Welcome back to Central Line. I'm Dr. Adam Striker, and we have an old friend with us today, Dr. Lalitha Sundararaman, guest editor of the June Monitor. The topic of today's show is the cost of perioperative waste, which touches on a few things -- supply chain issues, drug shortages, sustainability and more. Dr. Sundararaman, we're certainly glad to have you with us to explore this important topic. Welcome back.

Thank you, Adam. I'm really happy to be here.

Let's start today with the costs, the literal costs of care. And we'll dive right into some figures. Just as some background, we have covered environmental sustainability on the show. This touches on it a little bit. But it's becoming an increasingly important issue. But certainly as it relates to cost. The United States spends 4.3 trillion on health care every year. And according to a recent study in JAMA, the 20 to 30% of that is wasteful, which means our waste is larger than the GDP of Norway and Portugal combined, as you pointed out in that editorial you wrote. So if you don't mind, talk a little bit about the costs of care here and why the cost and waste are so high.

Sure. Thank you, Adam. Why is the cost of our health care so high and why is our waste so high? We're not even in the top ten countries with the best possible health care. In fact, if you just consider that our waste in health care is more than our military spending and is more than the spending for our primary and secondary education
combined, you'll be thinking like, there must be something cardinal that we're doing wrong. In fact, even if we save about 20% of just our health care wastage, which was pointed out in a study by McKinsey, then we could ensure 20 million additional Americans. And when more Americans are insured, this automatically further decreases waste and hence we will be actually setting up a favorable cycle. And that's why it's really important that we focus on this today.

DR. STRIKER:

Well, I do want to touch on a few of the aspects of what makes up the waste. Let's start with supply chain issues. If I'm not mistaken, the cost of supply chain now account for about 25% of pharma costs and 40% of medical device costs. Most practitioners are not experts on the supply chain. So why don't you give us a little bit of a quick overview on what exactly is going on with the supply chain, both as it relates to the pandemic and also as it maybe doesn't relate to the pandemic?

DR. SUNDARARAMAN:

Sure. Thank you. A supply chain is actually a series of steps and processes, including procuring, paying for, transporting, and delivering products and services from the site or sites of manufacturers to the patient. So obviously there are many parts to the supply chain, and it's such a tenuous process right now that even if one link is broken, this can result in a detriment to patient services. And that's why the supply chain is so important. And we just realized that during COVID, you know, when the supply chain was disrupted because of the pandemic, our healthcare took a real hit and simple stuff such as like PPE, personal protective equipment, hand sanitizers, were not available. And this affected healthcare in more ways than one. And why exactly is this? Why did this happen? Why did we allow it to happen? The reason being that healthcare services are a fast moving consumer goods industry. The nature of the healthcare services changes very quickly, and healthcare has a demand which has increased in certain sectors and decreased in certain sectors depending upon the climate. And hence, many hospital systems followed a just-in-time management protocol of their supply chain prior to COVID, meaning that they will gauge what they really need in healthcare services and increase the procurement of that particular product or services just in time to make sure that it doesn't affect patient healthcare. And obviously in COVID times we realized that that was not adequate. So because of the just in time policy, personal protective healthcare equipment did not get delivered. Hand sanitizers were super expensive and many other essential products and services, including personnel, were not available during COVID. And this After COVID. However, the healthcare industry has woken up a little bit and made some crucial changes to its supply chain, which therefore portends for a better future. Parts of the supply chain include the pharma industry and medical
device procurement, but there are many other parts to it, such as delivering healthcare 
services, so every single bit matters.

DR. STRIKER:

We still experience significant supply shortages where we are and I know I'm not alone,
is the fact that we are still experiencing basic equipment shortages, is that just because 
it's related to the general lack of supply of everything in our country right now? Or is 
there something specific about medical care supplies that needs to be factored in as it 
relates to supply shortages?

