DAAG Conference

Using Preference Probabilities as a Surrogate for Market Forecasts

February 28th, 2002
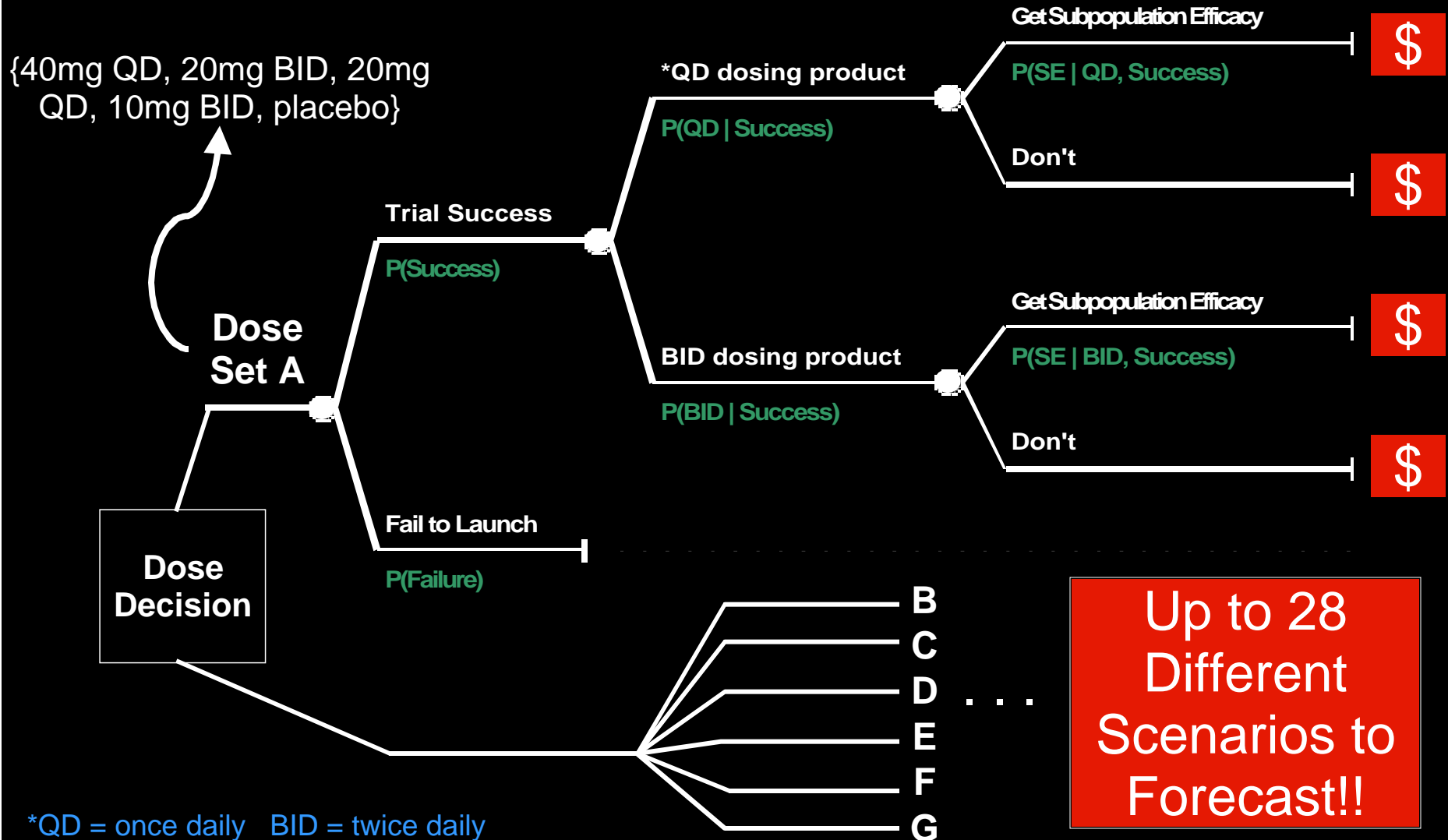
Lilly

Answers That Matter.

