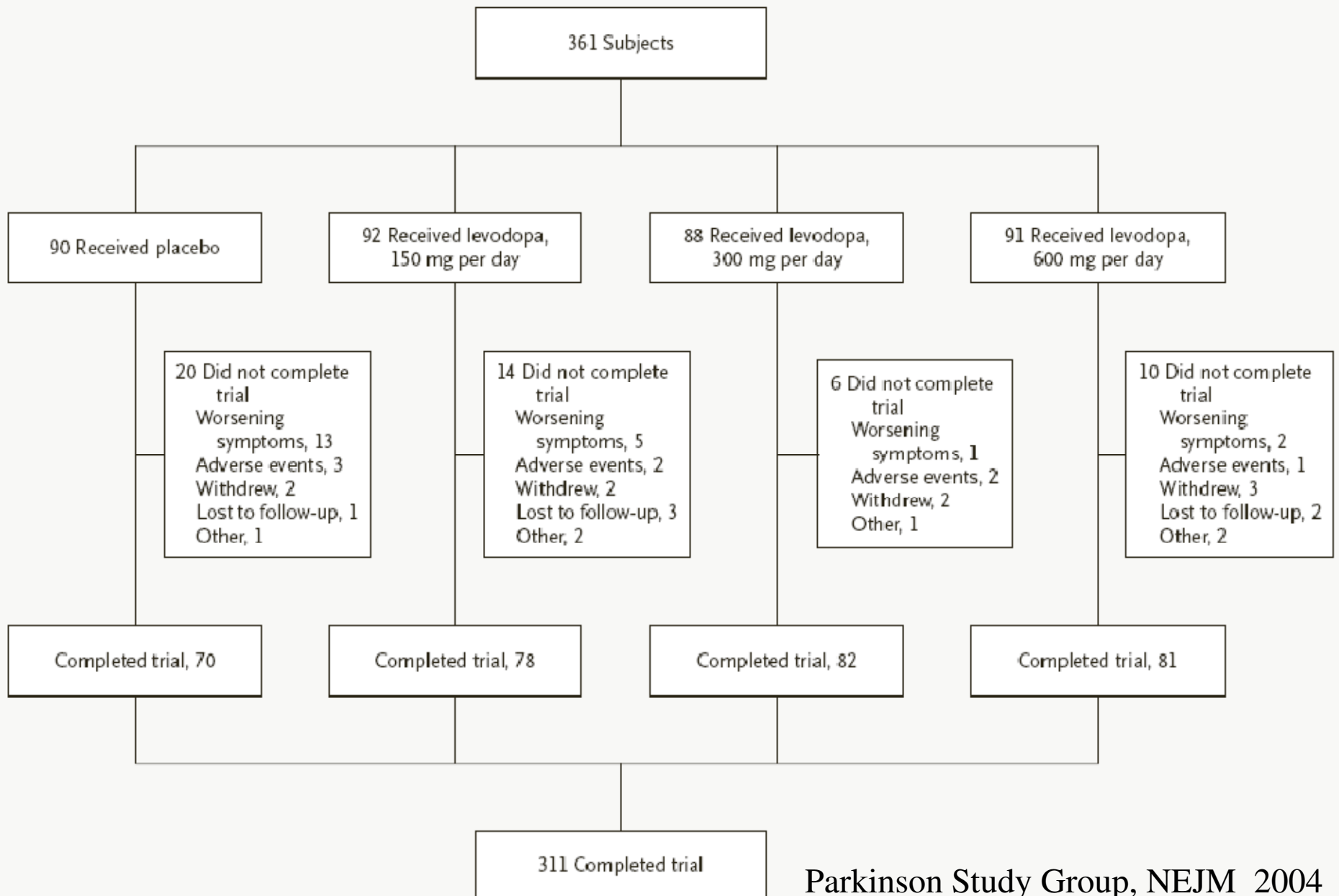
- PSG Working Groups
- PSG Advisor Program
 - <http://www.parkinson-study-group.org/parkinson-research/advisor-program>
- SRC feedback on proposals

