MetaMap Examples

- **MetaMap options**

- **Examples**
  - ✓ normal processing: *lung cancer*
  - ✓ variants: (-v) *lung cancer*
  - ✓ compound and multiple mappings: *obstructive sleep apnea*
  - ✓ term processing: (-zogm) *metabolized*
  - ✓ use of threshold: (-zog -r 600) *continuous pump-driven hemofiltration*
  - ✓ full utterance: *Physical fitness is a major determinant of femoral neck and lumbar spine bone mineral density.*
  - ✓ fielded output: (-f) *lung cancer*
  - ✓ show CUIs: (-I) *lung cancer*
  - ✓ show preferred names only: (-O) *lung cancer*
  - ✓ show preferred name sources: (-W) *lung cancer*
  - ✓ show sources: (-G) *scorpion sting*
  - ✓ show excluding sources: (-e MDR,DXP) *scorpion sting*
  - ✓ show restricting to specific sources: (-GR LCH) *scorpion sting*
  - ✓ show restricting to specific Semantic Type: (-J neop) *Lung cancer*

- **MetaMap Options**

```
> metamap06 -h

MetaMap (2006)

Usage: metamap [<options>] [<infile> [<outfile>]]

  <infile> contains text in one of several forms (default is user_input), and
  <outfile> is a file for results (default is <infile>.out).

  metamap options:
            -V --mm_data_version <none>                -0 --debug0
            -A --strict_model                          -1 --debug1
            -B --moderate_model                        -2 --debug2
            -C --relaxed_model                         -3 --debug3
  [DEFAULT] -t --tag_text                              -4 --debug4
            -L --longest_lexicon_match                 -5 --debug5
            -P --composite_phrases                     -6 --debug6
            -Q --quick_composite_phrases               -7 --debug7
  [DEFAULT] -a --no_acros_abbrs                        -9 --debug9
            -u --unique_acros_abbrs_only
            -d --no_derivational_variants
  [DEFAULT] -D --an_derivational_variants
  [DEFAULT] -l --stop_large_n
            -i --ignore_word_order
            -Y --prefer_multiple_concepts
            -y --word_sense_disambiguation
            -z --term_processing
            -o --allow_overmatches
            -g --allow_concept_gaps
            -8 --dynamic_variant_generation
            -K --ignore_stop_phrases
            -q --machine_output
            -f --fielded_output
            -T --tagger_output
            -F --formal_tagger_output
  [DEFAULT] -p --plain_syntax
            -x --syntax
            -H --display_original_phrases
            -v --variants
  [DEFAULT] -c --candidates
            -O --show_preferred_names_only
            -r --threshold <integer>
            -X --truncate_candidates_mappings
            -n --number_the_candidates
            -R --restrict_to_sources <list>
            -e --exclude_sources <list>
            -J --restrict_to_sts <list>
            -k --exclude_sts <list>
            -I --show_cuis
            -W --preferred_name_sources
  [DEFAULT] -s --semantic_types
  [DEFAULT] -m --mappings
            -G --sources
  [DEFAULT] -b --best_mappings_only
            -E --indicate_citation_end
            -h --help
            -w --warnings
```

Warning:
Subject to change

Figure 1. MetaMap Options

- **Normal processing:** *lung cancer* (term processing retrieves 6,196 candidates)

```
> metamap06

MetaMap (2006)


Control options:
  tag_text
  no_acros_abbrs
  an_derivational_variants
  stop_large_n
  plain_syntax
  candidates
  semantic_types
  mappings
  best_mappings_only
Initializing db_access (06)...
Berkeley DB databases (normal downstairs strict model) are open.
Static variants will come from table varsan.
Initializing lexicon (06)...
Accessing lexicon /nfsvol/nls/specialist/lexicon2005/data/lexiconStatic2005.
Variant generation mode: static.
Initializing tagger (06) on skr1...
Initializing db_access_for_genspec...successful.
|: lung cancer
|:


Processing 00000000.tx.1: lung cancer.

Phrase: "lung cancer."
Meta Candidates (8):
  1000 Lung Cancer (Malignant neoplasm of lung) [Neoplastic Process]
  1000 Lung Cancer (Carcinoma of lung) [Neoplastic Process]
   861 Cancer (Malignant Neoplasms) [Neoplastic Process]
   861 Lung [Body Part, Organ, or Organ Component]
   861 Cancer (Cancer Genus) [Invertebrate]
   861 Lung (Entire lung) [Body Part, Organ, or Organ Component]
   861 Cancer (Specialty Type - cancer) [Biomedical Occupation or Discipline]
   768 Pneumonia [Disease or Syndrome]
Meta Mapping (1000):
  1000 Lung Cancer (Carcinoma of lung) [Neoplastic Process]
Meta Mapping (1000):
  1000 Lung Cancer (Malignant neoplasm of lung) [Neoplastic Process]
```

