How does the timing of implant placement to extraction affect outcome?
Quirynen M, Van Assche N, Botticelli D, Berglundh T

CRD summary
This review assessed the effects of placing dental implants at different lengths of time after tooth extraction. The authors concluded that there was insufficient evidence to compare immediate or early placed implants with implants placed in healed sites. The review had methodological weaknesses, but the authors’ cautious conclusions and their recommendations for further research and improved reporting seem appropriate.

Authors’ objectives
To systematically review the clinical outcomes and incidence of complications associated with immediate (at the time of extraction) and early (after soft tissue healing) placement of implants following tooth extraction.

Searching
MEDLINE via PubMed was searched for English-language studies up to May 2005. Search terms were reported. Reference lists of included articles and previous reviews were screened. Six relevant journals (listed) were searched by hand.

Study selection
Prospective and retrospective studies (randomised and non-randomised trials, cohort studies, case control studies or case series with at least eight patients or 10 implants) of patients with single-tooth, partial or full edentulism treated with conventional root-form endosseous implants with or without simultaneous guided bone regeneration were eligible for the review. Studies had to have at least one year of follow-up (under loading) for at least 80% of implants. Included outcomes were implant loss, crestal bone loss, peri-implantitis and soft tissue complications. The included studies were heterogeneous with respect to patient characteristics (for example, history of periodontitis), defect characteristics and details of the treatment strategy. Approximately half of the studies reported on immediate or early placed implants only; others included a comparison with implants placed later. Study selection was performed by three independent reviewers.

Assessment of study quality
Study quality was rated as unknown, fair, average, good, better or best, but the authors stated that in general this classification was based on study design. No other details were reported. The authors did not state how the assessment was performed.

Data extraction
Data on implant loss were used to derive the last reported implant survival rate and its 95% confidence interval (CI). Three independent reviewers performed the data extraction.

Methods of synthesis
Studies were synthesised narratively by outcome. Pooled weighted mean survival rates were calculated for immediate, early and late placed implants; the method used for pooling was not reported. Differences between studies were discussed in the text.

Results of the review
Seventeen prospective (n=1,216 implants) and 17 retrospective (n=2,623 implants) studies were included. Mean follow-up, where reported, ranged from 13 to 84 months for prospective studies and from 15 to 96 months for retrospective studies. Most of the included studies were rated unknown quality or fair quality. Most studies reported only on implant survival.

In prospective studies, mean loss of immediately placed implants was 6.2% (range 0 to 40%, SD 10%) and that of early placed implants was 3.6% (range 0% to 6.4%). In retrospective studies, mean loss of immediately placed implants was 3.5% (range 0 to 14.8%, SD 4.1%). Pooled weighted mean survival rates and 95% CIs were presented graphically and
appeared to be slightly higher for immediate and delayed implants than for early implants; however, no numerical values were reported.

Authors' conclusions
Because of the lack of long-term data, it remains uncertain whether outcomes of immediate or early placed implants are comparable with those of implants placed in healed sites.

CRD commentary
The inclusion criteria for participants, interventions and outcomes were clear; a broad range of study designs were included, which meant that the review was not limited to the strongest evidence. The search was limited to one database plus handsearching and to English-language publications, so relevant studies could have been missed. Unpublished studies were not sought and risk of publication bias was not assessed. Study quality was assessed mainly on the basis of study design, which was of limited usefulness. Appropriate methods were used to reduce reviewer errors and bias in study selection and data extraction, but it was unclear whether similar methods were used for validity assessment. Relevant details of included studies were presented. A narrative synthesis was presented, which seemed appropriate in view of the clinical heterogeneity of the included studies. The heterogeneity suggested that the pooled estimates for rates of implant loss should be treated with caution. Although the review distinguished between prospective and retrospective studies, the best evidence was not highlighted and it was often unclear whether comparisons between different implant placement strategies were direct or indirect. Despite the methodological limitations of the review, the authors' cautious conclusions and recommendations for further research and improved reporting seem appropriate.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that research was required on peri-implant health, prosthesis stability, degree of bone loss and aesthetic outcome of immediate and early/delayed placed implants. They also stated that future studies should clearly describe the treated sites and report other key parameters in a standard way.

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**Record Status**
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.