Data-mining grant support

- PI time/effort
- Time/effort for PSG statistician help
- Funds for manuscript preparation
- Publication cost
- Travel as necessary
- Biological Assays

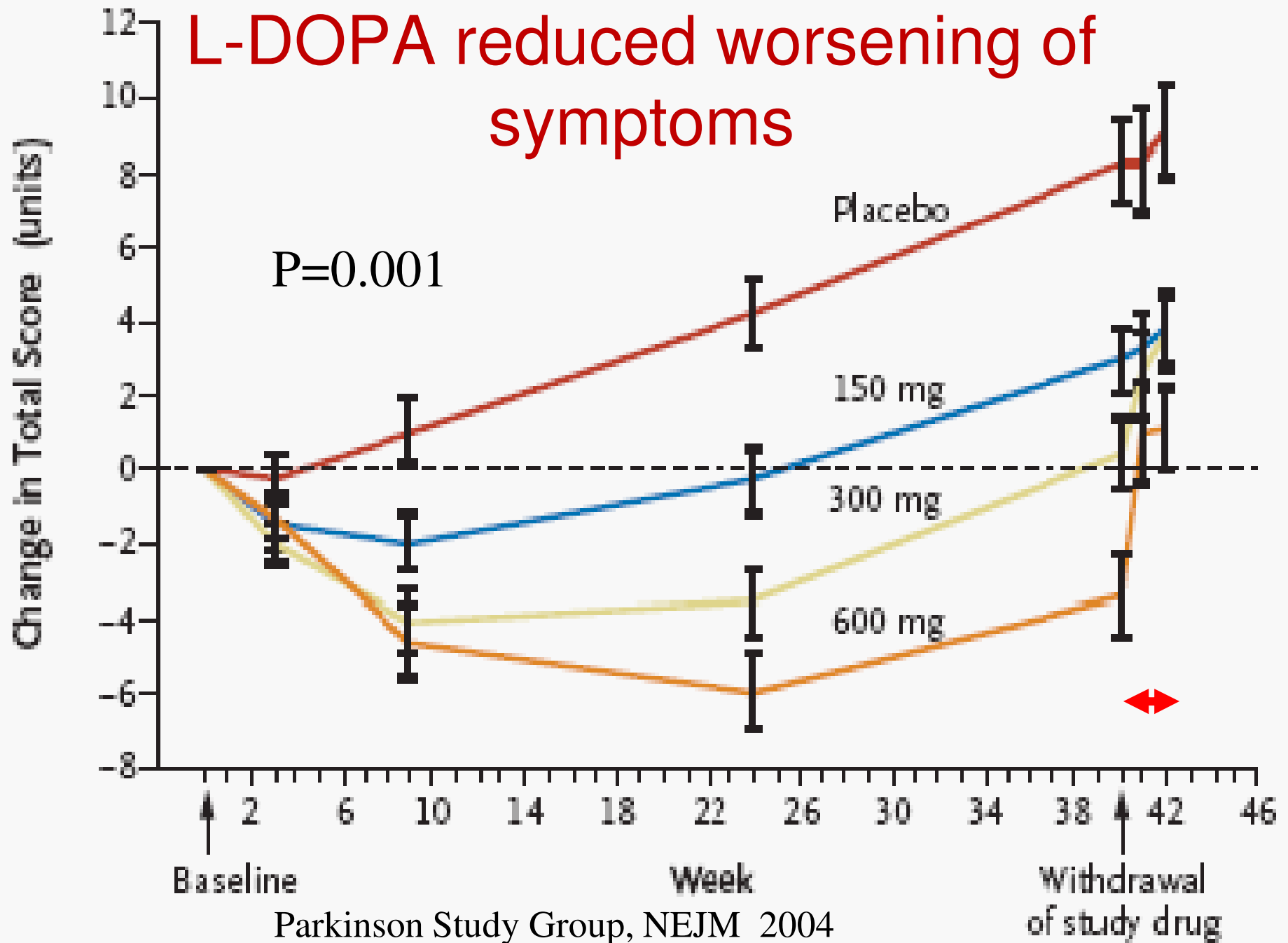
- Supported by PSG and Parkinson Disease Foundation

