Head and Neck Cancer: Summary of important changes to original decision tree

New Decision Trees

<table>
<tr><td rowspan="4">Oropharynx /unknown primary
28%

Stage I-II
10%</td><td rowspan="3">Fit for curative therapy
99%</td><td>Primary radiotherapy
95%</td><td colspan="3">Conventional fractionation 100%
66Gy 33f 34%
70Gy 35f 66%
60-66Gy/54Gy 30f 0%</td></tr>
<tr><td rowspan="2">Primary surgery
5%</td><td>Post-operative radiotherapy (PORT)
30%</td><td>Conventional fractionation 65%
60Gy 30f 8%
66Gy 33f 92%

Hypofractionation 35%
50Gy 20f 17%
55Gy 20f 83%</td></tr>
<tr><td colspan="2">No PORT 70%</td></tr>
<tr><td>Not fit for curative therapy
1%</td><td colspan="2">Palliative radiotherapy
25%</td><td>21Gy 3f 9%
20Gy 5f 40%
27-30Gy 6f 9%
30Gy 10f 40%
14Gy 4f 1%
50Gy 20f 1%</td></tr>
<tr><td colspan="4">No radiotherapy 75%</td></tr>
<tr><td>Stage III-IVB
86%</td><td>Fit for curative therapy
95%</td><td>Disease suitable for curative therapy
95%</td><td>primary radiotherapy +/- chemo [50/50 chemo split] 75%</td><td>Conventional fractionation 100%
70Gy 35f 5%
65-66Gy 30f 90%
66Gy 33f 5%</td></tr>
</table>

			Primary surgery 25%	PORT 90%	**Conventional fractionation** 20% 60Gy 30f 50% 66Gy 33f 50% **Hypofractionation** 80% 55Gy 20f 50% 50Gy 20f 50%
				No PORT 10%	
		Disease unsuitable for curative therapy 5%	Palliative radiotherapy 80%	21Gy 3f 9% 20Gy 5f 40% 27-30Gy 6f 9% 30Gy 10f 40% 14Gy 4f 1% 50Gy 20f 1%	
			No radiotherapy 20%		
	Not fit for curative therapy 5%		Palliative radiotherapy 60%		21Gy 3f 9% 20Gy 5f 40% 27-30Gy 6f 9% 30Gy 10f 40% 14Gy 4f 1% 50Gy 20f 1%
			No radiotherapy 40%		
Stage IVC 4%	Symptomatic 100%	Fit for palliative radiotherapy 90%		Distant palliative radiotherapy 40%	8Gy single 90% 20Gy 5f 10%
				Local palliative radiotherapy 60%	21Gy 3f 9% 20Gy 5f 40% 27-30Gy 6f 9%

				30Gy 10f 40% 14Gy 4f 1% 50Gy 20f 1%
		Not fit for palliative radiotherapy 10%		
	Asymptomatic	No radiotherapy 0%		

Oral cavity and lip 28% Stage I-IVB 98%	Suitable for curative surgery and radiotherapy 90%	Fit for surgery and surgical preference 50%	PORT 40%	**Conventional fractionation** 80% Adverse factors - 66Gy 33f [up to 70Gy 35f for macro-residual disease] 70% No adverse factors - 60Gy 30f 30% **Hypofractionation** 20% Adverse factors - 55Gy 20f 70% No adverse factors - 50Gy 20f 30%
			No PORT 60%	
		Fit for surgery and/or radiotherapy, radiotherapy preference 50%	Curative radiotherapy 90%	65Gy 30f 45% 55Gy 20f 45% 50Gy 15f (lip only) 10%
			Palliative radiotherapy 10%	8Gy single 10% 20Gy 5f 40% 27-30Gy 6f 10% 30Gy 10f 40%
	Unsuitable for curative surgery 5%	Fit for radiotherapy 95%	Curative radiotherapy 90%	65Gy 30f 45% 55Gy 20f 45% 50Gy 15f (lip only) 10%

