

**Table 56F-5 -- Differential Diagnosis of Leptomeningeal Metastasis**

**NEOPLASTIC**

Parenchymal metastases  
Dural metastases  
Castleman's disease\*

From Bradley: Neurology in  
Clinical Practice, 5th ed.

**INFECTIONS**

Bacterial/viral meningitis  
Fungal infections, including cryptococcus  
Lyme disease  
Neurocysticercosis  
Tuberculosis

\* "benign" CNS lymphoma  
associated with HIV

**GRANULOMATOUS DISORDERS**

Histiocytosis  
Sarcoidosis  
Wegener's granulomatosis

**INFLAMMATORY DISORDERS**

Multiple sclerosis  
Paraneoplastic encephalomyelitis  
Relapsing polychondritis  
Rheumatoid nodules  
Vasculitis (including granulomatous angiitis)

# Prognosis of LM

- Bad...ominous...grave...terminal
- Median survival untreated patients is **4-6 weeks**
  - Death from progression of neurologic dysfunction
- Treatment is intended to improve or stabilize neurologic status, maintain neurologic QOL, and prolong survival
- Fixed neurologic deficits rarely improve, but progression may be halted in some patients, and median survival can be increased to **4-6 months**
  - Only pain-related Nx Sx improve; confusion, Cr Ns, ataxia, weakness minimally improve or stabilize
- Breast CA (of solid tumors) responds best
  - MLOSurvival 6 mos; 11-25% 1 year survival
- Who to treat?

# Bad Prognostic Signs (bad to worst)

- Generally accepted that patients do poorly with:
- Poor performance status
- Multiple fixed neurologic deficits
- Bulky CNS disease (1/3 of patients)
- Coexistent carcinomatous encephalopathy
- CSF flow abnormalities (1/3 of patients)
- Widely metastatic aggressive cancers
  - 75% have progressive systemic cancer

# Neoplastic Meningitis-Related Prognostic Significance of the Karnovsky Performance Status

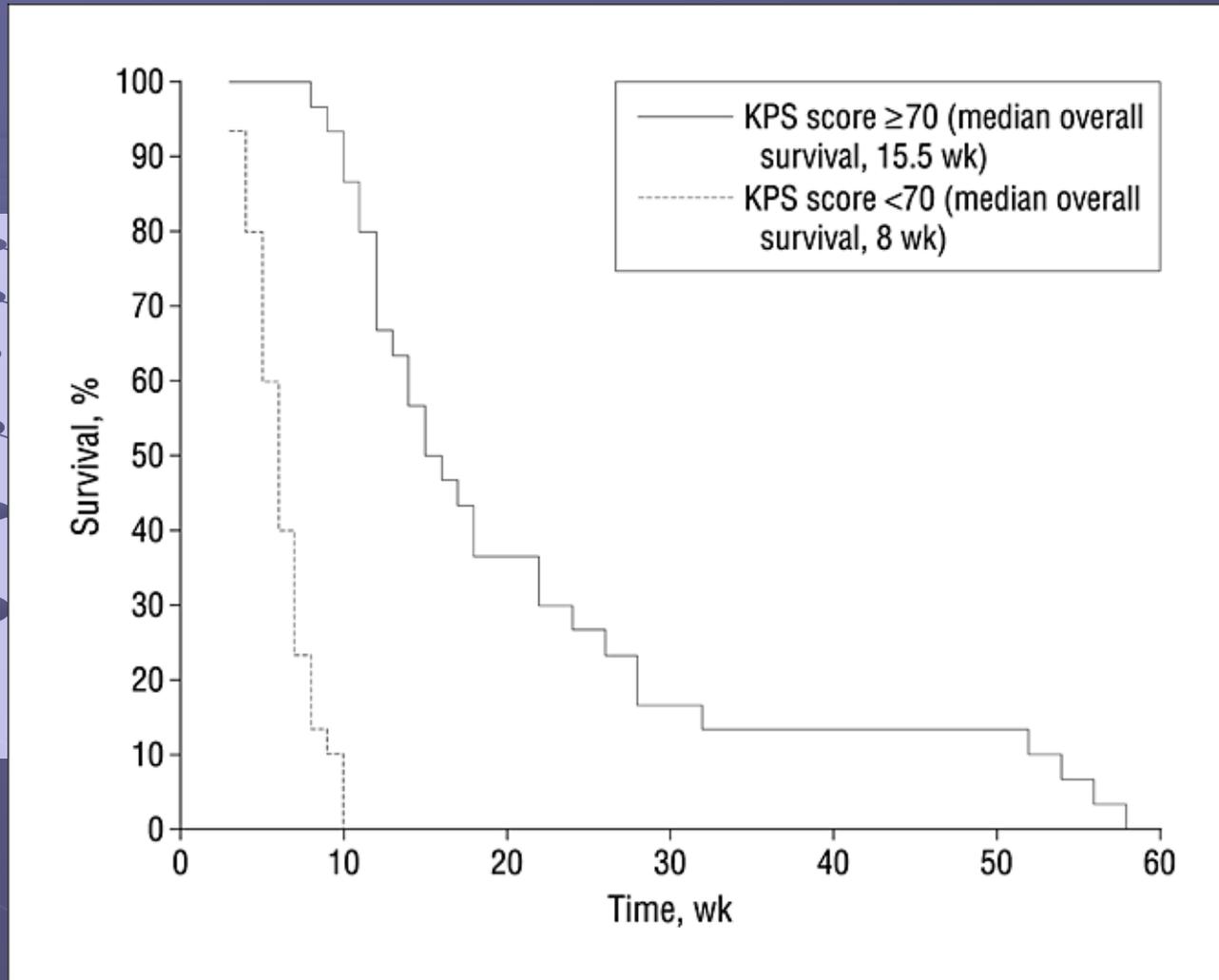
Chamberlain et al. *Arch Neurol.* 2009;66(1):74-78.

