Effective Ways to Perfect the Visualization of Clinical Trial Results

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ABSTRACT

A picture is worth a thousand words, which is why graphs are widely used for communicating clinical trial results. Well-designed graphs not only bring clarity to statistical results, they also add elegance to the report. How to make a perfect graph, however, is both technically and aesthetically challenging. This paper illustrates three different ways to present perfect graphs in the oncology area. The first example shows that color adjustment helps bring the audience's attention to subjects of interest. The second example illustrates how to clearly present multiple categories in a graph by using legends and text boxes. The third example demonstrates adding more information into a graphical display without compromising its clarity and beauty.

INTRODUCTION

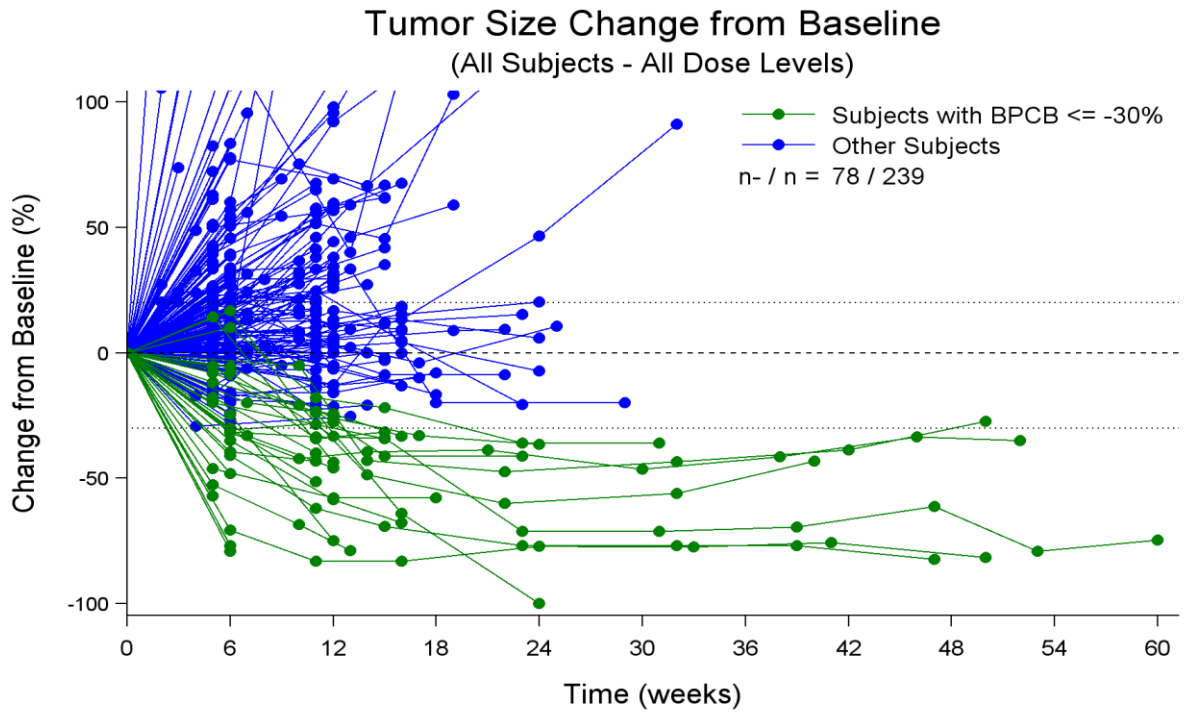
A well-designed, good looking graph should bring pleasure to the audiences/readers because it not only clearly communicates the statistical results, it also demonstrates the beauty of the results, as well. There are challenges both technically and aesthetically for making such pleasing graphical outputs. This paper will focus on three types of graphs (spider plot, barchart, and swim lanes) from the Oncology area that demonstrate different ways to perfect graphical displays.

All programs presented in this paper were developed on Server SAS® 9.3 in the Windows environment.

