Serial Extraction is an accepted interceptive Orthodontic procedure carried out to assist the correction of hereditary tooth-size jaw-size discrepancies. This early extraction procedure was first described by Robert Bunion in 1743 and it has stood the test of time.

**Definition**
Kjellgren coined the term 'serial extraction' in 1929. Serial extraction can be defined as a continuing interceptive Orthodontic effort begun in the early mixed dentition which is designed to avoid the development of a fully matured malocclusion in the permanent dentition in severely crowded mouths. This process involves the early removal of certain deciduous teeth (generally the milk canines and first molars) followed by the extraction of specific permanent teeth (normally the first premolars) in a pre-determined order, that is in a serial manner.

**Treatment Philosophy**
Serial extraction is based on the premise that arch length does not increase with age. Growth and development of the arches will only provide space for the erupted second and third molars posterior to the visible dentition. If crowding is evident at the age of 8 years, it will not improve by itself at the age of 12. The purpose of serial extraction is to minimize the duration of use of fixed appliances.

**Indications**
It is primarily indicated when there is evidence of severe crowding (exceeding 10 mm per arch) in a skeletal Class I malocclusion.

The ideal clinical presentation for a case of serial extraction will be a true severe genetic tooth size arch length discrepancy with a mesial step mixed dentition developing into a Class I molar relation, normal overjet and normal overbite in a facial pattern that is orthognathic (straight) or with minimal protrusion.

It can be used in the maxillary arch in a case of Class II molar malocclusion caused by the mesial shift of the upper first permanent molars and there is severe crowding in only the upper arch.

Clinical presentation of a case which should require immediate intervention to prevent a full blown malocclusion.

**Contra-indications:**
Serial extraction is strictly contra-indicated in any child with a skeletal Class II or skeletal Class III jaw discrepancy irrespective of the quantum of crowding. It is also not very useful in patients with Class I bimaxillary protrusion.

Serial extraction should always be utilized as an adjunct to fixed mechanotherapy and not as an alternative to it.

**Sequence of Extractions:**
The classical sequence of extractions has been:
1. The primary canines
2. The primary first molars
3. The permanent first premolars.

C, D, 4 is the most commonly followed protocol but the sequence may be varied depending upon the needs of a particular case such as extraction of primary first molars, followed by permanent first premolars and then the primary canines (D, 4, C). In few instances, primary canines are already lost as the permanent laterals erupt and only the primary first molars need to be removed followed by first premolars (D, 4).

Occasionally, the primary second molar may require extraction to facilitate the eruption of first premolars (C, D, E, 4).
Case Study 1

Clinical and radiological presentation of a case which will require interceptive Orthodontics in the form of serial extractions.

Case Study 2

This case has been presented with a series of radiographs to illustrate the decrowding which occurs as space is created by extractions. The patient’s parents were so happy with the smile at the end of serial extractions that they refused any further Orthodontic intervention.
This case, the son of a medical practitioner, has been under observation right from the primary dentition stage onwards.

The first extractions advised were upper milk centrals and lower milk centrals and laterals.

At the time of eruption of permanent lateral incisors, the milk canines had to be extracted to allow for proper alignment.

This was followed by extraction of ‘D’s in all quadrants.

An analysis of the last OPG led to the extraction of the upper premolars and lower ‘E’s and lower premolars when they erupt.
Case Study 4

Clinical pictures of this case helps us to visualize what happens when serial extraction is not done. The patient reported late when severe crowding had already malpositioned most of the teeth in occlusion. The ideal time for the first Orthodontic consultation is at the age of 7 years when such space discrepancies can be detected and any interceptive measures required can be undertaken.

Transient deepening of the bite results which require correction with fixed mechanotherapy. The procedure is suitable only for a small percentage of Class I patients in the early mixed dentition only.

Advantages:
1. Reduction in treatment time.
2. Reduction in treatment complexity.
3. Reduction in treatment cost.
4. Provides a more normal appearance of teeth and smile during the growing phase of the child.

Disadvantages:
Needs to be initiated only after a thorough evaluation of all the patients records. A proper diagnosis is mandatory as the process culminates in the extraction of four permanent premolars.
Minor spacing needs to be corrected by fixed mechanotherapy at the end of eruption of permanent canines along with uprighting of roots and correction of rotations, etc.