Earlier vs. Later Levodopa Study



Parkinson Study Group, NEJM 2004

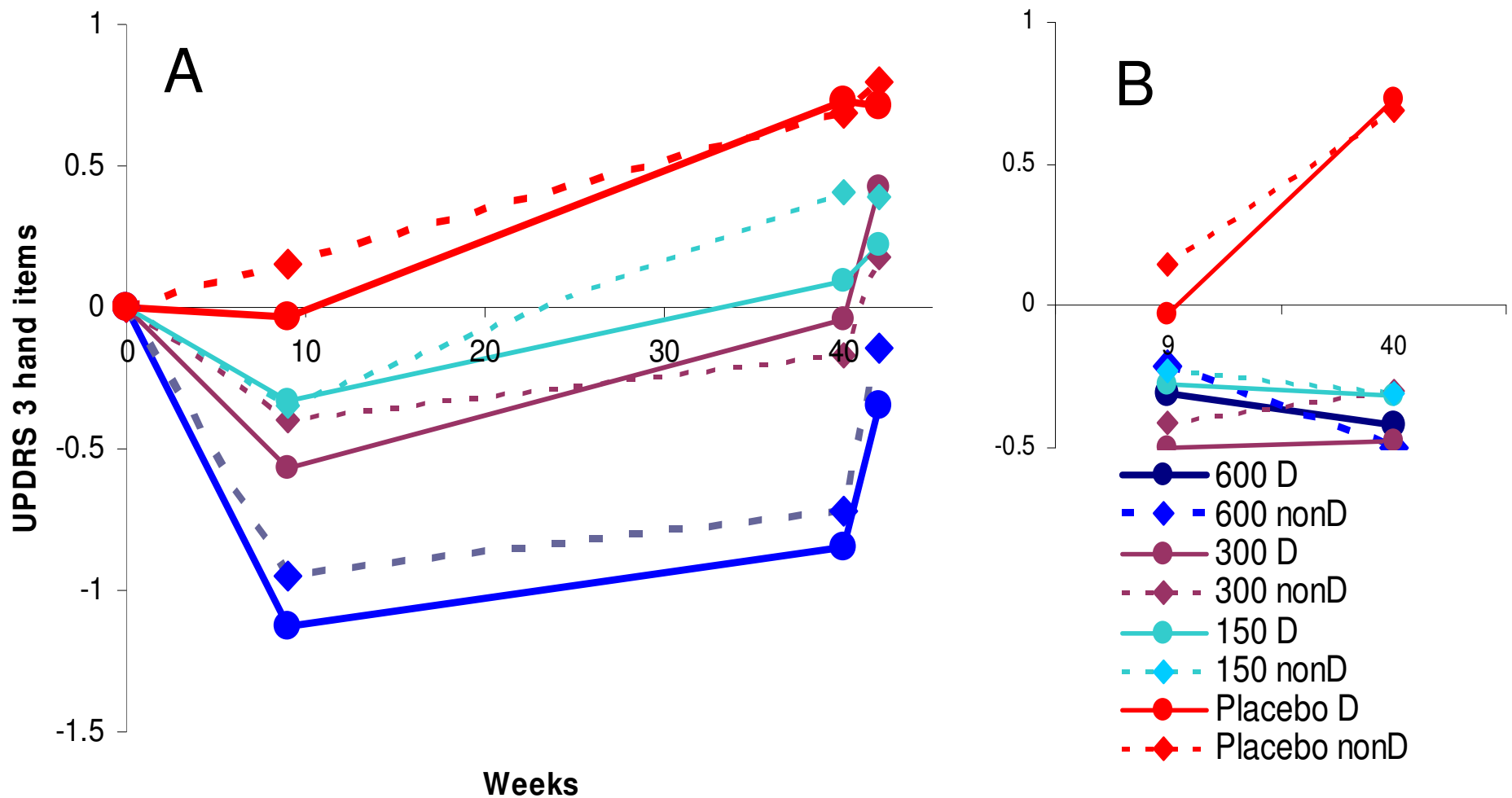
L-DOPA reduced worsening of symptoms