- KPS is easy to determine
- How about in patients matched for all the other bad prognostic signs?
- KPS < 70 vs. KPS > 70 matched for:
  - Age, 1<sup>o</sup> tumor site, site of NM (Cr Ns or cord), treatment (RT and chemo; systemic and intraventricular), CSF compartmentalization, encephalopathy, and bulky CNS disease

# Karnofsky Score

Karnofsky Score (KS)	Definition
100	Normal; no complaints; no evidence of disease
90	Able to carry on normal activity; minor signs or symptoms of disease
80	Normal activity with effort; some sign or symptoms of disease
70	Cares for self; unable to carry on normal activity or do active work
60	Requires occasional assistance, but is able to care for most personal needs
50	Requires considerable assistance and frequent medical care
40	Disabled; requires special care and assistance
30	Severely disabled; hospitalization is indicated, although death not imminent
20	Very sick; hospitalization necessary; active support treatment is necessary
10	Moribund; fatal processes progressing rapidly
0	Dead

## Survival in patients with neoplastic meningitis by Karnofsky performance status (KPS) score



Chamberlain, M. C. et al. Arch Neurol 2009;66:74-78.

# Conclusions

- A low Karnofsky performance score predicts poor survival in patients with NM
- Patients with low Karnofsky performance score may best be served by offering supportive care.
- Both CH and JJ were, “on the cusp” at 60-70%

# Survival of Breast Cancer Patients With Meningeal Carcinomatosis

Gauthier et al. *Ann Onc adv acc* 4/10

- Most common cause of nonhematologic MC
- Review of 91 Breast CA patients 2000-2007
- Report clinical and biologic features
- Determine significant prognostic features for response to therapy
- Develop and propose a prognostic score

# Results

- Multivariate statistical analysis of prognostic features
- 4 features associated with poor survival
  1. Poor performance status (ECOG 3-4)
  2. Number of prior chemotherapy regimens (>3)
  3. Negative hormone receptor status
  4. High Cyfra 21-1 levels (Br Ca tumor marker)

## ECOG PERFORMANCE STATUS SCALE

ECOG (Zubrod)	Karnofsky	Definitions
0	100	Asymptomatic
1	80-90	Symptomatic, fully ambulatory
2	60-70	Symptomatic, in bed less than 50% of the day
3	40-50	Symptomatic, in bed more than 50% of the day, but not bedridden
4	20-30	Bedridden