Figure 2. *Lung cancer* **using normal processing**

- **Variants:** (-v) *lung cancer*

```
> metamap06 -v

MetaMap (2006)


Control options:
  tag_text
  no_acros_abbrs
  an_derivational_variants
  stop_large_n
  plain_syntax
  candidates
  semantic_types
  mappings
  best_mappings_only
  variants
Initializing db_access (06)...
Berkeley DB databases (normal downstairs strict model) are open.
Static variants will come from table varsan.
Initializing lexicon (06)...
Accessing lexicon /nfsvol/nls/specialist/lexicon2005/data/lexiconStatic2005.
Variant generation mode: static.
Initializing tagger (06) on skr1...
Initializing db_access_for_genspec...successful.
|: lung cancer
|:

Processing 00000000.tx.1: lung cancer.

Phrase: "lung cancer."

lung cancer [noun] variants (n=1):
lung cancer{[noun], 0=[]}

lung [noun] variants (n=9):
lung{[noun], 0=[]}  lungs{[noun], 1="i"}  pneumonia{[noun], 5="ds"}
pneumoniae{[noun], 5="ds"}  pneumonias{[noun], 5="ds"}  pneumonic{[adj], 2="s"}
pulmonal{[adj], 4="ss"}  pulmonary{[adj], 2="s"}  pulmonic{[adj], 2="s"}

cancer [noun] variants (n=4):
cancer{[noun], 0=[]}  cancerous{[adj], 3="d"}  cancers{[noun], 1="i"}
carcinomatous{[adj], 2="s"}

Meta Candidates (8):
  1000 Lung Cancer (Malignant neoplasm of lung) [Neoplastic Process]
  1000 Lung Cancer (Carcinoma of lung) [Neoplastic Process]
   861 Cancer (Malignant Neoplasms) [Neoplastic Process]
   861 Lung [Body Part, Organ, or Organ Component]
   861 Cancer (Cancer Genus) [Invertebrate]
   861 Lung (Entire lung) [Body Part, Organ, or Organ Component]
   861 Cancer (Specialty Type - cancer) [Biomedical Occupation or Discipline]
   768 Pneumonia [Disease or Syndrome]
Meta Mapping (1000):
  1000 Lung Cancer (Carcinoma of lung) [Neoplastic Process]
Meta Mapping (1000):
  1000 Lung Cancer (Malignant neoplasm of lung) [Neoplastic Process]
```

Figure 3. Variants of *lung* and *cancer*

- **Compound and multiple mappings:** *obstructive sleep apnea* [turned off best_mappings_only (-b) to illustrate]

```
> metamap06 -b

MetaMap (2006)

Control options:
  tag_text
  no_acros_abbrs
  an_derivational_variants
  stop_large_n
  plain_syntax
  candidates
  semantic_types
  mappings
Initializing db_access (06)...
Berkeley DB databases (normal downstairs strict model) are open.
Static variants will come from table varsan.
Initializing lexicon (06)...
Accessing lexicon /nfsvol/nls/specialist/lexicon2005/data/lexiconStatic2005.
Variant generation mode: static.
Initializing tagger (06) on skr1...
Initializing db_access_for_genspec...successful.
|: obstructive sleep apnea
|:

Processing 00000000.tx.1: obstructive sleep apnea.

Phrase: "obstructive sleep apnea."
Meta Candidates (8):
  1000 Obstructive sleep apnoea (Sleep Apnea, Obstructive) [Disease or Syndrome]
   901 Apnea, Sleep (Sleep Apnea Syndromes) [Disease or Syndrome]
   827 APNOEA (Apnea) [Pathologic Function]
   827 Sleep [Organism Function]
   827 Obstructive (Obstructed) [Functional Concept]
   793 Sleeping (Asleep) [Finding]
   755 Sleepy [Finding]
   727 Sleeplessness [Sign or Symptom]
Meta Mapping (1000):
  1000 Obstructive sleep apnoea (Sleep Apnea, Obstructive) [Disease or Syndrome]
Meta Mapping (901):
   827 Obstructive (Obstructed) [Functional Concept]
   901 Apnea, Sleep (Sleep Apnea Syndromes) [Disease or Syndrome]
Meta Mapping (851):
   827 Obstructive (Obstructed) [Functional Concept]
   827 Sleep [Organism Function]
   827 APNOEA (Apnea) [Pathologic Function]
Meta Mapping (840):
   827 Obstructive (Obstructed) [Functional Concept]
   793 Sleeping (Asleep) [Finding]
   827 APNOEA (Apnea) [Pathologic Function]
Meta Mapping (828):
   827 Obstructive (Obstructed) [Functional Concept]
   755 Sleepy [Finding]
   827 APNOEA (Apnea) [Pathologic Function]
Meta Mapping (818):
   827 Obstructive (Obstructed) [Functional Concept]
   727 Sleeplessness [Sign or Symptom]
   827 APNOEA (Apnea) [Pathologic Function]
```

