# IJARETY

# International Journal of Advanced Research in Education and TechnologY (IJARETY)


**Volume 11, Issue 6, November-December 2024**

**Impact Factor: 7.394**



www.ijarety.in editor.ijarety@gmail.com

International Journal of Advanced Research in Education and TechnologY(IJARETY)

| ISSN: 2394-2975 | www.ijarety.in| | Impact Factor: 7.394| A Bi-Monthly, Double-Blind Peer Reviewed & Referred Journal |

|| Volume 11, Issue 6, November-December 2024 ||

DOI:10.15680/IJARETY.2024.1106110

# Selective Pressure Impression Technique – A Minuscule Narrative Review

**Dr.LakshmanaRao.Bathala [1], Dr. K.Bhanuprasad [2], Dr.P.V.Vaibhav [3], Dr.K.Lakshmi Priyanka [4]**

Professor & HOD, Department of Prosthodontics, Lenora Institute of Dental Sciences, Rajahmundry, Andhra Pradesh, India[1]

Senior Lecturer, Department of Prosthodontics, Lenora Institute of Dental Sciences, Rajahmundry, Andhra Pradesh, India[2]

P.G. Student, Department of Prosthodontics, Lenora Institute of Dental Sciences, Rajahmundry, Andhra Pradesh, India[3,4]

**ABSTRACT**: The Selective Pressure Impression Technique is a pivotal method in prosthodontics designed to optimize the functionality and comfort of removable prostheses. By selectively applying pressure to primary stress-bearing areas while relieving delicate or non-load-bearing tissues, this technique achieves a balanced distribution of masticatory forces. The process involves the use of custom trays, selective relief methods, and dual-viscosity impression materials, ensuring precise tissue recording. Widely used in complete dentures, flabby ridge cases, and atrophic ridges, it offers numerous advantages, including improved prosthesis stability, reduced tissue trauma, and enhanced patient comfort. This technique remains a cornerstone of modern prosthodontic practice, providing predictable and durable results for diverse clinical scenarios.

## I. INTRODUCTION

The Selective Impression Technique is a method in dentistry where specific areas of the oral tissue are selectively recorded during impression-making to achieve a balanced distribution of masticatory forces. This technique is primarily used in fabricating removable dentures, especially for cases involving edentulous patients or maxillofacial prosthetics.

**Key Concepts**:
To capture the details of supportive tissues selectively, focusing on load-bearing areas while minimizing undue pressure on non-load-bearing areas or delicate tissues.

**Applications**:
Complete Dentures: To ensure support from the primary stress-bearing areas while relieving non-stress-bearing regions.
Removable Partial Dentures: To selectively engage areas with better bone support for clasp retention or bases.
Maxillofacial Prosthetics: Used in cases of deformities or surgeries where tissue resilience varies significantly.
This technique uses materials of different viscosities (e.g., low-viscosity for relieved areas, high-viscosity for load-bearing areas). Incorporates block-out or relief techniques with wax or spacers in custom trays.
Synonyms for Selective Impression Technique:
Controlled Pressure Impression Technique; Functional Impression Technique; Selective Tissue placement technique and Selective Pressure Technique. [1-4]

**I. Selective Pressure Impression Technique, its clinical application and examples**:
**1. Understanding Selective Pressure Impression Technique**
The Selective Pressure Impression Technique aims to apply controlled pressure to primary stress-bearing areas. Minimize pressure on relief or sensitive areas. Balance functional forces to optimize denture support, retention, and stability.
**Key Components**:
**Primary Stress-Bearing Areas**:
Maxilla: Horizontal plates of hard palate, maxillary tuberosities.
Mandible: Buccal shelf, retromolar pads.

