**Neo4j Aura Instance Credentials**

**NEO4J\_URI=neo4j+s://20fee4c5.databases.neo4j.io**

**NEO4J\_USERNAME=neo4j**

**NEO4J\_PASSWORD=fM3c4rAdaOiCrYekXeWPi3dWNIAG6gsHiy6s-CMD1yE**

**AURA\_INSTANCEID=20fee4c5**

**AURA\_INSTANCENAME=Instance01**

1. **Condition - > symptom**

MATCH (c:MedicalCondition)-[:PRESENTS\_WITH]->(s:Symptom)

WHERE c.name IS NOT NULL AND s.name IS NOT NULL

WITH toLower(c.name) AS Condition, collect(DISTINCT toLower(s.name)) AS Symptoms

WHERE size(Symptoms) >= 2 AND size(Symptoms) <= 10

RETURN Condition, Symptoms, size(Symptoms) AS SymptomCount

ORDER BY SymptomCount DESC

**To get just conditions from above query use this**

MATCH (c:MedicalCondition)-[:PRESENTS\_WITH]->(s:Symptom)

WHERE c.name IS NOT NULL AND s.name IS NOT NULL

WITH toLower(c.name) AS Condition, collect(DISTINCT toLower(s.name)) AS Symptoms

WITH Condition, [symptom IN Symptoms WHERE symptom <> 'none'] AS CleanSymptoms

WHERE size(CleanSymptoms) >= 2 AND size(CleanSymptoms) <= 10

RETURN DISTINCT Condition

ORDER BY Condition

**Top 10 Examples You Can Confidently Use (With reasoning):**

| **Condition** | **Symptoms (short summary)** | **Why it’s a good example** |
| --- | --- | --- |
| **Prolapse discs** | neck pain, shoulder pain, backache | Clear orthopedic pain profile |
| **Concussion** | headache, fatigue, lack of concentration | Classic head trauma presentation |
| **Renal colic** | back pain, severe lower back pain, pain under ribs | Kidney-related pain cluster |
| **Urinary tract infection** | odor in urine, fever, frequent urination | Textbook UTI symptom triad |
| **Allergic rhinitis** | difficulty breathing, blocked nose | Common allergy condition |
| **Spondylosis** | neck pain, turning head pain | Spine/vertebrae degeneration with clear symptoms |
| **Optic neuritis** | eye pain, pain with eye movement | Neurological, precise symptoms |
| **Bronchitis** | cough, chronic cough | Simple, well-defined respiratory illness |
| **Viral infection of URT** | fever, fast breathing, ear inflammation | Specific enough to be distinguished |
| **Orbital cellulitis** | eye swelling, headaches | Acute infection, narrow and relevant |

**⚠️ Ones to be Cautious With (Ambiguous / Too Broad)**

| **Condition** | **Why it's less ideal** |
| --- | --- |
| **Anemia** | Symptoms like "fatigue" and "difficulty breathing" are too general |
| **Cancer** | “Breathing is labored, arm twitching” is too vague without context |
| **Heart failure** | "Difficulty breathing" alone is not distinctive |
| **Arrhythmia / Thyroiditis** | “Heart pounding” and “palpitations” overlap heavily |

1. **Condition and treatments.**

* **Conditions used here are from above condition-> symptom examples.**

WITH ["allergic rhinitis", "anemia", "arrhythmia", "autoimmune disease", "bronchitis", "cancer",

"chronic obstructive pulmonary disease", "concussion", "heart failure", "hepatitis c virus (hcv)",

"incisional hernia", "inflammation in lacrimal gland or duct", "kidney stones", "optic neuritis",

"orbital cellulitis", "prolapse discs", "renal colic", "respiratory infection", "septicemia",

"spondylitis", "spondylosis", "thyroiditis", "transverse myelitis", "urinary tract infection",

"viral diarrhea", "viral infection", "viral infection of upper respiratory tract"] AS goodConditions

MATCH (t:Treatment)-[:TREATS]->(c:MedicalCondition)

WHERE toLower(c.name) IN goodConditions AND t.name IS NOT NULL AND trim(t.name) <> ""

WITH toLower(c.name) AS Condition, collect(DISTINCT toLower(trim(t.name))) AS Treatments

WHERE size(Treatments) > 0

RETURN Condition, Treatments, size(Treatments) AS TreatmentCount

ORDER BY TreatmentCount DESC

**Top Condition–Treatment Examples (for docs or demos)**

| **Condition** | **Treatments** | **Why it’s Good** |
| --- | --- | --- |
| **Prolapse discs** | physiotherapy, short wave diathermy, cervical traction | Clear musculoskeletal treatment, targeted, clean |
| **Viral infection of URT** | supportive care, fever control | Simple, self-limiting infection management |
| **Optic neuritis** | steroids | Specific, targeted treatment |
| **Kidney stones** | pain management | Straightforward acute care |
| **Cancer** | biopsy | Diagnosis-linked treatment step, clear and teachable |
| **Incontinence (if from spondylosis/spondylitis)** | mild painkiller | Pain-focused for spinal issues |
| **Inflammation in lacrimal gland** | surgery | Surgical resolution — good for contrasting with non-invasive cases |
| **Incisional hernia** | mesh implant | Straightforward surgical case |
| **Viral diarrhea** | wait for 5–7 days | Self-care example, useful for contrast |

