

## Amit Jain's Classifications for Diabetic Foot Classifications

Amit Kumar C Jain\*

Consultant and Head, Amit Jain's Institute of Diabetic Foot And Wound Care, Brindhavvan Areion Hospital, Bangalore, India & Associate Professor, Department of Surgery, Rajarajeswari Medical College, Bangalore, India

**\*Corresponding author**

Amit Kumar C Jain

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**Abstract:** There are numerous classifications on diabetic foot available today but only few are used. Each classification has its own merit and demerits. This article classifies the diabetic foot classifications to make our understanding simple, easy and much clearer. This is in fact the first novel attempt by author to classify the classifications itself. The diabetic foot classifications are classified based on some features of the classification. This new classification for diabetic foot classification has made a pavement for Amit Jain's classification for diabetic foot classification to be considered a universal classification as it is now a classification supreme.

**Keywords:** Diabetic foot, Amit Jain, Classifications, Ulcer.

### INTRODUCTION

Foot problems are known complications in individuals with diabetes [1]. Foot ulcers develop in 15% to 25% of patients with diabetes and ulceration is considered to be the most important precursor of amputation [2- 4].

Various classifications have been proposed in past 3-4 decades on diabetic foot [1-5]. There are dozens of classification on diabetic foot but only few are used. Each of them has their own merits and demerits [6]. Further each classification has their own supporter's and opposer's be it a reviewer/researcher, groups or associations.

For example, Nather *et al.* [6] finds Wagner's and King's Classification more useful whereas Game *et al.* [7] finds Wagner's classification to be Imprecise. Kings staging system which Nather *et al.* [6] finds simple and good actually does not progress into said stages sequentially at all forget about other required features from a classification. Because of each one's own opinion/consensus on classification with each one's one expectation, there was never a universal classification on diabetic foot over years.

### Controversies over classifications

The author observed that there is huge controversies when it comes to classification on diabetic foot. The controversies are further enhanced with expectations of certain minimum featured from a classification but subsequent condemnation for not addressing other parameters which actually the classification was not intended to fulfill. The belief of simple, easy and good classification by one reviewer may not be the case with another reviewer. Further each reviewer may expect certain properties to be fulfilled by a classification which he may not expect from another classification. Also reviewers expect various properties from a classification like follow up advices [6] which are undesirable and unwanted features from a classification thereby creating a sort of literature

confusion among the readers relating to diabetic foot classifications. The author has often come across various sentences like 'There is no classification that gained widespread acceptance' [8] or 'There is no universally accepted classification system for diabetic foot ulcers' [3, 9] or 'There is no ideal classification for diabetic foot ulcers'.

What wondered the author was who in the universe should accept the universal classification. It's obvious that if one group accepts it or one region adopts a particular classification, the other groups would reject or find faults with another classification and this will continue for generation. The author has observed various barriers for not having a universal classification for diabetic foot and currently wouldn't discuss here as it is outside the scope of this article.

But one point is clear and agreed upon that there is a difference between a classification and a scoring system [7]. The classification is descriptive in nature and a score is meant to give an idea of severity and it is well known that it is difficult for a single classification to both [7]. One need to understand that the most important things needed from a classification is simplicity, ease of understanding and need as a common language [1, 6, 10].

**Classifying diabetic foot classification**

Since various diabetic foot classifications have been proposed, the author felt a need to classify the diabetic foot classifications itself to ease our understanding, expectations and to make concepts much clearer.

The various Amit Jain’s classifications for diabetic foot classifications are as follows and they are based on particular feature of classification.

**A] Amit Jain’s classification based on expansion of diabetic foot classifications**

Based on expansion of classification, Diabetic foot classifications are either of open type or of closed type classification [Table 1].

**Table-1: showing Amit Jain’s classification for diabetic foot classification based on expansion**

Sl no	based on expansion	Example
1	Open classification	Amit jain’s classification for diabetic foot complication
2	Closed classification	Wagner’s classification, university of texas classification,etc

**B] Amit Jain’s classification based on current usage of diabetic foot classifications**

According to current usage, diabetic foot classifications can be classified into historic, routinely used, and modern classifications [Table 2].

Some of the historic diabetic foot classifications are Knighton’s classification, Gibbon’s classification, Forrest classification, etc [9, 11, 12].

**Table-2: showing Amit jain’s classification for diabetic foot classification based on current usage**

Sl no	Based on current usage	Examples
1	Historic classification	Knighton’s classification, gibbon’s classification, forrest classification, etc
2	Routine classification	Wagner’s classification,etc
3	Modern classification	Amit jain’s classification for diabetic foot complications, kobe’s classification and amit jain’s diabetic foot ulcer classification

**Amit Jain’s classification based on distinctness of diabetic foot classification**

Based on distinctness, the diabetic foot classification is either Original or Derivatives [Extended]. The original diabetic foot classifications are Wagner’s classification, Amit Jain’s classification for diabetic foot complication, SAD classification, Amit Jain’s classification for diabetic foot ulcer, etc [1, 11, 13, 14].