DR. SUNDARARAMAN:

It's medical supplies which are actually more affected, especially in this climate and the 
reason being pretty diverse. You know, there are basically global procurement systems 
which, in certain areas, there are regional procurement systems which procure supply 
chain essentials from other global procurement systems. And hence, what happens is, 
these regional partners want to drive down prices, they want to negotiate further. And 
this results in delays in supplies. And even though therefore the procurement and 
production have increased, we are not seeing that in our country. The second reason is 
basically pharmaceuticals. Already in the US, pharmaceuticals are 50% higher priced 
than in other developed countries. And getting these products from overseas where 
they are mostly produced has resulted in shortages. The US has one of the most 
fragmented supply chain hierarchies. Now, what do I mean by that? You know, when 
we see who procures all the equipment and pharmaceuticals for a particular healthcare 
system is quite variable in the country. In some hospital systems, it is the materials 
management division of the hospital. In some hospital systems, it's the pharmacies 
which actually procure most of the essential drugs. And the other supply chain part is 
procured by the materials division. Whereas in some others the ordering of 
perioperative products results are brought about by the anesthesia technicians. So it's 
like so fragmented and disorganized. And that may be one reason why we have so 
much difficulty with our supply chain. And to date, we still have a shortage.

DR. STRIKER:

Well, as you pointed out, the drug shortages have been a big and very visible part of of 
the supply chain problems. And certainly the shortages are costly. And you already 
pointed out the significant cost difference between drugs in the United States as 
opposed to other developed countries. Do you mind just elaborating a little bit about that 
topic? Because I think it's an important one. And drug shortages has been on the radar
of anesthesiologists and the ASA for some time now, even before COVID. But let's let's spend just another minute or two talking about that, if you don't mind.

DR. SUNDARARAMAN:

Sure. So one of the questions that commonly people ask, especially, you know, people who come from other countries, is why are drugs so expensive in the US? You know, I used to pay like half a dollar for albuterol in my country and come now and the price is like about $60 for a single canister. Why is it so expensive? And the reason being is that, you know, many low-cost generic drugs are actually being manufactured outside the US. And a really surprising and sometimes shocking fact is most of the physical ingredients and most of the low-cost generic drugs and actually being manufactured by two manufacturers in the world. And they basically pretty much give us most of the low cost generic drugs at really low prices. And the reason that we are so dependent on these two manufacturers is that nobody in the US wants to really manufacture them here. They'd rather invest in like niche drugs, which have a high profit margin and also drugs, you know, where brand recognition is high because that would mean that their product is going to be bought by the particular supply chain, you know, helping in our hospital system and hence drive up their profit margin. So while many companies in the US actually procure these drugs from the manufacturing facilities, they don't really manufacture it here. And that's what is causing a persistent shortage in many generic drugs. Like you might have noticed in the OR that we had a shortage in hydrocortisone. We have a shortage in albuterol. We have a shortage in heparin. Drugs which are being probably there since the beginning of time and nobody really wants to invest in them now. And you might think like, why can't we just invest a little bit in like improving our manufacturing facilities so that we can just produce them here. Just to upgrade our manufacturing facilities to produce all these drugs, it would cost an average of $100 million. Nobody wants to invest that kind of money. It just wouldn't make sense to them when they can just procure them at low prices from developing countries. And that's the problem that we still have. To date, you know, bipartisan senators actually push the FDA and said like, you know what? You got to make sure that we don't really want to cause any further national shortages. And in 2019, they actually passed -- 2017 once and then in 2019 -- they passed a rule saying that the FDA can have powers to preventing drug shortages by changing market policies. But again, the FDA learned that manufacturers don't want to produce those drugs and they rather just abstain from that market. So really, there's not much solutions left for them in this degree, and that's why we still have those shortages today.

DR. STRIKER:

So why do the two big manufacturers do it then?
DR. SUNDARARAMAN:

So big manufacturers actually sell additional drugs to the same procurement parties and hence, they offer group deals and they offer like some of the drugs at less than market prices or lower market prices so as to drive the deal home. And also like labor and economics, are much cheaper in those countries than in ours. So hence it doesn't make economic sense for many times the drugs to be produced in our facilities here.

DR. STRIKER:

Do you think that this is somewhat of a national security issue in that when a crisis arises, we simply may not have access to these drugs because we're not producing them here?

