20160507 週六外科部晨會
住院醫師六大核心能力

報告者 外科部住院醫師 王耀鐸
指導者 神經外科 宋文鑫主任
李鴻福醫師

Patient information

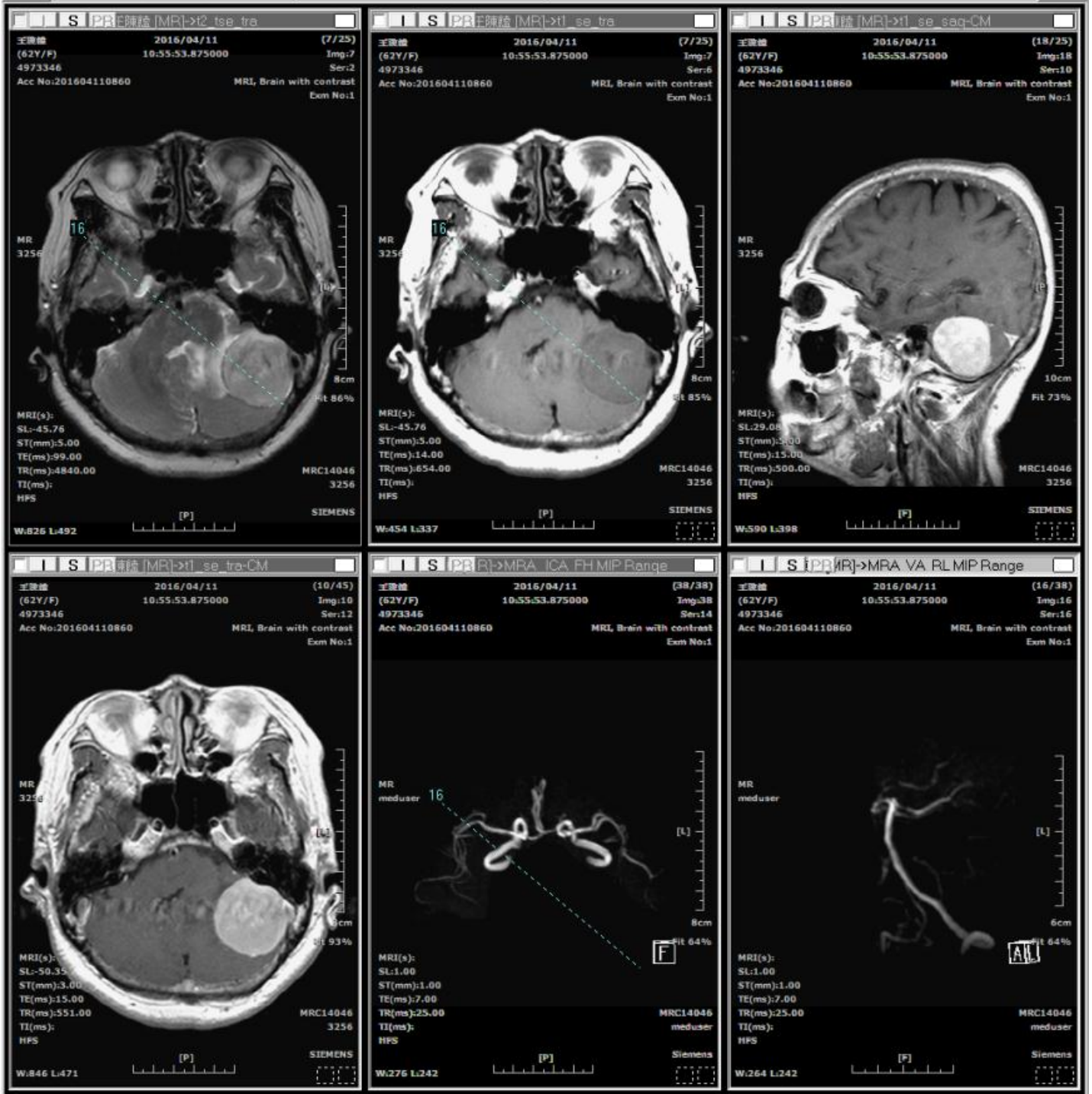
- Patient number: OOOOOOO
- Patient name: OOO
- Age / sex: 43 y/o, female
- Past history: 1. DM type 2
- 2. Hypertension

Chief complaint

- Sudden onset of weakness developed and numbness in the left U/L limbs at 4:30 AM on 2016/04/07