The following example will help illustrate how preference probabilities may be used.

- Y, a Phase II drug is under development. Due to resource constraints only a limited number of doses can be tested in Phase III clinical trials.

- Doses differ by amount of drug and frequency of therapy. Thus, each dose has a different market value than the next (larger dose → higher price; smaller frequency → higher value).

- A <u>decision</u> needs to be made as to which set of doses should be tested in Phase III clinical trials.

- The team has agreed to look at 7 different dose set alternatives: A, B, C, D, E, F, and G. Each alternative set consists of 5 different doses.

- The team wishes to use expected market value as a deciding metric – based on the market values of all possible clinical outcomes and the probabilities of achieving those outcomes.

Traditionally, one would have to forecast many different NPV outcomes.

{40mg QD, 20mg BID, 20mg QD, 10mg BID, placebo}

Dose Set A

Dose Decision

Trial Success
P(Success)

Fail to Launch
P(Failure)

***QD dosing product**
P(QD | Success)

BID dosing product
P(BID | Success)

Get Subpopulation Efficacy
P(SE | QD, Success)

Don't

Get Subpopulation Efficacy
P(SE | BID, Success)

Don't

$

$

$

$

B
C
D . . .
E
F
G

Up to 28 Different Scenarios to Forecast!!

*QD = once daily   BID = twice daily

As an alternative, one can use preference probabilities to capture market value.

Preference values are used to quantify the difference between various market scenarios

Suppose there are three <u>outcomes</u>: A, B, and C.
The team prefers A to B and B to C. The team is also <u>indifferent</u> to the following tradeoff:
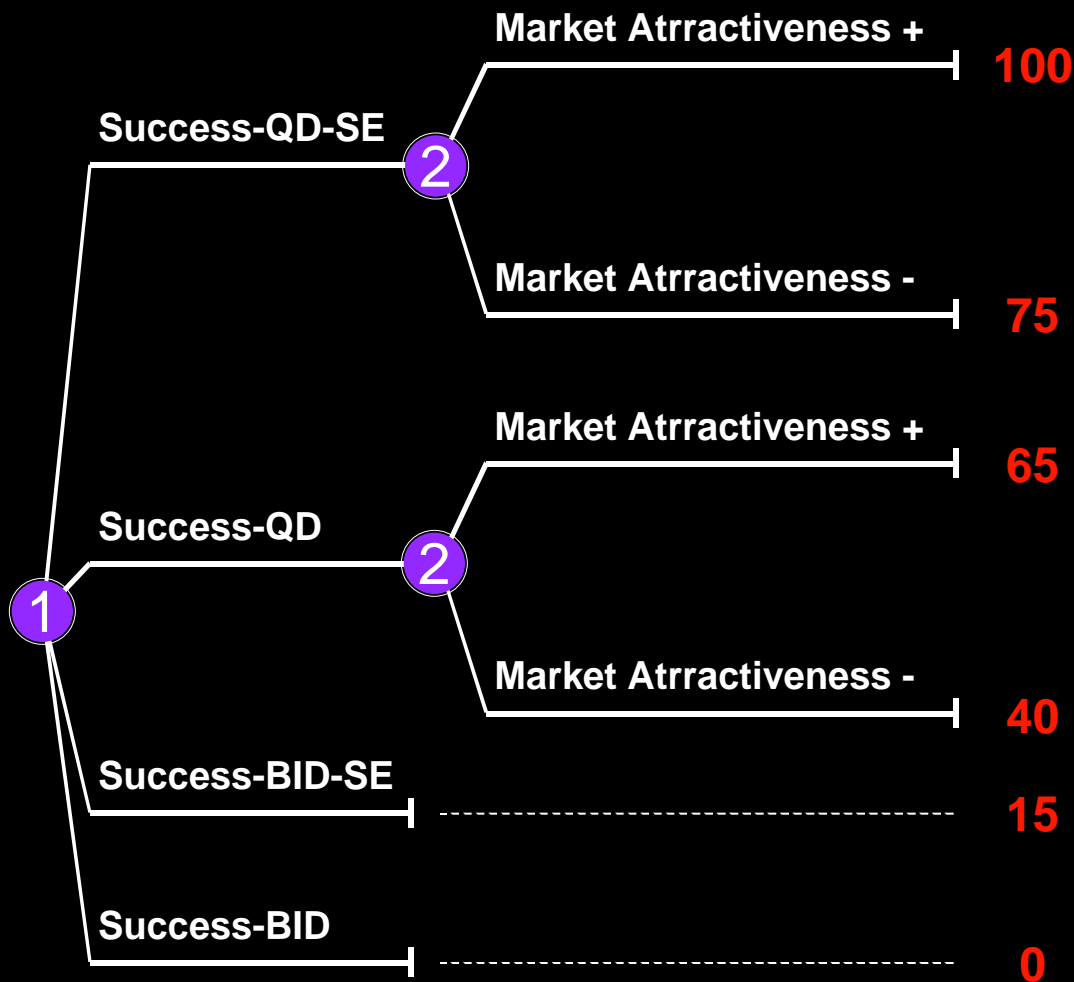
B   or   [diagram: branch with 0.75 → A and 0.25 → C]
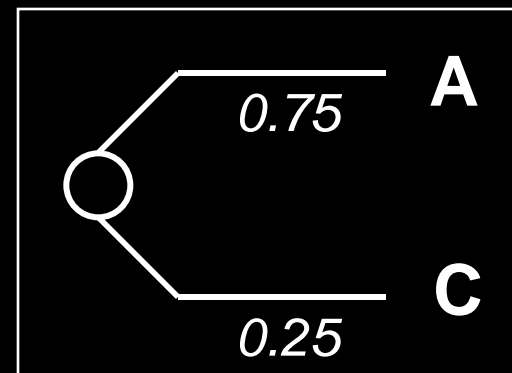
Thus, the preference values are A = 100, B = 75, and C = 0

