



**MODERN METHODS OF IMPLANT-SUPPORTED
REHABILITATION FOR COMPLETELY EDENTULOUS PATIENTS:
ALL-ON-4, ALL-ON-6, AND THEIR CLINICAL EFFECTIVENESS**

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Annotation: *Complete edentulism is a major oral health condition that significantly impairs mastication, speech, facial esthetics, and quality of life. Conventional removable dentures often provide limited retention and stability, particularly in patients with severe alveolar bone resorption. Implant-supported full-arch rehabilitation has become the gold standard for restoring function and esthetics, offering improved comfort, chewing efficiency, and long-term clinical outcomes. Among the most widely used treatment concepts are the **All-on-4** and **All-on-6** protocols, which restore a completely edentulous arch using four or six strategically placed dental implants.*

*This review examines the clinical principles, indications, advantages, limitations, and effectiveness of the **All-on-4** and **All-on-6** treatment concepts. It compares their biomechanical characteristics, implant survival rates, prosthetic outcomes, and long-term clinical performance based on current scientific evidence. Although both protocols demonstrate implant survival rates exceeding 95% and provide predictable functional and esthetic rehabilitation, the All-on-6 concept offers superior load distribution and prosthetic stability, whereas the All-on-4 approach is less invasive, more cost-effective, and often eliminates the need for bone augmentation. The choice of treatment should be individualized according to bone quality, anatomical conditions, functional demands, and patient-specific factors.*

Keywords: *Complete edentulism, dental implants, implant-supported rehabilitation, All-on-4, All-on-6, full-arch prosthesis, immediate loading, clinical effectiveness.*



Materials and Methods: This study was designed as a comprehensive narrative review of the current scientific literature on implant-supported rehabilitation for completely edentulous patients, with particular emphasis on the **All-on-4** and **All-on-6** treatment concepts. A systematic search of the literature was performed using internationally recognized electronic databases, including **PubMed**, **Scopus**, **Google Scholar**, and the **Cochrane Library**. **Peer-reviewed** articles published primarily between **2014** and **2025** were considered to ensure the inclusion of the most recent clinical evidence and technological advancements in implant dentistry.

The literature search was conducted using combinations of the following keywords: complete edentulism, implant-supported rehabilitation, **All-on-4**, **All-on-6**, **full-arch implant prosthesis**, **immediate loading**, **implant survival**, **clinical outcomes**, **prosthetic complications**, and **digital implant dentistry**. Original clinical studies, prospective and retrospective cohort studies, randomized controlled trials, systematic reviews, and meta-analyses published in English were included. Case reports, studies with insufficient follow-up periods, duplicate publications, and articles lacking clinical outcome data were excluded.

The selected publications were critically analyzed to compare the biological, surgical, prosthetic, and biomechanical characteristics of the All-on-4 and All-on-6 protocols. Particular attention was given to implant survival and success rates, primary stability, marginal bone loss, prosthetic complications, patient satisfaction, masticatory efficiency, esthetic outcomes, immediate loading protocols, and long-term clinical performance. In addition, recent advances in digital treatment planning, cone-beam computed tomography (CBCT), computer-guided implant surgery, and CAD/CAM-based prosthetic fabrication were evaluated for their contribution to treatment accuracy and predictability.

The collected data were synthesized through qualitative comparative analysis, allowing a comprehensive evaluation of the clinical effectiveness, advantages, limitations, and indications of both treatment concepts. This



methodological approach provides an evidence-based overview of current implant rehabilitation strategies for completely edentulous patients and supports informed clinical decision-making.

Results and Discussion: The analysis of the reviewed literature demonstrated that both the **All-on-4** and **All-on-6** treatment concepts are highly effective and predictable methods for the rehabilitation of completely edentulous patients. Most clinical studies reported implant survival rates exceeding **95%**, with several long-term investigations showing survival rates of **97–99%** after 5–10 years of follow-up. These findings confirm that implant-supported full-arch rehabilitation provides reliable long-term functional and esthetic outcomes when appropriate case selection and treatment protocols are followed.

The **All-on-4** concept has proven particularly beneficial for patients with moderate alveolar bone resorption. By placing the posterior implants at an angle, clinicians can maximize the available bone volume while avoiding critical anatomical structures such as the maxillary sinus and inferior alveolar nerve. This approach often eliminates the need for bone grafting procedures, shortens treatment time, reduces surgical complexity, and lowers overall treatment costs. Immediate loading protocols associated with All-on-4 allow patients to receive a fixed provisional prosthesis on the day of surgery, resulting in rapid restoration of oral function and improved patient satisfaction.

The **All-on-6** concept demonstrated several biomechanical advantages over the All-on-4 protocol. The placement of six implants provides a broader support area for the prosthesis, resulting in more favorable stress distribution, reduced cantilever length, and decreased mechanical loading on individual implants. These factors contribute to improved prosthetic stability and may reduce the incidence of mechanical complications such as screw loosening, framework fracture, or prosthesis failure, especially in patients with high occlusal forces or parafunctional habits such as bruxism. However, the All-on-6 technique generally requires greater bone volume and involves higher treatment costs.



From a biological perspective, both treatment concepts showed minimal marginal bone loss and high rates of successful osseointegration when proper surgical techniques and maintenance protocols were applied. Peri-implant soft tissue health remained stable in most patients who maintained good oral hygiene and attended regular follow-up appointments. Nevertheless, biological complications, including peri-implant mucositis and peri-implantitis, as well as technical complications such as prosthetic wear, acrylic tooth fracture, and screw loosening, were reported in a limited number of cases, emphasizing the importance of long-term maintenance.

Patient-reported outcomes consistently indicated significant improvements in chewing efficiency, speech, facial esthetics, comfort, self-confidence, and overall oral health-related quality of life compared with conventional removable complete dentures. Advances in digital implant dentistry, including **CBCT**, computer-guided implant placement, intraoral scanning, and **CAD/CAM** technology, have further improved treatment precision, reduced surgical errors, and enhanced the long-term predictability of implant-supported prosthetic rehabilitation.

Overall, the reviewed evidence suggests that both All-on-4 and All-on-6 are clinically successful treatment options. The choice between the two protocols should be individualized according to bone quality and quantity, anatomical conditions, functional demands, systemic health, esthetic expectations, and financial considerations. While All-on-4 offers a less invasive and more economical solution with excellent clinical outcomes, All-on-6 provides superior biomechanical support and may offer greater long-term stability in selected patients.

Conclusion: Implant-supported full-arch rehabilitation using the **All-on-4 and All-on-6** concepts has become one of the most reliable and effective treatment options for completely edentulous patients. Both protocols demonstrate high implant survival rates, predictable functional outcomes, and significant improvements in mastication, speech, facial esthetics, and overall quality of life. Current scientific evidence confirms that these treatment approaches provide long-term clinical success



with relatively low complication rates when proper patient selection, precise surgical planning, and regular maintenance are ensured.

The **All-on-4** concept is a minimally invasive and cost-effective solution, particularly suitable for patients with limited bone volume or those seeking immediate functional rehabilitation without extensive bone grafting procedures. In contrast, the **All-on-6** protocol offers enhanced biomechanical stability, improved load distribution, and greater prosthetic support, making it preferable for patients with adequate bone volume and higher functional demands.

Ultimately, the selection of the appropriate treatment protocol should be based on a comprehensive clinical evaluation, including anatomical, functional, systemic, and financial factors. Continuous advances in digital implant planning, guided surgery, and prosthetic technologies are expected to further improve the predictability, safety, and long-term success of implant-supported rehabilitation for completely edentulous patients.

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