On-line Table 1: Summary of the key aspects of the RANO response criteria

Criterion	Complete Response	Partial Response	Stable Disease	Progressive Disease
T1-weighted post-Gd measurable disease	None	≥50% decrease	<50% decrease but <25% increase	≥25% increase
T2/FLAIR	Stable or decreased	Stable or decreased	Stable or decreased	Increased
New lesion	None	None	None	Present
Corticosteroids	None	Stable or decreased	Stable or decreased	NA
Clinical status	Stable or increased	Stable or increased	Stable or increased	Decreased
Requirement for response	All	All	All	Any

Note:—NA indicates not applicable.

On-line Table 2: Standard brain imaging protocol

	Structural Brain MRI				Administer Contrast Agent[a]	
	T1 Pre-Gd	T2	FLAIR	DWI	T1 Post-Gd	3D T1 Volumetric (MPRAGE or SPGR)
Orientation	Axial	Axial	Axial	Axial	Axial	Axial or sagittal
Plane	2D	2D	2D	2D-EPI	2D	3D
TE (ms)	14	85	125	Minimum	14	3–4
TR (ms)	650	3000	11,000	Minimum	650	8
TI (ms)	NA	NA	2800	NA	NA	900 (Philips Healthcare or Siemens)[b]
Flip angle (excitation)	90°	90°	90°	90°	90°	10°
Flip angle (refocusing)	180°	180°	180°	180°	180°	NA
B-value	NA	NA	NA	0 and 1000	NA	NA
Section thickness (mm)	≤4.0	≤4.0	≤4.0	≤4.0	≤4.0	1
Section gap (mm)	≤4.0	≤4.0	≤4.0	≤4.0	≤4.0	NA
Matrix	256 × 180	256 × 180	256 × 180	128 × 128	256 × 180	256 × 256 (sagittal) 256 × 180 (axial)
FOV (mm)	230	230	230	230	230	256
NEX/NSA	1–2	1–2	1–2	1–2	1–2	1
No. of sections	32–42	32–42	32–42	32–42	32–42	128–160
Gd-DTPA[c]	No	No	No	No	Yes; 0.2 mmol/kg	Yes; 0.2 mmol/kg

Note:—NSA indicates the number of acquisitions; SPGR, spoiled gradient recalled echo; NA, not applicable.
[a] Contrast agent must be consistent throughout the trial.
[b] Philips Healthcare, Best, the Netherlands; Siemens, Erlangen, Germany.
[c] If the patient is older than 7 years of age, nonionic agents (eg, gadobutrol) may be used with a dosage of 0.1 mmol/kg.

On-line Table 3: Perfusion (dynamic-susceptibility contrast T2) imaging parameters

	Description					
Field strength	1.5T			3T		
Manufacturer	GE	Philips	Siemens	GE	Philips	Siemens
Sequence	EPI GE	PRESTO	Ep2dfid	EPI GE	PRESTO	Ep2dfid
Fixed parameter value						
Matrix	128	128	128	128	128	128
FOV (mm)	240	230	230	240	230	230
Section thickness (mm)	5	4	5	5	3.5	5
Intersection gap (mm)	≤1.5	≤0.5	≤0.5	≤1.5	≤0.5	≤0.5
Orientation	Axial	Axial	Axial	Axial	Axial	Axial
Flip angle	90°	10°	90°	90°	7°	90°
Variable parameter value						
TR (ms)	≤3000	16	≤2000	≤3000	16	≤2000
TE (ms)	60	30	30	60	24	30
Bandwidth (Hz/Px)	≤900	≤3000 (water-fat-shift ≤4.5)	≤1400	≤900	≤3000 (water-fat-shift ≤4.5)	≤1400
NSA/NEX	1	1	1	1	1	1
Phase %	100	100	100	100	100	100
Parallel imaging	No	2	2	No	2	2
No. of volumes/dynamics	≥60	≥60	≥60	≥60	≥60	≥60

Note:—EPI GE indicates echo planar imaging with gradient echo refocusing; NSA, number of acquisitions; PRESTO, principles of echo shifting with a train of observations; Ep2dfid, echo-planar imaging 2D free induction decay.

