Delphi Study – Horizon 2030

Identifying and predicting future trends in implant dentistry in Europe

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Introduction

The Delphi method

The Delphi method is a widely accepted technique for collecting data relating to complex topics. It is particularly useful when there is uncertain or incomplete knowledge available. Information is gathered by a structured group of experts using a subjective-intuitive approach, and is then used to develop a long-term forecast (20–30 years) of predicted trends and outcomes. The technique was first introduced by the RAND Corporation in the 1950s following a series of studies designed to develop a method for obtaining a reliable consensus of a group of experts (Dalkey et al. 1963).

Key characteristics of the Delphi method are (Linstone et al. 1975):

- a structured group of individuals who will deal with complex problems
- systematic communication
- individual feedback
- group judgement
- interactive discussion

The method typically builds consensus by distributing surveys over two or more 'rounds'. During the first round, initial contributions from experts are collected as answers to questionnaires which had been circulated beforehand. The second round uses the results of the first round, which are presented as feedback and so allow for multiple iterations with 'controlled opinion' feedback (Woudenberg et al. 1991). Once the data from each survey is analysed, the final forecast is developed by 'direct group consensus' from a panel of selected experts. This is carried out via electronic communication, and so has the advantage of ensuring confidentiality, anonymity and geographical diversity. This method also avoids some of the usual disadvantages which arise during group discussions, where some individuals may manipulate or influence (intentionally or otherwise) specific viewpoints.

Implant therapy

Although it is still a relatively new approach for rehabilitating edentulous patients, implant therapy is a cornerstone of dental treatment. Since first being introduced around 30 years ago, the field has changed dramatically. Completely new clinical scenarios have arisen due to: increasing demand, a growing evidence base and various technological advances.

In trying to define the future of the field, it is clear that implant dentistry is moving towards more efficient professional training programmes. More material resources are being allocated and the future research roadmaps are being defined. This is clear from the 'Overview of dental implant market trends in major European economies' (Millennium Research Group, 2015). The overview describes new and potential scenarios which might arise in the dental implant market. New technologies for planning and treating cases will increase our predictability and allow clinicians to more efficiently meet the needs of patients. On the other hand, however, new issues are emerging which require more complex approaches (such as implant-related pathologies, like peri-implantitis).

> "Although it is still a relatively new approach for rehabilitating edentulous patients, implant therapy is a cornerstone of dental treatment."

Similar Delphi-based studies have been carried out in Spain (Noguerol et al. 2011) and Europe (Madianos et al. 2016) to identify and predict trends in periodontology. While these studies also explored future scenarios in implant dentistry, this was not the main focus of the study.

There are a number of questions concerning the future of implant therapy which can be answered now with already existing scientific evidence. However, many aspects of professional practice and education in the field remain unclear and cannot be answered by scientific research alone. For this reason, group-based discussion and analysis using techniques like the Delphi method are particularly effective for identifying and answering these questions.

The general goal of this study was to provide information about relevant aspects of implant therapy which remain uncertain and cannot be clarified by scientific evidence. To this end, a scenario for 2030 was established and the specific goals of the study were to identify future trends in the following areas:

- types of implant treatment demands
- types of implants
- diagnosis and planning procedures
- surgical approaches
- prosthetic protocols
- peri-implant diseases
- professional practice in implant dentistry
- education and training in dental implants

Material and methods

Study design

The Delphi methodology, which employs expert opinion to achieve consensus, was used to predict future trends in implant dentistry for the year 2030. An advisory committee was established by the European Association for Osseointegration (EAO) to define the context and timeframe of the project, prepare an initial draft questionnaire and set up the required resources. A steering committee was then established, consisting of the advisory committee plus the EAO Board of Directors. The steering committee supported the advisory committee by reviewing and validating their questionnaire, selecting experts for the panel and analysing the results (Table 1).

The finalised questionnaire was then electronically distributed to the group of experts, and answers were received after the first and second rounds. Once the answers were collected and summarised, a systematised descriptive data analysis was carried out to parse the different opinions and discern whether consensus had been achieved. Answers which reached a minimum of 65% consensus were considered 'resolved' and were not discussed further. Those which did not meet this threshold were discussed at the final consensus meeting.

Questionnaire

An open-ended questionnaire containing 60 questions was developed by the advisory committee and further approved and validated by the steering committee. The questionnaire was expected to be completed in approximately 20 minutes. It was structured according to the following sections, specifically investigating trends in:

A. Implant treatment demands and patient's implications (6 questions)
B. Implant types (11 questions)
C. Diagnostic approaches (7 questions)
D. Surgical approaches (12 questions)
E. Prosthetic approaches (6 questions)
F. Peri-implant diseases (6 questions)
G. Professional practice (9 questions)
H. Education and training (3 questions)

Three well defined options for answers were provided to all questions (except in one question, where four options were provided). A free-text box was always provided following each question, in case users wished to provide different answers or clarifications about the questions.

Selection of experts and questionnaire rounds

Experts were selected based on two main criteria:

1. Geographical area. In order to ensure representation across the five distinct models of oral healthcare in Europe (Nordic, Bismarkian, British, Southern European and Eastern European) (Widstrom & Eaton, 2004)
2. Professional profile. Experts working in universities, in hospitals in the public sector or in clinical practice in the private sector were mainly selected

Using these criteria, 138 experts were invited to participate. Those who were selected were sent an invitation to participate in the study, as well as the online address where the questionnaire should be submitted.

The questionnaire was first sent in December 2017. Once the first round of answers had been collected, an identical questionnaire was sent in January 2018 for the second round of answers. This time, those who answered in the first round were also provided a descriptive analysis of the answers from the first round. At this stage, the experts were asked to review their answers in light of the collective results from the whole panel. At that point they could either confirm or adjust their answers.

Following the convention of the Delphi method, the following consensus levels were established:

- **no consensus:** threshold of 65% was not reached after second round
- **moderate consensus:** 65%–85%
- **high consensus:** 86%–100%

Consensus conference

A consensus meeting was held in Pfäffikon, Switzerland on 7 February 2018. This was held in conjunction with the EAO's 5th Consensus Conference. During this meeting, the second-round answers to each question were presented and evaluated by the combined steering committee. Only those answers which did not reach the 65% threshold after the second round were specifically discussed during the meeting. The questions were discussed in detail until a consensus was reached among those present. At this time, a final discussion and concluding analysis of the results were carried out and the bases for the final report were established.

Data analysis

After the first and second rounds, the answers to each question were individually analysed following descriptive statistics. Data was presented as absolute values and percentages, as well as mean values and standard deviations. In addition to statistical descriptors, the experts' testimonies (and the personal observations of any experts who remained opposed to the consensus in certain questions) were included in the analysis and used for the consensus report.

The full original study was published in Clinical Oral Implant Research in May 2019, and can be found online in the Wiley online library. Copy the link https://onlinelibrary.wiley.com/doi/abs/10.1111/clr.1343 into your browser to access the publication.

Table 1: Committee composition (participants and roles)

	Advisory committee	Steering committee	Expert panel	Technical team
Initial tasks	• General project design • Select management team • Establish a timeframe • Draft initial questionnaire	• Select expert panel • Draft final questionnaire		• General support • Submit online questionnaire
First round	• Deliver and collect the questionnaire • Evaluate results	• Deliver and collect the questionnaire • Evaluate results	• Answer questionnaire	• Data analysis
Second round	• Deliver and collect second questionnaire • Evaluate results	• Deliver and collect second questionnaire • Evaluate results	• Answer questionnaire	• Data analysis
Consensus meeting	• Discuss questions which did not reach a consensus • Brainstorm	• Discuss questions which did not reach a consensus • Brainstorm		• Meeting support
Final document	• Draft final document	• Review final document		• Translation and graphic design

Advisory committee

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Steering committee

Luca Cordaro, Ronald Jung, Bjorn Klinge, Pascal Valentini, Gil Alcoforado, Turker Ornekol, Bjarni Pjetursson, Irena Sailer, Isabella Rochietta, José Manuel Navarro, Lisa Heitz-Mayfield, Helena Francisco

1

First round.

- 60 questions
- Geographical stratification
- 138 experts (100%)

2

Second round.

- Without geographical stratification
- 56 experts (47.5%)

3

Final analysis.

- Without geographical stratification
- 52 experts (44%)
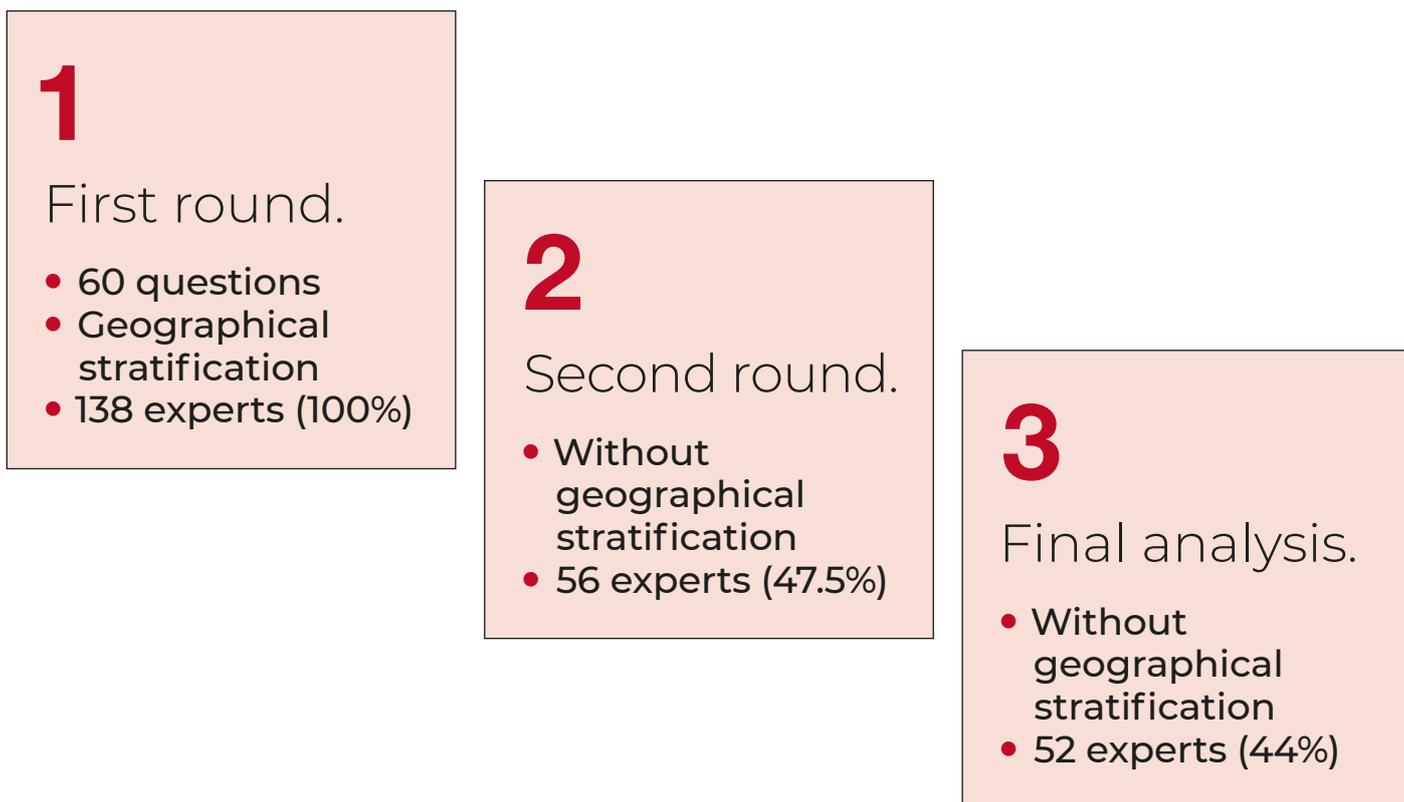
Figure 1: Design of the Delphi Project

Results and discussion

138 experts were invited to participate:

- 34 Nordic
- 36 Bismarkian
- 23 British
- 29 Southern Europe
- 16 Eastern Europe

From the invited experts, 56 (47.45%) answered the questionnaire in the first round, and 52 (44.06%) participated further in the second round.

