

## Supplementary information

### Supplement 1: search strategies

**The following search strategy was used in PubMed:** (((*esophag\**[tiab] OR *oesophag\**[tiab]))) AND ((*cancer*[tiab] OR *cancers*[tiab] OR *tumor*[tiab] OR *tumour*[tiab] OR *tumors*[tiab] OR *tumours*[tiab] OR *neoplasm*[tiab] OR *neoplasms*[tiab] OR *malignancy*[tiab] OR *malignancies*[tiab] OR *adenocarcinoma*[tiab] OR *adenocarcinomas*[tiab] OR *carcinoma*[tiab] OR *carcinomas*[tiab]))) AND ((*lymph node*[tiab] OR *lymph nodes*[tiab] OR *nodal*[tiab] OR *node*[tiab] OR *nodes*[tiab] OR *lymphovascular*[tiab]))

**The following search strategy was used in Embase:** (*Esophag\** OR *Oesophag\**).ti. AND (*cancer* OR *cancers* OR *tumor* OR *tumour* OR *tumors* OR *tumours* OR *neoplasm* OR *neoplasms* OR *malignancy* OR *malignancies* OR *adenocarcinoma* OR *adenocarcinomas* OR *carcinoma* OR *carcinomas*).ti. AND (*lymph node* OR *lymph nodes* OR *nodal* OR *node* OR *nodes* OR *lymphovascular*).ti,ab.

**The following search strategy was used in Cochrane:** (*Esophag\** OR *Oesophag\**) AND (*cancer* OR *cancers* OR *tumor* OR *tumour* OR *tumors* OR *tumours* OR *neoplasm* OR *neoplasms* OR *malignancy* OR *malignancies* OR *adenocarcinoma* OR *adenocarcinomas* OR *carcinoma* OR *carcinomas*) AND (*lymph node* OR *lymph nodes* OR *nodal* OR *node* OR *nodes* OR *lymphovascular*)

## Supplementary information

**Supplementary table 1. Quality assessment of included studies based on modified Newcastle–Ottawa Scale judgment.**

| Reference             | Selection    | Comparability | Outcome      | Total | Quality    |
|-----------------------|--------------|---------------|--------------|-------|------------|
|                       | Max. 4 stars | Max. 2 stars  | Max. 3 stars | Score | Assessment |
| <b>Samson 2016</b>    | ***          | *             | ***          | 7     | Good       |
| <b>Shin 2014</b>      | ***          | *             | ***          | 7     | Good       |
| <b>Brown 2017</b>     | ***          | *             | **           | 6     | Good       |
| <b>Crabtree 2013</b>  | ***          | *             | **           | 6     | Good       |
| <b>Gaur 2010</b>      | ***          | *             | **           | 6     | Good       |
| <b>Kunisaki 2010</b>  | ***          | *             | **           | 6     | Good       |
| <b>Duan 2017</b>      | ***          | -             | **           | 5     | Fair       |
| <b>Guo 2014</b>       | ***          | -             | **           | 5     | Fair       |
| <b>Hardacker 2014</b> | ***          | -             | **           | 5     | Fair       |

**Supplementary table 2. Reported or calculated effect size for differentiation (poor vs well) in relation to LNM.**

| Study                 | Odds ratio | 95% CI low | 95% CI upper | p value | Comment                              |
|-----------------------|------------|------------|--------------|---------|--------------------------------------|
| <b>Samson 2016</b>    | 8.7        | 3.8        | 19.9         | 0.00    |                                      |
| <b>Hardacker 2014</b> | 4.8        | 1.1        | 21.4         | 0.04    | Endpoint study: pT- and pN-upstaging |
| <b>Shin 2014</b>      | 5.7        | 1.5        | 21.1         | 0.01    | Population: cT1-T2 cases combined    |

## Supplementary information

**Supplementary table 3. Reported or calculated effect size for number of resected lymph nodes in relation to LNM.**

| Study                        | Mean difference | 95% CI low | 95% CI upper | p value | Comment                              |
|------------------------------|-----------------|------------|--------------|---------|--------------------------------------|
| <b>Samson 2016</b>           | 3.7             | 2.0        | 5.4          | 0.00    | Endpoint study: pT- and pN-upstaging |
|                              | Odds ratio      | 95% CI low | 95% CI upper | p value |                                      |
| <b>Brown 2017</b>            |                 |            |              |         |                                      |
| 10-15 lymph nodes*           | 1.6             | 1.1        | 2.5          | 0.02    | Endpoint study: pT- and pN-upstaging |
| 16-25 lymph nodes*           | 2.2             | 1.5        | 3.3          | 0.00    |                                      |
| >25 lymph nodes*             | 2.9             | 1.8        | 4.5          | 0.00    |                                      |
| * reference: <10 lymph nodes |                 |            |              |         |                                      |

**Supplementary table 4. Reported or calculated effect size for pathologic T stage (pT2 vs pT1) in relation to LNM.**

| Study                | Odds ratio | 95% CI low | 95% CI upper | p value | Comment  |
|----------------------|------------|------------|--------------|---------|--|
| <b>Brown 2017</b>    | 6.4        | 4.2        | 9.9          | 0.00    | Upstaging: pT- and pN stage combined cT1-T2 cases as one group |
| <b>Kunisaki 2010</b> | 8.4        | 3.6        | 19.3         | 0.00    |  |

## Supplementary information

**Supplementary table 5. Reported or calculated effect size for depth of invasion in the muscularis propria (longitudinal vs circular layer) in relation to LNM.**

| <b>Study</b>     | <b>Odds ratio</b> | <b>95% CI low</b> | <b>95% CI upper</b> | <b>p value</b> |
|------------------|-------------------|-------------------|---------------------|----------------|
| <b>Duan 2017</b> | 2.5               | 1.0               | 6.2                 | 0.04           |
| <b>Guo 2014</b>  | 2.5               | 1.0               | 6.0                 | 0.05           |