"Finding The Cure"

"Ladies and Gentlemen, the Franklin Marshall Lewis Memorial Prize is awarded for successful practical application of theoretical development in cancer research technology, and the name of this year's recipient is a name that's very familiar name to most of you.

"She's previously been awarded the Washington Medical Association's Outstanding Physician Award and the Amundson Medal of Merit. She holds the Kittering Research Chair at the University of Washington Medical School. She's a National Science Foundation Teaching Fellow. She's also on the Staff and the Advisory Board of the Fred Hutchinson Cancer Research Center. In addition to these distinctions, she's a loving wife, a devoted mother, and cares for a menagerie of pets; namely, two dogs, two cats, a pair of cockatiels, and, I'm told, a duck and her ducklings have recently taken-up residence in the back yard of her home.

"Ladies and Gentlemen, I am pleased and proud to present this year's winner of the Franklin Marshall Lewis Memorial Prize, Dr. Andrea Moore-McIntyre."

As the sound of applause began to swell, Andrea stood at her seat on the dais, smiled to the audience, walked three steps to the podium, and extended her hands to accept the engraved Stuben Crystal bowl. She accepted the bowl, then held it toward the audience, making a special gesture with the bowl in the direction of the tables populated by her family, her closest colleagues, and those oft-unmentioned, but exceedingly essential, lab technicians. She put the bowl down on the table next to the podium, turned to the microphone and said, "This darn bowl is heavier than I thought."

The presenter leaned in toward the microphone and remarked, "Maybe the check for $150,000 that's *inside* the bowl is what makes it so heavy, Andie."

The audience laughed, and so did Andie.

"Gee, thanks, Phil. My family didn't know anything about the check, until just now. Boy, am I gonna hear about it when *I* get home!" Again, the audience laughed. Andrea waited until the laughter died-down, then continued, "Well, folks, I have to begin by saying that I'm happy and honored to have received this award. But even though my name is the only one on this bowl, all of you know that achievements in this field that are attributed to one person, are, in all reality, the result of successful teamwork, and I'm just fortunate enough to be on the right team.

"As a matter of fact, I didn't even recruit or pick all of the members of the team. Several members on the team were recommended to me by valued colleagues, and I accepted these team members based purely upon those recommendations. Some team members literally forced themselves on me. They just wouldn't take 'No' for an answer.

And of course we all know that not being able to accept defeat is a required trait for those of us in cancer research. So, when I would say that there wasn't room on the team, these resourceful individuals would suggest new positions and new functions that I hadn't even thought of, but would turn out to be positions and functions that were needed. When I would tell them that there wasn't enough money for another team member, they would go out, on their own, and find the money that could be used for their own salaries! And there's one very special person who, when I told her that she had a reputation for being difficult to work with, put herself into therapy just to get on our team—where she is now a valuable and well-loved member on the team.

"So, on behalf of all of the people on the team, I want to thank the award committee for choosing me to receive this highly prestigious award; and you can all rest assured that my team, my 'scientific family', is going to get first dibs on this check because I *know* the kind of things that they'll be asking for. They'll ask for some new, and sorely needed, lab equipment. They're going to want to buy computer time on some very expensive computers in order to analyze some very complex research data. They're going to want to buy something special for the children in our cancer wards.

"Now, this doesn't mean that my husband and my children, my 'at-home family', would only want spend this check on frivolous things because anyone who knows them, knows that I'm blessed with a wonderful, supportive, and unselfish family at home, too. So, I have to make sure that there's some money left over for them because they also make lots of sacrifices. They tolerate having a wife and a mother who's not always around when they want her to be. They put up with the telephone ringing at all times of day and night. They put up with my 'scientific family' dropping in—sometimes unannounced, I might add—morning, noon and night. They put up with me not always being as attentive and even-tempered as, perhaps, a full-time wife and mother might be. They put up with all of this because they know the arena that I work in, and they know the stakes. They know that it's going to take long hours and hard work for the medical and scientific communities to 'turn the corner' on cancer, to get that one 'big break' that will make all the long hours and hard work pay off. They know that there's one thing that all of us in this room are working so hard for: The Cure."

Applause erupted from the audience, and after it died down, Andrea closed with, "I look forward to the day, hopefully in my lifetime, when we talk about cancer the way we now talk about…bubonic plague or polio; namely, a dreaded disease of the past. Thank you, and good-night."

