

# Relevance of TDM to clinical outcomes with busulfan

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## **Scope of the lecture:**

To examine the use of alkylators in cancer treatment.

Focus on busulfan and the need for TDM (and compare oral vs intravenous route)

How has therapeutic drug monitoring helped dosing.

How could we do better.

The role of DNA repair and dose and regimen of alkylator such as busulfan.

## **Learning objectives:**

1. That a non targeted drug is still so effective and first line after 60 years
2. That we have high quality real world data for TDM to make this drug less toxic and more effective
3. That sites may still not implement routine TDM in cancer despite evidence that it improves outcomes,

## **Extended abstract:**

Busulfan is an alkylating agent that is an effective component of the conditioning regimen for myeloablative autologous and allogeneic hematopoietic stem cell transplantation (HSCT). Several other alkylating agents have also shown clinical benefits. However one of the advantages of busulfan-based HSCT regimens over alternative alkylators is that both pharmacokinetic (PK)-guided dose adjustment methods and analytical methods for easily and accurately monitoring plasma concentrations are now very well established. PK-dose adjustment for busulfan has shown clear benefits in reducing overexposure and resultant toxicity such as veno-occlusive disease of the liver and preventing underexposure. However much of this literature is due to busulfan only being available orally, and poor dose-exposure predictability. However the more recent availability of an intravenous formulation of busulfan has enabled more predictability between dose and exposure. This presentation will discuss the relative cost: benefit issue of implementing TDM using oral vs. intravenous routes, the continuing problems with implementation into practice, and new methods that may make patient and hospital uptake more attractive.