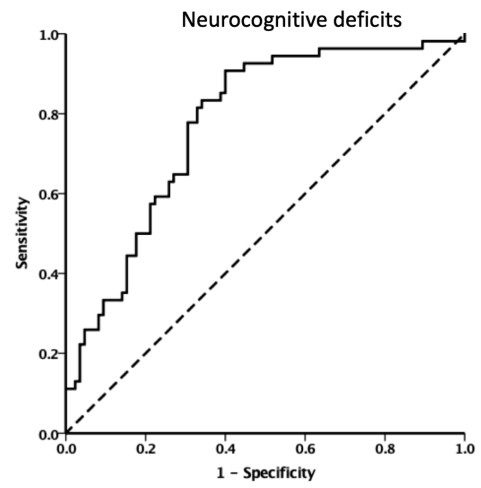
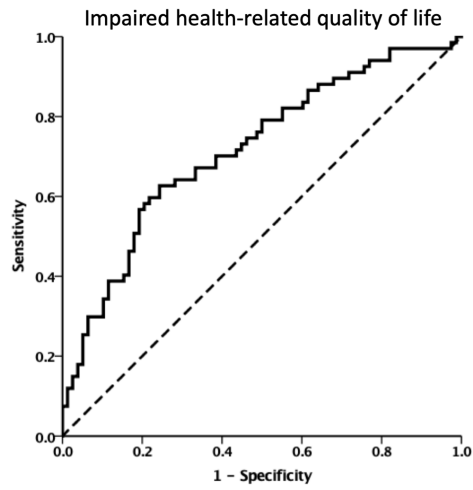


Supplementary Figure 1: Receiver Operating Curves (ROC) for the developed multivariable models and Area Under the ROC (AUC)

Model Health-related quality of life: AUC 0.717 (95%CI 0.633 to 0.801)

Model Neurocognitive deficits: AUC 0.775 (95%CI 0.696 to 0.853)



Supplementary Table 1: Health-related Quality of Life (HRQoL)

| | |
|-------------------------------------|---|
| Formula for full risk score: | $y=2.997 + (-0.003 \times \text{age in years}) + (-0.020 \times \text{largest tumor diameter before first intervention}) + (-0.826 \times \text{surgery[yes]}) + (0.655 \times \text{surgical complications[yes]}) + (0.291 \times \text{Charlson Comorbidity Index}) + (-0.849 \times \text{education level})$ |
| Explanation: | 2.997 is the intercept of the model. Largest tumor diameter before first intervention was measured in mm. Charlson comorbidity index ranges from 0 to 30). Education is classified as (1=primary/secondary, 2=tertiary vocational, 3 academic). |
| Formula for impaired HRQoL | $\text{HRQoL} = 1/1+e^{-y}$ |
| Example 1: | 80 years old patients with a skull base tumor of a maximum diameter of 44 millimetre who received surgery, with surgical complications, with a Charlson Comorbidity Index of 6, who only followed primary education: $y=2.997 + (-0.003 \times 80) + (-0.020 \times 44) + (-0.826 \times 1) + (0.655 \times 1) + (0.291 \times 6) + (-0.849 \times 1) = 2.603$ Chance for impaired HRQoL = $1/1+e^{-2.603}=93\%$ |
| Example 2: | 40 years old patients with a skull base tumor of a maximum diameter of 11 millimetre who received only surgery, without a surgical complications, with a Charlson Comorbidity Index of 2, who followed academic education: $y=2.997 + (-0.003 \times 40) + (-0.020 \times 11) + (-0.826 \times 1) + (0.655 \times 0) + (0.291 \times 2) + (-0.849 \times 3) = -0.134$ Chance for impaired HRQoL = $1/1+e^{0.134}=47\%$ |

Supplementary Table 2: Neurocognitive function

| | |
|--|--|
| Formula for full risk score: | $y = -2.212 + (0.024 \times \text{age in years}) + (0.022 \times \text{largest tumor diameter before first intervention}) + (0.979 \times \text{resection[yes]}) + (1.036 \times \text{radiotherapy[yes]}) + (-1.023 \times \text{education level}) + (0.123 \times \text{years since diagnosis})$. |
| Explanation: | 2.212 is the intercept of the model. Largest tumor diameter before first intervention was measured in mm. Education is classified as (1=primary/secondary, 2=tertiary vocational, 3 academic). |
| Formula for impaired neurocognitive function: | Impaired neurocognitive function = $1/1+e^{-y}$ |
| Example 1: | 80 years old patient with a maximum tumor diameter of 44 millimetre who was operated twice and received radiotherapy, who only followed primary education, 9 years after diagnosis: $y = -2.212 + (0.024 \times 80) + (0.022 \times 44) + (0.979 \times 1) + (1.036 \times 1) + (-1.023 \times 1) + (0.123 \times 9) = 2.775$. Chance for impaired neurocognitive function = $1/1+e^{-2.775} = 94\%$ |
| Example 2: | 40 years old patients with a maximum tumor diameter of 11 millimetre who was operated twice and who followed academic education, 9 years after diagnosis: $y = -2.212 + (0.024 \times 40) + (0.022 \times 11) + (0.979 \times 1) + (1.036 \times 0) + (-1.023 \times 3) + (0.123 \times 9) = -1.993$. Chance for impaired neurocognitive function = $1/1+e^{1.993} = 12\%$ |