Figure 4. Mappings for *Obstructive sleep apnea*

- **Term processing:** (-zogm) *metabolized* (normal processing returns nothing)

```
> metamap -zogm

MetaMap (2006)


Control options:
  tag_text
  no_acros_abbrs
  an_derivational_variants
  stop_large_n
  plain_syntax
  candidates
  semantic_types
  best_mappings_only
  term_processing
  allow_overmatches
  allow_concept_gaps
Initializing db_access (06)...
Berkeley DB databases (normal downstairs strict model) are open.
Static variants will come from table varsan.
Initializing lexicon (06)...
Accessing lexicon /nfsvol/nls/specialist/lexicon2005/data/lexiconStatic2005.
Variant generation mode: static.
Initializing tagger (06) on skr1...
Initializing db_access_for_genspec...successful.
|: metabolized
|:

Processing 00000000.tx.1: metabolized.

Phrase: "metabolized."
Meta Candidates (20):
   620 sulfur metabolizing bacteria (Sulfur-Reducing Bacteria) [Bacterium]
   608 Cytochrome P450 metabolised non-inducer [Molecular Function]
   591 retinoic acid-metabolizing enzyme (retinoic acid 4-hydroxylase) [Amino Acid,
Peptide, or Protein,Enzyme]
   591 chloromethane-metabolizing bacterium 1 [Bacterium]
   591 chloromethane-metabolizing bacterium 2 [Bacterium]
   591 chloromethane-metabolizing bacterium 3 [Bacterium]
   575 juvenile hormone-metabolizing epoxide hydrolase [Amino Acid, Peptide, or
Protein,Enzyme]
   575 retinoic acid-metabolizing enzyme, CYP26B1 (cytochrome P-450 CYP26B1) [Amino
Acid, Peptide, or Protein,Enzyme]
   565 retinoic acid-metabolizing cytochrome CYP26, murine (Cyp26a1 protein, mouse)
[Amino Acid, Peptide, or Protein,Enzyme]
   565 phenanthrene-metabolizing bacterium DGGE-band-1 [Bacterium]
   565 phenanthrene-metabolizing bacterium DGGE-band-2 [Bacterium]
   565 phenanthrene-metabolizing bacterium DGGE-band-3 [Bacterium]
   565 phenanthrene-metabolizing bacterium DGGE-band-4 [Bacterium]
   565 phenanthrene-metabolizing bacterium DGGE-band-5 [Bacterium]
   565 phenanthrene-metabolizing bacterium DGGE-band-6 [Bacterium]
   565 phenanthrene-metabolizing bacterium DGGE-band-7 [Bacterium]
   565 phenanthrene-metabolizing bacterium DGGE-band-8 [Bacterium]
   565 phenanthrene-metabolizing bacterium DGGE-band-9 [Bacterium]
   565 phenanthrene-metabolizing bacterium DGGE-band-10 [Bacterium]
   565 L-arginine metabolizing enzyme, Spinacia oleracea (PsbY protein, Spinacia
oleracea) [Amino Acid, Peptide, or Protein,Enzyme]
```