Once she got into the car for the ride home with her family, Dr. Andrea Moore-McIntyre is just plain "Andie" or "Mom". She's no longer the world-renown, highly respected cancer researcher and medical practitioner. Sure, her family knows that she often gets mentioned or quoted on NPR, occasionally she appears on TV, and once, got her picture in *Time Magazine*; but these accolades don't give her exemption from having to contend with children who complain about their homework or cleaning their rooms, nor is she exempted from having to cope and compromise with a husband who occasionally expresses feelings of emotional and physical neglect. For the most part

though, Andie's family *is* very understanding and supportive; nevertheless, with regard to *some* family matters, they don't agree with her decisions or her judgment.

Eric, her husband, *does* want to go back to Mazatlan, where they had their honeymoon because he believes that the trip will put some "zip" and some romance back into their marriage. Mark, her son, "is dyin'" for a new skateboard—even though he's already broken his arm and badly sprained his ankle while engaged in this activity—because he says he's "gonna turn pro". And Leann, her fourteen-year old daughter, says she wants to go to Disneyworld before she gets too old to really enjoy herself at an amusement park, but she also feels that she's old enough to go out on a date and stay out until midnight.

And, just like every other working parent/spouse, Dr. Andrea Moore-McIntyre, a.k.a. Andie, a.k.a. Mom, a.k.a. Babe deals with all of this as best she can: Some successes, some failures, and sometimes there's no noticeable difference or definitive result whatsoever.

So, while Andie's personal life returned to normal just as soon as she left the banquet hall, her professional life didn't return to normal until the following morning. There was still a mass of paperwork stacked on her desk. Her research funding sources were expecting quarterly reports about the progress in her lab experiments. There were the usual round of staff and faculty meetings to attend. There were graduate seminars and classes to teach. There were staff employee interviews and performance evaluations to conduct. And there were always a number of individuals who needed to receive a little motivation—supplied by either a "kick in the ass" or a "pat on the back", and Andie was both qualified and prepared to provide whichever course of action would be the more appropriate and/or effective.

Several days after the awards banquet, Andie was pensively walking down the corridor on her way to her research lab located in the West Wing of University of Washington Hospital. The long corridor was lined with medical research labs. Andie was mentally sifting through some of the data that she and her graduate student medical research team needed to review during this session, so she just barely missed being hit by a door to one of the labs opening into the corridor. (Doors opening into the corridor was a design flaw that she, and others, often noted, but no one had ever made a written, formal complaint. After all, they weren't engineers. They were medical people who were so concerned with what went on *behind* those doors that the doors themselves were a secondary consideration. Besides, no one had ever been seriously injured, and the design flaw was always a constant and reliable topic for idle conversation.)

This time, however, Andie was lucky that she wasn't knocked down. And as she caught a glimpse of the individual who'd come bowling-out from behind the door, she recognized Dr. Les Fowler, a close friends and colleague.

"Whoa there, Les. What's the rush? Where's the fire?"

"Hey, Andie, it's you. Wow! This is great! I'd hoped that you were somewhere in the building. I was just about to have you paged."

"Why? What's up?"

"I want you to see something that me and my 'lab rats' have been working on. We've been trying something new and have gotten back some results that… Well, I'd like you to take a look, and tell me what *you* think."

"Sure, Les, I'd love to, but I was just on my way to *my* lab. Do you need me right now?"

"Now *would* be a really good time because everyone's here, you know, just in case you have any questions; and unless you ask some questions that require either complex or lengthy answers, it should only take you, maybe, ten minutes to review the whole experiment.

"Ten minutes? Really?"

"Really."

Andie looked at her watch, then said, "Okay, I guess I can give you ten minutes, but not much more than that, so let's go take a look-see."

As Les and Andie entered the lab, the milling lab assistants turned their heads and nodded, in greeting, or acknowledgment, or approval. And as Les led her to the first station, the lab assistants fell in behind her just like the ducklings in Andie's back yard fell in behind "Mama Duck". Les led Andie through the stations, each of which was either a microscope holding a slide or a computer screen showing a series of graphic images, and each station usually had an accompanying sheaf of computer printouts with neat lines of numeric data, but sometimes, additional data was scribbled in the margins. At some stations, Les made brief comments or gave a brief explanation. And after they'd completed a tour of the entire experiment, consisting of three lab benches, everyone in the room could tell that Andie was impressed, so much so that she insisted on going through the entire circuit a second time.