| ISSN: 2394-2975 | www.ijarety.in| | Impact Factor: 7.394| A Bi-Monthly, Double-Blind Peer Reviewed & Referred Journal |

|| Volume 11, Issue 6, November-December 2024 ||

DOI:10.15680/IJARETY.2024.1106110

**Relief Areas**:
Maxilla: Incisive papilla, midline palatal suture.
Mandible: Thin ridges, mylohyoid ridge.

**2. Clinical Examples of Application**
**2A). Flabby Ridge**
Indicated in patient with hypermobile tissue in the maxillary anterior ridge. Relief wax placed over the flabby area on the custom tray. Heavy-body material (e.g., compound) applied to stress-bearing zones. Low-viscosity material (e.g., light-body PVS) for flabby areas results in minimal displacement of flabby tissue, improved stability. [5]

**2B). Severely Resorbed Mandibular Ridge**
Indicated in atrophic mandibular ridge with thin mucosa. Relief in thin mucosal areas using a spacer in the custom tray. Border molding with medium-body PVS to achieve a functional seal. Final impression using zinc oxide-eugenol for tissue adaptation which results in reduced pressure on the ridge, enhanced patient comfort. [2]

**2C). Combination Syndrome**
Indicated in maxillary anterior ridge resorption and flabby tissue due to opposing mandibular RPD. Custom tray with selective relief over anterior ridge and incisive papilla. Functional molding in posterior areas to maximize retention. Dual-viscosity impression material for accurate recording results in balanced force distribution, minimized anterior ridge trauma. [6]

**3. Materials Used in Selective Pressure Technique**
Impression Compounds: For stress-bearing areas (e.g., green stick compound).
Elastomeric Impression Materials: Polyvinyl siloxane (PVS) or polyether for functional impressions.
Zinc Oxide-Eugenol: Used as a secondary impression material for tissue adaptation. [7]

**4. Challenges in Clinical Application**
Accurate identification of stress-bearing and relief areas requires expertise. Custom tray design and material selection must be individualized for each patient. Excessive pressure or inadequate relief can compromise outcomes. [3]

**5. Modern Adaptations**
With advancements in materials and techniques, selective pressure can be enhanced using:
Digital Scanning: For precise identification of pressure zones.
CAD/CAM Fabrication: Customized tray and prosthesis design.
Soft Relining Materials: To manage pressure post-delivery. [1]

**II. Who proposed selective pressure impression technique?, it is working on which philosophy or theory :**
The Selective Pressure Impression Technique was first proposed by Dr. C.O.Boucher in the mid-20th century. This technique is rooted in the principle of selectively recording the oral tissues to optimize support, stability, and retention of the prosthesis. It is based on the "Selective Pressure Theory," which aims to balance functional stresses on the oral tissues while minimizing undue pressure on delicate or non-load-bearing areas.

**Philosophy or Theory**:
Selective Pressure Theory: This theory postulates that
Primary Stress-Bearing Areas (e.g., maxillary tuberosities, mandibular buccal shelves) should receive greater pressure to optimize load distribution and support.
Relief Areas (e.g., midline palatal suture, mandibular ridges with thin mucosa) should be relieved to prevent tissue damage or discomfort.
Peripheral Sealing Areas should ensure optimal retention by proper adaptation without overloading.
Rationale:
Based on the understanding that oral tissues vary in resilience and capacity to bear masticatory forces. Prevents over compression of delicate areas, which could lead to tissue irritation, bone resorption, or denture instability. This technique remains a cornerstone in prosthodontics due to its ability to enhance prosthesis longevity and patient comfort. [1,2, 7,8]

| ISSN: 2394-2975 | www.ijarety.in| | Impact Factor: 7.394| A Bi-Monthly, Double-Blind Peer Reviewed & Referred Journal |

|| Volume 11, Issue 6, November-December 2024 ||

DOI:10.15680/IJARETY.2024.1106110

**III. How to obtain the selective pressure impression technique**:

The Selective Pressure Impression Technique involves creating an impression that applies controlled pressure to stress-bearing areas while relieving delicate or non-stress-bearing regions. This is typically achieved using custom trays, selective spacer designs, and impression materials of varying viscosities. Here's a step-by-step approach:

**Steps to Obtain a Selective Pressure Impression**:

**Materials Commonly Used:**

Impression compounds (e.g., modeling plastic), Elastomers (e.g., polyvinyl siloxane, polyether) and Zinc oxide-eugenol paste for secondary impressions. [1-3,7]

**1. Patient Examination and Diagnosis**

Identify Stress-Bearing Areas: Evaluate and locate the primary load-bearing areas (e.g., maxillary ridges, mandibular buccal shelves).