**Consider Using with Caution (can be cleaned manually):**

| **Condition** | **Why to be cautious** |
| --- | --- |
| **Bronchitis** | Has valid treatments like bronchodilators, steroids, but mixed with diagnostics and general advice |
| **Thyroiditis** | Same as bronchitis — long list with valid entries but needs filtering |

**If you want to include symptoms along with condition and treatments**

WITH ["allergic rhinitis", "anemia", "arrhythmia", "autoimmune disease", "bronchitis", "cancer",

"chronic obstructive pulmonary disease", "concussion", "heart failure", "hepatitis c virus (hcv)",

"incisional hernia", "inflammation in lacrimal gland or duct", "kidney stones", "optic neuritis",

"orbital cellulitis", "prolapse discs", "renal colic", "respiratory infection", "septicemia",

"spondylitis", "spondylosis", "thyroiditis", "transverse myelitis", "urinary tract infection",

"viral diarrhea", "viral infection", "viral infection of upper respiratory tract"] AS goodConditions

MATCH (c:MedicalCondition)<-[:TREATS]-(t:Treatment)

WHERE toLower(c.name) IN goodConditions AND t.name IS NOT NULL AND trim(t.name) <> ""

OPTIONAL MATCH (c)-[:PRESENTS\_WITH]->(s:Symptom)

WITH toLower(c.name) AS Condition,

collect(DISTINCT toLower(trim(t.name))) AS Treatments,

collect(DISTINCT toLower(trim(s.name))) AS Symptoms

WHERE size(Treatments) > 0

RETURN Condition, Treatments, Symptoms, size(Treatments) AS TreatmentCount

ORDER BY TreatmentCount DESC

| **Condition** | **Treatments** | **Symptoms** | **Why It's a Good Example** |
| --- | --- | --- | --- |
| bronchitis | [observation, pulmonary function test, consult pulmonologist, inhaled bronchodilator, inhaled corticosteroids, antibiotic treatment, clinical examination, regular use of inhalation steroids, avoidance of allergen, painkillers] | [cough, chronic cough] | Mix of diagnostics and standard treatment protocols for respiratory conditions, though a bit overloaded. |
| thyroiditis | [observation, beta blockers, oral anti histamine, blood pressure medication, consult cardiologist] | [heart was pounding so hard, palpitations] | Heart-related symptoms managed appropriately in thyroid dysfunction. |
| prolapse discs | [physiotherapy, short wave diathermy, cervical traction] | [intense pain in neck, worsens when turning head, neck pain, pain in neck, backache, shoulder pain] | Focused spinal therapies for a specific orthopedic issue. |
| viral infection of upper respiratory tract | [supportive care, fever control] | [fever, fast breathing, inflammation in the ear] | Accurate symptomatic treatment for upper respiratory infections. |
| viral infection | [fever control] | [fever, fast breathing, inflammation in the ear] | Generic but appropriate symptom-targeted management. |
| inflammation in lacrimal gland or duct | [surgery] | [inflammation of the tear duct, small hole with intermittent drainage between bridge of nose and eye] | Localized surgical intervention for an anatomical issue. |
| arrhythmia | [consult your doctor] | [heart was pounding so hard, palpitations] | Symptom-specific referral for potentially life-threatening condition. |
| optic neuritis | [steroids] | [eye pain, pain with eye movement] | Specific therapy for autoimmune/inflammatory optic condition. |
| viral diarrhea | [wait for 5-7 days] | [diarrhea, watery diarrhea] | Conservative, evidence-based approach for self-limiting viral gastroenteritis. |
| kidney stones | [pain management] | [pain, sharp pain] | Standard pain-focused initial management. |
| incisional hernia | [mesh implant] | [abdominal pain, infection] | Surgical correction matched to physical symptoms. |
| spondylosis | [mild painkiller] | [intense pain in neck, worsens when turning head, neck pain, pain in neck] | Conservative approach for chronic degenerative spinal condition. |
| spondylitis | [mild painkiller] | [back pain, low back pain] | Chronic inflammation with non-invasive symptom relief. |
| cancer | [biopsy] | [] | Diagnostic pathway — important but lacks accompanying symptoms. |
| hepatitis c virus (hcv) | [platelet transfusions] | [lymphangitis, severe swelling of lymph nodes in the leg] | Severe symptom management for a systemic viral disease. |