In the first round, the established threshold for consensus (65%) was achieved in 16 questions (26%). In the second round, this threshold was reached in 49 questions (81.6%). The congruence level between both answering times was therefore multiplied by three.

The highest level of consensus in the second round was achieved in the following sections: Diagnostic procedures; Peri-implant diseases; Education and training. This was achieved in all questions. The lowest rate of correspondence was the 'Implant demand' section, where only 50% of the questions reached consensus.

A | Implant treatment demands and implant implications

A1. How do you think implant treatment demands will evolve?

A. **Increase** (36 out of 52) **69%**
B. **Be Maintained** (12 out of 52) **23%**
C. **Decrease** (4 out of 52) **8%**

Moderate consensus was reached supporting an upward trend of general demand for implant treatments. Consensus was achieved in the first round.
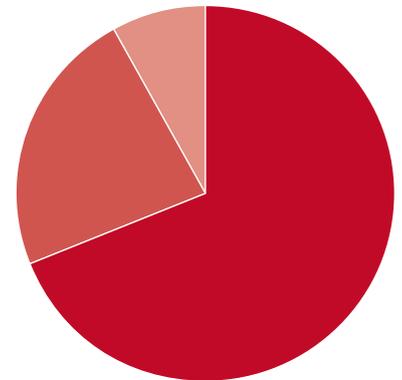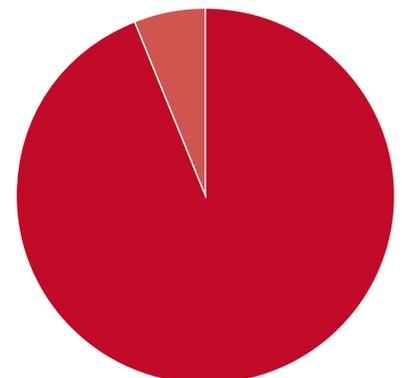
Comments

The majority of comments focused on the predicted trends in epidemiology leading to a pronounced decrease in edentulism. However, as the population ages, the cumulative rate of edentulism will increase. The difference between developed and developing societies was highlighted. In developed societies, there will be a tendency to maintain the natural dentition and hence reduce the need for dental implants. Growing economies in developing countries, however, will see a significant increase in demand for dental implants. There was also a perceived change in professionals' and patients' attitudes concerning the preservation of intact teeth. This will mean that traditional prosthetic treatments based on tooth preparations may be avoided.

A2. Treatment demands for single-tooth implants

A. **Increase** (49 out of 52) **94%**
B. **Be maintained** (3 out of 52) **6%**
C. **Decrease** (0 out of 52) **0%**

High consensus was reached regarding an increase in the use of single-tooth implants. Consensus achieved in first round.
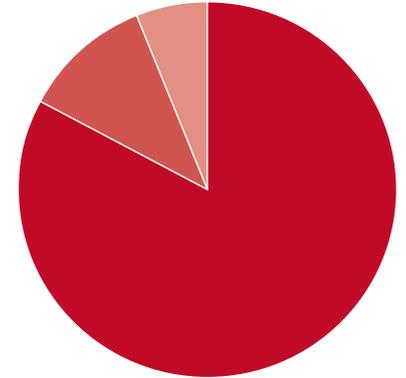
Comments

Most comments focused on the prediction that the oral health status of most of the population will improve (mainly in developed societies), where single-tooth replacements will mostly be performed with implants, not conventional FDPs.

A3. Treatment demands for short-span implant-supported fixed restorations

A. **Increase** (43 out of 52) **83%**
B. **Be maintained** (6 out of 52) **11%**
C. **Decrease** (3 out of 52) **6%**

Moderate consensus reached regarding an upward trend for partial implant treatments. Consensus was achieved in first round.

Comments

Due to improved oral health and the tendency to maintain the natural dentition, the few hopeless teeth which we do encounter will be replaced by short-term restorations with implants rather than conventional FDPs.

A4. Treatment demands for fully edentulous patients with fixed implant-supported restorations

A. **Increase** (16 out of 52) **31%**
B. **Be maintained** (10 out of 52) **19%**
C. **Decrease** (26 out of 52) **50%**
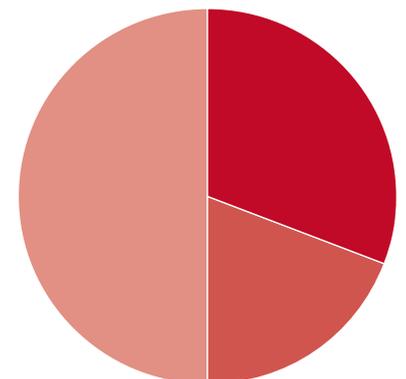
No consensus was reached regarding the evolution of the demand for full fixed implant-supported restorations. The trend favoured a decrease in demand.

Comments

Improved oral health will reduce the demand for fully edentulous restorations in the Western world, but positive economic growth will lead to an increase in the demand for implant-supported restorations for edentulous patients in other parts of the world. Overall, this will result in the levels of demand remaining the same.

Fixed solutions with fewer implants will be more popular than full fixed implant-supported restorations, due to costs and the incidence of peri-implantitis.

A5. Treatment demands for fully edentulous patients with removable implant-supported restorations (overdentures)

A. **Increase** (21 out of 52)

B. **Be maintained** (10 out of 52)

C. **Decrease** (21 out of 52)

40.5% (38% in the first round)

**19%** (23% in the first round)

40.5% (39% in the first round)
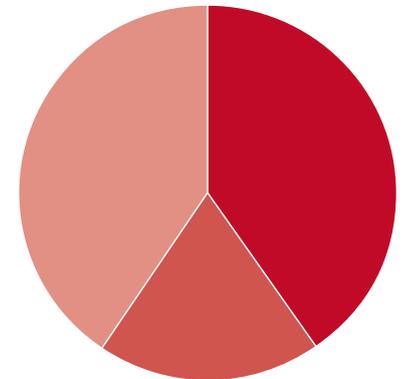
No consensus was reached concerning the evolution of the demand for full fixed implant-supported overdentures. The opinion was equally divided between an increase in demand.

Comments

Although most patients will demand fixed restorations, the affordability of overdentures will increase along with their coverage by public health systems. They will eventually replace dentures. A net increase is expected to occur in developing societies, while a decrease is expected in developed societies.

A6. Treatment demands for fully edentulous patients with fixed implant-supported restorations using a reduced number of implants (all-on-four/six)

A. **Increase** (30 out of 52)

B. **Be maintained** (9 out of 52)

C. **Decrease** (13 out of 52)

58%

17%

25%
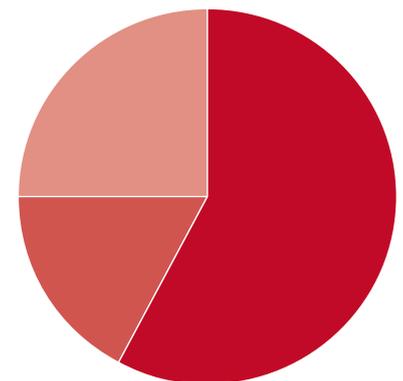
Despite no consensus being reached, there seems to be a predicted shift towards full implant-supported restorations on a smaller number of implants.
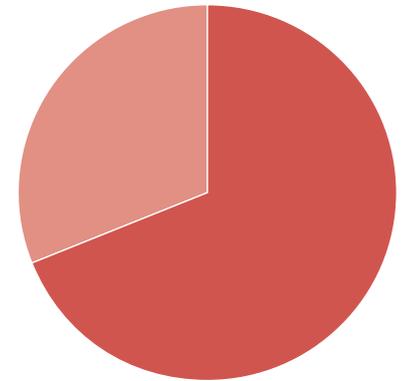
Comments

Due to the lower associated cost (compared to full implant-supported restorations), this solution will have higher demand in the future and will be extensively recommended by insurance companies and other third-party payment systems. It is also projected that as the population ages with more natural teeth, the number of edentulous patients will decrease. However, when edentulism occurs, the residual bone availability may be highly compromised and this may be the only possible solution for fixed implant restorations.

On the other hand, a high prevalence of peri-implant diseases is predicted to arise with this prosthetic solution.

B1. In regard to macro-design, what do you think dental implants will look like?

A. **Cylindrical** (0 out of 52)   **0%**

B. **Both** (36 out of 52)   **69%**

C. **Tapered** (16 out of 52)   **31%**

Moderate consensus was reached regarding macro-design. Consensus was achieved in the second round. Experts supported the existence of both cylindrical and tapered implants.
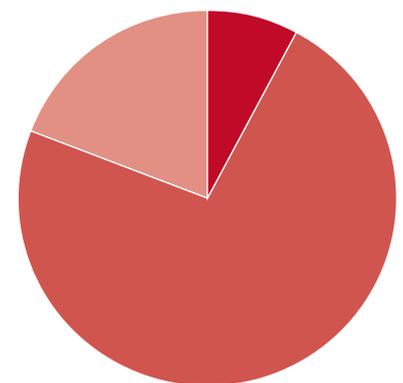
Comments

Opinion seems to favour tapered macro-designs since they facilitate the surgical procedures, although the consensus was that implants should be chosen according to the site.