Present illness

- **20160407** ER(WBC: 5600, Hb: 13.6, Na: 137, K: 3.6)
  - ➔ PE: No tinnitus, no unstable gait
  - ➔ discharge and arrange Neuron OPD management
- **20160408** Neuron OPD
- NE:
- Cranial nerves: **tongue deviation to left side.**
- Cerebellar: no ataxia (失調), no poor balance, no dysmetria (辨距障礙)
- Muscle power: **Grade 4 in left U/L limbs**.
- Babinski signs: present, bilateral.
- consciousness: alert, normal mentality, fluent speech


2016/04/11
MRI, Brain with contrast
MRC14046
SIEMENS
MRI(s):
MR
MRA_ICA_FH MIP Range
MRA_VA_RL MIP Range

- 2016/04/11 consult NS 宋文鑫主任
- 2016/04/22

Left subccipital craniotomy with removal of left C-P angle tumor under Navigation guide (Medtronic S7i) by using microscope and CUSA.

Brain Tumors (1)

- **Primary :**
  1. meningeal —meningioma
  2. Parenchyma:
  neuron—central neurocytoma(rare)
  Glial cell- astrocyte--astrocytoma I-II, AA, GBM
  oligodendrocyte-- oligodendroglioma
  microglia
  ependyma- ependymoma
  3. others: primary lymphoma, Pituitary tumor,…

Meningioma

- **Benign**: (WHO grade I) 85% Meningothelious
- not meet the criteria for a higher grade lesion
- **Malignant**: 15% (WHO grade II, III)
- II ➔ atypical, clear cell, and chordoid
- III➔ anaplastic, papillary, and rhabdoid meningiomas
  - ➔ infiltration of brain
  - ➔ abundant mitoses with atypical forms
  - ➔ multifocal microscopic foci of necrosis

Brain Tumors (2)

- Secondary- lung, breast, melanoma
  solitary—breast, colon, and renal cell carcinoma
  multiple—lung cancer and malignant melanoma

Arch Neurol. 1988;45(7):741

Pathology

- PATHOLOGICAL DIAGNOSIS:
- Meningioma, transitional type
- MICRO:
- spindle-shaped cells
- meningotheliomatous cells
- regular, round or oval nuclei with pale cytoplasm and indistinct cell borders.

Meningioma subtypes

	WHO grade
Meningiomas with low risk of recurrence or aggressive growth:	
Meningothelial	I
Fibrous (fibroblastic)	I
Transitional (mixed)	I
Psammomatous	I
Angiomatous	I
Microcystic	I
Secretory	I
Lymphoplasmacyte-rich	I
Metaplastic	I
Meningiomas with greater likelihood of recurrence and/or aggressive behavior:	
Atypical	II
Clear cell (intracranial)	II
Chordoid	II
Rhabdoid	III
Papillary	III
Anaplastic (malignant)	III
Meningiomas of any subtype or grade with high proliferative index and/or brain invasion	

Discussion

- **Symptom**
- asymptomatic or minimally symptomatic (0.9%)
- Seizure (25~40%)
- Focal findings: Visual changes, Hearing loss, Mental status changes, Extremity weakness, Obstructive hydrocephalus
- Spontaneous hemorrhage
- **Sign / image study**
- MRI: the "tail" sign
- CT: well-defined extra-axial mass that displaces the normal brain
- **Management**
- Pure resection (I)
- RADIATION THERAPY (III)
- RT after subtotal resection (II, III)
- **Prognosis**
- Atypical (II), malignant(III) < grade I meningiomas

DDx of Brain Tumor (Primary)

1. Astrocytic tumors

(1a) Pilocytic astrocytoma

(1b) Glioblastoma

2. Oligodendroglial tumors

(2a) Oligodendroglioma

3. Oligoastrocytic tumors

(3a) Oligoastrocytoma

1a Rosenthal fibers

1b 80% of secondary ==> mutation in IDH1, rare in primary glioblastoma (5-10%).