1. USING THE RIGHT COLOR COMBINATION

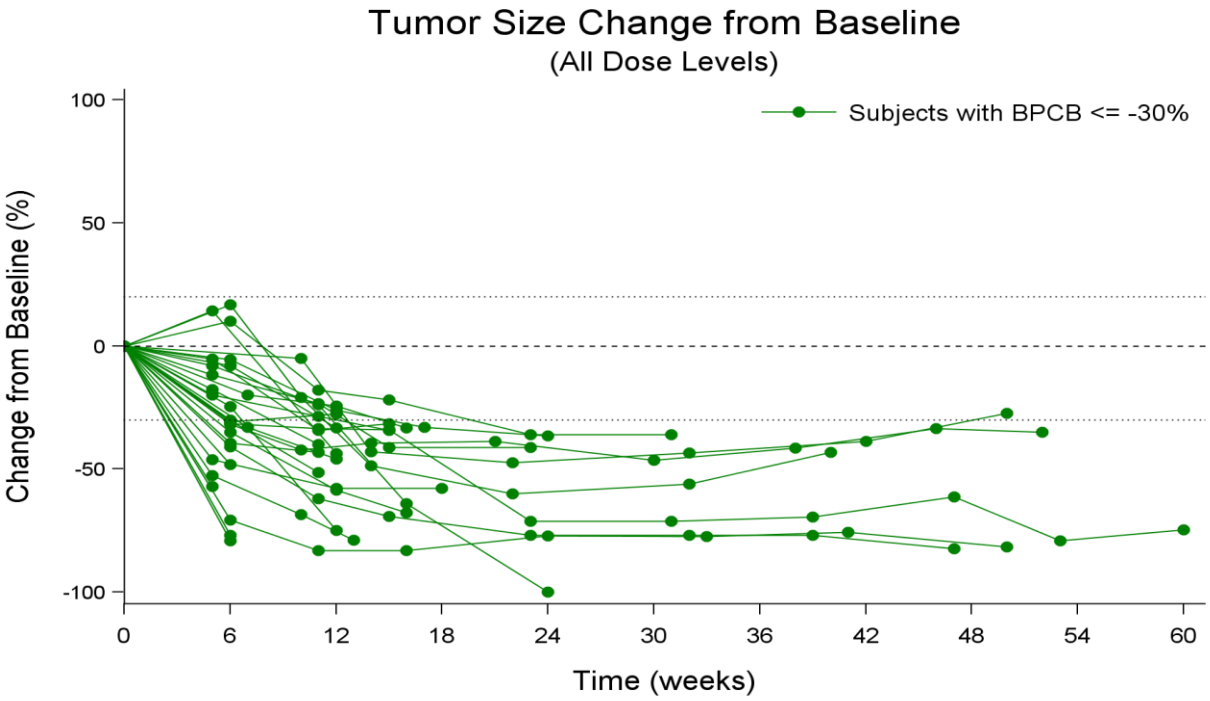
a. The Original Graph

The following spider plot simply shows two categories - subjects with best tumor shrinkage percentage more than 30% and others over time - by using two different colors (green and blue, respectively).