B2. Regarding the design of the implant neck, what do you think dental implants will look like?

A. **Soft-tissue-level** (4 out of 52)   **8%**

B. **Both** (38 out of 52)   **73%**

C. **Bone-level** (10 out of 52)   **19%**

Moderate consensus was reached about implant neck placement. Consensus was achieved in the second round. Experts supported the existence of both soft-tissue-level and bone-level implants.
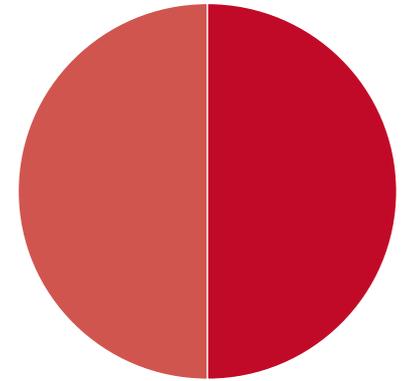
Comments

Due to higher demand for aesthetic results, bone-level implants will be the preferred design. However, due to the high prevalence of peri-implant diseases, tissue-level implants will still have a clear role in posterior regions.

B3. In regard to the length of the implant, how do you think dental implants will look?

A. **Shorter** (26 out of 52)   ■ **50%**
B. **Similar to today** (26 out of 52)   ■ **50%**
C. **Longer** (0 out of 52)   ■ **0%**

No consensus was reached regarding implant length for the 2030 forecast. The experts' opinion was evenly divided (50%) between shorter implants and implant lengths similar to today. No-one believed that implants would be longer.

Comments

There will be a need for both short and long implants since the mechanical requirements for long-lasting and durable restorations will not change. Shorter implants will be needed in sites where there is reduced bone support, mainly because the number of implant replacements will likely increase due to the high prevalence of peri-implantitis.

B4. In regard to the diameter of the implant, what do you think dental implants will look like?

A. **Narrower** (19 out of 52)   ■ **36.5%**
B. **Similar to today** (33 out of 52)   ■ **63.5%**
C. **Wider** (0 out of 52)   ■ **0%**
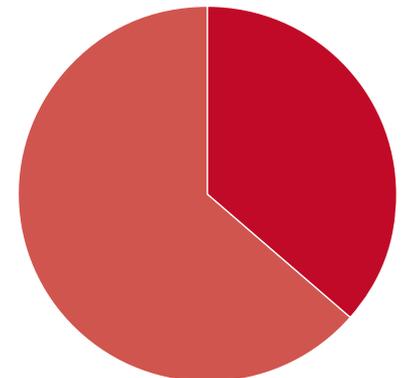
No consensus was reached regarding the evolution of implant diameter. Most experts believed that the current situation would be maintained. The use of wider implants was disregarded.

Comments

Stable marginal bone levels have been demonstrated with both narrow and wide implants, although the mechanical requirements for long-lasting and strong restorations will not change. While stronger alloys appear to offset the mechanical demands of narrower implants, there is no clear indication whether the alveolar process allows for standard implants. The choice will be based on an individual basis.

B5. Regarding the number of implants used to replace chewing units, what do you think the tendency will be?

A. **More implants per chewing unit** (0 out of 52)   **0%**

B. **Similar to today** (15 out of 52)   **29%**

C. **Fewer implants per chewing** (37 out of 52)   **71%**
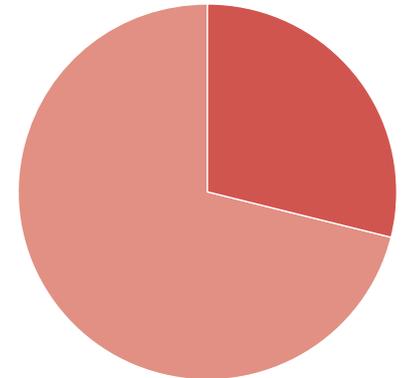
There was moderate consensus regarding the number of implants per chewing unit. Consensus was reached in the second round. Experts felt that fewer implants would be needed per chewing unit. Increasing the number of implants was not supported by any expert.

Comments

Stronger alloys will allow fewer implants per chewing units.

B6. In regard to the material which dental implants are made of, what do you think the trend will be?

A. **Titanium** (15 out of 52)   **29%**

B. **Both** (36 out of 52)   **69%**

C. **Ceramic** (1 out of 52)   **2%**
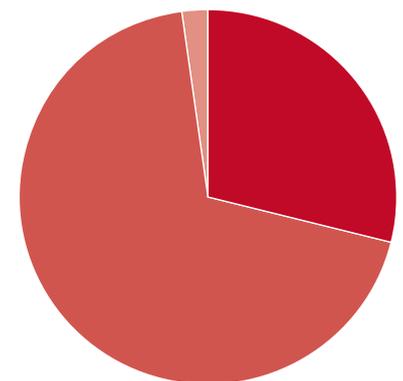
Moderate consensus was reached regarding the manufacturing material of implants. Consensus was achieved in the second round. Experts supported the use of both titanium and ceramic implants in the 2030 forecast. The option of all-ceramic implants received little support (2%).

Comments

Although titanium has demonstrated superior biological qualities and mechanical strength, demand for non-metal implants will increase due to aesthetic or environmentally-driven choices. Hence there will be need for both.

B7. In regard to the material which dental implant surfaces are made of, what do you think the trend will be?

A. **Bioactive surfaces** (44 out of 52)   **85%**
B. **Similar to today** (8 out of 52)   **15%**
C. **Inert surfaces** (0 out of 52)   **0%**
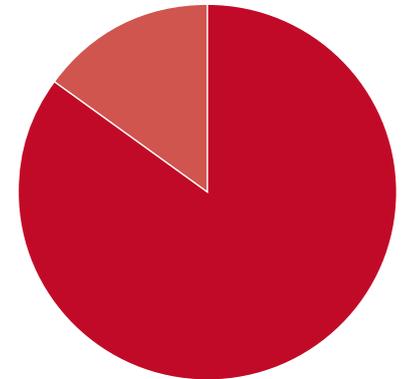
There was moderate consensus about implant surfaces. Consensus was reached in the first round; the majority of experts supported bioactive surfaces.

Comments

New technologies are expected to develop effective bioactive surfaces which will enhance osseointegration and reduce bacterial colonisation.

B8. Regarding the micro-topography of implant surfaces, what do you think the trend will be?

A. **Reduced roughness** (30 out of 52)   **58%**
B. **Similar to today** (21 out of 52)   **40%**
C. **Increased roughness** (1 out of 52)   **2%**
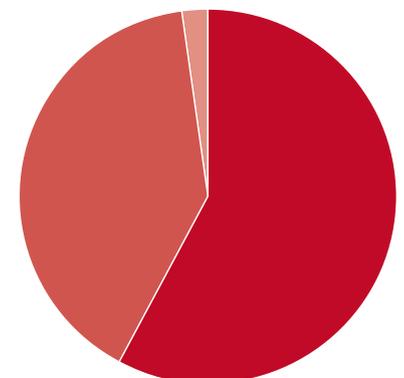
No consensus was reached regarding the expected roughness of implant surfaces. It seems, however, that in the future the roughness of micro-topography will tend to be similar to or less than today's.
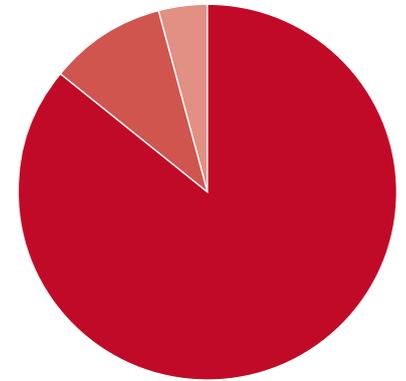
Comments

There are conflicting opinions about the ideal micro-topography for attaining optimal osseointegration (rougher surfaces) and for reducing plaque accumulation when exposed (smoother surfaces). It seems that customised implants are needed, with the choice of surface topography depending on the patient's individual risk factors, site anatomy, and so on.

B9. **In regard to the connection between implants and abutments, what do you think the trend will be?**

A. **Internal connection** (45 out of 52)   **86%**

B. **Both** (5 out of 52)   **10%**

C. **External connection** (2 out of 52)   **4%**

High consensus was reached regarding the type of connections which will be used in 2030, generally supporting the use of internal connections. Consensus achieved in the first round.
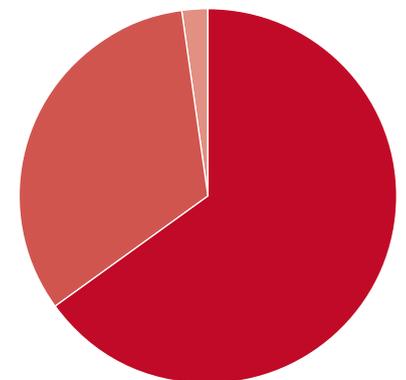
Comments

There is clear evidence supporting the biological and mechanical advantages of using internal connections.

B10. **In regard to the design of the abutments, what do you think the trend will be?**

A. **Customised** (34 out of 52)   **65%**

B. **Both** (17 out of 52)   **33%**

C. **Standard** (1 out of 52)   **2%**

Consensus on the abutment design was achieved in the second round. Moderate consensus supported the use of customised abutments.
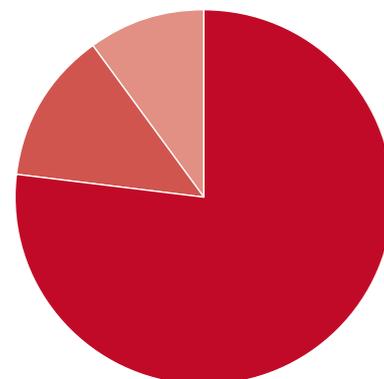
Comments

While customised abutments will be predominantly used in the aesthetic zone, standard abutments will still be used (or preferred) in posterior areas.

B11. In regard to the micro-topography of the abutment surface, what do you think the trend will be?

A. **Polished** (40 out of 52)　　　77%

B. **Both** (7 out of 52)　　　13%

C. **Textured** (5 out of 52)　　　10%

There was moderate consensus supporting polished abutment surfaces in the second round concerning micro-topography.

Comments

While textured abutments may improve the biological attachment of peri-implant tissues, they also encourage bacterial colonisation. The prevention of peri-implant diseases should be a priority in the future, and so the majority of experts supported polished abutment surfaces.

C1. How do you think we will make pre-surgical implant diagnoses in the majority of cases?