Figure 5. *Metabolized* **using term processing**

- **Use of threshold:** (-zog −r 600) *continuous pump-driven hemofiltration* (507 candidates if no threshold)

```
> metamap06 -zog -r 600

MetaMap (2006)


Control options:
  tag_text
  no_acros_abbrs
  an_derivational_variants
  stop_large_n
  plain_syntax
  candidates
  semantic_types
  mappings
  best_mappings_only
  term_processing
  allow_overmatches
  allow_concept_gaps
  threshold=600
Initializing db_access (06)...
Berkeley DB databases (normal downstairs strict model) are open.
Static variants will come from table varsan.
Initializing lexicon (06)...
Accessing lexicon /nfsvol/nls/specialist/lexicon2005/data/lexiconStatic2005.
Variant generation mode: static.
Initializing tagger (06) on skr1...
Initializing db_access_for_genspec...successful.
|: continuous pump-driven hemofiltration
|:


Processing 00000000.tx.1: continuous pump-driven hemofiltration.

Phrase: "continuous pump-driven hemofiltration."
Meta Candidates (7):
   812 Pump (pump (device)) [Medical Device]
   812 Pump (Entity Code - Pump) [Intellectual Product]
   736 Continuous haemofiltration (Continuous hemofiltration) [Therapeutic or
Preventive Procedure]
   666 CONTINUOUS INSULIN INFUSION PUMP [Medical Device]
   645 Haemofiltration (Hemofiltration) [Therapeutic or Preventive Procedure]
   645 Continuous [Temporal Concept]
   612 Drive (Intrinsic drive) [Mental Process]
Meta Mapping (880):
   666 CONTINUOUS INSULIN INFUSION PUMP [Medical Device]
   612 Drive (Intrinsic drive) [Mental Process]
   645 Haemofiltration (Hemofiltration) [Therapeutic or Preventive Procedure]
```

Figure 6. *Continuous pump-driven hemofiltration* **with a threshold**

- **Full utterance:** *Physical fitness is a major determinant of femoral neck and lumbar spine bone mineral density.*

```
> metamap06

MetaMap (2006)


Control options:
  tag_text
  no_acros_abbrs
  an_derivational_variants
  stop_large_n
  plain_syntax
  candidates
  semantic_types
  mappings
  best_mappings_only
Initializing db_access (06)...
Berkeley DB databases (normal downstairs strict model) are open.
Static variants will come from table varsan.
Initializing lexicon (06)...
Accessing lexicon /nfsvol/nls/specialist/lexicon2005/data/lexiconStatic2005.
Variant generation mode: static.
Initializing tagger (06) on skr1...
Initializing db_access_for_genspec...successful.
|: Physical fitness is a major determinant of femoral neck and lumbar spine bone
mineral density.
|:


Processing 00000000.tx.1: Physical fitness is a major determinant of femoral neck and
lumbar spine bone mineral density.

Phrase: "Physical fitness"
Meta Candidates (6):
  1000 Physical Fitness [Idea or Concept]
   861 Physical [Functional Concept]
   861 Fitness [Daily or Recreational Activity]
   861 Physical (Physical assessment findings) [Finding]
   789 Fit (Seizures) [Sign or Symptom]
   789 Fit (Fit and well) [Finding]
Meta Mapping (1000):
  1000 Physical Fitness [Idea or Concept]

Phrase: "is"
Meta Candidates (0): <none>
Meta Mapping: <none>

Phrase: "a major determinant"
Meta Candidates (1):
   694 Major [Qualitative Concept]
Meta Mapping (694):
   694 Major [Qualitative Concept]

                        (Continued below)
```