2a "fried egg" cells

3a similar to other gliomas

3. Ependymal tumors

(3a) Ependymoma

4. Choroid plexus tumors

(4a) Choroid plexus papilloma

(4b) Choroid plexus carcinoma

3a

==> visual loss (due to papilledema)

==> bilateral Babinski sign

4 neuroectodermal in origin and similar in structure to a normal choroid plexus

5. Other neuroepithelial tumors

(5a) Astroblastoma

(5b) Chordoid glioma of the third ventricle

(5c) Angiocentric glioma

5a

==> Appears "bubbly" in nature

==> Polarized, unipolar in structure

==> Peripheral vasculature

==> Radial arrangement as a pseudorosette

6. Neuronal and mixed neuronal-glial tumors

(6a) Gangliocytoma

(6b) Ganglioglioma

(6c) Central neurocytoma

(6d) Paraganglioma

6a

==> epilepsy

==> The key feature is a lack of glial cells. The tumour is composed of abnormal mature ganglion cells

==> appears hyperattenuating on non contrast imaging

7. Tumors of the pineal region

(7a) Pineocytoma

(7b) Pineoblastoma

8. Embryonal tumors

(8a) Medulloblastoma

(8b) CNS primitive neuroectodermal tumor (PNET)

8a

==> IICP sign(早晨起床時頭痛、無預警噴射性嘔吐、血壓高、呼吸不規律),

==> 小腦功能上的異常 (ataxia, poor balance, dysmetria)

==> Homer-wright rosette

2. Donnely et al.: Diagnostic imaging. Pediatrics. 1st ed. Amirsys, 2005.
3. Osborn et al.: Diagnostic imaging. Brain. 1st ed. Amirsys, 2004.
4. Slovis: Caffey's pediatric diagnostic imaging. 11th ed. Mosby, 2008.
5. Weir et al.: Image atlas of human anatomy. 3rd ed. Mosby, 2003.
6. Chawla et al.: Paediatric PNET: pre-surgical MRI features. clinical radiology(2007) 62, 43-52.

9. Tumors of cranial and paraspinal nerves

(9a) Schwannoma

(9b) Neurofibroma

(9c) Perineurioma

9a

1. NE: Ipislateral muscle weakness, increased DTR/ babinski(+)

2. CT: well defined, isodense ; enhanced with contrast medium

3. MRI: 在硬腦膜外膨大, 看起來就像啞鈴一樣。

4. Golden standard:

顯微鏡下可見antoni A and B; 免疫組織學染色則可見S100 protein。

1. Up-to-date. Intradural nerve sheath tumors. Last literature review for version 17.3: September 30, 2009
2. Up-to-date. Spinal cord tumors. Last literature review for version 17.3: September 30, 2009
3. Robert I. Grossman, David M. Yousem. Neuroradiology: the requisites. 2nd ed. Mosby, 2003.

10. Tumors of meningothelial cells

(10a) Meningioma

11. Mesenchymal tumors

(11a) Ewing sarcoma - PNET

10a

MRI:

FLAIR: Hyperintense perifocal vasogenic edema

T2*: calicification

T1 with Gd enhansement: homogeneous hyperintense mass might with **dural tail sign**

DWI: variable

12. Primary melanocytic lesions

(12a) Diffuse melanocytosis

(12b) Melanocytoma

(12c) Malignant melanoma

13. Other neoplasms related to the meninges

(13a) Hemangioblastoma

12b

black, commonly extend onto the surface of the optic nerve and invade the nerve fiber layer

14. Lymphomas and hematopoietic neoplasms

14

diagnosed by a lymph node biopsy

15. Germ cell tumors

15a

(15a) Germinoma

==>pineal region "engulf"

(15b) Choriocarcinoma

15b

(15c) Teratoma

==> increase chorionic gonadotropin

==>vaginal bleeding

- **favorable prognosis**
- surgical resection
- radiation therapy
- **poor prognosis**
- control of symptoms
- Control of peritumoral edema and increased intracranial pressure with corticosteroids
- Treatment and prevention of seizures.
- Management and prevention of venous thromboembolic disease