A. **3D CBCT** (42 out of 52) **81%**
B. **Standard radiography** (6 out of 52) **11%**
C. **Non-ionising imaging techniques** (4 out of 52) **8%**
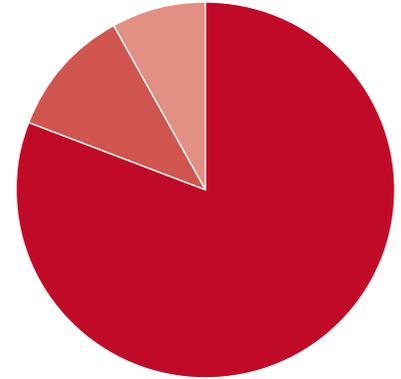
The consensus was that 3D CBCT would be the preferred method for pre-surgical implant diagnosis. Moderate consensus was achieved in the first round.

Comments

New technologies should develop 3D CBCT technologies with improved accuracy and lower levels of radiation.

C2. Do you believe 3D-CBCT analysis will be generalised for pre-surgical implant diagnosis?

A. **Yes, since radiation doses will decrease** (42 out of 52) **81%**
B. **Both 2D and 3D analysis will be used, similar to today** (8 out of 52) **15%**
C. **No, since most procedures can be done with standard 2D x-rays** (2 out of 52) **4%**
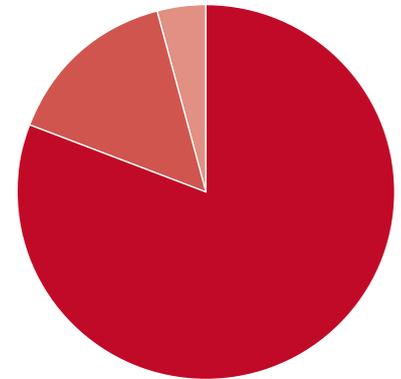
The consensus was that 3D-CBCT analysis would become the preferred method, because of the anticipated reduction in radiation doses. Moderate consensus was achieved in the first round.

Comments

It is expected that 3D CBCT will become more affordable and with less radiation, which will allow it to be used more extensively.

C | Diagnosis procedures

C3. **Do you believe that peri-implant bone-level stability will be measured by the changes at interproximal crestal bone levels on peri-apical radiographs?**

A. **Yes, since sensitivity for small changes will improve** (4 out of 52)
B. **The standard system and innovations will be used in a similar way** (15 out of 52)
C. **No, since there will be sensitive methods for evaluating buccal bone changes** (33 out of 52)

8%
29%
63%
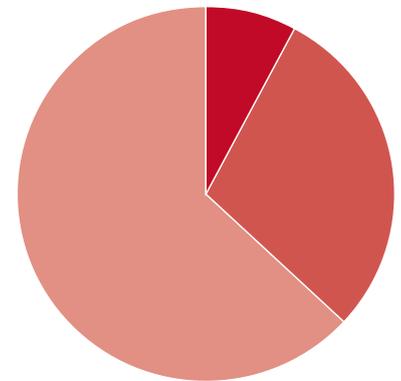
No consensus was reached supporting the use of peri-apical radiographs to assess bone stability, although there seems to be a belief that more sensitive methods will be available for this.

Comments

Other methods should be developed to allow accurate assessment not only of interproximal sites, but also of buccal and lingual aspects.

C4. **Do you believe that peri-implant tissue health and disease will be measured by means of probing in future?**

A. **Yes, since sensitivity for small changes will improve** (1 out of 52)
B. **Probing will be used together with innovative methodologies** (42 out of 52)
C. **No since there will be sensitive methods for evaluating soft tissues without probing** (9 out of 52)

2%
81%
17%
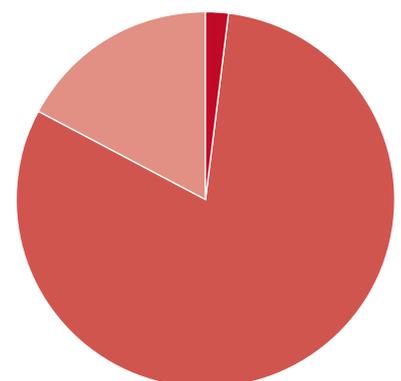
Moderate consensus was reached supporting the belief that probing will be used with other innovative methodologies to measure peri-implant tissue health. Consensus was achieved in the first round.

Comments

Other methods should be developed to detect inflammatory changes in the peri-implant tissues and bone-level changes. However, probing is still the most sensitive method for detecting inflammation through bleeding on probing.

C5. **Do you believe that the use of biomarkers in peri-implant tissue fluid will be part of standard diagnostic procedures to assess tissue health and disease?**

A. **Yes, since their sensitivity and specificity will improve** (35 out of 52)
B. **It will be part of a common research parameter, but not used in clinics** (12 out of 52)
C. **No, since the information provided does not change the treatment plan** (5 out of 52)

67%

23%

10%
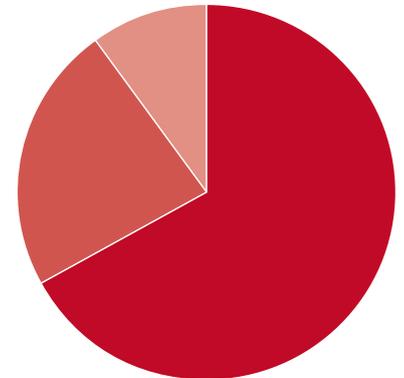
Moderate consensus was reached about the question whether biomarkers in peri-implant tissue fluid will become part of the standard diagnostic process. The general belief was that they will improve specificity in early diagnoses of peri-implant diseases. Consensus was achieved in the second round.

**C6.** **Do you believe that direct digital restorative diagnoses will replace standard diagnostic procedures?**

A. **Yes, since they will be more applicable and costs will be reduced** (46 out of 52)
B. **It will be only one part of more sophisticated implant practices, but will not be generalised** (6 out of 52)
C. **No, since it does not provide more information than what we get with standard diagnoses** (0 out of 52)

88%

12%

0%
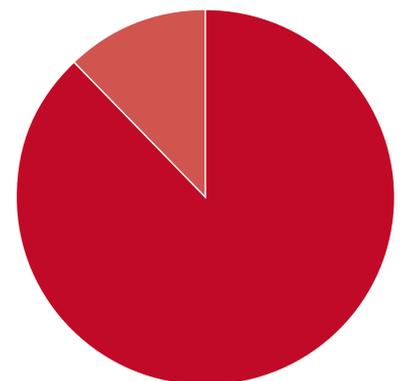
There was moderate consensus that digital restorative procedures will replace standard diagnoses. Consensus achieved in the first round.

C7. **Do you believe that digital impressions will be used as routine procedures, or will conventional impressions remain the standard for treatment planning purposes?**

A. **Digital impressions as the standard** (43 out of 52) **83%**

B. **Both the same** (9 out of 52) **17%**

C. **Conventional impressions as the standard** (0 out of 52) **0%**
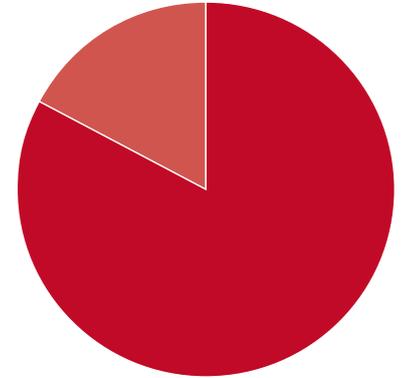
There was moderate consensus on digital impressions becoming the standard in treatment planning. Consensus was achieved in the first round.

D1. Do you believe that in the future implant placement will be mainly:

A. **Fully guided** (4 out of 52)   **8%**
B. **Guide oriented** (44 out of 52)   **84%**
C. **'Brain' guided** (4 out of 52)   **8%**

The consensus was that placement will be guide-oriented using splints, but not fully guided. Moderate consensus was achieved in the first round.
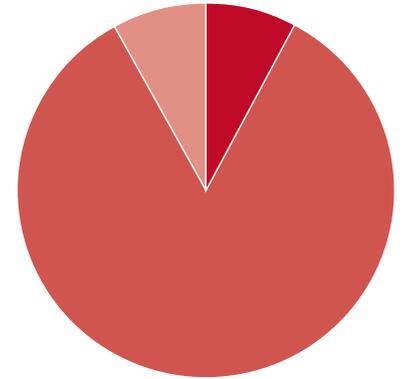
Comments

It will be most likely that fully guided methods will be used in complex cases, but the majority of cases will use guide-oriented placement. Most dentists will have 3D printer technology available to them for constructing their own guides which will make this technology more affordable.

D2. Do you believe that dynamic navigation will be:

A. **Used routinely** (5 out of 52)   **10%**
B. **Only in select cases** (38 out of 52)   **73%**
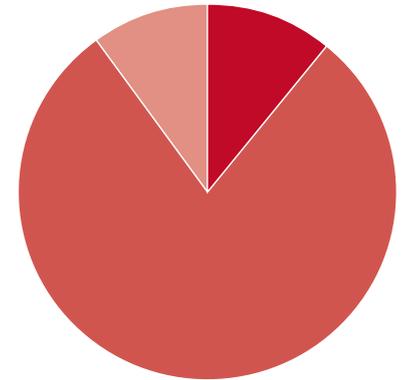C. **Seldom used** (9 out of 52)   **17%**

Moderate consensus was reached regarding the application of surgical navigation systems: it will likely only be used in certain cases. Consensus achieved in the second round.
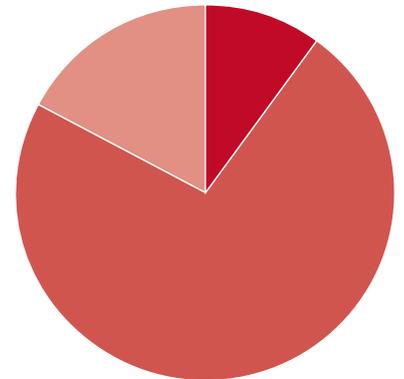
D3. Do you believe future flapless surgery will be:

A. **The standard, when feasible** (6 out of 52) **11%**
B. **Only in select cases** (41 out of 52) **79%**
C. **Seldom used** (5 out of 52) **10%**

There was moderate consensus about the use of flapless surgery, and on the whole it was agreed that it would be used in select cases. Consensus was achieved in the second round.