Figure 7. Full utterance example

```
Phrase: "of femoral neck"
Meta Candidates (12):
   964 Femur Neck (Structure of neck of femur) [Body Location or Region]
   861 Neck [Body Location or Region]
   861 Neck (Entire neck) [Body Part, Organ, or Organ Component]
   805 Cervical [Spatial Concept]
   768 Cervix (Cervix Uteri) [Body Part, Organ, or Organ Component]
   768 Cervix (Uterus - Cervix (MMHCC)) [Tissue]
   768 Cervix (Cervix Specimen Code) [Intellectual Product]
   768 Cervix (Cervix Specimen) [Body Substance]
   694 Femoral (Femur) [Body Part, Organ, or Organ Component]
   638 Thigh (Thigh structure) [Body Location or Region]
   638 Thigh (Entire thigh) [Body Part, Organ, or Organ Component]
   623 Femur (Entire femur) [Body Part, Organ, or Organ Component]
Meta Mapping (964):
   964 Femur Neck (Structure of neck of femur) [Body Location or Region]

Phrase: "and"
Meta Candidates (0): <none>
Meta Mapping: <none>

Phrase: "lumbar spine bone mineral density."
Meta Candidates (20):
   884 Bone Mineral Density (Bone Density) [Laboratory or Test Result]
         Bone Density
   804 MINERAL (Mineral Oil) [Lipid,Pharmacologic Substance]
   804 mineral (Minerals) [Inorganic Chemical]
   804 density [Natural Phenomenon or Process]
   804 Bone (Skeletal bone) [Body Part, Organ, or Organ Component]
   804 Bone (Bone Tissue) [Tissue]
   804 Bone (Entire bone (organ)) [Body Part, Organ, or Organ Component]
   804 Bone (Entire bony skeleton) [Body System]
   804 Density (Kind of quantity - Density) [Quantitative Concept]
   771 Minerals (dietary mineral) [Food]
   733 Dense [Qualitative Concept]
   733 Bony [Functional Concept]
   673 Lumbar spine (Bone structure of lumbar vertebra) [Body Part, Organ, or Organ
Component]
   673 Lumbar spine (Entire lumbar spine) [Body Location or Region]
   637 Lumbar (Lumbar Region) [Body Location or Region]
   637 Spine (Vertebral column) [Body Part, Organ, or Organ Component]
   637 Spine (Entire vertebral column) [Body Part, Organ, or Organ Component]
   637 Spine (Entire spine) [Body Part, Organ, or Organ Component]
   566 Spinal [Spatial Concept]
Meta Mapping (893):
   673 Lumbar spine (Bone structure of lumbar vertebra) [Body Part, Organ, or Organ
Component]
   884 Bone Mineral Density (Bone Density) [Laboratory or Test Result]
Meta Mapping (893):
   673 Lumbar spine (Entire lumbar spine) [Body Location or Region]
   884 Bone Mineral Density (Bone Density) [Laboratory or Test Result]
```

Figure 7. Full utterance example (concluded)

- **Fielded output: (-f)** *lung cancer*

```
> metamap06 -f


MetaMap (2006)


Control options:
  tag_text
  no_acros_abbrs
  an_derivational_variants
  stop_large_n
  plain_syntax
  candidates
  semantic_types
  mappings
  best_mappings_only
  fielded_output
Initializing db_access (06)...
Berkeley DB databases (normal downstairs strict model) are open.
Static variants will come from table varsan.
Initializing lexicon (06)...
Accessing lexicon /nfsvol/nls/specialist/lexicon2005/data/lexiconStatic2005.
Variant generation mode: static.
Initializing tagger (06) on skr1...
Initializing db_access_for_genspec...successful.
|: lung cancer
|:
00000000.tx.1  1      u      lung cancer.
00000000.tx.1  2      p      lung cancer.  [head([lexmatch([lung
cancer]),inputmatch([lung,cancer]),tag(noun),tokens([lung,cancer])]),punc([inputmatch([.]),tokens
([])])]
00000000.tx.1  3      c      1      8      1000   Lung Cancer    Malignant neoplasm of lung
       lung,cancer    neop   [[[1,2],[1,2],0]]     yes    no
00000000.tx.1  4      c      2      8      1000   Lung Cancer    Carcinoma of lung
       lung,cancer    neop   [[[1,2],[1,2],0]]     yes    no
00000000.tx.1  5      c      3      8      861    Cancer Malignant Neoplasms    cancer neop
       [[[2,2],[1,1],0]]     yes    no
00000000.tx.1  6      c      4      8      861    Lung   Lung   lung   bpoc
       [[[1,1],[1,1],0]]     yes    no
00000000.tx.1  7      c      5      8      861    Cancer Cancer Genus    cancer invt
       [[[2,2],[1,1],0]]     yes    no
00000000.tx.1  8      c      6      8      861    Lung   Entire lung    lung   bpoc
       [[[1,1],[1,1],0]]     yes    no
00000000.tx.1  9      c      7      8      861    Cancer Specialty Type - cancer       cancer
       bmod   [[[2,2],[1,1],0]]     yes    no
00000000.tx.1  10     c      8      8      768    Pneumonia      Pneumonia      pneumonia
       dsyn   [[[1,1],[1,1],5]]     yes    no
00000000.tx.1  11     m      1      2      1000
00000000.tx.1  12     mc     1      2      1      1      1000   Lung Cancer    Carcinoma of
lung   lung,cancer    neop   [[[1,2],[1,2],0]]     yes    no
00000000.tx.1  13     m      2      2      1000
00000000.tx.1  14     mc     2      2      1      1      1000   Lung Cancer    Malignant
neoplasm of lung       lung,cancer    neop   [[[1,2],[1,2],0]]     yes    no
```