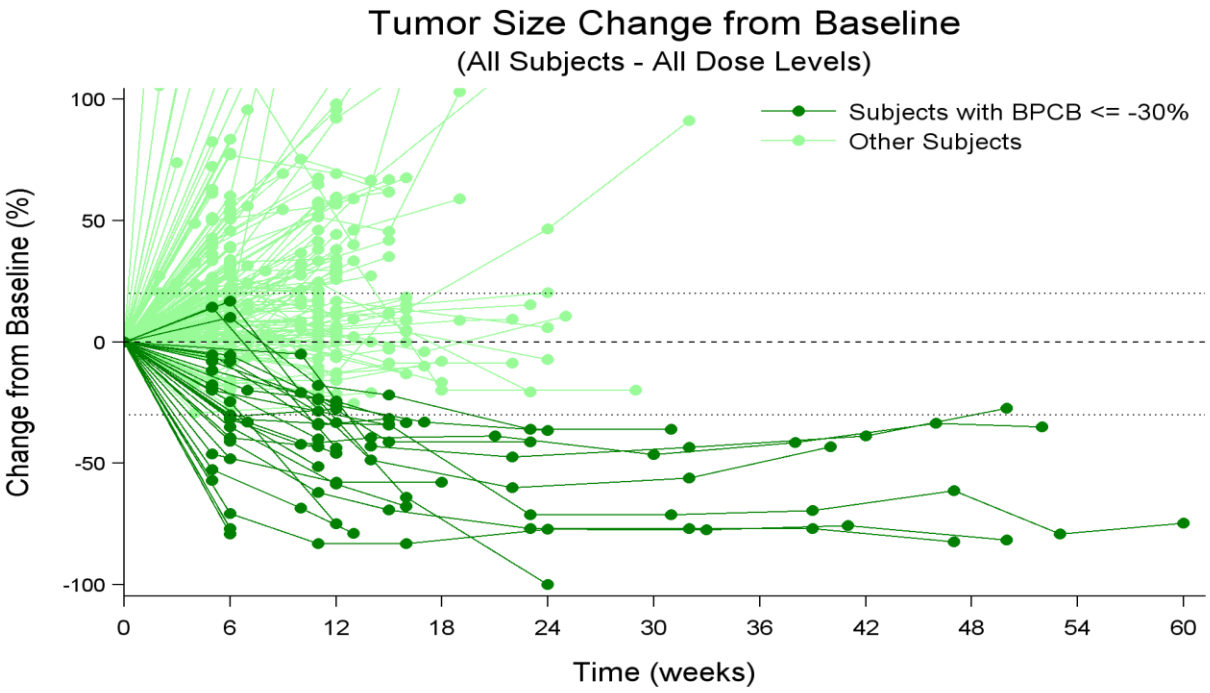
b. The Second Graph

It simply dropped the subjects with best tumor shrinkage percentage less than 30%. But excluding other subjects in the display is the drawback.



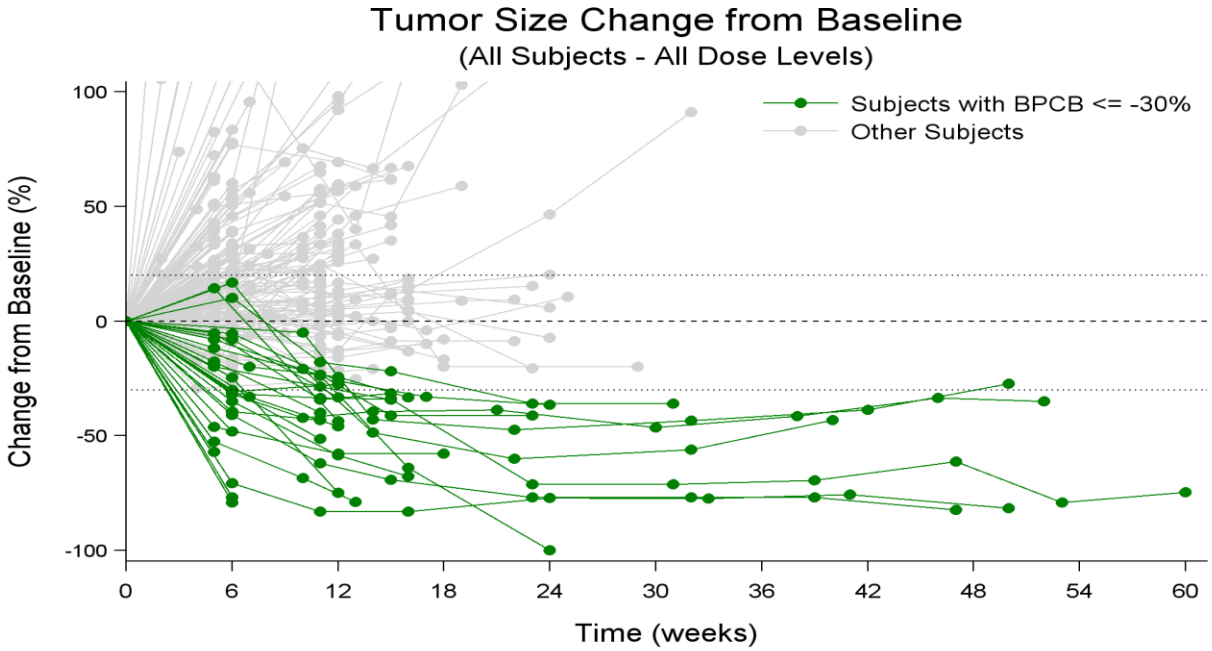
c. The Third Graph

Like the original graph that shows subjects with best tumor shrinkage percentage more than 30% and others by using two different colors, the color contrast is just not good enough to show the big picture.