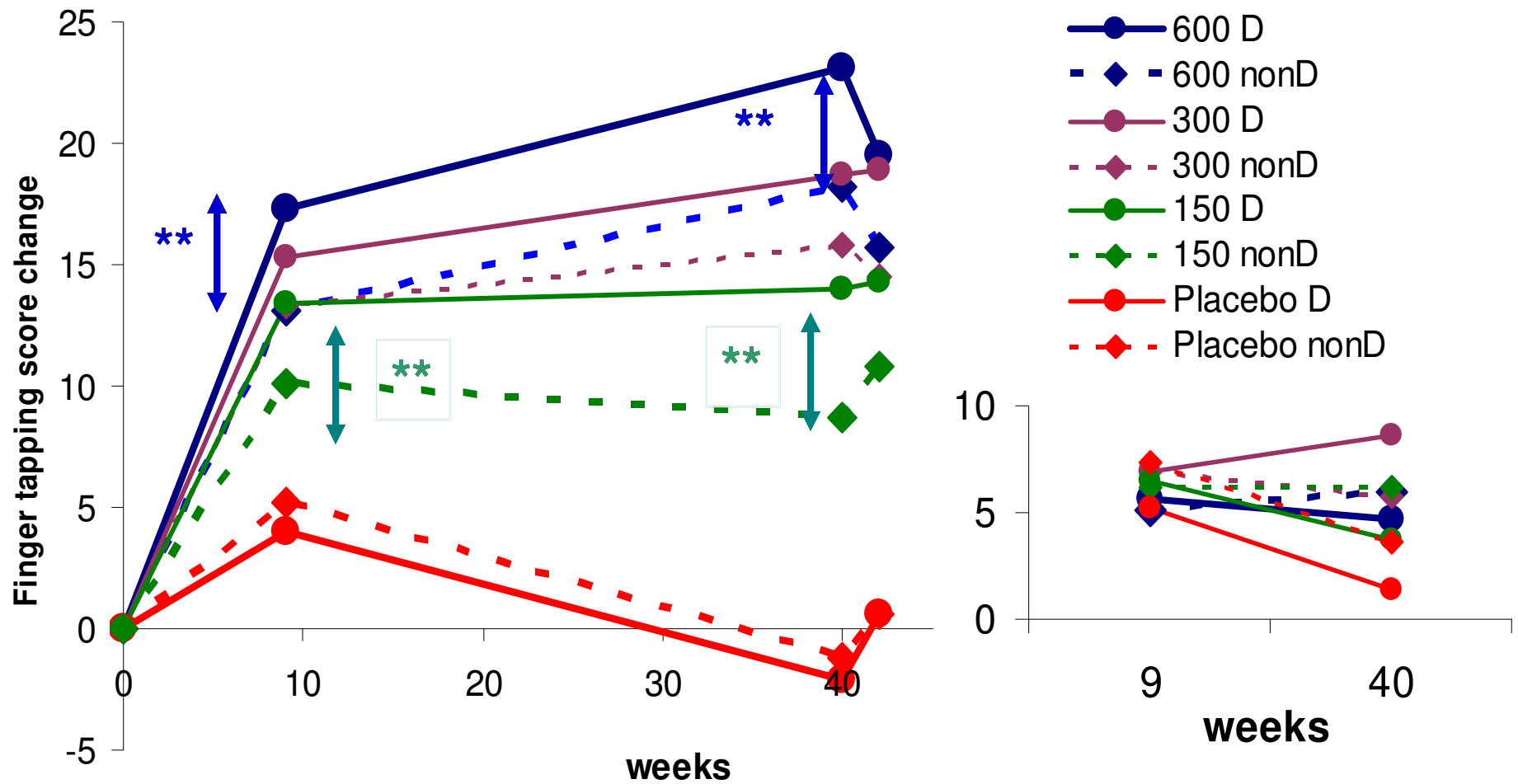
Motor Learning and dopamine in PD: Specific hypothesis for data-mining

