

Diagnosis Tree Rules (Backward Chain)

Knowledge Base(Rules):

Rule 10. If Suspect Cancer = NO, then Cancer = NO

Rule 20. If Symptoms localized = YES, then Localized Cancers = YES

Rule 30. If Symptoms localized = NO, then Skin Cancers = YES

Rule 40. If Skin Cancers = YES

 AND Sores = YES

 AND Red Patches = YES

 AND Warts = NO

 AND New Scars = YES,

Then Basal Cell Skin Cancer = YES

Rule 50. If Skin Cancers = YES

 AND Sores = YES

 AND Red Patches = YES

 AND Warts = YES,

Then Squamous Cell Skin Cancer = YES

Rule 60. If Localized Cancers = YES, then CHECK PAIN

Rule 70. If Pain = Chest

 AND Pain in Breast or Nipple = YES

 AND Red or Irritated or Scaly skin on Breast = YES

 AND Lumps in Breast or Armpit or Collarbone = YES,

then Breast Cancer = YES

Rule 80. If Pain = Chest

 AND Cough or Breathing Issues = YES

 AND Bloody Cough = YES

 AND Lung Infections = YES

 AND Blood Clots = YES

 AND Frequent Headaches = YES,

then Lung Cancer = YES

Rule 90. If Pain = Stomach

 AND Diabetes = YES

 AND Yellow Skin = YES

 AND Blood Clots = YES,

then Pancreatic Cancer = YES

Rule **100**. If Pain = Stomach

AND Pressure in Abdomen = YES

AND Bowel Changes = YES

AND Blood from Rectum = YES,

then Colon or Rectal Cancer = YES

Rule **110**. If Pain = Neck

AND Neck Swelling or Lump = YES

AND Breathing or Swallowing Issues = YES

AND Voice Changes = YES

AND Constant Cough = YES,

then Thyroid Cancer = YES

Rule **120**. If Pain = Bones

AND Bleeding or Bruising Easily = YES

AND Fever or Chills or Night Sweats = YES

AND Enlarged Liver or Spleen = YES

AND Swollen Lymph Nodes = YES,

then Leukemia = YES

Conclusion List:

10 Cancer

20 Localized Cancers (used as an input variable too)

30 Skin Cancers (used as an input variable too)

40 Basal Cell Skin Cancer

50 Squamous Cell Skin Cancer

60 CHECK PAIN

70 Breast Cancer

80 Lung Cancer

90 Pancreatic Cancer

100 Colon or Rectal Cancer

110 Thyroid Cancer

120 Leukemia

Variable List:

Suspect Cancer
Symptoms localized
Sores
Red Patches
Warts
New Scars
Pain (Used after prompted by CHECK PAIN result)
Pain in Breast or Nipple
Red or Irritated or Scaly skin on Breast
Lumps in Breast or Armpit or Collarbone
Cough or Breathing Issues
Bloody Cough
Lung Infections
Blood Clots
Frequent Headaches
Diabetes
Yellow Skin
Blood Clots
Pressure in Abdomen
Bowel Changes
Blood from Rectum
Neck Swelling or Lump
Breathing or Swallowing Issues
Voice Changes
Constant Cough
Bleeding or Bruising Easily
Fever or Chills or Night Sweats
Enlarged Liver or Spleen
Swollen Lymph Nodes

Clause Variable List

1 Suspect Cancer

2

3

4

5

6

-

7 Symptoms Localized

8

9

10

11

12

-

13 Symptoms Localized

14

15

16

17

18

-

19 Skin Cancers

20 Sores

21 Red Patches

22 Warts

23 New Scars

24

-

25 Skin Cancers

26 Sores

27 Red Patches

28 Warts

29

30

-

31 Localized Cancers

32

33

34

35

36

-

37 Pain

38 Pain in Breast or Nipple

39 Red or Irritated or Scaly skin on Breast

40 Lumps in Breast or Armpit or Collarbone

41

42

-

43 Pain

44 Cough or Breathing Issues

45 Bloody Cough

46 Lung Infections

47 Blood Clots

48 Frequent Headaches

-

49 If Pain

50 Diabetes

51 Yellow Skin

52 Blood Clots

-

53 Pain

54 Pressure in Abdomen

55 Bowel Changes

56 Blood from Rectum

-

57 Pain

58 Neck Swelling or Lump

59 Breathing or Swallowing Issues

60 Voice Changes

61 Constant Cough

-

62 Pain

63 Bleeding or Bruising Easily

64 Fever or Chills or Night Sweats

65 Enlarged Liver or Spleen

66 Swollen Lymph Nodes

Treatment Tree Rules (Forward Chain)