D4. Do you believe ridge preservation approaches will be:

A. **More frequent** (39 out of 52) **75%**
B. **Similar** (11 out of 52) **21%**
C. **Less frequent** (2 out of 52) **4%**
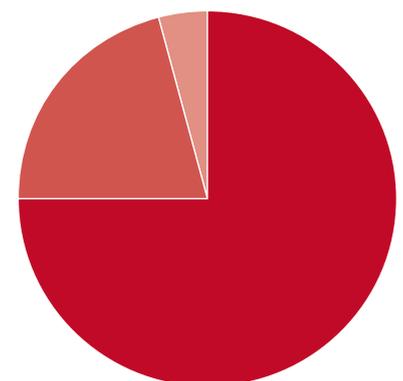
Moderate consensus that ridge preservation procedures will be used more frequently in the 2030 forecast. Consensus was achieved in the second round.
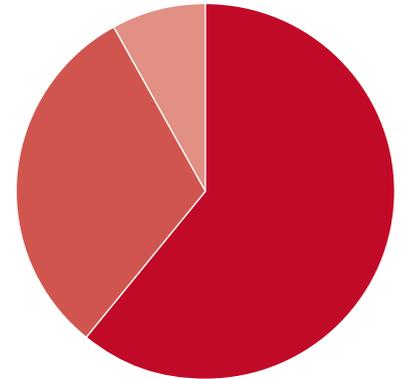
Comments

More predictable bio-materials and techniques for ridge preservation will be developed in future.

D5. Do you believe immediate implant placement after tooth extraction will be used:

A. **More frequently** (32 out of 52) **61%**

B. **Similarly** (16 out of 52) **31%**

C. **Less frequently** (4 out of 52) **8%**

No consensus was reached regarding the future trend for immediate implant placement.

Regardless, after reviewing the outcomes, the expert panel concluded that immediate placement will either be used more frequently or remain largely the same. The least likely scenario was that the procedure would be used less frequently.
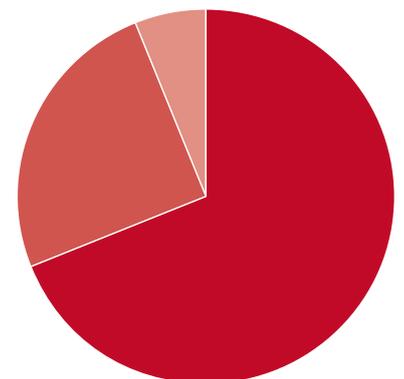
Comments

Since more teeth are expected to be maintained in the future, the presence of residual bone will decrease. Because of this, immediate implant placement will be less predictable. However, the easiness of the technique and its clear advantages for the patient will still make the protocol very popular.

D6. Do you believe the use of implant placement with simultaneous bone regeneration will be:

A. **More frequent** (36 out of 52) **69%**

B. **Similar** (13 out of 52) **25%**

C. **Less frequent** (3 out of 52) **6%**

There was moderate consensus that the use of implant placement with simultaneous bone regeneration will be more frequent. Consensus was achieved in the second round.
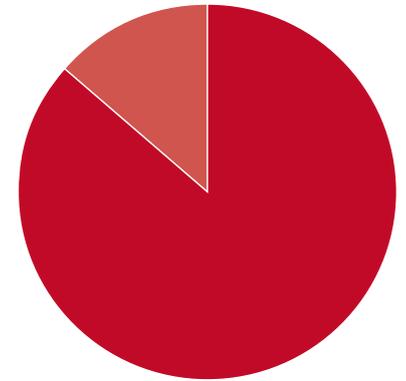
Comments

More teeth are expected to be maintained in the future, so the presence of residual bone will decrease and the need for bone regeneration will increase. Furthermore, improved bone regeneration materials will mean that simultaneous implant placement will be used more frequently.

D7.   Do you believe implant placement with simultaneous soft tissue reconstruction will be:

A. **More frequent** (45 out of 52)   ▮ **86.5%**

B. **Similar** (7 out of 52)   ▮ **13.5%**

C. **Less frequent** (0 out of 52)   ▮ **0%**

High consensus that implant placement with simultaneous soft tissue reconstruction will be used more frequently. Consensus achieved in the first round.

Comments

The improvement of the surgical techniques and the advent of more predictable bio-materials for increasing soft-tissue thickness will increase the demand for these surgical protocols. This will also be driven by higher aesthetic demands from patients striving for more ambitious outcomes.

D8.   Do you believe implant placement after staged bone regeneration will be used:

A. **More frequently** (4 out of 52)   ▮ **8%**

B. **Similarly** (38 out of 52)   ▮ **73%**

C. **Less frequently** (10 out of 52)   ▮ **19%**
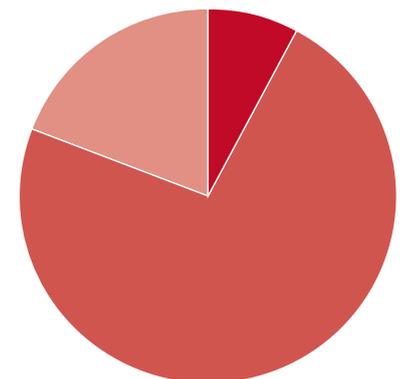
There was moderate consensus supporting the view that implant placement after staged bone regeneration will be used at a similar frequency to today. Consensus was achieved in the second round.
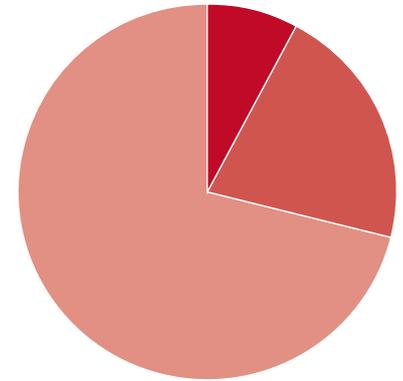
Comments

Although the tendency for maintaining the natural dentition will reduce the prevalence of long-term edentulousness, the higher incidence of peri-implantitis and dental implant replacement following implant loss will increase the need for major regenerative interventions.

D9. Do you believe vertical bone regenerative procedures using bone blocks will be:

A. **More frequent** (4 out of 52) **8%**

B. **Similar** (11 out of 52) **21%**

C. **Less frequent** (37 out of 52) **71%**

There was moderate consensus that there would be less frequent use of vertical bone regenerative procedures using bone blocks in the future. Consensus was achieved in the second round.
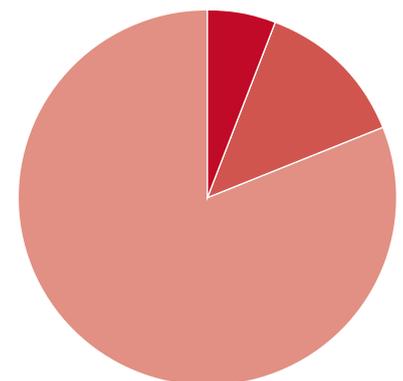
Comments

The trend in favour of maintaining natural dentition will mean lower rates of long-term edentulousness but higher rates of peri-implantitis and dental implant replacement after implant loss. This will in turn increase the need for major regenerative interventions. Furthermore, improved regenerative technologies and surgical techniques will result in these procedures being performed more extensively.

D10. Do you think the use of zygomatic implants for the treatment of the atrophic maxilla will be:

A. **More frequent** (3 out of 52) **6%**

B. **Similar** (7 out of 52) **13%**

C. **Less frequent** (42 out of 52) **81%**

Moderate consensus was reached about the use of zygomatic implants: these implants will be used less frequently than they are now. Consensus was achieved in the first round.
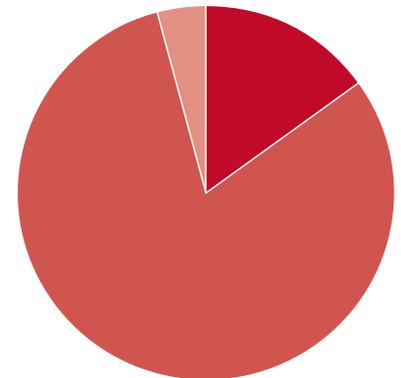
Comments

The continuous development of improved dental implants and regenerative technologies will reduce the need for aggressive approaches such as zygomatic implants.

D | Surgical protocols

D11. What do you think future regenerative technologies will be based on?

A. **Biomaterials with cell therapies** (8 out of 52)   ■ **15%**
B. **Biomaterials with biologics** (42 out of 52)   ■ **81%**
C. **Biomaterials alone** (2 out of 52)   ■ **4%**

There was moderate consensus that future regenerative technologies will be based on biomaterials and biological products. Consensus achieved in the second round.

Comments

There is an expectation that effective biomaterials and biologics which may be used in combination will be developed for improved outcomes.

D12. What do you think will be the standard material for bone replacement grafts?

A. **Autologous** (1 out of 52)   ■ **2%**
B. **Allogeneic** (2 out of 52)   ■ **4%**
C. **Xenogeneic** (27 out of 52)   ■ **52%**
D. **Synthetic** (22 out of 52)   ■ **42%**
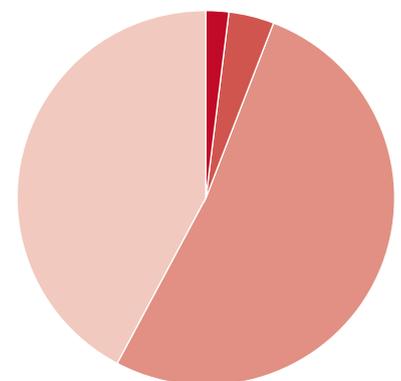
No consensus was reached about which bone replacement graft will be used as the standard material. It should be noted that synthetic and xenogeneic materials seem to be favoured over allogeneic and autologous grafts.
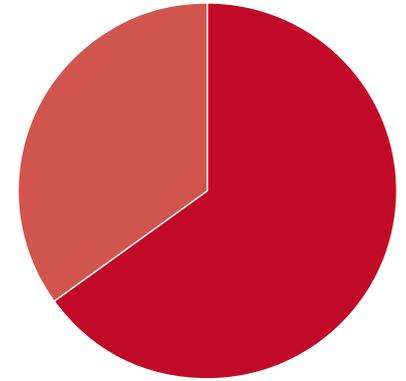
Comments

While it is anticipated that biomaterials for bone replacement will be largely synthetic in future, these are currently not as predictable as xenogeneic bone replacement grafts. The general thinking is that both will be used in future.

E1. Do you believe immediate loading protocols will be performed:

A. **More frequently** (34 out of 52) **65%**
B. **Similarly** (18 out of 52) **35%**
C. **Less frequently** (0 out of 52) **0%**

The consensus was that immediate loading protocols will be used more frequently than they are at present. Moderate consensus was achieved in the second round.

Comments

While there are expectations that future implant developments will improve the predictability of implant loading protocols, the majority of patients will still be treated using delayed protocols, although non-loading times will be reduced.

E2. What will the trend for prosthesis fixation be?