DR. SUNDARARAMAN:

Oh, absolutely. In fact, the consulting company McKinsey was hired at the end of COVID or during the, you know, variant of COVID in order to find out what can be done to the health care industry and supply chain in the health care industry to make sure that we don't land into the same problem again. And McKinsey found out that the supply chain was pretty tenuous coming in from China and India, and being outsourced to far away. And they actually suggested regionalization of at least procurement networks. And that has actually helped in the sense that now we don't have a just in time policy. And instead, there's like a regional procurement network which procures these medications and other essential supplies and then distributes it locally and hence they have a little bit of bandwidth to help accommodate changes in supply versus demand. And that's why we are in a little bit of a better position now. And when you compare to other fast moving consumer goods industries like aerospace and automobiles, actually healthcare industry, according to McKinsey, have shown the best improvement since the end of COVID by about 60% in trying to mend its fragile supply chain networks.

DR. STRIKER:

So would you say that efforts are continuing to improve or are we stagnant now with those improvements, or is the outlook positive over the next few years?

DR. SUNDARARAMAN:

I think the outlook is positive, but we still have so many major issues, right? We don't manufacture many of the drugs. We're still dependent on other countries supplying them
to us. And, you know, we're also dependent upon many hospital systems. So what has happened is that in the US there are many major hospital systems which actually bring about more and more hospital mergers. And these hospital mergers have also caused hospitals to drive their own price points. And hence you will find that there's a wide variability in the price points of various services, pharmaceuticals and medical devices amongst different parts of the country. And that is also one more reason why there is such a disparity in our healthcare system. Unless all these issues are also sorted out, in addition to supply chain, there can be a regional variability itself in the supply chain and that is still going to make it difficult for the average consumer, the average patient.

DR. STRIKER:

Well, certainly a lot of tentacles to increased health care costs. And this is one of those that our patients aren't usually thinking about, and probably our politicians aren't thinking about it as much. But when you peel back these layers, you start to see just just how complicated health care costs and expenditures really are and how it can turn into a vicious cycle very quickly.

DR. SUNDARARAMAN:

You know, one of the major subsets of health care waste is administrative costs. And that is actually exactly what distinguishes us from even other developed countries like the UK and many other developing nations. And what are these administrative costs? These administrative costs are going through multiple payer systems, multiple insurance networks, and multiple chains of command for the same payee versus payer. So many people suggested at the Congress and the Senate level that going into a single payer system. But this almost never wins. And that kind of distinguishes us from many of the other developed countries in the top ten list we were speaking about earlier. And unfortunately, that's a healthcare waste, which I think is not going to change. Our administrative costs actually amount to almost $230 billion. And if we just reduce about 20% of that, we can insure 20 million additional Americans. And that would really help us. Right.

DR. STRIKER:

Well, it's staggering when you when you put those figures in perspective, it really is. I do want to touch on environmental sustainability, but before we do that, let's let's go ahead and take a short patient safety break.

(SOUNDBITE OF MUSIC)
DR. ALEX ARRIAGA:

Hi, this is Dr. Alex Arriaga with the ASA Patient Safety Editorial Board. Perioperative insulin administration in the pediatric population requires attention to details. There are considerations pertaining to perioperative fasting, insulin formulations and dosing, and management of hyperglycemia, hypoglycemia, and other potential metabolic abnormalities. In addition, insulin pumps and continuous glucose monitors are becoming increasingly common. Attention to principles of patient safety can help avoid preventable patient harm regarding perioperative insulin administration. Avoid excessive reliance on verbal communications over those that are written. Have on ongoing mechanism to review insulin order sets and policies with attention to any insulin ordering practices that may be unclear. Provide clinicians with a means for updated and accessible education on the latest in diabetic perioperative management. By promoting patient safety and best practices in perioperative insulin administration, health care professionals can work together in providing even better pediatric care to the pediatric population.

VOICE OVER:

For more information on patient safety, visit asahq.org/patientsafet22.

DR. STRIKER:

Welcome back. I want to talk a little bit about sustainability. And this is becoming certainly an increasingly important topic for a lot of anesthesiologists, just out of pure concern for global health. But in addition, it's becoming objectively more of a factor than I think it used to be, even when we started talking about it in the ASA a number of years ago, it really has become a greater factor in global health than it was even 15 years ago. And let's start with greenhouse gases. We now know that the health care industry is responsible for about 6% of all global greenhouse gas emissions and air pollutants. Let's go ahead, if you don't mind, and talk a little bit about how this problem is being tackled and what we can do about it in our practices.

