

Medical Nanobot Societal Impact Worksheet

What segment of the population do you represent?

What are the positive impacts of nanobots?

What are the negative impacts of nanobots?

Should the nanobots be used at all?

Who will pay for the nanobots (Insurance companies, government, private corporations, individuals, or other)?

Should nanobot use be limited (otherwise terminal patients, for instance, and what about injuries/disease vs. congenital problems vs. old age)?

Who should control the information that nanobots gather?

Identity – Government

You represent the U.S. government, including the Congress which can make laws preventing certain uses of nanobots, and regulatory agencies like the Food and Drug Administration, which can enforce those laws. Your primary motivations are:

- Protect the American people from harm (even if they want otherwise)
- Promote and preserve American technological superiority

As you decide how you think medical nanobots should be used, consider the following:

- Working nanobots are an exciting new technology with many benefits. The Congressional Committee on Advanced Technology is highly encouraging development by American firms.
- By the same token, the Department of Defense urges taking precautions to prevent nanobots from falling into the hands of competitors in other countries.
- More seriously, nanobots should not fall into the hands of people who might use them to do harm. A nanobot that cleans cholesterol from arteries might be modified to damage those arteries. The National Security Agency (NSA) is recommending tight security around the use of nanobots.
- Concerns have developed within the National Institutes of Health (NIH) that overuse of nanobots may result in diseases that can actually attack nanobots. Some NIH researchers are suggesting that nanobots be used sparingly, only when conventional medical treatment would fail.
- Concerns have arisen within the Drug Enforcement Agency (DEA) that nanobots might be able to modify the brain and thus become a kind of drug. Some DEA officials are suggesting that nanobots be banned altogether.
- Recent budget cuts means that there is little funding available for use in building special, controlled facilities at which nanobots can be safely used.

Note: you may come up with additional ideas, so don't feel limited by the list above. Also, it is OK if different members of your group feel differently. Try to come to a compromise. If you can't, tell the other groups about your differences of opinion.

Identity Sheet – Insurance Industry

You represent the insurance industry, including both small companies and large Health Maintenance Organizations (HMOs). Your job is to pay for medical procedures on behalf of patients. Your primary motivations are:

- Ensure that covered patients get the medical care they need.
- Control as much as possible decisions about necessary medical care.
- Keep medical costs as low as possible to insure maximum profits.

As you decide how you think medical nanobots should be used, consider the following:

- Medical nanobots may offer a significant new tool in improving people's health.
- However, nanobots will probably be very, very expensive.
- Nanobots will likely require special hospital rooms to prevent their escaping into the environment and patients with nanobots in their bodies may not be allowed to wander freely – which means possibly long and expensive hospital stays.
- If the use of nanobots is to be covered by insurance, the cost of insurance will likely be very high.
- Mandating that all insurance coverage include nanobots will likely make insurance too expensive for most people or bankrupt the insurance industry.
- If insurance companies pay the bill, decisions about when to use nanobots needs to be carefully considered.
- Medical information gathered by nanobots (provided you have access to that information) may help with decisions regarding who should be covered by your insurance.
- Despite their initial cost, widespread use of nanobots may actually lower medical costs in the long run by preventing serious illnesses at an early stage – for instance, by eliminating build-up in arteries and years of heart problems and medical bills.

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Identity Sheet – Health Care Workers

You represent the health care workers employed by hospitals, including doctors, nurses, and other support staff. Your primary motivations are:

- Ensure that your patients get the medical care they need.
- Protect your role as decision-makers regarding medical matters.
- Make certain that the hospital is a safe workplace, with as little risk to workers as possible.

As you decide how you think medical nanobots should be used, consider the following:

- Medical nanobots could save lives and improve patients' health.
- Nanobots may encourage people to act irresponsibly (by smoking for instance) on the assumption that nanobots will fix the damage.
- Nanobots also raise serious problems-for instance, could they one day replace surgeons by automatically fixing what goes wrong in the body?
- Medical decisions are very complex. Careful thought should be given before machines are allowed to take away some of the decision making from physicians and patients.
- Likewise, privacy is important. New regulations may be necessary to maintain confidentiality.
- The use of nanobots may pose a danger to health care workers if they are not handled very carefully.
- Since nanobots cannot be visually examined by health care workers to make certain they are in working order, who should be responsible for any damage resulting from their use.

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Identity Sheet – Patients

You represent patients seeking medical care. There is not simply one kind of patient, so try to be aware of the different needs and financial resources among your group. Elderly patients may well have different interests than younger ones. Wealthy patients will have different resources available than those with more modest incomes. With these differences in mind, your primary motivations are:

- Make sure that you can get the medical care you need.
- Ensure that you have a say in what kinds of care you need.

As you decide how you think medical nanobots should be used, consider the following:

- Presently, medical costs can be so high that many people cannot even afford insurance. Nanobots may improve our health, but may also increase medical costs dramatically.
- Given the possibilities of nanobots to make life longer and better, should they be available to as many people as possible?
- Because nanobots can provide so much benefit, should insurance companies pay for their use? Is it wrong to deny nanobots to people who need them?
- Some people believe that since government funds were used to develop nanobots, the government should make nanobots equally accessible to everyone.
- Is it possible that nanobots could create two classes of patients—those that can afford nanobots and those that cannot. Patients who can afford nanobots might benefit whereas those without nanobots may suffer due to outdated medical treatments and equipment.
- Should people who want to use nanobots for non-life saving purposes (for instance, cosmetic surgery) be allowed?
- Whose property is the information nanobots gather about your body?

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Identity Sheet – Nanobot Manufacturer

You represent a company that has developed medical nanobots and is seeking to begin using them. Your primary motivations are:

- To provide a valuable product to consumers.
- To generate profit for stockholders.

As you decide how you think medical nanobots should be used, consider the following:

- The development of medical nanobots has not been easy or cheap – many nanobots must be sold before you can begin to show a profit.
- Nanobots can drastically improve the lives and health of many people, and you would like to encourage their use as much as possible. Such widespread use will also ensure maximum income.
- You want your nanobots to be the only ones for sale. You therefore do not want your designs to fall into the hands of competitors who might secretly use them to further their own research.
- Your engineers assure you that it is virtually impossible to have any defects in the nanobots you make. Nor do you decide when to use them. So are you responsible for any damage resulting from their use?
- Some people in your legal department are concerned that you still do not know enough about the long-term effects of the use of medical nanobots. They worry that such long-term use may cause damage and open you up to future lawsuits. They suggest not selling nanobots until long-term studies can be conducted, which may take ten or twenty years.
- Your company developed nanobots and therefore you do not want government controlling them.

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