Immediate implant placement means that the dental implant fixture is placed at the same time as the tooth being replaced is extracted. This type of treatment is possible but there are various conditions and contributing factors that will determine whether or not we can perform immediate implant placement.

We cannot make a blanket statement that we can extract a tooth and place an implant in the same time. As with all dental procedures, whether to extract and place an implant at the same time is very patient, area and even tooth specific.

With over 28 years of experience and empirical studies there are some self imposed rules that I follow when considering whether to place an implant at the same time as the extraction of a tooth. The following article deals with the rationale and then general rules to follow. All these rules obviously can be modified when dealing with actual patient situations.

**Single Rooted teeth:**

Generally a single rooted tooth can be extracted and an implant placed at the same time. Here we see an anterior tooth extracted and implant placed in the extraction socket. The right graphic shows the void being filled with bone. Single rooted teeth are the most ideal when performing the immediate implant tooth replacement procedure. When the implant fixture is placed (especially the conical root form type) they usually fill the available space almost completely. Slight voids can be filled with an autograft. Since the amount of bone is small it can be obtained easily even from the preparation site.
Multy Rooted Teeth:

a) Molars:

When we are dealing with multi rooted teeth as with the molars I recommend not using the immediate implant placement technique. There are too many voids (that are also usually large) that will need to be grafted and there is a high potential for complications. Since we need to graft anyways why not graft the socket and get an ideal ridge for implant placement. This option will give us a very high success rate as opposed to immediate implant placement with significant socket grafting.

Immediate dental implant placement in molar areas leaves large voids around the implant.

b) Premolars:

Premolars are multy rooted with fused roots and are often difficult to evaluate. They can give the impression of adequate bone where in fact there will be deficiencies causing possible early failure. When we extract the premolars a thorough examination of the roots and socket needs to be done to decide weather to place an implant at the same time. The socket space can be round, oval or a figure 8 with distinct two rooted areas. Often it is a long oval and we will end up with voids.

Too Lingual

Too Buccal
Lots of voids on both sides. Wider implant decreases the buccal and lingual voids.

So how do we place the implant in the premolar areas. Placing it in the buccal root area is not recommended since the buccal wall is usually very thin and inadequate to support an implant. Placing it in the lingual root area will create non axial loading and a food trap on the buccal.

Placing it in the center will create a void on both the buccal and the lingual. If the buccal and lingual areas are small then we can graft these areas and place the implant. But with larger voids this may become a problem. Too much empty space may create the illusion on the radiograph that there is good bone height when in fact there are large voids on both the buccal and the lingual. Grafting this area is possible but again we need to be cautious. The requirements are as follows:

1) Maximum 1.5mm of space on the lingual or buccal

2) The buccal and lingual walls are intact

3) We are able to get primary closure with a coronally placed pedicile flap in 2 stage situations.

4) There is adequate space between the implant and the adjacent teeth disto buccal.

If there is any doubt whether all these conditions exist it is better to error on the side of caution and perform the extraction without immediate implant placement.

**Single Rooted Teeth and Complications:**

Single rooted teeth cannot always be replaced with immediate implant placement there are various factors that will not allow this procedure.

The requirement for an immediate implant placement are:

1) Initial Stability. The implant fixture must be secure in the bone. Any mobility will cause failure.
2) Minimization of voids around the new implant fixture.
3) Adequate bone available between the dental implant and adjacent structures. This includes teeth nerves and other implants.
4) Adequate Buccal and lingual Bone.
If there is bone apical to the tooth that will be extracted then this bone can be used to stabilize the new dental implant fixture. If there inadequate bone available apical to the extracted tooth then the stability can be attained with lateral engagement of the dental implant.

Inadequate bone apical to extraction but adequate bone in the lateral aspect

In this situation we can widen the diameter of the implant to create stability and no increase the length. Caution must be used to make sure we do not damage adjacent teeth. We need to also consider the distance between the implant and the adjacent tooth (or implant) at the coronal area. Placing implants too close together with teeth or other implants will result in complications and even implant loss.

In this situation we need to extract the tooth allow for healing and bone fill. Now we can place a more narrow implant to allow adequate space between he implant and the adjacent teeth.
immediate placement at time of extraction with socket grafting. Note the implant is well past the apex of the original tooth.
Delayed Placement with extraction and grafting and then placement. In this case the buccal wall was lost and therefore immediate placement was not possible. Notice the abundant bone on either side of the implant.

