



Comparison: Technegas™ v. Insta/Vent™ Plus

	Technegas	Insta/Vent™ Plus	Observations
Cost Considerations	<ul style="list-style-type: none"> • Technegas™ Generator (capital expense) • Generator service by authorized service personnel every 12 months • 200 Volt Power Supply • Dedicated power supply for charging battery in generator • Laboratory grade Argon (99.99% pure) not in an aluminum cylinder • Crucible for each study • Kit for each study • High Specific Activity 99mTc (100-250mCi/mL) • 95% or Absolute Ethyl Alcohol • Set-Up and production time approximately 10 minutes 	<ul style="list-style-type: none"> • Lead Shield (one time cost only) • Kit for each study 	<p>The TechnegasPlus Generator has a quoted life expectancy of approximately 15 years. It's cost is believed to be \$38,000+. Special payment programs may allow generator cost to be included in consumable "package" at an increased price.</p>
Maintenance	<ul style="list-style-type: none"> • Generator service by authorized service personnel every 12 months • Crucible oven must be cleaned regularly. • Generator is battery powered so must be plugged in for recharging when not in use. 	<ul style="list-style-type: none"> • Blow air through pressure port, as necessary, to remove dust. • Replace oxygen tubing as needed. 	<p>Well maintained Insta/Vent™ Plus lead shields can last for decades in the field.</p>
SPECT Imaging	Yes	Yes	<p>Insta/Vent™ Plus customers perform SPECT using DTPA, PYP, MDP, MIBI and Sulphur Colloid. Note: DTPA has been approved by FDA for lung imaging. PYP, MDP, MIBI and Sulphur Colloid require a physician's order.</p>

Carbon Particles Inhaled	Yes	No	Carbon tagged particles, used with Technegas™, are inhaled but not exhaled. Current research has not adequately justified the safety of this practice or determined the frequency at which this procedure can be safely performed.
Set-Up Time	Approximately 10 Minutes	1-3 Minutes	<p>Technegas™ administration consumes approximately 10 minutes of valuable operator time, unless there's a delay during set-up or a patient isn't ready within the 10 minute window of availability. Should this occur the administration process must start over.</p> <p>Set-up for Insta/Vent™ Plus is approximately 1-3 minutes and includes just attaching an oxygen tube to the lead shield, inserting a radioaerosol kit and injecting the drug.</p>
Administration Time	3-4 Breaths (20-30 seconds) (unless count rate is low)	8-20 breaths (30-90 seconds)	<p>Excellent Insta/Vent™ Plus images can be obtained in as little as 8 breaths but most often 10-20 breaths are taken.</p> <p>3-4 breaths, as claimed by Technegas™, may or may not be adequate to fully ventilate an abnormal lung. Should count rates be low or a patient not ready, the 10 minute limit of Technegas™ availability could easily be exceeded. This would then require the study to be started over.</p>

Activity for Lung Ventilation Study (^{99m} Tc)	100-250mCi/mL	20mCi/mL	High specific activity ^{99m} Tc may or may not be readily available 24/7.
Available 24/7	Yes	Yes	Technegas™ and Insta/Vent™ Plus are available 24/7, as long as ^{99m} Tc is.
Radiation Clearance	Approximately 6 Hours (Half-Life of ^{99m} Tc)	30 - 60 minutes for normal patients. 10-20 minutes for smokers.	Clearance time for radioaerosol may be extended by use of PYP or Sulphur Colloid.
Radiation Exposure	Unknown	Minimal	<p>Technegas™ is often compared to unequal applications such as Xenon, CT, and the single tube UltraVent with an elevated administration time. Safety used to be featured but now just reduced exposure levels to women's breasts as compared to CT is highlighted. Actual levels of exposure are unknown.</p> <p>With exceptional shielding and rapid dosing, radiation exposure is minimal with the Insta/Vent™ Plus.</p>
Particle Growth	Hydrophobic and Particles Aggregate	None	<p>Technegas™ particles start at 30-60nm but start to aggregate immediately, reaching their maximum usefulness within 10 minutes.</p> <p>Because of Insta/Vent™ Plus's unidirectional air flow, particles are not subjected to a humid environment such as in a single tube system, and therefore maintains its particle size of .28μM, until inhalation.</p>