In open diabetic foot classification, various new diabetic foot lesions can be included in the classification. Example of an open diabetic foot classification is Amit Jain’s classification for diabetic foot complications [1, 3, 4]. Amit Jain’s classification of diabetic foot complication is currently the only classification that can encompass most lesions seen in diabetic foot universally.

In a closed diabetic foot classification, no new lesions can be incorporated. Examples in this category are Wagner’s classification, university of Texas classification, etc.

They are currently not used. The routinely used diabetic foot classification is Wagner-Meggitt classification.

The modern diabetic foot classifications which are new are Amit Jain’s classification for diabetic foot complications, Kobe’s classification and Amit Jain’s classification for diabetic foot ulcers [1, 14]. All these new classification are exclusively for diabetic foot.

The derivative (extended) diabetic foot classification is those which are obtained from original classification. Examples are University of Texas classification [From Wagner’s classification] [15, 16], SINBAD classification [From S.A.D classification], etc [13]. In other words they are modified version from originally proposed diabetic foot classification [Table 3].

**Table-3: showing Amit Jain’s classification for diabetic foot classification based on distinctness**

Sl no	Based on distinctness	Examples
1	Original classification	Wagner’s classification, amit jain’s classification for diabetic foot complication, sad classification, amit jain’s diabetic foot ulcer classification, etc
2	Derivative classification	University of texas classification, sinbad classification, etc

**Amit Jain’s classification based on lesion inclusion in diabetic foot classification**

Based on lesion inclusion, diabetic foot classifications are complete/comprehensive, incomplete or focal classification [Table 4].

Complete classification/comprehensive diabetic foot classifications are those which include wide variety of lesions. Example in this category is Amit Jain’s classification for diabetic foot complication that includes most of the lesions seen universally in current scenario.

Incomplete diabetic foot classifications are those which utilize only few selected lesion in them, Examples in this category are Wagner’s classification and King’s classification [6, 11]. Wagner’s classification has only ulcer and gangrene.

Focal diabetic foot classifications are those that describe only a particular lesion. Example of focal classification is PEDIS classification and Amit Jain’s diabetic foot ulcer classification [11, 14].

One has to understand that an incomplete and focal classification cannot become a universal classification for Diabetic foot on whole. For years almost all reviewers/ committees/ consensus/association were only discussing on diabetic foot ulcer classification which are incomplete or focal and argued on them being ideal/ universal classification for diabetic foot complications.

A focal classification can be a good/ best /universal classification for a focal lesion of diabetic foot only like diabetic foot ulcer, diabetic foot osteomyelitis etc and not on whole for diabetic foot complication.

This classification based on distinctness has made the point very clear thereby laying rest on most arguments for a universal classification paving its way only for Amit Jain’s classification for diabetic foot complication that is the only comprehensive classification existing till date.

**Table-4: Showing Amit Jain’s classification for diabetic foot classification based on lesion inclusion**

Sl no	Based on lesion inclusion	Examples
1	Complete classification	Amit jain’s classification for diabetic foot complication
2	Incomplete classification	Wagner’s classification, king’s classification, etc
3	Focal classification	Pedis classification, amit jain’s diabetic foot ulcer classification, etc

**Amit Jain’s classification based on ease of understanding of diabetic foot classification**

Based on ease of understanding, diabetic foot classifications can be simple, complex and complicated [Table 5]. The best examples of simple diabetic foot classification are Amit Jain’s classification for diabetic foot complications, Wagner’s classification, Amit Jain’s diabetic foot ulcer classification, etc. They are easy to understand and remembered by any health care professional.

The complex diabetic foot classification are little difficult to remember and understand. The example in this category is University of Texas classification. Earlier many used to consider university

of Texas classifications either complex or complicated [1, 6]. After devising this new classification system for diabetic foot classification, the author places the Texas classification in complex category.

Complicated diabetic foot classifications are most difficult to understand and remember. Example in this category is SINDBAD and PEDIS [6].

The author had previously developed the concept of Simple, Complex and Complicated [S.C.C] for ulcer classification [14] and for Offloading classification [17] and now similarly applied here to simply our understanding.