Mark Relief Areas: Identify non-load-bearing areas (e.g., midline palatal suture, flabby tissue) for minimal pressure. [2]

**2. Preliminary Impression**

Use alginate or impression compound to capture a general impression of the edentulous ridge. Pour the impression in dental stone to obtain a diagnostic cast. [1]

**3. Custom Tray Fabrication**

Fabricate a custom tray on the diagnostic cast. Provide a spacer (1-2 mm thick) using wax or foil over relief areas (e.g., incisive papilla, rugae, thin mucosa). Extend the tray to within 2 mm of the functional sulcus. [7]

**4. Border Molding**

Apply medium or high-viscosity material (e.g., green stick compound) to the tray borders. Shape the borders by instructing the patient to perform functional movements (e.g., smiling, puckering, opening wide). Trim and refine the borders as needed. [3]

**5. Selective Pressure Application**

Remove the spacer from the tray to expose the primary stress-bearing areas (e.g., maxillary tuberosities, mandibular buccal shelves). Relief areas (e.g., midline suture) are left with space for minimal pressure. [8]

**6. Secondary Impression**

Use a dual-viscosity impression material: High-viscosity material for stress-bearing areas (e.g., impression compound, heavy-body PVS). Low-viscosity material for relief areas (e.g., light-body PVS, zinc oxide-eugenol). Seat the tray in the patient's mouth and apply uniform, controlled pressure. Ensure proper adaptation and stability during the setting of the material.[2]

**7. Evaluation of the Final Impression**

Inspect the impression to confirm: Precise recording of stress-bearing areas, minimal compression in relief areas and proper border seal for retention. [1]

**8. Cast Pouring and Denture Fabrication**

Pour the final impression in dental stone. Proceed with designing and fabricating the complete denture based on the selective impression. This step-by-step procedure ensures the prosthesis distributes masticatory forces effectively, improving comfort and minimizing tissue trauma.

**IV. Indications for selective pressure impression technique**

The Selective Pressure Impression Technique is indicated in clinical situations where differential pressure on oral tissues is required to achieve optimal support, stability, and retention of the prosthesis. Below are its main indications:

**Indications for Selective Pressure Impression Technique**:

1. Complete Dentures in Edentulous Patients

For patients with varying tissue resilience or bone support. To distribute forces optimally over stress-bearing areas while relieving non-stress-bearing areas. [2]

2. Flabby or Resilient Tissues

When the residual ridge contains hypermobile or flabby tissues, especially in the anterior maxilla. Relieving these areas prevents tissue irritation and enhances stability. [5]

3. Atrophic or Resorbed Ridges

For severely resorbed ridges, particularly in the mandible, to provide support while avoiding excessive pressure on thin mucosa. [2]

4. Cases with Uneven Ridge Morphology

| ISSN: 2394-2975 | www.ijarety.in| | Impact Factor: 7.394| A Bi-Monthly, Double-Blind Peer Reviewed & Referred Journal |

|| Volume 11, Issue 6, November-December 2024 ||

DOI:10.15680/IJARETY.2024.1106110

When the ridge has irregularities or bony undercuts, selective pressure helps record tissue evenly while avoiding trauma. [7]

5. Combination Syndrome

Patients with combination syndrome, where maxillary anterior ridge resorption is paired with lower distal extension cases, require selective pressure to avoid excessive anterior ridge pressure. [6]

6. Patients with Compromised Retention and Stability

When anatomical factors limit retention and stability, selective pressure helps achieve a functional seal and enhances denture retention. [3]

7. Maxillofacial Prosthetics

For patients with surgical defects or deformities, selective pressure helps manage soft tissue variations and irregularities. [9]

