TIVA: at extremes of age & weight

The obvious answer for total intravenous anesthesia at extremes of age and weight is to titrate the drug to effect. However, it is useful to understand general principles: how do pharmacokinetics and pharmacodynamics change with age and weight, particularly at the extremes?

For extremely young patients (neonates), one must consider the route of metabolism of our anesthetic drugs. The pharmacodynamics (concentration vs. response) for most anesthetic drugs is typically the same as in older children and adults. However, the pharmacokinetics (dose vs. concentration) can be very different from the pharmacokinetics in older children, based on the level of development of the specific metabolic pathways.

At the other extreme of age, the dose of most anesthetic drugs in HEALTHY elderly patients decreases by 20-50% with increasing age, especially as patients start to approach their 80s. However, for elderly individuals with systemic illness, or on multiple other medications, the decrease may be far more extreme than the 20-50% decrease in healthy elderly individuals.

There are very few patients in the “extremely skinny” variety. I’d probably give them lots of propofol. They can use the fat.

It becomes more difficult to calculate the correct dose for patients in the morbidly obese category. A variety of dosing schemes have been proposed to calculate the pharmacokinetics of propofol, opioids, and other anesthetic drugs in morbidly obese individuals. These will be reviewed during the lecture.