# Model for Surgical Planning and Virtual Surgery for Craniofacial, Sinus, Skull Base and Neurological Surgery

**This device uses an algorithm for surgical planning by ranking surgical approaches and a combination of pathways to reach the surgical target, while reducing collateral damage. This method will be more consistent and predictable than the current method of intuition.**

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**Category**
Software/Healthcare IT
Selection of Available
Technologies

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## What is the Problem?

Surgical planning may involve identifying a surgical target or target region, and then selecting a surgical pathway to reach that surgical target. Selection of a particular surgical pathway is often based upon the access that the surgical pathway provides to the surgical target in view of the nearby anatomy. Better access to the surgical target may lead to a better surgical outcome. Another goal of surgical planning is to reduce collateral damage to the nearby anatomy. Pathway trauma might be reduced by appropriate selection of surgical pathways. However, the number of possible surgical pathways and combinations thereof is extensive. Moreover, because of the inconsistent and unpredictable nature of target pathologies, selection of an appropriate pathway or combination of pathways is often unintuitive. Therefore, a systematic approach to comparing, evaluating, and selecting between surgical approaches may improve surgical outcomes.

## What is the Solution?

This solution is a method and system that uses an algorithm for surgical planning. These methods and systems can be employed during surgical planning to assist in selection of one or more surgical approaches, and involve determining surgical-approach characteristics and surgical-pathway characteristics that can be used to rank various surgical approaches. These surgical approach rankings are achieved through computing and can aid in selecting an appropriate surgical pathway or combination of pathways for a given surgical target.

## What Differentiates it from Solutions Available Today?

Currently surgical pathway selection is often based upon intuition, with the decision based on the access that the surgical pathway provides to the surgical target with regards to the nearby anatomy. However, given the inconsistent and unpredictable nature of target pathologies and the many possible pathways, this is often unintuitive. A representation of the selected surgical

pathway or combination of pathways can be provided via an output device that may improve access to the surgical target and reduce collateral damage, among other potential benefits.

**Patent Information:**

**References**

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