Look Left and Right: psychometric evaluation of a novel assessment for post-stroke spatial inattention using data from the SIGHT trial

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1 Background & rationale

Spatial inattention is a common and disabling consequence of stroke, predicting longer admissions and poorer functional recovery **[1]**.

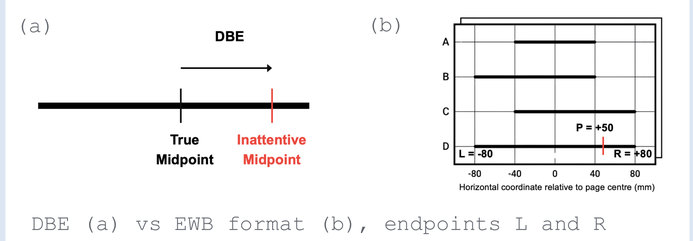
Line bisection is a widely used bedside test for spatial inattention, but its traditional score (**directional bisection error; DBE)** is insensitive **[2,3].**

Despite 292 available tools, none is recommended for clinical use due to a systemic lack of psychometric evidence **[4,5].**

2 The Endpoint Weightings Bias

[6,7,8]

Instead of a single error score, **Endpoint Weightings Bias (EWB)** varies the position of each line endpoint across 16 trials and estimates, by regression, how strongly each endpoint pulls the response. Their difference is the **EWB** which is positive in left inattention, zero when balanced, negative in right.



DBE (a) vs EWB format (b), endpoints L and R varied, P marks the response

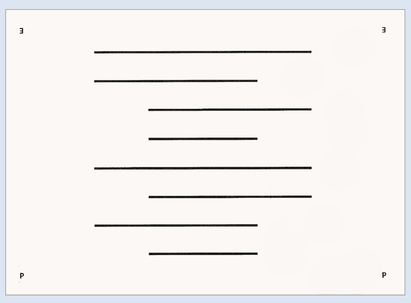
Traditional bisection

- Single directional error
- Only tells us if inattention is present or absent
- Cannot characterise the deficit

EWB approach

- Weights each endpoint separately
- Severity is graded and not binary
- Detects what DBE calls normal [6,7]

"Line bisection shows us the seesaw is tilted but EWB asks how much weight did they put on each side?"



3 Aim & research questions

Aim. To establish the validity of EWB against established inattention measures and 12-week functional outcomes in stroke survivors, using SIGHT trial data.

1. **Construct validity.** Does EWB correlate with established inattention measures more strongly than DBE?
2. **Criterion validity.** Does EWB separate stroke survivors from controls and classify inattention at least as well as established tests?
3. **Predictive validity.** Does baseline EWB predict participation and independence at 12 weeks beyond established measures?
4. **Responsiveness.** Are changes in EWB associated with changes on established inattention measures from baseline to Day 11?
5. **Exploratory.** Does EWB differ by visual field deficit or side of inattention?

4 Design & participants

Design. Analysis of quantitative data from SIGHT (a Phase II, multi-centre, 1:1 randomised, assessor-blind trial of a spatial inattention intervention) plus a normative data collection arm.

Clinical sample. n = 206 stroke survivors: adults, imaging-confirmed stroke, 1-75 days post-stroke, inattention on at least one established measure. Personal consultee provisions and aphasia-friendly materials include people who lack capacity to consent.

Controls. n = 50, age- and gender-matched, single 30-minute session, no neurological condition affecting cognition, vision, or spatial attention.

Timepoints. Baseline (T0) · Day 11 (T1) · 12 weeks (T2).

5 Measures & timepoints

Measure	Construct	T0	T1	T2
EWB task	Measure under evaluation	●	●	●
BIT Line Bisection [10]	Comparison measure	●	—	—
Star Cancellation [10]	Inattention screen	●	—	●
OCS Cancellation [11]	Ego- / allocentric inattention	●	●	●
VISA visual field [12]	Field deficit	●	—	—
NIHSS [13]	Stroke severity	●	—	—
SIS 3.0 [14]	Participation, ADL, recovery	—	—	●

6 Analysis plan

1. Pearson (or Spearman) correlations of EWB, DBE and comparators at baseline; dependent correlations compared in an SEM framework.
2. Stroke versus control comparison with Cohen's *d*; ROC/AUC with 95% CIs; paired AUCs compared by DeLong's test.
3. Hierarchical multiple regression on SIS Participation at 12 weeks, covariates, then an established measure, then EWB.
4. Regression conditioning on baseline values of both measures (T0→T1), plus standardised response means for EWB and DBE.
5. EWB by visual field deficit status, FDR-corrected.

All analyses in R, two-tailed, α = .05, effect sizes with 95% CIs. Pre-registered on OSF and agreed with the trial statistician before data access. At N = 206 the study detects r = .22, AUC = .65, f^2 = .09, SRM = 0.23 at 90% power.

7 What this will add

The first psychometric evaluation of EWB in acute and subacute stroke, at a scale no previous study has reached. This is the first exploration of whether EWB predicts participation and independence rather than only other tests.

If EWB outperforms DBE, a measure already usable at the bedside with paper and pencil becomes a better one: improving stratification, prognosis, and the targeting of rehabilitation.

8 PPI, ethics & governance

PPI. The study draws on SIGHT's survivor-led advisory panel, with representation on the Trial Management Group and Trial Steering Committee. The panel will be consulted on interpretation and dissemination. The panel asked for the term *spatial inattention* rather than *neglect*, which this study follows.

Ethics. Analysis of SIGHT data falls under the Health Research Authority and NHS Research Ethics Committee approval (IRAS 335220; ISRCTN34708853). Ethical approval to be sought via UEA Faculty of Medicine and Health Sciences; de-identified data only, held under UK GDPR.

Timeline. Recruitment closes April 2027; database lock anticipated August 2027.

Watch a demo!
www.youtube.com/watch?v=GI-Q43cRiGE

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