**Table-5: Showing Amit Jain’s classification for diabetic foot classification based on ease of understanding**

Sl no	Based on ease of understanding	Examples
1	Simple classification	Amit jain’s diabetic foot ulcer classification, wagner’s classification, amit jain’s classification for diabetic foot complication,etc
2	Complex classification	University of texas, etc
3	Complicated classification	Pedis classification,etc

**Amit Jain’s classification based on clinical applicability of diabetic foot classification**

Based on clinical applicability, Diabetic foot classifications are either practical classifications or research classification. The example of practical classification is Amit Jain’s diabetic foot ulcer

classification, Wagner’s classification and Amit Jain’s classification for diabetic foot complication. They can be used clinically with ease. The example of research diabetic foot classification is PEDIS classification [6-8].

**Amit Jain's classification based on expectation of diabetic foot classification**

Based on expectation, diabetic foot classification is either an ideal classification or universal classification.

The author has observed from literature that the researchers have often mixed up both. In earlier scenario, there were no defined criteria for universal versus ideal classification.

An ideal classification can be considered one that fulfils almost all criteria expected by researchers. This seems to be not possible in current scenario knowing that diabetic foot is multifactorial, multilesional with multilevel involvement. We should stop expecting from a single classification to address all the expectations from reviewer.

A universal classification for diabetic foot should be one that is simple, easy to understand, practical and that includes all the lesion in diabetic foot which is one of the most important and requisite criteria. There was no accepted universal classification earlier as they never looked into these criteria of prime importance. It's been high time that there should be a universal classification for diabetic foot on a whole and it need not be the idealistic classification as expected by many researchers and reviewers. An ideal classification need not be a universal classification and a universal classification need not be an ideal classification in diabetic foot field.

Amit Jain's classification for diabetic foot complication is the only classification that can now be considered as a universal classification.

**Amit Jain's classification for diabetic foot complications – the classification supreme**

This new classification for diabetic foot has changed the entire perception of how diabetic foot was analyzed over years where most focused only on ulcers and this classification made us all looked beyond ulcers [2].

A classification is considered good by many if it is simple, enough to be remembered, easily applied in

clinical practice, provides easy communication and takes into account all triad of diabetic foot namely neuropathy, ischemia and infection [1, 6, 7, 10]. Amit Jain's classification for diabetic foot complication is simplest of all classification till date, easy to remember, easily applied in practice, and provides good communication [1, 2]. It also includes all the triad of diabetic foot [6] namely the infective complications like abscess, wet gangrene, cellulitis, necrotizing fasciitis, etc, the neuropathic complications like trophic/neuropathic ulcer, claw toe, charcot foot, hammer toe, etc and the ischemic complications like dry gangrene or an ischemic ulcer [1, 2].

Further, this classification is unique as it encompasses various lesions around the world with ease which no classification was able to do till date [Table 6]. It is an excellent teaching tool to disseminate the knowledge of diabetic foot which was a known neglected entity worldwide [1, 2, 11, 14]. When it was originally proposed [1], there was no research study done on this classification and hence outcomes were not known [1]. But over last few years, more than half dozen studies have been done on this classification [2, 4, 17, 18, 19, 20, 21]. Various studies [18-22] have shown that type 1 diabetic foot complications are the most common cause for hospitalization, most common cause of major amputation and mortality. Further, the stump complications are most commonly encountered in type 1 diabetic foot complication. Apparently, Nather *et al.* [6] failed to look into these studies in one of its latest reviews on choosing diabetic foot classification thereby creating literature confusion [23]. In this review, a follow up action was expected from a classification which no classification in diabetic foot can do as most were incomplete or focal classification and it is considered to be undesirable property and illogical expectation from a classification [1] that encompasses more than 10 different lesions with varied spectrum of severity and multilevel involvement.

Today, Amit Jain's classification for diabetic foot is a component of Amit Jain's principle and practice of diabetic foot [14, 18, 21] which is aimed at standardization and improvisation of diabetic foot practice around the world.

**Table-6: Showing amit Jain's classification for diabetic foot complications- the classification supreme**

Sl no	Type of complication	Lesions
1	Type 1 diabetic foot complication	Abscess, cellulitis, wet gangrene, necrotizing fasciitis, etc
2	Type 2 diabetic foot complication	Trophic ulcer, claw toe, charcot foot, dry gangrene, hammer toe, etc
3	Type 3 diabetic foot complication	Mixed lesions like trophic ulcer with osteomyelitis, etc

**CONCLUSION**

For years, different diabetic foot classifications have been proposed. Most of them have been only for ulcers. The Amit Jain's classification for diabetic foot classifications now makes our understanding clear on different classification on diabetic foot. Amit Jain's

classification for diabetic foot complication is an open, simple, original, practical, complete, modern classification that is now a classification supreme as it includes all complication seen in diabetic foot around the world, thereby calling upon it to be the only universal classification for diabetic foot complication.

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