d. The Final Version

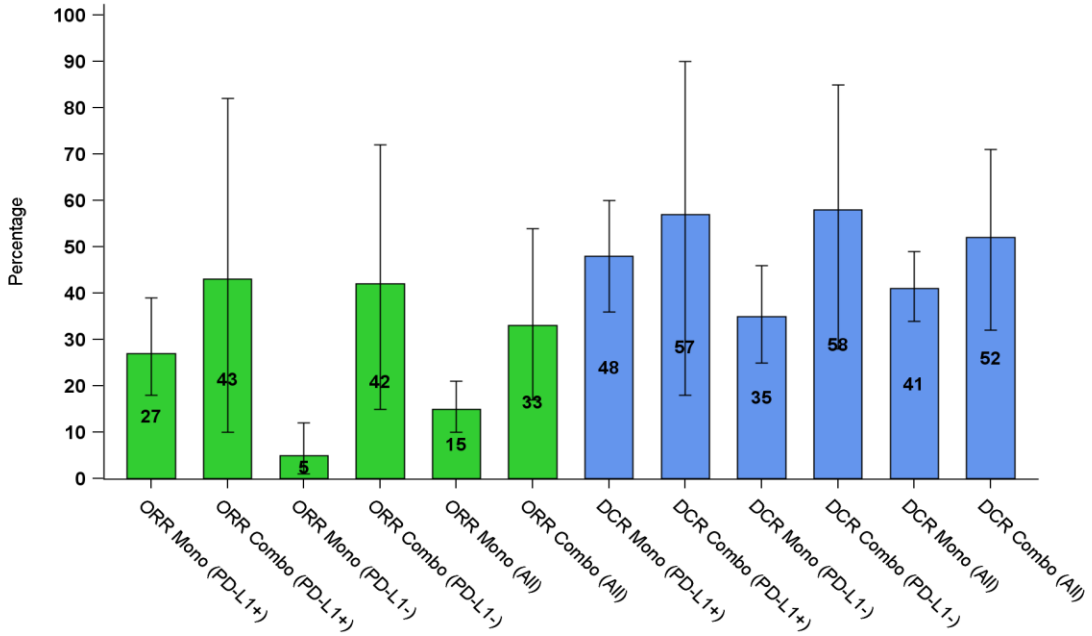
Like the original graph that shows subjects with best tumor shrinkage percentage more than 30% and others by using two different colors, the below graph is the display that was presented in the ASCO 2014 conference by the top executives of AstraZeneca that shows the color change from blue to gray.



2. USING RIGHT LEGENDS AND TEXT BOXES

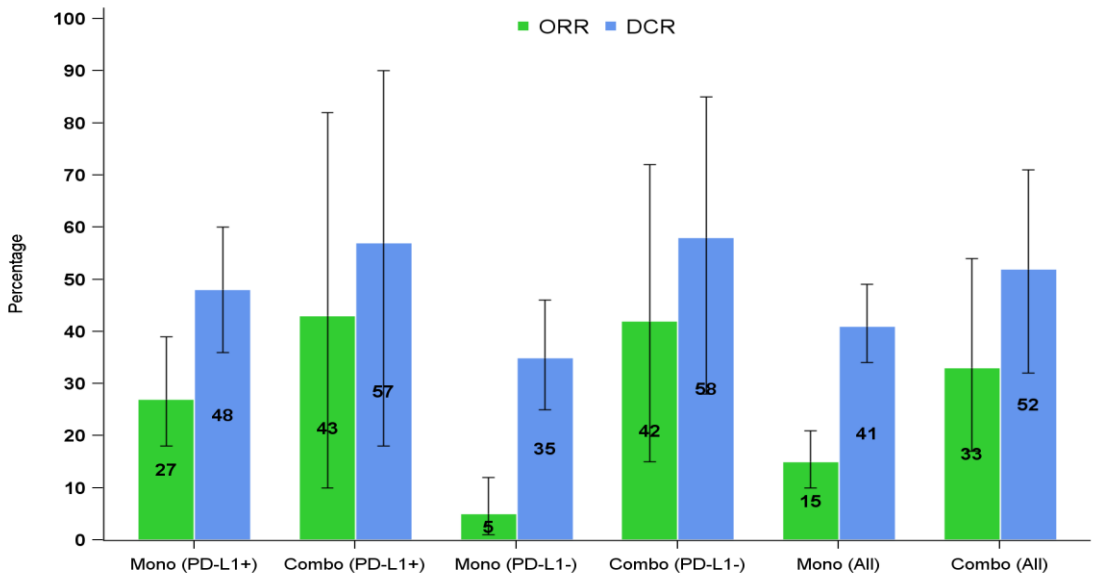
a. The original graph without legends and text boxes