<p>Mean Particle Size</p>	<p>30-60nm at production.</p>	<p>0.28 μM at inhalation</p>	<p>Insta/Vent™ Plus has a MMAD of 0.28μM, meaning half of its particles start much smaller than this. Being a two tube system, with unidirectional air flow, particles avoid humidity and don't begin to grow until they are inhaled.</p> <p>During the 10 minute prep time, Technegas™ particles start to aggregate. One must wonder what the particle size actually is at 2 minutes, 5 minutes or upon inhalation.</p>
<p>Particle Size Measurement</p>	<p>Electron Microscopy</p>	<p>California Measurements Quartz Crystal, 10-Stage Microbalance Cascade Analyzer, Model PC-2</p>	<p>United States Food and Drug Administration (FDA) recommend cascade impactors for measuring drug particles. Unlike the Anderson Cascade Impactor, the Quartz Crystal, 10-Stage Microbalance Cascade Analyzer allows all particles, large and small, to be measured for an accurate MMAD.</p> <p>Electron Microscopy will provide accurate particle size measurements at the time of production but does not provide vital information about the growth of Technegas™ particles or provide the particle size at the time of inhalation.</p>
<p>Minimal Exclusion Criteria</p>	<p>Yes</p>	<p>Yes</p>	<p>Both delivery systems may be safely performed on almost all patients, including young women of child-bearing age, pregnant women and those with renal impairment, iodinated contrast allergy and chronic lung obstruction disease.</p>

<p>Conserving Reservoir Bag and Internal Air Flow Control Mechanism</p>	<p>No</p>	<p>1L, Latex Free</p>	<p>The conserving reservoir and air flow control mechanism in the Insta/Vent™ Plus allows aerosol to be collected during patient exhalation. Upon inhalation aerosol mist from both the top tube and the reservoir are immediately delivered to the patient. This allows each breath to be fully medicated and dramatically increases the speed of delivery and patient comfort.</p>
<p>Supports Shallow Breathers</p>	<p>No</p>	<p>Yes</p>	<p>Insta/Vent™ Plus was originally designed for shallow breathers. It's unidirectional airflow and internal air flow control mechanism allows rapid dosing with normal tidal breaths and no breathing resistance.</p> <p>Special breathing patterns based on a patient's condition are required with Technegas™.</p>
<p>Use with Ventilator Dependent Patients</p>	<p>Attachment</p>	<p>Special Kit</p>	<p>Insta/Vent™ Plus has a special kit for ventilator dependent patients. It is easy to use, available in a small case quantity of just 6 each and allows patient dosing with a single nuclear technician.</p> <p>Technegas™ may be used with ventilator dependent patients. However, it requires a multi-step procedure that recommends using two specially trained technicians.</p>
<p>United States Food and Drug Administration (FDA) Clearance</p>	<p>No</p>	<p>Yes</p>	<p>Insta/Vent™ Plus was cleared by the FDA in 1998.</p>

Research	Outside USA	USA	<p>Having not been cleared by the United States Food and Drug Administration (FDA), Technegas™ research comes from outside the United States. As of yet, most studies have compared it to Krypton, Xenon and single tube radioaerosol systems using DTPA. Without a head-to-head comparison using a small particle producing, unidirectional radioaerosol delivery system with SPECT, its effectiveness can only be speculative.</p> <p>A detailed financial comparison between Insta/Vent™ Plus and Technegas™ would provide pertinent information. Additionally, a long term risk analysis on the inhalation of Technegas™ carbon particles and repetitive procedures would be valuable.</p>
Technical Support in USA	Select Distributors	Manufacturer and Distributors	<p>Medi/Nuclear's® customer service representatives are highly skilled and able to immediately answer most questions, provide troubleshooting tips, send instructional information, and handle product exchanges or repairs. For product related questions a customer may contact Medi/Nuclear® directly or one of its many fine distributors.</p>
*Technegas information was compiled from information available to the public, on the internet.			