Rule 10. If Cancer = NO, then Treatment = None

Rule 20. If Basal = YES AND
Centralized = YES AND
Excisable = YES
Then Treatment = Targeted Radiation

Rule 30. If Basal = YES AND
Centralized = YES AND
Excisable = NO
Then Treatment = Surgical Removal

Rule 40. If Basal = YES AND
Centralized = NO
Then Treatment = Immunotherapy

Rule 50. If Squamous = YES AND
Centralized = YES AND
Excisable = YES
Then Treatment = Surgical Removal

Rule 60. If Squamous = YES AND
Centralized = YES AND
Excisable = NO
Then Treatment = Targeted Radiation

Rule 70. If Squamous = YES AND
Centralized = NO AND
Weak = YES
Then Treatment = Chemotherapy

Rule 80. If Squamous = YES AND
Centralized = NO AND
Weak = NO
Then Treatment = Immunotherapy

** Using centralized as the same as spread, it's the same conceptually and because centralized isn't being used during the same branch (cancer) we don't need to initialize a new variable

Rule 90. If Breast = YES AND
Centralized = NO AND
Late = YES
Then Treatment = Systemic Therapy

Rule 100. If Breast = YES AND
Centralized = NO AND
Late = NO AND
Large = YES
Then Treatment = Systemic Therapy then Surgical Removal

Rule 110. If Breast = YES AND
Centralized = NO AND
Late = NO AND
Large = NO
Then Treatment = Surgical Removal

Rule 120. If Breast = YES AND
Centralized = YES AND
Excisable = YES
Then Treatment = Surgical Removal

Rule 130. If Breast = YES AND
Centralized = YES AND
Excisable = NO
Then Treatment = Targeted Radiation

Rule 140. If Colon = YES AND
Early = YES AND
Excisable = YES
Then Treatment = Colonoscopy

Rule 150. If Colon = YES AND
Early = YES AND
Excisable = NO
Then Treatment = Colectomy

Rule 160. If Colon = YES AND

Early = NO

Then Treatment = Colectomy

Rule 170. If Leukemia = YES AND

Acute = YES AND

Myeloid = YES

Then Treatment = ATRA Drug Therapy

Rule 180. If Leukemia = YES AND

Acute = YES AND

Lymphoid = YES

Then Treatment = Chemotherapy

Rule 190. If Leukemia = YES AND

Chronic = YES AND

Myeloid = YES

Then Treatment = TKI Inhibitor

Rule 200. If Leukemia = YES AND

Chronic = YES AND

Lymphoid = YES AND

Urgent = YES

Then Treatment = Targeted Drugs, Chemotherapy, or Immunotherapy

Rule 210. If Leukemia = YES AND

Chronic = YES AND

Lymphoid = NO AND

Urgent = NO

Then Treatment = Low-Dose Radiation or Surgical Removal

Rule 220. If Lung = YES AND

Small = NO AND

Early = YES

Then Treatment = Surgical Removal or Targeted Therapy then Removal

Rule 230. If Lung = YES AND

Small = NO AND

Early = NO

Then Treatment = Radiation, Chemo, or Immunotherapy

Rule 240. If Lung = YES AND
Small = YES AND
Excisable = YES
Then Treatment = Surgical Removal then Chemotherapy

Rule 250. If Lung = YES AND
Small = YES AND
Excisable = NO
Then Treatment = Chemoradiation

Rule 260. If Pancreatic = YES AND
Excisable = YES AND
Risk = YES
Then Treatment = Chemo or Radiation Therapy then consider Surgery

Rule 270. If Pancreatic = YES AND
Excisable = YES AND
Risk = NO
Then Treatment = Surgical Removal

Rule 280. If Pancreatic = YES AND
Excisable = NO
Then Treatment = Chemotherapy

Rule 290. If Thyroid = YES AND
Covered = YES AND
Centralized = NO
Then Treatment = Radical Neck Dissection

Rule 300. If Thyroid = YES AND
Covered = YES AND
Centralized = YES
Then Treatment = Thyroidectomy