This barchart plot constitutes two types of endpoints - ORR and DCR, two types of tumor expressions - PD-L1 Negative and Positive, and two types of therapies - Mono and Combo (combination). In this example, there is no legend created.



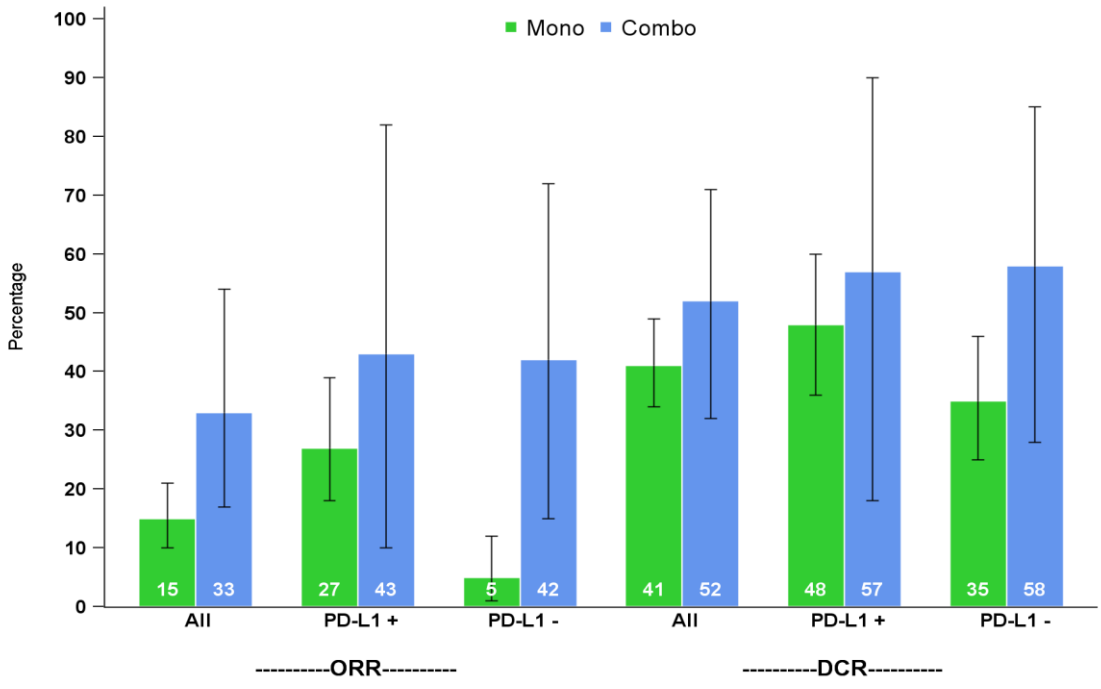
b. The second graph with legends

This graph contains a legend for the two types of endpoints - ORR and DCR, and reduces tick marks displayed on the X axis. The display has more clarity and is easier to review compared to the previous display.