**what are the advantages of selective pressure impression technique**

The Selective Pressure Impression Technique offers several advantages that enhance the performance and comfort of prosthetic appliances, especially complete dentures. Here's a list of its benefits:

**Advantages of Selective Pressure Impression Technique**:

**1. Optimal Load Distribution**

Ensures that masticatory forces are distributed primarily over the primary stress-bearing areas, reducing trauma to less resilient tissues. This improves the longevity of the denture and reduces tissue resorption. [1]

**2. Preservation of Delicate Tissues**

Provides relief to non-stress-bearing or sensitive areas (e.g., midline palatal suture, flabby tissues), preventing irritation, ulceration, or inflammation. [5]

**3. Enhanced Stability and Retention**

Selectively compresses stress-bearing areas while ensuring a proper peripheral seal. This improves denture stability during function and retention through better suction. [3]

**4. Improved Patient Comfort**

Minimizes discomfort by preventing excessive pressure on delicate or non-resilient areas. This leads to greater patient acceptance of the prosthesis. [2]

**5. Customization to Individual Anatomy**

The technique can be tailored to each patient's unique ridge morphology and tissue characteristics, ensuring a more accurate and functional fit. [7]

**6. Reduced Bone Resorption**

By avoiding over-compression of the residual ridge, the technique helps preserve the underlying bone structure, reducing long-term ridge resorption. [8]

**7. Versatility in Challenging Cases**

Suitable for complex cases like flabby ridges, severely resorbed ridges, and combination syndrome, where a standard impression technique may fail. [6]

**8. Long-Term Prosthesis Performance**

Ensures the prosthesis maintains its fit, function, and comfort over time by preserving the health of the supporting tissues. [1]

Comparison of Intraoral Scanning and Conventional Impression Techniques: This study assessed the three-dimensional deviations between models obtained from intraoral scanning and conventional impressions. It found that restorations from intraoral scanning were more apically positioned than those from conventional techniques, suggesting potential issues with occlusal fit. [10]

Comparison of Conventional and Digital Impression Approaches for Maxillary Edentulism: This research indicated that digital impressions yielded comparable results to conventional impressions in cases of maxillary edentulism, highlighting the potential of digital methods in such scenarios. [11]

| ISSN: 2394-2975 | www.ijarety.in| | Impact Factor: 7.394| A Bi-Monthly, Double-Blind Peer Reviewed & Referred Journal |

|| Volume 11, Issue 6, November-December 2024 ||

DOI:10.15680/IJARETY.2024.1106110

Accuracy of Digital Impression Taking Using Intraoral Scanners: This study demonstrated that intraoral digital scanners provided significantly higher accuracy than conventional methods, with mean thickness of replicas being lower in the digital technique. [12]

According to Eirini Palantza and co-workers, while comparing the accuracy of full-arch conventional implant impressions using two different materials (A-silicone and polyether) to full-arch digital implant impressions produced from two intraoral scanning devices, the accuracy of full-mouth mandibular implant impressions is influenced by both the impression technique used (conventional vs. digital) and the impression material used (A-silicone vs. polyether) or the intraoral scanner used (Trios vs. Heron). [13]

As per Gamal Elkafrawy et al., the crossover study compared intraoral digital impression techniques with conventional selective pressure impression techniques for patients with flabby ridges. The findings suggested that digital impressions could be a viable alternative in such cases. [14]

Trueness of Full-Arch Dental Models Obtained by Digital and Conventional Impressions: This study aimed to compare the trueness of complete- and partial-arch impressions obtained using conventional impression materials and intraoral scanners. [15]

These studies collectively suggest that while digital impressions offer advantages in terms of accuracy and patient comfort, certain clinical situations may still benefit from conventional techniques. The choice between methods should be based on individual patient needs and specific clinical scenarios.

