

# Hedge Fund Quantitative Analyst Interview Report

Nbody Labs, Company

May 1, 2023

## 1 Interview Transcript

Below is the complete transcript of the interview. The topics covered in the interview are: Topic 1, ..., Topic n.

## 2 Technical Interview

Below are the questions and solutions generated by NBodyLabs.

### 2.1 Question #0:

**Problem:** Consider a patient with a history of facial trauma who requires corrective jaw surgery. The patient's maxilla is misaligned by 5mm to the left and 3mm downwards. The mandible is misaligned by 4mm to the right and 2mm upwards. Calculate the total horizontal and vertical displacement required for both maxilla and mandible to achieve proper alignment. Additionally, describe the potential challenges and risks in performing this corrective surgery.

**Difficulty:** Medium

**Topic:** Oral and Maxillofacial Surgery

**Reference Solution:** To calculate the total horizontal and vertical displacement required for both maxilla and mandible to achieve proper alignment, we first need to determine the individual displacements for each bone. The maxilla is misaligned by 5mm to the left (negative) and 3mm downwards (negative). The mandible is misaligned by 4mm to the right (positive) and 2mm upwards (positive). To achieve proper alignment, we need to move the maxilla to the right and upwards, and the mandible to the left and downwards. The total horizontal displacement required for both maxilla and mandible is the sum of the absolute values of their individual horizontal displacements, which is:  $|(-5)| + |(+4)| = 5 + 4 = 9\text{mm}$ . The total

vertical displacement required for both maxilla and mandible is the sum of the absolute values of their individual vertical displacements, which is:  $|(-3)| + |(+2)| = 3 + 2 = 5\text{mm}$ . Therefore, the total horizontal and vertical displacement required for both maxilla and mandible to achieve proper alignment is 9mm and 5mm, respectively. Potential challenges and risks in performing this corrective surgery include: 1) Accurate assessment of the misalignment and planning the surgical procedure to ensure proper alignment is achieved. 2) Risk of infection, bleeding, and nerve damage during the surgery. 3) Potential difficulty in achieving stable fixation of the bones after realignment, which may require the use of plates, screws, or other fixation devices. 4) Risk of post-operative complications such as malocclusion, temporomandibular joint disorders, or relapse of the misalignment. To minimize these risks, a thorough pre-operative assessment, careful surgical planning, and appropriate post-operative care and follow-up are essential.

**Grading Rubric:** {'rubric': [{'Question': 'Question Number 0', 'Rubric': [{'Category': 'Calculation of individual displacements', 'Description': "Assess the candidate's ability to calculate the individual horizontal and vertical displacements for the maxilla and mandible.", 'Score': {'0': 'Incorrect or no calculation of individual displacements.', '1': 'Partial calculation of individual displacements, with one or more errors.', '2': 'Correct calculation of individual displacements for both maxilla and mandible.'}]}, {'Category': 'Calculation of total displacements', 'Description': "Assess the candidate's ability to calculate the total horizontal and vertical displacements required for both maxilla and mandible.", 'Score': {'0': 'Incorrect or no calculation of total displacements.', '1': 'Partial calculation of total displacements, with one or more errors.', '2': 'Correct calculation of total horizontal and vertical displacements.'}]}, {'Category': 'Identification of challenges and risks', 'Description': "Assess the candidate's ability to identify potential challenges and risks associated with the corrective surgery.", 'Score': {'0': 'No or irrelevant challenges and risks identified.', '1': 'Some relevant challenges and risks identified, but not comprehensive.', '2': 'Comprehensive identification of challenges and risks related to the corrective surgery.'}]}, {'Category': 'Structured thought process', 'Description': "Assess the candidate's ability to present the solution in a clear and structured manner.", 'Score': {'0': 'Unstructured or unclear presentation of the solution.', '1': 'Partially structured presentation of the solution, with some clarity issues.', '2': 'Clear and structured presentation of the solution.'}}]}]}

**Feedback on Candidate Solution:** The candidate correctly calculated the individual horizontal and vertical displacements for the maxilla and mandible, as well as the total horizontal and vertical displacements required for proper alignment. They also provided a comprehensive identification of challenges and risks related to the corrective surgery. The presentation of the solution was clear and structured.

**Candidate Score:** 8 / 8