- 1) Active hand use enhances the motor function in the presence of levodopa more than either activity without meds or relative inactivity with levodopa
- 2) Active use of dominant hand during washout period will worsen the motor deficit more than relative non-use of non-dominant hand.
- 3) Motor learning occurs with levodopa, but not with D2 agonist

Change in UPDRS scores for hand movements



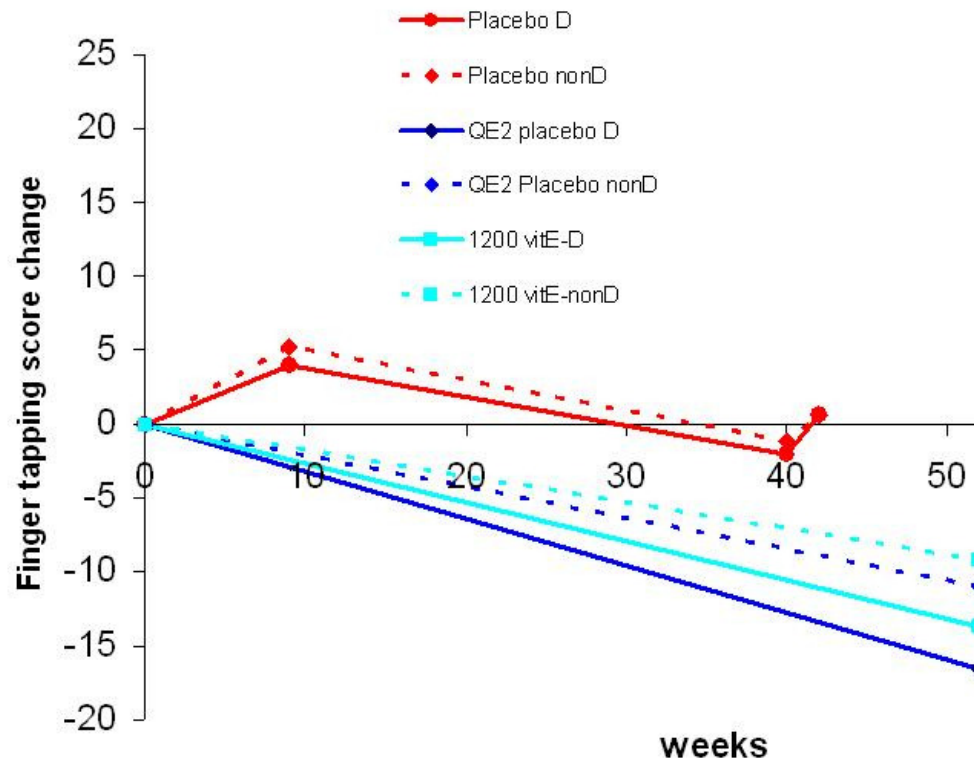
Change in finger tapping counts



Motor Learning and dopamine in PD: Specific hypothesis for data-mining

- 1) Active hand use enhances the motor function in the presence of levodopa more than either activity without meds or relative inactivity with levodopa
- 2) **Active use of dominant hand during washout period will worsen the motor deficit more than relative non-use of non-dominant hand.**
- 3) Motor learning occurs with levodopa, but not with D2 agonist

