

**SPEAKER 1:** Whatever we discuss so far is a MAC patient that doesn't have advanced disease or cavitory disease. And for treatment for those, you're going to continue based off whatever we discuss. But the question is, if the patient does have very severe, debilitating disease, or cavitory lesion in your chest image, what going to be the best treatment? What we do and we would recommend is starting one injectable, aminoglycoside, in that setting.

We have done multiple studies on aminoglycoside susceptibilities in NTM. And there are much higher numbers in other part and other researchers done. In all, we concluded that amikacin does have highest susceptibility against MAC. And that is a reason for the first line injectable, I would suggest amikacin for the patients. Usually, we're going to give every day amikacin, and that's going to be injectable after placement for intravascular catheter, and we are going to control for a couple of things that are concerning.

Remember, amikacin first does have kidney damage risk. So you need to check B1 and creatinine every week and make sure never toxicity is not going to be your case. Second thing is you need to check for the hearing tests. And why is important? Many studies, starting 1960s, showing that aminoglycosides can increase risk for hearing loss.

And that is the reason that you're going to check your patient every month. And just remember, hearing loss is permanent damage. And patients that does have this side effects, never going to be repaired and recovered. That is a reason you're always concerned and every month check. If there is high frequency damage, probably you need to stop that. But always risk benefits should be discussed with patient, with family, and consider clinical setting and make your final judgment.

Recently, and that is in end of 2018, we have new medication-- basically new form of amikacin. FDA approved base of two big study-- international multi-center studies, that's showing inhaled amikacin is effective as other medication, and basically improving lung function, and condition, too. The new medication is lipid [INAUDIBLE] amikacin.

A little bit back about pharmacology here. As you know, amikacin doesn't have good effects and penetration in the lungs. So we are giving very high dose injectable medication that increase risk for toxicity. But in the same time, we want to get best penetration in the lung. Researchers find out a way to put amikacin inside the lipids. And this lipid basically going to attach to the cell wall of immune cells and deliver amikacin intracellular, and increase intracellular killing. And it is exactly what where we want to do.

Liposomal amikacin inhaler is a medication that almost 60% reach to the entire part of lower alveoli and [INAUDIBLE] macrophages. And as you know, mycobacteria is intracellular pathogen. So that is the way we're going to kill and stop growth of mycobacterium inside macrophages. And because you are using as inhaler, concentration in the blood is not high as injectable amikacin makes for you. So in that setting, you'll have less toxicity, and compliance improve, and in the same time, bacteria going to kill, and also faster convert sputum to negative.