A. **Screw-retained** (45 out of 52) **87%**
B. **Both** (7 out of 52) **13%**
C. **Cemented** (0 out of 52) **0%**

There was a high consensus that screw-retained restorations will be preferred to cemented restorations. Consensus was achieved in the first round.
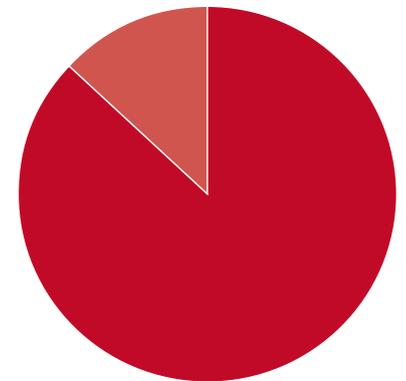
Comments

Screw retention has major advantages compared to approaches using cement. Furthermore, improvements to components will make screw-retention even more preferable.

E3. What will the preferred method for impressions be?

A. **Fully digital** (47 out of 52) ▮ 90%
B. **Both** (5 out of 52) ▮ 10%
C. **Analogue** (0 out of 52) ▮ 0%

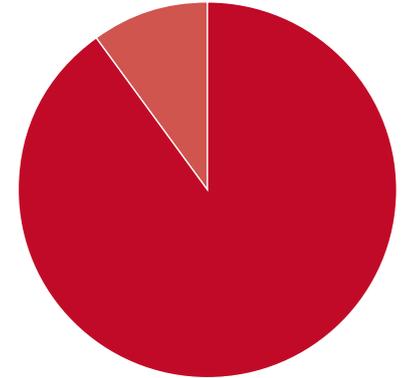High consensus was reached that fully digital impressions would be use for prostheses. Consensus was achieved in the first round.

Comments

This technology is already used widely and with great success. Further software and instrument developments will make this technology even more ubiquitous in future.

E4. In restorations based on a covered structure, how will the prosthetic framework be made?

A. **Digitally milled** (9 out of 52) ▮ **17%**
B. **Analogue milled** (0 out of 52) ▮ **0%**
C. **Digital 3D printed** (43 out of 52) ▮ **83%**
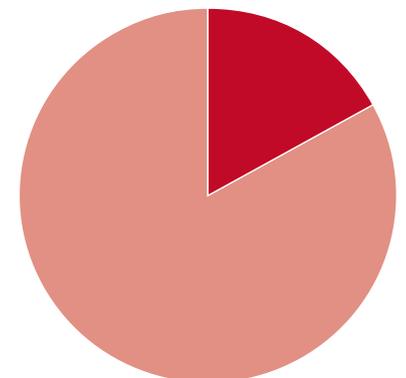
There was moderate consensus about digital 3D printing versus digital or analogue milling for manufacturing prosthetic frameworks. Consensus achieved in the second round.

Comments

Digital 3D printing is a promising technology, but its applications for making prosthetic frameworks will depend on the development of 3D printable materials with suitable qualities.

E5.   In restorations based on a covered structure, what will the preferred covering material be?

A. **Ceramic** (7 out of 52)   **13%**

B. **Hybrid materials** (45 out of 52)   **87%**

C. **Composite** (0 out of 52)   **0%**

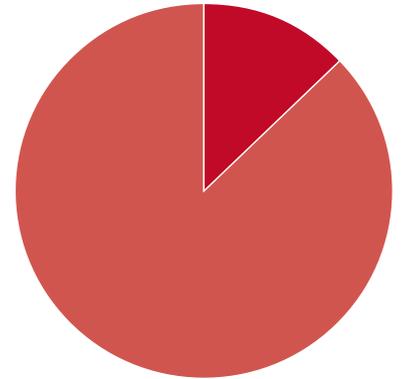There was a high consensus that hybrid covering materials (ceramic and composite) would be used for prosthetic frameworks. Consensus was achieved in the first round.

E6.   Under normal circumstances, what would be the expected longevity of implant treatments without complications?

A. **Less than 10 years** (3 out of 52)   **6%**

B. **10–20 years** (42 out of 52)   **81%**

C. **More than 20 years** (7 out of 52)   **13%**

There was moderate consensus that the expected average complication-free longevity of implants will range between 10 and 20 years. Consensus was achieved in the second round.
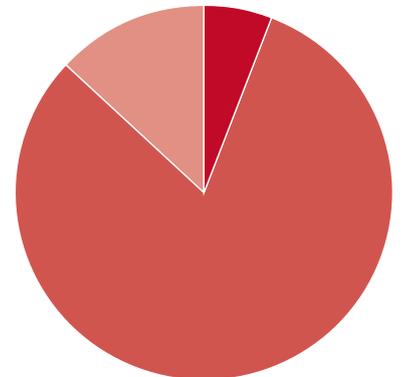
Comments

Expected improvements in diagnostic, surgical and prosthetic protocols – as well as materials – will hopefully increase the durability of implant-supported restorations continuously over the course of 20+ years. However, the high prevalence of peri-implant diseases and implant-related technical complications at present make this prediction uncertain.

F | Peri-implant diseases

F1. The prevalence of peri–implantitis will:

A. **Increase** (39 out of 52) ▮ **75%**
B. **Be similar** (12 out of 52) ▮ **23%**
C. **Decrease** (1 out of 52) ▮ **2%**

Moderate consensus was reached that there will be an increased prevalence of peri-implantitis. Consensus achieved in the second round.

Comments
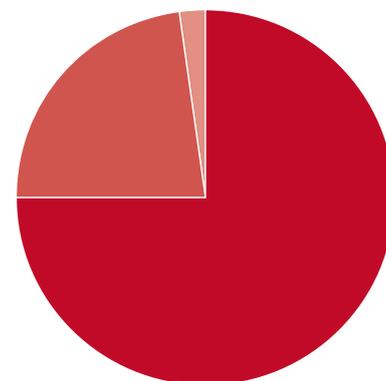
As the use of dental implants becomes more widespread, it is expected that more general dentists will use this mode of therapy. With this, there is a chance that they will have less education and training, which may increase the number of complications (with peri-implantitis as the most frequent). Additionally, more patients will have implants, which will also increase the prevalence of peri-implantitis.

On the other hand, the development of improved implant materials with antimicrobial properties may help in reducing the prevalence.

F2. The treatment of peri–implantitis will be mainly:

A. **Non-surgical** (2 out of 52) ▮ **4%**
B. **Both** (45 out of 52) ▮ **86%**
C. **Surgical** (5 out of 52) ▮ **10%**
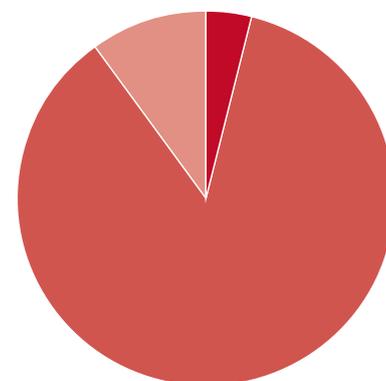
There was high consensus concerning how peri-implantitis would be treated in the 2030 scenario. Treatment will likely be a combination of surgical and non-surgical approaches. This consensus was achieved in the first round.

Comments

New treatment modalities are expected to emerge for effective non-surgical treatment of peri-implantitis. On the other hand, new and predictable regenerative approaches will allow for more reconstructive therapies, which will increase the number of surgical treatments of peri-implantitis.

F3.   The surgical treatment of peri-implantitis will be mainly:

A. **Resective** (4 out of 52)   **8%**

B. **Both** (44 out of 52)   **84%**

C. **Regenerative** (4 out of 52)   **8%**
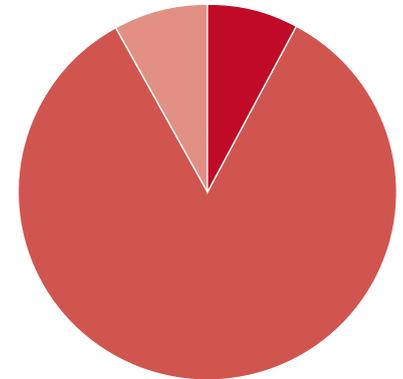
There was moderate consensus on the surgical treatment of peri-implantitis: both surgical and non-surgical approaches will be used. Consensus was achieved in the second round.

F4.   The non-surgical treatment of peri-implantitis will be mainly:

A. **Pharmacological** (2 out of 52)   **4%**

B. **Both** (48 out of 52)   **92%**

C. **Mechanical** (2 out of 52)   **4%**
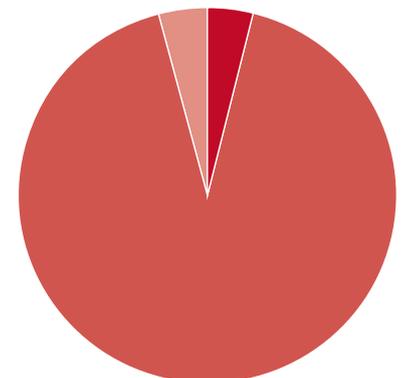
There was a high consensus supporting non-surgical treatments for peri-implantitis which combine mechanical and pharmacological strategies. Consensus was achieved in the first round.

F5.   Will preventive interventions for peri-implant diseases be effective?

A. **Yes** (44 out of 52)   **85%**

B. **Similar to today** (7 out of 52)   **13%**

C. **No** (1 out of 52)   **2%**
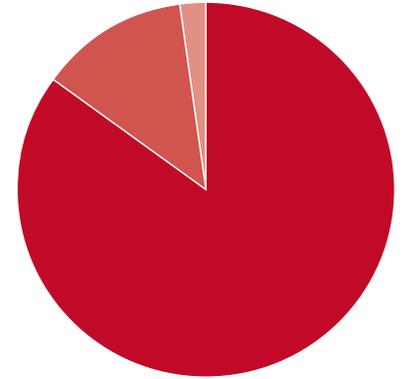
Moderate consensus was reached regarding the efficacy of preventive interventions for peri-implantitis. It was agreed that interventions will be more efficient than they are at present. Consensus was achieved in the second round.

Comments

It will be important to educate and train future dentists in preventive measures in implant dentistry, as well as in early detection of biological complications.

F6.   By what means will prevention and treatment of peri-implant diseases be achieved?

A. **Anti-infective implant and abutment materials** (14 out of 52)   **27%**

B. **Improving patients' behaviour/hygiene** (38 out of 52)   **73%**

C. **More effective antimicrobial therapies** (0 out of 52)   **0%**
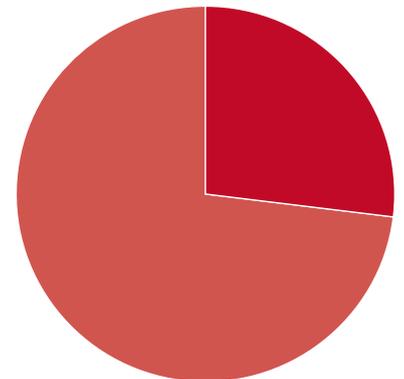
There was moderate consensus surrounding the most effective method for preventing peri-implantitis, which was agreed to be improving patients' hygienic behaviour. Consensus achieved in the second round.

