INTRODUCTION

The idea of the model surveyor was introduced in 1918 and the first surveyor developed specifically for use in Prosthodontics was made commercially available in 1921. There are two types of model surveyors: electronic model surveyors and mechanical model surveyors. The electronic surveyors are complicated and expensive, hence their use is restricted to research and large commercial dental laboratories.

In this unit, we will be discussing the mechanical surveyors which are relatively inexpensive and easy to use. Every dental technologist learns to use a mechanical model surveyor as a student and should continue to use one in practice when constructing removable partial dentures.

OBJECTIVES

At the end of this unit, you should be able to:

- describe a model surveyor
- name the parts of a model surveyor
- list the accessories of a model surveyor and their functions.

Description of a Model Surveyor

A model surveyor can be described as an instrument used to determine the relative parallelism of two or more surfaces of the teeth or other parts of the cast of a dental arch. It can also be referred to as a Parallel meter.
A Model Surveyor with the Accessories

3.1.1 Parts of a Model Surveyor

A mechanical model surveyor consists of the following:

- Surveying platform – It is a metal plate parallel to the floor where a cast holder can be placed. It forms the base of the surveyor onto which all the other components are attached and supported.
- Cast holder/surveying table – It is a stand placed over the surveying platform. This stand has a base and a table to place a cast.
- Vertical arm – It arises vertically from the surveying platform. It is designed to support the surveying arm at its free end.
- Horizontal arm – It extends horizontally from the top of the vertical arm, designed to support the surveying arm at its free end. It is fixed in some surveyors, while in some it can be revolved horizontally.
- Surveying arm (Chuck) – It extends vertically from the free end of the horizontal arm. It is parallel to the vertical arm and can move upward and downward. The lower end of this arm has a mandrel into which tools used for surveying can be locked in.

3.2 Model Surveyor Accessories and their Functions

These are tools attached to the mandrel of the surveying arm during different stages of surveying.

- Analysing rod – A parallel sided rod used to determine the parallelism of the tooth surfaces before marking the survey line. It is more of a diagnostic tool which helps to analyse the height of contours, the presence/absence of favourable and unfavourable undercuts for a particular path of insertion.
Carbon markers – They resemble the lead points commercially available for the micro-tip pencils. They are used to draw lines along the most bulbous area of the cast being surveyed (e.g. teeth). The resultant line formed by the carbon marker is known as a survey line.

- Undercut gauges – These are parallel sided rods with lips or heads of specific sizes used to measure the depth and location of the undercuts on the analysed tooth. Stewart states the availability of undercut gauges in three standard sizes namely, 0.010 inch, 0.015 inch and 0.020 inch while McCracken states the availability of undercut gauges at 0.010, 0.020, and 0.030 inch. All these gauges have the same shank, only the size of the tip or bead varies. The area of the tooth that matches the gauge is chosen as the undercut.

- Wax carving knives (chisel) - They can be attached to the mandrel of the surveying arm. They are used to directly trim the excess wax used in blocking-out while surveying.

- **Uses of a Model Surveyor**
  - Surveying and blocking out the master cast.
  - Contouring crowns and cast restorations.
  - Contouring wax pattern.
  - Measuring a specific depth of undercut.
  - Surveying ceramic veneers before final glazing.

- **CONCLUSION**

In this unit, you have learnt about the model surveyor, as an important device to use when constructing removable partial dentures. It is expected that by now you should be able to describe a model surveyor.

- **SUMMARY**

This unit has focused on the definition of a model surveyor, the functions of its various parts and accessories and the use of a model surveyor in general.

The next unit will highlight the principles of surveying, as a continuation of this unit.

- **TUTOR-MARKED ASSIGNMENT**
  - Describe a model surveyor.
  - Mention two (2) parts of a model surveyor.
  - Name three (3) model surveying accessories, and their functions.

**UNIT 2    PRINCIPLES OF SURVEYING**
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- Objectives
- Main Content
  - Definitions
  - Principles of Surveying
  - Techniques of Surveying
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- INTRODUCTION

A partial denture must be designed so that it can easily be inserted and removed by the patient, will be retained against reasonable dislodging forces and will have the best possible appearance. The main objective in surveying is to determine the most advantageous path of insertion bearing these principles in mind.

In unit 1, we have studied the model surveyor, its component parts, accessories and functions, Hope you enjoyed it. In this unit, we are going to learn how to use the device in surveying models for partial denture design.

- OBJECTIVES

At the end of this unit, you should be able to:

- define surveying and other related terms
- state the principles of surveying
- describe how to use a model surveyor
- classify survey line.

- MAIN CONTENT

- Definitions

Surveying can be defined as the procedure of locating or delineating the contour and position of the abutment teeth and associated structures before designing a removable partial denture.

Survey line-It is a line produced on a cast by a surveyor marking the greatest prominence of contour in relation to the planned path of placement of a restoration.
Path of insertion-It is defined as the direction in which a partial denture is placed upon and removed from the abutment. There may be a single or multiple path of insertion.

A single path of insertion may be created if sufficient guide surfaces are contacted by the denture; it is most likely to exist when bounded edentulous areas are present. Occasionally, a rotational path of insertion can be used.

Multiple paths of insertion will exist where guide surfaces are not utilised e.g. where the abutment teeth are divergent.

Path of insertion coincides with the path of withdrawal and may or may not coincide with the path of displacement.

Path of displacement-It is the direction in which the denture tends to be displaced in function. It is variable but is assumed for the purpose of design to be usually at right angles to the occlusal plane.

Guide surfaces or guide planes-Are defined as two or more vertically parallel surfaces of abutment teeth so oriented as to direct the path of placement and removal of removable partial dentures. It may occur naturally but more commonly need to be prepared.

Principles of Surveying

A thorough knowledge about surveying is essential for one to understand the designing procedure of a removable partial denture, in order to determine the part of insertion of the denture and also position/ type of components to be used in the prosthesis. Hence, surveying is done during partial denture designing, because of the following:-

← To design a removable partial denture such that it’s rigid and flexible components are appropriately positioned to obtain good retention and support.
← To determine the path of insertion of a prosthesis such that there is no interference to insertion along this path.
← To mark the height of contour of the area (hard or soft tissues) above the undercut.
← To mark the survey lines (Height of contour of a tooth).
← To locate the undesirable undercuts into which the prosthesis should not extend.
← This is a SAMPLE (Few pages have been extracted from the complete notes:-It’s meant to show you the topics covered in the full notes and as per the course outline.)
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**Call/text/whatsapp** +254 719754141/734000520

**Email:**

naarocom@gmail.com

info@naarocom.com

sales@naarocom.com

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