			Palliative radiotherapy 15%	21Gy 3f 9% 20Gy 5f 40% 27-30Gy 6f 9% 30Gy 10f 40% 14Gy 4f 1% 50Gy 20f 1%
		Not fit for radiotherapy 5%		
	Not suitable for either radiotherapy or surgery 5%			
Stage IVC 2%	Symptomatic 70%	Fit for palliative radiotherapy 90%	Local palliative radiotherapy 60%	21Gy 3f 9% 20Gy 5f 40% 27-30Gy 6f 9% 30Gy 10f 40% 14Gy 4f 1% 50Gy 20f 1%
			Distant palliative radiotherapy 40%	8Gy single 90% 20Gy 5f 10%
		Not fit for palliative radiotherapy 10%		
	Asymptomatic	No radiotherapy 30%		

Nasopharyngeal cancer 2% Stage I-IVB 98%	Fit for radiotherapy 99%	Suitable for curative radiotherapy 95%	66Gy 33f 5% 70Gy 35f 90% 65Gy 30f 5%	
		Unsuitable for curative radiotherapy 5%	Palliative radiotherapy 95%	21Gy 3f 9% 20Gy 5f 40% 27-30Gy 6f 9% 30Gy 10f 40% 14Gy 4f 1% 50Gy 20f 1%
			No radiotherapy 5%	
	Not fit for radiotherapy 1%			
Stage IVC 2%	Symptomatic 100%	Fit for palliative radiotherapy 90%	Local palliative radiotherapy 60%	21Gy 3f 9% 20Gy 5f 40% 27-30Gy 6f 9% 30Gy 10f 40% 14Gy 4f 1% 50Gy 20f 1%
			Distant palliative radiotherapy 40%	8Gy single 90% 20Gy 5f 10%
		Not fit for palliative radiotherapy 10%		
	Asymptomatic	No radiotherapy 0%		

<table>
<tr><td rowspan="4">Glottic larynx
19%

Stage I-II or Tis
70%</td><td rowspan="2">Fit for curative therapy
95%</td><td>Primary radiotherapy
80%</td><td colspan="3">Hypofractionation 100%
55Gy 20f 80%
50Gy 16f 18%
63Gy 30f 1%
63Gy 30f 1%</td></tr>
<tr><td>Primary surgery
20%</td><td colspan="3">No PORT 100%</td></tr>
<tr><td rowspan="2">Not fit for curative therapy
5%</td><td>Fit for palliative radiotherapy
20%</td><td colspan="3">21Gy 3f 9%
20Gy 5f 40%
27-30Gy 6f 9%
30Gy 10f 40%
14Gy 4f 1%
50Gy 20f 1%</td></tr>
<tr><td colspan="4">Not fit for palliative radiotherapy 80%</td></tr>
<tr><td rowspan="4">Stage III-IV</td><td rowspan="4">Stage III-IVB
29%</td><td rowspan="3">Disease suitable for laryngeal preservation
50%</td><td>Fit for curative radiotherapy +/- chemotherapy [50/50 chemo split]
90%</td><td colspan="3">Conventional fractionation 100%
66Gy 33f 30%
70Gy 35f 50%
54Gy/60Gy/65Gy 30f 20%</td></tr>
<tr><td rowspan="2">Not fit for curative radiotherapy
10%</td><td>Palliative radiotherapy
60%</td><td colspan="2">21Gy 3f 9%
20Gy 5f 40%
27-30Gy 6f 9%
30Gy 10f 40%
14Gy 4f 1%
50Gy 20f 1%</td></tr>
<tr><td colspan="3">No radiotherapy 40%</td></tr>
<tr><td>Disease not suitable for laryngeal preservation
50%</td><td>Suitable for surgery
90%</td><td>Fit for surgery
95%</td><td>PORT
80%</td><td>Conventional fractionation 80%
Adverse features - 66Gy 33f 55%
No adverse features – 60Gy 30f 45%