## II. CONCLUSION

The Selective Pressure Impression Technique is an essential approach in prosthodontics that ensures optimal force distribution, tissue preservation, and prosthetic stability. By selectively compressing primary stress-bearing areas and relieving non-load-bearing or sensitive regions, it minimizes tissue trauma and enhances the comfort and functionality of removable dentures. This technique is particularly beneficial in managing complex cases, such as flabby ridges, resorbed ridges, and maxillofacial defects, where traditional methods may fall short. Its versatility, combined with predictable clinical outcomes, underscores its enduring value in modern prosthodontic practice. As advancements in materials and techniques continue, the selective pressure approach will remain a cornerstone for achieving successful and patient-centered prosthetic solutions.

## REFERENCES

1. Zarb GA, Bolender CL, Eckert SE. "Prosthodontic Treatment for Edentulous Patients: Complete Dentures and Implant-Supported Prostheses." 13th Edition. Mosby, 2013.
2. Boucher CO. "Boucher's Prosthodontic Treatment for Edentulous Patients." 12th Edition. Mosby, 2004.
3. Jacob RF, Shalla SC. "Principles of Complete Denture Impression Making: Theories and Techniques." Journal of Prosthodontics, 1995.
4. Zafrullah K, et al. "Comparison of Selective Pressure and Mucostatic Techniques for Complete Denture Impression: A Clinical Review." Journal of Prosthetic Dentistry, 2019.
5. Lynch CD, Allen PF. "Management of the Flabby Ridge: Using Selective Impression Techniques." Dental Update, 2006.
6. Kelly E. "Changes Caused by a Mandibular Removable Partial Denture Opposing a Maxillary Complete Denture." Journal of Prosthetic Dentistry, 1972.
7. Winkler S. Essentials of Complete Denture Prosthodontics, 2nd Edition, Ishiyaku EuroAmerica, 2000.
8. Murray MD, Darvell BW. "The Evolution of Impression Techniques for Complete Dentures." Journal of Prosthodontics, 1993.
9. Taylor TD. Clinical Maxillofacial Prosthetics, Quintessence, 2000.
10. Ye-Kyu Rhee , Yoon-Hyuk Huh , Lee-Ra Cho , Chan-Jin Park. Comparison of intraoral scanning and conventional impression techniques using 3-dimensional superimposition. J Adv Prosthodont. 2015 Dec 30;7(6):460–467.
11. Sinem Kahya Karaca Kıvanc Akca. Comparison of conventional and digital impression approaches for edentulous maxilla: clinical study. BMC Oral Health 2024; 24(1378):2-9.

| ISSN: 2394-2975 | www.ijarety.in| | Impact Factor: 7.394| A Bi-Monthly, Double-Blind Peer Reviewed & Referred Journal |

|| Volume 11, Issue 6, November-December 2024 ||

DOI:10.15680/IJARETY.2024.1106110

12. Arash Zarbakhsh , Ezatollah Jalalian , Nazanin Samiei, Mohammad Hossein Mahgoli , Hadi Kaseb Ghane. Accuracy of Digital Impression Taking Using Intraoral Scanner versus the Conventional Technique. Front Dent 2021;18:26.
13. Eirini Palantza , Nikitas Sykaras, Panagiotis Zoidis, Stefanos Kourtis. In vitro comparison of accuracy between conventional and digital impression using elastomeric materials and two intra-oral scanning devices. J Esthet Restor Dent 2024; 36(8): 1179-1198.
14. Gamal Elkafrawy, Mohammed M.; Asal, Safa'a Alsayed; El-Sheikh, Ali Mohamed. Digital versus conventional impression technique for flabby ridge in complete denture construction. Tanta Dental Journal 2021; 18(4):109-113.
15. Yonca Onbasi, Sabrin Abu-Hossin, Maria Paulig, Lara Berger, Manfred Wichmann & Ragai-Edward Matta. Trueness of full-arch dental models obtained by digital and conventional impression techniques: an in vivo study. Scientific Reports 2022; 12 : 19-27.


# International Journal of Advanced Research in Education and Technology

ISSN: 2394-2975 Impact Factor: 7.394

www.ijarety.in editor.ijarety@gmail.com