c. The final graph with legends and text boxes

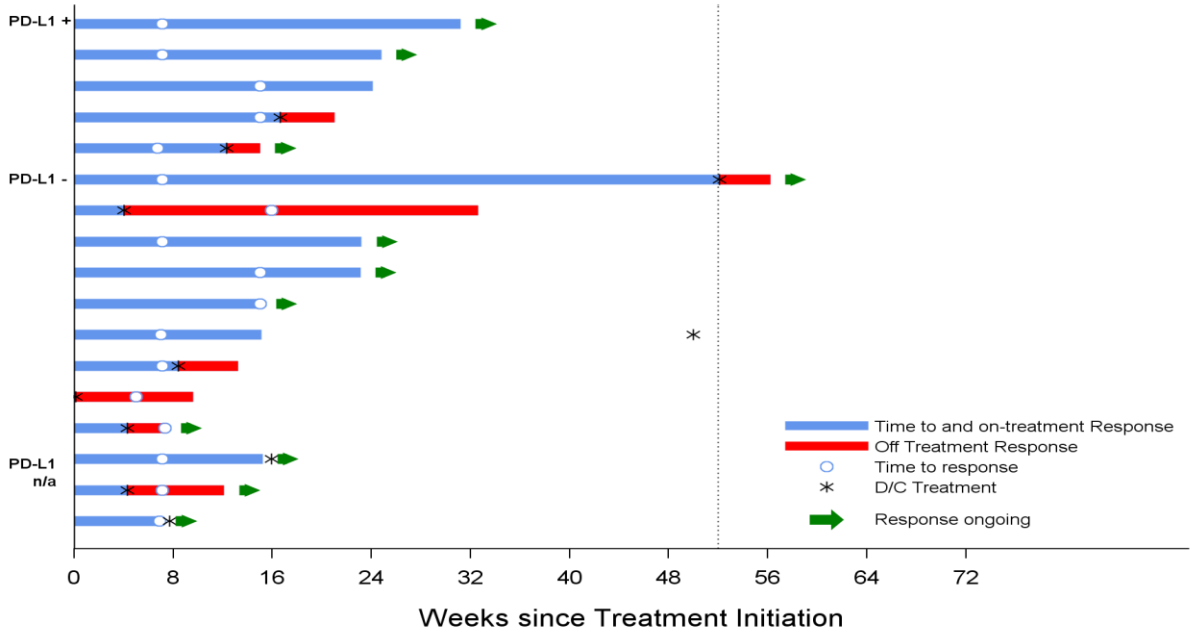
This graphical display contains a legend for the therapeutic types, and two text boxes for the endpoint types. The X axis indicates two types of tumor expressions. This display is much easier to review and facilitates the interpretation of data.



3. ADDING AS MUCH INFORMATION AS YOU CAN BY DIFFERENT MARKERS

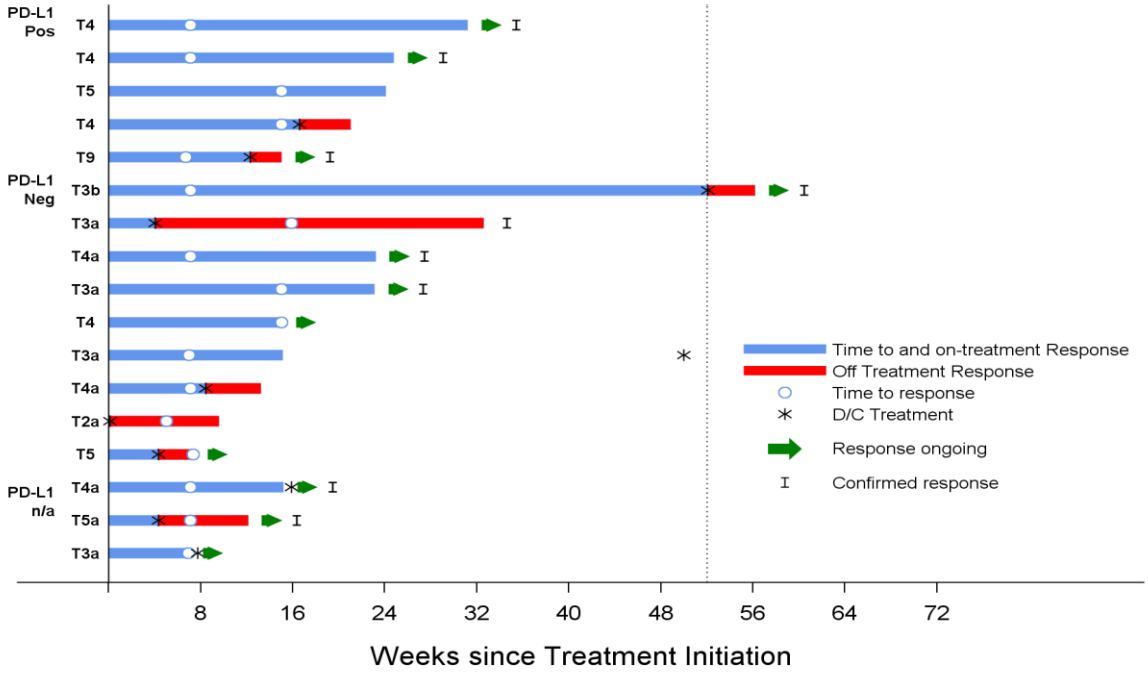
a. The original graph

This swim lane graph is broadly used in the Oncology area. It may contain information such as the duration of responses, treatment discontinuation, types of tumor expressions, etc.