After she'd completed the second circuit, Andie addressed the group. "I'd say that congratulations are in order, here, because it appears to me, on just a cursory examination, that you all may have made a significant breakthrough. And as wonderful as that may be, I have to caution you to do a couple of things—and I don't mean to sound condescending because you're all professionals, and I'm merely reminding you of some things that you already know. First of all, check and re-check, and then check again, all of your measurements and observations, then be absolutely certain that your documentation accurately reflects your data. And finally, tell *no one* what you've accomplished here, until the results are in the hands of whoever's going to publish your findings because, as I'm sure you know, it is through the process of publication that the

scientific community acknowledges both the existence *and* the validity of your work. So, other than that, I can only say, 'Good work', and I hope that the final results are as bright and potentially beneficial as what I've seen here today."

Andie shook a few hands on her way out of the lab, then continued down the hallway to her own lab. Along the way, she entertained some thoughts about how she might be able to incorporate some of Dr. Fowler's ideas into her own research, and she considered what some of the results might be. But since Dr. Fowler's approach was so different than her own, Andie didn't see any immediately possible applications which wouldn't require her to shut-down her current experiments in order to incorporate Dr. Fowler's methodology and procedures. So, by the time that Andie opened the door to her lab and greeted her assistants, she'd already discarded the possibility of incorporating Dr. Fowler's ideas.

Andie also recalled, from her days as a lab assistant, that there is an information grapevine among lab assistants, such that one, or several, of her lab assistants were probably also aware of what was going on in Dr. Fowler's lab. But she also knew that almost all lab assistants adhered to the unwritten code of not revealing what one learned about what was going on in another lab—no matter how exciting or ground-breaking it might be.

Andie entered her lab, apologized for being late, then sat down with her assistants at the work/lunch/conference table, whereupon they began discussing the status and future direction for the current round of experiments. After the discussion ended, Andie returned to her office. She recalled and felt slightly envious of Dr. Fowler and his potentially valuable breakthrough in cancer research. She was also happy for him and happy for cancer patients everywhere; nevertheless, she knew that she'd feel a lot happier if *she* had a breakthrough of her own—this feeling being a function of pride, ambition and desire—but when it came right down to it, everyone in cancer research and treatment is of the same mind: A breakthrough by anyone is a benefit for everyone!

When Andie arrived home from work that evening, she was welcomed by appetizing odors coming from the kitchen, indicating that someone had already taken care of the evening's meal. (Eric and the kids had become accustomed to either preparing a meal, or gathering and prepping the constituent elements of a meal, if they wanted to have dinner before eight o'clock at night because Andie rarely arrived home before six. Her family had long since gotten over their resentment of these circumstances and had come to accept the situation.) Upon entering the kitchen, Andie could see that either Eric or the kids had prepared a simple, but nutritious, dinner. It was also apparent that Eric and the kids had already eaten their dinner; for, hers was waiting for her, as usual, on the kitchen counter next to the stove, and there was a note right next to her plate informing her that Eric had gone to a meeting, Leann was visiting a friend, and Mark was at karate practice.

Andie went upstairs, changed clothes, checked the phone messages, and came back down to the kitchen to eat. During the course of these activities, she wondered—

and not for the first time—when and how her family had become so… dysfunctional. Sure, there were no extreme indicators like violent behavior, frequent and/or loud arguments, or serious neglect, but in fact and for example, she didn't even know if her children had experimented with drugs. (She hadn't observed any indicators that either of them were "using", however based upon their general personality types, she suspected that Leann had experimented, but Mark hadn't.) Andie also didn't know how far either of her children had gone in their experimenting with sex—she assumed that, based upon age and personality, both of her children had experimented to *some* degree.

The only time that the family ate dinner together was on holidays. They all had their separate interests and activities to keep them occupied. They had ceased to be a close-knit family and had become more like "housemates". Andie was all too aware that this was not how she and Eric had planned to live their lives.

These brooding thoughts about her family caused Andie to feel somewhat depressed, so that when her meal caused blood to relocate from her head down to her stomach, in order to facilitate the digestive process, she began to feel drowsy, so she decided to go to bed early and watch TV, until either Eric came home, or she fell asleep.

She went upstairs where she washed her face and brushed her teeth; put on a nightgown; climbed under the covers; turned on the TV with the remote; flipped through the channels; chose a vapid, and therefore boring, and therefore sleep-inducing, program; whereupon she promptly fell asleep. Later, when Eric crawled under the covers, Andie awoke briefly and ever so slightly—just enough to kiss him on the cheek and snuggle-up next to him.