Comments

Even though new implant materials (particularly abutment materials with anti-infective properties) will be developed, preventive measures will largely depend on the patient's behaviour and whether effective oral hygiene measures are undertaken.

G1. Implant surgery will be performed mainly by:

A. **General dentists** (10 out of 52)   **19%**

B. **Both** (37 out of 52)   **71%**

C. **Specialists** (5 out of 52)   **10%**

Moderate consensus was reached that implant surgery will be carried out by both general dentists and specialists. Consensus was achieved in the second round.
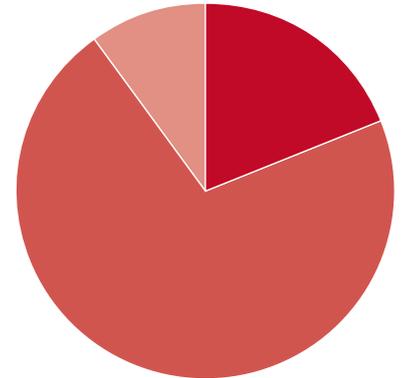
G2. Implant prostheses will be done mainly by:

A. **General dentists** (12 out of 52)   **23%**

B. **Both** (39 out of 52)   **75%**

C. **Specialists** (1 out of 52)   **2%**

There was moderate consensus that prosthetic procedures will be carried out by general dentists and specialists. Consensus achieved in the second round.
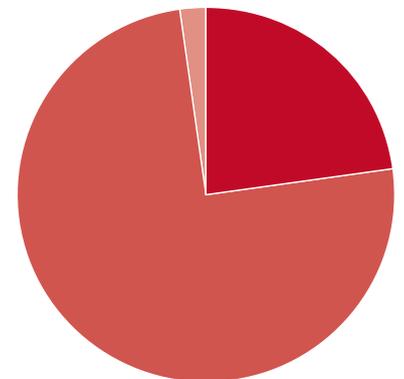
G3. What need will there be for a specific specialist in implant therapy (implantologist)?

A. **More** (25 out of 52) **48%**

B. **Similar** (19 out of 52) **37%**

C. **Less** (8 out of 52) **15%**
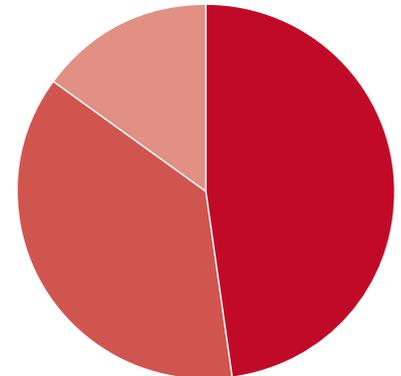
No consensus was achieved regarding the need for implant specialists.

Comments

It is anticipated that more advanced or complex cases will require specialists or highly trained dentists with extensive experience, and these kinds of cases are expected to become more common in future. It is not clear whether there is a need for a speciality to be fully devoted to a single therapeutic area, or if extended training will be required for dental implants within classic dental specialities (oral surgery, periodontology, and prosthodontics).

G4. The time allocated to implant dentistry in relation to the overall activity of a general dentist will tend to be:

A. **More** (38 out of 52) **73%**

B. **Similar** (11 out of 52) **21%**

C. **Less** (3 out of 52) **6%**
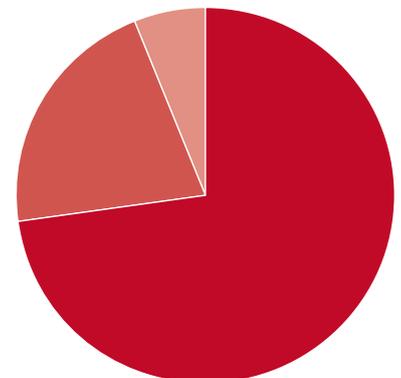
There was moderate consensus that the length of time that dentists will dedicate to implant treatments in the future will increase. Consensus was achieved in the first round.

G5. The economic return from implant dentistry in relation to a general dentist's global activity will tend to be:

A. **Higher** (26 out of 52)　　　　　**50%**

B. **Similar** (20 out of 52)　　　　　**38%**

C. **Less** (6 out of 52)　　　　　　　**12%**
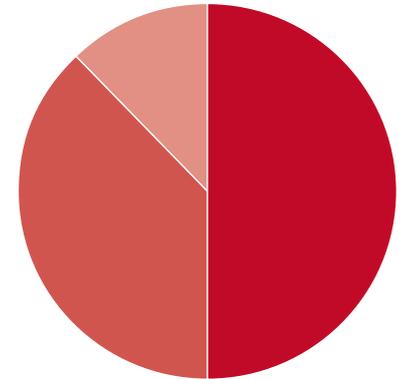
No consensus was reached regarding the economic return gained from implant dentistry compared with the global activity of a general dentist.

Comments

It is expected that the cost to perform implant dentistry will decrease, but the overall cost of treatment will likely increase.

G6. How do you foresee the costs of implants changing for practitioners?

A. **Higher** (0 out of 52)　　　　　　**0%**

B. **Similar** (11 out of 52)　　　　　**21%**

C. **Lower** (41 out of 52)　　　　　　**79%**
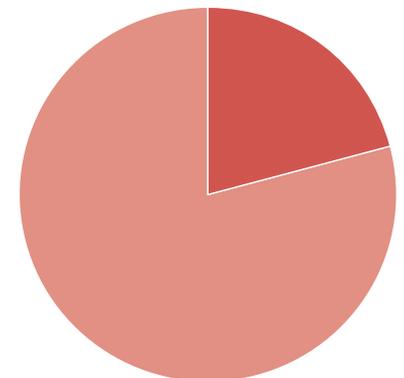
There was moderate consensus that implant costs for the practitioner would decrease in the future. Consensus was achieved in the first round.

Comments

Although the cost of implants is expected to decrease, the introduction of new and advanced technologies will likely mean that the overall cost to practitioners will be similar to today. We may then see an even more marked difference between high-cost/high-tech implants and low-cost/basic implants.

G7. How do you foresee the costs of implant prostheses changing for practitioners?

A. **Higher** (2 out of 52)   ⬛ **4%**
B. **Similar** (11 out of 52)   ⬛ **21%**
C. **Lower** (39 out of 52)   ⬛ **75%**
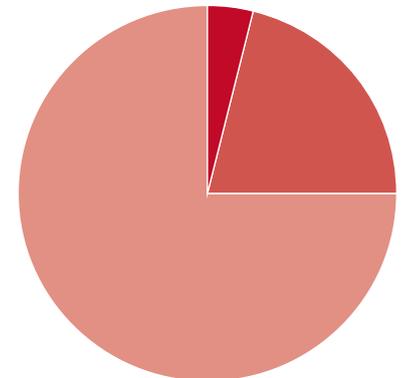
Moderate consensus was reached about the cost of implant prostheses for the practitioner: they will be lower. Consensus was achieved in the second round.

Comments

Although the cost of materials and digital technologies is expected to decrease in the future, the need for investment in new technological equipment will reduce the number of dentists moving to fully digital workflows. Eventually, however, most restorations will be completed as part of a fully digital workflow.

G8. How do you foresee the expected costs of implant treatment changing for the patient?

A. **Higher** (1 out of 52)   ⬛ **2%**
B. **Similar** (5 out of 52)   ⬛ **10%**
C. **Less** (46 out of 52)   ⬛ **88%**
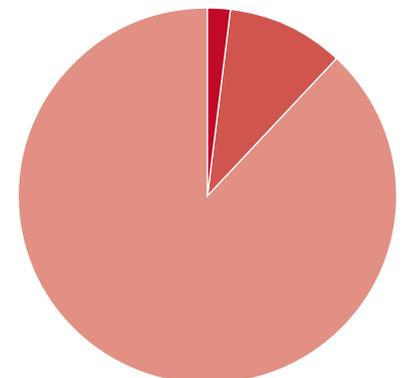
Comments

The offer of low-cost solutions will impact the cost of implant treatment for patients.

G9. **How do you think implant dentistry practice will change in the future?**

A. **More generalised** (37 out of 52)   █ **71%**

B. **Similar** (9 out of 52)   █ **17%**

C. **More specialised** (6 out of 52)   █ **11%**
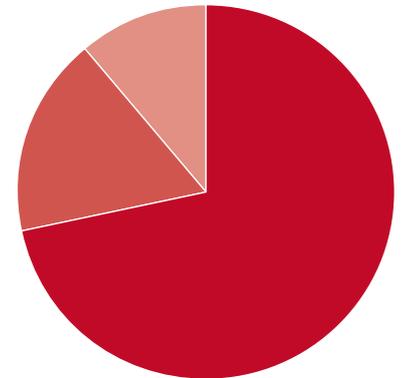
The consensus was that implant dentistry practice will move towards a more generalised approach. Moderate consensus was achieved in the second round.

Comments

The widespread incorporation of dental implant therapy in undergraduate curricula will mean that more general dentists can access this mode of therapy. However, there will still be a need for specialists to treat the most complex cases.

H1. How will implant education and training in universities be delivered?

A. **Mainly undergraduate** (1 out of 52) **2%**
B. **Both** (40 out of 52) **77%**
C. **Mainly postgraduate** (11 out of 52) **21%**
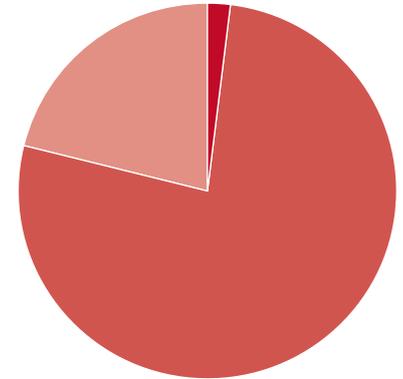
Moderate consensus was reached that universities will have an active role in both undergraduate and postgraduate education. Consensus was achieved in the first round.

H2. Postgraduate implant education will be delivered mainly by:

A. **Universities** (35 out of 52) **67%**
B. **Scientific organisations** (15 out of 52) **29%**
C. **Industry** (2 out of 52) **4%**
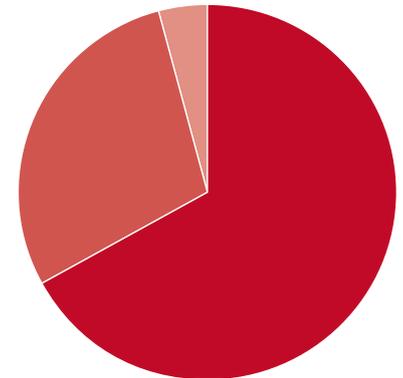
There was moderate consensus that postgraduate education will mainly be provided by universities, followed by scientific organisations. Very few thought that the industry would be the main source of postgraduate training. Consensus was achieved in the second round.