Figure 8. Fielded output for normal processing of *lung cancer*

- **Show CUIs: (-I)** *lung cancer*

```
> metamap06 -I


MetaMap (2006)


Control options:
  tag_text
  no_acros_abbrs
  an_derivational_variants
  stop_large_n
  plain_syntax
  candidates
  semantic_types
  mappings
  best_mappings_only
  show_cuis
Initializing db_access (06)...
Berkeley DB databases (normal downstairs strict model) are open.
Static variants will come from table varsan.
Initializing lexicon (06)...
Accessing lexicon /nfsvol/nls/specialist/lexicon2005/data/lexiconStatic2005.
Variant generation mode: static.
Initializing tagger (06) on skr1...
Initializing db_access_for_genspec...successful.
|: lung cancer
|:


Processing 00000000.tx.1: lung cancer.

Phrase: "lung cancer."
Meta Candidates (8):
  1000 C0242379:Lung Cancer (Malignant neoplasm of lung) [Neoplastic Process]
  1000 C0684249:Lung Cancer (Carcinoma of lung) [Neoplastic Process]
   861 C0006826:Cancer (Malignant Neoplasms) [Neoplastic Process]
   861 C0024109:Lung [Body Part, Organ, or Organ Component]
   861 C0998265:Cancer (Cancer Genus) [Invertebrate]
   861 C1278908:Lung (Entire lung) [Body Part, Organ, or Organ Component]
   861 C1547140:Cancer (Specialty Type - cancer) [Biomedical Occupation or Discipline]
   768 C0032285:Pneumonia [Disease or Syndrome]
Meta Mapping (1000):
  1000 C0684249:Lung Cancer (Carcinoma of lung) [Neoplastic Process]
Meta Mapping (1000):
  1000 C0242379:Lung Cancer (Malignant neoplasm of lung) [Neoplastic Process]
```

Figure 9. Show Concept Unique Identifiers (CUIs) for normal processing of *lung cancer*

- **Show preferred names only: (-O)** *lung cancer*

```
> metamap06 -O


MetaMap (2006)


Control options:
  tag_text
  no_acros_abbrs
  an_derivational_variants
  stop_large_n
  plain_syntax
  candidates
  semantic_types
  mappings
  best_mappings_only
  show_preferred_names_only
Initializing db_access (06)...
Berkeley DB databases (normal downstairs strict model) are open.
Static variants will come from table varsan.
Initializing lexicon (06)...
Accessing lexicon /nfsvol/nls/specialist/lexicon2005/data/lexiconStatic2005.
Variant generation mode: static.
Initializing tagger (06) on skr1...
Initializing db_access_for_genspec...successful.
|: lung cancer
|:


Processing 00000000.tx.1: lung cancer.

Phrase: "lung cancer."
Meta Candidates (8):
  1000 Malignant neoplasm of lung [Neoplastic Process]
  1000 Carcinoma of lung [Neoplastic Process]
   861 Malignant Neoplasms [Neoplastic Process]
   861 Lung [Body Part, Organ, or Organ Component]
   861 Cancer Genus [Invertebrate]
   861 Entire lung [Body Part, Organ, or Organ Component]
   861 Specialty Type - cancer [Biomedical Occupation or Discipline]
   768 Pneumonia [Disease or Syndrome]
Meta Mapping (1000):
  1000 Carcinoma of lung [Neoplastic Process]
Meta Mapping (1000):
  1000 Malignant neoplasm of lung [Neoplastic Process]
```

