



Today, I want to tell you about a bad idea I have that I can't get out of my mind: Let me begin by pointing out that 100 years ago, there were 85 million people in this country. Fifty years ago, there were 168 million and today there are 300 million of us. Is there anyone who doesn't think there are too many of us?

Any time we do something, there are too many of us doing the same thing. Everywhere we go to do something, it's crowded. Everywhere we go there are more people than the space available. Look at the number of kids in our classrooms. If there's a good movie, too many of us try to get in at the same time and the line is around the block. Look at the roads coming into town in the morning. Now, look at the commuters going home at night. Do we all have to do everything at the same time? 128 million Americans commute to work every day and 76% do it alone in their cars at the same hour. Ridiculous. The idea I can't stop thinking about is this: We should rearrange the way we use our 24-hour day. Divide the day into three parts like they do in hospitals. Those same streets that are crowded during the day are empty at night. I say we have to forget about night and day and use the roads all 24 hours. Of course, this would be a major change in our lives. We'd have to find a way to light up everything 24 hours a day. Stores should be open 24 hours a day. So should theaters and restaurants. Buses and all public transportation should run all day and all night. We'd still all work for eight hours - but not the same eight. We might even consider dividing the workday into just two parts instead of three if that would work out better. Workers would all be able to find parking places when they got to their jobs because two thirds of the people wouldn't be there then. If it turns out no one wants one of the shifts because of the time, the pay for those undesirable hours would be raised to make that shift more attractive, again, like

they do in hospitals, or the least desirable shift would be cut to seven hours instead of eight to get more people working then.

It might be a good idea if we had some way of identifying ourselves, too, so everyone knew which work group we belonged to. It could be an article of clothing we wear or some impermanent tattoo on the arm or hand. A person's work group could become a matter of pride...like belonging to a club. There might even be competition between the three groups.

In this new world, we wouldn't all be having breakfast, lunch and dinner at the same time. We wouldn't go to bed the same hours. Television shows would be available when viewers wanted them...not when the networks felt like showing them. People would get used to a reordered life.

Now, I'm not saying there aren't some problems with this idea. For instance, I don't think people who work in different time periods should get married. Or if they did marry, one of them should change shifts. This new schedule might even cut down on the divorce rate in this country. If a husband and wife weren't getting along, one of them could move into another time group. The bed would still only be made once, though.

Not everyone works, but those who were retired or otherwise unemployed would still have to choose one of the three time periods during which they would routinely do chores likeshopping, housework, or lawn mowing. We've got to do something. People are not going to stop having more children than they can take care of and there's a finite amount of space left in America to accommodate all of them. If you disagree with me on this idea, write me a letter but please don't mail it.

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The upper inflection zone of the inspiratory pressure volume curve may give some guidance related to the level of pressure necessary to achieve near-maximal opening of which the lung is capable. Once opened, the applied pressure should be released in stages, using oxygenation and perhaps expiratory deflation mechanics, to identify the appropriate PEEP that sustains full recruitment (decremental PEEP trial). Inspiratory crackles audible in dependent zones during tidal breathing imply the repeated tidal re-opening of lung units. Ideally, PEEP is adjusted until these disappear. Gas exchange measurements may also help to determine when recruitment maneuvers should be attempted again.

Before we embrace the "open lung" concept, it is important not only to understand the principles of recruitment but also to ask whether open lung techniques should be applied - and to whom. Opening and closure of lung units may not always be harmful; when relatively low pressures are required to ventilate effectively and surfactant function is well preserved, any lung damaging effect of tidal opening and closing should be modest. For example, obese patients and those with acute and chronic congestive heart failure normally have basilar crepitations believed to imply tidal opening and closure of small airways. Moreover, almost all experimental data favoring the use of recruitment maneuvers have been collected in models of acute lung injury that are highly "recruitable" (e.g., surfactant depletion and oleic acid injury). In the clinical setting, many critically ill patients with acute lung injury may have very little tissue that is unstable and therefore at risk for tidal opening and closure.

Finally, although recruitment maneuvers may prove instrumental in selecting the PEEP/tidal volume combination to maintain the open lung, it is questionable whether periodic recruitment maneuvers are needed once an optimal PEEP/tidal volume combination has been identified and implemented. In my practice I reserve recruitment maneuvers for instances in which deterioration has been observed, as after airway suctioning or new clinical event requires adjustment of PEEP and tidal volume.

If the goal should indeed be to first accomplish and then maintain maximal recruitment, what else makes sense? Full recruitment might logically be achieved by utilizing the prone position and by providing adequate PEEP and adequate tidal volume at the lowest acceptable level of FIO₂ (so as to minimize the risk of absorption collapse). It also makes good sense to reduce lung edema (and consequently the compressive forces on dependent tissues) whenever possible. In both supine and prone positions, recruitment maneuvers are likely to add significantly to the care of many patients. It remains controversial whether such measures as using sighs, maintenance of a spontaneous breathing pattern, varying tidal volume or modifying the chest wall so as to better redistribute transalveolar forces will prove clinically useful.

How is the Injured Lung Best Recruited?

- Prone position
- Adequate PEEP
- Adequate tidal volume
- Recruiting maneuvers
- Silence excessive expiratory muscle activity
- Biologically variable ventilation (?)
- Chest wall modification (?)
- Lowest acceptable FIO₂ (?)
- Minimize lung edema (?)