

## Laboratories Need To Apply Green Principles

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We do not inherit the earth from our ancestors; we borrow it from our children

The world has been struggling for decades to preserve the earth. Despite the efforts of various governments, foundations, groups to lead greener movements, the earth is still suffering from increased global warming, pollution, North pole and Antarctic melting, and of course diseases in humans and animals.

We want to inherit a better world to our next generations. We need to ask ourselves, what we do NOW is going to improve the sustainability of the earth or will worsen the current situation of global warming. Mr. Barack Obama mentioned in his quote: "We are the first generation to feel the impact of climate change and the last generation who can do something about it".

The awareness of mankind to contribute to the preservation needs to be increased. All industry leaders shall be leaders in environmental preservation movements. In particular, industries utilising large amounts of natural resources or producing waste which contributes to the increased worsening of the environment, should contribute the most to the efforts of giving back to nature.

### Where does the medical laboratory stand?

Medical laboratories are one of the main sources of energy consumers and waste generators. Clinical laboratories are said to consume 10 times as much energy compared to offices. It also consumes 4 times as much water than offices. Scientific laboratories in general produce 5.5 million tonnes of plastic waste alone every year, which is 1.8% of the plastic waste produced worldwide. Hardly any other place uses as much plastic as hospitals for hygienic reasons. Medical laboratories consume a lot of disposable plastics especially for use on patients, and with the same reasons: Hygiene which remains uncompromisable. Nothing may come as a higher priority than patient safety, which forces the laboratory to use disposables. And then comes safety in the workplace, which is also an important reason to use disposables. Considering those reasons, it seems not to be close to the horizon that plastics disposables will see a reduced utilization in the near future. Although said as not necessarily a utopia, the road to reducing the use of disposable plastics is still long. So what can we do as medical laboratory practitioners, to help the earth from getting worse?

The following, although not a Pandora's Box, may serve as ways for us to contribute.

There are at least four ways the medical lab practitioner can contribute to. Firstly: design a green building, if you have the liberty and access to it; secondly: create and implement policies on resource utilization and waste management; thirdly: implement environment best practices and habits in the workplace, and fourthly: imply policies on utilization of eco-friendly products.

### **1. Design of a green building**

Not every lab can be designed according to green building principles, as many laboratories occupy already existing buildings, but if one has the luxury of starting a lab from anew, the following are some important features of a green laboratory building:

- Orientation of building towards sunrise, so that individuals working in the building will have access to morning sun.
- Easy to accessed be by public transport so workers and service users can reach the lab with minimal use of time and energy.
- Recycling facilities within premises Unused land and rooftops turned into gardens
- Utilisation of recycled materials for construction
- Maximum use of natural light, with low emissivity glass, high windows
- Water conservation by storing rainwater, and using water from sewage for toilets flushing and landscape irrigation

### **2. Creating and implementing policies on resource utilization and waste management**

Lab management needs to understand more about what policies on resource utilization and waste management can be implemented?

- The most effective approach to green resource utilisation is to use eco-friendly equipment for air conditioning, lights, toilets. Motion sensor lights, which are switched on and off when people enter or leave, green air conditioning system using 'variable refrigerant volume' which can increase air conditioning efficiency by 30% or more, toilets which flush with 4.5 liter instead of 6 liter water, waterless urinoirs, motion sensor faucets, just to mention some.
- To minimise utilisation of clean water, use stored rainwater and waste water instead for toilet flushers and watering the gardens.
- Standard laboratory waste management shall be practiced, with as much recycled products used as possible.

### **3. Implementing environment best practices and habits in the workplace**

- It has been a worldwide recommendation for all citizens of the earth since the last decade that people shall not use disposable plastic cups. A personal tumbler usage policy shall be a standard policy for all medical laboratories.

For all plastic use, it is mostly common to urge on usage of reusable plastic or other materials. However, although recycled materials are already a step forward, the recycling process itself in practice is not as easy and simple. That is why as long as reusable materials are available, this must be the choice before recycled materials.

- Each laboratory shall have a policy on paper consumption. Which documents are allowed for printing, how much paper in the kitchen or toilets are to be used, shall be policies implemented with enforcement.



- Whenever possible, laboratories shall implement the R5 policy and audit it periodically. R5 stands for: Reduce, Reuse, Recycle, Replace, Replant. Reduce everything possible to increase efficiency: waste, electricity, water, paper. Reuse waste like plastic bottles as plant pots, etc. Recycle whatever is recyclable. Replace as much eco-unfriendly materials with eco-friendly materials like fabric towels instead of paper towels. Replant, or reforestation as much plants in gardens and lands to serve as buffer.
- Implement a freezer usage policy: periodic defrosting, cleaning out of unneeded materials,

#### 4. Implementing policies on utilization of eco-friendly products

What are categorized as eco-friendly products? In principle, eco-friendly products are products which cause minimal harm to people and the environment.

Some characteristics of eco-friendly products are:

- Products which are not produced using a lot of resources (electricity, water, pesticides, etc)
- Renewable energy from wind, solar, rain, waves, geothermal sources, plants, are good resources alternatives whenever available
- Products made of recycled material – yard waste, recycled glass–paper–plastic, rather than aluminum cans which needs 500 years to decompose.
- Products which are produced in a manner producing minimal harmful waste.
- Some features are: not containing chlorofluorocarbons, or hydro–chlorofluorocarbons, or other ozone–depleting substances; low embodied energy (energy required to produce and transport the materials and products)
- Some eco-friendly PPE: organic cotton or recycled material laboratory coats; nitrile gloves; reusable and biodegradable goggles, polyethylene shoe covers.

All the above are opportunities of individual labs. Apart from that, group of medical laboratory practitioners may start movements, perhaps in collaboration with the IVD industry in raising awareness of practitioners by conducting surveys, or creating self-assessments for laboratories. Self-assessments may serve as awareness tools and if followed with site visits may also serve as competition programs. Even a simple freezer usage competition may work as an effective tool in raising awareness. Greenlab leaders in the country/region may conduct webinars continuously as to keep the awareness at a high level.

The road to a green earth is still very long, and some may think is impossible, as mankind nowadays live with the comfortability of today's technology and convenience, but there is no other choice than striving for embitterment. Because we want the coming generations to live in a livable world, eating healthy food and breathing healthy air. To quote a saying from the Aborigines: "Look after the land and the land will look after you, destroy the land and it will destroy you".

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