**Full flap to visualize buccal bone.**

I recommend that a full thickness flap always be used in the case of immediate implant placement. There is no way that we can accurately determine if the buccal bone is adequate without direct visual examination. The coronal area may be adequate but the more apical areas can have bone may be too thin and extracting the tooth and placing the implant at the same time may create a perforation. We can be fooled since radiographs do not show the thickness of the buccal bone. If there is a perforation it needs to be grafted. (How to do this this is another article).

Here we see and upper right first premolar extraction. The tooth came out smoothly and the apical cyst came out in one piece as well with no puss present. Without a full flap on the buccal we may not notice that there is a large perforation. Examining the socket is not always enough the bone may be intact but extremely thin with very small perforations.
Ligual Placement of Implant fixture.

The placement of the implant fixture will need to be more lingual than the natural tooth in the anterior Maxillary area. There the buccal bone is too thin in most cases to be prepared in any way.

By placing the implant fixture lingually and grafting the buccal 1-2 mm will add 1-2 mm of bone on the buccal. I also recommend a tapering implant since there is a significant buccal concavity in the maxillary anteriors and even placing the implant more lingually may not be enough to create a perforation.
Immediate extraction and implant placement. Note in this situation not only do we need to place the implant more lingual but the angulation of the implant must be changed from the angulation of the tooth as not to involve other structures such as teeth or implants already placed.

**Single stage or two stage implant placement.**

This decision has many of its own factors as well but as far as immediate implant placement is concerned we need to address how much grafting was done at the time of this implant placement. If there is minimal grafting to fill a socket that is mostly filled with the implant fixture then we can use the single stage placement option. If there is more grafting needed near the coronal area and there are more than 2mm of graft bone exposed it would be more successful to use the two stage placement option.
Infection

Obviously if there is a large area of infection we would not be placing the implant at the same time. The criteria is how is the infection contained. If there is an endo lesion with an apical cyst that is removed easily and in one piece and there is enough bone to stabilize the implant then we could place the implant at the time of tooth extraction. However if there is an acute episode with pus and a draining sinus immediate implant placement would be contraindicated. Of course there are many situations in between these two extremes and we need to consider all the other factors with immediate implant placement with the additional factor of more bone loss due to infection.

The tooth being extracted.

The actual type or condition of the tooth needs to be considered in the decision whether to place the implant at the same time as the extraction.

a) If a tooth has external resorption chances are there is a biological disruption in the area and I would prefer it be gone before I place an implant in the same area.

b) Internal resorption is a response in the tooth and I feel comfortable in extracting a tooth with internal resorption and placing at the same time.

c) Retained Primary teeth that need to be extracted are experiencing some sort of external resorption. Similarly to permanent teeth I would recommend not to place an implant in this area at the same time as the extraction.

Location Optimization

We do not always place an implant in the exact same location as the tooth being extracted. By changing the location of the implant placement compared to the location of the tooth that is extracted can allow us to perform immediate implant placement in more situations as well as creating a better success rates for implant survival.

There are situations that involve extractions and placement of implants in areas of already missing teeth. So in a reality we are extracting and placing implants at the same time but in different locations. The other requirements such as adequate bone obviously continue to apply.
This movie shows a posterior lower bridge with the distal tooth needing extraction. Since this tooth is what supports the bridge the two teeth that are replaced by the bridge (pontics) will need to be removed as well. If the bone is adequate the implants can be placed in the pontic areas at the same time as the tooth removal.

In the above situation there are several teeth need extractions. If 4 implants are being placed to support a bar they do not necessarily need to be in the exact same place as the tooth being extracted. The best sites for implant placement are selected and implants are placed in these locations. This again is considered immediate implant placement but with "location optimization".
Conclusion:

Summary: Immediate Implant Placement General Rules:

1) Only teeth marked in green are to be replaced with immediate implant placement unless location optimization is used.

2) No external resorption present.

3) Not primary teeth.

4) No Acute infection with pus.

5) Adequate apical bone 3.5mm or more.

6) Adequate lateral bone 2mm or more.

7) Full flap to visualize Buccal bone to apex of extracted tooth.

8) Primary closure and 2 stage placement with more than 1.5mm of voids.

9) Initial Stability must be present.

10) Lingual placement of fixture compared to tooth being extracted. Angulations depend also on adjacent structures.