Figure 10. Show preferred names only for normal processing of *lung cancer*

- **Show preferred name sources: (-W)** *lung cancer*

```
> metamap06 -W


MetaMap (2006)


Control options:
  tag_text
  no_acros_abbrs
  an_derivational_variants
  stop_large_n
  plain_syntax
  candidates
  semantic_types
  mappings
  best_mappings_only
  preferred_name_sources
Initializing db_access (06)...
Berkeley DB databases (normal downstairs strict model) are open.
Static variants will come from table varsan.
Initializing lexicon (06)...
Accessing lexicon /nfsvol/nls/specialist/lexicon2005/data/lexiconStatic2005.
Variant generation mode: static.
Initializing tagger (06) on skr1...
Initializing db_access_for_genspec...successful.
|: lung cancer
|:


Processing 00000000.tx.1: lung cancer.

Phrase: "lung cancer."
Meta Candidates (8):
  1000 Lung Cancer (Malignant neoplasm of lung) [Neoplastic Process] [MTH,SNOMEDCT]
  1000 Lung Cancer (Carcinoma of lung) [Neoplastic Process] [MDR,MTH]
   861 Cancer (Malignant Neoplasms) [Neoplastic Process] [MTH,PSY]
   861 Lung [Body Part, Organ, or Organ Component]
[HL7V2.5,MSH,MTH,NCI,PSY,RCD,SNM,SNOMEDCT,UWDA]
   861 Cancer (Cancer Genus) [Invertebrate] [MTH]
   861 Lung (Entire lung) [Body Part, Organ, or Organ Component] [MTH,SNOMEDCT]
   861 Cancer (Specialty Type - cancer) [Biomedical Occupation or Discipline] [MTH]
   768 Pneumonia [Disease or Syndrome]
[ICPC,ICPC2EENG,ICPC2P,LCH,MDR,MEDLINEPLUS,MSH,MTH,NCI,NDFRT,NOC,PSY,RCD,SNM,SNOMEDCT]
Meta Mapping (1000):
  1000 Lung Cancer (Carcinoma of lung) [Neoplastic Process] [MDR,MTH]
Meta Mapping (1000):
  1000 Lung Cancer (Malignant neoplasm of lung) [Neoplastic Process] [MTH,SNOMEDCT]
```

Figure 11. Show preferred name sources for normal processing of *lung cancer*

- **Show sources: (-G)** *scorpion sting*

```
> metamap06 –G

MetaMap (2006)


Control options:
  tag_text
  no_acros_abbrs
  an_derivational_variants
  stop_large_n
  plain_syntax
  candidates
  semantic_types
  mappings
  best_mappings_only
  sources
Initializing db_access (06)...
Berkeley DB databases (normal downstairs strict model) are open.
Static variants will come from table varsan.
Initializing lexicon (06)...
Accessing lexicon /nfsvol/nls/specialist/lexicon2005/data/lexiconStatic2005.
Variant generation mode: static.
Initializing tagger (06) on skr1...
Initializing db_access_for_genspec...successful.
|: scorpion sting
|:


Processing 00000000.tx.1: scorpion sting.

Phrase: "scorpion sting."
Meta Candidates (4):
  1000 Scorpion sting {MDR,DXP} [Injury or Poisoning]
   861 Sting (Sting Injury {MTH,MSH,MDR,RCD,SNM,SNOMEDCT,SNMI,WHO}) [Injury or
Poisoning]
   694 Scorpion (Scorpions {LCH,MSH,MTH,SNM,SNOMEDCT,SNMI,CSP,RCD,NCBI})
[Invertebrate]
   694 SCORPION (Scorpion antigen {MTH,LNC}) [Immunologic Factor]
Meta Mapping (1000):
  1000 Scorpion sting {MDR,DXP} [Injury or Poisoning]
```

Figure 12. Show Sources for normal processing of *lung cancer*

- **Show excluding sources: (-e MDR,DXP)** *scorpion sting*

Abbreviated Normal processing (with –I show CUIs) results for *scorpion sting*:

```
> metamap06 -I

Processing 00000000.tx.1: scorpion sting.

Phrase: "scorpion sting."
Meta Candidates (4):
  1000 C0238417:Scorpion sting [Injury or Poisoning]
   861 C0038340:Sting (Sting Injury) [Injury or Poisoning]
   694 C0036451:Scorpion (Scorpions) [Invertebrate]
   694 C1442901:SCORPION (Scorpion antigen) [Immunologic Factor] Meta Mapping (1000):
  1000 C0238417:Scorpion sting [Injury or Poisoning]
```

Results of a search for CUI C0238417 (Scorpion sting) in the mrconso.eng file (a
filtered version of the UMLS MRCON and MRSO files focused on the English language
(ENG) terms) to determine which sources the concept comes from shows "MDR" and "DXP".

```
C0238417:L0317595:S1646686|585955|P|PF|Scorpion sting|MDR|LT|10039728
C0238417:L0317595:S0401407|585956|P|VC|SCORPION STING|DXP|DI|U001717
C0238417:L0317595:S0401407|585956|P|VC|SCORPION STING|DXP|FI|U003456
```