* **Conditions used here are not from above condition ->symptoms**

**Final Query**

WITH 1 AS dummy

CALL {

WITH dummy

MATCH (t:Treatment)-[:TREATS]->(c:MedicalCondition)

WHERE t.name IS NOT NULL AND trim(t.name) <> ""

WITH toLower(trim(t.name)) AS treatment, count(DISTINCT c.name) AS conditionCount

WHERE conditionCount > 15

RETURN collect(treatment) AS GenericTreatments

}

WITH GenericTreatments

MATCH (t:Treatment)-[:TREATS]->(c:MedicalCondition)

WHERE c.name IS NOT NULL AND toLower(trim(c.name)) <> "none"

AND t.name IS NOT NULL AND trim(t.name) <> ""

WITH toLower(trim(c.name)) AS Condition, toLower(trim(t.name)) AS Treatment, GenericTreatments

WHERE NOT Treatment IN GenericTreatments

WITH Condition, collect(DISTINCT Treatment) AS Treatments

WHERE size(Treatments) > 0

RETURN Condition, Treatments, size(Treatments) AS TreatmentCount

ORDER BY TreatmentCount DESC

**Top Clean, Specific Examples**

| **Condition** | **Treatments** | **Why It's a Good Example** |
| --- | --- | --- |
| **polycystic ovary syndrome** | [intrauterine insemination, follicular study, hysterosalpingogram (hsg), weight reduction, metformin] | Targeted fertility and hormonal treatments. |
| **prolapse discs** | [physiotherapy, short wave diathermy, cervical traction] | Focused spinal therapies for a specific back issue. |
| **asthma** | [blow test, spirometry, comprehensive differential diagnosis, steam inhalation, deep breathing exercise] | Diagnostics and breathing-focused interventions. |
| **plantar fasciitis** | [physiotherapy, medication, ibuprofen] | Textbook conservative management. |
| **pneumonia** | [follow-up chest x-rays, consult pulmonologist, clinical examination of respiratory system] | Respiratory-focused and specialist-driven. |
| **migraine** | [migraine management, medrol pack] | Specific to neurovascular symptom relief. |
| **endometriosis** | [diagnostic laparoscopy] | Gold standard for diagnosis. |
| **epilepsy** | [surgery] | Surgical treatment is used in refractory epilepsy – condition-specific. |
| **infertility** | [hormonal profile test, consult infertility specialist, clinical examination, repeat semen examination] | Relevant investigations. |
| **preeclampsia** | [antihypertensives, rest] | Accurate and contextually right. |
| **fibroids** | [fibroid treatment] | Specific enough to suggest it’s a curated path. |
| **erectile dysfunction** | [psychotherapy techniques] | Psychological angle of treatment shows awareness. |
| **lyme disease** | [antibiotics, injectable antibiotics] | Spot-on clinical management. |
| **speech delay** | [speech therapy] | Direct and relevant. |
| **urinary infection** | [pain relief] | Conservative approach to symptom management (though antibiotic may be missing). |
| **intervertebral disc prolapse at l4l5** | [discectomy surgery] | Precise location-specific surgical recommendation. |

**If you want to include symptoms along with condition and treatments**

WITH 1 AS dummy

CALL {

WITH dummy

MATCH (t:Treatment)-[:TREATS]->(c:MedicalCondition)

WHERE t.name IS NOT NULL AND trim(t.name) <> ""

WITH toLower(trim(t.name)) AS treatment, count(DISTINCT c.name) AS conditionCount

WHERE conditionCount > 15

RETURN collect(treatment) AS GenericTreatments

}

WITH GenericTreatments

MATCH (t:Treatment)-[:TREATS]->(c:MedicalCondition)

WHERE c.name IS NOT NULL

AND toLower(trim(c.name)) <> "none"

AND toLower(trim(c.name)) <> "not specified"

AND t.name IS NOT NULL AND trim(t.name) <> ""

OPTIONAL MATCH (c)-[:PRESENTS\_WITH]->(s:Symptom)

WHERE s.name IS NOT NULL AND toLower(trim(s.name)) <> "none"

WITH GenericTreatments,

toLower(trim(c.name)) AS Condition,

collect(DISTINCT toLower(trim(t.name))) AS Treatments,

collect(DISTINCT toLower(trim(s.name))) AS Symptoms

WHERE size(Symptoms) > 0

AND ALL(tName IN Treatments WHERE NOT tName IN GenericTreatments)

