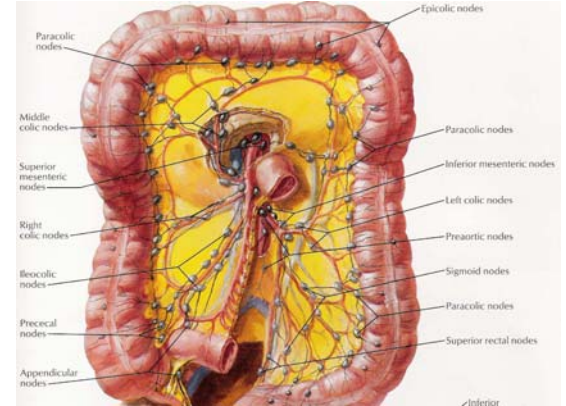


# ADEQUATE SURGICAL RESECTION FOR COLON CANCER HOW MANY LYMPH NODES SHOULD BE ANALYZED?

## Introduction

The single most important determinant of prognosis in patients with carcinoma of the colon is lymph node involvement

- **5 year survival**
  - Stage I (T1-2N0) — 93 percent
  - Stage IIA (T3N0) — 85 percent
  - Stage IIB (T4N0) — 72 percent
  - Stage IIIA (T1-2N1) — 83 percent
  - Stage IIIB (T3-4 N1) — 64 percent
  - Stage IIIC (N2) — 44 percent
  - Stage IV — 8 percent



## How many lymph nodes need to be examined to accurately stage the regional lymph node basin?

- 1989 Scott & Grace minimum of 13 LN would detect 90% of patients with nodal metastasis
- 1990 The Working Party Report to the World Congress of Gastroenterology recommended minimum of 12 LN examined
- 1996 Goldstein et al. recommends  $\geq 17$  LN to be examined
- 1999 Wong et al. suggests a minimum of 14 LM examined
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## Colon cancer survival is associated with increasing number of lymph nodes analyzed

- TE Voyer, et al. 2003
  - largest prospective database for stage II & stage III colon cancer
  - >3500 patients enrolled
  - survival decreased with increasing lymph node involvement

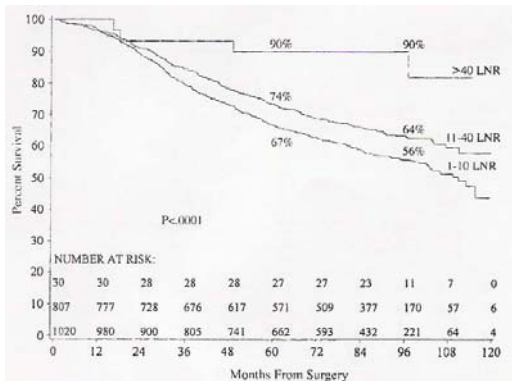


Fig 4. Overall survival for patients with N1 disease. LNR, lymph nodes recovered.

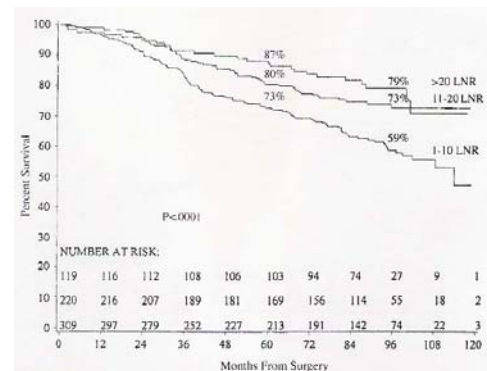
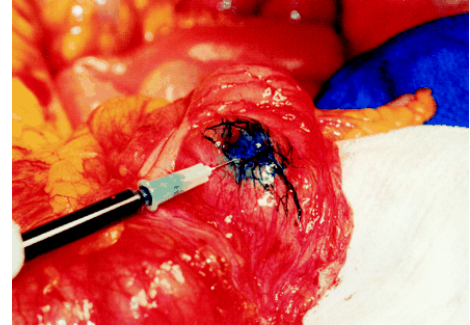


Fig 6. Overall survival for patients with N0 disease. LNR, lymph nodes recovered.

- After controlling for the # of LN involved, survival increased as the # of LN recovered increased
- Even when no nodes were involved, survival improved as more nodes were recovered
  - 2 mechanisms might explain these findings:
    - Surgeon as a technician → more complete excision
    - More complete examination by pathologist → more accurate staging
    - \*\*\*Because all patients received chemotherapy, no bias

What is the role of **Lymphatic Mapping, Sentinel Nodes, & Ultrastaging?**

- Lymphatic mapping (LM) can be used to improve staging by focused *ultrastaging* examination of sentinel nodes (SN), looking for micrometastasis
- Before mobilization of colon, .5-1 cc isosulfan blue dye injected around periphery of tumor and travels to the SN within 30-60 seconds
- Ultrastaging involves serial sectioning combined with immunohistochemical techniques
- LM has a false-negative rate is ~10% due to skip metastasis
- Many studies have shown that detection of micrometastasis by serial sectioning demonstrated no staging impact and no significant impact on patient survival



### Conclusions:

- There have been many attempts to define the minimum number of lymph nodes that should be evaluated to provide adequate nodal staging of colorectal cancer, but the best advice is still to assess as many lymph nodes as possible
- After controlling for the number of lymph nodes involved, survival increased as the number of lymph nodes recovered increased
- Because sentinel lymph nodes may occur in unexpected places, lymphatic mapping may be a good adjunct to surgical and pathological staging of colorectal cancer, but, currently in routine practice, concentrating the efforts on only a selected number of sentinel nodes is not recommended.

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June 30, 2005