DR. SUNDARARAMAN:

Sure. Thank you. The healthcare industry causing contributions to the greenhouse effect is a major, major problem. As you said, 6%--some people give the data as even higher--of the global emissions from the healthcare industry. And of that, 80% of hospital derived emissions come from the supply chain. So procurement of products, sterilization of the or, you know, using even the blanket warmers, using autoclaving and especially incinerator of biological waste, all of these contribute to production of
greenhouse gases. But how is it significant for the anesthesiologist? Right. So anesthetics contribute very significantly to the global greenhouse gases. The global warming potential of volatile anesthetics and nitrous oxide is not insignificant. And to just kind of put it in perspective, if I give one hour of a desflurane based anesthetic, this can be actually compared to driving 200-400 miles in a car and the same amount of greenhouse gases being produced. That's how much we are actually contributing. And if you consider that many of the bariatric protocols actually included Desflurane and so did many of the other anesthetic protocols, this actually presents a facet of an anesthetic which we could potentially change to decrease our carbon footprint. Current recommendations for mitigating the waste anesthetic gas pollution include using low fresh gas flows, avoiding desflurane, avoiding nitrous oxide and preferably using total IV anesthesia. And all of these can produce such a significant change in the carbon footprint we leave behind. And this can be the personal change that all anesthesiologists should seek out to bring about in their anesthetics and hence leave our earth better than we found it.

DR. STRIKER:

How does that practice compare to other countries around the world, the use of volatile agents versus total IV anesthesia? Is there a difference?

DR. SUNDARARAMAN:

So volatile anesthetics and IV anesthetics are used probably comparably in many other countries. But when you consider total perioperative carbon footprint, there is a significant difference between the United States and other countries. And for example, there’s this landmark study, which was published in an ophthalmology journal about a big ophthalmological institute in southern India, which is called as the Aravan Health Care System and the Aravan Health Care System does about a thousand cataracts a day in India, and they still manage to leave only 5% of the carbon footprint when compared to an equivalent number of cases in the US and UK. What exactly are we doing wrong then? Well, Aravan explains it that they have an assembly line system. They reutilize most instruments. They use disposables for essential services and this helps to decrease their carbon footprint. They have also comparable outcomes. That's what makes it so surprising. This is actually extremely mimicable. We can do this in the US too, and hence we can really decrease our carbon footprint. There are other models out there, I'm sure, and if we just look around, we can learn many more ways to decrease our own greenhouse gas emissions.

DR. STRIKER:
Well, let's talk about reprocessing versus single use devices. Are we making any progress shifting from a take-make-waste linear approach to a more circular economy of conservation and reuse that reduces emission and perhaps even saves money?

DR. SUNDARARAMAN:

Yes. In a big study, which was done by Yale researchers, it has been found that there is no difference in infection outcomes between standard sterilized reusable equipment and disposable equipment used in the perioperative area. So when we bring all this data into mind and we change our anesthetic practices to include more reutilization and reprocessing of devices, then I think it will make a significant difference. For example, pulse oximeter cables can be reprocessed, many of them, but we still fail to do so. And hence changing our practices in this regard can really help us bring about a more circular economy wherein reutilization and reprocessing drives down our waste.

DR. STRIKER:

This is something that I know other countries do better than the US. Why do you think that with that data out there that a lot of our organizations and institutions here do not adopt that practice, that we seem to be clinging a lot more to single use disposable devices?

DR. SUNDARARAMAN:

There is a myth that disposable devices cause less infection than reprocessed or utilizable adequately sterilized devices. And we believe in that myth. And unfortunately, that is something which has to be broken so that more people get convinced to use reprocessing devices like what is happening in other countries. In other countries, the economy basically drives them to reprocess and reutilize devices, and hence they have learned that it can be profitable and can give good outcomes. But we have not learned that lesson yet. And that's one thing we have to do. And the other is health care industries themselves have vested interests in making us actually not reuse and buy more stock from them. And I think that's one more thing which has driven our reutilization down.

DR. STRIKER:

Well, the manufacturers on their packaging and their inserts stipulate that these products are only good for single use. They're only going to guarantee them for single use. And then the FDA will mandate that institutions are responsible for anything they reprocess. They're taking on all the risk. And so it seems like from two different angles,
the regulatory and manufacturers, all the risk is being shifted on to the local institution and consequently the practitioners, whether it's the myth about infections or the true medical legal risk that the institutions and the practitioners take on seems like a great burden that might be preventing that kind of a practice from taking hold. What do you think of that?