Table 1 Antiepileptic drugs (AED) used for brain tumor patients

EIAEDs	Dose	Side effects	Approved for Monotherapy in U.S.
Carbamazapine (Tegretol, Tegretol XR, Carbitrol)	400–2400 mg/d (bid to qid)	Drowsiness, dizziness, diploplia, bone marrow suppression (especially leucopenia), rash, hyponatremia, hepatotoxicity, arrhythmia	Yes
Oxcarbazepine (Trileptal)	1200–2400 mg/day (bid –qid) (TPC: 12–30 μg/ml)	Drowsiness, dizziness, diploplia, rash, nausea, hyponatremia, lymphadenopathy, hepatotoxicity	Yes
Phenytoin (Dilantin)	15–20 mg/kg load, and then 3–5 mg/kg/day (qd to bid) (TPC: 10–20 μg/ml)	Drowsiness, dizziness, rash, gingival hyperplasia, hirsuitism, bone marrow suppression, hepatotoxicity, neuropathy, cerebellar degeneration, folate deficiency, osteomalacia, lupus, lymphadenopathy	Yes
Phenobarbital	10–20 mg/kg load and then 1–3 mg/kg/day (qd) (TPC:15–40 μg/ml)	Drowsiness, dizziness, impaired cognitive function, hyperactivity, rash, bone marrow suppression (rare), hepatotoxicity (rare), frozen shoulder, Dupuytren's contracture, reduced libido	Yes
Primidone (Mysoline)	750–2000 mg (tid) (TPC: primidone 5–12 μg/ml; phenobarbital 15–40 μg/ml)	Similar to phenobarbital	Yes
Non-EIAEDs	**Dose**	**Side effects**	**Approved for Monotherapy for Partial or Secondary Generalized Seizures in U.S.**
Clonazepam (Klonopin)	2–20 mg/day (qd to qid)	Drowsiness, ataxia, behavior problems, hyperactivity, hypersalivation, seizure exacerbation, hepatotoxicity, blood dyscrasia	No
Felbamate (Felbatol)	1,200–3,600 mg/day (tid to qid)	Substantial risk of aplastic anemia or liver failure; drowsiness, headache, nausea, constipation	Yes (2nd line)
Gabapentin (Neurontin)	900–4,800 mg/day (tid to qid)[a]	Drowsiness, dizziness, fatigue, ataxia	No
Lamotrigine (Lamictal)	300–500 mg/day; 100–150 mg/day if taking valproic acid (qd to bid) (TPC: 3–14 μg/ml)	Drowsiness, dizziness, fatigue, ataxia, rash, hepatotoxicity	Yes
Levetiracetam (Keppra)	1,000–3,000 mg/day (bid) [a]	Drowsiness, fatigue, nervousness, headaches	No
Pregabalin (Lyrica)	150–600 mg/day (bid to qid)	Drowsiness, dizziness, edema, impaired concentration, blurred vision, weight gain, ataxia, possible dependency	No
Tiagabine (Gabitril)	32–56 mg/day (bid to qid)[a]	Drowsiness, dizziness, fatigue, nervousness, tremor, decreased concentration	No
Topriamate (Topamax)	200–400 mg/day (bid)[a]	Drowsiness, fatigue, decreased concentration, parasthesias, weight loss, kidney stones	Yes
Valproic acid (Depakote)	15–60 mg/kg/day (tid to qid) (TPC:50–100 μg/ml)	Drowsiness, nausea, tremor, thrombocytopenia, hepatotoxicity, weight gain, hair loss, pancreatitis	Yes
Zonisamide (Zonegran)	200–600 mg/day (qd-bid) (TPC: 10–30 μg/ml)	Drowsiness, dizziness, anorexia, nausea, headache, difficulty concentrating, weight loss, renal stones	No

[a] Therapeutic plasma concentration not established; TPCR: target plasma concentration; EIAED: enzyme-inducing antiepieptic drugs; qd = once daily; bid = twice daily; tid = three times daily; qid = 4 times daily