Hypofractionation 20%
Adverse features - 55Gy 20f 70%
No adverse features – 50Gy 20f 30%</td></tr>
</table>

					No PORT 20%
				Not fit for surgery 5%	
			Not suitable for surgery 10%	Curative radiotherapy 50%	**Conventional fractionation** 90% 66Gy 33f 30% 70Gy 35f 50% 54Gy/60Gy/65Gy 30f 20%
				Palliative radiotherapy 45%	21Gy 3f 9% 20Gy 5f 40% 27-30Gy 6f 9% 30Gy 10f 40% 14Gy 4f 1% 50Gy 20f 1%
				No radiotherapy 5%	
	Stage IV C 1%	Symptomatic 80%	Fit for palliative radiotherapy 90%	Local palliative radiotherapy 60%	21Gy 3f 9% 20Gy 5f 40% 27-30Gy 6f 9% 30Gy 10f 40% 14Gy 4f 1% 50Gy 20f 1%
				Distant palliative radiotherapy 40%	8Gy single 90% 20Gy 5f 10%
			Not fit for palliative radiotherapy 10%		
		Asymptomatic	No radiotherapy 20%		

Nasal cavity and paranasal sinuses 1% Stage I-II 20%		Fit for surgery 95%	PORT 80%	60Gy 30f 45% 66Gy 33f 50% 50Gy 20f 5%		
			No PORT 20%			
		Not fit for surgery 5%	Fit for radiotherapy 80%	Curative radiotherapy 90%	70Gy 35f 50% 55Gy 20f 5% 65-66Gy 30f 20% 66Gy 33f 25%	
				Palliative radiotherapy 10%	20Gy 5f 40% 27-30Gy 6f 40% 30Gy 10f 20%	
			Not fit for radiotherapy 20%			
Stage III-IVB 78%	T3-T4a 80%	Fit for surgery and PORT 95%	60Gy 30f 45% 66Gy 33f 50% 50Gy 20f 5%			
		Not fit for surgery 5%	Fit for radiotherapy 80%	Curative radiotherapy 70%	70Gy 35f 50% 55Gy 20f 25% 54/60/65-66Gy 30f 20% 66Gy 33f 5%	
				Palliative radiotherapy 30%	20Gy 5f 40% 27-30Gy 6f 40% 8Gy 1f 20%	
			Not fit for RT 20%			
	T4b 20%	Suitable for curative surgery 20%	Fit for surgery and PORT 95%		60Gy 30f 45% 66Gy 33f 50% 50Gy 20f 5%	
			Not fit for surgery 5%	Fit for radiotherapy 80%	Curative radiotherapy 90%	70Gy 35f 50% 55Gy 20f 5%

						54/60/65-66Gy 30f 20% 66Gy 33f 25%
					Palliative radiotherapy 10%	20Gy 5f 40% 27-30Gy 6f 40% 8Gy 1f 20%
				Not fit for radiotherapy 20%		
		Unsuitable for curative surgery 80%	Fit for radiotherapy 90%	Curative radiotherapy 30%	70Gy 35f 33% 50Gy 20f 67% 54/60/65-66Gy 30f 0% 66Gy 33f 0%	
				Palliative radiotherapy 70%	20Gy 5f 10% 27-30Gy 6f 20% 30Gy 10f 70%	
			Not fit for radiotherapy 10%			
IVC 2%		Symptomatic 50%	Fit for palliative radiotherapy 90%	Local palliative radiotherapy 60%	8Gy single 40% 20Gy 5f 40% 27-30Gy 6f 5% 30Gy 10f 15%	
				Distant palliative radiotherapy 40%	8Gy single 90% 20Gy 5f 10%	
			Not fit for radiotherapy 10%			
		Asymptomatic	No radiotherapy 50%			