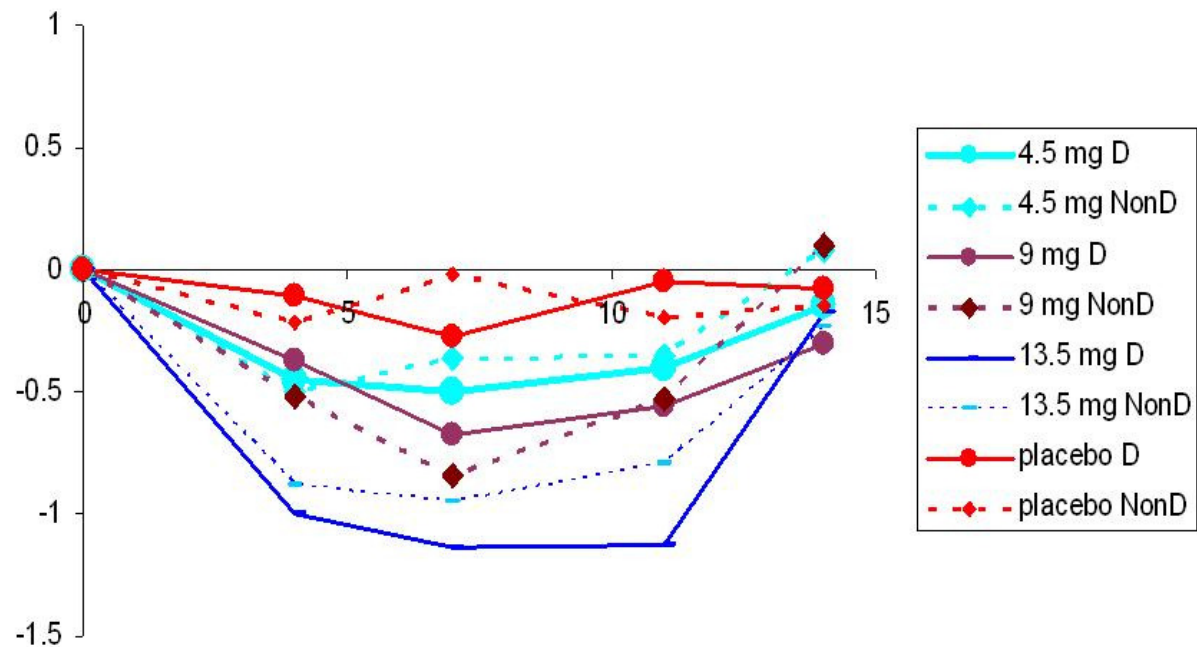
Changes in finger tapping counts in placebo groups QE2 Study



Motor Learning and dopamine in PD: Specific hypothesis for data-mining

- 1) Active hand use enhances the motor function in the presence of levodopa more than either activity without meds or relative inactivity with levodopa
- 2) Active use of dominant hand during washout period will worsen the motor deficit more than relative non-use of non-dominant hand.
- 3) **Motor learning occurs with levodopa, but not with D2 agonist**

Changes in UPDRS in PATCH STUDY



Comparing Study Populations

	ELLDOPA	PATCH	QE2
Average age range	64 - 65	60 - 62	60 - 63
Year since Dx	5.3 – 7.6	1.1 -1.5	?
UPDRS at start (T/m)	27 – 29 (19 - 20)	24 – 27 (17 – 20)	23 - 24 (17)
Duration of study	42 weeks	11 weeks	16 months 12 months

Data-mining Steps

- Hypothesis to test
- Selecting studies to examine:
 - Outcome measures
 - Variables to consider
- PSG Resources and Help
- Data-mining proposal
- Analysis: PSG statistician
- **Interpretation and Limitations**
- Publication
- Stepping stone for new studies and new insights

Limitations of data-mining study

- Hypothesis is validated!
 - Quick and minor work compared to a prospective study
- Study population is limited.
 - Handedness as a proxy for activity and practice
 - Finger tapping is very simple and limited for testing motor learning
- Limited dataset for each study
 - Inconclusive for the two other hypotheses

Data-mining Steps

- Hypothesis to test
- Selecting studies to examine:
 - Outcome measures
 - Variables to consider
- PSG Resources and Help
- Data-mining proposal
- Analysis: PSG statistician
- Interpretation and Limitations
- Publication
- **Stepping stone for new prospective studies**
 - **More concrete ideas about parameters to consider**
- **New insights**