Comments

It is expected that universities will play a more active role in postgraduate training in the future.

H3. Postgraduate implant education will be delivered mainly by means of:

A. **Proximate learning** (4 out of 52) **8%**

B. **Both** (48 out of 52) **92%**

C. **Distance learning** (0 out of 52) **0%**
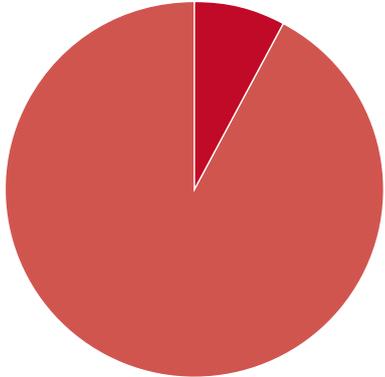
High consensus was achieved supporting the view that postgraduate education will be delivered both by proximate (on-site) and distance (online) learning. Consensus was achieved in the first round.

Summary of the results

Answers which achieved a high consensus (above 86%)

- Demand for single-tooth implants will increase
- The majority of implant-abutment connections will be internal
- Digital restorative diagnostic procedures will be used regularly
- Implant placement and soft tissue reconstruction will be performed simultaneously
- Prosthesis attachments will be screw-retained
- Prosthesis impressions will be mainly digital
- Composite ceramic mixed materials will be used for prosthesis coverings
- Peri-implantitis treatment will combine surgical and non-surgical procedures
- Non-surgical peri-implantitis treatment will combine mechanical and pharmacological strategies
- Implant treatment costs will be lower for patients
- Continuous training in implant therapies will be delivered through on-site and online courses

Answers which achieved a moderate consensus (65–85%)

- The general demand for implants will increase
- Demand for short-span implants will increase
- Both cylindrical and tapered implants will be used
- Both bone-level and tissue-level implants will be used
- Fewer implants will be placed per chewing unit
- Both titanium and ceramic implants will be used
- The use of bioactive surfaces will increase
- Customised abutments will be used more often
- The micro-topography of implant surfaces will be more polished
- 3D CBCT will be more widely used for pre-surgical diagnosis
- 3D CBCT will be used more widely in general
- New probing methods will be integrated with peri-implant health diagnostics
- Biomarkers will be used in peri-implant health diagnostics
- Impressions will be a standard procedure in treatment and planning
- Implant placement will be partially guided by surgical templates
- Guided navigation will be used in select cases only
- Flapless surgery will be used in select cases only
- Ridge preservation will be used more frequently
- Implant placement with simultaneous bone regeneration will be used more frequently
- Delayed implant placement after bone regeneration will be used in a similar way to today
- Vertical bone regeneration with bone-block grafts will be used less frequently
- The use of zygomatic implants will decrease
- Biomaterials and biologics will be used more frequently
- Immediate loading protocols will be used more frequently
- The use of 3D impressions for producing prosthetic frameworks will be widespread
- The expected (complication-free) longevity of implants will be between 20 and 40 years
- Peri-implantitis prevalence will increase
- Both regenerative and resective surgery will be used for treating peri-implantitis

Answers which achieved a moderate consensus (65–85%) (continued)

- Preventive interventions for peri-implantitis will be more effective
- The most effective preventive measure for peri-implantitis will be the patient's own hygiene
- Implant surgery will be performed both by general dentists and specialists
- Prosthetic procedures will be performed both by general dentists and specialists
- The length of time allocated to implants versus other dental practice activities will be higher
- Implant costs will be lower for practitioners
- The cost of implant prostheses costs will be lower for practitioners
- Implant therapies will tend to be more generalised in implant dentistry
- Universities will deliver graduate and postgraduate courses in implant treatment
- Postgraduate education in implant treatment will be mainly delivered by universities

Questions without a clear consensus (less than 65%)

- Demand for fixed prostheses in fully edentulous patients
- Demand for treatment using overdentures in fully edentulous patients
- Demand for prostheses in fully edentulous patients with a small number of implants
- Trends for implant length
- Trends for implant diameter
- Trends for implant roughness
- Systems for bone-level detection
- Immediate placement of implants
- Standard material used in bone grafts
- Need for specialists in implant treatments
- Economic return of implant therapies

Summary of the results by themes

The level of consensus is indicated by colour:

- high
- moderate
- no consensus

If consensus was achieved in the first round it is indicated with a tick in the table below.

A. Implant demand

	Consensus	First round?
A1. General demand for implants		
Will increase	Moderate (69%)	✓
A2. Demand for single-tooth implants		
Will increase	High (94%)	✓
A3. Demand for short-span implants		
Will increase	Moderate (83%)	✓
A4. Treatment demands for fully edentulous patients with fixed prosthesis		
Most common answer: will decrease (50%)	No consensus	✗
A5. Treatment demands for fully edentulous patients with overdentures		
Most common answer: will increase/decrease (40.5%)	No consensus	✗
A6. Treatment demands for fully edentulous patients with a small number of implants		
Most common answer: will increase (58%)	No consensus	✗

B. The type of implant

	Consensus	First round?
B1. Macro-design of implants		
Cylindrical and tapered implants will both be used	Moderate (69%)	✗
B2. Design of implant necks		
Bone- and tissue-level will both be used	Moderate (73%)	✗

	Consensus	First round?
B3. Implant length		
Opinion divided between similar to today (50%) and shorter (50%)	No consensus	×
B4. Implant diameter		
Opinion divided between similar to today (63.5%) or narrower (36.6%)	No consensus	×
B5. Number of implants per chewing unit		
Fewer implants per chewing unit	Moderate (71%)	×
B6. Implant manufacturing material		
Titanium and ceramic implants will both be used	Moderate (69%)	×
B7. Implant surface material		
Bioactive surfaces will be used	Moderate (85%)	×
B8. Micro-topography of implants		
Opinion divided between reduced roughness (58%) or similar to today (40%)	No consensus	×
B9. Type of connection between implant and abutment		
Internal connections	High (86%)	✓
B10. Abutment design		
Customised abutments	Moderate (65%)	×
B11. Micro-topography of surfaces		
Polished surfaces	Moderate (77%)	×

C. Diagnostic procedures

	Consensus	First round?
C1. Pre-surgical implant diagnoses		
Preferably 3D CBCT	Moderate (81%)	✓
C2. Performed with 3D CBCT		
Yes. Mainly because radiation doses will be reduced	Moderate (81%)	✓
C3. Bone-level detection		
New diagnosis methods will likely emerge (no x-ray)	No consensus	×
C4. Peri-implant tissue health assessment		
Other methods will be combined with probing	Moderate (81%)	✓
C5. Peri-implant health diagnosis using biomarkers		
Increased use of biomarkers because of their sensitivity	Moderate (67%)	×
C6. Digital restorative diagnosis		
Will replace standard diagnostic procedures.	High (88%)	✓
C7. Digital impressions for treatment plans		
Will become a standard procedure.	Moderate (83%)	✓

D. Surgical protocols

	Consensus	First round?
D1. Implant placement guides		
Partially guided by surgical templates	Moderate (84%)	✗
D2. Dynamic navigation for implant placement		
Only in select cases	Moderate (73%)	✗
D3. Flapless surgery		
Only in select cases	Moderate (73%)	✗
D4. Ridge preservation		
More frequent	Moderate (75%)	✗
D5. Immediate placement of implants		
Opinion divided between increase (61%) or similar to today (31%)	No consensus	✗
D6. Implant placement with simultaneous bone regeneration		
More frequent	Moderate (69%)	✗
D7. Implant placement with simultaneous soft-tissue reconstruction		
More frequent	Moderate (86.5%)	✓
D8. Delayed implant placement after bone regeneration		
Similar to today	Moderate (73%)	✗
D9. Vertical bone regeneration using bone blocks		
Less frequent	Moderate (71%)	✗
D10. Zygomatic implants		
Less frequent	Moderate (65%)	✗
D11. Future regenerative technologies		
Use of biomaterials and biologicals	Moderate (81%)	✗
D12. Standard bone graft materials		
Opinion divided between synthetic (42%) and xenogeneic (52%) grafts	No consensus	✗

E. Restorative protocols

	Consensus	First round?
E1. Immediate loading protocols		
More frequent	Moderate (65%)	✗
E2. Prosthesis fixation: screwed or cemented		
Screw-retained	High (87%)	✓
E3. Impressions		
Digital	High (90%)	✓

	Consensus	First round?
E4. Prosthetic framework		
Predominantly 3D printing	Moderate (83%)	✗
E5. Covering materials		
Hybrid materials (ceramic-composite)	High (87%)	✓
E6. Longevity of implants		
Expected to be complication-free for 20–40 years	Moderate (81%)	✗

F. Peri-implant diseases

	Consensus	First round?
F1. Prevalence of peri-implantitis		
Increase	Moderate (75%)	✗
F2. Treatment of peri-implantitis		
Both surgical and non-surgical strategies will be used	High (86%)	✓
F3. Surgical peri-implantitis treatment		
Both resective and regenerative approaches will be used	Moderate (84%)	✗
F4. Non-surgical treatment of peri-implantitis		
Mechanical and pharmacological strategies will be combined	High (92%)	✓
F5. Preventive intervention in peri-implant diseases		
More effective	Moderate (85%)	✗
F6. Prevention and treatment of peri-implant disease		
Patient hygiene will be the most effective measure	Moderate (73%)	✗

G. Professional practice

	Consensus	First round?
G1. Who will perform implant surgery?		
Specialists and general dentists	Moderate (71%)	✗
G2. Who will produce implant prostheses?		
Specialists and general dentists	Moderate (75%)	✗
G3. Need for specialists in implant treatment		
Opinion divided between more (48%) or similar to today (37%)	No consensus	✗
G4. Time allocated to implant therapies		
Higher, compared with the time spent in general practice	Moderate (73%)	✗
G5. Economic return of implant therapies		
Opinion divided between increase (50%) or similar to today (38%)	No consensus	✗
G6. Implant cost for practitioners		
Decrease	Moderate (79%)	✓

	Consensus	First round?
G7. Cost of implant prostheses for practitioners		
Decrease	Moderate (85%)	✗
G8. Cost of implant treatment for patients		
Decrease	High (88%)	✓
G9. Outlook for implant dentistry practice		
More generalised	Moderate (71%)	✗

H. Education and training

	Consensus	First round?
H1. University education in implant dentistry		
Both graduate and postgraduate courses	Moderate (77%)	✓
H2. Postgraduate education		
Mainly at universities	Moderate (67%)	✗
H3. Postgraduate training courses: methodology		
On-site and online	High (92%)	✓

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