Metastatic neck nodes skin primary 5%	Suitable and fit for surgery 95%	PORT 90%	**Conventional radiotherapy** 70% 60Gy 30f 100% **Hypofractionated** 30% 50Gy 20f 80% 55Gy 20f 20%
		No RT 10%	
	Not fit for surgery 5%	Fit for palliative radiotherapy 90%	21Gy 3f 9% 20Gy 5f 40% 27-30Gy 6f 9% 30Gy 10f 40% 14Gy 4f 1% 50Gy 20f 1%
		No RT 10%	

Hypopharynx/ supraglottic tumours 11% Stage I-II 10%	Fit for curative therapy 99%	Primary radiotherapy 80%	66Gy 33f 30% 70Gy 35f 50% 65Gy 30f 20%	
		Primary surgery 20%	PORT 30%	**Conventional fractionation** 65% 66Gy 33f 85% 60Gy 30f 15% **Hypofractionation** 35% 50Gy 20f 17% 55Gy 20f 83%
			No radiotherapy 70%	

<table>
<tr><td rowspan="2"></td><td rowspan="2">Not fit for curative therapy 1%</td><td>Palliative radiotherapy 25%</td><td colspan="3">21Gy 3f 9%
20Gy 5f 40%
27-30Gy 6f 9%
30Gy 10f 40%
14Gy 4f 1%
50Gy 20f 1%</td></tr>
<tr><td colspan="4">No RT 75%</td></tr>
<tr><td rowspan="5">Stage III-IVB 85%</td><td rowspan="5">Fit for curative therapy 80%</td><td rowspan="3">Disease suitable for curative therapy 80%</td><td>Primary radiotherapy +/- chemotherapy [50/50 chemo split] 30%</td><td colspan="2">66Gy 33f 5%
70Gy 35f 90%
54/60/65Gy 30f 5%</td></tr>
<tr><td rowspan="2">Primary surgery 70%</td><td>PORT 90%</td><td>Conventional fractionation 70%
60Gy 30f 50%
66Gy 33f 50%

Hypofractionation 30%
50Gy 20f 50%
55Gy 20f 50%</td></tr>
<tr><td colspan="2">No PORT 10%</td></tr>
<tr><td rowspan="2">Disease not suitable for curative therapy 20%</td><td>Palliative radiotherapy 30%</td><td colspan="2">21Gy 3f 9%
20Gy 5f 40%
27-30Gy 6f 9%
30Gy 10f 40%
14Gy 4f 1%
50Gy 20f 1%</td></tr>
<tr><td colspan="3">No radiotherapy 70%</td></tr>
</table>

	Not fit for curative therapy 20%	Palliative radiotherapy 30%		21Gy 3f 9% 20Gy 5f 40% 27-30Gy 6f 9% 30Gy 10f 40% 14Gy 4f 1% 50Gy 20f 1%
		No radiotherapy 70%		
IVC 5%	Symptomatic 50%	Fit for palliative radiotherapy 90%	Local palliative radiotherapy 60%	21Gy 3f 9% 20Gy 5f 40% 27-30Gy 6f 9% 30Gy 10f 40% 14Gy 4f 1% 50Gy 20f 1%
			Distant palliative radiotherapy 40%	8Gy single 90% 20Gy 5f 10%
		Unfit for palliative radiotherapy 10%		
	Asymptomatic 50%	No radiotherapy		

Salivary gland tumours 6%	Fit for surgery 95%	PORT 80%	60Gy 30f 14% 66Gy 33f 15% 70Gy 35f 35% 55Gy/50Gy 20f 35% 45Gy 25f 1%
		No radiotherapy 20%	
	Not fit for surgery 5%	Fit for palliative radiotherapy 80%	21Gy 3f 9% 20Gy 5f 40% 27-30Gy 6f 9% 30Gy 10f 40% 14Gy 4f 1% 50Gy 20f 1%
		No radiotherapy 20%	

Key changes from previous model:

- Changes to palliative radiotherapy regimens used
  - in the previous model: 8Gy/1f, 20Gy/5f, 27Gy/6f, 30Gy/10f
  - now: 21Gy 3f, 20Gy 5f, 27-30Gy 6f, 30Gy 10f, 14Gy 4f, 50Gy 20f 1
    - with 8Gy single and 20Gy 5f used for distant palliative radiotherapy
- oropharynx/unknown primary
  - stage I-II
    - removal of accelerated fractionation for primary radiotherapy, conventional fractionation only
    - for primary radiotherapy, increasing use of 66Gy in 33f (conventional fractionation)
  - stage III-IV
    - removal of altered fractionation for primary RT (+/- chemo)
    - changes for conventional fractionation for primary RT
      - 68Gy in 34f removed from old model
      - 65-66Gy 30f and 66Gy 33f added
  - stage IV

        - previous model – 70% of patients modelled as symptomatic, now 100%
- oral cavity and lip
    - stage I-IVB
        - PORT
            - 60Gy 30f added to conventional fractionation for patients with no adverse features
            - conventional and hypofractionated therapy classified by whether adverse features were present or absent
        - primary curative RT
            - old model
                - stratified by conventional fractionation, normo/hyperfractionation or hypofractionation
            - updated model
                - fractions included: 65Gy 30f, 55Gy 20f, 50Gy 15f (lip only)
                - multiple fractions from old model removed e.g. 68/34f, 81.2 Gy/68f (DAHANCA), 66-70Gy in 33-35f
    - stage IVc
        - palliative radiotherapy stratified by whether local or distant radiotherapy and suitable fractions included
- nasal cavity and paranasal sinuses
    - stage I-II
        - 50Gy 20f added to PORT regimens
        - 65-66Gy 30f and 66Gy 33f added to primary RT regimes. Removed stratification by conventional and hypofractionated
    - stage T3-T4b
        - PORT – removed 55Gy/20f and 70Gy/35f. Added 50Gy 20f
        - primary RT – added 54/60/65-66Gy 30f and 66Gy 33f
- nasopharyngeal
    - 65Gy 30f added to primary RT
    - distant palliative radiotherapy regimen remains unchanged, but local palliative radiotherapy regimen changed as indicated in first bullet point e.g. removal of 8Gy 1f
- glottic larynx
    - stage I-II or Tis
        - PORT no longer indicated after primary surgery (now 100% receiving no PORT, vs 90% in old model)
        - for primary RT, new model uses 100% of patients receiving hypofractionation (conventional fractionation removed).
            - hypofractionated regimens added: 55Gy 20f, 50Gy 16f, 63Gy 30f, 63Gy 30f

    - stage III-IVB
        - for disease suitable for laryngeal preservation and receiving curative RT
            - altered fractionation removed. In new model 100% of patients receiving conventional fractionation
                - removed 81.2Gy/68f, removed DAHANCA 68Gy/34f
                - addition of 66Gy 33f and 54Gy/60Gy/65Gy 30f
                - added +/- chemotherapy to decision tree alongside RT
            - PORT if not suitable for laryngeal preservation
                - now classified depending on whether adverse features present. Now subdivided into hypofractionated vs conventional fractionation
- metastatic neck nodes skin primary
    - for PORT, conventional fractionation regime changed from 70Gy/35f in old model to 60Gy 30f in updated model
- hypopharynx and supraglottic tumours
    - stage I-II
        - for primary RT, altered fractionation (normo/hyper/hypofr) removed, except 65Gy/30f which remains
        - for PORT
            - conventional fractionation 70Gy/35f removed. Other two unchanged
            - hypofractionation 65Gy/30f removed, 50Gy/20f added
    - stage III-IVB
        - for primary RT
            - conventional vs altered fractionation distinction removed
                - 54/60/65Gy 30f added
                - 72Gy/42f and 55Gy/20f removed
        - for PORT
            - conventional fractionation 70Gy/35f removed. Other two unchanged
            - hypofractionation 65Gy/30f removed, 50Gy/20f added
- salivary gland tumours
    - for PORT, 45Gy 25f added