On-line Table 4: Decision rules for structural imaging and diffusion/perfusion status

| Structural MRI Review Response	Diffusion Status	Perfusion Status	Combined Structural/Functional MRI Response
Complete response	Unable to assess/missing	Unable to assess/missing	Complete response
	Normal	Normal/decreased	Complete response
	Increased	Normal/decreased	Complete response
	Unable to assess/missing	Normal/decreased	Complete response
	Decreased	Normal/decreased	Complete response
	Decreased	Unable to assess/missing	Complete response
	Decreased	Increased	Progressive disease/recurrent disease
	Normal	Increased	Progressive disease/recurrent disease
	Increased	Increased	Progressive disease/recurrent disease
	Unable to assess/missing	Increased	Progressive disease/recurrent disease
Partial response	Unable to assess/missing	Unable to assess/missing	Partial response
	Normal	Normal/decreased	Partial response
	Increased	Normal/decreased	Partial response
	Unable to assess/missing	Normal/decreased	Partial response
	Decreased	Normal/decreased	Stable disease
	Decreased	Unable to assess/missing	Stable disease
	Decreased	Increased	Progressive disease/recurrent disease
	Normal	Increased	Progressive disease/recurrent disease
	Increased	Increased	Progressive disease/recurrent disease
	Unable to assess/missing	Increased	Progressive disease/recurrent disease
Stable disease	Unable to assess/missing	Unable to assess/missing	Stable disease
	Normal	Normal/decreased	Stable disease
	Increased	Normal/decreased	Stable disease
	Unable to assess/missing	Normal/decreased	Stable disease
	Decreased	Normal/decreased	Stable disease
	Decreased	Unable to assess/missing	Stable disease
	Decreased	Increased	Progressive disease/recurrent disease
	Normal	Increased	Progressive disease/recurrent disease
	Increased	Increased	Progressive disease/recurrent disease
	Unable to assess/missing	Increased	Progressive disease/recurrent disease
No change	Unable to assess/missing	Unable to assess/missing	No change
	Normal	Normal/decreased	No change
	Increased	Normal/decreased	No change
	Unable to assess/missing	Normal/decreased	No change
	Decreased	Normal/decreased	No change
	Decreased	Unable to assess/missing	No change
	Decreased	Increased	Progressive disease/recurrent disease
	Normal	Increased	Progressive disease/recurrent disease
	Increased	Increased	Progressive disease/recurrent disease
	Unable to assess/missing	Increased	Progressive disease/recurrent disease
Progressive disease/recurrent disease	Unable to assess/missing	Unable to assess/missing	Progressive disease/recurrent disease
	Normal	Normal/decreased	Stable disease
	Increased	Normal/decreased	Stable disease
	Unable to assess/missing	Normal/decreased	Stable disease
	Decreased	Normal/decreased	Stable disease
	Decreased	Unable to assess/missing	Progressive disease/recurrent disease
	Decreased	Increased	Progressive disease/recurrent disease
	Normal	Increased	Progressive disease/recurrent disease
	Increased	Increased	Progressive disease/recurrent disease
	Unable to assess/missing	Increased	Progressive disease/recurrent disease

Structural MRI Review Response	Diffusion Status	Perfusion Status	Combined Structural/Functional MRI Response
Pseudoprogression	Unable to assess/missing	Unable to assess/missing	Pseudoprogression
	Normal	Normal/decreased	Stable disease
	Increased	Normal/decreased	Stable disease
	Unable to assess/missing	Normal/decreased	Stable disease
	Decreased	Normal/decreased	Stable disease
	Decreased	Unable to assess/missing	Progressive disease/recurrent disease
	Decreased	Increased	Progressive disease/recurrent disease
	Normal	Increased	Progressive disease/recurrent disease
	Increased	Increased	Progressive disease/recurrent disease
	Unable to assess/missing	Increased	Progressive disease/recurrent disease
Unable to assess	Unable to assess/missing	Unable to assess/missing	Unable to assess
	Normal	Normal/decreased	Stable disease
	Increased	Normal/decreased	Stable disease
	Unable to assess/missing	Normal/decreased	Stable disease
	Decreased	Normal/decreased	Stable disease
	Decreased	Unable to assess/missing	Stable disease
	Decreased	Increased	Progressive disease/recurrent disease
	Normal	Increased	Progressive disease/recurrent disease
	Increased	Increased	Progressive disease/recurrent disease
	Unable to assess/missing	Increased	Progressive disease/recurrent disease

On-line Table 5: Comparison of recommended sequences for Response Assessment in Neuro-Oncology criteria and the Consensus on Recommendation for a Standardized Brain Tumor Imaging Protocol[4,19]