J Neurooncol (2006) 80:313–332

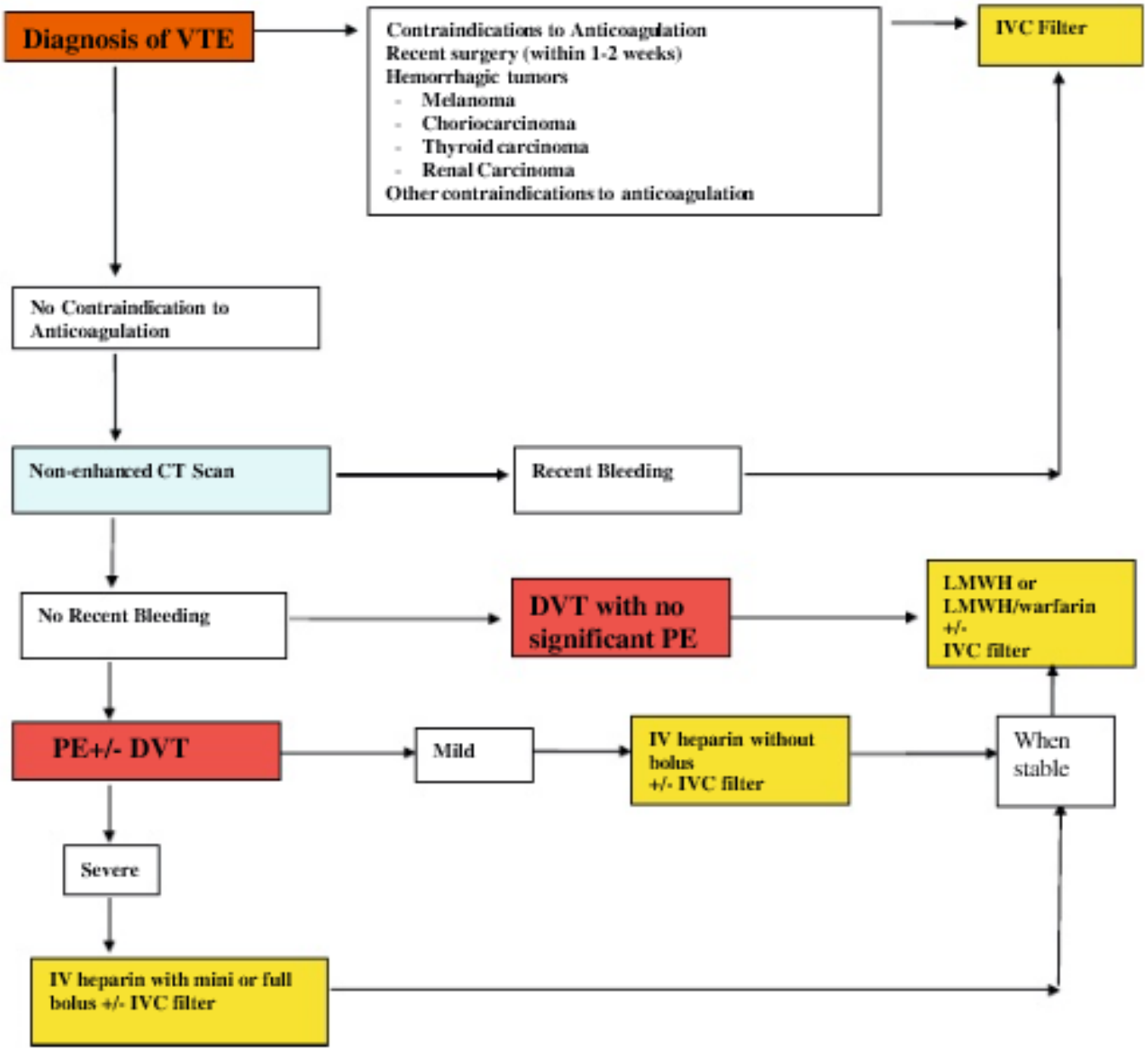


Fig. 4 Algorithm for the treatment of venous thromboembolic disease in brain tumor patients. LMWH: low molecular weight heparin; IVC: inferior vena cava; PE: pulmonary embolism; DVT: Deep-vein thrombosis

J Neurooncol (2006) 80:313–332

Indications for surgical resection

1. Solitary lesions larger than 3 cm
2. Lesions in noneloquent areas of the brain
3. Limited and/or controlled systemic disease
4. Karnofsky score greather than 70
5. One symptomatic lesion with multiple asymptomatic lesions (The symptomatic lesion should be resected, and remaining lesions should be treated with radiotherapy.)

Karnofsky Performance Status scale

Value	Level of functional capacity	Definition
100	Normal, no complaints, no evidence of disease	Able to carry on normal activity and to work; no special care needed
90	Able to carry on normal activity, minor signs or symptoms of disease	
80	Normal activity with effort, some signs or symptoms of disease	
70	Cares for self, unable to carry on normal activity or to do active work	Unable to work; able to live at home and care for most personal needs; various degrees of assistance needed
60	Requires occasional assistance but is able to care for most needs	
50	Requires considerable assistance and frequent medical care	
40	Disabled, requires special care and assistance	Unable to care for self; requires equivalent of institutional or hospital care; disease may be progressing rapidly
30	Severely disabled, hospitalization is indicated although death is not imminent	
20	Hospitalization is necessary, very sick, active supportive treatment necessary	
10	Moribund, fatal processes progressing rapidly	
0	Dead	