During the quiet hours, Andie was awakened by a strange dream. Once awake, she felt thirsty. She got out of bed and padded down the hallway and down the stairs to the kitchen. She got a glass from the cabinet, walked over to the commercial-type water dispenser, drew herself some water, and drank. One glass didn't slake her thirst, so she drank another, and then another. The cold water going down her throat and into her stomach brought her into a more alert state of wakefulness. It was more than she'd anticipated, and frankly, more than she desired. She hadn't meant to drink so much water because she knew that it would probably make her have to get up to pee that much sooner, which meant that she'd have to awaken again, just that much sooner. Then, something about the phenomenon of extreme thirst "clicked" in her mind about the way the cancer cells have a voracious "thirst" for nutrients. However, cancer cells lack the capacity, or propensity, (almost like, lacking a "desire") to generate healthy tissue from the consumption of nutrients. This thought reminded her of the novel and creative methodology that Dr. Fowler was employing in his apparently successful laboratory experiment. Next, her mind began to toy with the possibility of combining of the "thirsty cancer cell" metaphor with Dr. Fowler's approach. Now, Andie was fully awake, and her thinking was beginning to accelerate. She began pacing in the kitchen, but as her mind began expanding and exploring possibilities, the kitchen soon became too confining; so she paced between the kitchen and the hallway that lead to the adjacent TV/rec room. Shortly thereafter, as her excitement grew, Andie began pacing outside in the warm

summer air under a bright full moon. She paced across the patio and around the back yard. She could *feel* herself making progress. She could *feel* the beginning of something wonderful happening in her mind. Her whole body began to tingle. It was like watching a Roman candle beginning to burn—from the inside! She almost felt like giggling with glee as pieces of a solution to a vast, complex, and heretofore unsolved puzzle began to coalesce. The human, societal, medical, and personal/professional implications of what was going on in her mind were almost as mind-blowing as the birthing process of the solution itself! And the "solution itself" was a growing, almost glowing, mental picture of chemical formulae, forming a beautifully symmetrical lattice, almost as complex and elegant as Watson and Crick's double helix. And as this lattice advanced toward its fulfillment, Andie's pacing became more energetic and consumed more space, until she eventually realized that she couldn't complete the mental picture within the confines of her back yard. The elegant complexity of the solution required a grander "canvas" for its completion. Dr. Andrea Moore-McIntyre would have to leave her house and back yard and go walking into and onto the clean, natural "canvas" along the shores of Lake Washington. It was a perfect night for such a walk: a warm gentle breeze blowing onto the shore from the lake, a huge full moon hanging in an inky-black sky, the moon's silvery reflection dancing on the waves of the lake.

Andie hastily donned a jogging suit and left her house almost at a run, somewhat fearful that the digression of dressing might short-circuit her thought processes. But her fear was unfounded; for, in her mind, the concept continued its crystal-like growth toward completion and fulfillment.

As Andie fast-walked along the shore of Lake Washington, the mental picture/process of crystalline thought began to partake of, and be reflected in, the natural harmony between air, water, light and land. This glorious macro-micro exchange filled Andie's mind; such that, she became almost oblivious to, yet totally immersed in, her surroundings. Then, in what felt like "all-of-a-sudden", Andie found herself standing on a spit of land that jutted out into the water on the far eastern shore in Seward Park—land surrounded by water, like a lymph node surrounded by tissue. The solution to The Cure for cancer was clear in her mind. The solution was so clear, so natural, and now, so seemingly simple, that Andie *knew* that she wouldn't forget it before she returned home. She knew that she wouldn't *ever*, <u>couldn't</u> ever, forget it! The experience of discovery was a fulfilled epiphany.

Andie said a brief prayer of thanks, took a deep breath, and calmly turned to go back to her house and enter into her computer what her mind had already accomplished. She had taken less than a dozen steps when she heard footsteps behind her. She turned and saw a dark figure striding toward her. It was a man—she could tell that much. But Andie felt no fear, for she had just overcome not only her own greatest fear, but the greatest fear of generations of scientific and medical minds: The fear that no one would ever find the cure for cancer. Thus, at that moment, Andie felt only love for all fellow human beings. She still felt that love as the faceless man raised his arm. She was still feeling that love as the lumpy piece of driftwood in the man's hand came crashing down against the side of her head. Andie lost consciousness.

The following morning, an early-morning jogger literally tripped over Dr. Andrea Moore-McIntyre's dead, brutally beaten body that had been heedlessly discarded beside a path in a heavily wooded part of Seward Park.