RANO, Recommended Sequences	Standardized Brain Tumor Imaging Protocol, Recommended Sequences
Axial T1-weighted 2D	3D T1-weighted precontrast
Axial T2-weighted + axial 2D FLAIR	Axial 2D FLAIR
DWI	Axial 2D DWI
Gadolinium injection	Gadolinium injection
Axial 2D T1-weighted	Axial 2D T2-weighted
Axial 3D T1-weighted	3D T1-weighted
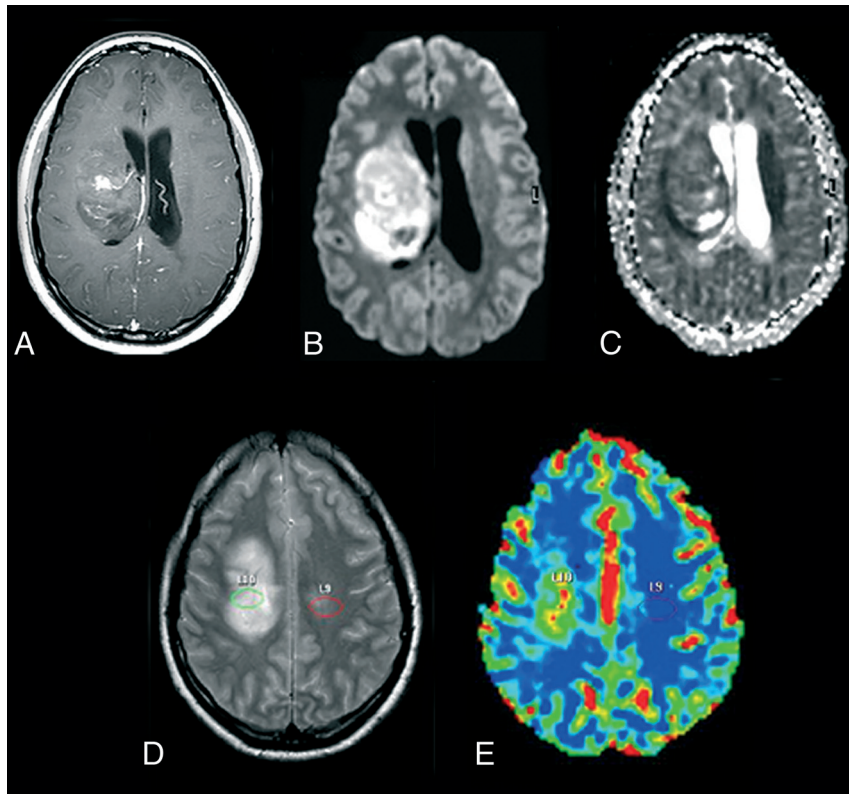
ON-LINE FIG 1. An example of tumor imaging by T1 postgadolinium MR imaging (*A*), diffusion-weighted imaging (*B*), apparent diffusion coefficient mapping (*C*), T2 MR imaging with regions of interest (*D*), and cerebral blood volume (*E*).
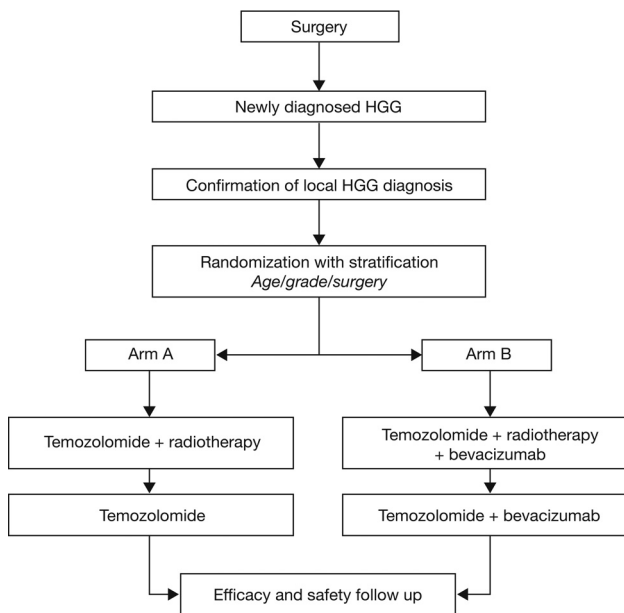
ON-LINE FIG 2. HERBY study design.
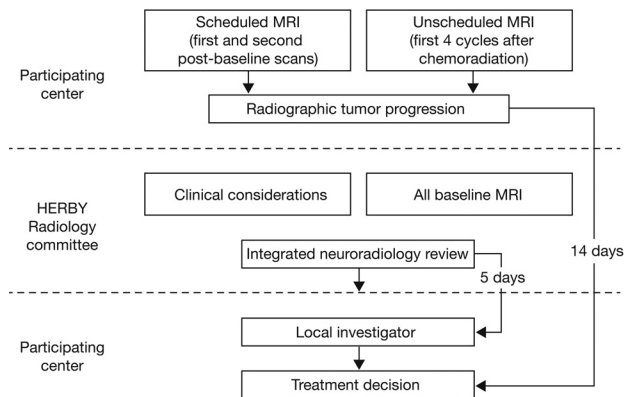
ON-LINE FIG 3. Algorithm to assess early progression in HERBY.