RETURN Condition, Treatments, Symptoms, size(Treatments) AS TreatmentCount

ORDER BY TreatmentCount DESC

| **Condition** | **Treatments** | **Symptoms** | **Why It's a Good Example** |
| --- | --- | --- | --- |
| pneumonia | [follow-up chest x-rays, consult pulmonologist, clinical examination of respiratory system] | [fever, pneumonia] | Respiratory-focused and specialist-driven. |
| prolapse discs | [physiotherapy, short wave diathermy, cervical traction] | [intense pain in neck, worsens when turning head, neck pain, pain in neck, backache, shoulder pain] | Focused spinal therapies for a specific back issue. |
| compression of nerve root | [physiotherapy, epidural steroid injection] | [intense pain in neck, worsens when turning head] | Symptom-specific interventions for nerve-related pain. |
| viral infection of upper respiratory tract | [supportive care, fever control] | [fever, fast breathing, inflammation in the ear] | Targeted conservative therapy for viral illness. |
| preeclampsia | [antihypertensives, rest] | [edema at ankles] | Accurate and contextually appropriate for pregnancy. |
| upper respiratory tract infection | [warm saline gargles, steam] | [chronic cough] | Symptomatic relief with non-pharmacologic treatments. |
| pericoronitis | [medication, ibuprofen] | [swelling] | Conservative treatment of dental inflammation. |
| vuj calculus | [flush therapy] | [moderate dilatation of ureter and pelvicaliceal system] | Specific renal condition and matching conservative approach. |
| infected tooth | [root canal therapy] | [toothache] | Definitive and condition-specific dental treatment. |
| wheezing | [steroid and wheeze medicine] | [difficulty breathing] | Direct correlation between symptom and treatment. |
| kidney stones | [pain management] | [pain, sharp pain] | First-line management for acute stone pain. |
| viral infection | [fever control] | [fever, fast breathing, inflammation in the ear] | General supportive care aligned to viral symptomology. |
| optic neuritis | [steroids] | [eye pain, pain with eye movement] | Specific autoimmune optic nerve treatment. |
| viral diarrhea | [wait for 5-7 days] | [diarrhea, watery diarrhea] | Standard self-limiting viral treatment strategy. |
| cervical spine compression | [physiotherapy] | [neckache] | Conservative therapy for spinal compression. |
| urinary infection | [pain relief] | [frequent urination] | Symptom-based relief (though antibiotic would be better). |
| incisional hernia | [mesh implant] | [abdominal pain, infection] | Specific surgical resolution of abdominal issue. |
| spondylosis | [mild painkiller] | [intense pain in neck, worsens when turning head, neck pain, pain in neck] | Chronic pain condition with conservative management. |
| spondylitis | [mild painkiller] | [back pain, low back pain] | Conservative management for chronic spinal inflammation. |
| GER (gastroesophageal reflux) | [antireflux therapy] | [nausea] | Straightforward therapy for acid reflux. |
| health anxiety disorder | [cognitive behavioral therapy] | [anxiety] | Psychological symptom with matching psychotherapy. |
| inflammation in lacrimal gland or duct | [surgery] | [inflammation of the tear duct, small hole with intermittent drainage between bridge of nose and eye] | Localized surgery for very specific anatomical issue. |
| arrhythmia | [consult your doctor] | [heart was pounding so hard, palpitations] | Specialist consultation advised for serious cardiac symptoms. |
| malaria | [malaria treatment] | [vomiting] | Direct treatment reference for a specific infection. |
| hepatitis C virus (HCV) | [platelet transfusions] | [lymphangitis, severe swelling of lymph nodes in the leg] | Immune-mediated symptom management. |
| laryngitis | [stop smoking] | [dry croaky voice] | Lifestyle-based advice for a self-limiting condition. |

1. **End to End**

**If you want to include condition, symptom, treatments, medication and side effects use these 3 examples urinary tract infection", "infected tooth", "arachnoid cysts”**

WITH ["urinary tract infection", "infected tooth", "arachnoid cysts"] AS targetConditions

MATCH (condition:MedicalCondition)

WHERE toLower(condition.name) IN targetConditions

OPTIONAL MATCH (condition)-[:PRESENTS\_WITH]->(symptom:Symptom)

OPTIONAL MATCH (treatment:Treatment)-[:TREATS]->(condition)

OPTIONAL MATCH (medication:Medication)

WHERE (medication)-[:TREATS]->(condition)

OR (medication)-[:RELATED\_TO]->(treatment)

OR (treatment)-[:RELATED\_TO]->(medication)

OPTIONAL MATCH (medication)-[:CAUSES]->(sideEffect:Symptom)

RETURN DISTINCT

toLower(condition.name) AS Condition,

collect(DISTINCT toLower(symptom.name)) AS Symptoms,

collect(DISTINCT toLower(treatment.name)) AS Treatments,

collect(DISTINCT toLower(medication.name)) AS Medications,

collect(DISTINCT toLower(sideEffect.name)) AS SideEffects,

size(collect(DISTINCT treatment.name)) AS TreatmentCount,

size(collect(DISTINCT medication.name)) AS MedicationCount

ORDER BY Condition