DR. SUNDARARAMAN:

So if we are to meet these objectives and help in achieving these climate objectives, then we have to make every effort to scale up the circular economy solutions wherein products and resources are conserved and reused throughout rather than just disposed of. We have to have a right to repair movement, meaning that we have the right as well as the wherewithal and the knowledge to repair some equipment without having to return them completely to the manufacturer or dispose of them and then buy new ones. And I think that's what is now being more discussed, especially at the higher levels.

DR. STRIKER:

What would you say to the argument that, well, reprocessing in and of itself is going to generate more waste, more gases? There's cost involved in that, not only financial, but environmental costs. Is it That's not a fair argument. It's a lot more cost environmentally with the waste we're engaging in now as opposed to reprocessing? Or is there is there no merit to that? Or what would you say to that argument?

DR. SUNDARARAMAN:

Oh, it's a very fair question because I used to think the same thing. You know, if we're going to reutilize the instruments and we're going to autoclave or use a sterilizer, we're again adding to the carbon footprint. So is it better to just use disposables then? And that is a fair argument which has been put up quite often. But they have done studies and they found out if you want to balance adequately carbon footprint and health care wastage and cost involved, then one of the better solutions would be to reprocess and reutilise and achieve a more circular economy. So guess it's not exactly one thing versus another, but a sort of a better, healthier balance that we hope to achieve.

DR. STRIKER:

And finally, still relating to this topic, I do want to ask you, what do you think about the idea that this is maybe tough for anesthesiologists? Anesthesiologists in general are taking care of one patient at a time or perhaps a couple patients at a time, depending on the staffing ratios. But we're focused on that individual at that time during during an
anesthetic. And the environmental arguments make a lot of sense from the 10,000 foot view from a global health perspective. But I wonder if it's just hard for some anesthesiologists when it's that patient specifically to say, you know what, I'm not going to use this agent because of environmental concerns. This patient really would benefit from it. And I need to be focused on this patient, and I'm not going to use that reusable device. I don't want to worry about an infectious risk with this patient because I'm focused on this patient. We should be focused on our patients. How do you feel it's difficult for the anesthesiologist individually to make that change on a case by case basis. And and if that is true, if that if that is a barrier, are these things that really should only be handled at a systems level rather than an individual level, because it's hard to ask an individual anesthesiologist to to not focus on that individual patient. What do you think about that?

DR. SUNDARARAMAN:

I think that individual patient care always trumps and we have to tailor our anesthetic to whatever the patient is required. But, you know, most of the cases that are being done currently in this country are one and two cases. Cases where we can establish certain green protocols to help our waste management and our carbon footprint. When it comes to a certain specific patient who has different requirements, we should do what is best for the patient. And, you know, we can't be worried at that point about other things which might affect the environment and waste gases. But for most cases, that's not the case, right? For most one and two patients we can adhere to set protocols wherein we don't use nitrous oxide, we don't use desflurane, and we try to minimize waste. And that's what we should focus on.

DR. STRIKER:

Well, before I let you go, I'd like you to talk a little bit about why this is so important, what you hope the readers will take away from this very vital issue, and what they might learn from it.

DR. SUNDARARAMAN:

What I really want to focus on is that waste is actually costly and our health care waste is costing us. It's costing us from delivering quality care to our patient, it's causing us to actually make changes in our anesthetics because supply chain affects our drug availability and then we kind of work around it. And hence, if we anticipate better modify our practice, we could offer more quality care, which is standardized to the patient while also helping our planet. In this issue, what I mainly aim is to educate to protect our planet at a global level, to initiate awareness about health care expenditures at the
national level, and also hope to persuade you as a listener on a personal level to modify your anesthetics to protect our people and our planet. Thank you.

DR. STRIKER:

Dr. Sundararaman. It is always a pleasure to have you. Thank you for joining us again. And I look forward to when we get a chance to talk again.

DR. SUNDARARAMAN:

Thank you, Adam. It's been a great pleasure.

DR. STRIKER:

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(SOUNDBITE OF MUSIC)

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