Results when excluding MDR,DXP sources. Note the lack of the 1000 score candidate
"Scorpion sting". The –e option also displays the remaining sources for each concept.

```
> metamap06 -e MDR,DXP


MetaMap (2006)


Control options:
  tag_text
  no_acros_abbrs
  an_derivational_variants
  stop_large_n
  plain_syntax
  candidates
  semantic_types
  mappings
  best_mappings_only
  exclude_sources=[MDR,DXP]
Initializing db_access (06)...
Berkeley DB databases (normal downstairs strict model) are open.
Static variants will come from table varsan.
Initializing lexicon (06)...
Accessing lexicon /nfsvol/nls/specialist/lexicon2005/data/lexiconStatic2005.
Variant generation mode: static.
Initializing tagger (06) on skr1...
Initializing db_access_for_genspec...successful.
|: scorpion sting
|:
```

(Continued below)

Figure 13. Exclude sources (MDR, DXP) for *Scorpion sting*
(Medical Dictionary for Regulatory Activities Terminology (MedDRA), 7.1 [MDR] and DXplain, 1994 [DXP])

```
Processing 00000000.tx.1: scorpion sting.

Phrase: "scorpion sting."
Meta Candidates (3):
   861 Sting (Sting Injury) [Injury or Poisoning]
   694 Scorpion (Scorpions) [Invertebrate]
   694 SCORPION (Scorpion antigen) [Immunologic Factor]
Meta Mapping (888):
   694 SCORPION (Scorpion antigen) [Immunologic Factor]
   861 Sting (Sting Injury) [Injury or Poisoning]
Meta Mapping (888):
   694 Scorpion (Scorpions) [Invertebrate]
   861 Sting (Sting Injury) [Injury or Poisoning]
```

Figure 13. Exclude sources (MDR, DXP) for *Scorpion sting* (concluded)
(Medical Dictionary for Regulatory Activities Terminology (MedDRA), 7.1 [MDR] and DXplain, 1994 [DXP])

NOTE: You must specify the –G option if you want to see the sources in the results.

- **Show restricting to specific sources: (-GR LCH)** *Scorpion sting*

```
> metamap06 -GR LCH

MetaMap (2006)


Control options:
  tag_text
  no_acros_abbrs
  an_derivational_variants
  stop_large_n
  plain_syntax
  candidates
  semantic_types
  mappings
  best_mappings_only
  sources
  restrict_to_sources=[LCH]
Initializing db_access (06)...
Berkeley DB databases (normal downstairs strict model) are open.
Static variants will come from table varsan.
Initializing lexicon (06)...
Accessing lexicon /nfsvol/nls/specialist/lexicon2005/data/lexiconStatic2005.
Variant generation mode: static.
Initializing tagger (06) on skr1...
Initializing db_access_for_genspec...successful.
|: scorpion sting
|:


Processing 00000000.tx.1: scorpion sting.

Phrase: "scorpion sting."
Meta Candidates (1):
   694 Scorpion (Scorpions {LCH}) [Invertebrate]
Meta Mapping (694):
   694 Scorpion (Scorpions {LCH}) [Invertebrate]
```

Figure 14. Show restricting to Library of Congress Subject Headings, 1990 (LCH) for
Scorpion sting

NOTE: You must specify the –G option if you want to see the sources in the results.

- **Show restricting to specific Semantic Type: (-J neop)** *Lung cancer*

```
> metamap06 -J neop


MetaMap (2006)


Control options:
  tag_text
  no_acros_abbrs
  an_derivational_variants
  stop_large_n
  plain_syntax
  candidates
  semantic_types
  mappings
  best_mappings_only
  restrict_to_sts=[neop]
Initializing db_access (06)...
Berkeley DB databases (normal downstairs strict model) are open.
Static variants will come from table varsan.
Initializing lexicon (06)...
Accessing lexicon /nfsvol/nls/specialist/lexicon2005/data/lexiconStatic2005.
Variant generation mode: static.
Initializing tagger (06) on skr1...
Initializing db_access_for_genspec...successful.
|: lung cancer
|:


Processing 00000000.tx.1: lung cancer.

Phrase: "lung cancer."
Meta Candidates (3):
  1000 Lung Cancer (Malignant neoplasm of lung) [Neoplastic Process]
  1000 Lung Cancer (Carcinoma of lung) [Neoplastic Process]
   861 Cancer (Malignant Neoplasms) [Neoplastic Process]
Meta Mapping (1000):
  1000 Lung Cancer (Carcinoma of lung) [Neoplastic Process]
Meta Mapping (1000):
  1000 Lung Cancer (Malignant neoplasm of lung) [Neoplastic Process]
```

Figure 15. Show restricting to Neoplastic Process (neop) Semantic Type for *Lung cancer*