The exercise can be expanded to include all groups of possible outcomes.

Market Atractiveness +

100

Success-QD-SE

2

Market Atractiveness -

75

Market Atractiveness +

65

Success-QD

2

Market Atractiveness -
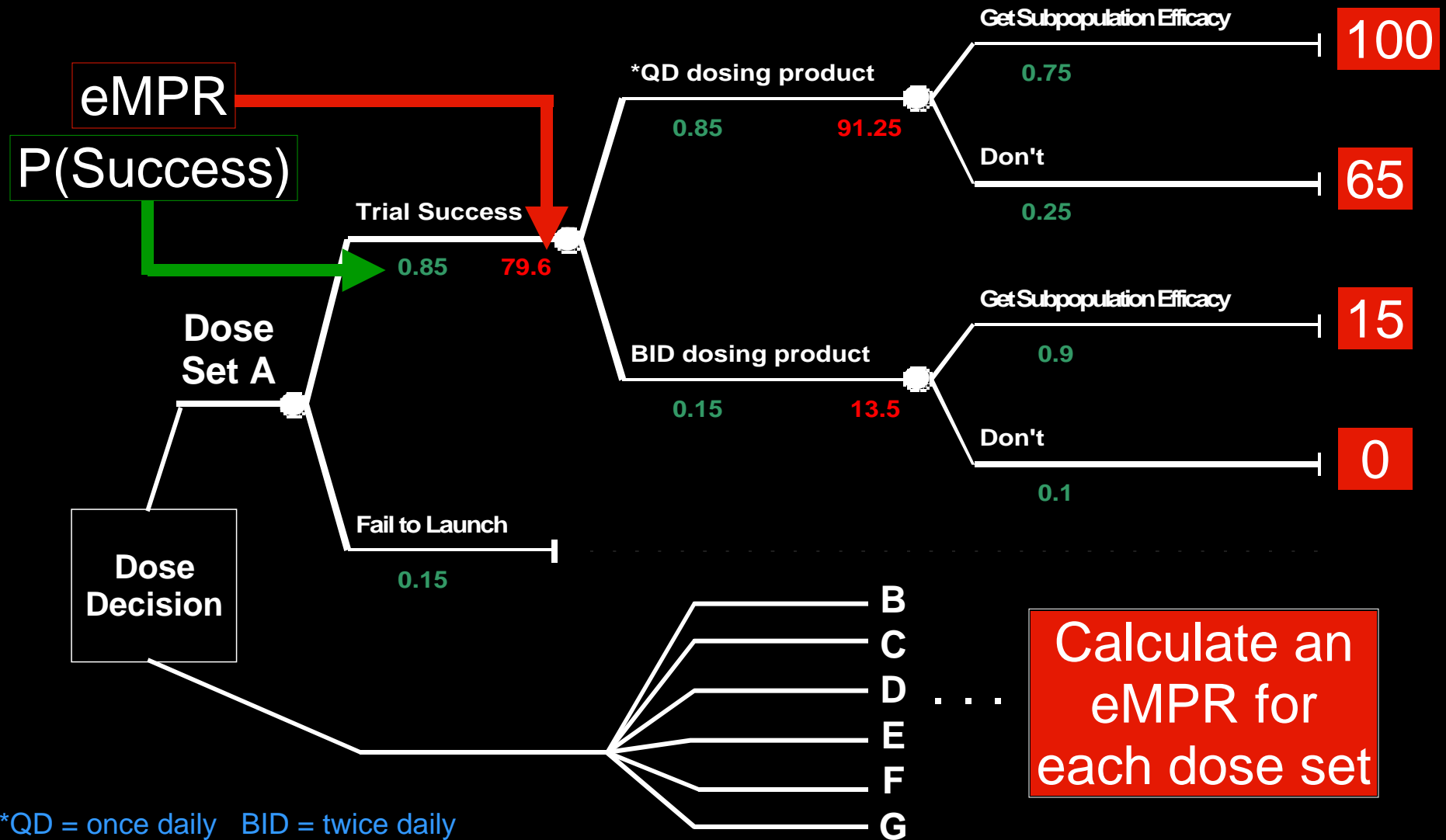
40

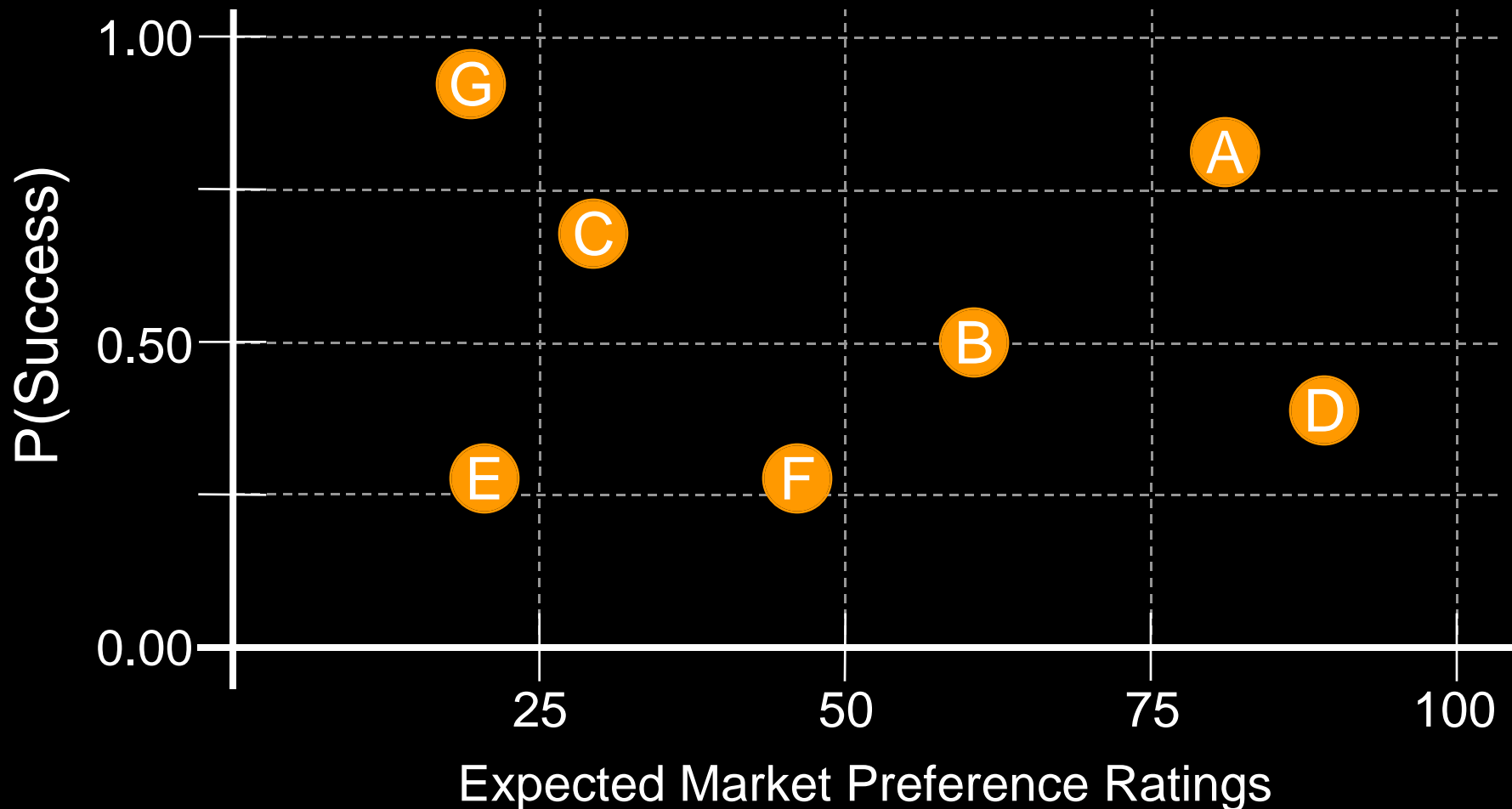**Success-BID-SE**

15

1

Success-BID

0

Distinctions:

1 Possible Clinical Outcomes
(i.e. do we get a QD product?)

2 Inherent market attractiveness of dose set
(i.e. does the particular set of doses have pricing advantages?)

*In the actual project, there were other layers of distinction -- taken out here for purpose of illustration

Insert the relevant probabilities & end node preference values for each dose set and roll back the tree.

eMPR

P(Success)

Trial Success
0.85   **79.6**

*QD dosing product
0.85   **91.25**

Get Subpopulation Efficacy
0.75   **100**

Don't
0.25   **65**

BID dosing product
0.15   **13.5**

Get Subpopulation Efficacy
0.9   **15**

Don't
0.1   **0**

Dose Set A

Fail to Launch
0.15

Dose Decision

B
C
D
E
F
G

Calculate an eMPR for each dose set

*QD = once daily   BID = twice daily

After calculating the expected MPR, the results are plotted against P(Success).

There are several advantages and disadvantages in using this technique.

Advantages

Very quick and efficient

Captures the team's preferences without digging in to unneeded detail

List of alternatives can be narrowed down without heavy market research

Scale can be used as a basis for trade-off arguments when the decision needs to be made

Disadvantages

It may be difficult for clients to understand the relative preference differences at the end of the day

Market research may not completely buy in to this approach

On occasion, the team's preferences on outcomes may be too tight (i.e. A=0, B=98, C=99, and D=100) to differentiate themselves in the analysis.

Any Questions?