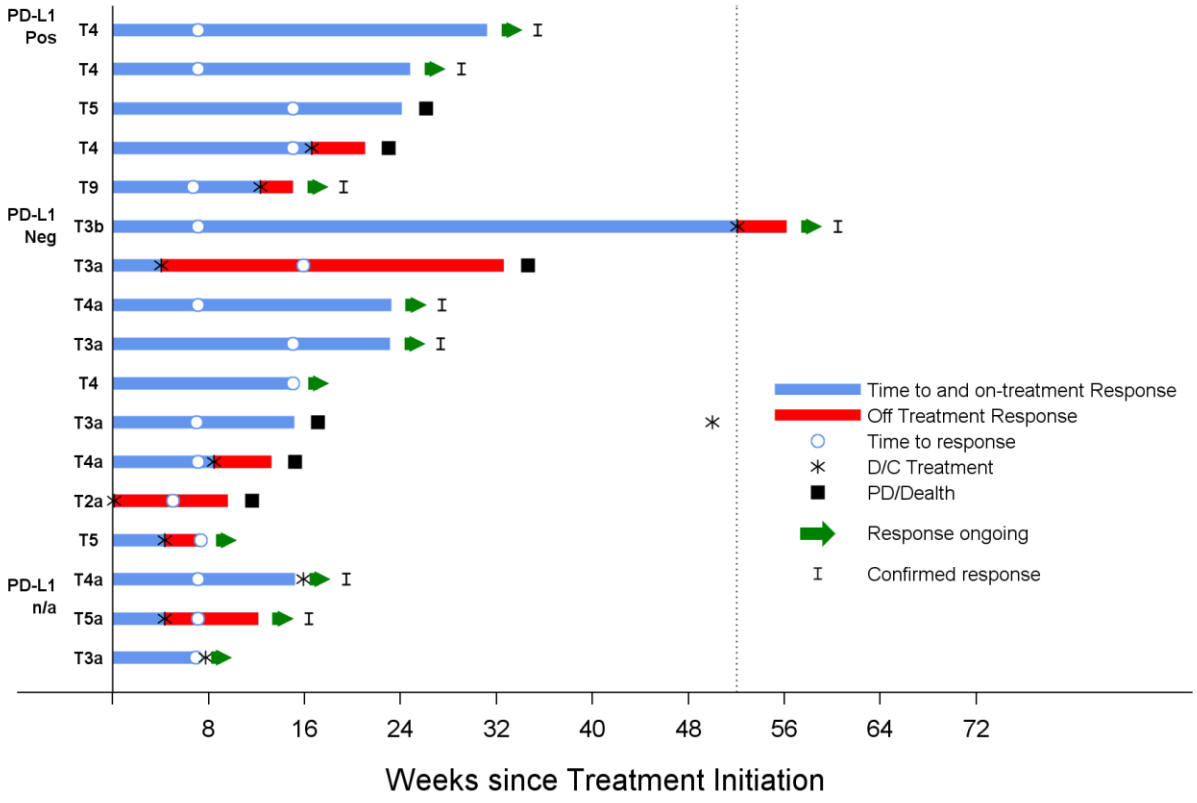
b. The second graph

In addition to the above graph, this graph contains the confirmed response.



c. The final graph

In addition to the above graph, this graph contains progression and death information.



CONCLUSION

Having a good understanding of the trial results, and knowing what you want to communicate to your audiences/readers, is very important for an accurate interpretation of the clinical data. Once you have the whole picture of the trial and the study results in your mind, then you will know how to draw a pleasing graph for yourself and the reviewers.

REFERENCES

[1]. http://support.sas.com/kb/40/255.html

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