Rule 310. If Thyroid = YES AND
Covered = YES
Then Treatment = Lobectomy

Rule 320. If Basal = NO AND

Squamous = NO AND
Breast = NO AND
Colon = NO AND
Leukemia = NO AND
Lung = NO AND
Pancreatic = NO AND
Thyroid = NO
Then Treatment = None

Variable List:

Cancer
Basal
Centralized
Excisable
Squamous
Weak
Breast
Late
Large
Colon
Early
Leukemia
Acute
Myeloid
Lymphoid
Chronic
Urgent
Lung
Small
Pancreatic
Risk
Thyroid
Covered

Clause Variable List:

1. Cancer
- 2.
- 3.
- 4.
- 5.

- 6.
- 7.
- 8.
- 9.
10. Basal
11. Centralized
12. Excisable
- 13.
- 14.
- 15.
- 16.
- 17.
- 18.
19. Basal
20. Centralized
21. Excisable
- 22.
- 23.
- 24.
- 25.
- 26.
- 27.
28. Basal
29. Centralized
- 30.
- 31.
- 32.
- 33.
- 34.
- 35.
- 36.
37. Squamous
38. Centralized
39. Excisable
- 40.
- 41.
- 42.
- 43.
- 44.
- 45.

- 46. Squamous
- 47. Centralized
- 48. Excisable
- 49.
- 50.
- 51.
- 52.
- 53.
- 54.
- 55. Squamous
- 56. Centralized
- 57. Weak
- 58.
- 59.
- 60.
- 61.
- 62.
- 63.
- 64. Squamous
- 65. Centralized
- 66. Weak
- 67.
- 68.
- 69.
- 70.
- 71.
- 72.
- 73. Breast
- 74. Centralized
- 75. Late
- 76.
- 77.
- 78.
- 79.
- 80.
- 81.
- 82. Breast
- 83. Centralized
- 84. Late
- 85. Large

- 86.
- 87.
- 88.
- 89.
- 90.
- 91. Breast
- 92. Centralized
- 93. Late
- 94. Large
- 95.
- 96.
- 97.
- 98.
- 99.
- 100. Breast
- 101. Centralized
- 102. Excisable
- 103.
- 104.
- 105.
- 106.
- 107.
- 108.
- 109. Breast
- 110. Centralized
- 111. Excisable
- 112.
- 113.
- 114.
- 115.
- 116.
- 117.
- 118. Colon
- 119. Early
- 120. Excisable
- 121.
- 122.
- 123.
- 124.
- 125.

- 126.
- 127. Colon
- 128. Early
- 129. Excisable
- 130.
- 131.
- 132.
- 133.
- 134.
- 135.
- 136. Colon
- 137. Early
- 138.
- 139.
- 140.
- 141.
- 142.
- 143.
- 144.
- 145. Leukemia
- 146. Acute
- 147. Myeloid
- 148.
- 149.
- 150.
- 151.
- 152.
- 153.
- 154. Leukemia
- 155. Acute
- 156. Lymphoid
- 157.
- 158.
- 159.
- 160.
- 161.
- 162.
- 163. Leukemia
- 164. Chronic
- 165. Myeloid

166.
167.
168.
169.
170.
171.
172. Leukemia
173. Chronic
174. Lymphoid
175. Urgent
176.
177.
178.
179.
180.
181. Leukemia
182. Chronic
183. Lymphoid
184. Urgent
185.
186.
187.
188.
189.
190. Lung
191. Small
192. Early
193.
194.
195.
196.
197.
198.
199. Lung
200. Small
201. Early
202.
203.
204.
205.

206.
207.
208. Lung
209. Small
210. Excisable
211.
212.
213.
214.
215.
216.
217. Lung
218. Small
219. Excisable
220.
221.
222.
223.
224.
225.
226. Pancreatic
227. Excisable
228. Risk
229.
230.
231.
232.
233.
234.
235. Pancreatic
236. Excisable
237. Risk
238.
239.
240.
241.
242.
243.
244. Pancreatic
245. Excisale

246.
247.
248.
249.
250.
251.
252.
253. Thyroid
254. Covered
255. Centralized
256.
257.
258.
259.
260.
261.
262. Thyroid
263. Covered
264. Centralized
265.
266.
267.
268.
269.
270.
271. Thyroid
272. Covered
273.
274.
275.
276.
277.
278.
279.
280. Basal
281. Squamous
282. Breast
283. Colon
284. Leukemia
285. Lung

- 286. Pancreatic
- 287. Thyroid
- 288.